

SESSION VI

***SERVICES AND INTELLECTUAL PROPERTY
RIGHTS***

**PATENT SYSTEMS IN APEC: ROLE IN NONTARIFF TRADE BARRIERS
AND STRATEGIC TRADE POLICY**

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Abstract: Do differences in national patent systems constitute nontariff barriers to trade (NTBs)? Are national patent systems an instrument of strategic trade policy (STP)? Is the harmonization of patent systems necessary to reduce patent-related NTBs and STPs? This paper describes the state of patent laws across APEC nations, examines case studies of patent-related NTBs and STPs, and assesses whether patent harmonization in APEC will help reduce trade distortions. It is argued that some patent reforms are needed to reduce or avoid patent-related NTBs and STPs, but that the harmonization of patent laws itself is a limited solution. Patent *laws* per se are often not the source of trade distortions, but rather the *practices* of strategic private and public interests. More attention needs to be shifted to competition rules and to determining which features of patent systems are most conducive to social welfare.

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I. Introduction

"And?"

"The Japanese had already patented the products. In Japan."

"You mean they already had the algorithms?"

"No. They just had patents. In Japan, patenting is a form of war. The Japanese patent like crazy. And they have a strange system. It takes eight years to get a patent in Japan, but your application is made public after eighteen months, after which royalties are moot. And of course Japan doesn't have reciprocal licensing agreements with America. It's one of the ways they keep their edge.

"Anyway, when I got to Japan I found Sony and Hitachi had some related patents and they had done what is called 'patent flooding.' Meaning they covered possible related uses. They didn't have the rights to use my algorithms - but I discovered I didn't have the rights, either. Because they had already patented the **use** of my invention."

-- Rising Sun, Michael Crichton
(NY: Ballantine Books, 1992), p. 202.

The Asia-Pacific Economic Cooperation (APEC) has been formed to pursue, among other things, greater trade and technological cooperation. An important consideration in this pursuit is how well established intellectual property rights are, for such rights influence the market access and market share of domestic and foreign interests. In addition to the fictional novel Rising Sun, a number of surveys of U.S. corporate officials have expressed concern that countries (particularly Asian and especially Japan) are using patent policies as part of some strategic industrial plan, and that such behavior is a threat to free trade.¹ Thus a concern is that unless international patenting conflicts are addressed, some of the objectives of APEC might be undermined.

This paper reviews patent systems among APEC members and examines whether differences in patent laws and policies might constitute *nontariff barriers to trade (NTBs)* or enable nations to use patent policies as instruments of *strategic trade policy (STP)*. The paper then considers whether the *harmonization* of APEC patent systems could reduce the use of patent laws and policies as NTBs or STPs. Thus a contribution of this paper is in helping to assess the level of priority that patenting matters should receive in APEC negotiations.

The main findings of the paper are as follows: there are ways in which patent systems can be used as NTBs or STPs, and there have been instances where they were used as such. However, it is argued that harmonizing international patent laws is a limited solution. In many instances, it is not the laws per se that are the sources of trade conflicts, but the ways the laws are practised. Secondly, not all patent-related barriers to trade are the result of *public* strategies but of *private* (corporate) strategies, which fall outside the scope of public laws.

First, a few remarks on a working definition of NTBs or STPs. As Olechowshi (1987, p. 120) points out, they are easier to define by what they are not than by what they are, and offers as a working definition: "all public regulations and government practises that introduce unequal treatment for domestic

¹ See, for example, GAO (1993) and Oppenheimer and Tuths (1987).

and foreign goods of the same or similar products." The UNCTAD classification of NTBs rests on this sort of working definition. In addition, Laird and Yeats (1990, p. 16) point out that "intent [should be] a factor used for the identification of nontariff barriers," but that "intent cannot be determined without ... [an] investigation of their nature and actual operation." In other words, the discrimination may not exist in any of the properties of a policy measure but in the way the measure is applied.

The relevance of the above remarks for the study of trade and patent systems is that, first, both *public* and *private* measures may restrict trade or lead to discriminatory domestic and foreign treatment. Often, reports of international patent conflicts have failed to distinguish between actions caused by governments and those by private agents (e.g. corporate strategies). This has implications for global patent harmonization in that legal reforms which set standards for government actions only will have limited effects on reducing trade impediments.

Secondly, on the issue of *intent* to intervene or discriminate in trade, patent laws can be either inherently discriminatory (for example, when foreign evidence is outlawed in national court) or discriminatory in operation (for example, when certain types of inventions - e.g. pharmaceuticals - are declared unpatentable, thus hurting foreigners who tend to invent them and benefiting domestic inventors who tend to imitate them). More difficult to establish are cases where the laws or execution of the laws are applied to both domestic and foreign patentees (i.e. national treatment) in a non-discriminatory and transparent way, but nonetheless the system favours domestic inventors. For example, to the extent that the domestic system has features which foreign systems do not have (such as opposition to a competitor's patent grant, or native language requirements), domestic agents may be better able to utilize their system (that is, to win patent grants). In these cases, governments might be fully aware that their systems give domestic inventors an advantage but do not change their laws. Other patenting difficulties that foreigners face might better be categorized as *unintended* structural impediments to global patenting (for example, registration procedures, trial procedures, fees, and staffing problems).

Despite the potential for patent laws or practises to act as trade barriers, the UNCTAD classification of nontariff trade barriers does not include patent policies.² There might be several justifications for this. First, overall cases of patent policies used as an NTB/STP might be relatively very small compared to other policies like government procurement or standards. Secondly, patent policies are not, for the most part, "border" measures. Patent policies determine internal (national) and global market shares and access. Thirdly, patents affect trade flows rather indirectly. Patents are more concerned with trade in "ideas." *New* patents issued, for example, do not translate into commodities or services until reduced to practise, if at all and usually with some time lag. Trade flows are affected when counterfeit or infringed products violate *existing* patent rights.

A few related literature should be mentioned. A number of studies have raised the issue that disharmony in international patent laws may constitute NTBs.³ These studies do not, however, go into the details of patent systems in order to examine the sources of international conflict, as in this paper.

² See Table 2.1 in Laird and Yeats (1990).

³ See, for example, Stern (1987), Oppenheimer and Tuths (1987), Tussie (1993), Tyson (1993), and Primo Braga (1996).

Secondly, there are some empirical work on whether stronger patent rights encourage or impede trade.⁴ These studies, however, cannot indicate whether differences in patent regimes have acted as NTBs, for the following reasons: the empirical studies focus on an aggregate index of patent rights. As discussed in this paper, it is not the overall level of rights that discriminate in trade but the composition of rights (that is, the individual features of patent systems). Furthermore, their unit of analysis is the firm (exporter), and the focus is on how patent rights affect the profit-maximizing export behavior of firms. In the case of NTBs and STPs, the unit of analysis is the government, and the focus should be on how governments choose patent system features or policies to block imports or shift rents to domestic industry.⁵

The next section reviews some trends in intra-APEC patenting. It also reviews some basic features of patent systems and describes how these features differ across APEC. Section III examines cases of international patenting conflicts and examines which features of national patent laws, if any, played a role in the conflicts. These cases help to shed light on the extent to which patent systems have been used to restrict imports or foster domestic firms - that is, used as NTBs or STPs. Section IV, in light of the cases discussed in section III, evaluates whether patent harmonization is likely to be effective at minimizing international patenting conflicts.

II. Trends in Intra-APEC Patenting and APEC Patent Systems

At present, intra-APEC patenting activity is rather modest. Table 1 shows patent applications received by APEC members from domestic inventors, other APEC members, and total foreign inventors, in 1980 and 1990.⁶ Patent application data are useful in showing where inventions come from and where they go. Furthermore, by disclosing technical knowledge, patent applications are a useful source of knowledge spillovers; otherwise, should inventors not apply for patents, new pieces of knowledge would remain trade secrets, unless they are leaked or discovered through reverse engineering. Of course, there are some limitations with patent application data. They, for instance, do not capture all the flow of new inventions. Some new inventions are not patented, either because the subject matter is unpatentable (for example, biogenetic discoveries; weapons; toys) or because the inventor chooses to keep them secret. The quality of inventions is also not accounted for. A modest invention and a major invention each get counted as one new patent application. Thus a rise in patenting could be due to a mixture of increases in quantity and quality. Finally, not all inventions are marketed or manufactured (i.e. they may be "sitting on the shelf"). An increase in patenting activity need not suggest that society is utilizing newer technologies.

Subject to these provisos, the data in Table 1 provide some indication of the extent of intra-APEC trade in "ideas." The U.S. and Japan are the largest sources of new ideas, as well as being the prime destinations. While there has been a significantly greater rise in total foreign and intra-APEC patenting than in domestic patenting (with the exception of Japan), most of the new ideas tend to flow among the richer members of APEC (Australia, Canada, Japan, Korea, and the U.S.). There are several possible

⁴ See Maskus and Penubarti (1995) and Smith (1996).

⁵ One could argue that this empirical literature captures the *effects* of government patent-related NTBs on trade *indirectly*. To the extent that patent-related NTBs restrict trade, they should be reflected in the data.

⁶ Absent from the table are Brunei, China, Papua New Guinea, and Taiwan, for which data are not available.

Table 1. Intra-APEC Patenting*1990 Patent Applications from:*

	Domestic	APEC Members:						Total
	Residents	Aus	Can	Jpn	Mex	New Z	USA	Foreign
Aus	6948	—	520	1895	6	148	8681	19559
Can	2782	612	—	4444	8	29	16832	35135
Chile	191	8	14	11	2	4	285	642
H. Kong	21	6	2	273	n/a	1	404	1060
Indon*	49	20	4	144	n/a	2	259	731
Jpn	333373	637	663	—	7	33	19578	43419
Korea	9083	365	332	7346	5	1	7360	22304
Malay	92	57	32	357	1	5	912	2213
Mex	750	24	71	124	—	6	2893	4539
New Z	802	361	77	141	1	n/a	1699	3869
Philip	147	44	3	173	1	1	960	1822
Singa*	4	13	7	233	n/a	5	371	1003
Thai	73	47	12	360	1	—	813	1867
USA	91410	1398	3683	35771	76	105	—	84690

1980 Patent Applications from:

	Domestic	APEC Members:						Total
	Residents	Aus	Can	Jpn	Mex	New Z	USA	Foreign
Aus	6582	—	183	1015	7	181	3883	9354
Can	1785	233	—	2018	18	37	13125	23189
Chile	140	n/a	n/a	n/a	n/a	n/a	n/a	685
H. Kong	10	7	6	142	0	0	240	723
Indon	5	17	4	60	0	3	174	475
Jpn	165730	154	271	—	20	27	10391	25290
Korea	1241	21	9	1622	1	2	1151	3829
Malay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mex	665	0	2	56	—	5	340	4132
New Z	1148	235	28	69	0	—	857	2290
Philip	119	48	15	192	1	5	654	1454
Singa	2	13	2	98	0	1	233	631
Thai	18	8	1	35	1	1	69	184
USA	62098	517	1969	12951	77	119	—	42231

Notes:

* indicates data from 1985

n/a indicates not available

Total Foreign indicates total non-resident applications (including from APEC members)

Source:

WIPO (1980, 1990)

reasons why new ideas tend to flow less to the rest of APEC. First, the markets may be small; for example, while Hong Kong and Singapore are fast growing economies, their markets (other than their financial markets) may be considered relatively small. Secondly, the patent rights may be weak (or application procedures unwieldy) to attract patent applications. Thirdly, the risk of imitation might be low enough that inventors believe they can introduce their inventions without the need for a (costly) patent. It remains to be seen whether improved economic relations within APEC will enhance intra-APEC patenting, due say to an increase in market size, patent rights, and scientific capability.

Currently, patent laws vary across APEC members, although there has been a greater convergence of standards recently owing to the Trade-Related Intellectual Property Rights (TRIPs) agreement. This can be seen from some measures of overall patent protection levels shown in Table 2. The patent rights indexes range from 0 (no protection) to 5 (strongest protection).⁷ Between 1980 and 1990, patent protection levels diverge somewhat due to a strengthening of rights in countries that already provide strong protection, but by 1995, the overall levels converge, as measured by the standard deviation. Generally, patent protection levels are highest in those APEC nations that, as shown in Table 1, are the major recipients of international patent applications.

There are, of course, some major limitations with the patent rights indexes shown in Table 2. First, the levels refer to "laws on the books," that is, to statutory provisions. They need not reflect the "actual" level of protection since there is no indication of how laws are actually carried out or have been carried out. Secondly, the indexes aggregate patent features. Often it is the individual features that are the subject of trade controversy. For example, both the U.S. and Japan rate very highly in terms of providing overall patent protection, but their differences in patent system details give rise to suggestions that their patent laws act as barriers to trade. Thus, to analyze issues pertaining to NTBs and STP, it is important to disaggregate patent systems by their features.

The differences in overall *levels* of protection are important nonetheless, particularly between the strong patent rights countries (usually the developed) and the weak (usually less developed). Weak patent rights nations can, for example, by imposing compulsory licensing, providing lax enforcement, or citing public interest claims, divert the market away from foreign nationals who own patent rights to local domestic producers, and thus distort international trade. Weak patent rights nations can discriminate against foreigners even when adhering to the national treatment principle, provided the same low levels of protection are provided to both domestic and foreign innovators. This favours domestic producers (at the expense of foreign) if domestic producers are imitators.

Thus differences in *overall* levels of patent protection are still relevant in so far as there still are some APEC members with very weak or no patent laws. For example, Papua New Guinea does not yet have a patent system; Indonesia joined the Paris Convention in 1970, but did not have patent laws until

⁷ The measures are based on Ginarte and Park (1997) and Rapp and Rozek (1990). Both indexes are similar in rating national patent laws on the basis of whether certain patent rights and enforcement provisions exist. The indexes differ in their method of scoring. The Ginarte-Park measure allows for more variability. They also differ in the coverage of countries and time periods. The Rapp-Rozek covers more countries but only a single time period.

Table 2. Index of Patent Rights among APEC members

	1980	1990	1995	1984*
Austral	3.23	3.32	3.63	4
Brunei	n/a	n/a	n/a	4
Canada	2.76	2.76	3.05	4
Chile	2.41	2.41	2.61	2
China	n/a	n/a	n/a	1
H. Kong	2.24	2.57	2.71	3
Indon	0.33	0.33	n/a	0
Japan	3.94	3.94	4.33	4
Korea	3.28	3.94	4.05	3
Malay	2.57	2.37	n/a	3
Mexico	1.40	1.63	1.95	2
New Zeal	3.32	3.32	3.32	4
Papua NG	0	0	n/a	0
Philip	2.67	2.67	n/a	4
Singap	2.57	2.57	2.57	4
Taiwan	n/a	n/a	n/a	3
Thail	1.85	1.85	1.85	1
USA	4.19	4.52	4.52	5
<i>Std Dev</i>	1.14	1.21	0.87	1.46

Sources:

Ginarte and Park (1997), Park (1997)

* from Rapp and Rozek (1990)

(n/a indicates not available)

1989; Brunei's patent system is not independent as it is based on the patent systems of the U.K., Singapore, and Malaysia (meaning that any patent granted in any of those countries can receive protection in Brunei provided it is registered within three years of grant date).⁸ Hong Kong is also dependent on the U.K. patent system. Singapore has only recently (in 1994) ended its dependence on the U.K. patent system and enacted its own laws.

Turning now to differences in patent systems, the following features will be highlighted for consideration: priority; novelty; interpretation of claims; publication; examination; opposition; duration; working requirements; and compulsory licensing. Table 3 provides a summary of these patent features across APEC.

Priority. In all APEC nations (except the U.S.), the *first-to-file* rule prevails, under which the first applicant to file for a particular invention has priority (in the awarding of any patent) over subsequent applicants. In the U.S., the *first-to-invent* rule prevails, under which the original inventor has priority. In the event of a conflict (where two or more inventors seek protection for substantially the same invention), *interference* proceedings are held in the U.S. to determine the first inventor. Such proceedings are costly and time-consuming (which is one reason given for advocating a switch to a first-to-file system). However, they are not as numerous; about one percent of total applications result in such proceedings, and less than one-tenth of one percent of them result in a patent being granted to someone other than the first to file.⁹

The question is whether the coexistence of these two different priority rules constitutes a structural impediment to trade. Before the TRIPs agreement, the U.S. rule was discriminatory because foreigners were unable to use evidence from outside the U.S. to establish that they were the first to invent.¹⁰ The U.S. laws (sections 102 a, b of Title 35) have since been modified to permit evidence from WTO member nations. This removes one advantage that U.S. inventors had over foreign; however, U.S. inventors who desire more time to developing their inventions before applying for patents abroad might be disadvantaged if some other party files abroad first for a similar invention. As Wiggs (1993) points out, however, the disadvantage to

⁸ A dependent patent system is likely to be convenient for a small economy like Brunei, with a population under 300,000 and with limited qualified manpower and technical expertise. Brunei is currently considering developing an independent system in the near future (see the APEC *Industrial Property Rights 1996 Symposium* Web Site - www.jpo-miti.go.jp/pate/repo/apec).

⁹ See GAO (1993).

¹⁰ See Moy (1992).

Table 3. Patent System Features among APEC members

	1 Exam for Novelty	2 Opposition After Grant	3 Working Required Within	4 Compul- sory License	5 Member- ship in	6 Duration (yrs)	7 Public- ation in or upon	8 Grace Period	9 Doctrine of Equiv.
Australia	yes	3 months	3 yrs	X	a,b	20	18 months	6 months	yes
Brunei	no	none		-	b		grant	none	
Canada	yes			X	a,b	20	18 months	1 year	yes
Chile	yes			-	b	15	60 days	none	
China	yes	3 months		X	a	20	18 months	none	yes
H. Kong				-	a,b	20	grant	none	
Indon		6 months	3 yrs	X	a,b	14	6 months	none	
Japan	yes	pre-grant	3 yrs	XX	a,b	20	18 months	6 months	no
Korea	yes	2 months	3 yrs	XX	a,b	20	18 months	none	
Malay			3 yrs	X	b	15	grant	none	
Mexico	yes		3 yrs	-	a,b	20	18 months	none	
New Zeal	yes	3 months	3 yrs	X	a,b	20	grant	none	
Papua NG									
Philip	yes		2 yrs	X	a,b	17	grant	none	
Singap	yes		3 yrs	X	a,b	20	grant	none	no
Taiwan	maybe	3 months	3 yrs	X		20	grant	none	no
Thailand	yes	180 days	3 yrs	X	b	15	grant	none	
USA*	yes	none		-	a,b	20	grant	1 year	yes

Notes:

For column 4:

X denotes yes

XX denotes yes after non-working for 4 years from filing date or 3 years from date of grant

- denotes no explicit provisions in laws

For column 5:

a. Paris Convention

b. WTO

For Column 9:

This doctrine permits judges to declare an invention to be infringing upon another if it operates in "substan- the same way, and is therefore "essentially" an equivalent invention.

* U.S. Patent Award is based on "first-to-invent." All others on "first-to-file."

Blank indicates information not available

Sources:

Jacobs (1996), Park (1997)

U.S. inventors stems not from the first-to-file rule but from the absolute novelty requirements abroad, a feature which is next considered.^{11,12}

Novelty. A patent is awarded to an invention that is novel, non-obvious, and industrially applicable.¹³ An invention loses its novelty if it were publicly known, sold, or used before application. Some countries allow exceptions if the disclosure occurs during experimental testing or at an officially recognized international exhibition. The U.S. and Canada provide a *grace period* of one year, during which time inventors may use an invention commercially or publish information about it before deciding whether to apply for a patent. An advantage of a grace period is that inventors can begin marketing to determine whether the pursuit of a patent is worthwhile. The disadvantage is that, by using this option, inventors lose their patent rights in countries that do not have grace periods. Thus differences in grace periods across countries tend to distort marketing and patenting decisions.

One way in which novelty is not destroyed by disclosure is when a patent applicant first files in a country that is a member of the *Paris Convention* (of course, before disclosing anything). The applicant then has one year to apply for patents in any other member countries. During that time, the applicant can publicly disclose her invention, and the other member countries will not void her application, as they will treat the filing date in the first country of application as the effective filing date.

It is still the case, however, that an applicant cannot take advantage of grace periods in the U.S. or Canada because grace periods apply to actions taken *before* a patent is filed. In Paris Convention countries without grace periods, the inventor must still file first (somewhere in a Paris Convention country) before disclosing or marketing her invention.

The grace period complements the first-to-invent rule. By first inventing and then commercially practising her invention (for up to twelve months), the inventor in effect prevents other applicants from applying for a patent on a similar invention. Not only is she the first to invent, but her disclosure destroys novelty for other inventors (including those who might file first in other jurisdictions with the first-to-file rule). Only she can exercise the option to apply for a patent within one year of disclosure. A grace period with a first-to-file rule would effectively operate like a first-to-invent system since the grace period extends

¹¹ Wiggs's (1993) point is that even if the U.S. also had a first-to-file rule, U.S. inventors could still see their foreign patent rights in jeopardy unless similar novelty concepts are adopted abroad. If an inventor is from a country with a one year grace period (see below) and publishes her result before applying for a patent, she qualifies for a patent in her home country but forfeits her rights in countries with absolute novelty. Thus where grace periods are not provided, it is likely to be the novelty condition which spurs inventors to file first rather than the fear that a rival will file a similar invention first.

¹² Another argument against the first-to-file rule is that it disadvantages the small inventor. However, this assumes that large inventors cannot often be the first to invent. Larger inventors with more resources (for instance, laboratories and personnel), connections to the research world, and a large stock of accumulated knowledge (and variations of inventions), might possibly produce stronger evidence of being first. Small inventors are also likely to find the cost of interference proceedings especially prohibitive.

¹³ Note that a patent is not granted on the basis of its value in terms of its the net present discounted benefits. The economic value of a patent is useful to economic (welfare) analysis but is not a patent examiner's criteria, at least officially.

only to the inventor who first publicly discloses the invention.¹⁴ Only she can file within twelve months of disclosure and not have the disclosure used against her. Others who try to file before her *will* have the disclosure used against them. Thus systems with grace periods and the first-to-file rule will in effect give priority to those who are *first to disclose*. This would defeat the purpose of having a grace period in order to allow inventors to test-market their inventions or improve their ideas further before applying for a patent. Under this hybrid system, inventors may race to disclose incomplete ideas.

Interpretation of Claims. Once an invention is determined to be novel, the next question is "how novel?" This is where the scope of protection is relevant. Patent claims are outlined in the patent's *specifications*. If the patent applicant drafts claims too broadly, she is likely to be rejected for a patent since broad claims are likely to step on some prior knowledge, in which case the invention is not novel. If she drafts claims too narrowly, her competitors are likely to invent around her invention. The claims define the scope of protection and determine whether other inventions will infringe on hers; other inventions must, in other words, lie outside the scope of her invention. Some examiners (particularly in Japan and Korea) favour a relatively narrow scope while others (in the U.S.) permit a relatively broad scope, thus resulting in different kinds of infringement suits and judgements across countries. Some countries (the U.S., Australia, Canada, and China) allow, in infringement suits, claims of an existing invention to cover not only those that are *explicitly* expressed in the patent but also those that are implicit. This is the exercise of the *doctrine of equivalents*, which holds that inventions that substantially perform the same function, in substantially the same way, and produce substantially the same result, are the same inventions. Hence, by exercising the doctrine of equivalents, patent holders can make certain technologically neighbouring inventions around theirs liable for infringement.

Publication. Another key difference between patent systems concerns the publication of patent applications. In some APEC nations, the application is kept confidential until the patent is granted, and is kept confidential if the patent is not granted. In other APEC countries, the contents of the application are published after 18 months of application. While early publication contributes to quicker knowledge diffusion, it has some ambiguous effects on the patent applicant's incentives for patenting. On the one hand, it enables competitors to build on the knowledge and possibly make improvements which lead to patented inventions that compete with the applicant's or force parties into cross-licensing. On the other hand, the information in the application can be used by potential competitors to distance themselves from the applicant - that is, to develop inventions that avoid infringement and costly litigation, or avoid unwanted cross-licensing arrangements.¹⁵

Examination. A notable factor here is that in Japan patent examinations can be deferred (for up to seven years). Like grace periods, this feature permits applicants to modify their inventions during the deferral

¹⁴ The case where it will not be like a first-to-invent system is if the first inventor keeps the knowledge secret till applying, while a second (but later) inventor discloses the invention before the first inventor applies. The disclosure makes the invention no longer novel but the inventor who first brought the disclosure (i.e. the second, later inventor) has a grace period to decide whether to apply for a patent.

¹⁵ Unless of course the objective is specifically to get involved in litigation and cross-licensing. The next section discusses patents as instruments of rent-seeking.

period, while obtaining first-to-file status early on. A criticism with this feature is that it leads to strategic patenting behavior. Applicants who do not have a complete invention to file may nonetheless, by filing first and requesting a deferral of examination, prevent others from applying for a patent on a similar invention.

Opposition. Some systems allow the public to oppose the granting of a patent. Others (like the U.S.) do not provide for opposition. Where opposition is permitted, it takes place after a patent is granted. Only in Japan does it take place before the granting of a patent. Pre-grant opposition is preferable if only to prevent the granting and later revoking of an invalid patent. Post-grant opposition is preferable if rivals tend solely to use the process strategically to delay or prevent the granting of a patent to the applicant. The advantage of having oppositions in the first place is that they spread the burden of establishing novelty (and other proof of qualification for a patent) among the public and examiners. It is possible for examiners to overlook factors that are pertinent to the establishment of novelty, non-obviousness, and industrial applicability. The disadvantage is that rivals may offer self-interested (possibly frivolous) arguments against granting.

Duration. Most APEC nations provide 20 years of protection from the date of application. While adequate for some firms, it may not be adequate for others. Pharmaceutical firms, for example, use up much time to obtain marketing approval (through clinical tests). If, for instance, it takes 12 years to obtain approval, firms have 8 years of effective protection left, which may not be enough to recoup their fixed innovation costs.

Working Requirements. Some countries require that an invention be worked - i.e. utilized (manufactured or marketed) - or else the patentee forfeits her rights. Other countries (like the U.S. and Canada) do not require working. One advantage of requiring working is that it prevents patentees from hoarding knowledge. In the absence of such requirements, an inventor may patent strategically to prevent others from acquiring her technology (and putting it to use) or to wait patiently for the arrival of future innovations that might infringe on her technology, thus leading to profitable legal settlements or collection of royalties. A disadvantage of working requirements is that it does not give inventors the option to choose the most opportune moment to market or manufacture.

Compulsory Licensing. Some countries may require patent holders to license their inventions to others. This helps to diffuse the invention more widely (and possibly lower prices). Such mandated licensing can also be used by the government to break deadlocks (for example, when patents *block* each other - i.e. contain overlapping subject material that causes the manufacturing of one invention to infringe upon the other), or be used by the government in the event of national interest (health or safety). On the other hand, compulsory licensing reduces the patent holder's exclusive rights, and has been a major source of complaint against patent systems that feature this.

In short, patent features vary across countries. No one particular feature is ideal for all countries. Each has advantages and disadvantages, making any attempt at global patent harmonization difficult since it is unclear which feature (or combination of features) is best for national or global welfare. The next section explores how these patent features have been utilized in public policy and in private practise. The objective is to examine the extent to which differences in national patent features have resulted in NTBs and STPs.

III. Strategic Patenting Cases

This section examines some case studies of patent-related trade barriers. It is useful to divide the cases into two groups (though in some cases it is not very easy to make this distinction): namely those due to public sector strategies and those due to private sector strategies. The former includes examples of NTBs and STPs resulting largely from government actions; the latter are examples of patent-related barriers to trade resulting largely from corporate strategies. The distinction is relevant for public policy initiatives like patent harmonization since it helps to identify the source of conflict and the likely nature of policy response required - whether it be in the area of patent law, competition law, or other. Table 4 contains a brief summary of the case studies.

The distinction is also important because it is often easy to mistakenly conclude that the discriminatory treatment of foreign firms is the outcome of public policy (i.e. as an NTB or STP). Yet a simple fact must not be overlooked: that private firms will choose their patenting strategies to maximize their well-being, not society's. Their chosen strategies may very well deviate from *socially optimal* strategies. Among their strategies, it must be allowed that private firms will try to pre-empt or frustrate the patenting efforts of rivals (both domestic and foreign). It is somewhat surprising that surveys of patent-related NTBs or STPs sometimes ignore the basic point that private firms act to promote their own welfare, not society's. Consequently many surveys tend to view international patenting conflicts as the result of national or government policy.

While most of the case studies describe conflict between the U.S. and Japan, certain similarities in the patent systems of Japan, Taiwan, Korea, and Singapore, and in those of the U.S., Canada, New Zealand, and Australia, make the lessons from the case studies applicable to a wider APEC context.

On the surface most laws themselves do not appear inherently discriminatory. According to Wineberg (1988, P. 12):

"... an examination of the principal provisions of the Japanese patent laws does not reveal anything particularly different or discriminatory. Japan has patterned its patent laws on that of the Federal Republic of Germany."

Kotabe (1992, p. 157) supports this view noting that:

"Pre-grant opposition and deferred examination are the only procedural mechanisms unique to the Japanese patent system"

Thus, as Thorson and Fortkort (1993, p. 212) put it, "one must look beyond the mere form of the laws." A key theme in the case studies that follow is that it is not necessarily the laws per se that give rise to discriminatory treatment of foreigners but the way the laws are carried out or practised.¹⁶

¹⁶ Wineberg (1988) also stresses the cultural factors behind the differential effects of patent laws on foreigners.

Table 4. Strategic Patent Cases

<u>Parties (Nationality):</u>		<u>Patent Issue:</u>
Allied Signal (USA)	vs. MITI Consortia, (Japan)	Pre-Grant Opposition
Texas Instruments (USA)	vs. MITI (Japan)	Compulsory Licensing
Dow Corning (USA)	vs. Sumitomo Electric (Japan)	Compulsory Licensing
Ampex (USA)	vs. Sony, JVC, Matsushita (Japan)	Narrow Scope
Lemelson (USA, 1992)	vs. Toyota, Nissan Mazda, Honda (Japan) Ford, GM, Chrysler (USA)	Submarine Patenting
Honeywell (USA)	vs. Minolta Camera (Japan)	Non-Manufacturing of Auto-Focus Technology
Fusion System (USA)	vs. Mitsubishi Electric (Japan)	Patent Flooding
SanDisk (USA)	vs. Samsung (S. Korea)	Narrow Scope
Citibank (USA)	vs. Sakura Bank, Mitsubishi Bank (Japan)	Pre-Grant Opposition
Intel (USA)	vs. Twinhead (Taiwan)	Purchase of Non-Intel Microprocessing Chip

Sources:

Bremmer et. al. (1996), GAO (1993), McDonell (1995), Purchasing (1996), Shota (1992), Wysocki Jr. (1997)

A. Public Patenting Strategies

The following describe situations where foreign patentees believed that there were *public* motives impeding their access to national markets.

Examination Difficulties. A generic problem faced by patent applicants in Japan is the lengthy examination period. Some view this as a strategic trade barrier. However, the examination period is long for Japanese applicants as well. It can be somewhat longer for foreign nationals partly because they need more time to comply with Japanese legal requirements (for example, to translate technical information into Japanese *kanji* characters)¹⁷ and partly because they must deal with Japanese patent agents (*benrishi*) and not with attorneys from their home country. Some foreign patents applicants have complained of communication problems with their *benrishi*.¹⁸ Japanese law does not admit foreign attorneys to practise before the Japanese Patent Office (JPO); likewise the U.S. does not admit Japanese attorneys but only those attorneys from countries which reciprocally admit U.S. attorneys.

It is difficult to determine whether the lengthy examinations are used (intentionally) to discriminate against foreigners. To the extent that foreign patent applications are discouraged, there would be less new knowledge to be disclosed to the Japanese public (from the publication of foreign patent applications); this would be counterproductive to any public strategy to try to exploit and imitate foreign technologies. The lengthier examinations may have some other purpose, say to induce cross-licensing.¹⁹

Examinations are generally longer in Japan because the JPO is relatively understaffed. The average workload per examiner is three times that in the U.S.²⁰ The workload can be reduced by either increasing the number of qualified examiners or decreasing the number of applications. Due to a practise called *patent flooding* and the patentability of minor inventions (*utility models*) - both of which are discussed more fully below - the JPO receives the greatest number of patent applications (see Table 1).

Pre-grant Opposition. Because firms can oppose a grant before the patent is even granted, opposing firms can create a long delay in the patent application process. During this time, the patent application is made public (i.e. 18 months after filing), and Japanese competitors can invent around the applicant's patent, taking advantage of the narrow scope examiners accept to make minimal changes without infringing on the applicant's patent.

The following example shows how this patent system feature can be used to promote domestic industry. In the early 1970s, *Allied Signal*, a U.S. firm, developed an amorphous metal technology useful as a transformer in power utilities. This was targetted by MITI as a critical technology. A consortia of Japanese firms opposed Allied Signal's patent application. Eventually, Allied Signal did get protection, but

¹⁷ Patent applications in Japan must be filed in Japanese, whereas they may be filed in any language in the U.S. and translated later.

¹⁸ See GAO (1993) and Thorson-Fortkort (1993).

¹⁹ See Wineberg (1988) for a discussion of this point.

²⁰ See Kotabe (1992).

the pre-grant opposition consumed much time (10 years). Consequently, since protection issues from the date of application, Allied Signal received only 10 years of effective protection.

Compulsory Licensing. Using this patent system feature, the Japanese government was able to help promote its domestic semiconductor industry. As a condition for entering the Japanese market, *Texas Instruments (TI)* was required to take on *Sony* as a joint venture partner and to license its patents to the Japanese semiconductor industry. In Japan, TI faced tremendous difficulty obtaining a patent for its *Kilby* patent. It first filed in 1960 and faced numerous oppositions. The JPO rejected TI's application on the grounds that TI's patent claims were too "broad." By 1989, the JPO eventually granted a patent to TI, but the protection lasts until 2001.

As another example, in the early 1980s, *Dow Corning* sought a patent for optical fiber cables in Japan, but MITI deemed that telecommunications was a vital national interest. Dow Corning was compelled to license the technology to Japanese firms. Subsequently the technology leaked and *Sumitomo* developed a very similar technology which it then tried to export to the U.S. Dow Corning requested the U.S. Trade Representative to ban the imports of Sumitomo's cables; Sumitomo sued to have the patent invalidated, but the U.S. courts rejected it on the grounds that its technology was developed in substantially the same way (this is an example of the use of the doctrine of equivalents).

Joint Research Ventures. Strategic government preferences to domestic interests can be pursued through this forum. In MITI's *Very Large Scale Integration (VLSI)* project, while Japanese firms obtained free access to the patented technologies developed under this project, foreign participants were required, in quid pro quo fashion, to cross-license their technologies to obtain access.²¹

Patent Examination. The judgement of novelty, non-obviousness, industrial applicability, and scope is often subjective. In other words, patent examiners within or across countries can vary in their interpretation of the inventive step and claims of a patent. With this degree of discretion that patent examiners have, some U.S. firms have felt that examiners in Japan tend to reject foreign patent applications for technologies that MITI might target as critical to Japanese industry.

For example, a case study in Oppenheimer and Tuths (1987) describes the patenting difficulties faced by a small U.S. software developer. It developed a pattern-recognizing invention. But around the same time, Japan's *Nippon Telephone & Telegraph (NTT)* was sponsoring a *Pattern Information Processing System (PIPS)* project of its own. While the software company obtained patents in the U.S., Canada, Europe, and South America, it could not as easily in Japan. The Japanese examiner claimed that the utility or application of the technology was not clear. Eventually the company pared down its claims, as narrowly as possible, and was awarded a patent. The narrow scope of the patent granted to the company enabled Japanese competitors to pursue the PIPS project without infringing upon the software company's rights.

²¹ See Oppenheimer and Tuths (1987).

As another example, *Ampex*, a U.S. VCR producer, was also required to narrow its claims for its prototype VCR invention. This enabled several Japanese companies (*Sony*, *JVC*, and *Matsushita*) to develop close variations of Ampex's invention - in particular, compact home versions.

B. Private Patenting Strategies

Patents can be an important tool in strategic competition. The possession of patents can be a trump card for firms that seek favourable licensing terms, joint ventures and other strategic alliances. The following are examples and methods of patenting to capture market share. In the process, private strategic patenting may cause market share away to be taken away from domestic *as well as* foreign rivals.

Submarine Patents. Also known as *stealth* patents, these patents surface rather unexpectedly (sometimes decades after being filed) to challenge the rights of new technologies. That is, they surface with claims that their technological territory covers the claims of new technologies. The idea is to enable the holder of such patents to collect royalties or damages from infringement suits against the users of new technologies. While sometimes it is legitimate to claim that a new invention is a variant of an older one, other times submarine patenting is a lucrative form of activity. Both domestic and foreign firms may fall prey to submarine patenting. Thus, this activity can also be an obstacle to international trade.

An example of the effects of submarine patenting on trade relations is the case of *Lemelson vs.* twelve Japanese automotive companies.²² Jerome H. Lemelson, the namesake of the annual MIT-Lemelson prize, is a major patent applicant (owning nearly 500 patents). He neither manufactures nor makes prototypes of his inventions. In 1992, he successfully collected \$100 million from twelve Japanese automotive companies (including Toyota, Nissan, Mazda, and Honda) which all settled with him rather than go to court. His claim was that all of these companies were using image processing and other devices which he already had rights to from earlier patents. Lemelson has also pursued U.S. automotive companies, but *Ford Motors* is going to court. In this instance, Ford Motor would likely prefer to see the doctrine of equivalents applied less broadly. At issue is that the scanning device in Ford factories is mobile (i.e. can be hand-held) whereas the drawings in Lemelson's patents show the scanner in a fixed position.

From a social welfare point of view, submarine patenting is an unproductive, rent-seeking activity. Submarine patents make "no real technological contribution."²³ Resources are diverted to an activity that transfers rents from the "intended" practitioner of new knowledge to the non-practitioner (rent-seeker). As Bruce Lehman, the U.S. Commissioner of Patents and Trademarks, remarks:

"I thought what the patent system was all about was coming here and getting a patent and going to some banker or venture capitalist ... and get money, and then you go out and start a company and put products out on the marketplace. And you go sue the people that infringe on you." -- Wysocki (1997), p. A8.

To the rent-seekers, patenting itself is a business.

²² For fuller details, see Wysocki (1997).

²³ See Stern (1993).

This is an example where the obstacle to trade (domestic and international) has its origins in private strategic behavior, not public. Moreover, this activity adds to the transactions costs of doing business for both domestic and foreign firms *non-discriminantly* - although a case could be made that foreign firms less familiar with the practise or less innovative (say from smaller APEC nations) may be more adversely affected.

While the patent laws here are not explicitly discriminatory to foreign interests, it would be useful to consider what patent reforms might reduce submarine patenting and its barriers to trade.²⁴ In the U.S., patent laws do not allow for the publication of a patent application until (and unless) it is granted. If instead they allowed for the publication after 18 months of the date of application, as in other parts of the world, there would be less of a chance that firms would be surprised by submarine patents. Secondly, it might be useful to include manufacturing as a requirement of patents that are granted. Some countries of course have working requirements (after 3 years). The U.S. does not, and it could consider having one within a longer period (say 5-7 years). This would cut down on the hoarding of patents. Alternatively, working could be required only as a condition for being able to sue for infringement.²⁵ Finally, another proposal for reducing submarine patenting is to limit *continuation-in-part* patent applications. These allow applicants continually to file slightly revised versions of their patent applications. Thus, strategically motivated firms could adjust their applications to incorporate claims that cover the technologies of their rivals. As long as the applicants were first to file or invent, any commercialized technology which "steps" on the revised claims can be found to infringe. The laws could therefore put an upper limit on the number of revisions allowed and some time limitations on which to make them. Another proposal is to begin patent protection from the date of filing rather than the date of grant. Applicants would therefore use up their own (duration) time in making those revisions.

Blocking Patents. Firms can also strategically patent to prevent others from entering their technology territory. This practise is known as *strategic* blocking. Firms invent around their own core patents, and as a "fence," the new patents prevent others from developing and patenting inventions near their core technology neighborhood. The incumbents are likely, but not always, to have the advantage in doing so since they have easier access to the original research records of their core technologies. These blocking patents may act as entry barriers if competitors know that those patents are pending or are granted. Competitors risk getting embroiled in litigation if they enter a market and infringe upon existing technologies. Research by Cohen et al. (1996) report that 82% of respondents indicated that blocking was a motive for patenting. Seeking protection for their intellectual property rights was secondary.

Portfolio Patenting. In Schumpeterian competition, firms would study the patenting and R&D strategies of rivals. The rivals in turn would do the same. But patents, however, disclose new knowledge (in exchange for the protection) and possibly some key information about firm strategies. One way to make it difficult for rivals to keep track of one's R&D results, strategies, and priorities is to file multiple patents (i.e. a portfolio

²⁴ The following policy suggestions are from Stern (1993).

²⁵ In a 1992 case, Minolta (Japan) paid Honeywell (USA) royalties of \$127 million for using in Minolta Alpha 7000 cameras the SLR (single lens reflex) technology which Honeywell developed in the mid-1970s but never manufactured. Honeywell has also sought to enforce its rights against video camera producers which, Honeywell argues, use the SLR technology (see Shota (1992)).

of them), each carrying a piece of the puzzle. This makes it costly and time-consuming for rivals (or future innovators) to trace all the information. An external effect of this is that it taxes the patent system (in terms of examination time and the search for prior art). Such a practise works against the social objectives of technology creation and diffusion, but works to allow certain firms to maintain market share.

Patent Flooding. A popular Japanese corporate strategy is to surround a foreign company's (or in some cases domestic company's) core patent with numerous patent applications representing minor improvements. This time (in contrast to a previous example) the *rivals* invent around a company's core patent. It is as if the rivals take the core technology "hostage." These flooded patents come so close to "blocking" the core patent (that is, they are all so close to infringing upon each other in use) that all the firms are forced into cross-licensing (thus exchanging each other's technology).

Patent flooding has in the past enabled some Japanese firms to appropriate the technologies of foreign firms. For example, *Mitsubishi Electric Co.* filed several hundreds of utility models around the U.S.'s *Fusion System Corp.* Indeed, relative to foreign applicants, Japanese companies like Mitsubishi, Ricoh, Matsushita, and Sharp have numerous utility filings (i.e. for every three patent applications, they have at least one utility model application).²⁶

A factor that contributes to patent flooding is the patentability of utility models; that is, for inventions that represent less of an inventive step required to qualify for an ordinary patent. Often, fringe technological ideas are the subject of utility models. With the publication of a rival's patent, competing firms can file applications for small changes in the design, shape, or structure of the rival's technology.²⁷ Again, the laws permitting patent flooding are not inherently discriminatory to foreigners. Patent flooding is something that foreigners can also practise on the Japanese firms. Indeed, Korean firms have started to flood applications around core Japanese technologies.

By clogging up the patent examination office, patent flooding also contributes to lengthy delays in patent granting. It also explains why Japan leads in domestic patenting (see Table 1). Patent flooding may also be seen as an unproductive use of time and resources. From a social welfare point of view, firms could better devote their time, energy, and resources to investing in more inventive projects rather than, essentially, to setting strategic traps for their competitors. One way to prevent patent flooding is to limit the number of utility filings, or make utility models require a larger inventive step. Another is to adopt the doctrine of equivalents so that patent claims can be more broadly interpreted, and thereby include or anticipate some of the patent and utility model applications that might be filed around the core patent.

Narrow Scope. When the scope of a patent granted is too narrow, it is easier for firms to "bump" into each other in technological space since firms can invent more closely to the central "core" of existing technologies. It also allows more inventors to participate in patenting: from producers of high quality inventions to low, from large inventive steps to small, or from great novelty to little. Hence it should not be surprising to see more infringement suits and invalidation challenges in regimes that reward narrower scope. (Offsetting this might be whatever technological benefits a narrower scope provides).

²⁶ See Thorson and Fortkort (1993), p. 300.

²⁷ For example, if someone has a patent for a plane, one could file utility models on the cockpit design, fuel injection process, or the landing gear.

For example, *SanDisk* (USA) has sued *Samsung* (Korea) for what the former sees is a slight modification of its flash technology; *Grid Systems Corp.* (USA), the developer of the basic structure of laptops, has sued *Toshiba* (Japan) for the latter's slight modification of the structure and display of the laptop; and *Micron Technology* (USA) has challenged *Goldstar* and *Hyundai* (Korea) for their modification of Micron's process for holding the structures of memory chips together. However, *if* patent harmonization should require that nations standardize "scope" and to do so at a fairly broad range, this might bias against the awarding of patents to the smaller APEC members. Their innovations - compared to those of the advanced industrial members of APEC - are likely to be of a relatively lower inventive step, quality, and novelty. At their stage of development, their innovations may largely consist of improvements which build upon existing knowledge bases.

Pre-grant Opposition. Pre-grant oppositions can be used by firms to frustrate rival patent seekers. Applicants facing such opposition must respond to each one individually and sequentially.

Recently, *Citibank* faced numerous oppositions against the patenting of its cyberbank technology.²⁸ Led by *Sakura* and *Mitsubishi Banks*, the oppositions argued that Citibank's claims were too broad and that a patent granted to Citibank would give the latter too much "territory" over cyberbank technologies. Another motive for the opposition was that the Japanese banks invested heavily in the British version of the technology (i.e. Mondex) developed by *National Westminster*. They would therefore have preferred the patent go to the British bank.

In some cases, the Japanese oppositions do not succeed. Recently, *Genentech* fairly easily withstood 38 oppositions (led by *Toyobo*) against the patenting of its TPA (a drug for treating heart attacks). Its patent in Japan was granted within 4 years of application, while it was turned down in Europe. One strategic reason Genentech received favourable treatment by the authorities might be that the market for TPA in Japan is small.

A key question whether is it possible to eliminate unproductive oppositions (aimed solely at thwarting competitors' patenting applications) without eliminating the pre-grant opposition feature. As a model, Article 25 of Decision 313, Cartegena Agreement (1992), provides legislation to be used to penalize excessively tactical oppositions. Overall, however, only ten percent of applications are opposed in Japan.²⁹ Of these, the average application faces about two oppositions. Generally, the broader and more valuable inventions are opposed.

Restrictions on Licensees. Just as governments can impose licensing restrictions, private agents can also. In the case of *Intel* (USA) vs. *Twinhead* (Taiwan), the latter, a producer of notebook personal computers, had been obtaining supplies of microprocessor chips from both Intel and Intel's licensees. Intel requested *Section 337* proceedings against Twinhead, arguing that Twinhead's sale of notebook PCs containing chips of Intel's licensees (who incidentally were also Intel's competitors) was tantamount to infringing upon Intel's patents. Intel sought to collect royalties from Twinhead for using chips supplied by Intel's licensees. Eventually Intel

²⁸ See Bremmer et. al. (1996).

²⁹ See Thorson and Fortkort, p. 297.

lost, and was found to "misuse" its patent rights.³⁰ Intel's underlying objective appeared to be to discourage Twinhead and other PC firms from using non-Intel chips, and thus allow Intel to retain its dominant market share. It appeared not to be the case that Intel was harmed by a foreign infringer, but that Intel faced growing competition from other chip makers and was choosing a 'response' strategy.

IV. Conclusions: Should APEC Harmonize its Patent Systems?

This section provides a general assessment of whether patent harmonization in APEC will help constrain the use of patent-related trade barriers or strategic industrial policies. Stern (1987, p. 204), argues that:

"National intellectual property laws act like NTBs only where there is disharmony in the law of nations. If every nation had identical intellectual property laws, to pick an extreme case, intellectual property laws would not operate as NTBs."

The conclusion in this paper, in light of the examples and case studies considered in the previous section, is that the harmonization of patent laws would not alone eliminate or reduce patent-related barriers to trade. First, it is not the laws (or differences in laws) per se which give rise to NTBs or STPs, but the *practises* of governments and firms. Secondly, it is not only -or even mainly - the legal or public authorities that can create NTBs or engage in STPs to promote some national interest, but private agents as well. The latter, in pursuing their own private interests, may pursue practises which restrict domestic and/or foreign competition. To the extent that patent harmonization focuses only on binding government actions or on setting rules for government behavior, the effort will fail to reduce patent-related barriers to trade. Other laws, rules, or penalties governing private practises are needed; for example, unfair competition rules or other laws that reach areas outside the scope of patent laws.

Laws themselves are unlikely to eliminate strategic *motives* on the part of firms or governments. In the case of firms, one could argue that it is in the nature of most firms to be strategic in competition, and that this should be taken as a given in policy formation. In the case of governments, however, a case could be made that, as public institutions, they *should* be able to act in the social interest and commit, through international rules, not to use strategic patent policies which, if applied worldwide, reduce world trade and welfare.³¹ This case, of course, is subject to opposing political economy pressures for governments to choose policies that benefit particular groups or sectors.

Nonetheless, to the extent that private strategic patenting and rent-seeking behavior continue to occur, tying public sector hands alone would not eliminate patent-related barriers to trade. International agreements, such as TRIPS, appear to concentrate predominantly on rules governing public sector behavior (with regard to the provision, administration, and enforcement of patent rights). More attention is needed to address barriers to trade resulting from private patenting behavior. While certain changes in patent laws may help to reduce abusive private strategic behavior, it is also important to address those abusive practises more directly.

³⁰ See McDonnell (1995) for details.

³¹ A major cost to the world would be the misallocation of patent protection to less efficient inventors.

In thinking about international patent harmonization, it is important to acknowledge what the *objectives* of harmonization are. For instance, it is possible to misinterpret the idea of a level playing field to mean the equal presence of domestic and foreign agents in the market. This is not the case. The idea behind a level playing field is to remove distortions - or to create equal "opportunities," not equal outcomes. The relevance of this is that harmonization or patent policy reform should seek not to ensure that foreign firms will play the same strategies that domestic firms have the advantage in playing, but should seek to remove the strategic practises which create the distortion or barriers to trade in the first place. This is subtle point that is often overlooked.³²

It is also important to acknowledge the *costs* of patent harmonization as well as the *benefits* (say from reduced trade distortions). The harmonization of APEC patent laws (let alone those of the entire world) will be an ambitious and costly undertaking: the meetings and negotiations; the lobbying to get approval of the harmonized treaty from national legislative and executive bodies; the changing of individual country laws; and the transition process.

Another kind of harmonization cost is the cost of choosing the "wrong" standards - wrong, say, from an economic, ethical, or other view. In discussions of harmonization, it should not be assumed that choosing uniform standards will be distortion free. Unfortunately there is much disagreement about which particular patent system feature is best; for example, is post-grant opposition better, pre-grant, or none at all? Is a first-to-file or first-to-invent system fairer? Is a narrow scope or broad scope optimal? Should patent laws all apply the doctrine of equivalents? Not only is it not clear which of these various features is best for stimulating innovation and productivity, it is also unclear which reduces or increases barriers to trade and competition. The odds are that a given choice of uniform standards will be inefficient. Thus, the argument in favour of imposing APEC (or worldwide) uniform standards must rest on the idea that the elimination of transactions costs has such large global gains that they outweigh all the inefficiencies arising from standardizing along imperfectly chosen patent system features.³³

One advantage of taking more seriously the *practises* of laws across patent systems is that if much of the NTBs or STPs can be reduced or eliminated by *penalizing* abusive patenting practises without having to change much, if any, of the laws, there would be less pressure to have to harmonize patent laws fully or even partially, and incur these costs of global harmonization.

Finally, the remainder of this section considers some issues that patent harmonization does not address, and that ought to be addressed in future debate. First, APEC consists of a diverse group of countries, at different stages of development. In some countries, patent systems are quite complex and evolved. In others, patent systems have just been created or are in the process of being created. In these countries, their high-tech or innovation sectors are also not as fully developed as those of the advanced

³² For example, policy recommendations in Thorson and Fortkort (1993) include the suggestion that U.S. firms be able to acquire the "skills" and opportunity to use pre-grant opposition, patent flooding, and utility models to compete on an equal footing with the Japanese firms in the Japanese market. From an economic point of view, this is much less efficient than setting policies to eliminate abusive practises on the part of *both* domestic and foreign firms. In principle, the focus of harmonization (or of the idea of a level playing field) should be not so much on the relative well-being of domestic and foreign firms but rather on the broader issue of whether the environment in which they operate is free of distortions.

³³ A future work could test this proposition in a multi-country general, equilibrium simulation model.

members of APEC. It is unlikely to expect strategic private patenting behavior to be a major issue here. Their firms are unlikely to compete successfully against their counterparts from Japan or the U.S. at the game of strategic patenting. Thus rules governing strategic patenting are not likely to receive as high a priority as say getting technical cooperation from advanced APEC members, training examiners, and acquiring resources to develop their judicial infrastructure further. In other words, there are different priorities across APEC nations. This is not to say, however, that the experiences in Japan and the U.S. cannot be important lessons for the smaller APEC members to draw upon as their patent systems mature. Yet APEC may be too diverse a group to reach mutually interested agreements on patent harmonization.

Harmonization will also be inadequate in guaranteeing that patent rights are equally protected around the world. Clearly the enforcement infrastructure varies across countries, depending partly on the resources countries have. Poorer economies that say have the same laws as the rest of the world would likely have fewer resources to put into protecting and enforcing patent rights.

Likewise, another factor that varies internationally is the cost of patenting. Even if the laws are the same, as long as the cost of patenting remains uneven, there are still likely to remain significant transactions costs and impediments to international trade and patenting (see Meller (1997)).

In conclusion, there is scope for patent reform to improve APEC trade relations provided both public and private patent-related barriers to trade are addressed. However, patent law harmonization alone is not a sufficient response to international patenting conflicts and patent-related trade barriers. It is also necessary to (i) focus on the practises of the laws, (ii) complement patenting rules with other rules (concerning unfair competition), and (iii) address the costs of patenting, the limited resources for enforcement, the different priorities of different APEC members, and the desirability of different patenting features.

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Measuring Trade Impediments to Services within APEC

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Abstract

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.

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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.

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.

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

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

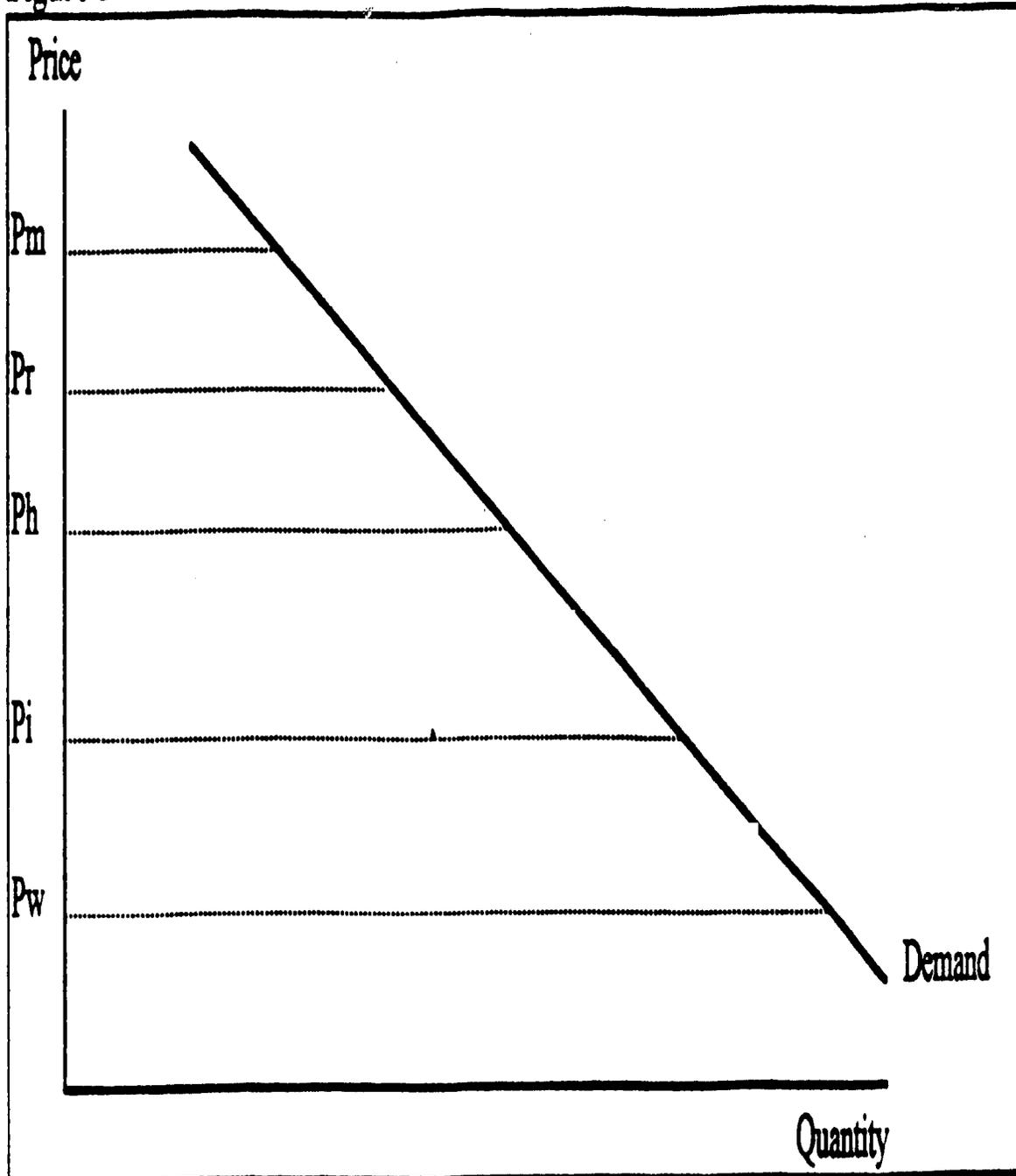
- a Licensing procedures
 - b Technical standards
 - c Recognition of qualifications
 - d Other measures related to Article VI of GATS
-

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 interest for this project. This wedge will provide the *prima facie* price-impact of the trade impediments.

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 (1) 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 these 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 desired features are traded. There can be problems with hedonic pricing such as with the functional specification, multicollinearity and identification, with the function capturing the interaction of supply and demand factors. The hedonic approach is 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 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 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.

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

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).

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.

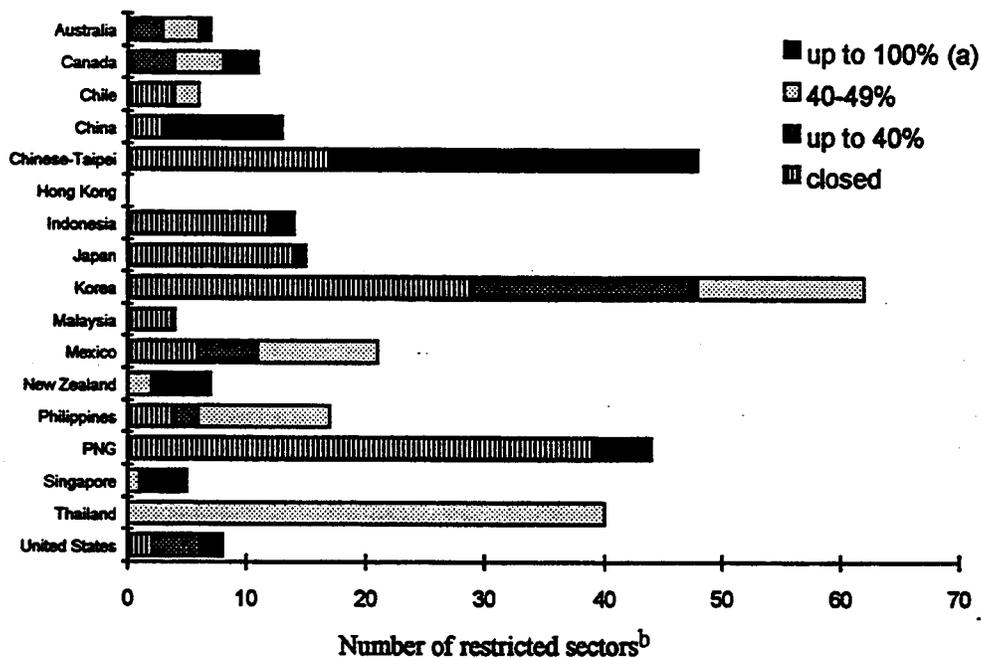
Figure 6: Schematic representation of major FDI impediments across APEC

	AUS	BD	CDA	CHL	PRC	HK	INA	JPN	ROK	MAS	MEX	NZ	RP	PNG	SIN	CT	THA	US
Screening/ notification	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	□	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	□	Ⓟ	Ⓟ	□
Restricted/ closed sectors	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ
Performance requirements	□	□	□	Ⓟ	Ⓟ	□	Ⓟ	□	Ⓟ	Ⓟ	□	□	Ⓟ	Ⓟ	□	Ⓟ	Ⓟ	□
Fiscal incentives	□	□	□	□	Ⓟ	□	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	□	□	Ⓟ	Ⓟ	Ⓟ	Ⓟ	□
Taxation	□	□	□	Ⓟ	Ⓟ	□	Ⓟ	Ⓟ	Ⓟ	Ⓟ	□	□	Ⓟ	Ⓟ	Ⓟ	Ⓟ	Ⓟ	□
Priority sectors	Ⓟ	Ⓟ	□	□	Ⓟ	□	Ⓟ	□	□	Ⓟ	Ⓟ	□	Ⓟ	Ⓟ	□	Ⓟ	Ⓟ	□
Exchange controls	□	Ⓟ	□	□	Ⓟ	□	□	□	Ⓟ	□	□	□	□	Ⓟ	□	Ⓟ	□	□

Note: Shaded areas 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.

Source: IC (1996).

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 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.

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

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 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.

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.

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

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 Pw 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 Pw 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 Pm or Pr 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. 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 on a country basis 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 revenues (e.g. monopoly arrangements), 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 Survey of Impediments to Trade and Investment in the APEC region (PECC 1995). 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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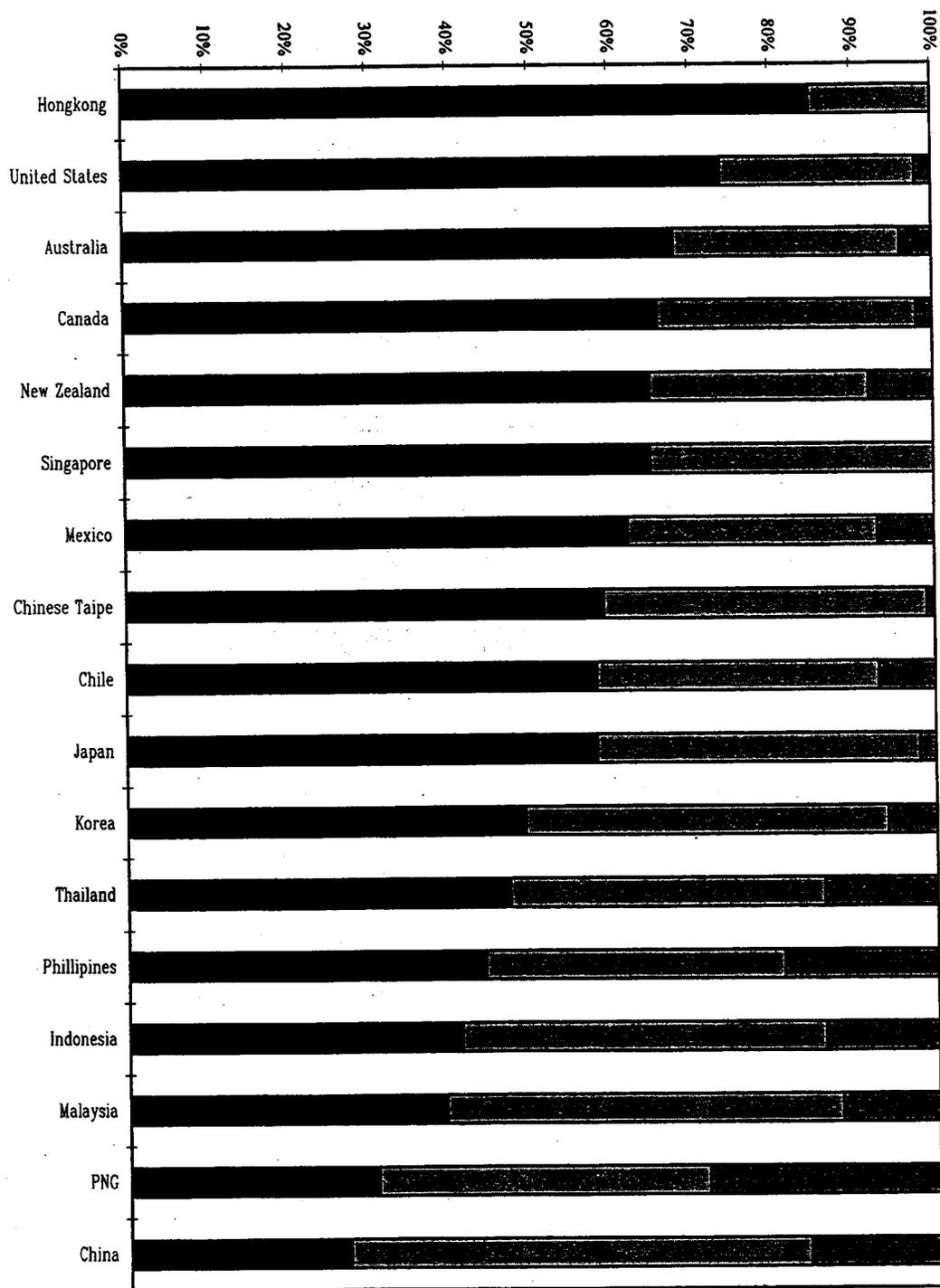
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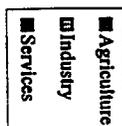
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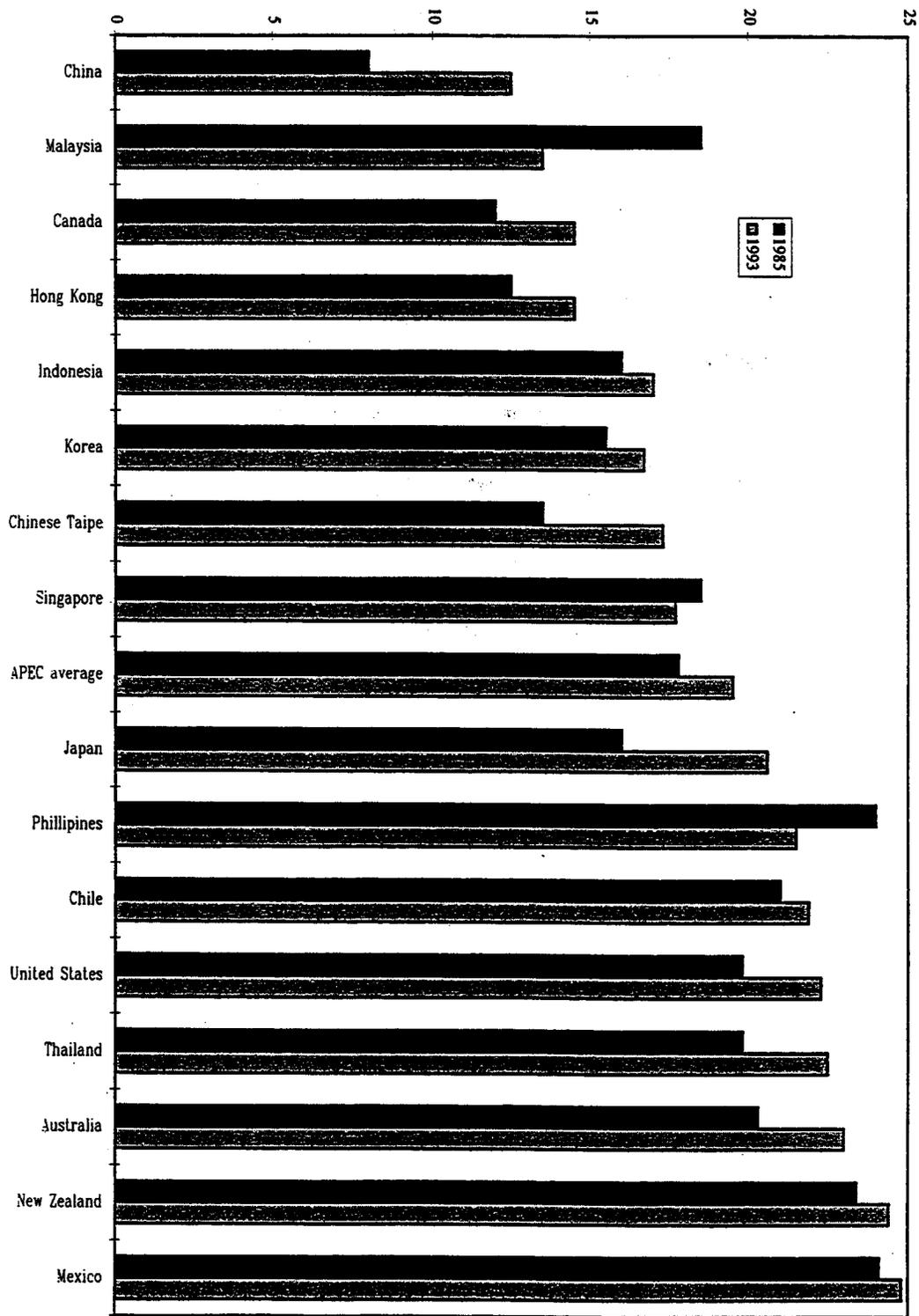
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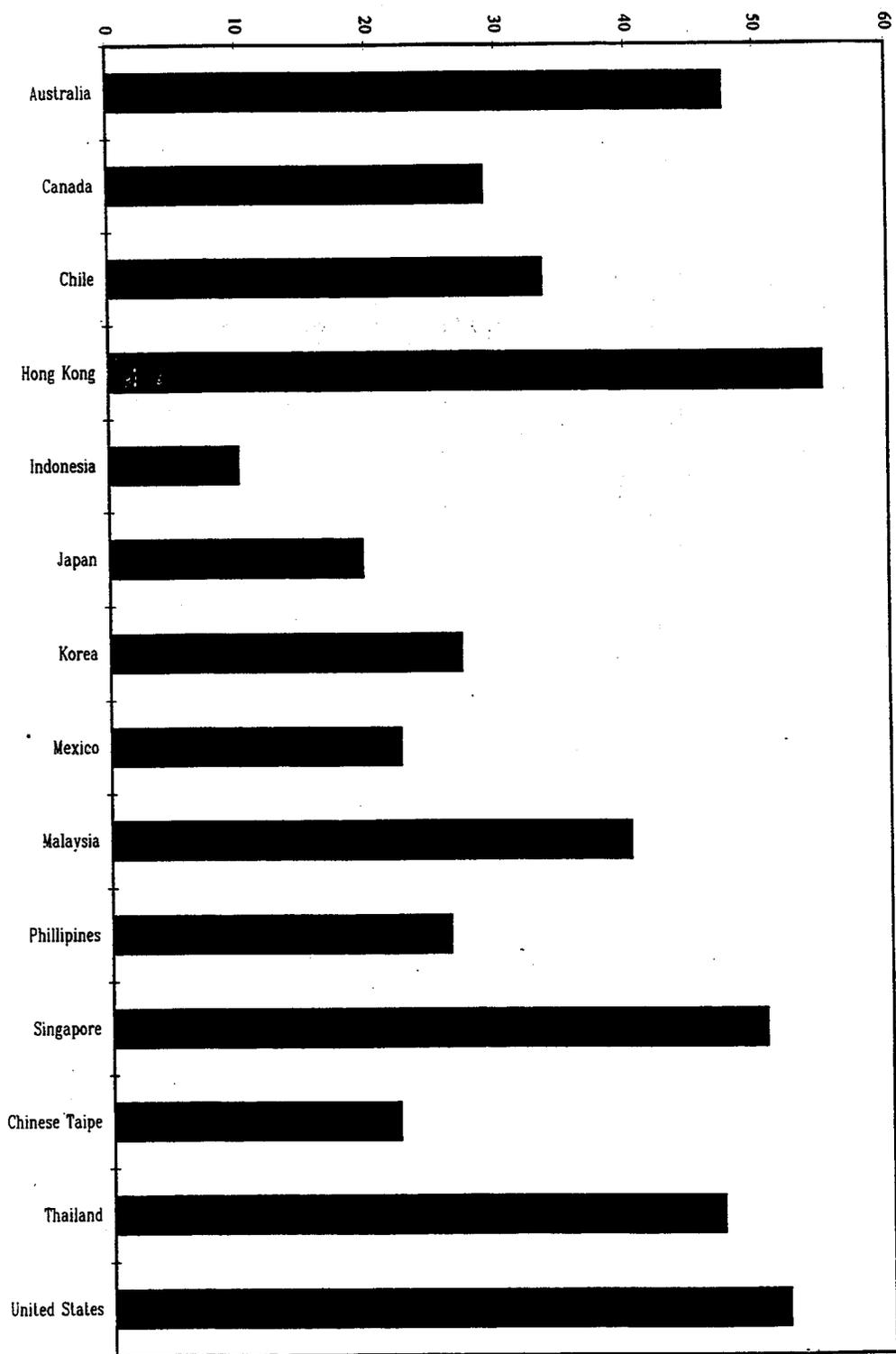


Sheet1 Chart 1



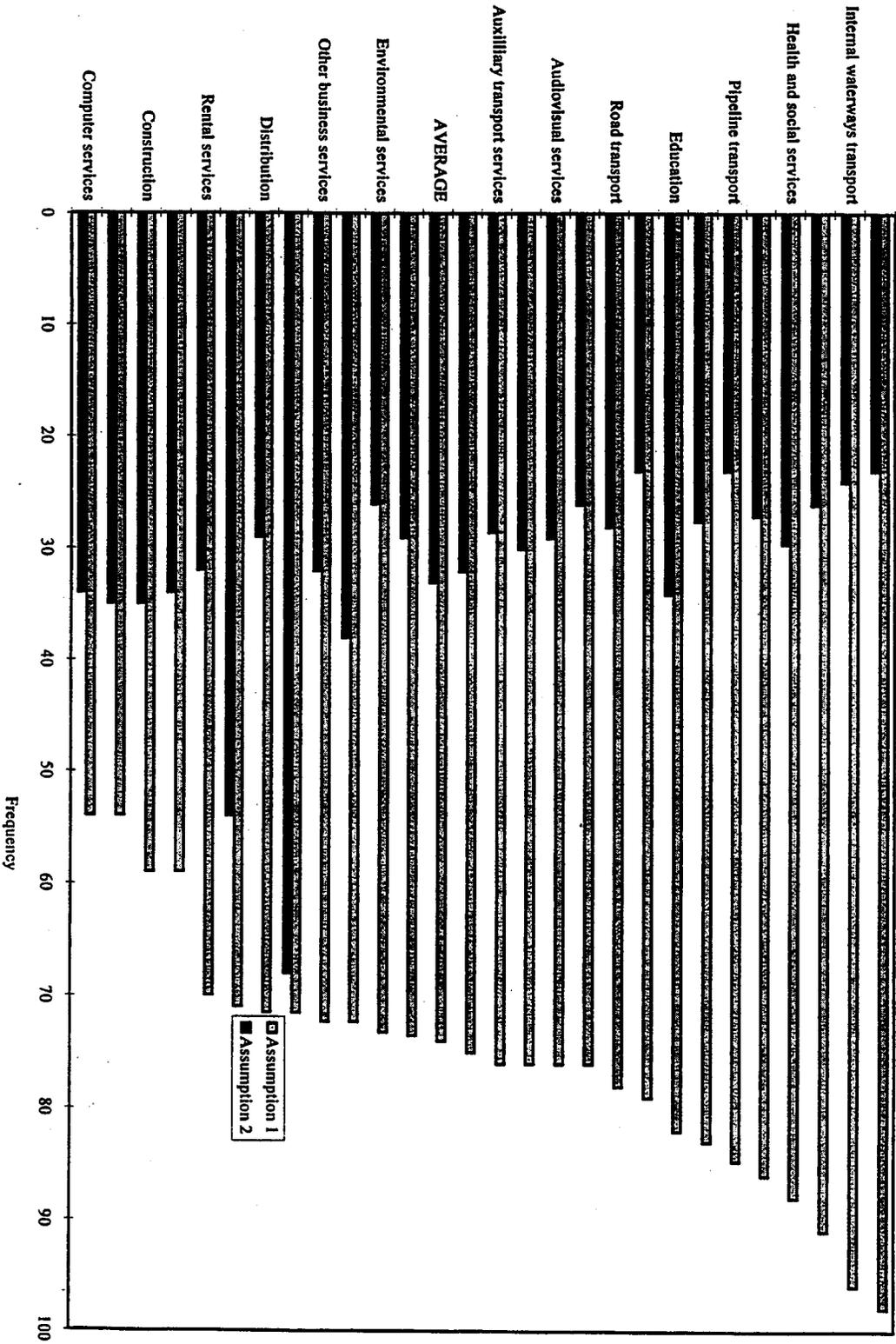


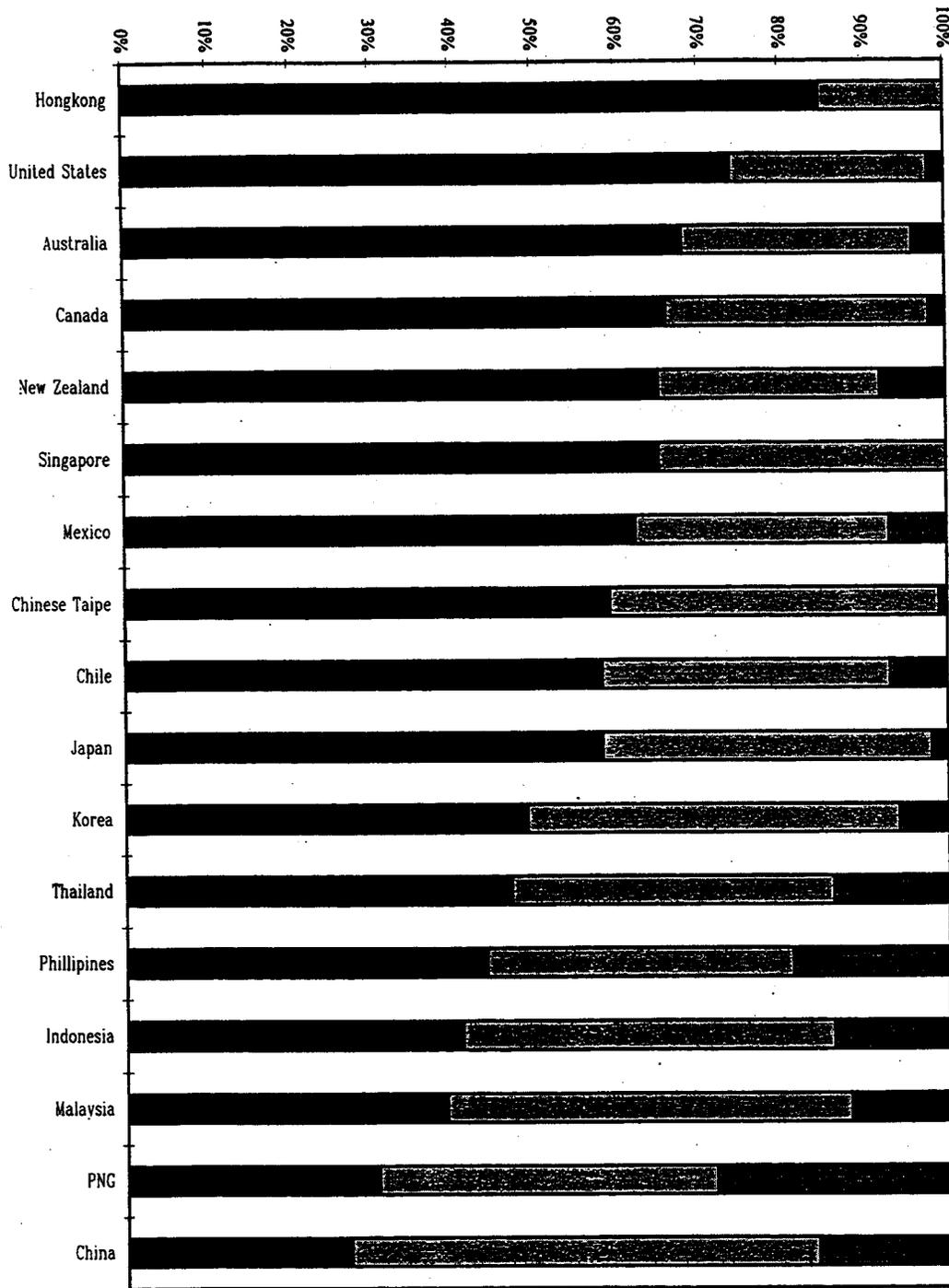
Sheet1 Chart 2



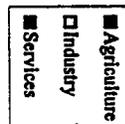
Sheet1 Chart 3

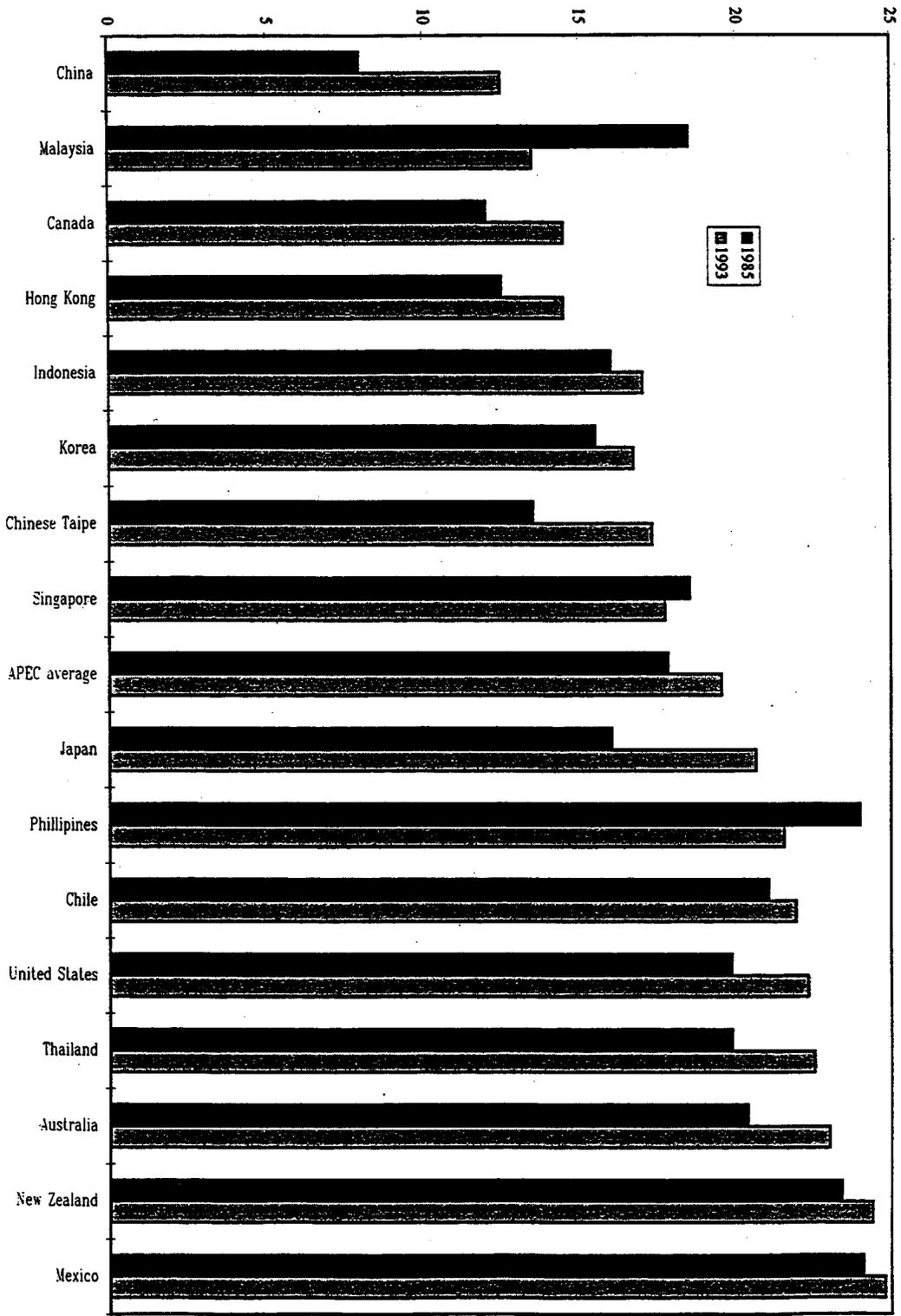
Sheet Chart 4



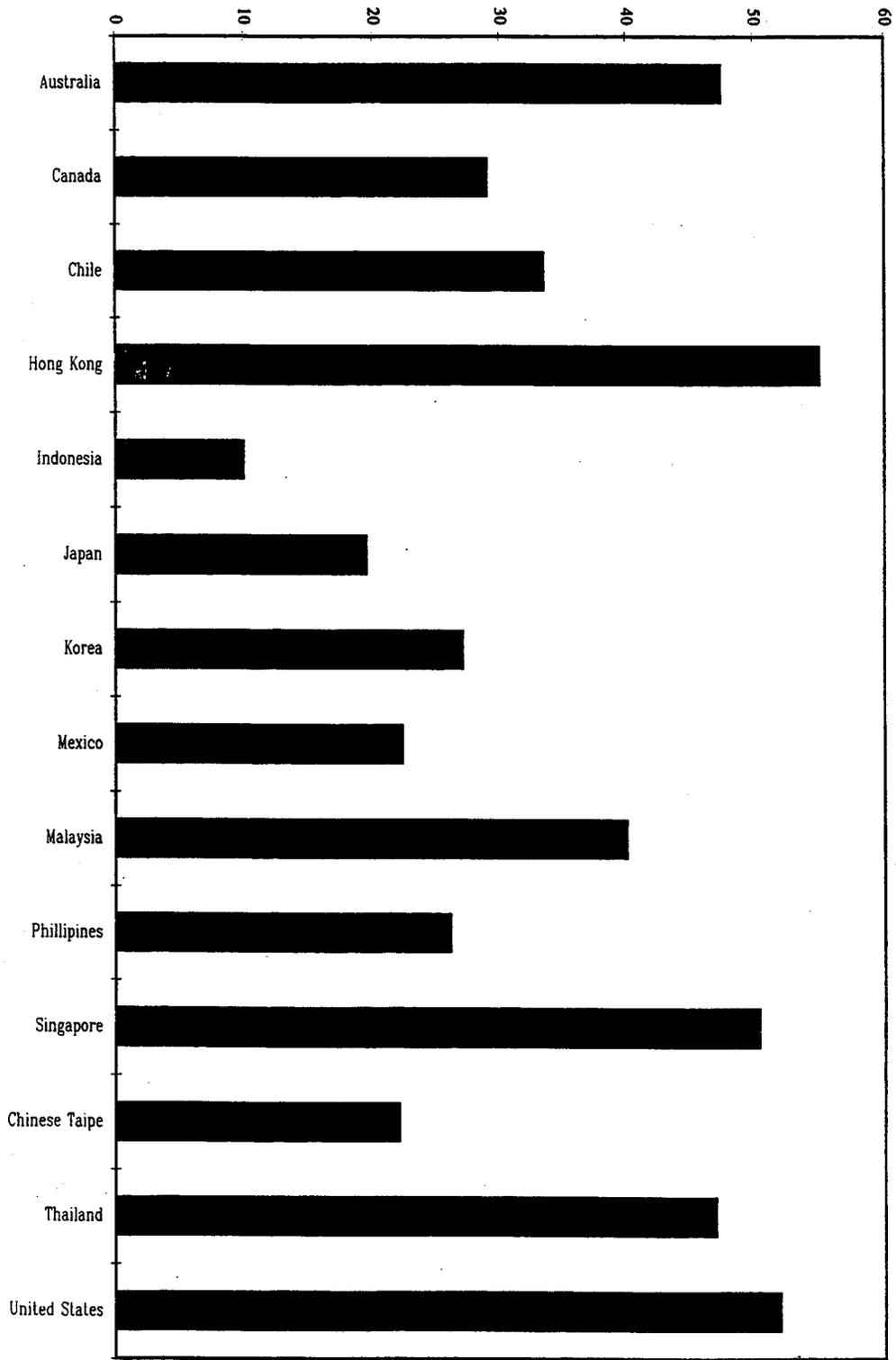


Sheet2 Chart 1



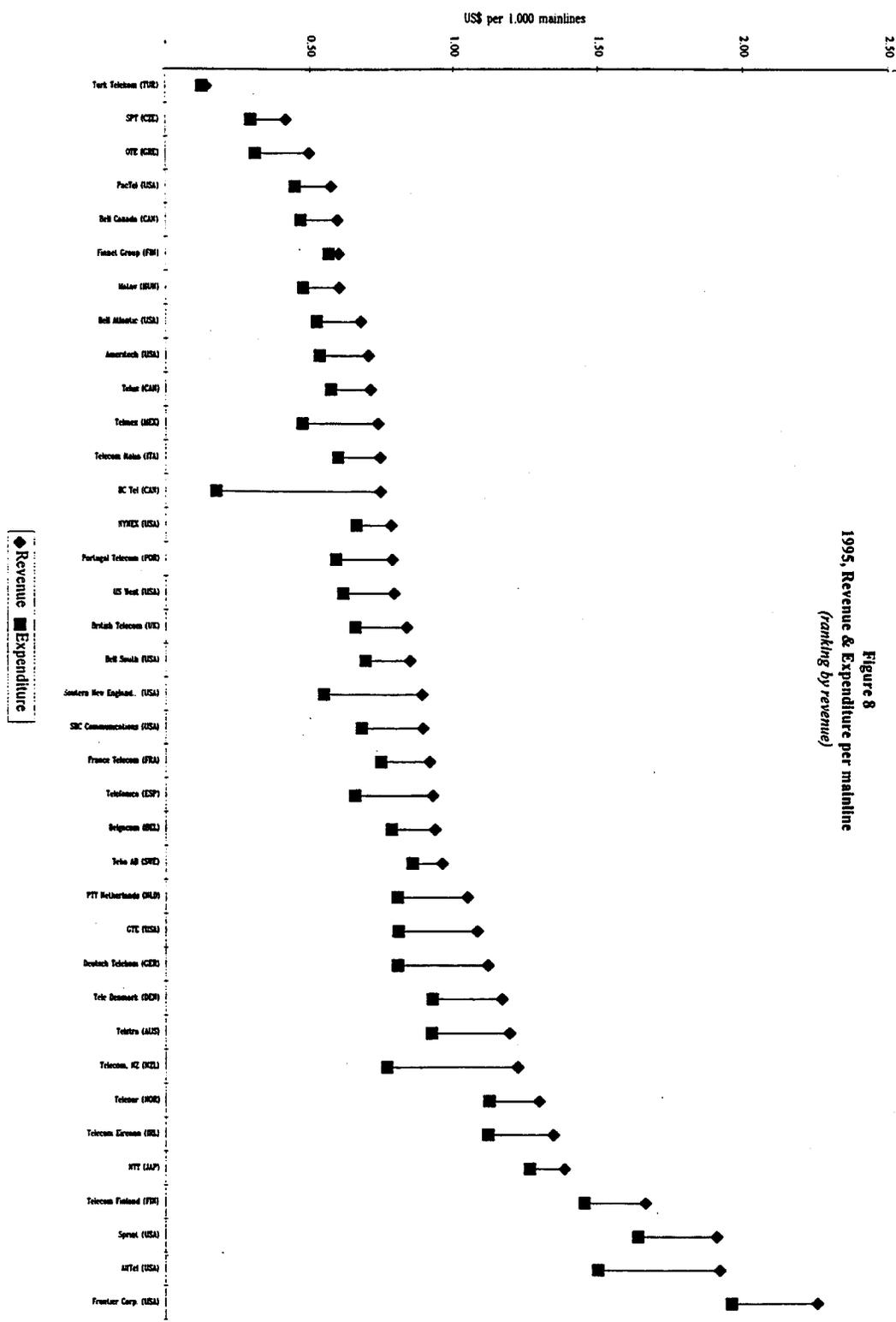


Sheet2 Chart 2



Sheet12 Chart 3

charts - R & X Chart 5



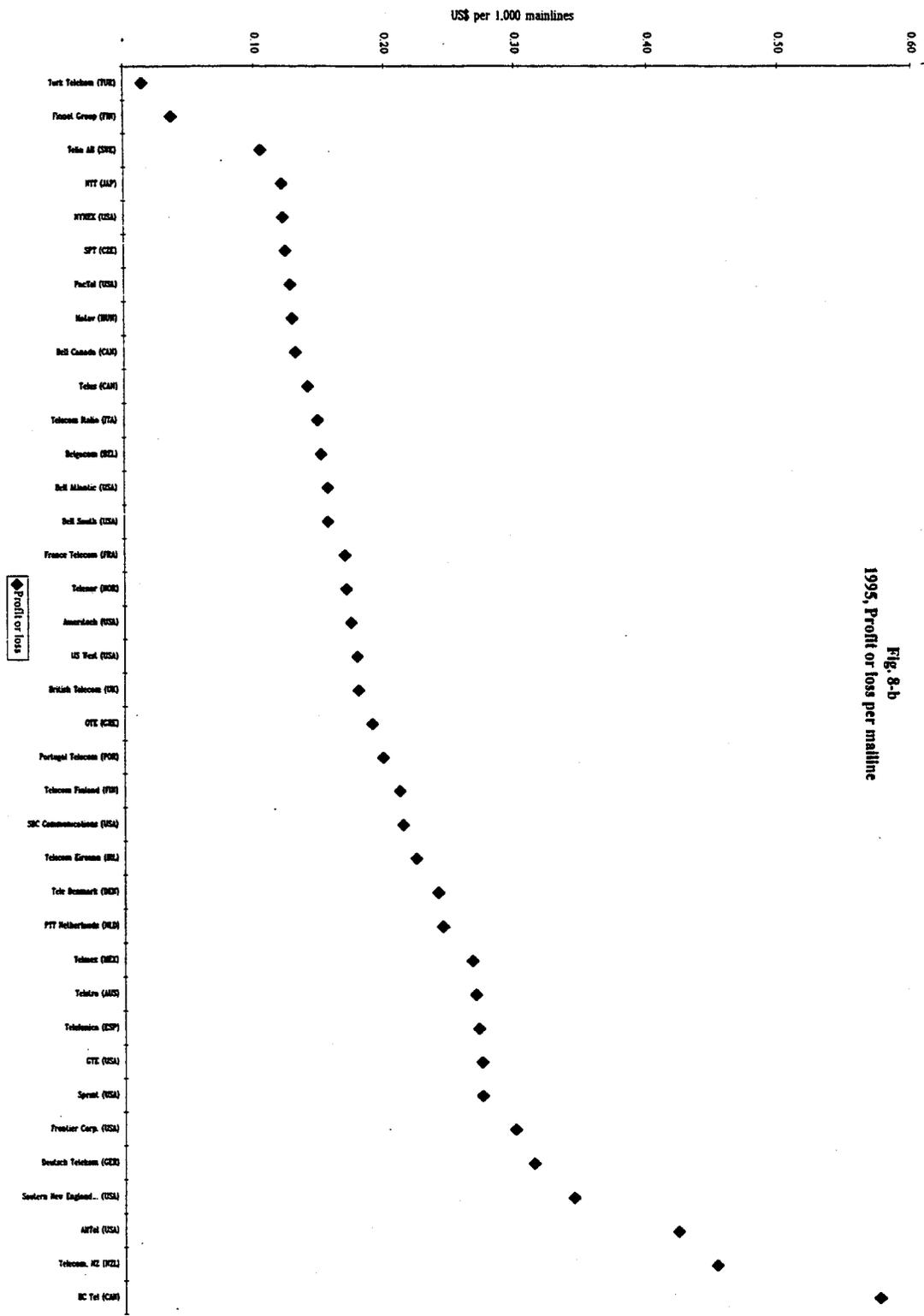
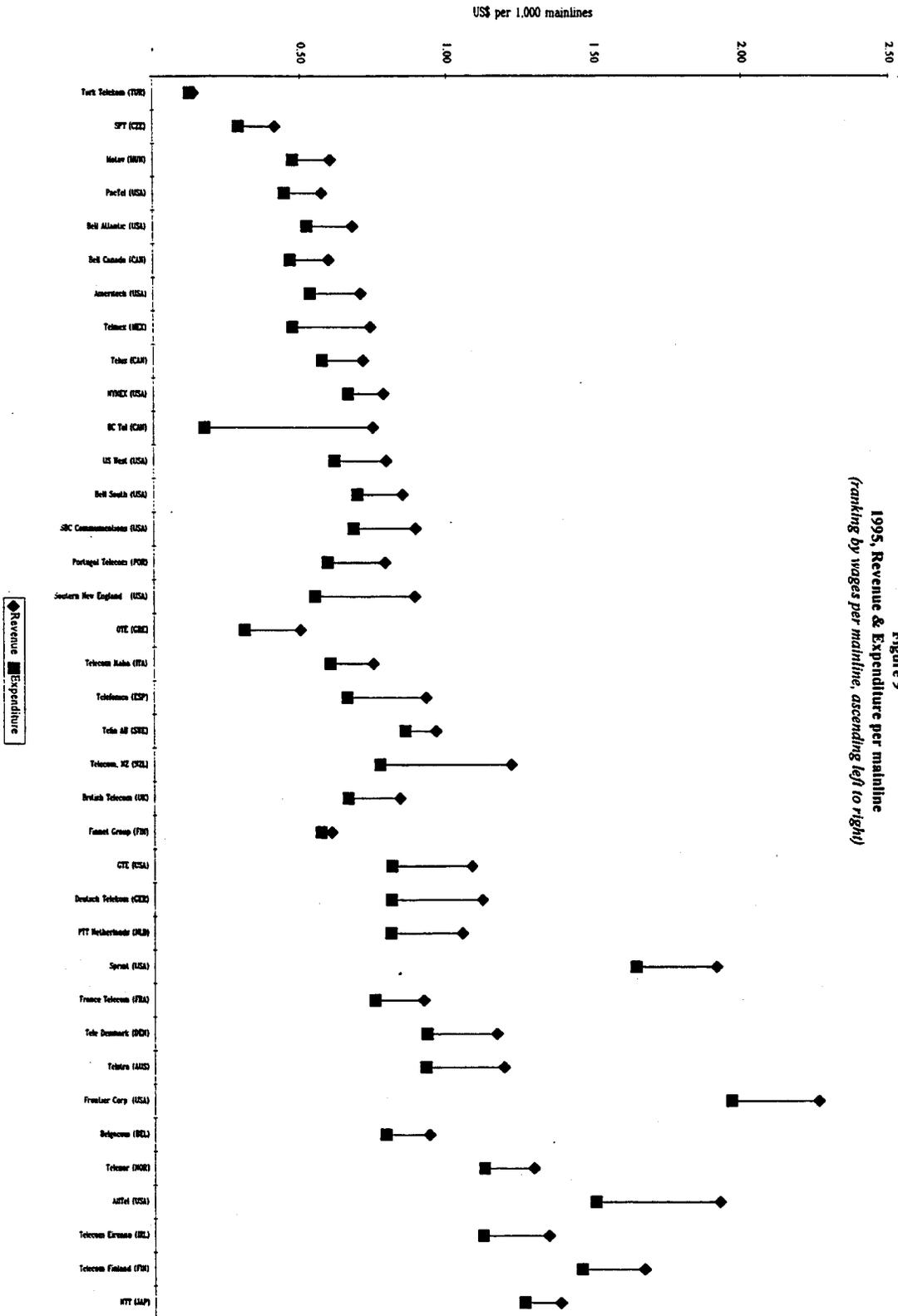


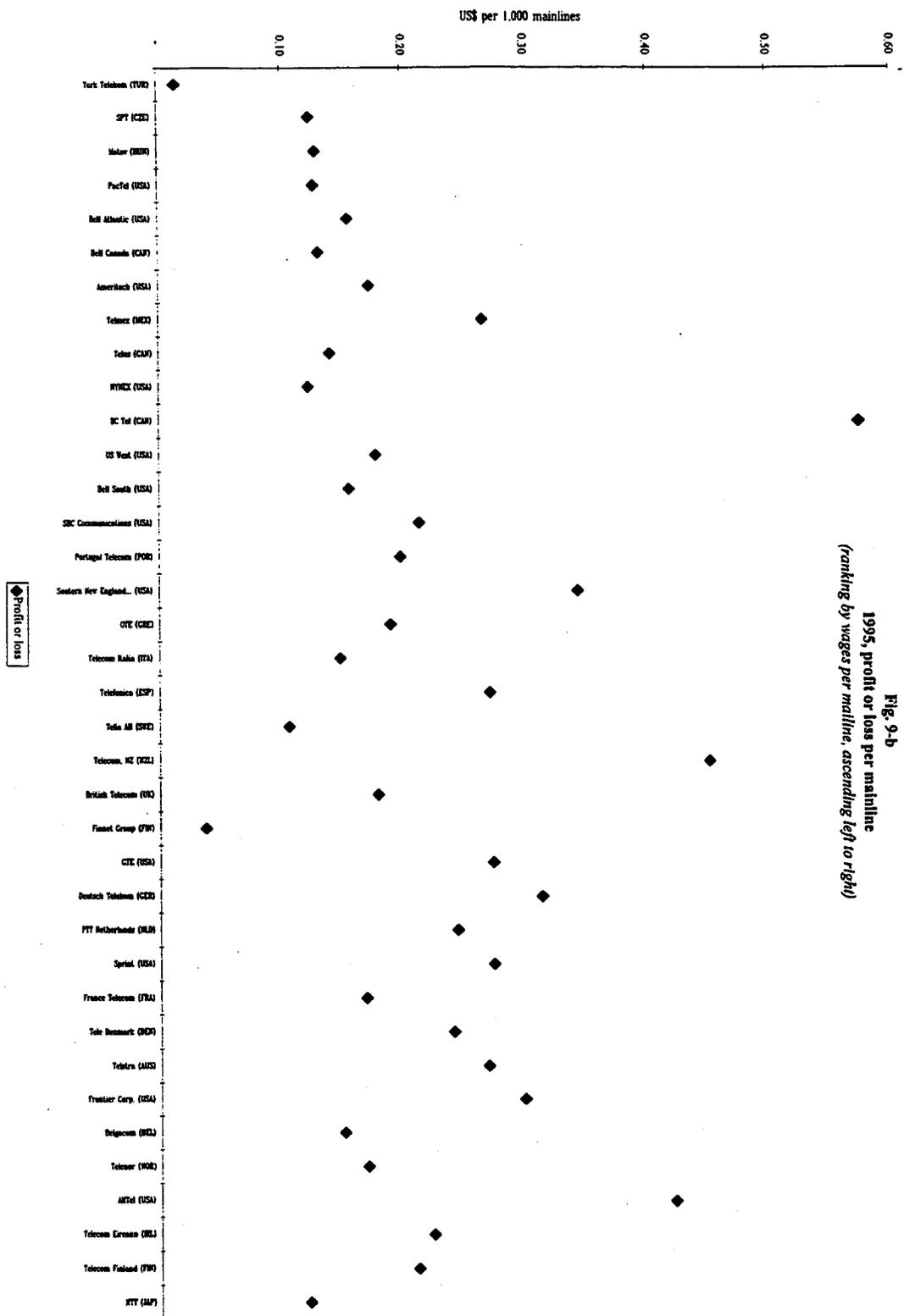
Fig. 8-b
1995, Profit or loss per mainline

charts - profit Chart 1

charts - R & X Chart 2

Figure 9
1995, Revenue & Expenditure per mainline
(Ranking by wages per mainline, ascending left to right)





charts - profit Chart 2

charts - R & X Chart 3

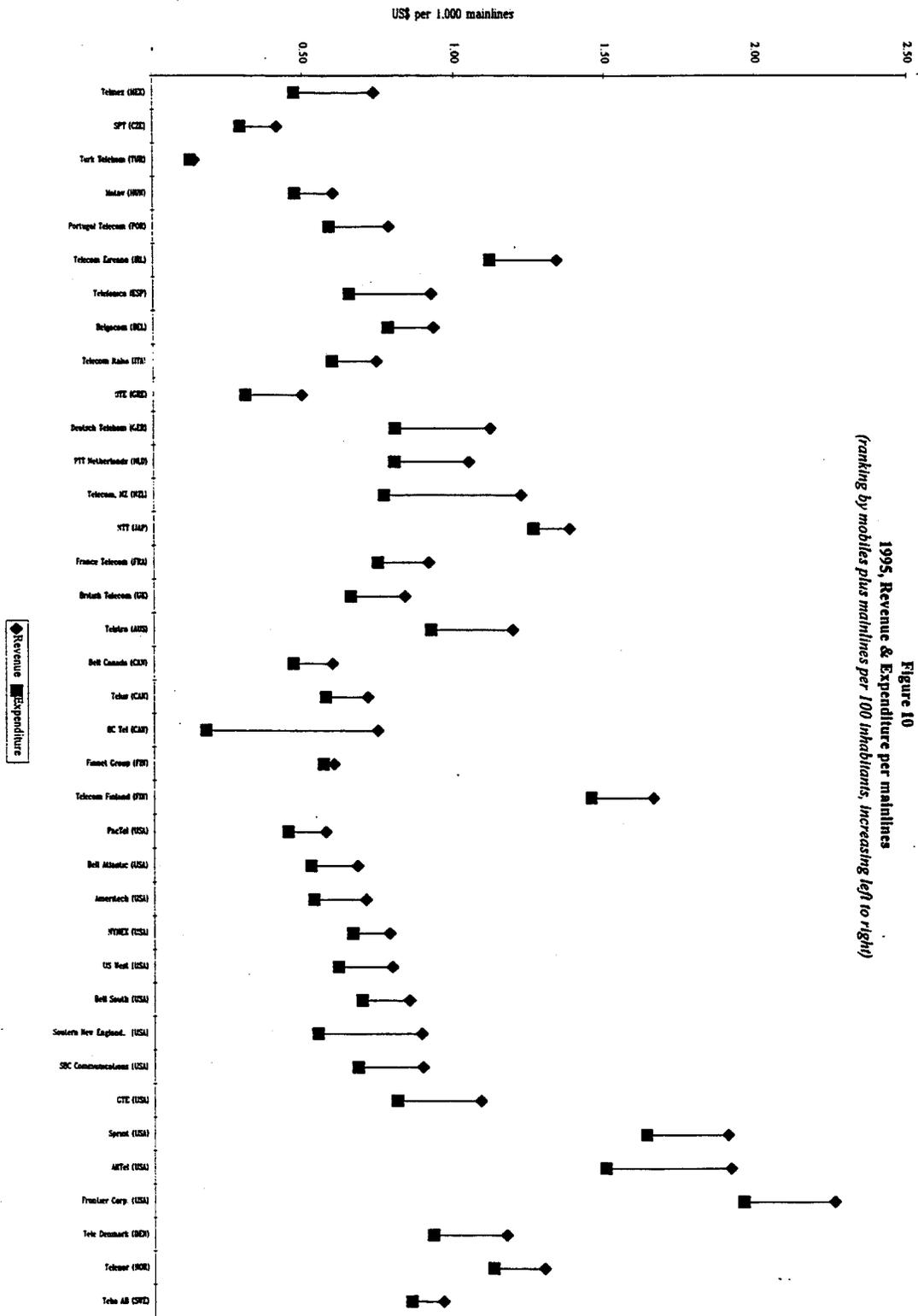


Figure 10
 1995, Revenue & Expenditure per mainlines
 (Ranking by mobiles plus mainlines per 100 inhabitants, increasing left to right)

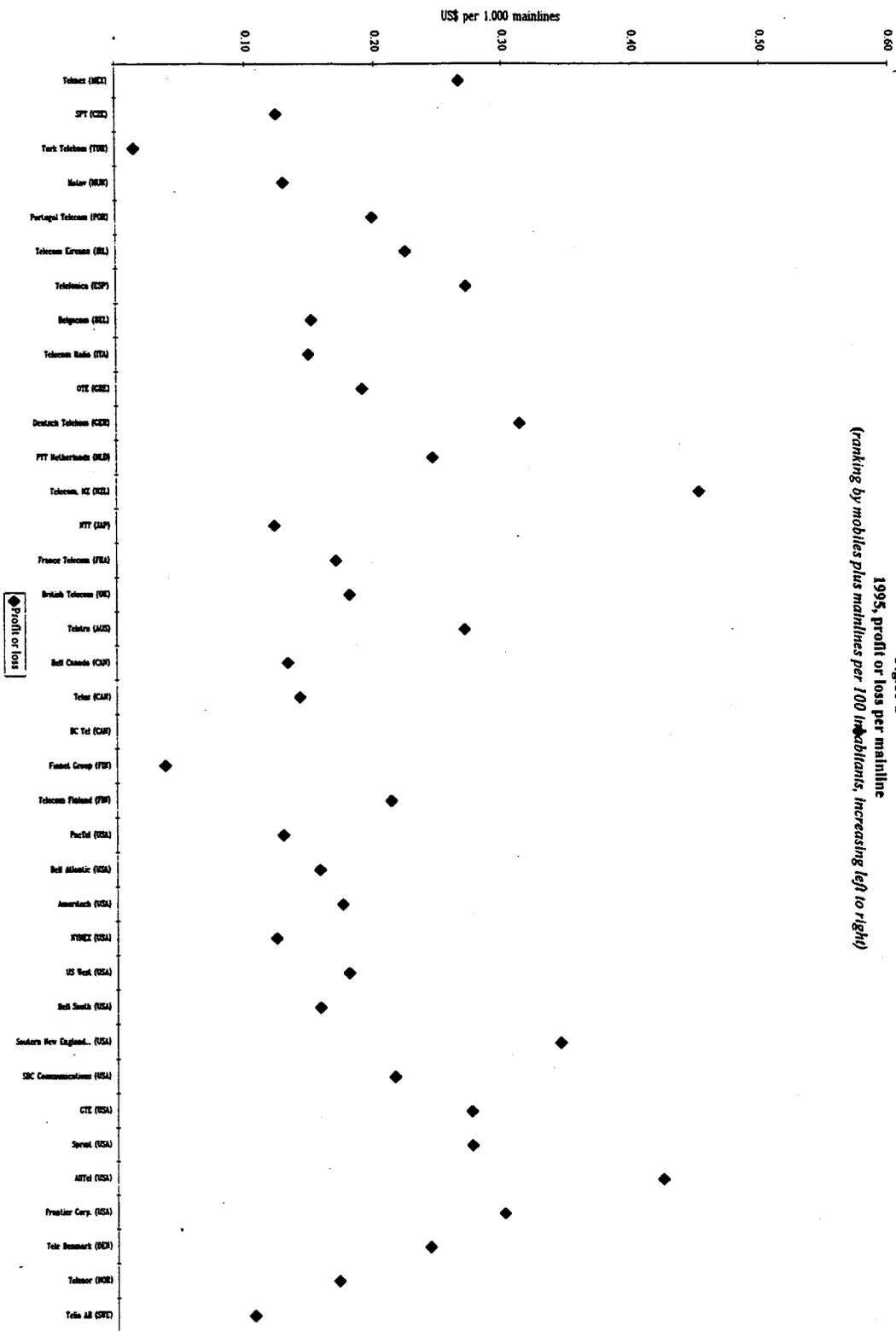


Fig. 10-b
 1995, profit or loss per mainline
 (Ranking by mobiles plus mainlines per 100 inhabitants, increasing left to right)

charts - profit Chart 3

Comments by Carlos Alberto Braga on
Patent Systems in APEC: Role in Nontariff Trade Barriers and Strategic Trade Policies by
Walter Park
and
Measuring Trade Impediments to Services within APEC by
Malcom Bosworth, Christopher Findlay, Ray Trewin, and Tony Warren

Let me start by saying that I enjoyed the papers, and I tried to measure the contribution based on one letter that I received that said that the USITC, when requesting these papers, was striving to get a critical assessment of the state of the literature. While reading the papers on the metro on my way here, my first role in the critical assessment of the literature was to see if I were quoted. I was quoted in your paper. I was not quoted in yours. So that was the first problem. We are still in a very initial stage in some of these issues, particularly when we try to talk about relevance, particularly from the perspective of developing countries. The paper on intellectual property rights is good not only on the strength of the intellectual property rights regimes, but also on how these regimes are implemented. I do not have any disagreement in terms of the issues that were raised. Those issues are particularly relevant for the industrialized countries that are the OECD level countries in the context of APEC negotiations. Most of the papers give relevant examples about the U.S.-Japanese relations.

For developing countries, some other issues require attention even at the level of negotiations related not only to the issue of how the law is applied but also to how to put in place the commitments at different levels. For instance, some of these countries, as Professor Park mentioned, do not yet even have a full system of patent protection. Those that have made commitments that are WTO members probably will have something in place shortly. The question of enforcement is another dimension of negotiations. We already see enforcement in bilateral relations mentioned in passing, relative to a major economy like China, and relative to relations with the United States. The enforcement issue is going to be contentious in industrializing countries because enforcement is very resource-intensive. Many countries do not have experience in how to do it and will need technical assistance, especially where different practices can cause friction for the sake of friction.

The intellectual property rights paper is useful for defining two issues: implementation and enforcement. The other issues of private action and strategic behavior are interesting. In the end, however, the chief issue is what a nontariff barrier to trade is? Since the 1980s, we can say that intellectual property rights do affect trade. The literature has come to a consensus. Many models try to show this consensus. The dimensions of this impact of intellectual property rights, however, are open as in the question of private action, and in the effect of competition laws. We need to consider all this at the level of negotiations.

The paper on services poses the different alternatives to identify the implications of protection in the area of services for trade. The OECD has done a comprehensive study of the literature, and 3 years ago we did a study identifying the nontariff barriers to trade (still the most comprehensive review, with focus on developing countries). In terms of how to measure these, the seven steps from an economic perspective are right. I would add that one more way to put some benchmarks in the area of telecommunications that the FCC has just released for international phone calls.

To bring all this to a computer general equilibrium models, you mention some initial experiments of Drucilla Brown and others, published already in a book about the Uruguay Round. An issue of *Asia-*

Pacific Economic Review, with several pieces on this topic in a conference in Canberra, has among others, Joseph Francois advancing this discussion about how to model at the level of a general equilibrium model. This material needs attention for all the APEC countries in the content of the GATS.

We need to be careful not to give the wrong impression. The GATS is not a stand-still agreement. The offers made in Marrakesh in 1994 were tantamount to stand-still in the sense that the countries did not use the GATS to liberalize the regimes significantly. Their offers were status quo, but GATS is not stand-still. Major commitments in terms of liberalization of basic telecommunications agreement have been achieved. These commitments were the first big success of the GATS agreement.

Comments by Michael Ferrantino¹ on

**"Patent Systems in APEC: Role in Nontariff Barriers
and Strategic Trade Policy" by Walter Park**

Firms which seek to patent abroad can be subjected to a variety of irritations and frustrations, of types not experienced under their home-country intellectual property laws. Walter Park has provided us with a very useful overview of these irritations, and asks whether they constitute nontariff barriers to trade (NTBs) or instruments of strategic trade policy. As David Richardson points out elsewhere in this symposium, the economic issues involved in constructing a socially optimal international regime for intellectual property rights (IPRs) are indeed murky. From the standpoint of economic theory, the question of whether any particular country's IPR practices are relatively close to the optimum, either from the standpoint of national or global welfare, is yet more difficult. Among policymakers, at least in "Washington consensus" circles, there is a good deal more confidence in the right direction to head. Strong IPRs are better than weak, including strong recognition of foreigners' rights, and it is sometimes implied that the difference between a "strong" and "weak" system can be determined by casual inspection. *A priori*, the likelihood of economic theorists neglecting practical considerations and of policymakers ignoring basic economics cannot easily be ranked. Thus, the present effort at detailing the practical effects of different national patent systems in their actual operation is particularly salutary.

It should be emphasized at the outset that Park's concern is primarily with international trade in intellectual property, rather than merchandise trade. The present paper does not take up the question of whether strong recognition of foreign intellectual property tends to promote merchandise trade (e.g. by preventing reverse engineering of goods post-shipment) or to substitute for merchandise trade (e.g. by facilitating tariff-hopping direct investment, which is more profitable if employees in the foreign subsidiary cannot leave and set up shop using technologies learned in their first employment).

The evidence on the international effects of strong IPRs is beginning to accumulate. Strong IPRs generally encourage more trade in technological information itself, whether measured by values of royalties and license fees or by cross-licensing of patents (Ferrantino (1993), Ginarte and Park (1996)). Exports from developed countries to developing countries increase with stronger IPRs (Maskus and Penabarti (1995)), particularly when the developing country involved has sufficient technological capacity to make imitation viable (Smith (1997)). Countries with weak IPRs receive less foreign direct investment, and what they do receive is heavily weighted toward sales, distribution, and rudimentary production with widely diffused technologies (Lee and Mansfield (1996)). But strong IPRs do not necessarily stimulate all cross-border transactions. Cross-licensing of patents is reduced among countries with the highest level of IPR protection, since firms prefer not to share a truly effective patent monopoly (Ginarte and Park (1996)), and intrafirm exports of multinational firms may be stimulated by weaker IPRs, possibly to conceal steps of the production process (Ferrantino (1993)).

¹ The author is with the Office of Economics of the U.S. International Trade Commission. These comments are solely meant to represent the opinions of individual authors. They are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners or the U.S. government.

On the basis of the available evidence, it is reasonable to infer that strengthening of IPRs is complementary with trade and investment liberalization. This inference comes with a caveat; the complex effects of simultaneous liberalizations on the behavior of multinational firms are still not completely understood. By restricting his scope in the present paper to international patenting, Park is dealing in an area where the lines of argument are considerably clearer.

What people generally mean by a "strong" IPR regime is one in which inventors easily obtain recognition of their inventions, have reasonable prospects of discouraging imitators through the legal process, and thereby have greater incentives to invent. A strong global regime, by extension, is one in which inventors easily obtain worldwide recognition and can discourage imitators anywhere on the globe. APEC's Osaka Action Agenda of 1995 adheres fairly closely to this approach.

The TRIPS agreement, proof text for the APEC IPR goals, recognizes that countries might design their IPR systems for both "developmental and technological objectives" and that the least-developed countries need "flexibility ... in domestic implementation ... in order to enable them to create a sound and viable technological base." This implies that poorer countries, with weaker research capabilities, might find it in their interest to permit a good deal of domestic imitation of foreign intellectual property.

Park's analysis does not focus directly on differences between developed and developing countries, but rather on differences between the patent systems of the United States and Japan, which he sees as paradigmatic of a greater divide within APEC. He gives Taiwan, Korea, and Singapore as examples of economies with relatively Japanese-style systems, and Canada, New Zealand, and Australia as examples of economies with systems similar to the United States.

Japan has a deep technological base and engages in a good deal of innovation, as reflected in the large number of Japanese patent applications outside of Japan. Some of the underlying tensions behind the institutional differences discussed in the paper can be highlighted by an analysis of Park's Table 1, which assigns equal weights to each patent authority's data to adjust for the problem of varying patent scope in different countries. In considering ten countries other than the "big four" patenters, one finds patent applications in the "typical" APEC country look as follows:

APEC Patents by Country of Filer in 10 Technology-Importing Economies, 1990
(percent of total)

United States	38.6
Japan	14.0
Domestic	10.7
Australia	2.2
Canada	0.9
Other foreign	33.6

Allowing for the fact that countries with relatively low levels of patenting probably do not seek many applications outside the domestic market, this probably gives a fairly good picture of the relative contribution of various countries to overall technological effort in the APEC region. If one considers that pirated technology from overseas is not always matched by a corresponding patent application from the inventor, then the share of foreign technological effort in general, and U.S.

technological effort in particular, in APEC's overall development is necessarily greater than that indicated. By the above indicator, total exportable U.S. technological output in 1990 was 2.76 times the size of exportable Japanese technological output. For comparison, U.S. population, GDP, and manufacturing GDP (the latter two valued on a World Bank Atlas basis) were 2.02, 1.73, and 1.07 times the Japanese level respectively. This reflects the higher level of research productivity in the U.S. economy, also manifested in the chronic surplus in the U.S.-Japan bilateral technology trade balance. In 1995, for example, U.S. receipts of royalties and license fees from Japan were about \$5.34 billion, versus U.S. payments to Japan of \$1.47 billion.

This surplus would be even greater if it were easier for U.S. firms to make direct investments in Japan - the share of U.S. technology receipts from Japan not accounted for by U.S. affiliates is a relatively high 28 percent, as compared to 16 percent for receipts from other countries.

By contrast, Park's data on the 1990 distribution of patent applications filed in each of the four major APEC technology sources reduces to the following:

Patents filed in	Patents originating from (percent of total)					
	Domestic USA	Japan	Australia	Canada	Other foreign	
USA	52.1	---	21.9	0.8	2.2	24.8
Japan	89.5	5.2	---	1.2	1.2	6.0
Australia	26.2	32.7	7.2	---	2.0	31.9
Canada	8.3	44.4	11.7	1.6	---	34.5

In the United States, the share of patents filed by U.S. inventors is only modestly higher than the total share of U.S. patents in the technology-importing markets, reflecting a reasonable preference of U.S. inventors for patenting at home. In Japan, by contrast, it is particularly difficult for any foreigner to get a patent. Given the U.S. lead in the overall volume of patentable inventions, it is striking that the share of patent applications filed in Japan and of U.S. origin, is less than one-quarter the share of patent applications filed in the United States and of Japanese origin. One expects the reverse situation - the Japanese net importation of technology in value terms, as reflected in licenses and royalties, should be reflected in a large share of patents filed in Japan being of U.S. origin.

The data thus suggest that either Japanese patent laws, or the patenting behavior of Japanese firms, creates a non-tariff barrier to trade in disembodied technology. This reduces U.S. firms' technology rents in the Japanese market, and perhaps in similar markets with Japanese-style rules and behavior. Park's account of the Japanese patent system and practices outlines how this takes place in practice. One reasonable interpretation of this state of affairs is that while Japan has now graduated to the stage of being a net technology exporter relative to most of APEC, its institutions still reflect its historical position as a net technology importer relative to the United States, with a system designed to facilitate imitation of U.S. (and to a lesser extent, European) technology even at some potential cost to the ability of emerging Japanese inventors to secure enforceable rights on their own innovations.

In contrast with this institutional analysis, both the Ginarte/Park index of patent rights for 1995 and the older Rapp and Rozek index (which covers more countries) reflect a fairly clear demarcation between developed and developing countries in terms of overall strength of patent rights,

with Japan looking like the former group. As Park notes, the tension between his numerical scoring of Japan as having strong IPRs and his institutional analysis of the Japanese system as potentially engendering NTBs is based on the reliance of the numerical scores on *de jure* features of the patent system, while the institutional analysis uncovers issues of *de facto* implementation.

The dichotomy between developed- and developing-economy APEC members is easily explained in economic terms. As Park recognizes, any patent regime must balance the gains of increased patent protection in terms of accelerated technical progress against the losses associated with the monopoly position of the patentee and the relative lack of competition. An MFN strengthening of IPRs in APEC's weak IPR countries will boost the incentives to research worldwide. By cutting off technological imitation, this will raise the price of some goods, with costs for consumers. Poorer countries are further down the product cycle, and can more readily produce imitative goods with mature technologies than engage in competitive innovation with the developed countries. Indeed, these countries already pay a substantial amount for international licenses and royalties (Evenson (1990)). Moreover, developing countries tend to be net importers of high-tech goods and in the short run may benefit from the option of buying cheaper imitation varieties of these goods. Thus, there tends to be a dichotomy between the interests of developed countries and developing countries, with the former desiring strong IPRs in order to earn greater rents from innovation with the latter disproportionately enjoying the benefits of imitation and competition (Chin and Grossman (1990), Deardorff (1992)).

In current APEC discussions, the developing members have elevated the issue of TRIPS implementation and technical assistance. They have argued, so far effectively, that the task of TRIPS implementation is so great as to preclude the taking up of new issues raised by the United States. These issues include the granting of rights for new technologies, particularly those based on information or biotechnology, which are still unpatentable in many countries.

The Japanese system is not "weak" in the same sense that the systems in developing APEC countries are said to be weak. The Japanese system maintains a substantial legal and administrative apparatus for processing both patents and patent disputes, and handles twice as many applications every year as the U.S. system. One main reason for this is the narrowness of scope of Japanese (and Korean) patents, which makes it easier for inventors to file claims for non-infringing close substitutes than in the U.S. system. Narrowness is partly induced by law and partly by the behavior of patent examiners, but it is essentially set by government. Under a narrow-scope system, the rents earned by any individual patentee are smaller than under a broad-scope system. Setting narrow scope leads to two of the private practices which Park discusses, patent flooding (in which competitors file numerous patents for minor modifications of the original invention to limit its scope) and patent blocking (the original inventor's defense against flooding, in which the inventor files the minor modifications simultaneously with the original).

Interestingly, when patent systems are operated on an MFN basis foreign firms may adopt the strategic practices in the local market. Park documents that Korean firms "flood" the Japanese patent authority with applications which surround valuable Japanese patents. U.S. firms seem not to do this very often. This may be attributable to the relative positions of the United States and Korea in the product cycle; it pays U.S. firms more to seek protection for their already existing inventions than to drain rents from Japanese inventions. Moreover, the barrier to entry imposed by the requirement that applications be filed in Japanese (the U.S. accepts foreign-language applications contingent on their eventual translation, which aids in establishing priority) and the non-recognition of foreign lawyers in

Japanese patent court are probably easier barriers for Korean than U.S. patenters to surmount, given historical circumstances.

Park's characterization of patent systems APEC-wide identifies several other features which, when contrasted with the U.S. system, either facilitate imitation or tend to reduce the rents obtainable from any patent eventually granted. About half of APEC, including the United States, publish patents upon grant, maintaining secrecy in the interim. The other half, including Japan, publish the application 18 months (or less) after application, making the information public. The United States, Australia, Canada, and China maintain the doctrine of equivalence, which effectively increases the scope of existing patents by permitting infringement suits against inventions which are substantially equivalent to the patented invention even if the equivalent inventions are not explicitly referenced in the patent. Many APEC countries, including Canada, Australia and Japan, provide for compulsory licensing, which forces patenters to share rents with local rivals. Compulsory licensing tends to transfer rents from technology-exporting to technology-importing countries, while in countries with a strong innovative base it may aid in facilitating collusion. Some non-U.S. APEC economies permit firms to legally oppose patent applications, in effect suing for infringement before the patent is even granted. This tends to favor incumbent firms over innovative entrants in general and domestic incumbents over foreign innovators in particular. While several countries permit opposition 2-6 months after the grant, Japan's system of pre-grant opposition provides the strongest protection for incumbent firms against innovators.

Measures which create barriers to entry for foreign innovators, or which transfer rents from innovators to imitators, tend to operate against the interest of U.S. producers, but may be understandable from the particularistic interest of developing countries wishing to benefit from low-cost imitation or to protect incumbent firms. Such measures make increasingly less sense as economies deepen their national technological capacities, and graduate from imitator to innovator status. It is striking how many provisions of the patent systems in Japan, Australia, and Canada tend to facilitate imitation at the expense of innovation, imposing costs not only on U.S. inventors but on the more innovative firms in those economies as well. Given the rapid expansion of technological capacity and education throughout the APEC region, the pool of potential innovators within each economy will grow ever larger, with those innovators probably benefiting under regimes converging toward the U.S. model with less dynamic incumbent firms preferring the status quo.

Given this set of facts, it makes sense for the United States to broaden the discussion of intellectual property in APEC, arguing that in the long run the development interests of the region are served by a mix of national systems which place progressively more weight on innovation while continuing to recognize some legitimate differences of national interest within the region. Patenting institutions which generate large numbers of applications relative to the economic value of those applications are inherently inefficient, generating rent-seeking behavior of primary benefit to lawyers and bureaucrats. The current bilateral barrier to services trade in patent law between the United States and Japan (the U.S. permits foreign patent lawyers only on a reciprocal basis) is an issue which links the APEC goal of reducing service-oriented barriers with IPRs; it would be interesting to know how many other APEC economies besides Japan maintain a similar barrier. Indeed, permitting APEC-wide free trade in patent lawyer services would represent a concession by the United States in terms of the services themselves, since Japan currently must hire U.S. lawyers to file tens of thousands of applications at the U.S. Patent and Trademark Office annually, and those lawyers' income would

decline under free trade in their services. But the increase in U.S. technology income which could result from permitting U.S. innovators to use their accustomed counsel in the Japanese system could well offset these losses.

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Comments by Richard Brown¹ on

**“Measuring Trade in Impediments to Services within APEC,” by
Malcolm Bosworth, Christopher Findlay, Ray Trewin, and Tony Warren**

The authors discuss methods of deriving partial equilibrium estimates of the effects of impediments to trade in services, examine the use of partial equilibrium estimates as means of benchmarking, and outline a seven-step approach to measuring the impact of impediments to services trade. The authors identify and discuss Australian impediments to trade in telecommunication services, and outline how the seven-step approach could be used to derive a price-impact measure of the effect of these impediments. Further, the authors highlight areas for future work, most importantly work that would assess the trade-impeding impact of foreign direct investment measures. In developing this paper, the authors drew on previous work performed for the Pacific Economic Cooperation Council and ongoing work by the Australian Industry Commission, the Australian National University, and the University of Adelaide.

The authors begin by defining impediments to services trade as a “comprehensive set of service related regulations or practices that distort an economy’s efficient allocation of resources, including those that may cause an increase in the volume of trade and investment.” This broad definition is appropriate as it comprehensively captures the nature of impediments to trade in services, including market access and national treatment restrictions, and applies to all modes of delivering services (i.e., cross-border flows, consumption abroad, commercial presence, and movement of individual service providers). The authors proceed by discussing alternative means of measuring impediments to trade in services and, in the process, indicate a preference for price-impact measures. Price impact measures examine an impediment’s effect on domestic prices.

The authors then proceed to outline and briefly discuss the seven-step approach method. These steps include:

- 1) rigorously defining the service industry/service activity using Central Product Classification (CPC) codes and International Standard Industrial Classification (ISIC) codes;
- 2) comprehensively identifying specific impediments to trade;
- 3) identifying the impact of each impediment on prices;
- 4) determining the relevant “price wedge,” which the authors identify as the difference between the actual price in the domestic market, shaped by industry structure and regulation, and the price in a market without trade or investment impediments (a benchmark market);
- 5) identifying the appropriate benchmark market, with the preferred benchmark market being the theoretical perfectly competitive market (i.e., one in which prices would track long run marginal cost);
- 6) decomposing the wedge to identify the price impact of specific impediments and other factors; and
- 7) incorporating price-impact figures into a general equilibrium model to assess the effect of impediments on the overall economy.

¹The author is with the Office of Industries of the U.S. International Trade Commission. These comments are solely meant to represent the opinions of individual authors. They are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners or the U.S. government.

Before commencing the discussion of Australian impediments to telecommunications trade, the authors acknowledge the importance and the difficulty of measuring restrictions on foreign direct investment, as this is an important means of delivering services. The authors note problems regarding the identification, transparency, and quantification of impediments to foreign direct investment, and thus the difficulty of assessing their impact on prices and national economies.

The authors then proceed to demonstrate how the approach outlined above could be used to measure the impact of Australian impediments on international calling. In defining the industry, the authors note the deficiencies of both the CPC and ISIC codes, and instead rely on the Industry Commission's definition of international calls. The Industry Commission defines international calls as those involving 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. This seems an adequate definition for the immediate purpose of assessing the impact of telecommunications reform in Australia.

However, the authors' approach could be applicable to more APEC countries if they narrowed the scope of their examination to international voice services (CPC 7521). This may benefit examinations of certain countries by allowing the authors to identify and consider only those trade impediments and investment restrictions that pertain to international voice services, rather than other basic and value-added services provided over international circuits. In addition, restrictions on the provision of international voice services on a facilities or resale basis, or through various network technologies (e.g., wireline, cellular, microwave, satellite, etc.), are now specified in the WTO's supplementary basic telecommunication schedules, which would further ease the task of identifying impediments. The disadvantage of narrowing the scope in the proposed manner is that data on telecommunication services is not available on a subsector-by-subsector basis. The authors may also wish to consider how the increasing use of refiling, call-back, and country-direct services affects the pricing and volume of international calling in Australia and other APEC countries.

With respect to identifying specific Australian impediments to trade in telecommunication services, the authors identify:

- 1) past discriminatory practices that stemmed largely from Australian operators' control of the installation and maintenance of line links for the provision of all public telecommunication services;
- 2) past and current foreign investment caps on Telstra, Optus, and Vodafone; and
- 3) past and current adherence to the international accounting rate system.

The authors then reasonably argue that two companies' exclusive control over line links through July 1, 1997, and adherence to the international accounting rate system increased the price of international calling in Australia. They note that the price impact of foreign investment restrictions is not clear.

The authors identify a price wedge stemming from duopolistic control of line links, restrictions on foreign investment, restrictions on the entry of foreign technical "specialists," and continued adherence to the international accounting system. The authors' contention that these first three factors result in a price wedge appears reasonable. However, Australia's adherence to the international accounting system would seem to have little bearing on the existence of a price wedge as all countries adhere to this system. Observance of the system would not keep Australia from representing the "best practice" market.

The authors proceed to generate certain benchmark costs on the basis of OECD and ITU data. The work to date appears to end with the calculation of revenue-expenditure wedges, ranked by revenues in one instance (figure 8), and by wages in another instance (figure 9).

The authors have developed an ambitious, but reasonable, approach to measuring the impact of impediments to trade in services. This is a noteworthy achievement as it focuses on a sector of the economy that accounts for 60-70 percent of GDP and 70-80 percent of private sector employment, at least in most developed economies. The authors have also clearly identified the need for more service industry and trade data, and for more work to be conducted in the area of foreign direct investment.

SESSION VII

PUBLIC PRACTICES

Liberalizing Government Procurement in the APEC Nations¹

Simon J. Evenett
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(First draft September 8th 1997)

Abstract:

In recent years East Asian nations have increased their expenditures on infrastructure projects, raising the concern that biased government procurement policies are retarding the growth of imports. The effect of central government procurement policies on bilateral imports was estimated using 1990 data from fourteen APEC nations. These estimates were used to forecast the percentage increase in the imports of a nation whose government unilaterally decides to cease discriminating against the foreign suppliers of tradeable goods. The forecasted increases were larger in nations where the ratio of government spending on tradeable goods to that nation's private sector spending on tradeable goods was larger. Given that this ratio differs significantly across the fourteen APEC nations studied, the percentage increase in imports due to liberalizing government procurement policies varies from approximately one per cent for Australia, Canada and the United States to approximately twelve per cent for Indonesia, Malaysia and Singapore.

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1. Introduction

Two tendencies highlight the importance of quantifying the effects of government procurement policies on trade flows. First, the desire by several APEC nations to integrate their economies into the world trading system through a combination of unilateral and plurilateral liberalization initiatives. Secondly, in attempt to sustain their nation's high rates of economic growth, many East Asian governments are expanding their spending on infrastructure projects. These two tendencies begs the question: to what extent has the failure to liberalize government procurement policies offset the progress made in opening these economies to increased trade flows?

In this paper two mechanisms by which government procurement policies depress trade flows are considered. In the absence of these policies increased government spending (on tradeable goods) would have increased the demand for imports as some contracts are likely to have been awarded to foreign suppliers. This direct effect on the demand for foreign goods is augmented by the following indirect resource effect. In the absence of these policies, had some contracts been awarded to foreign firms then the amount of societal resources forgone to meet the nation's additional government expenditures would have been smaller. Since some of those forgone resources could have been used by domestic firms to produce exports, these policies reduce the nation's exports too.

This study examines the effects of government procurement policies on the bilateral imports of fourteen APEC nations in 1990. A well-known theory of bilateral import flows is modified to take into account the effects of government procurement policies, which restrict the purchase of tradeable⁴ goods to domestic suppliers. This conceptual framework is confronted with data, and the resulting statistical estimates are used to forecast the percentage increase in a given nation's imports resulting from a unilateral decision by that nation's government to buy tradeable goods from foreign and domestic suppliers in a non-discriminatory manner.

The central finding is that the forecasted increases in imports are higher in those nations where eliminating government procurement policies results in a higher percentage increase in the overall demand for tradeable goods. Alternatively put, eliminating a biased government procurement policy will result in a higher percentage increase in imports in nations where the ratio of the government's spending on tradeable goods to the private sector's spending on tradeable goods is higher. This ratio differs substantially across the fourteen APEC nations studied here. Unilateral liberalization of government procurement policies are forecasted to raise Australia's, Canada's and the United States' imports by approximately one per cent; whereas it would raise Indonesia's, Malaysia's and Singapore's imports by approximately twelve per cent in 1990. These forecasts for 1990 will understate the restrictive effect of these policies in 1998 in those nations where the recent growth of their government's spending on tradeable goods has exceeded the growth of their private sector's spending on tradeable goods.

⁴ A "non tradeable" good or service is a good that due to their characteristics of the good is only traded in the nation in which it was produced. Haircuts are an example of a non-tradeable good. A "tradeable" good is one that can be sold in market outside the nation in which it is produced. Whether a "tradeable" good is indeed "traded" (sold to a purchaser outside the nation in which it was produced) depends on a host of factors, such as transportation costs, tariffs and non-tariff barriers (like government procurement policies.)

Turning to the political economy of trade policy liberalization, if policymakers are keen to adopt liberalization packages that minimize the “disruption” (or percentage increase) of imports, then this study’s findings imply that the APEC nations are unlikely to reach a plurilateral agreement that results in each nation’s government spending similar proportions of their expenditures on tradeable goods supplied by foreign firms. Those national governments whose expenditures on tradeable goods are higher (relative to their respective private sector’s spending on tradeable goods) will want to liberalize their procurement policies at a slower rate, so as to minimize the “surges” in imports.

This paper is organized as follows. The related institutional and theoretical literature are discussed in the next section. The conceptual framework is described in the Section Three. The estimation strategy, data employed, estimating equation and results are described in Section Four, as are the forecasted increased in imports that would result from a nation’s unilateral liberalization of its government procurement policies. The implications of the empirical findings for the likelihood, and pace, of such liberalization are discussed in Section Five.

2. Institutional and Theoretical Considerations

Hoekman (1995) has noted that several objectives lead governments not to buy goods and services from the lowest cost supplier, irrespective of the location of the supplier. Specifically, “these [objectives] may include a desire to promote the development of domestic industry or technology; support particular types of enterprises (e.g. small- and medium-sized firms); or safeguard national security.”⁵ In an attempt to meet these objectives governments employ an arsenal of policy instruments to reduce the procurement of foreign-supplied goods by state, and private sector, entities. These policy instruments include offering price preferences to domestic suppliers; demanding that foreign suppliers meet higher cost and safety standards than domestic suppliers; direct bans on bidding or purchases from foreign suppliers; and imposing domestic-content requirements on domestic bidders for government contracts.

As Hoekman (1995) and Mattoo (1996, 1997) have argued, there is a presumption that the effect of these policies is to increase government expenditure, and reduce imports, national and world welfare. Interestingly, theoretical analysis of the effects of these policies effects have identified some circumstances where such policies have no effect on imports and national welfare (Baldwin and Richardson (1972), Richardson (1972) and Miyagiwa (1991)); and other circumstances where such policies might actually raise the welfare of the nation with the discriminatory procurement policies (McAfee and McMillan (1989)). Whether these logical possibilities are relevant to studying actual procurement policies; and whether the potential welfare gains from implementing these policies are large, are empirical matters. Indeed, in his assessment of the literature, Mattoo (1996) concludes that “the design of optimal⁶ discriminatory policy is difficult, and, in any case, the gains are unlikely to be large. Most seriously, the legitimisation of discrimination may lead to adverse political consequences, both at the national and international level, which outweigh the potential gains.” A detailed survey of the empirical estimates of the effect of these policies on imports and national welfare in a partial-equilibrium setting is found in Francois et. al. (1997).

⁵ Hoekman (1995), page 1.

⁶ That is, welfare-enhancing.

Conceptual Framework

Motivation and Assumptions

When studying the economic effects of a particular policy instrument it is customary to develop a theoretical framework that generates a relationship between the existence, or magnitude, of the given policy instrument and an economic variable of interest. Naturally, quantifying the effect of this policy instrument requires empirical counterparts to each of the variables in the predicted relationship. Two major problems emerge when this methodology is applied to quantifying the effects of government procurement policies. First, such policies involve a large number of policy instruments (or actions) that could plausibly affect the amount of goods supplied to governments by foreign firms, and empirical counterparts for them all may not exist.⁷

Secondly, governments have different methods for buying goods, such as purchases from markets and tendering. Previous theoretical research has demonstrated that the magnitude and direction of the effects of procurement policies on trade flows depends crucially on whether the market is perfectly competitive; the nature of any strategic interaction between firms; the share of total expenditure on the good accounted for by government expenditures; and on the characteristics of the tendering process⁸. Even if unambiguous predictions had emerged from theoretical analysis, an enormous amount of data would be required to implement this methodology at the disaggregated level.

In order to develop a tractable conceptual framework that yields predictions of the overall effect of these policies on a nation's imports, a modified version of this methodology is employed. Rather than examine the effect of each policy instrument separately, the maintained assumption is that together these policy instruments ensure that the government in question does not buy any tradeable goods from foreign suppliers. Consequently, the empirical analysis does not turn on the number, or nature, of these policy instruments but on the share of the nation's Gross Domestic Product (GDP) that its government spends on tradeable goods.

Formally, Anderson's (1979) model of bilateral trade flow determination in the presence of non-tradeable goods is modified to incorporate a government that buys both tradeable and non-tradeable goods. Denote:

⁷ For example, foreign firms may be at a disadvantage when bidding if they expect that the probability that the government will pay for any ex post cost-overruns is lower for them than for domestic firms. What observable could proxy for this unobservable policy instrument? Mattoo (1997) examines the effects of "bail out" policies that discriminate between domestic and foreign firms.

⁸ Baldwin and Richardson (1972), Richardson (1972), Miyagiwa (1991).

M_{ij}	Volume of nation i 's imports purchased from nation j
Y_k	GDP of nation k , $k \in \{i, j\}$
Y_w	World GDP
ϕ_k	Share of nation k 's private sector spending on tradeable goods, $k \in \{i, j\}$
θ_k	Share of nation k 's GDP that is spent on tradeable goods, $k \in \{i, j\}$
τ_k	Share of nation k 's GDP that is paid in lump sum taxes by the residents of nation k , $k \in \{i, j\}$
g_{kn}	Share of nation k 's GDP that is spent by nation k 's government on non-tradeable goods, $k \in \{i, j\}$
g_{kt}	Share of nation k 's GDP that is spent by nation k 's government on tradeable goods, $k \in \{i, j\}$

The following assumptions are made:

- A1 Other than government procurement policies, trade is free of all other impediments.
- A2 Each nation's trade is in balance.
- A3 Each nation's government budget is in balance.
- A4 Each nation's private sector has identical homothetic preferences.
- A5 Each good is produced in only one nation. (The Perfect Specialization Assumption.)

Helpman (1987) has demonstrated how to relax the assumption that each nation's trade is balanced. Although this relaxation alters the theoretical determinants of import flows, Helpman (1987) and Hummels and Levinsohn (1995) report that incorporating trade imbalances into the empirical approach did not alter their qualitative conclusions. Given that a trade imbalance implies that a nation's total expenditure differs from its total income, and that a government budget deficit or surplus implies that the government's total expenditure differs from its total income, Helpman's derivation of trade flows in the presence of trade imbalances could be reformulated to examine the case of government budget deficits also.

Deardorff (1997) has demonstrated, under certain conditions, that the assumption of Perfect Specialization is not needed to generate the class of so-called frictionless gravity equations, of which the theoretical relationship derived below is a member. Before concluding that assumption A5 is too strict, it is worth noting that Deardorff's formulation assumes that consumers randomly choose over suppliers of the same good, which may seem to some as stretching credulity too far. In the same framework, Deardorff relaxed the assumption of identical homothetic preferences⁹.

Whereas Anderson (1979), Bergstrand (1985,1989) and Deardorff (1997) include international transportation costs in their derivation of the determinants of trade flows, only the first two authors give an explicit role to tariffs in their theoretical derivation.

⁹ Hunter and Markusen (1988), Hunter (1991) and Markusen (1986) also analyze the effects of non-homothetic preferences on trade flows. Bergstrand (1985)'s formulation assumed that domestic varieties of a good were closer substitutes for one another, than any imported variety was with any one domestic variety.

Derivation

Anderson (1979, section II) considered the case where the share of GDP accounted for by tradeable goods differed across nations and where there was no government spending or taxes, ie. $\forall k \quad \tau_k = g_{kn} = g_{kt} = 0$ and $\phi_k = \theta_k$. He demonstrated that:

$$(1) \quad M_{ij} = \frac{\theta_i \theta_j}{\sum_i \theta_i \left(\frac{Y_i}{Y_w} \right)} \cdot \frac{Y_i Y_j}{Y_w}$$

Now suppose that each nation's government raises lump sum taxes and spends this amount entirely on tradeable and non-tradeable goods, $\forall k \quad \tau_k = g_{kn} + g_{kt}$. Furthermore, assume that in each nation the government has the same preferences over tradeable goods as the private sector, and thus does not discriminate between foreign and domestic suppliers. In this case, the share of nation k's GDP spent on tradeable goods is the weighted average of the share spent by the private sector (ϕ_k) and the share spent by the government (g_{kt}/τ_k). Specifically,

$$(2) \quad \theta_k = \phi_k (1 - \tau_k) + \left(\frac{g_{kt}}{\tau_k} \right) \tau_k = \phi_k (1 - \tau_k) + g_{kt}$$

Unlike the Anderson (1979, section II) model, the allocation of a nation i's GDP between the private sector and the government, as well as the expenditure shares ϕ_i and (g_{it}/τ_i) , determine nation i's overall expenditure share on tradeable goods, θ_i . Like Anderson's (1979, section II) model nation i spends in total $\theta_i Y_i$ on tradeable goods in a non-discriminatory manner. Furthermore, since the government of nation j (one of nation i's trading partners) buys goods in a non-discriminatory manner, all of nation j's tradeable good output $\theta_j Y_j$ can be sold on domestic and international markets. Taken together, with the assumptions above, this implies that the total value of nation i's imports from nation j is given by (1). In sum, the introduction of a non-discriminatory procurement policy will raise (lower) imports when a government spends a larger (smaller) share of its income on tradeable goods¹⁰.

In contrast, now assume that each government only buys tradeable goods from its own nation's producers, ie. $\forall k \quad g_{kn} = 1$ and $g_{kt} = 0$. This has two implications. First, although the share of domestically-produced tradeable goods output in GDP is given by (2), the share of GDP that is spent on tradeable goods in a non-discriminatory manner equals $\phi_k (1 - \tau_k) = \theta_k - g_{kt}$. From the assumption of identical homothetic preferences, the share of every foreign-produced tradeable good consumed by nation i in equilibrium will equal the nation i's share of world expenditure on tradeable goods, or

¹⁰ In his comments on this paper, Bergstrand provides an extensive derivation of these arguments. Bergstrand's derivation, which is based on the assumption that each government's expenditure share on foreign produced tradeables is non-negative, is not to be confused from the derivation which is derived on the assumption that the government's expenditure share on foreign produced tradeables is zero.

$$(3) \quad \frac{\phi_i(1-\tau_i)Y_i}{\sum_i (\phi_i(1-\tau_i)Y_i)} = \frac{(\theta_i - g_{it})Y_i}{\sum_i (\theta_i - g_{it})Y_i}$$

Secondly, after satisfying its own government's purchases of tradeable goods, the producers of tradeable goods in nation j have only $(\theta_j - g_{jt})Y_j$ of output to be distributed across all of the private sector purchasers of tradeable goods. Thus, the total value of nation i's imports from nation j is given by:

$$(4) \quad M_{ij} = \frac{(\theta_i - g_{it})(\theta_j - g_{jt})}{\sum_i (\theta_i - g_{it})} \cdot \frac{Y_i Y_j}{Y_w}$$

Equation (4) implies that government procurement policies reduce the total value of imports in equilibrium by reducing both the demand for imports, and the value of the goods that exporting nations have available to export. Furthermore, by dividing the expression for bilateral imports in (1) by the expression in (4), the theory predicts that (holding everything else constant) a complete liberalization of

$$100 \left(\frac{\theta_i}{\theta_i - g_{it}} \right) \%$$

nation i's government procurement policies will raise nation i's imports by

$$100 \left(\frac{1}{1 - \left(\frac{g_{it}}{\theta_i} \right)} \right) \%$$

or $\left(\frac{1}{1 - \left(\frac{g_{it}}{\theta_i} \right)} \right) \%$. Thus, the larger is the ratio of government spending on tradeable goods to total national spending on tradeable goods, the larger is the percentage increase in nation i's imports that results from unilaterally liberalizing its government procurement practices.

4. Estimation Strategy

To assess the accuracy of the theoretical relationship between government procurement policies and imports outlined above, by employing a tight link between this prediction (4) and the reduced form that is taken to with data, the estimation strategy enables the parameter estimates to be interpreted in light of the theory. Thus, unlike many studies of the "gravity equation"¹¹, no attempt is made to include other variables which "ought to matter" but which are outside the realm of the theory under consideration.¹²

¹¹ The "gravity equation" postulates that the volume of imports by one nation from another nation is positively related to those nation's GDPs and negatively related to the geographical distance between those two nations. Initially, this postulated relationship had no theoretical foundation, even though it appeared to be an empirical regularity in the data. As noted in the last section, several scholars went on to provide such a theoretical foundation.

¹² For a devastating methodological critique of the empirical studies of the "gravity equation" which
(continued...)

4.1 Data Employed

Empirical counterparts for all of the variables in equation (4) were found for fourteen APEC nations¹³ in 1990. The value of bilateral imports between each of the fourteen nations for 1990 were collected from the IMF's *Direction of Trade Statistics*. Eliminating pairs of nations where import data were unreported or missing left 174 pairs. Data on each nation's GDP in 1990 was collected from the IMF's *International Financial Statistics Yearbook* (1995). Both the GDP and import data were converted to United States dollars at 1990 purchasing power parities.

The share of GDP spent on tradeable goods in each nation was proxied by one minus the share of service sector output in the nation's GDP. This proxy was taken from the World Bank's *World Development Report* in 1996 and the *World Tables* CD-ROM. This proxy will tend to understate the actual share of tradeable goods in nationS where some of its service sector output (for example, financial services) are tradeable. As Table One makes clear the size of the tradeable goods sector substantially differs across the fourteen nations in the sample.

Finding a proxy for government purchases of tradeable goods was more difficult. The IMF's *A Manual on Government Finance Statistics* (1986) was employed to locate those reported expenditures in the IMF's *Government Finance Statistics Yearbook* (GFS) that do not include transfer payments, payments for wages, salaries and non-tradeable services. Unfortunately, central government expenditures on different types of goods and services for current consumption were reported together. Fortunately, central government expenditures used to acquire fixed capital assets¹⁴ (other than land) were reported separately. This expenditure is likely to be on goods that are tradeable, such as construction materials, power generators and alike. The ratio of the government's spending on acquiring fixed capital assets to the nation's GDP was taken as a proxy for that nation's spending on all tradeable goods (as a share of national GDP)¹⁵. This proxy for g_{it} is reported for each nation in Table One, and again there is substantial variation across the nations in the sample. Furthermore, as reported in the last column of Table One, the ratio of the government spending proxy on tradeable goods to the nation's overall spending on tradeable goods varies substantially across the nations in the sample. Thus, if the theoretical predictions are borne out in the data, the restrictive effect of the government procurement policies also substantially varies across nations.

(...continued)

include variables that "ought to matter" see Leamer and Levinsohn (1996).

¹³ The fourteen nations were Australia, Canada, Chile, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, the Philippines, Singapore, Thailand and the United States of America.

¹⁴ For each nation this spending is reported in line 4 of Table C ("Expenditure and Lending minus Repayments by Economic Type" of the Consolidated Central Government) in the GFS.

¹⁵ To the extent that governments buy some tradeable goods for current consumption, this proxy will understate the actual total government spending on tradeable goods. This implies that the point estimates (presented in the next subsection) of the increase in bilateral imports due to liberalizing government procurement practices are underestimates.

TABLE ONE: GOVERNMENT AND OVERALL SPENDING ON TRADEABLE GOODS

Nation	Government Spending on Fixed Capital Assets as a Percentage of GDP (Proxy for g_{kt})	Share of Non-Service Sector Output as a Percentage of GDP (Proxy for θ_k)	Ratio of Government to Overall Spending on Tradeable Goods
Australia	0.00421	0.34136	0.01234
Canada	0.00329	0.34349	0.00958
Chile	0.01872	0.45000	0.04162
Indonesia	0.06675	0.60935	0.10955
Japan	0.00771	0.44493	0.01733
Korea	0.00899	0.52130	0.01724
Malaysia	0.06172	0.58000	0.10641
Mexico	0.01119	0.38664	0.02894
New Zealand	0.00859	0.33353	0.02576
Papua New Guinea	0.03518	0.59383	0.05925
The Philippines	0.01286	0.56376	0.02281
Singapore	0.03239	0.37314	0.08680
Thailand	0.02293	0.49770	0.04608
United States	0.00242	0.30089	0.00806

Sources: see text

4.2 Estimating Equation

To estimate the contribution of government procurement policies to the value of bilateral imports, logarithms of equation (4) were taken so that the government expenditure terms were separated from the GDP terms:

$$(5) \quad \ln(M_{ij}) = \ln(Y_i Y_j) - \ln\left(\left(\sum_i (\theta_i - g_{it}) \left(\frac{Y_i}{Y_w}\right)\right) Y_w\right) + \ln(\theta_i - g_{it}) + \ln(\theta_j - g_{jt})$$

As the second term does not vary across nations it was subsumed into a constant. Furthermore, assuming that the observed bilateral imports are mismeasured rationalizes the inclusion of an error term, yielding an unscaled estimating equation:

$$(6) \quad \ln(M_{ij}) = \beta_0 + \beta_1 \ln(Y_i Y_j) + \beta_2 \ln(\theta_i - g_{it}) + \beta_3 \ln(\theta_j - g_{jt}) + \varepsilon_{ij}$$

To prevent the estimates from being driven by the scale of $\ln(M_{ij})$ and $\ln(Y_i Y_j)$, both the dependent variable and the first regressor are scaled by the GDP of the importing nation, Y_i . This yields the base specification:

$$(7) \quad \ln\left(\frac{M_{ij}}{Y_i}\right) = \beta_0 + \beta_1 \ln(Y_j) + \beta_2 \ln(\theta_i - g_{it}) + \beta_3 \ln(\theta_j - g_{jt}) + \varepsilon_{ij}$$

where the predicted parameter values are $\beta_0 < 0$, $\beta_1 = \beta_2 = \beta_3 = 1$.

Table Two reports the estimated parameters, where a White Correction to the standard errors was performed to take account of heteroskedacity. Although far from perfect, the parameter estimates provide some support for the theoretical prediction under consideration. First, the estimated parameters

$\hat{\beta}_0$, $\hat{\beta}_1$ and $\hat{\beta}_2$ have the correct sign and are statistically significant. Secondly, the parameter estimate for the effect of government procurement policies on bilateral imports ($\hat{\beta}_2$) is very close to its predicted value of one.

In contrast, since the parameter estimate $\hat{\beta}_3$ is statistically insignificant there is no evidence that the effect of a nation's government procurement policies reduces the amount of goods exported. In sum, the parameter estimates provides support for the proposition that biased government procurement policies reduce the demand for imports. There is little evidence that such policies reduce the supply of exports. Given the simplicity of, and restrictive assumptions underlying, the theoretical model it is not surprising that this estimating equation does not account for all of the variation in bilateral imports between these APEC nations.

TABLE TWO: PARAMETER ESTIMATES FOR BASE SPECIFICATION

Parameter	Estimated Parameter Value (White Corrected Standard Error)
$\hat{\beta}_0$	-23.817 (1.662)
$\hat{\beta}_1$	0.722 (0.066)
$\hat{\beta}_2$	0.991 (0.452)
$\hat{\beta}_3$	-0.501 (0.567)
Number of Observations	174
R^2	0.466

4.3 Forecasted Effects of Government Procurement Liberalization

Holding the other determinants of bilateral imports constant, the parameter estimate ($\hat{\beta}_2$) is used to forecast the percentage increase in a given nation's imports resulting from the complete liberalization of its government's procurement policies. Those forecasts, with their ninety-five per cent confidence intervals, are presented in Table Three. For Australia, Canada and the United States, whose government spending on fixed assets is small compared to the size of their nation's overall spending on tradeable goods sector, the

forecasted increases are positive but small (of the order of approximately one percent.) In contrast, the point estimates for the forecasted increases in imports were approximately ten times larger (between eleven to twelve per cent) for Indonesia, Malaysia and Singapore. The forecasted increases for Papua New Guinea and Singapore highlight the importance of comparing the share of government spending on tradeable goods with the total national share of spending on tradeable goods. Both nation's governments spend approximately three and a half per cent of their GDP buying fixed capital assets, yet in terms of percentage changes procurement liberalization in Singapore would raise imports by almost twice as much as in Papua New Guinea. This arises because Singapore's smaller total tradeable goods sector implies that the additional demand for imports created by such liberalization is proportionally larger.

Given the concerns about the quality of the proxy variables noted above, these forecasts should not be taken as extremely precise estimates. Rather they highlight the order of magnitude of, and the relevant factors underlying, the import expanding effects of procurement liberalization¹⁶.

¹⁶ Other important caveats to these empirical results should be mentioned. First, the proxy for government spending on tradeable goods probably only accounts for government spending on capital goods, and not current goods. As noted above, a proxy that includes both types of spending would probably generate higher forecasts. Secondly, the analysis considers only spending by central governments, and not by state and local governments. To the extent that local governments have biased procurement policies too then the forecasts presented here are likely to be underestimates. Analysts who have detailed state and public enterprise spending data could repeat the above empirical strategy and probably obtain more accurate results. Thirdly, to the extent that some nation's procurement practices are less biased towards domestic producers as a result of their membership of the General Agreement on Tariffs and Trade's/World Trade Organization's Government Procurement Agreement, then the forecasts presented here are more likely to be overestimates. See Hoekman (1997) for an account of the operation of this agreement, and its possible effects on the spending behavior of member governments. Fourthly, the conceptual framework adopted here abstracts from the macroeconomic effects of liberalizing procurement practices on the trade balance, current account and exchange rates. As such, the forecasts present above should be thought of as estimates of the long run, rather than the short run, impact on imports.

TABLE THREE:

PREDICTED INCREASES IN BILATERAL IMPORTS DUE TO LIBERALIZING GOVERNMENT PROCUREMENT PRACTICES

Nation	Point Estimate for Percentage Increase in	95% Confidence Interval	95% Confidence Interval
	Bilateral Imports	Lower Bound	Upper Bound
Australia	1.369	0.144	2.594
Canada	1.055	0.250	1.999
Chile	4.509	1.070	8.545
Indonesia	11.675	2.770	22.125
Japan	1.784	0.432	3.381
Korea	1.811	0.430	3.432
Malaysia	11.953	2.836	22.652
Mexico	3.150	0.747	5.970
New Zealand	3.111	0.738	5.895
Papua New Guinea	6.578	1.561	12.466
The Philippines	2.427	0.576	4.600
Singapore	11.093	2.632	21.023
Thailand	5.079	1.205	9.625
United States	0.944	0.224	1.789

Unless there is a substantial amount of spending on tradeable goods by non-central government bodies, or by government-owned enterprises (that follow the central government's procurement policies), Australia, Canada, Japan, Korea and the United States are unlikely to experience large import surges due to liberalizing procurement practices. However, such liberalization by those South East Asian nations whose government spending on tradeable goods is larger share of overall demand for tradeable goods, will result in larger percentage increases in imports.

5. Policy Implications

Given that complete liberalization of government procurement practices will lead to asymmetric increases in imports across APEC nations, what does this imply about both the likelihood that such liberalization occurs in the first place, and for the unilateral or collective nature of such liberalization? If policymakers prefer liberalization initiatives that do not lead to significant surges in imports¹⁷ (or large redistributions of income) then two implications follow from the empirical findings presented above. First, if liberalization proceeds in a unilateral fashion, (say) as part of a nation's Individual Action Plan, then those nations that are currently spending (or plan to spend) larger proportions of their GDPs on infrastructure projects (and other tradeable goods) are likely to want to liberalize more slowly. Secondly a

¹⁷ Presumably the existence of the "escape clause" in United States (and international) trade law is an indication that policymakers are concerned about (at least temporarily) remedying the effects of import surges.

plan to liberalize procurement practices collectively, whose objective is to ensure that each nation purchases approximately the same proportion of tradeable goods from foreign suppliers, is unlikely to obtain the unanimous consent of APEC members.

Disagreement over the appropriate pace of unilateral liberalization, and over the extent of any collective agreement to liberalize, is likely to ensure this remains a controversial policy issue. Furthermore, should spending on infrastructure spending (and other tradeable goods) rise as East Asian nations enter their next stage of economic development, this issue is likely to become even more contentious as reform-minded nations perceive greater forgone export opportunities, and nations opposed to reform expect such liberalization to generate large import surges.

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State Trading in Agriculture: An Analytical Framework

By

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Abstract

This paper highlights some of the recent concerns regarding agricultural state trading enterprises (STEs) and proposes an analytical framework to examine the trade impacts of such entities. Issues associated with discriminatory pricing, exclusive rights to sell and purchase commodities, and unfair competitive advantage vis-a-vis private traders are expected to be major concerns on the export side, while on the import side, the relevance of tariffication in the presence of STEs is being questioned. Our paper proposes that, in most instances, tariff equivalents are the most relevant methodology to quantify the trade impacts of agricultural STEs. But, obtaining empirical information that would enable the calculation of such measures is not an easy task. To that end, a classification scheme which highlights the different types of STEs in terms of their ability to distort trade is proposed. Quantification can then focus on those most likely to impact trade.

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STATE TRADING IN AGRICULTURE: AN ANALYTICAL FRAMEWORK¹

The Uruguay Round of GATT (General Agreement on Tariffs and Trade) negotiations made substantial progress in reducing barriers to agricultural trade in the areas of market access, export subsidies, domestic support, and phytosanitary measures. Even as the implementation of the Uruguay Round agreement advances, several issues have come to the forefront as “unfinished business.” One of the key focal points likely to emerge for future negotiations is that of state trading enterprises (STE).

The issue of state trading is as old as the GATT. The topic was intensively debated at the time of the Preparatory Committee meetings for the Havana Conference. Some countries at that time wanted to clip the wings of state trading enterprises, but the opportunity was lost. Too many countries relied on parastatals for their control on trade. The GATT rules that emerged merely tried to impose criteria for the performance of state trading enterprises.

This document represents our effort to stimulate discussions on the economics of state trading. The paper defines and raises concerns about terminology, discusses the importance of the topic, identifies major areas of policy concern, and discusses the suitability of existing analytical tools to study the issue. A number of country examples are used to advance the arguments. These examples highlight the practical difficulties that policymakers and negotiators are likely to face in designing policies and developing disciplines that are acceptable from a multilateral perspective.

II. What is state trading?

The literature includes several definitions of state trading (Lloyd, 1982). Much of the early focus was on state conduct of foreign trade (Hazard, 1959), on the practice of governments monopolizing foreign trade (Baldwin, 1970), and on the role of institutions wholly or partly owned by the Government (Ghai, 1973). These concepts gradually gave way to a functional definition, with Kostecki (1982) arguing that state trading occurs when a government or a government-backed agency determines the essential terms (including prices or quantities) on which exports and imports have to take place. Kostecki's characterization emphasized the role of government control rather than the creation of specialized institutions, since it is primarily the direct control that makes state traders behave differently from private entrepreneurs. Sorenson (1991), picking up on this theme, asserted that both market control and the impact that governments exercise over individual transactions are relevant. He argued that state trading exists when a government, an agency of the government, or an institution granted exclusive rights by the government, controls trade or materially affects the conditions of trade on a *transaction by transaction basis*. Sorenson's definition suggests that use of tariffs, quotas, and other traditional trade instruments does not constitute state trading, though trade by government-chartered marketing boards with monopolies would.

¹This publication is an out-growth of a brainstorming session on state trading that was held at the Economic Research Service, USDA on November 4, 1996. The authors would like to thank those individuals who participated in the workshop and reviewed the papers, especially Karen Ackerman who assisted in various phases of the project.

Departing from the functionalist approach, the recently concluded Uruguay Round of GATT negotiations adopted largely an institutional approach to state trading, defining STEs as “*governmental and nongovernmental enterprises, including marketing boards, which have been granted exclusive or special rights or privileges, including statutory or constitutional powers, in the exercise of which they influence through purchases or sales the level or direction of imports or exports.*” (WTO, 1994). Under this revised definition, WTO country notifications² on STEs include government agencies, statutory marketing boards, export marketing boards, regulatory marketing boards, fiscal monopolies, canalizing agencies, foreign trade enterprises, and boards or corporations resulting from nationalized industries.³ The U.S. initially acknowledged that the Commodity Credit Corporation was a state-trading organization, and other traders, including Canada, Australia, New Zealand, and Japan have recognized the existence of STEs in their countries.⁴ But, controversy surrounds the characterization of the European Union intervention agencies which manipulate markets but do not directly engage in trade, as well as U.S. marketing orders which may not be STEs in the traditional (institutional) sense but may impact international trade. To date, neither the European Union nor the U.S. have included such agencies/arrangements in their notifications.

Uruguay Round and State Trading

The activities of State Trading Enterprises (STEs) are governed by Article XVII of GATT 1947 which recognizes these entities as legitimate participants in international trade but establishes guidelines with respect to their behavior. The Uruguay Round Agreement did not directly change any of the provisions in Article XVII; instead it includes a Memorandum (Understanding on Interpretation of Article XVII) to clarify the definition and scope of trading activities, improve notification requirements, and facilitate formation of a Working Party on State Trading.

A Working Party was established in early 1995 under the Committee on Trade in Goods to provide a practical understanding of state trading as defined in the Memorandum, and to explore means of ensuring transparency in activities of STEs. The Working Party has met several times, reviewing current notification requirements and considering proposals to improve the existing questionnaire.

There are three key questions raised by the Uruguay Round definition of STEs. First, what is meant by a governmental institution or an enterprise? Is this an industrial organization usage of the term or is there a legal interpretation to it? Large differences exist in the organizational structures and managerial characteristics of trading units established or maintained by the state. At one end of the spectrum might be units fully integrated into government administration (departments, ministries, etc.) and whose day-to-day management is guided by the Government; at the other end might be units that are managerially autonomous even though the Government may subscribe to their capital stock wholly or partially. In between lie many combinations, including STEs that are subsidiaries of parastatal organizations or institutions, where the Government may hold minority shares but exert influence through other means. Second, how does one define exclusive or special rights or privileges? The vagueness of the expression leaves the door open for members to interpret according to their own canons when an enterprise has exclusive or special privileges. Third, must an entity make purchases or sales itself to qualify as an STE?

²Information about STEs and their activities are provided to the WTO on the basis of a questionnaire adopted in 1960. Responses to the questions are called “notifications.”

³Descriptions of activities that portray these parastatal characteristics can be found in WTO (1995).

⁴The U.S. first included the CCC as a state trader in its notification under Article XVII in 1979. The second notification was made in 1995 following the Uruguay Round Agreement. A revised notification in 1997 omitted mention of the CCC.

How does one classify institutions that are not physically involved with sales but contract with exporters/importers or require applicants for permits or licenses to demonstrate that exports meet standards set by them. Several organizations, including the New Zealand Apple and Pear Board, fall into this latter grouping.

Several provisions in Article XVII of GATT 1947 regulate the behavior of these organizations. These criteria were (and are still):

- o. that STEs should be subject to the GATT principle of non-discrimination, and therefore not discriminate among sources of imports or exports (Article XVII (1a));
- o. that they should act on the basis of “commercial consideration” (Article XVII (1b)), with respect to “price, quantity, availability, marketability, transportation, and other conditions of purchase and sale”, and should “afford the enterprises of other contracting parties adequate opportunity in accordance with customary business practice, to compete in such purchases or sales”;
- o. that importing state traders should not grant protection above that given by the bound tariff schedules (Article II (4)), a provision which is strengthened by the general admonition to countries to uphold the provisions of the Havana Charter (Article XXIX). The Article mandated full disclosure of import costs and profit margins of state import firms (Article 31:4), and stated that the agencies themselves must import supplies adequate to meet “full domestic demand” for the product (Article 31:5). The applicability of the Havana Charter in this case has been confirmed by panel findings.

All these requirements can be subject to several interpretations. For instance, does nondiscriminatory treatment entail most-favored nation obligation or national treatment obligation or both (Bernier, 1982)? Similarly, what constitutes commercial considerations, and is the ultimate objective to ensure that STEs act in ways similar to private traders? And, what does prejudice “legitimate” commercial interests imply? Can quantitative benchmarks be established to define these guidelines? Is there a time limit on how long any information can be held as proprietary? The definition of STEs and the interpretation of associated provisions are still matters of discussion among member countries.

III. Why is there so much interest in state trading enterprises?

There are three fundamental reasons why there is so much interest in the activities of state trading enterprises. The first relates to their influence on competition in agricultural markets; the second to the possibility that countries might use STEs as a vehicle to circumvent the disciplines achieved in the Uruguay Round; and, third, the impending accession to the WTO of China and Russia, two countries that use state trading enterprises extensively to regulate international trade. Let us now elaborate on each.

Role of STEs in agricultural trade

That state trading plays a significant role in international agricultural trade is well accepted. Take the world wheat market as an example. More than a decade ago, McCalla and Schmitz (1982) pointed out

that the proportion of wheat trade involving only private traders was small and declining. They argued that 95 percent of world trade in wheat in 1973-77 involved a state trader on at least one side of the transaction and that state trader to state trader transactions accounted for one-third of the trade. Since then, while there have been changes in the world wheat market brought on by the wave of privatization and structural reform programs that would suggest a diminished role for state traders, other developments indicate that the activities of state traders may not have abated all that much.⁵ For instance, though it is true that state trading as existed in the Former Soviet Union (foreign trade enterprises) no longer endures, *prima facie* evidence suggests that most of the republics of the FSU still use organizations that are directly or indirectly controlled by the Government and are akin to state traders. Similarly, with the CCC now considered a state trader, U.S. exports that were supported by EEP (Export Enhancement Program) bonuses during the last decade could be classified as state trading.

Moving beyond the wheat market to agriculture in general, consider the following statistics: in 1995 and 1996, 30 countries notified the WTO that a total of more than 100 STEs in their countries were involved in trade in agricultural products. Sixteen of these countries listed STEs for grains, and 10 reported STEs in dairy product trade. STEs were also reported for cotton, fish, forest products, horticultural products, livestock, meats, oilseeds, distilled liquor, and some tropical products. These statistics are most likely underestimated because the new WTO definition is still subject to interpretation and many member countries have yet to meet their reporting requirements.

Potential for STEs to circumvent WTO disciplines

One of the major breakthroughs in the Uruguay Round negotiations was that, for the first time in almost 50 years, member countries were successful in bringing agricultural trade under the general discipline of the GATT. This meant that many of the provisions and loopholes that had previously made agricultural support possible are now more constrained. Little was done to bring more discipline to state trading organizations through which many Governments provide support to the agricultural sector. The combination of these two developments has generated growing concern that some countries may use STEs--also referred to as single-desk buying or selling agents--to circumvent Uruguay Round commitments.⁶

⁵The diminished role of state traders is most apparent in Latin American countries like Argentina and Brazil, which have dismantled many parastatal institutions during the last decade.

⁶Although STEs may have the ability to circumvent the Uruguay Round Agreement commitments, there is little evidence to suggest that they are in fact doing so.

Among the principal concerns is the behavior of STE exporters who may use their exclusive monopoly and/or monopsony power to engage in unfair trading competition. U.S. producers, for instance, have complained that the Canadian Wheat Board (CWB) subsidizes grain through its pricing policies to their competitive disadvantage. Similarly, the use of subsidiaries by the New Zealand Dairy Board to acquire U.S. dairy quotas and pocket rents has come to the attention of dairy interests in the United States. Thus, political pressures to bring state trading to the forefront of policy debates have been growing in the U.S., and both the Administration and the Congress have initiated actions to address these concerns.⁷

The Agreement on Agriculture and STEs

There are several references to state trading in the Agreement on Agriculture: the definition of nontariff barriers subject to conversion to tariff equivalents includes nontariff measures maintained through STEs; export subsidy disciplines are applicable to governments and their “agencies”; and, when providing information to the Committee on Agriculture regarding implementation, WTO members are asked to explain the administration of market access and export subsidy commitments, including details about STEs and their relevant activities. In addition, Japan agreed to sets limits on the price mark-up that the Japanese Food Agency could establish for stipulated commodities. The Agreement, however, is much less explicit with regards to disciplines on export credits and other subsidies administered through state trading organizations.

Accession of China and Russia

The impending accession to the WTO of China, Russia, and Taiwan has generated considerable nervousness in the international trading community. All three countries use parastatal organizations to conduct the basic tenets of domestic policy. The lack of transparency in their behavior makes other countries suspicious about the fairness of their trading practices. While it seems unrealistic to assume that these countries would completely subjugate themselves to international norms, it is more likely that they would accede to norms of international discipline as a condition of accession rather than agree to do so afterwards. The global community, it seems, is pushing for more transparency in the practices of existing organizations as well as assurance that new state trading parastatals are not brought to the forefront of the international trade arena.⁸ Both China (vegetable oil) and Taiwan (rice), for instance, are attempting to create new state trading institutions to administer the trade regime (quota) that will emerge from accession to the WTO.

IV. Why do countries pursue state trading activities?

The notifications made to the WTO indicate several reasons why countries pursue state trading (GATT, 1995).⁹ Among most developed countries, the primary motivation for pursuing state trading appears to be to attain domestic policy objectives of income support and price stabilization for producers.

⁷On September 12, 1996, the House Committee on Agriculture held a public hearing on the effects of state trading on world agricultural trade. The Deputy Secretary of Agriculture and two panels of industry witnesses participated. Much of the focus was on the lack of transparency in the operations of STEs.

⁸The fact that some of these countries still engage in barter trade heightens even more the concerns about transparency.

⁹Implicit in all these justifications is the assumption that markets, when left to themselves, will not reach a solution that meets society’s goal.

Fulfillment of these objectives, in turn, requires regulations on quantities and prices of traded goods. Hence, prices of commodities in question, are most often “fixed” directly by the STE or by the Government through parastatal organizations. Typically, monopoly/monopsony rights are considered essential if the aim is to insulate the domestic market from foreign markets. In the case of exporting agencies, the focus has been on granting parastatal organizations monopsony power in the domestic market and “single selling desk” authority in international markets. For importers, the policy is reversed, with parastatals having sole purchasing authority in the international market and monopoly selling rights in the domestic market. Because price stability is an integral part of the domestic policy agenda of most developed nations, many parastatal organizations also participate in intervention activities. Hence, management and disposal of stocks is a common feature of these enterprises and government-set targets for reserve stocks are maintained and managed by state trading enterprises. Activities of the Canadian Wheat Board (CWB) among exporters, and the Japan Food Agency (JFA), among importers, would be illustrations of developed country state trading enterprises being used as instruments to attain domestic policy objectives.

Among developing countries, state trading is frequently rationalized as a means to operationalize the cheap food policy (food security obligations) under which retail prices are lower than producer and/or world levels. This policy generally involves taxing producers (agricultural sector) to subsidize consumers (industrial sector) and, as earlier, requires regulations on quantities and prices of traded goods. State trading enterprises are viewed as effective administrative vehicles to execute this domestic policy objective, especially if the goal includes transportation and distribution of subsidized food or agricultural inputs. The practices of the Food Corporation of India and BULOG in Indonesia, both of which have sole authority for domestic purchases of grains and exclusive rights on imports, illustrate these types of functions.

The notifications submitted to the WTO cite several other reasons why countries pursue state trading. Some of these, such as achievement of economies of scale in trading operations (foreign market development and quality control), improvements in terms of trade, fulfillment of international commitments on quantity/price, and credit requirements, can be considered as subsets of the overall objective of income support and/or cheap food policy. Others, such as maintaining public health, providing capital funds to initiate entrepreneurship, rationing of foreign currency reserves, and generating revenue for the treasury may be not be directly related to agriculture but are nonetheless given as reasons for which STEs are initiated.

The notifications do not include information from countries that are not members of the WTO. But, the form of economic organization in some of these excluded countries--China and, until recently, Russia--may be such that state trading is the only compatible form of international interface (McCalla and Schmitz, 1982). Hence, a centrally planned economy with public ownership and/or distribution systems, may find private international trade incompatible with those domestic organization. These countries, therefore, may have little choice but to pursue state trading.

Though not stated explicitly in any of the country notifications, many governments prefer parastatal organizations because these allow them flexibility to carry out political mandates expeditiously. Hence, it is not uncommon to see governments use STEs to implement policies that would otherwise receive parliamentary scrutiny (treasury-financed subsidies). Similarly, state trading is often preferred to taxes/subsidies for redistributing incomes among different groups because it is more convenient and less likely to give rise to political protests. Indeed, it is the covert nature of STE activities that makes them

attractive relative to other policy instruments. For these reasons, any attempt to eliminate STEs in future negotiations is likely to meet with resistance from many member countries.

Policies implemented through STEs involve a wide spectrum of activities. It is possible that policies are in conflict with one another. For instance, if the objective of the STE is domestic price stabilization, then its international bargaining power may be weak because its excess demand and excess supply curves will be perfectly inelastic and it will buy the necessary imports, or sell any surplus, at any world price (WTO, 1995). While state trading is one means of attaining various domestic and trade policy objectives, it is not the only instrument. Income support for producers, for instance, could be done through decoupled payments without ever resorting to parastatal organizations. This suggests that it is important to rank policies and practices in terms of their capacity to distort trade. Moreover, much of the rationale that has been offered as justifications for parastatal organizations, including risk management, economies of scale associated with marketing, development of niche markets, and new customers through market development, could be executed just as efficiently by private traders (Carter, 1996).

V. What are special concerns about STE exporters?

The fundamental concern with activities of exporting state trading enterprises is that such entities might be the vehicle through which member countries attempt to circumvent the Uruguay Round commitments made in the Agreement on Agriculture. Why might state trading enterprises be in a position to circumvent Uruguay Round disciplines and engage in unfair trading practice? Because, it is argued, statutory regulations provide STEs with opportunities unavailable to commercial firms that compete against them.

To begin with, many STEs have exclusive rights to purchase and sell particular commodities destined for the domestic and/or export markets. Depending on the objectives of the STE, they might use this statutory power to act as a monopsonist/monopolist, offering producers prices lower than those available in the world market and/or charging consumers prices higher than those prevailing in the international market. The added returns/profits that would be available from the domestic market could be used by the STE to subsidize foreign sales of one or more commodities in which it has monopoly and/or monopsony rights.¹⁰ This economic rent stemming from statutory powers is typically not available to commercial firms that have to compete against STEs in the international market.

Besides, some STE's engage in the practice of price pooling where the final price paid to producers is a blended price based on net revenue of all sales in foreign and domestic markets. Price pooling, designed essentially to stabilize price and income risks to producers, allows STEs to pay producers the same return regardless of the time of delivery during the marketing year. Consequently, STEs have greater flexibility in discretionary pricing in the international market (through delayed payments to domestic

¹⁰Subsidization of export sales of agricultural products is permissible as long as countries remain within their WTO commitments.

producers), an arrangement not available to private exporters who have to compete with other domestic sellers in acquiring exportable products.¹¹

It is also suggested that STEs that control domestic supplies or exports have less uncertainty in sourcing supplies. This allows them greater freedom than private firms in making export sales commitments and permits STEs to make long-term agreements with importing country governments. However, commercial exporters like Cargill can source from various countries to fulfill their sales commitments, a benefit that is normally unavailable to STEs.¹²

In addition, most STEs have exclusive rights to export sales of particular products. Exclusive export rights can enhance the monopoly powers and rents available to STEs and encourage the practice of price discrimination across export markets.¹³ One extreme type of price discrimination is predatory pricing in which STEs--armed with Government underwriting of losses--may attempt to drive commercial competitors out of the market. But, the ability of STEs to discriminate across export markets depends as much on the responses of competitors in the international market place as on exclusive domestic rights to exports.

Governments can provide facilities to STEs that are not available to private firms. The most obvious of these are subsidies paid out to cover deficits on payment guarantees to producers. The Canadian Government, for example, provided financial assistance to barley producers in 3 of the last 10 crop years when average market returns were lower than initial payments. While underwriting of producer payments by the Government is permissible under WTO rules, such guarantees may provide two additional indirect benefits: they allow state traders to undertake pricing risks beyond what a commercial enterprise might do, especially if STEs have goals other than profit maximization; and, an interest rate advantage may accrue to STEs because of their association with the Government. Typically, the perceived risk of lending to the Government is lower than to private entities, and STEs--working with Government secured loans--may face lower borrowing costs than commercial exporters. The CWB estimates that these benefits are worth around \$60 million annually, though Carter and Loyns (1996) hypothesize that the subsidy is greatly underestimated. With cost advantages such as these, STEs may be in a better position than commercial exporters to undercut competitors' prices.

Quantifying Benefits of State Trading Enterprises

One study (Kraft, Furtran, and Tyrchniewicz, 1996) estimates that the single-desk status (ability to discriminate) of the Canadian Wheat Board yields \$557-\$690 million annually to Canadian producers in the wheat pool. Others argue that price pooling in itself does not necessarily lead to higher producer prices. Carter and Loyns (1996), for instance, question the ability of the CWB to extract significantly higher prices "because Canadian grain must be priced competitively in world markets, and the majority of Canadian wheat sales are into markets where price is more important than quality."

¹¹Private exporters are also more restricted in their pricing operations relative to STE exporters because the cost of storage limits their ability to hold commodities for a long duration.

¹²Examples of exceptions include the New Zealand Dairy Board and Australian Wheat Board, both of which can source from other countries.

¹³Price discrimination *per se* is not prohibited by the GATT; rather, it is permitted for commercial reasons to meet conditions of supply and demand in export markets.

Finally, STEs are also known to enjoy facilities unavailable to commercial exporters. These include tax benefits, transport subsidies, preferential foreign exchange rates and public utilities, and occasional capital expansion funds. These benefits may, over the long run, provide STEs with a competitive edge vis-a-vis commercial exporters.

VI. What are special concerns about state trading importers?

The existence of state trading importing agencies raises a question of the relevance of some of the disciplines agreed to in the Uruguay Round. The conversion of non-tariff barriers and the binding of those tariffs was clearly the most significant outcome of the Agreement on Agriculture. But, tariffs can be of very little meaning when a parastatal organization regulates total demand. Because most state trading importers have exclusive rights to purchase and sell particular commodities, it is difficult to determine whether purchases--both domestic and imports--are being restricted because of lack of demand or because of specific governmental policy such as domestic protection, control of foreign exchange regime, or revenue generation. Under these circumstances, if the parastatal agency decides to keep strict control on sales and purchases, then the existence of tariffs in place of quotas may not enhance demand and improve market access. Product availability and consumer choice will remain distorted.

In cases where new tariffs were erected, the Uruguay Round also introduced the concept of tariff rate quotas (TRQs) as a means to expand imports for those products subject to tariffication.¹⁴ These provisions in themselves do not guarantee improved market access. If the over-quota tariffs are prohibitively high--as is the case for many countries--then, in practice, the only imports entering the country might be the minimum access commitments. Or, if countries included existing preferential arrangements in current access commitments, then the possibilities for expansion in imports remain limited. Compounding this problem is the suggestion by some that countries should be permitted to include future preferential arrangements to fulfill minimum access commitments.

WTO rules allow monopoly importers to administer imports into a country provided decisions are based on "commercial considerations." But, what is meant by "commercial considerations"? The lack of transparency in the decision-making procedures makes it difficult to determine whether purchases are in the spirit of the WTO. These decisions, in turn, could determine who gets the monopoly rent associated with quotas or licenses. Could it be that STEs discriminate among exporters for non-commercial reasons? The "legalization" of tariff rate quotas following the Uruguay Round Agreement makes import administration by STEs a pressing concern, especially in view of the vagueness that exists in the Agreement on Import Licensing Procedures with regard to the allocation of import quotas.

The tendency of several countries--following the Uruguay Round--to establish new state trading import agencies to administer minimum purchase requirements is another major concern. The Philippines, for example, announced a new state trading agency to implement its meat tariff rate quotas. Similarly, Taiwan is planning to set up new STEs to import rice and sugar as per WTO minimum access requirements. And, China recently re-introduced state trading in vegetable oil as a prelude to WTO

¹⁴A tariff rate quota refers to a trade regime with three characteristics: a quota that is set at current and/or minimum access, low tariffs on imports within the quota, and high tariffs on above-quota imports.

accession. The objective, in all three cases, appears to be to grant exclusive purchase rights to parastatal organizations so that the Government can continue to control trade. These practices impede entry of private entrepreneurs, stifle competition, and distort consumer preferences.

Several other issues regarding importing agencies can also cause trade frictions. Many STEs control the grades and standards of imported products. Such control can lead to discriminatory treatment against goods of certain national origin, impeding the free flow of goods. Similarly, some countries maintain multi-tiered exchange rate systems, where STEs are given preferential rates for purchases. This discourages competition and puts private importers at a distinct disadvantage. And, STEs are occasionally allowed to keep over-quota tariff revenues or resale price differentials. STEs can use revenue from such sources to subsidize other aspects of their operations to the disadvantage of private entrepreneurs. Special privileges accorded to STEs and their impact on competition policy are at the heart of all these issues.

VII. How does one measure the trade impacts of STEs?

The principle analytical task in monitoring the impact of STEs is to measure the effects on quantities traded, consumed, and produced of activities of state trading enterprises. Distortions that arise from STE activities are quantifiable in principle. The international trade literature has dealt with this issue in terms of “equivalence” of state trading and tariffs. Lloyd (1982) shows that a state trader that restricts imports will have an equivalent effect on domestic price to a tariff of a certain amount. Similarly, it could be argued that an STE which restricts/expands exports can be shown to have an effect on domestic price equivalent to an export tax/subsidy. The implications of this are that one can build state trading into an analytical framework as a set of equivalent tariffs or subsidies. Such an approach views state trading as one of several instruments that might be used to pursue objectives of governmental policy and dispenses with a need for a special theory of state trading. It treats the theory of state trading activity as an application of existing theory of (private) trading.

How valid is this equivalence approach in analyzing the trade impacts of agricultural STEs? In asking the question, two separate issues should be kept in mind. One is its relevance in the context of **current international trade rules** and the other is its ability to capture **distortions in trade flows** relative to a free-trade (or a welfare-maximizing) norm. These issues are clearly separable both in practical and theoretical terms. One deals with rules that exist, the other suggests possible changes in the rules. One is easily definable and subject to straightforward quantitative estimation, the other is dependent upon a range of assumptions about the behavioral functions of imperfectly competitive enterprises. The analytical issue with respect to current rules is dealt with first, and that of imperfect competition is treated subsequently.

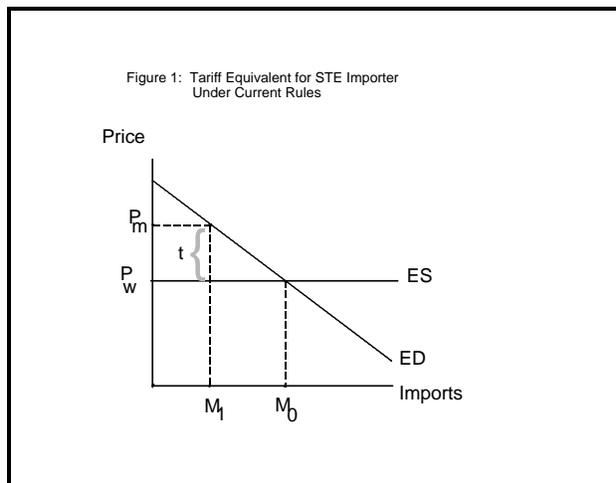
Framework for Analysis of Distortion under Current Rules

The provisions of the GATT have generally proved inadequate to curb the activities of state trading enterprises and have been weakly enforced. The contracting parties of the GATT were expected to inform the Secretariat of the existence of state trading enterprises, but relatively few countries made the effort, and the questionnaire developed in 1960 to be used for notification was somewhat undemanding. This led to several attempts over the years to strengthen and make more specific the constraints, but the efforts have so far proved fruitless.

Most STEs trade in agricultural goods. This undoubtedly contributed to the lax enforcement of existing regulations. Because agricultural policies were generally not controlled by trade rules, it would have been futile to have tight restrictions on the agencies which carried out policies. This gave room for the possible defense of STEs as administrators of non-tariff barriers allowed under Article XI (2) and, perhaps more than any other factor, prevented the strict application of Article II (4) to agricultural trade. When dispute settlement panels considered the activities of state importers, such as the case of the Australian complaint against the Korean Livestock Product Marketing Organization (LPMO) in 1989, they found Article II (4) did not apply to quantitative restrictions legally applied under Article XI. The comparison of the mark-up and the bound tariff was not deemed appropriate when quantitative restrictions were present. Now that quantitative restrictions have been largely removed as a result of the Uruguay Round Agreement on Agriculture, the rules are easier to enforce.

State trading importers, as discussed above (page 3), have one overriding obligation, to satisfy local demand for the imported product, and one rigid constraint, to avoid giving more protection than the bound tariff. In addition there is the more general injunction that they should behave like commercial concerns, and they are supposed to respect *mfn* principles¹⁵. Thus the analytical issue is whether local demand is satisfied and whether the operation of the STE grants more protection than the bound tariff. The question as to whether they act commercially is best thought of as a combination of the two more precise conditions: if they import to satisfy the level of domestic demand which would face a private importer paying the bound tariff they could be deemed to be behaving “commercially”.¹⁶

The analytical framework for measuring protection is quite well developed in the literature. If we can conceptualize an import demand function for a product then the gap between the world price level and the wholesale price of the same (or equivalent) good is the tariff equivalent of the set of policies (including market structure conditions) which operate to determine the import quantity. This is illustrated in Figure 1 where the STE is a trading agency operating under competitive norms. ED is the excess demand curve faced by the STE and ES is the excess supply schedule which is perfectly elastic at the world price P_w . The appropriate analytical device in this case is the **tariff equivalent** which



combines both the demand satisfying and tariff binding constraints. If the STE imports and sells at the same price (account being taken of handling costs) then there will be a zero tariff equivalent. If the STE merely sells in competition with private importers then the tariff equivalent will be the actual tariff applied

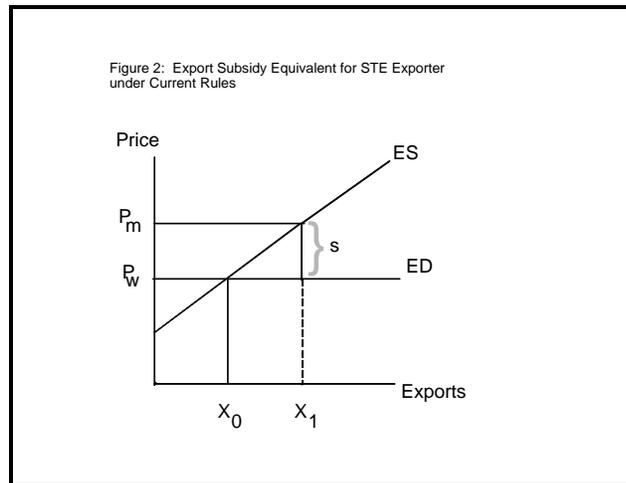
¹⁵*MFN*, or the most favored nation clause, requires members to grant to the products of other members treatment no less favorable than accorded to the products of any other country. Thus, no country is to give special trading advantages to another country or to discriminate against it.

¹⁶To place further restrictions on importing STEs as to their behavior in dimensions other than import quantities and prices would seem to be outside the spirit of the WTO.

to private transactions.¹⁷ The trade impact of the STE is the reduction in import volume (M_1M_0) that would be caused by a tariff (t) of this amount.

State trading exporters are subject to only one firm constraint, that they should not grant export subsidies that would exceed the allowable subsidies in the Schedules. The same general injunction to behave commercially applies to STEs, but this again can be taken to be a shorthand for a prohibition on the granting of subsidies. The analytical issue is, therefore, whether the STE in question grants an export subsidy and if so whether that subsidy is within the Schedule.¹⁸

The traditional analysis of export subsidies is also adequate for dealing with the problem of state traders (figure 2). A STE will exhibit to the world an export supply schedule (ES) which will be observable at the price (P_w) and quantity of sale (X_0). In addition, there will be a domestic price paid to the producer (P_m) by the STE. The degree of subsidy can, therefore, be measured as an **export subsidy equivalent** (s), analogous to the tariff equivalent of the importing STE. The trade effect is the amount by which an export subsidy of that amount would expand trade (X_0X_1). The level of export subsidy equivalent multiplied by the quantity of exports will give the equivalent expenditure on export subsidies.



Framework for Analysis of Distortion under Imperfect Competition

The second issue, the analysis of distortions arising from imperfectly competitive behavior of STEs, is somewhat more complex. Monopoly power can be exercised by both private and public enterprises in several ways which will effect trade flows. Analysis of the trade impacts of state trading from a welfare perspective thus takes one immediately into a deeper area of enquiry than that of whether state trading violates current trade rules. This requires a more complex framework

If one takes the view that the WTO should move the world toward a situation of perfect competition in all domestic and international markets, then all public and private abuses of power are

¹⁷We would not wish to belittle the practical problems of collecting data on import demand when no imported goods have been allowed onto the domestic market, or when there are other constraints such as foreign exchange restrictions or health and safety standards which make the comparison tricky.

¹⁸Under current WTO rules, there is really a double test in that the STE would have to comply with both the quantity and expenditure provisions of the Schedules. But, it is quite possible that a STE could grant a subsidy which in value terms did not violate the Schedule limits, but the quantity that benefitted from that subsidy could be above the quantity allowed to be subsidized.

potential targets for regulation. The activities of state traders would just be one aspect of this approach. The analytic framework which one would use would be conceptually simple if operationally complex. One would have to measure market power in all markets and devise rules which would address this range of issues. The rules would presumably apply to both private and public actors and to factor markets as well as goods and services. It is unlikely that the world is willing to go this far in the foreseeable future.

In that case the question becomes which set of non-competitive activities should be targeted? The playing field may be level but the players can be of very different sizes. Presumably the issue comes down to one of the external impacts of market distortions: which departures from the competitive norm are likely to be causing the greatest problems for other countries? This helps to narrow down the range of topics to be explored in that it suggests that purely domestic monopolies that do not trade may be of little interest.

If we omit domestic monopoly in non-tradables as a trade issue we can focus on two aspects: (a) the impact of domestic market power on the trade outcome and (b) the exploitation of international market power through the manipulation of trade quantities (or prices). The first can be thought of as the “small country” case and the second as a “large country” problem, though even the smallest of countries can be important in the sale of any particular product.¹⁹

Small Country Case

The analytical issue in the small country case is how to derive the trade impacts of the exercise of monopoly power in domestic markets. Monopoly power can come in three guises: the control over domestic production, the control over domestic use or consumption, and the control over trade quantities (imports or exports). Assume to start with that these functions are separate (i.e., the same agency does not control production and trade). Also assume initially that the country in question is indeed complying with all the WTO regulations discussed above. Thus the trading enterprise is not granting protection above the bound level, and not imposing quantitative restrictions on trade flows.²⁰ If the country is active in export markets there are no illegal export subsidies being paid, directly or indirectly to producers. The focus is therefore on the nature of the trade distortion other than those related to hidden protection through non-tariff means and camouflaged export subsidies.

Assume a domestic monopolist (public or private) trying to use market power to maximize profits. Consider first the import case. The monopolist would like to restrict production below the competitive level in order to drive up the price. However the consumers can buy from abroad at the world price. The monopolist acts so as to bring marginal cost of domestic production into line with marginal revenue as

¹⁹An example is the tiny island of Grenada which markets about one third of the world’s nutmeg.

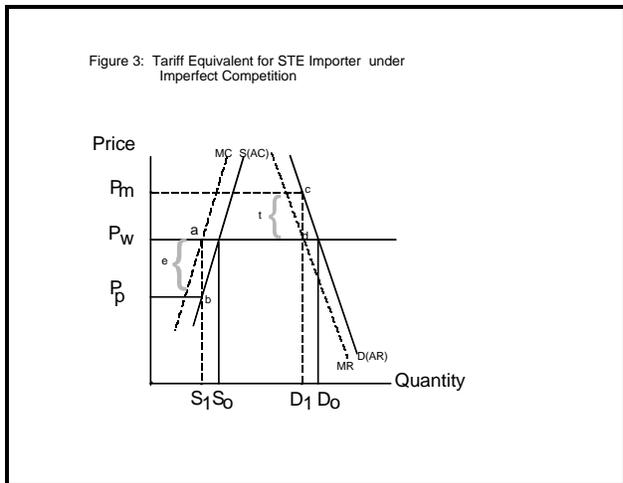
²⁰The question of what constitutes a quantitative restriction is important here. If an STE “decides” to import only a specific quantity of a product in a year, is that a quantitative restriction on trade? Yes, if it is not possible for another entity to purchase more on world markets and import that additional quantity. No, if the STE does not have such monopsony rights but merely chooses that as an appropriate import level given market needs and local market conditions. The key question is thus whether the state trading enterprise imposes quantitative restrictions on other actors in the market. In what follows, we assume that the STE does not have the right to prevent other firms from importing over the bound tariff.

given by the price of imports (i.e., world price plus tariff if any). If a domestic monopolist has no help from any quantitative controls over imports then buyers can always satisfy their needs from imports. The quantity of imports would not be markedly different from that of a competitive industry. The trade effect of a domestic monopolist is therefore very limited in the absence of (quantitative) trade restrictions. The exporter case is similar. The producer will try to gain some monopoly rents by restricting production until marginal cost is equal to world price plus tariff. But again, if the monopolist is also selling abroad and has no control over imports, then the impact is minimal. In neither case is there major distortions in trade flows relative to a competitive system.

Consider now the possibility of a monopsonist (public or private) who acts as the sole purchaser of domestic output and tries to minimize cost. The monopsonist might wish to purchase less from the domestic supplier than would a competitive purchase sector. The rent would come from purchasing less of the domestic product (at a lower price than the cost of imports) in order to equate the marginal cost of buying from the domestic market with the world price (plus tariff). But this would require export controls (or the compulsory purchase of all domestic product, which implies a ban on exports). However, if domestic firms can export, the monopsonist loses its market power. Export restrictions are, therefore, the key issue with respect to the use of monopsony power on the domestic market.²¹ Such restrictions are the vital link between the use of monopsony power and impact on trade flows.

In short, the only non-competitive action that remains unconstrained by existing trade rules is the decision as to **how much to produce**. The trade impact of monopoly (or monopsony) power at the national level arises not from the production decision *per se* but from the support of domestic monopolies (and monopsonies) **with non-tariff trade restrictions**. Tariffication and the removal of quantitative import and export restraints should render largely irrelevant the domestic market structure.

Monopoly control over trade, however, cannot be dismissed lightly as with control over production or use. Consider three cases. In the first, a trade monopoly is a “pure” profit-maximizer, or rent-seeker using control over trade to exploit either domestic buyers or domestic sellers or both. If the objective of the STE is to maximize profits by exploiting consumers, then even in the small country case with no power to change world prices, the trader would impose trade restrictions equivalent to a tariff or an export subsidy. Figure 3 provides an illustration of this for the **importer case**. The rent-maximizing tariff for the STE importer would be the gap (t) between marginal and average revenue on the domestic market, while the volume of imports associated with this trade restriction would be S_0D_1 , a quantity that is D_1D_0 lower than the free trade solution (S_0D_0). Conversely, if the objective of the STE was to exploit producers, the equivalent policy would be a subsidy on imports to lower domestic price until the marginal



²¹It is arguable that the use of export restrictions itself is not allowed under the current trading rules. It is also rare for such restrictions to be challenged by trading partners (or at least the exporters).

cost of buying from the domestic producer equaled the world price. The level of rent-maximizing subsidy would be the difference (e) between the supply price and the marginal cost of purchasing from domestic sources. However, if the STE importer controlled domestic marketing as well and decided to exploit both consumers and producers to maximize its profits, imports could be sold domestically at the high price and domestic product could be purchased at the low price. This type of market differentiation has existed in several countries of the Former Soviet Union.

The framework for measuring the impact for such a consumer-exploiting STE importer is similar to that discussed above. The measurement of the trade effect is simply the **tariff equivalent** of the policy set. In the case of a producer-exploiting STE, the measurement of trade effect is the **import subsidy equivalent**. With market differentiation, the trade impacts would no longer simply be represented by the tariff equivalent: it would have to be calculated from the **producer and consumer subsidy equivalent** (OECD, 1987; USDA, 1987).²²

The second case is where the trade monopoly is in place to support the producer monopoly, so that together they exploit domestic consumers. If the entire rent is handed over to producers as decoupled payments, this scenario differs from the consumer-exploiting trade monopoly only in the distribution of rents. But, if the rent is distributed to producers in the form of higher prices (P_m in figure 3), the trade impacts would be as if the STE were exploiting consumers. In either case, the tariff equivalent would still represent the trade effects of STE activities.²³

The third case is that of a producer-exploiting monopsony linked to a trade monopoly which would keep domestic prices low with import subsidies or export taxes. This would be tantamount to the cheap food policy pursued by several developing countries. The trade impact (S_1S_0) would be measured, as before, by the subsidy/tax equivalent (e).

In summary, in the small country case, the operation of domestic monopolies and monopsonies unsupported by trade monopolies (or quantitative restrictions) pose no problem for trade. If they are linked to a body that controls trade flows, they can exploit either domestic consumers with tariff-like policies or domestic producers with tax-like policies. The only case where measurement of the trade effect is likely to be problematic is where the state trader runs a complex policy of splitting the domestic market and thus using a combination of producer and consumer taxes in conjunction with trade measures.

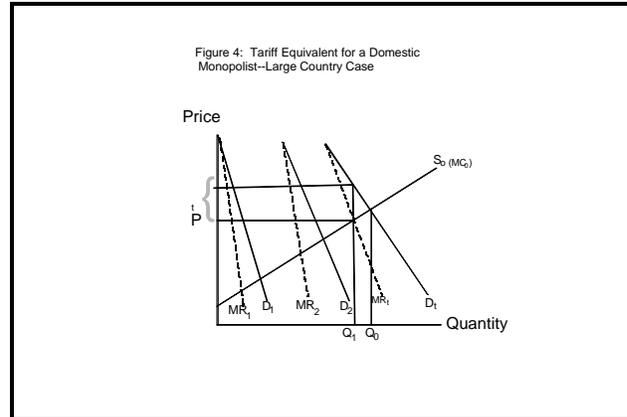
²²The situation would be similar for an STE exporter, with the difference that the policy instruments would be an export subsidy if consumers were to be exploited, and an export tax if producers were to be exploited. In cases where both are exploited, the PSE/CSE concept again becomes relevant.

²³If only part of the rent is passed on to producer in the form of higher prices, this would be equivalent to market segmentation, and the PSE/CSE would be the relevant measure.

Large Country Case

If we drop the assumption that the country cannot alter its terms of trade, the trade impact is marginally more difficult to compute. However, the analysis does not change markedly. Take figure 4 as an illustration. The demand faced by the monopolist is the sum of domestic and foreign demand curves, and is less than infinitely elastic.

The monopolist equates total marginal costs (MC_0) to total marginal revenue (MR_t), and not just to domestic marginal revenue (MR_1). There will, therefore, be some profits to be had by reducing production and pushing up world price. The impact on trade flows can be depicted by a **producer tax equivalent** (t) on domestic production, where the height represents the degree of market power in the total market. But, in practice, restraining domestic production in the absence of trade controls is unlikely to cause trade problems. The domestic monopolist, likewise, has some market power if world prices are impacted by the restriction of purchases on the domestic market. With less purchased from the domestic market, imports would increase and world prices would rise. But the trade impact is due to the reduction in production and can be calculated from the producer tax equivalent as before.



The situation becomes a little more interesting when one considers a profit-maximizing “pure” trade monopolist/monopsonist, who could discriminate among markets and impose optimal trade taxes. Essentially, a monopolist trader would equate its excess supply schedule with the marginal export revenue function and impose an optimal export tax. This is in addition to the trade taxes that might be used to exploit the domestic market. A monopsonist trader, on the other hand, would equate its excess demand schedule with the marginal import cost function and impose an optimal import tariff. The trade effects, in both cases, can be represented with a tariff equivalent.

Traders that function in support of producers and/or consumers would face similar situations. The coalition between the domestic monopolist and the state trader would set a somewhat higher tariff against imports so as to exploit the world market as well as the domestic one. The monopsonist with supporting trade controls would impose a lower domestic producer price so as to gain a little from weaker world market prices. In general, the terms of trade impact is a refinement on the calculation of the measure of the trade effect. It will not often shift either the direction nor dominate the magnitude of the impact on trade.

Analytical Approach and Complexity of State Trading Practices

The tariff/subsidy equivalent approach that has been proposed to analyze the distortionary impacts of STEs is relatively simple. It transforms the entire set of policies and activities associated with state trading into one summary measure that can be compared over time; across commodities, policies, and countries; and, is easily understood. But is the analytical framework completely adequate for addressing some of the thorny issues associated with state trading?

One of the primary concerns raised about state trading enterprises is their ability to cross-subsidize across markets as a result of the economic rent stemming from statutory powers given to them. Analytically, this concern is not a real problem: it would just mean that the tariff/subsidy equivalents would have to be measured in two or more markets rather than in a single market. Hence, cross-subsidization between the internal and external markets would be measured as higher protection (tariff equivalents) in the domestic market and greater subsidization (export subsidy equivalents) in foreign markets. The same would be true for cross-subsidization across commodities. Tariff/subsidy equivalents could be measured in the different markets and compared to their WTO obligations.

Price pooling schemes are often cited as another source of concern. But, to a large extent, the analytical issue is no different than cross-subsidization across markets or products. The tariff equivalents would still represent the trade impacts of policy. Where the analysis becomes more complex is in cases of price-pooling across time (between years). In this situation, the tariff equivalent should be calculated over the length of time in which the policy is applicable. Pooling across time may have an impact on stocks and hence trade. But even here, it is difficult to argue that pooling has an unequivocal effect on the volume of trade.

Does the price gap capture the “unfair competitive advantage” that STEs are able to secure from Governmental association? Tax benefits, transport subsidies, and preferential exchange rates were cited as some of these provisions. If we assume that the objective of the STE is to maximize profits with price as the decision rule, then conceptually, these do not pose any problems. Clearly, if the STE sets prices to maximize its profits taking into account the effects of these provisions, then the price gap would capture the bevy of provisions that facilitate STE activities. However, if there are cases where the tariff equivalent did not capture this effect, then it will be necessary to calculate the tariff or subsidy equivalents of the policy and come up with alternative measures such as PSEs/CSEs. Input subsidies, or policies that are defined as part of WTO internal support disciplines, may fall in this category.

The issue is often raised of so-called “hidden” or implicit subsidies associated with certain STE activities. To the extent that these are not reflected in either domestic or trade prices, it could suggest that the tariff equivalent does not adequately represent the trade impacts of STEs. Availability of preferred interest rates which allows STEs to undertake pricing risks beyond what a commercial enterprise might do could be one such example. But, such cases are likely to be few and far between, and the concern relates not necessarily to the appropriateness of the analytical framework but rather to the availability of data to capture these activities.

The proposed analytical framework captures most but not all the trade effects associated with STEs. For instance, it is difficult to quantify the benefits for STEs of making long-term agreements with other public enterprises or the advantages that STEs derive from governmental market promotion programs channeled exclusively through them. Clearly, if such instances are important, then the analysis of the trade impacts of STEs will have to go well beyond the simple concepts of tariff and subsidy equivalents presented in this paper.

VIII. Developing a Classification Scheme for State Trading Enterprises

Our discussions so far have focused on issues and concerns about state trading enterprises (STEs) and the measurement of the extent of market distortions such entities generate. We have suggested that the link between domestic market structure and trade controls is a key issue that can be expected to impact a STEs **capacity to distort international trade**. For instance, a statutory marketing board that has exclusive authority to purchase and sell domestic output may influence international trade very differently than a STE which merely administers automatic licenses. Similarly, a STE importer that is a player in the domestic market can be expected to influence trade much more than a trading agency that is an issuer of licences. Clearly, our understanding of the economics of STEs can be greatly enhanced by developing a framework which would facilitate classification of such entities in terms of their ability to impact trade.

A classification scheme--or taxonomy--which provides the conceptual foundation for understanding and analyzing the market effects of STEs can be useful in several respects. First, it can provide a snapshot of the similarities and differences among STEs in terms of several broad economic traits. Policymakers might find it useful to know, for instance, whether the Canadian Wheat Board and the Australian Wheat Board are comparable with respect to ownership structure, trade structure, or other relevant characteristics. Second, a classification scheme provides a starting point for building an inventory of STEs. An inventory listing, especially if it includes information on market shares, can provide policymakers with a perspective on the changing importance of STEs in agricultural trade. Third, even though the trade impacts of STEs can be measured through tariff equivalents, there have been very few attempts to empirically assess the quantitative impacts of such entities on international agriculture trade. This paucity of empirical analyses is likely to continue because of the difficulties of obtaining information considered proprietary. To the extent that one of the goals of the WTO is to move towards freer trade taking into account the existence of STEs, a classification scheme that provides qualitative indications (or ordinal ranking) of the trade impacts of such enterprises could facilitate policymakers and negotiators make informed decisions. Lastly, a classification scheme might be the basis for organizing thoughts around the issue and focusing on a sub-set of policy concerns, especially as they relate to the need for detailed case studies.

For any classification scheme to be useful, it must have several characteristics. At a minimum, it has to be geared towards achieving some specific goal. In the case of STEs, the goal should be the grouping of entities based on the firm's capacity to distort international trade. Moreover, a classification scheme should be easily understood and interpretable. Thus, the practice of classifying STEs as statutory marketing board or export marketing board or regulatory marketing board may not be very useful if it does not provide insights into the economics of market distortion. A classification scheme should also be comparable over time, across sectors, policies and countries, and be robust. Where possible, it should be non-controversial and acceptable to all. Finally, a classification scheme should be precisely defined, though precision itself should not lead to excessive disaggregation such that the economic categorization becomes meaningless.

What might be an appropriate classification scheme to understand the economics of state trading enterprises? Our discussions on the conceptual framework presented earlier suggests that there are several elements associated with the market regime under which an STE operates as well as its institutional structure which determine the parastatal's capacity to distort international trade. We will now describe these in greater detail, focusing on how each of these might help us understand the capacity of a STE to distort international trade.

Trade Balance

Trade balance for a commodity at a point in time establishes whether an STE is an exporter or an importer. Why is it important to classify STEs as exporters or importers? Because, as indicated earlier, the behavior of exporting STEs can be expected to be very different from STE importers. Whereas a STE exporter attempts to enhance trade and competition in the international market, a STE importer is more interested in restricting trade and augmenting protection in the domestic market. The concern with exporting STEs is relatively simple: do they violate the Agreement on Agriculture export subsidy disciplines? The issue with importing STEs is more complex: do they use tariffs and other nontariff barriers to trade (NTBs) to protect domestic industries? *Ceteris paribus*, if the objective of multilateral negotiations is to move towards freer trade taking into account the possibilities of rules violation, an exporter that directly enhances international competition might be considered “less objectionable” to one that restricts competition. Indeed, identifying the trade balance associated with a STE is the first step towards understanding the economics of such enterprises.

Market Control

Market control refers to four specific activities that a STE might be engaged in: imports, exports, domestic procurement (purchases), and domestic marketing (sales). The ability of a STE to distort international trade depends, among other things, on the control it exercises over these activities. If a STE regulates all of these activities, then its capacity to distort markets is likely to be much greater than if it controlled none of the activities.

What are the various possibilities that exist with respect to control of imports, exports, domestic procurement, and domestic marketing, and can we establish a qualitative index of trade distortion based on the type of regime in operation? At one end of the spectrum would be a market regime where the STE maintains complete control over each of these activities. In practical terms, this would most likely represent a situation where the STE has single desk authority on imports, is the sole seller of exports, has monopoly power on domestic marketing (sales), and is a monopsonist buyer with respect to domestic procurement. All transactions, whether in the domestic or international markets, would have to be channeled through the STE. The other extreme would be a market regime where the STE has no control over imports, exports, domestic marketing, or domestic procurement. Presumably, the STE--in this situation--would behave no differently than a competitive private firm, and the possibilities for a STE to distort internal and international markets are, thus, very limited.

Straddling these two extremes are several possibilities. A STE might still be the single desk authority for imports but face competition in domestic marketing. Domestic consumers, therefore, would have the choice of purchasing either from the parastatal organization or from other domestic suppliers. Similarly, the STE might be the sole seller in the export market but face competition in domestic procurement. Domestic producers can sell either to the parastatal or to other domestic consumers. From a free trade perspective where more competition is preferred to less, a STE that has exclusive authority for **both** domestic procurement/marketing and international sales/purchases would be considered less desirable than one which controls only **one** of the markets.

Policy Regime

Two separate issues emerge regarding the policy regime: the first concerns the type of policy instruments in use, while the second relates to the competitive edge that a STE might be able to gain because of exclusive access to certain policy instruments. A STE that relies on quantitative restrictions on imports (or exports) is likely to distort international trade much more than a STE that obtains its protection from tariffs. From a free trade perspective, therefore, a STE that is supported by tariffs is preferred to one that resorts to non-tariff trade barriers. Comparable arguments can also be made (and conclusions drawn) with respect to various domestic policy instruments. As has been established in the literature elsewhere, income payments which only directly affect producers are preferred to market price support payments which distort both consumer and producer preferences. The second issue on policy regimes relates to the use of instruments that allow STEs to obtain a competitive edge over other firms operating in the same market. For instance, does preferential allocation of quotas (monopoly rents) or exclusive access to tariff revenues benefit parastatal organizations to the detriment of commercial firms. If so, a STE which does not have access to preferential governmental assistance can be considered more desirable to one that receives such benefits.

Product Range

Product range might be another indicator of the capacity of a firm to distort trade. Presumably, if a STE trades in several products, it has more leverage in manipulating markets and more discretionary authority in moving away from free trade for any specific commodity. The ability of any firm to move away from a competitive solution depends on the market power that it exercises within a country or internationally. Market power depends, among other things, on a firm's capacity to differentiate its product and regulate use of substitutes. If a firm has complete control over the commodity and its substitutes, then it has a greater capacity to distort trade. This capacity is likely to be even greater if the STE has control over upstream and downstream activities and can engage in transfer pricing as a consequence of vertical/horizontal integration. From the perspective of moving towards free trade, a STE that trades only in one commodity may be preferable to one that controls several products.

Ownership and Management Structure

The ownership and management structure of an STE can impact international trade in several ways. An STE which is owned by the Government and has been established to provide income and price stability may behave differently than an STE owned by producers which has as its objectives profit maximization. Or, an STE that is owned by the Government and is guaranteed against bankruptcy is likely to impact trade differently than a commercial firm operating without government assistance. Clearly, if a continuum on trade distortion were to be established, an STE financed entirely by producers without the deep pockets of the Government is more likely to move towards free trade than an STE owned by the Government. Ownership, in this case, is being used as a proxy to represent the move towards a welfare maximizing norm.

Creating STE Archetypes

Classification of STEs requires attention to market control mechanisms, policy regimes, as well as institutional characteristics such as ownership structure and product range. Table 1 provides a classification scheme for STEs based on the market control mechanism and the policy regime faced by parastatals. A **Type I** STE is defined as a parastatal which operates under a competitive market regime without any controls on either domestic or international trade. The institutional characteristics of the enterprise is not important under these conditions because the STE is competing with private firms on a level field. One possible exception to this might be a situation where an STE gains a competitive edge over commercial firms as a result of exclusive government programs, such as tax benefits and/or subsidies on utilities.

Type	Quantitative Trade Controls?	Domestic Market controls on procurement and/or marketing?	Examples	Classification Scheme
Type I	None	None	Australian Meat and Livestock Corporation	Green
Type II	None	Yes	Some U.S. Marketing Orders (i.e. California Raisins)	Green
Type III	Yes	No	Australian Wheat Board, New Zealand Dairy Board	Amber
Type IV	Yes	Yes	Canadian Wheat Board, BULOG	Red

But this is likely to be an exception rather than the rule. An example of a Type I STE is the Australian Meat and Livestock Corporation which essentially engages in market promotion activities only. A **Type II** STE would be a parastatal organization which operates without any restrictions on external trade but maintains controls over the domestic market. Depending on whether the parastatal organization deals with multiple or single commodities and based on whether it was owned by the Government or producers, Type II could be further disaggregated as necessary. Some U.S. marketing orders, such as the California Raisin Board, is an example of a Type II STE. A **Type III** STE would be a parastatal which operates in a competitive domestic environment but benefits from **quantitative controls on external trade**. As before, variants of type III would depend on ownership and product structures. The Australian Wheat Board or the New Zealand Dairy Board are examples of Type III STEs. A **Type IV** STE would be a parastatal which imposes quantitative restrictions on imports and maintains control over the domestic market as well.

Variants would depend on product and ownership structure. BULOG among importers and the Canadian Wheat Board among exporters are examples of Type IV STEs. But, it is worth pointing out that the same STE might be classified differently, depending on the commodity under consideration. For instance, the China Cereal Oil and Food Corporation (COFCO) would be designated as Type IV for cereals (exclusive control over external trade and domestic marketing) but Type III for vegetable oils (monopoly in external trade only). A similar argument could be made for the Canadian Wheat Board with respect to feed barley where it is not a monopsonist in the domestic market. Is it feasible, based on the typology described above, to group STE archetypes in terms of their ability to distort agricultural trade? One possible grouping, paralleling that in the Uruguay Round Agreement on Agriculture, is to color code them in terms of **green**, **amber**, and **red**. **Green** STEs would be those which are least likely to distort trade and may not need scrutiny vis-a-vis current rules violation. Clearly, Type I STEs, which have little, if any, capacity to influence external trade, would fall in this category. But, it also seems logical to group Type II STEs in the green category largely because of the absence of trade controls. Domestic consumers (producers) can resort to international markets for purchases or sales, suggesting that domestic controls without trade restrictions does not significantly violate competitive norms. **Amber** STEs are defined as those which allow competition in the domestic market but not in external trade. These would be Type III STEs which have the ability to distort trade but are not as distortionary as Type IV STEs. The policy goals for amber STEs should be to address the extent of market control they exercise as well as to examine their institutional characteristics. **Red** STEs would be those which maintain control over both the domestic and external markets (Type IV). These STEs have the capacity to distort trade the most because of exclusive marketing authority in both markets. The policy goal vis-a-vis red STEs should be to address entry restrictions into these markets. Institutional characteristics, while important, do not necessarily constitute the overriding impediment to a move towards free trade.

The classification scheme we propose is one means of deriving a qualitative measure of the distortionary impact of STEs. But, it is not an end in itself. This qualitative information should be used in conjunction with two others measures: empirical estimates of the tariff equivalents, and means testing which would indicate how large a player in the global market the STE might be. Then, and only then, will we have a realistic picture of the capacity of a STE to distort international trade.

X. Conclusion

State trading in agriculture is not a new phenomenon. It has, though, been getting additional attention recently because of the Uruguay Round Agreement on Agriculture which disciplines many of the traditional methods of providing support.

The basic objective of this paper was to examine trade policy issues concerning agricultural state trading enterprises. On the export side, practices such as selective price cutting and price pooling schemes are often cited as major irritants. Issues on the import side include the relevance of tariffication in the presence of state trading, the adequacy of price mark-ups in disciplining STEs, and procedures for administration of tariff-rate quotas. The primary concern with agricultural STEs is the prospect of circumvention of Uruguay Round commitments. The ambiguities associated with the Uruguay Round definition of STEs do not make matters any easier.

The focus of the analysis was on the trade distortions arising from activities of STEs. The analytical framework that is proposed to examine distortions under current WTO rules is rather straight

forward: traditional tariff equivalents and corresponding export subsidy equivalents could be used to represent the trade effects.

More complex is the question as to whether non-competitive conditions in domestic markets distort trade and how one measures the impacts. We concluded that, for a small country, the disruption in trade is minimal when the production and purchasing monopolies are not supported by trade controls. But, even in cases where trade controls are used, the impact of trade policies themselves can be expressed in terms of tariff equivalents, and come under the purview of current rules. Links between domestic and trade monopolies are common ways of providing producer protection, but again, this can be measured using tariff equivalent methods.

Though the calculation of tariff equivalents gives a quantitative indication of the trade impacts of STEs, for many purposes a qualitative categorization of the types of STEs is useful. We suggest such a taxonomy based on the variables of market structure, policy instruments, and ownership.

Our paper suggests that the concepts and analytical framework to look at the trade impacts of STEs are relatively well-developed. The real challenge is to devise a system that would make available the necessary empirical information to calculate the tariff and subsidy equivalents.

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Comments by Maurice Schiff on

**The Effect of Liberalizing Government Procurement Practices on APEC Nations' Imports
by Simon Evenett
and
State Trading in Agriculture: An Analytical Framework by
Praveen Dixit and Tim Josling**

I read the papers in reverse order, so I am going to make my comments in reverse order to the presentation. The paper by Praveen Dixit and Tim Josling on State Trading in Agriculture in an Analytical Framework tries to tackle the issues of defining state trading, the interest in state trading enterprises, and measurement of their impact, with some classification schemes. I will comment next on Simon Evenett's paper. He follows a different approach because all the state trading or the government procurement is put together, and the overall impact is measured together rather than distinguishing between different categories. So the two papers are quite complementary.

So I touch on a number of points. First, in the matter of state trading enterprise, one issue is China and Russia, trying to get accession to the World Trade Organization. And can they use that to get around all sorts of things. A paper by Bach and Will Martin, State Trading in China, says there is a lot of competition among state trading agencies in enterprising China because some of them are at commune level, or at provincial level, and so on. There is contestability and competition. Probably Russia is different, so one might differentiate between China and Russia.

Page 7 states that trading enterprises and LDCs are to implement chief food policies, with taxation on producers and certainly on consumers. Implementation, of course, requires regulation of quantities and prices of traded goods. One might want to distinguish whether the country imports or exports. After all, if you tax production--consumption--of an importing country, you are going to increase imports and the problems of balance of payments or of the budget. You want to minimize or control the amount of imports. But for a net exporter like Argentina, when it taxes producers, it exports a bit less. So it is not clear that it needs to start controlling. If the model in mind were of an importing country (you must recall that there are some countries that export). The issue of measuring tariff equivalent and so makes me hesitate on whether we can turn all this into tariff equivalents or not? I guess the "whether" depends on the approach.

It is probably a good just to be a good economist and see what is happening. And if there are monopolies or cross-subsidizations and so on, see what is happening. Measure the impact on incentives, and then on trade, or on production or on consumption, or something like that. For instance, I remember an agriculture project years ago. Some people claimed, for example, that in one country they received 20 percent less for their output than on imports. They overlooked how the marketing board tended to buy their output at the beginning of the season, and how the imports came at the end of the season. After a good economist corrected for the cost of storing over the year, then the 20 percent fell down to maybe 6 percent. So you want to be careful about the structure of the industry, studying on a case by case basis.

On the issue on page 7 again--whether state trading enterprises are viewed as an effective administrative vehicle to execute domestic policy objectives, I was thinking that is nice to say about state trading enterprises. Deepak Aluwalia has a paper about leakages of about 45 percent for edible oil, 30 percent for wheat, and so on. So I am not sure how effective state enterprises are in achieving goals. Finally, on the classification, type 2, type 3 and so on; as long as there are no quantitative restrictions or monopolies on trade, those are type 2 that control domestic trade and that would have little effect on trade.

For example, the paper by Simon Evenett shows that those who procure locally, domestically on (tradables) are not involved with the trade sector, but in some countries they have a tremendous impact on trade. You could also subsidize production, and if you do that, you tax consumption. And to subsidize production is like putting a tariff at the same rate. So domestically you can have the same impact as you do with trade policy. So distinguish between type 2 and type 3; be a bit careful. One can find some other policy that gives exactly the same result.

The second paper on the effects on APEC nation imports, of liberalizing government procurement practices, raises the concern that liberalizing government procurement will raise imports, much more in some countries than in others. Those that are much more exposed depend more on trade and will have larger effects than those less dependent. The larger countries will see less impact relative to GDP. And therefore, liberalization may be difficult, in sort of a cooperative or joint agreement, as a regional agreement.

One issue or basic assumption of the model is balanced trade. If trade is balanced, I should be happy to have a huge increase in imports, because then I also have a huge increase in exports. This balance means that everything was inefficient before, when buying only domestically, procuring domestically. Now that I can procure abroad, I get great efficiency gains of specialization, great increases in imports and trade, since trade is by definition balanced. Somehow these policy conclusions are not consistent with the methodology of the paper. In fact, both papers should clarify what happens to trade and welfare. If exports are equal to imports, I should not worry about trade balance but about welfare. The two intuitions here are that (1) if the government liberalizes trade, in terms of procurements, then imports will rise. And (2) the increased efficiency will cause some sort of gain. And a gain in welfare or a gain in income means that these resources may be spent on exporting, and there may be more exports. I think differently. The first intuition is fine. If you liberalize imports of procurements, they rise. But when income goes up, imports, not exports, may go up. Typically exports are driven not by domestic demand, but by foreign demand. In fact, when you liberalize these imports and imports go up, you see an impact on the real exchange rates. But in the model I do not see any prices.

My thinking is that liberalized imports create a demand for imports that goes up. That liberalization creates disequilibrium in your balance of payments. Or, if you want the excess demands for tradables and nontradables, you have an adjustment in the relative price of tradables and nontradables. So you get a depreciation of the real exchange rate that will lead to an increase in exports. And that would be a secondary mechanism by which exports would rise.

Now, let me add that equation 6, which comes out of the model of Anderson, transformed to take into account government procurement, allows the author to go from equation 6 to 7 by dividing by YI . To eliminate some problems of scale, he divides by Y . This works only if β_1 is equal to 1, which is what the paper tests for. But the test comes out to 0.722, which is significantly different from one. In fact, if you were to add here minus 1, minus β_1 , Line Y , et cetera, which would make it identical, and then run it with the YI on the other side, then maybe we would have values for our co-efficient somewhat biased because that variable is missing in the test.

The last thing to say concerns (1) whether exports are equal to imports or not, or (2) whether we should build in some disequilibrium so as to allow some disequilibrium in the short and medium runs. Then, when one liberalizes, we have a disequilibrium between exports and imports. And again, page 14, states that β_3 , being close to zero, means that there is no evidence that the effects of a nation's

procurement policies reduce the amount of goods exported. But we started from the model basis that exports equals imports. So either we have an disequilibrium or an equilibrium.

Comments by Jeffrey Bergstrand on

**“The Effect of Liberalizing Government Procurement Practices on APEC Nations’ Imports” by
Simon J. Evenett**

This paper uses a standard international trade methodology to determine reasonable parameter estimates of the effects of liberalizing government procurement policies. While the overall methodology is certainly suitable, there appear to be some minor inconsistencies in the modification of the underlying theoretical framework that suggest the empirical model estimated may be misrepresenting the claimed effects, and some other minor aspects that might be addressed to avoid potential misspecification errors. This paper modifies a well-known theoretical foundation for the gravity equation in international trade [Anderson (1979)] to introduce a potential role for government spending on tradeables to estimate ultimately if there are potential trade-creating aspects from “liberalizing government procurement policies” in the APEC region. However, I found the derivations of theoretical reduced-form equation (4) incomplete and consequently misleading. However, I think the paper can be corrected to more clearly reveal what is likely transpiring.

First, the author unfortunately chooses some confusing redefinitions of Anderson’s original notation such that it is difficult to see how this paper’s reduced-form compares cleanly with Anderson’s. Here M_{ij} corresponds with M_{ji} in Anderson. Henceforth, to follow the derivations I will use M_{ij} to denote the trade flow from j to i (as in the paper) and $M_{ij} = M'_{ji}$, the latter denoting in Anderson’s model the trade flow from j to i . In this model, modifying Anderson:

$$(1) \quad M^P_{ij} = M^P_{ji} = \gamma_j \phi_i Y_{di}$$

where P denotes a private sector import by i from j , ϕ_i (as in this paper) denotes the share of private sector spending on tradeable goods in nation i , Y^D_i denotes disposable income in nation i [$= (1-\tau_i)Y_i$], and γ_j denotes the share of tradeable expenditures of nation i spent on country j . As in Anderson, assume identical homothetic utility such that γ_j is identical across importing countries and equals nation j ’s share of world output of tradeables; this is consistent with the model here.

In this model,

$$(2) \quad M^G_{ij} = M^G_{ji} = \gamma_j g_{it} Y_i$$

where M^G_{ij} denotes the import by nation i ’s government from j of goods, g_{it} denotes (as in this paper) the share of country i ’s GDP spent on tradeables by the government (hence, government procurement policies (favoring domestic suppliers) tend to lower g_{it}). Consequently, the overall bilateral trade flow is:

$$(3) \quad M_{ij} = M'_{ji} = \gamma_j [\phi_i (1-\tau_i) + g_{it}] Y_i$$

Solving this model as in Anderson (1979) yields:

$$(4) \quad \sum_i M_{ij} = \sum_i M'_{ji} = \gamma_j \{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i \}$$

or

$$(5) \quad [\phi_j (1-\tau_j) + g_{jt}] Y_j = \gamma_j \{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i \}$$

or

$$(6) \quad \gamma_j = [\phi_j (1-\tau_j) + g_{jt}] Y_j / \{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i \}$$

Substituting equation (6) into equation (3) yields:

$$(7) \quad M_{ij} = M'_{ji} = [\phi_i (1-\tau_i) + g_{it}] [\phi_j (1-\tau_j) + g_{jt}] Y_i Y_j / (\{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i / Y_w \} Y_w)$$

similar to, but not identical to, equation (4) in this paper.

There seems a fundamental, yet correctable, error in the construction of the first two terms in the numerator of the paper's equation (4). In fact, since the terms $\theta - g_t$ in the paper's eq. (4) can be replaced by $\phi (1-\tau)$ for each country, then in the paper's present construction any reduction in g_t (that is, switching government expenditures from tradeables to nontradeables) for a given tax rate, τ , must be accompanied by a rise in g_n , leaving *no net effect on trade*. (Recall, $\tau = g_t + g_n$ for budget balance.)

By contrast, eq. (7) above makes more sense intuitively, since -- with $\tau = g_t + g_n$ -- a fall in g_t can be accompanied by an equal percentage rise in g_n but there will be a net decrease *or* increase in the trade flow depending upon whether ϕ is less than or greater than $1/2$, since for instance $\phi_i (1-\tau_i) + g_{it} = \phi_i - \phi_i g_{in} + (1-\phi_i) g_{it}$.

A second important, and unrelated to the first, point is that the author uses the model of Anderson that *suppresses* distance, a factor influencing transport costs. Anderson's paper provides a nice way of thinking about the role of transport costs, as do other papers in the gravity-equation literature cited recently in Jeffrey Frankel's *Regional Trading Blocs in the World Economic System* (Washington, D.C.: Institute for International Economics, 1997). I reserve some concern that the estimated equations did not include a role for distance as a proxy for transportation costs. The author's footnote 5 does not provide a sufficiently convincing rationale for excluding distance in this study.

Third, these considerations may shed some light upon the empirical estimates of the coefficients of empirical equation (7) in the paper. According to the model, β_1 should equal one and β_2 should equal β_3 when the underlying variables are properly measured. Thus, I would imagine some of the final inferences in the paper would be amended were some of these modifications introduced.

Comments by John Reeder¹ on
State Trading Enterprises (STEs) by
Praveen Dixit and Tim Josling

Overall: This is an excellent article that discusses current thinking on STEs. Their classification system for STEs is an interesting new framework, and adds to understanding that STEs vary in their effects on trade and production.

Economic assumptions about STEs and economic efficiency

It may be helpful to readers if the authors would have briefly described the STE issue in a larger economic framework. STE are but one small part of the larger debate of public choice: what do government and private industry do in a private economy? STEs represent government activity as applied to a specific industry or business sector. A priori, STEs are not bad or good, more or less efficient than private enterprises in the real world of second best. In many factor markets, it is wrong to characterize a specific STE as economically inefficient without an analysis of the supply and demand conditions affecting the product, the market structure, and other related government goals or policies.

For example, it may appear prima facie to be inefficient for a coffee marketing board in a small producing developing country to impose export taxes to raise government revenues. Yet without other tax revenues, what are the government's choices? STEs can also be analyzed through other criteria used to measure good governance: is the enterprise run efficiently? Does it operate transparently through public accountability and published results? In developing countries, one may find STEs that operate clandestinely and inefficiently, not dissimilar to other portions of their governments.

Historical background of the issue

Another aspect of the issue the authors could have more fully explained is the historical framework of STEs. On page 6, the authors do discuss why countries pursue state trading in agriculture. Many STEs were created in the midst of the Depression of the 1930s or in some cases in the agricultural bust right after WWI (the Canadian Wheat Board). Agricultural surpluses in tropical products such as coffee or sugar or cocoa also motivated creation of STEs.

Another motive behind the creation of STEs was industrial structure, particularly with decentralized farmers facing monopsony processors, traders (including railroads), and large purchasers with market power. An STE is an alternative regulatory structure for dealing with market power. In theory, it is possible to regulate monopoly or monopsony power through public bodies such as utility rate commissions or railroad rate commissions (such as the former ICC), but economic research has shown that such regulation is often ineffective. Developing countries created parastatals in the 1940s, and 1950s

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because of a belief that a market failure required the presence of the state to begin industries dominated theretofore by the developed countries (steel and petroleum for example).

Specific commodities and STEs.

It may also be helpful to consider the type of commodity affected and its specific supply and demand history. Dairy seems to be a sector that is strongly affected worldwide by government policies; is the New Zealand Dairy Board's existence related to this?

Specific page comments:

Page 4, third paragraph: I agree that STE trading may not have changed all that much. In wheat trade, the four big exporters, the U.S., Canada, Australia, and the EU all have had some form of state trading over the past decade, depending on the definition of STEs.

Page 4, second paragraph: As to reasons behind the current policy interest in STEs, the GATT obviously covered STEs since the immediate post-WWII period, however none of the leading powers, particularly the United States, had any interest in curtailing or curbing STEs. So when did the U.S. change its views on this topic, and begin its current opposition to STEs? This policy change can be seen as a logical continuation of the U.S. initiative, begun in the Reagan Administration, to eliminate government influence and regulation on trade and domestic production. The drive for "free trade" (by which is meant "unregulated" trade) obviously benefits certain groups more than others.

As a corollary to this, the U.S. Government and the multilateral financial institutions have been pushing developing countries since the debt crisis of the early 1980s to carry out so-called "neo-liberal reforms" that entail the elimination of parastatals and privatization of government owned industries (steel, utilities, petroleum for example), and this certainly included elimination of STEs.

Private multinational and financial interests have also been behind the neo-liberal reforms to further their own pecuniary interests. This group also includes politically connected elites in certain developing countries (as well as the Former Soviet Union (FSU)) who have made scandalously high profits (rent seeking) from their purchase of previous public enterprises and STEs. This also involves the issue of good governance.

Page 10, first paragraph.--I agree with the ambiguity as to whether an STE can raise capital at a lower cost than private enterprises. There is probably some lower interest rate charged for a government backed loan, but that depends on the government entity and on the private enterprise to which a comparison is made. D.C. Government bonds are currently rated as junk bonds "BBB" by Standard and Poors; Sally Mae or Ginnie Mae bonds are rated much closer to U.S. bond rates. What rate does an ADM or a Cargill pay for short term loans or credit to finance its grain trading, and what rate does the CWB pay? A well-run STE is probably viewed by lenders as credit worthy, and would receive a low rate of interest. But a well run merchant trading company like Cargill with annual sales of over \$40 billion is also going to receive a prime rate from its bankers.

Pages 15-18: The analytical presentation on pages 15-18 is a little obtuse (at least for this non PhD-economist), partly because their figures are not easily readable nor explained well. I would shorten this explanation, and make the figures more readable.

Page 28 (reference GAO study): GAO has published a more recent study, **Canada, Australia, and New Zealand: Potential Ability of Agricultural STEs to Distort Trade**, June 1996, you may want to cite.