
A Systematic Evaluation of Services Trade Barriers: The Case of Thailand

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Thailand is one of many countries that maintains significant barriers to trade in services. It maintains restrictions on foreign direct investment in many sectors, which impinge on the ability of foreign firms to deliver services via commercial presence. There are also sector-specific restrictions in key services industries — telecommunications, finance, air passenger transport (a key input to tourism), maritime transport, and professional services — many of which not only restrict foreign firms, but also the entry and operations of new domestic firms. Such trade restrictions, which protect incumbents and dampen competitive pressures, are likely to hold back the productivity growth of Thailand's services industries. They are also likely to impose a significant cost burden on the rest of the Thai economy.

The paper does the following.

- It makes use of existing estimates of the first round price or cost impacts of services trade barriers in seven different services sectors in Thailand, estimates made primarily by the Australian National University and the Australian Productivity Commission and reported in Findlay and Warren (2000).
- Uses these in a newly developed CGE model of the Thai economy, based on version 5 of the GTAP database, but with a treatment of trade delivered via commercial presence (using FDI data from UNCTAD and USITC), to demonstrate the welfare effects of various 'what if' scenarios involving partial and full removal of restrictive regulations in some or all services sectors.

The paper also examines the extent of the adjustment costs likely to be incurred in the process.

The paper uses the results of these modelling scenarios to draw conclusions about the sectoral priorities for services trade liberalisation in Thailand, as well as a ranking of adjustment costs. The modelling results show that it would be dangerous to draw conclusions about sectoral priorities just from the height of the initial trade barriers. Also critical is the relative sizes of the affected sectors, and whether the trade barriers are rent-creating or cost-escalating.

The paper also examines how the priorities (and adjustment costs) might change if the liberalisation were to be carried out in a multisectoral (beyond just services) or multilateral context. Even more than for goods trade, the main effects of services trade liberalisation come from unilateral action. Adding additional sectors or additional countries makes very little difference to the results. The paper discusses the characteristics of services trade barriers that contribute to this result.

Studies to date

Few of the early multi-country studies recognised FDI as a mode of services delivery (table 1). Petri (1997) was a pioneering exception. Of those multi-country studies that did include FDI, few contained more than a single aggregate services sector. This reflects the constraints on model size associated with modelling FDI in a multi-sector, multi-country context. These constraints are still relevant.

In addition, many of the earlier multi-country studies took their estimates of barriers to services trade from the very early pioneering work of Hoekman (1995). His study combined an index measure of barriers to services trade, derived from GATS schedules, with ‘guestimates’ of the tax equivalents of those barriers. It therefore suffered from the incomplete coverage of GATS schedules, and lacked an econometric basis for the tax equivalents. More recent work by Brown and Stern (2001), Dee and Hanslow (2001) and Verikios and Zhang (2001) has begun, in a limited way, to make use of the more comprehensive econometric estimates available.

Two recent, single-country studies by Konan and Maskus (2002) and Jensen Rutherford and Tarr (2003) have been able to combine a much more disaggregated treatment of the services sector with much more detailed and country-specific measures of barriers to services trade. In Jensen, Rutherford and Tarr (2003), the estimates of barriers to services trade were based on the methodology of Findlay and Warren (2000). Konan and Maskus (2002) did not include a treatment of FDI, because in Tunisia’s highly regulated economy, FDI was prohibited in many key services sectors, and they judged there was no way to predict how responsive sectors that were inactive in the benchmark would be to FDI in the liberalised environment. Jensen, Rutherford and Tarr (2003) judged FDI from new multinational service providers to be possible in 11 of their sectors (all in services), and modelled it accordingly.

The methodology in this paper is to develop a model of the Thai economy, with a reasonable amount of services sector detail and where possible, a tailor-made, industry-by-industry treatment of barriers to services trade.

Table 1 Selected CGE studies of services trade liberalisation

Study	No of services sectors	Modes of services delivery		Barriers to modes of delivery		Source of estimates of services trade barriers
		FDI	Other	FDI	Other	
Multicountry studies						
Brown et al. (1996)	5	X	✓	X	✓	Hoekman (1995)
McKibbin and Wilcoxen (1996)	1	X	✓	✓ (in-direct)	✓	Assumed
Petri (1997)	1	✓	✓	✓	X	Hoekman (1995)
Hertel et al. (1999)	5	X	✓	X	✓	Hoekman (1995) and Francois and Hoekman (1999)
Robinson et al. (1999)	6	X	✓	X	✓	Hoekman (1995)
Hertel (2000)	8	X	✓	X	✓	Francois and Hoekman (1999)
Brown and Stern (2001)	1	✓	✓	✓	✓	Francois and Hoekman (1999)
Benjamin and Diao (2000)	1	X	✓	X	✓	Assumed
Chadha (2001)	8	X	✓	X	✓	Hoekman (1995)
Dee and Hanslow (2001)	1	✓	✓	✓	✓	Kalirajan et al. (2000) and Warren (2000b)
Verikios and Zhang (2001)	6	✓	✓	✓	✓	Kalirajan et al. (2000) and Warren (2000b)
Single country studies						
Konan and Maskus (2002)	14	X	✓	X	✓	Zarrouk (2000), Balhous & Mustapha (2000), World Bank (2000), etc.
Jensen, Rutherford and Tarr (2003)	20	✓	✓	✓	✓	Zemnitsky (2001) and assumed

Source: See table for references.

But rather than being a model of a single country, it has two regions — Thailand and the rest of the world. This model can be used to look at the effects on the Thai economy of

unilateral changes to services sectors barriers. A unilateral approach is the appropriate way to demonstrate the flow-on costs of services sector barriers to other sectors, and to the economy as a whole.

The model can also be used to look at the additional effects on Thailand of services trade liberalisation in the rest of the world. As will be seen later, grouping a large number of countries into a single rest of the world region introduces several important sources of aggregation bias for that region. The high peaks in tariff and non-tariff protection in various sectors and countries are averaged out, as are the barriers to commercial presence between individual countries in the rest of the world — in the aggregate region, such commercial presence is treated as domestic ownership by the rest of the world aggregate. Because of this averaging of trade protection, and the corresponding reduction in dispersion, the welfare results of trade liberalisation in the rest of the world will be understated for that region. Nevertheless, the results can give some indication of the flow-on effects for Thailand.

The model has 24 industrial sectors, shown in table 2. The model's database is derived from version 5 of the database for the GTAP model (Hertel 1997), so the 24 sectors are aggregates of GTAP sectors, also shown in table 2. The Thai model retains all the services sector detail of the GTAP model, but in the interests of conserving computer storage, it aggregates the agricultural and manufacturing sectors somewhat. As will be seen, this introduces some aggregation bias when measuring the effects of trade protection in these sectors, even in Thailand. But although the welfare effects of trade liberalisation in these sectors are likely to be understated, they nevertheless give a useful point of contrast with the measured effects of services trade liberalisation.

Modelling commercial presence

Is it generally recognised that because services are often delivered face-to-face, trade can occur in a number of ways:

- cross-border trade;
- the temporary movement of the consumer ('consumption abroad');
- commercial presence; and
- the temporary movement of the service provider ('movement of natural persons').

Table 2 Sectoral aggregation of the Thai services model

<i>Sectors in the Thai model</i>	<i>Corresponding GTAP sectors</i>
Agriculture	Paddy rice, wheat, cereal grains, vegetables, oil seeds, sugar cane, plant-based fibres, crops nec, cattle, sheep goats, horses, animal products nec, raw milk, wool, silk-worm cocoons
Other primary	Forestry, fishing, coal, oil, gas, minerals nec.
Food	Meat, meat products nec, vegetable oils, dairy products, processed rice, sugar, food products nec, beverages and tobacco
Textiles, clothing, footwear	Textiles, wearing apparel, leather products
Wood products	Wood products, paper products, publishing
Petroleum and chemicals	Petroleum, coal products, chemical, rubber, plastic products, mineral products nec
Metals and products	Ferrous metals, metals nec, metal products
Transport equipment	Motor vehicles and parts, transport equipment nec
Other manufacturing	Electronic equipment, machinery and equipment nec, manufactures nec
Electricity	Electricity
Gas manufacture, distribution	Gas manufacture, distribution
Water	Water
Construction	Construction
Trade	Trade
Transport nec	Transport nec
Sea transport	Sea transport
Air transport	Air transport
Communication	Communication
Financial services nec	Financial services nec
Insurance	Insurance
Business services nec	Business services nec
Recreation and other services	Recreation and other services
Public admin, defence, health, education	Public admin, defence, health, education
Ownership of dwellings	Ownership of dwellings

Source: Based on GTAP database.

Trade that occurs through three of those modes — cross-border trade, consumption abroad and the temporary movement of natural persons — is captured to a greater or lesser extent in conventional balance of payments statistics (see Karsenty (2000) for details). These statistics are typically the source of services trade data in single-country input-output tables, and therefore make their way into the datasets for multi-country models such as GTAP (eg Hertel 1997).

By contrast, services delivered via FDI are not measured at all in conventional balance of trade or merchandise trade statistics. One of the challenges of modelling services trade is to come up with data on services traded via commercial presence. This requires more than just data on FDI — it requires full input-output data on the costs and sales structures of foreign affiliates. Yet few countries collect such data.

To date, data on the activities of foreign affiliates have been estimated fairly crudely from the patchy FDI data available, using a series of fairly heroic assumptions. This was the approach taken originally by Petri (1997). A similar approach was taken by Dee and Hanslow (2001), whose FDI data also formed the basis of the modelling by Brown and Stern (2001) and Verikios and Zhang (2001). In both cases, expensive use was made of an assumption that the costs or sales structures of foreign affiliates were the same as domestically owned firms. This is unlikely since, as emphasised in the theoretical literature on the activities of multinationals, foreign affiliates likely succeed at what they do because of firm-level product differentiation.

Fairly aggregate data on the costs and sales structures of foreign affiliates are now available for selected OECD countries through the efforts of the OECD in conjunction with Eurostat (eg OECD 1999). It is hoped in future to make use of this data. For the Thai model, in the meantime, it was decided to retain the assumption that *initially*, the costs and sales structures of foreign affiliates are the same as domestically owned firms. But note that this only applies in the initial database. As will be seen, the theoretical structure of the model allows the costs and sales structures of foreign owned and domestic firms to be determined independently, based on relative prices.

The data on the activities of foreign affiliates in the current model of Thailand are imputed using methods similar to Petri (1997). Bilateral FDI stock data at the disaggregated GTAP level of commodity aggregation have been compiled by Phamduc (2002) from the UNCTAD investment directories. These data are inflated up to get estimates of the output of FDI firms by commodity and country of ownership, using additional information obtained from USITC (eg USITC 2001). The data from USITC are based on the activities of US affiliates in a number of countries. They first correct for the fact that not all the capital used by foreign affiliates is financed by FDI, so that the FDI to useable capital ratio is typically greater than one. They then provide ratios of sales to useable capital for affiliates in a range of countries, broken down by industry of operation. There appears to be more variation in the resulting FDI to sales ratios across industries than there is across countries of operation. So the FDI to sales ratios that have been applied to Phamduc's FDI stock data in the current model are industry-specific, but averaged across countries of operation. The resulting sales measures are used as estimates of the output of FDI firms, and the costs and sales structures for these firms are simply pro rated from the GTAP database.¹

Note that using this approach, estimates are obtained of the activities of foreign affiliates, not just in services, but also in all primary and manufacturing activities. This means that

¹ Because of the assumption in GTAP that the country sourcing of imports is made at the border, not by individual agents within an economy, only the domestic cost structures and the international trade flows of FDI firms need be pro rated. The domestic sales structures do not need to be split, with a significant saving in computer memory requirements.

the model can keep track, not just of how services trade liberalisation influences FDI in services, but also how it affects FDI in downstream using industries.

There was one minor adjustment that was made to the above estimation strategy. According to the UNCTAD data summarised by Phamduc (2002), there is no inward foreign direct investment in the communications industry in Thailand (an industry that includes both telecommunications and postal services). The functional forms in the model are such that there would continue to be no inward foreign direct investment in communications, even in the face of trade liberalisation in that sector. To avoid this outcome, an initial foreign investment share was set at 1 per cent.

The resulting foreign ownership shares of each industry in the model are shown in table 3. The foreign ownership share in wholesale and retail trade in Thailand is apparently relatively high. This is broadly consistent with data on foreign equity investment from the Bank of Thailand, which shows that the distribution sector accounted for 21 per cent of all foreign equity investment, and 41 per cent of non-manufacturing investment, over the period January 1997 to October 2003.² Note, however, that according to the UNCTAD data, there is no inward foreign direct investment in the transport equipment industry in Thailand. Finally, note that the foreign ownership shares shown for industries in the rest of the world represent the share owned by Thai firms. In the UNCTAD data, this is based on what other countries report as the source of their inward FDI. As noted earlier, the FDI between individual countries within the rest of the world region is counted in this model as being the activity of domestic firms in this region, although the services trade barriers that operate on those within-region flows are still included as trade barriers in the model.

Modelling the temporary movement of natural persons

In common with the models of table 1, the Thai model treats labour as being completely immobile regionally, being traded only indirectly through trade in intermediate goods and services. This approach nevertheless can be consistent with the *temporary* movement of people. If people move for less than a year, they do not officially change residence, their earnings are therefore recorded in balance of payments statistics as an international transaction (and in a model of the above sort could be lumped in with repatriation of profits), and if their movement is strictly short term, the chances are that most of the income so earned is spent back home, so from the expenditure side, it looks as if no movement has occurred.

² From CEIC Asia Database, produced by Econdata Pty Ltd, which contains over 80,000 primary source time series covering 15 Asian countries.

Table 3 Foreign ownership shares of industries in the model

Per cent

	<i>Industries located in Thailand</i>	<i>Industries located in the rest of the world</i>
Agriculture	0	0
Other primary	11.0	0.1
Food	9.4	0.1
Textiles, clothing, footwear	7.3	0.2
Wood products	0.0	0.1
Petroleum and chemicals	14.6	0.2
Metals and products	32.4	0.1
Transport equipment	0.0	0.1
Other manufacturing	34.4	0.1
Electricity	0	0.1
Gas manufacture, distribution	0	0.1
Water	0	0.1
Construction	63.5	0.1
Trade	76.6	0
Transport nec	4.2	0
Sea transport	4.2	0
Air transport	4.2	0
Communication	1.0	0
Financial services nec	8.0	0
Insurance	31.0	0
Business services nec	2.9	0
Recreation and other services	0	0
Public admin, defence, health, education	0	0
Ownership of dwellings	0	0

Source: Based on Phamduc (2002) and USITC (2001).

Nevertheless, multinational operations often require the movement of people, particularly expatriate executives and specialists, for more than a year. Because of the complementarities involved, this model follows Dee and Hanslow (2001) by lumping such barriers to the permanent movement of people together with other barriers to FDI, and barriers to the temporary movement of people together with barriers to the other three modes of service delivery, but does not model either the temporary or permanent movement of people directly. This approach is adequate when the focus of attention is on barriers to FDI, as is the case in some sectors in Thailand. Winters (2002) shows how the temporary movement of people can be modelled directly, taking into account differences in the productivity of temporary and permanent workers, and the importance of worker remittances to home country income.

Modelling barriers to services trade

The GTAP model database does not include any barriers to services trade. Hence they have to be injected into the database in some way before they can be removed via policy simulation.

The relevant barriers to services trade are shown in tables 4 and 5. The estimates for aviation are taken from Doove et al. (2000), which extends the work of Gonenc and Nicoletti (2000) to non-OECD countries. The estimates for banking are taken from Dee (2003), which combines the work of Kalirajan et al. (2000) and Barth, Caprio and Levine (2002). The estimates for distribution are taken from Kalirajan (2000), for maritime from Clark, Dollar and Micco (2001) and for professional services from Nguyen-Hong (2000). The estimates for electricity generation are taken from Doove et al. (2000), which extends the work of Steiner (2000) to non-OECD countries. The estimates for telecommunications are taken from Dee (2003), which extends the work of Warren (2000).

The tables also note whether the impact of the trade barriers is rent creating (because the restrictions inflate markups) or cost-escalating (because the restrictions add to marginal costs). This matters crucially for how the trade or regulatory restrictions are modelled. It also matters crucially for their estimated effects.

Those barriers that are listed as having a price impact via markups, and hence are rent-creating, are injected into the model as output tax equivalents, with the rents from these ‘taxes’ flowing to the private sector owners of the industries rather than to the government. However, provision is made for rents to be taxed by the host country before they are repatriated to the home country.

Those that are listed as affecting prices via costs do not have to be injected into the database initially. Their removal is modelled as a productivity improvement of that magnitude in the associated industry.

Note that once the GTAP model database has been split by ownership as described above, it is possible to inject a different output tax equivalent for domestic and foreign owned firms in the same industry. Tables 4 and 5 note where the treatment of domestic and foreign owned firms differs, and hence where this treatment is appropriate.

For sectors other than air passenger and maritime transport, the barriers affect services delivered primarily via commercial presence and are modelled as such. For maritime transport, which is traded cross-border, the barriers still affect the real resource cost of delivering the service in the source country, and so are similar to barriers to commercial presence. For these industries, however, the GTAP database also records cross-border trade, so a decision has to be made about whether to model barriers to this cross-border trade, and how big these barriers should be.

Table 4 **Direct price impacts of Thailand's trade and regulatory restrictions in services**

per cent

Sector and policy measure	Direct price impact	
	via markups	via costs
International air passenger transport (domestic and foreign providers)^a		
Restrictions on designation, capacity, price and non-scheduled services	8	8
Banking — domestic providers		
No restrictions	0	
Banking — foreign providers		
Restrictions on equity, lending, expanding branches, movement of people	11	
Distribution services — domestic providers		
Restrictions on large scale stores, some statutory monopoly		2
Distribution services — foreign providers		
Restrictions on large scale stores, some statutory monopoly, inadequate protection of intellectual property rights.		6
Electricity supply — domestic and foreign providers		
Absence of unbundling or wholesale price pool		11
Maritime — domestic and foreign providers		
Mandatory port services, organised crime		4
Professional services – domestic providers^b		
Restrictions on form of establishment		2
Professional services – foreign providers^b		
Restrictions on form of establishment, equity, movement of people	4	
Telecommunications — domestic providers^c		
Restrictions on competition, interconnection	26	
Telecommunications — foreign providers^c		
Restrictions on equity, competition, interconnection	86	

^a In the absence of definitive research, the 50/50 split between price and cost impacts is arbitrary. ^b Lower bound estimate based on findings for engineering services. ^c A simple average of price impacts for fixed line and cellular services.

Source: See text.

Table 5 **Direct price impacts of trade and regulatory restrictions in services in the rest of the world**

per cent

Sector and policy measure	Direct price impact ^d	
	via markups	via costs
International air passenger transport (domestic and foreign providers)^a		
Restrictions on designation, capacity, price and non-scheduled services	6	6
Banking — domestic providers		
Restrictions on domestic bank licenses, raising funds, lending, lines of business, expanding branches, movement of people	3	
Banking — foreign providers		
Restrictions on foreign bank licenses, equity, raising funds, lending, lines of business, expanding branches, movt of people	7	
Distribution services — domestic providers		
Restrictions on acquisition of properties, equity, large-scale stores, local govt requirements, statutory monopoly, inadequate protection of intellectual property rights		4
Distribution services — foreign providers		
Same as for domestic		2
Electricity supply — domestic and foreign providers^b		
Absence of unbundling, third party access, wholesale price pool		13
Maritime — domestic and foreign providers		
Mandatory port services, organised crime		5
Professional services – domestic providers^b		
Restrictions on form of establishment, equity, licensing and accreditation, various operational requirements		2
Professional services – foreign providers^b		
Same as for domestic	6	
Telecommunications — domestic providers^c		
Restrictions on interconnection, resale, competition	8	
Telecommunications — foreign providers^c		
Restrictions on interconnection, resale, equity, competition	19	

^a In the absence of definitive research, the 50/50 split between price and cost impacts is arbitrary. ^b Lower bound estimate based on findings for engineering services. ^c A simple average of price impacts for fixed line and cellular services. ^d A simple arithmetic average of available estimates for countries other than Thailand.

Source: See text.

It was judged that the nature of the barriers to trade in professional services (eg nationality and similar requirements) was such that they were likely to affect cross-border trade as much as trade via commercial presence. Hence an additional barrier to cross-border trade was injected into the model database for the industry Business services nec, in the form of an export tax equivalent on exports of this service from the source country, but with the rents from this tax equivalent flowing to the private sectors providers in the source country. The magnitude of this tax was the same as the tax on foreign providers delivering via commercial presence. For banking, distribution, electricity supply, maritime and telecommunications, the barriers were judged not to affect cross-border trade.

The barriers to international air passenger transport affect exports of that service in the first instance. Hence the rent-creating component of those barriers was modelled as an export tax equivalent on exports of air services from Thailand to the rest of the world, and from the rest of the world to Thailand. Exports were taxed in both directions, and when unilateral liberalisation is modelled, the taxes are removed in both directions. This is because the barriers are those embodied in Thailand's bilateral air services agreements. Once again, the rents from the tax equivalent are directed to the private sector, not to governments. Note, however, that this treatment is likely to overstate the effects of these barriers, since some of the exports from the Air transport industry in the model would be exports of air freight services, not air passenger transport services.

Some of the barriers to air passenger transport are also likely to have inflated costs in the industry. With a sufficiently liberal air services regime (eg one that allowed inter-lining), the costs savings from liberalisation could also conceivably flow on to internal air services. Thus the liberalisation of these cost escalating barriers is modelled as a productivity improvement in the whole Air transport industry, rather than just as a productivity improvement affecting exports. Again, this is likely to overstate the effects to the extent that in the model, the sector also covers air freight.

It is desirable to inject the output or export tax equivalents (where appropriate) into the database in a way that preserves the general equilibrium adding up conditions of the original database, and does minimal damage to the underlying data flows. Malcolm (1998) has shown how this can be done. Essentially, it involves running a model simulation to inject the tax wedges using a Cobb-Douglas specification for all demand systems. This trades on the characteristic of the Cobb-Douglas functional form that it preserves value shares. In the current context, a version of the Thai model was prepared with Cobb-Douglas demand system and other necessary adjustments spelt out by Malcolm (1998). This was used to inject the necessary trade barrier tax wedges while causing minimal adjustments to the other data flows in the model.

Model structure

The Thai model is a model of firm-level product differentiation. Its theoretical structure is essentially the same as FTAP, the model incorporating services delivered via FDI that was developed by Dee and Hanslow (2001) and documented in Hanslow, Phamduc and Verikios (1999).

As in FTAP, the treatment of FDI follows closely the pioneering work of Petri (1997). It also incorporates increasing returns to scale and large-group monopolistic competition in all sectors. This follows Francois, McDonald and Nordstrom (1995), among others, who adopted this treatment for manufacturing and resource sectors, and Brown et al. (1995) and Markusen, Rutherford and Tarr (1999), who used similar treatments for services. Finally, it makes provision for capital accumulation and international borrowing and lending. This uses a treatment of international (portfolio) capital mobility developed by McDougall (1993). The model is implemented using the GEMPACK software suite (Harrison and Pearson 1996).

The model takes the standard GTAP framework of Hertel (1997) as a description of the *location* of economic activity, and then disaggregates this by *ownership*. For example, each industry located in Thailand comprises Thai owned firms, along with foreign multinationals. Each of these firm ownership *types* is modelled as making its own independent choice of inputs to production, according to standard GTAP theory. And each firm type has its own sales structure.

On the purchasing side, agents make choices among the products or services of each firm type, distinguished by both ownership and location, and then among the individual (and symmetric) firms of a given type — the model recognises the firm-level product differentiation associated with monopolistic competition. Firms choose among intermediate inputs and investment goods, while households and governments choose among final goods and services.

Agents are assumed to choose first among products or services from domestic or foreign locations, with a CES elasticity of substitution of 5. They then choose among particular foreign locations, and among ownership categories in a particular location, both with a CES elasticity of substitution of 10. Finally, they choose among the individual firms of a particular ownership and location, with a CES elasticity of substitution of 15. With firm-level product differentiation, agents benefit from having more firms to choose among, because it is more likely that they can find a product or service suited to their particular needs. Capitalising on this, Francois, McDonald and Nordstrom (1995) show that the choice among individual firms can be modelled in a conventional model of firm types (not firms) by allowing a productivity improvement whenever the output of a particular firm type (and hence the number of individual firms in it) expands. But because the substitutability among individual firms is assumed here to be very high, the incremental

gain from greater variety is not very great and this productivity enhancing effect is not particularly strong (the elasticity of productivity with respect to output³ is $1/15 = 0.0667$).

The first two choices, among domestic and foreign locations, are identical to the choices in the original GTAP model. They have been parameterised using values, 5 and 10, that are roughly twice the standard GTAP Armington elasticities. Two reasons can be given for doubling the standard elasticities. One is that only with such elasticities can GTAP successfully reproduce historical changes in trade patterns (Gehlhar 1997). The other is that higher elasticities accord better with notions of firm level product differentiation.

The order of the first three choices, among locations and then among ownership categories, is the opposite of the order adopted by Petri (1997). The current treatment assumes that from a Thai perspective, for example, a US multinational located in Thailand is a closer substitute for a Thai owned firm than it is for a US firm located in the United States. Petri's treatment assumes that US owned firms are closer substitutes for each other than for Thai firms, irrespective of location.

There are two reasons for preferring the current treatment.

- The first is that Petri's treatment produces a model in which multilateral liberalisation of tariffs on manufactured goods produces large economic welfare losses, for most individual economies and for the world as a whole — an uncomfortable result at odds with conventional trade theory.
- The second is that, in many instances, it accords better with reality. One of the distinguishing characteristics of services is that they are tailored each time to meet the needs of the individual consumer. Another characteristic is that they are often delivered face to face, sometimes making commercial presence (through FDI) the only viable means of trade. These taken together mean that service firms in a given location, irrespective of ownership, will tailor their services to meet local tastes and requirements, and thus appear to be close substitutes, as in the current treatment.

This treatment has been subsequently adopted by others (eg Brown, Deardorff and Stern 2000).

What about the capital supply side? The simplest way to deal with this is to assume perfect substitution between different types of capital and other financial assets, particularly bonds, so that global arbitrage ensures that FDI capital earns the going world real interest rate everywhere, and asset ownership does not need to be modelled explicitly.

³ The equivalent elasticity of productivity with respect to *inputs* is $0.0667/(1 - 0.0667) = 0.0714$, where this latter concept is used by Francois, McDonald and Nordstrom (1995). The elasticities of productivity with respect to output and inputs are not equal because of the assumption of increasing returns to scale.

However, if the source of firm-level product differentiation happens to be firm-specific assets in the form of human capital held in the head of the FDI capital owner back home, then the assumption of perfect arbitrage sits very uncomfortably with the notion of rents earned by firm-specific assets.

Petri (1997) realised this, and had asset holders in each home base allocate their (fixed) total wealth among capital in different locations according to a structure of preferences that did not assume perfect substitution, and hence did not impose perfect arbitrage nor perfect capital mobility. Brown and Stern (2001) similarly allow for less than perfect capital mobility.

Similarly, in FTAP the supply of FDI is determined by the same imperfect transformation among types of wealth as in Petri (1997). Investors in each economy first divide their wealth between ‘bonds’ (which can be thought of as any instrument of portfolio investment), real physical capital, and land and natural resources in their country of residence. This choice is governed by a CET semi-elasticity of 1, meaning that a one percentage point increase in the rate of return on real physical capital, for example, would increase the ratio of real physical capital to bond holdings by one per cent. A bond is a bond, irrespective of who issues it, implying perfect international arbitrage of rates of return on bonds. However, capital in different locations is seen as different things. Investors next choose the industry sector in which they invest (with a CET semi-elasticity of 1.2). They next choose whether to invest at home or overseas in their chosen sector (with a CET semi-elasticity of 1.3). Finally, they choose a particular overseas region in which to invest (with a CET semi-elasticity of 1.4).

The less than perfect transformation among different forms of wealth can be justified as reflecting some combination of risk aversion and less than perfect information. It is important to note, however, that while the measure of economic welfare in FTAP currently recognises the positive income contribution that FDI can make, it does not discount that for any costs associated with risk taking, given risk aversion. This is an important qualification to the current results, and will be the subject of further research.

While the chosen CET parameters at each ‘node’ of the nesting structure may appear low, the number of nests means that choices at the final level (across destinations of FDI) are actually very flexible. For example, it can be shown that, holding total wealth fixed but allowing all other adjustments across asset types and locations to take place, the implied semi-elasticity of transformation between foreign destinations can easily reach 20, and be as high as 60. The variation across regions in these implied elasticities comes about because of the different initial shares of assets in various regional portfolios.

Thus FTAP differs from many previous models, by having less than perfect capital mobility across sectors. Furthermore, the choice of sector is relatively early in the nesting structure, so that the implied elasticities guiding choice of sector, holding only total wealth

constant, are relatively low. As a result, FTAP tends to exhibit behaviour where resources move less readily between sectors in a given region, but more readily across regions in a given sector, although the differences are not dramatic. The current treatment is consistent with the idea that the knowledge capital often required to succeed in foreign direct investment, despite the difficulties of language and distance, is likely to be sector-specific. The corresponding behaviour carries through to the Thai model (which differs only by having a single rest of the world region).

Petri's model assumed that total wealth in each region was fixed. In FTAP and the current model, while regional endowments of land and natural resources are fixed (and held solely by each region's residents), regional capital stocks can accumulate over time, and net bond holdings of each region can adjust to help finance the accumulation of domestic and foreign capital by each region's investors. The treatment of capital accumulation follows the original treatment of McDougall (1993).

With this treatment of capital accumulation, the model provides a long-run snapshot view of the impact of trade liberalisation, ten years after it has occurred. To the extent that liberalisation leads to changes in regional incomes and savings, this will be reflected in changes to the capital stocks that investors in each region will have been able to accumulate. As noted, investors in each region are not restricted to their own savings pool in order to finance capital investment. They may also issue bonds to help with that investment, but only according to their own preferences about capital versus bond holding, and only according to the willingness of others to accept the additional bonds.

With this treatment, also, returns to FDI capital ultimately accrue to the region that finances it, which may not be the same as the region that nominally 'owns' it. While not necessarily critical to model outcomes in terms of relative goods and factor price or quantity movements, this modelling 'frill' is critical to the way the gains from services trade liberalisation are distributed regionally.

Measuring the costs of services trade barriers to the Thai economy

The Thai model has been used to examine the effects of eliminating the barriers to services trade summarised in tables 4 and 5 on the level of income in Thailand. The results are comparative static, showing only the impact of trade liberalisation. During the ten year adjustment period, many other changes will affect each economy, but they are not taken into account in the current analysis. For this reason, the results should not be interpreted as indicating the likely changes that would occur *over time* in the Thai economy — such results would require *all* changes, not just changes in trade barriers, to be taken into account. The model results should instead be seen as providing an indication, at some point in time ten years after liberalisation, of how different the Thai economy would be,

compared with the alternative situation at the same point in time, had the liberalisation not taken place.

To put the overall effects of Thai services trade liberalisation in context, they are compared with the effects of services trade liberalisation in the rest of the world, as well as with the effects of liberalisation of agriculture and manufacturing in both places. Subsequently, the effects of services trade liberalisation on sectoral output and employment are examined in more detail, as these give important information about the likely adjustment costs associated with services trade liberalisation.

Overall welfare effects of unilateral action

In order to understand how the overall welfare effects of services trade liberalisation compare with the effects of liberalisation in agriculture and manufacturing, it is important to understand how the sizes of the initial trade barriers compare. The services trade barriers that are examined in this report were listed in tables 4 and 5. For comparison, table 6 gives the trade barriers in agriculture and manufacturing that are embedded in the Thai model's database. These were inherited directly from the GTAP model database.

On average, the tariff barriers on manufactured goods in Thailand look higher than in the rest of the world, but this is the result of some significant averaging across the individual countries in the rest of the world region. Even in Thailand, the averaging across individual GTAP manufacturing industries (see table 2) will have produced some aggregation bias, in that the average tariff rates in table 6 will be significantly lower than some of the tariff peaks on individual items within each industry aggregate.

Some forms of agricultural support are significantly higher in the rest of the world than they are in Thailand, particularly subsidies on the use of capital and land in agriculture. These are now much higher than the subsidies to output or exports in the rest of the world, reflecting the extent to which agricultural support has become de-coupled from production or export levels over time. Tariffs on both primary agricultural commodities and processed food remain higher in Thailand than in the rest of the world.

The average tariff rates on some agricultural and manufacturing industries in both Thailand and the rest of the world exceed the measured tax equivalents of the barriers to trade in services in Thailand. Does this mean that services trade liberalisation in Thailand should be a lower priority than unilateral or multilateral liberalisation of agriculture or manufacturing?

Table 7 suggests otherwise. On a unilateral basis (first column of table 7), the gains to Thailand from services trade reform far exceed those from reform in agriculture or manufacturing.

Table 6 Rates of protection in agriculture and manufacturing

Per cent

	<i>Thailand</i>	<i>Rest of the world</i>
Tariff rates		
Agriculture	20.3	17.4
Other primary	0.8	1.3
Food and beverages	37.2	32.1
Textiles, clothing, footwear	25.2	13.4
Wood and products	12.6	3.5
Petroleum and chemical prods	15.6	6.7
Metal and products	11.9	4.0
Transport equipment	31.5	12.0
Other manufacturing	9.7	2.6
Export tax equivalents of ATC^a		
Textiles, clothing, footwear	0.4	4.0
Export subsidy rate		
Food and beverages	0.0	1.4
Output subsidy rate		
Agriculture	0.0	0.4
Ave subsidy rate on intermediate inputs		
Agriculture	0.0	0.1
Land subsidy rate		
Agriculture	0.0	18.9
Capital subsidy rate		
Agriculture	0.0	11.8

^a Agreement on Textiles and Clothing.

Source: GTAP model database.

In fact, in part because of the aggregation bias mentioned above, unilateral liberalisation of agriculture and manufacturing is projected to yield small net welfare losses, relative to what would otherwise have taken place. Unilateral tariff liberalisation creates two offsetting effects — a gain in allocative efficiency, and a terms of trade loss. The allocative efficiency gains are proportional to the square of the tariff rates, but terms of trade effects tend to be linear in tariff rates. So when tariff rates are high, the allocative efficiency gains will dominate. But when tariff rates are low (or appear to be so), the terms of trade effects can dominate.

Table 7 Thailand's welfare implications of trade liberalisation in services and goods

Equivalent variation in \$US million

	<i>Thailand liberalises</i>	<i>Rest of the world liberalises</i>	<i>Thailand and the rest of the world liberalise^a</i>
Services liberalisation			
Equivalent variation	2285	970	3183
- contribution from			
allocative efficiency effects	138	-8	137
terms of trade effects	83	-149	-131
endowment effects	129	-36	79
productivity gains	2635	-6	2582
internat. interest and rent	-700	1169	516
Agricultural liberalisation			
Equivalent variation	-21	1901	1921
- contribution from			
allocative efficiency effects	597	752	1181
terms of trade effects	-491	1364	1119
endowment effects	-16	90	72
productivity gains	-3	47	48
internat. interest and rent	-108	-352	-499
Manufacturing liberalisation			
Equivalent variation	-489	1536	1036
- contribution from			
allocative efficiency effects	965	452	1246
terms of trade effects	-1324	698	-475
endowment effects	287	74	360
productivity gains	45	20	67
internat. interest and rent	-462	292	-162

^a Individual items may not add to row total because of interaction effects, where the presence of liberalisation in one region may affect the gains from liberalisation in another.

Source: FTAP2 model results.

In table 7, there are more sources of welfare gain than just allocative efficiency and terms of trade effects. Because the model allows for capital accumulation, liberalisation also has an endowment effect by inducing a higher capital stock than otherwise. Because the model allows for gains from greater variety, tariff liberalisation also yields a productivity gain from this source. But because the model also requires additional capital to be financed from international borrowing if it cannot be financed out of domestic saving, there can be a net welfare loss from higher international debt service payments (and when services trade is liberalised, there can also be an international redistribution of the rents from services trade barriers). These last welfare effects parallel the distinction between GDP and GNP.

Table 7 shows that with unilateral liberalisation of agriculture and manufacturing, the sources of gain (including allocative efficiency effects) are insufficient to outweigh the sources of loss. With a more disaggregated representation of tariff and non-tariff protection, the balance could be reversed.

Whatever the actual magnitude of the effects from agriculture and manufacturing reform, table 7 also shows quite clearly the sources of the greater gains from removing barriers to services trade. Not only does removing rent-escalating barriers yield a gain in allocative efficiency, but removing cost-escalating barriers yields a significant productivity gain in addition to that available from greater variety. And as expected, the rectangle gains from productivity improvements exceed the triangle gains from better allocative efficiency by a significant margin.

Further, services trade liberalisation yields a small terms of trade gain, rather than a terms of trade loss. This is a secondary effect, since services trade liberalisation has its first round affect primarily on domestic prices and costs. But the resulting increase in demand by the rest of the world for imports from Thailand gives Thailand a significant indirect terms of trade gain.

Thailand is projected to have a positive endowment effect from unilateral services trade liberalisation. However, it also has a negative welfare contribution from international rent and interest payments. Here there are two offsetting affects. As with other types of liberalisation, higher capital stocks than otherwise may have required greater FDI or foreign borrowing than otherwise, with a resultant increase in debt service payments and profits repatriated to foreigners. But the profits that are repatriated overseas by foreign multinationals operating in Thailand no longer contain a super-normal rent component, so Thailand gains in relative terms on this score. The results in table 7 suggest that the former effect dominates.

Overall, unilateral removal of services trade barriers generates positive movements in all but one of the contributors to welfare. This contrasts with the more widespread pattern of offsetting effects generated by unilateral liberalisation of agricultural or manufacturing protection.

On overall welfare grounds, removing barriers to services trade would seem to be a higher priority than removing barriers to agriculture or manufacturing. However, this conclusion does not yet take into account the possible adjustment costs associated with the different types of liberalisation. These are considered in more detail shortly.

A case for multilateral action?

Table 7 also shows the relative importance of pursuing trade reform on a unilateral or multilateral basis. As pointed out theoretically by Bagwell and Staiger (1999), there are important gains from reciprocity in tariff reform. Pursuing tariff liberalisation on a multilateral rather than unilateral basis helps to neutralise the terms of trade losses associated with unilateral reform. According to table 7, Thailand has much more to gain from multilateral rather than unilateral tariff reform on this basis, although again, the strength of this conclusion may be a function of aggregation bias.

Table 7 demonstrates, however, that the case for reciprocity in services is somewhat less strong. Thailand is projected to gain when the rest of the world liberalises its services trade. But the real message from the second and third columns of table 7 is that the important gains from services trade reform come from unilateral action.

Sectoral priorities in services

It is not clear a priori which services sectors would be contributing most to the overall welfare gain from the removal of services trade barriers shown in table 7. In percentage terms, the biggest barriers are in telecommunications. But these barriers are primarily rent-creating, and likely to yield a smaller ‘bang for the buck’ than the cost-escalating barriers in some other sectors. Further, the telecommunications sector, while important strategically, is smaller in absolute size than some other sectors such as Trade and Business services nec.

Table 8 shows the break-down of overall welfare gains from the unilateral removal of services trade barriers into the gains from removing them in each services sector separately. The largest gains in absolute terms come from removing the services trade barriers in Trade, Electricity and Business services nec (where the barriers to trade in professional services have been taken as typical of the barriers in the latter model sector). The dollar welfare gains to removing trade barriers in Financial services nec and Communications are considerably smaller than those from removing barriers in Trade and Business services nec.

Note, however, that the gains to liberalising Financial Services nec and Communications are somewhat understated because of a peculiarity of the model database — the apparently low foreign ownership shares in these two sectors (see table 3) — together with the assumption of functional forms in the model which imply relatively small gains from trade liberalisation when market penetration by foreign operators is low to begin with. The foreign ownership shares are lower than is suggested by anecdotal evidence. Increasing the foreign ownership shares would increase the gains from trade reform in these sectors, although not dramatically.

Table 8 Thailand's welfare implications of services trade liberalisation — by services sector

Equivalent variation in \$US million

	<i>Allocative efficiency effects</i>	<i>Terms of trade effects</i>	<i>Endowment effects</i>	<i>Productivity gains</i>	<i>Total equivalent variation^b</i>
Air transport	49	27	44	330	365
Financial services nec	1	0	3	1	0
Trade	30	-44	51	1336	990
Electricity	23	-23	14	655	501
Sea transport	3	-14	4	115	99
Business services nec	5	132	7	190	302
Communications	26	0	7	-2	3
Total^a	138	83	129	2635	2285

^a Individual items may not add to column total because of interaction effects, where the presence of liberalisation in one sector may affect the gains from liberalisation in another. ^b To conserve space, the contribution from international interest and rent payments has been omitted, but can be recovered via subtraction.

Source: FTAP2 model results.

In order to correct for the size of each sector, table 9 shows the *percentage* contribution of each sector to the overall gain from removing services trade barriers, relative to the *percentage* contribution of each sector to the total value added generated in the seven sectors. Table 9 confirms that Financial services nec and Communications together contribute only about 10 per cent of the total value added of the seven sectors. Yet their contribution to the gains from removing services trade barriers is minimal, primarily because the barriers are primarily rent-creating and yield only rectangle gains. The barriers to trade in Business services etc are also primarily rent-creating, so the contribution of this sector to the overall welfare gain is less than its contribution to value added.

The gains to removing trade barriers in Trade and Electricity are large, partly because the sectors themselves are large, but also because the barriers in these sectors are cost-escalating, so their removal can yield significant rectangle gains. The welfare gains to removing trade barriers in Air transport are small, partly because the sector is small. But the percentage contribution of this sector to the overall gains from reform exceeds its contribution to value added, again because the barriers are at least in part cost-escalating. The gains to removing barriers in sea transport are small, partly because the sector is small, and partly because the barriers are small.

The priorities identified in this section are only among the seven sectors for which detailed background research exists on the price impacts of services trade barriers. But a more general message can be drawn — do not ignore the chance to remove relatively small barriers in relatively large sectors, especially when the barriers are of the sort to escalate costs.

Table 9 Sectoral contribution to services trade liberalisation, relative to sector size

Per cent

	<i>Sectoral contribution to value added</i>	<i>Sectoral contribution to gains from services trade liberalisation</i>
Air transport	5	16
Financial services nec	7	0
Trade	52	44
Electricity	10	22
Sea transport	4	4
Business services nec	18	14
Communications	4	0
Total	100	100

Source: FTAP2 model results.

Other negotiating priorities in services

Dee and Hanslow (2001) found that globally, the gains to removing barriers to market access were about 75 per cent of the total gains from services trade reform, while the gains to removing derogations from national treatment were about 25 per cent of the total gains. Part of the reason was that some of the greatest barriers were market access barriers. But part of the reason was that removing national treatment barriers alone could produce second best economic welfare losses in some sectors. The reason was that, in the presence of significant market access barriers, a domestic services sector was likely to be too small relative to the first best optimum. But liberalising just national treatment barriers could increase foreign competition and make the local industry even smaller, thus moving resources in the opposite direction to what would be a first best optimum.

However, as noted, this result was a global result. It was also based on a characterisation of services trade barriers that was based solely on those found in banking and telecommunications. As noted, these are primarily rent-creating, whereas other barriers are cost-escalating.

How do the gains from removing market access and national treatment barriers compare in Thailand? When the gains in the first column of table 7 are broken down this way, the gains from removing market access barriers are \$US 1631 million while the gains from removing derogations from national treatment are \$US 671 million. Thus the results for Thailand are roughly the same as those found globally — about 70 per cent of the total gains come from removing the non-discriminatory barriers to market access. This is an important finding, since trade negotiators trained in the field of goods trade typically put highest priority on derogations from national treatment.

Adjustment costs from removing services trade barriers

As noted, the above conclusions have been based on overall measures of economic welfare. While there might be gains to some economic agents and losses to others, a positive overall result means that the gains exceed the losses. So *if the gainers were to compensate the losers*, there would be a clear Pareto improvement — no economic agent would be made worse off, and at least one would be made better off. In these circumstances, one would expect a consensus in favour of reform.

However, political processes do not always operate to ensure that the gainers compensate the losers, and even if such compensation takes place, it may occur only at a considerable political cost. Thus it is important, not just to identify sources of overall welfare gains, but also to identify where losses do occur, and to identify strategies to minimise the losses to particular groups while maximising the gains overall. CGE models are particularly well equipped to identify such losses, because of the wealth of sectoral detail embodied in them.

Adjustment costs from output changes

Table 10 shows the implications for sectoral output in Thailand of the total unilateral removal of barriers to services trade. Because the model has recognised commercial presence as a mode of services delivery, and distinguished economic activity by ownership as well as location, output results are available for Thai owned firms and foreign multinationals separately.

The first thing to note about table 10 is that in one sense, the political economy of services trade reform is completely different to that of tariff reform — when tariffs are removed, the liberalised sector is smaller than otherwise; when services trade barriers are removed, the liberalised sector can often be larger than otherwise. This is a function of two things — the relative importance of non-discriminatory barriers to market access relative to derogations from national treatment, and the relative unimportance of heavily impeded cross-border trade, the liberalisation of which might have been a factor in moving activity offshore.

The second thing to note about table 10 is that when a services sector expands, it generally does so because of the relative expansion of both Thai owned and foreign multinationals. In part, this is a function of the assumption in the model that Thai owned and foreign multinationals produce differentiated products. Nevertheless, the extent of substitution between them is relatively high. And there are trade barriers in some services sectors that have discriminated heavily against foreign multinationals relative to Thai owned firms. So it is conceivable that the model could have produced a result where the activities of foreign multinationals expanded and those of Thai firms contracted as a result of the removal of the discrimination against foreigners. However, table 10 suggests that this is unlikely to occur in practice.

Table 10 Effect of services trade liberalisation on industry output in Thailand
Percentage deviation from control

	<i>Domestic owned firms</i>	<i>Foreign owned firms</i>
Agriculture	-0.3	-0.3
Other primary	-0.1	0.0
Food and beverages	-0.1	0.1
Textiles, clothing, footwear	0.0	0.1
Wood and products	-0.1	0.0
Petroleum and chemical prods	0.0	0.1
Metal and products	0.1	0.2
Transport equipment	-0.2	0.0
Other manufacturing	-0.3	-0.1
Electricity	3.6	0.0
Gas	-5.7	0.0
Water	2.1	0.0
Construction	0.3	0.4
Trade	0.8	7.1
Transport nec	-0.6	-0.4
Sea transport	6.1	6.4
Air transport	17.5	18.0
Communication	10.3	40.5
Financial services nec	-0.4	7.5
Insurance	0.9	1.1
Business services nec	3.2	2.4
Recreation and other services	1.4	0.0
Public admin, health, education	0.8	0.0
Ownership of dwellings	0.5	0.0

Source: FTAP2 model results.

But what about the flow-own benefits to downstream using industries? Dee, Hanslow and Phamduc (2003) disaggregated results similar to those above to tease out the relative importance of four features that characterise the current model:

- input-output linkages, whereby downstream using industries would benefit from cheaper services inputs;
- economy-wide resource constraints for labour, land and natural resources;
- capital accumulation; and
- the additional income effects associated with international borrowing and lending and the redistribution of rents from services trade barriers.

The disaggregation showed that the single most important feature accounting for the direction of movement of downstream using industries was the presence of economy-wide resource constraints. The downstream using industries benefit from cheaper services, but lose out to the services sector itself in the competition for skilled and unskilled labour (land and natural resources being used only in the model's primary sectors). To some extent, the

availability of more capital through greater capital accumulation can alleviate this constraint, but not entirely. Firstly, the additional capital is not a free good — it needs to be financed. Secondly, labour and capital are not perfect substitutes. Table 10 shows that the overall outcome is similar to that found in Dee, Hanslow and Phamduc (2003). It is the non-services sectors that lose in relative terms from the removal of barriers to services trade.

How big are the adjustment costs associated with the output effects shown in table 10? Attempts have been made to quantify such adjustment costs in a single country model (PC 2002, 2003). The method involves imputing the gross movements in employed and unemployed persons from the net movements that lie behind the output results of table 10, then imputing an adjustment cost to each gross movement across industry, occupation and region, as well as moves into or out of employment. Moves from employment to unemployment were judged most costly (in terms of forgone earnings), moves across regions were also costly, moves across occupations were costly (in retraining terms) if the two occupations were not closely related, and moves across industries in the same occupation and region were least costly.

Despite all the detail that went into the calculations, there was one factor that was the overwhelming determinant of the size of the resulting adjustment costs. This was whether the relative moves in output shown in table 10 (relative to what would have happened otherwise) translated into absolute expansions or contractions over time. This could only be determined in a full forecasting model that took account, not just of changes in industry assistance, but also of all the other factors likely to affect economic performance over the ten year adjustment period.

Nevertheless, some rough indication can be gauged by comparing the cumulative deviations from control shown in table 10 with the underlying rates of economic growth experienced in the Thai economy over recent times. The worst relative contraction in output is projected to occur in the gas distribution industry, a services sector industry that does not experience any services trade liberalisation of its own, but loses out to electricity as its domestic regulatory regime is improved. The cumulative deviation from control of -5.7 per cent for the gas industry over a ten year period would be fully neutralised by an underlying economic growth rate of just over half a per cent a year. With underlying economic growth any faster than this, the gas industry would simply be growing more slowly than otherwise, rather than contracting in absolute terms, as a result of the removal of barriers to services trade. And the adjustment costs are likely to be significantly smaller in an industry that is growing more slowly over time, rather than contracting. Since the Thai economy has sustained economic growth rates that substantially exceed half a per cent over most of the last decade, the adjustment costs associated with the relative reductions in industry output shown in table 10 are likely to be relatively minor.

There is an additional source of adjustment cost not captured in table 10, and that is the losses (if any) incurred by the incumbents in each services industry as the trade barriers are removed and the sectors made more contestable. The model is not sufficiently detailed to have a representation of incumbents and new entrants separately. However, incumbents are only likely to lose from the removal of services trade barriers that are rent-creating. Where barriers are cost-escalating, their removal is likely to benefit incumbents as well as new entrants.

Adjustment costs from changes in primary factor usage

Table 11 shows the cumulative deviations in control in the usage of skilled and unskilled labour and capital as a result of the unilateral removal of all barriers to services trade. As expected, the employment effects are mostly a more magnified version of the output effects, as a fixed (relative to what would have occurred otherwise) quantity of skilled and unskilled labour is reallocated from losing to gaining industries. The capital results are less dramatic than the labour results, as overall capital accumulation moderates the relative contractions in some industries.

There is one noticeable exception to the above pattern. In electricity generation, where the domestic regulatory regime has likely had the effect of escalating resource use above what it otherwise would be, services trade liberalisation means that resources are freed for use elsewhere. The downside cost of this is a significant reallocation (in relative terms) of skilled and unskilled labour. This can *potentially* create significant adjustment costs. If the electricity industry has to shed jobs, rather than simply slow the rate of new hiring, not all the shed workers, who were trained to run electricity generation plants, would have the skills to take up new jobs in the air transport or communications industries, even with significant retraining. They may retire early, or take much lower paid jobs elsewhere, while the new jobs in air transport and communications go to freshly trained new entrants to the workforce.

Whether this occurs depends critically on whether employment in electricity falls in absolute terms over time. The cumulative deviation in control over a ten year period of about -30 per cent shown for skilled and unskilled labour in both the electricity and gas sectors would be neutralised by underlying economic growth of 2.6 per cent a year. With economic growth faster than this, the cumulative deviations in control could be accommodated by the electricity and gas industries slowing the rate of new hiring, rather than shedding labour in absolute terms. The Thai economy has managed to sustain economic growth exceeding 2.6 per cent a year for most of the last decade. This suggests that the adjustment costs associated with the relative changes in employment shown in table 11 are likely to be minor.

Table 11 Effect of services trade liberalisation on primary factor usage in Thailand

Percentage deviation from control

	<i>Unskilled labour</i>	<i>Skilled labour</i>	<i>Capital</i>
Agriculture	-0.6	-0.8	-0.1
Other primary	-0.4	-0.6	-0.1
Food and beverages	-0.5	-1.4	0.0
Textiles, clothing, footwear	-0.4	-1.5	0.1
Wood and products	-1.1	-2.1	0.0
Petroleum and chemical prods	-0.4	-1.4	0.1
Metal and products	0.0	-1.1	0.1
Transport equipment	-1.6	-2.6	0.0
Other manufacturing	-2.3	-3.4	-0.1
Electricity	-29.7	-30.5	-2.3
Gas	-32.7	-33.5	-2.6
Water	9.7	8.5	0.8
Construction	1.0	-0.2	0.3
Trade	0.3	-1.2	0.2
Transport nec	-2.3	-3.7	0.0
Sea transport	11.5	9.9	0.8
Air transport	63.3	61.0	3.2
Communication	56.7	55.0	3.7
Financial services nec	0.8	-0.3	0.2
Insurance	1.9	0.8	0.3
Business services nec	4.8	3.6	0.5
Recreation and other services	4.4	3.3	0.5
Public admin, health, education	1.7	0.6	0.2
Ownership of dwellings	2.8	0.0	0.3

Source: FTAP2 model results.

Note that the assumption of a fixed (relative) supply of unskilled labour is a conservative one, in the sense that it maximises the adjustment costs associated with services trade liberalisation. If there were a significant pool of unemployed workers that could be brought into employment by the additional opportunities created by services trade liberalisation, then the unskilled labour column in table 11 would look more like the capital column, and the adjustment costs would be correspondingly lower.

Policy priorities — a final assessment

The results of this paper have demonstrated that it is not possible to get an accurate picture of policy priorities just by looking at the first-round effects of services trade barriers. Other factors need to be taken into account — whether the barriers are rent-creating or cost-escalating, and the sizes of the services sectors affected.

Among the seven different services sectors examined in detail, the policy priorities would appear to be as follows:

- distribution services;
- electricity;
- air transport;
- business services nec;
- maritime;
- communications; and
- financial services nec.

The empirical work summarised in tables 4 and 5 has confirmed that elements of Thailand's policy regime in these sectors have been inhibiting performance — either inflating markups (in air passenger transport, banking, telecommunications and professional services) or raising the real resource costs of doing business (in air passenger transport, distribution services, electricity supply, maritime and professional services).

The empirical work in this paper has confirmed that this lower performance in services has had a significant deleterious effect on the whole Thai economy.

The barriers to services trade in distribution and electricity have had the biggest deleterious effect, not because the 'tax equivalents' of the trade barriers are particularly high, but because they are cost-escalating rather than rent-creating, and because the sectors they affect are relatively large. The trade barriers in air passenger transport and business services nec are also relatively damaging because they are (at least in part) cost escalating.

Further, this paper has shown that loosening the regulatory regimes in an appropriate manner would not reduce the size of the services sector, neither its domestically nor foreign owned component. Instead, removing the restrictions on services trade would improve the productivity of the services sector and contribute significantly to deepening the services intensity of the Thai economy.

The paper has also shown that the gains from services trade reform would come largely from unilateral action. Thailand has much less to gain from services trade reform elsewhere in the world, and should not feel obliged to wait for progress in multilateral forums.

There would be some adjustment pressures, particularly downward pressure on employment levels in those services sectors undergoing the highest rates of productivity improvement. But the results in this paper suggest that these adjustment pressures could be absorbed by maintaining overall economic growth at current levels. With annual growth

rates of as little as 2.6 per cent, the adjustment pressures would translate into a slower rate of employment growth in the affected sectors, rather than an absolute contraction in employment. The adjustment costs are likely to be significantly smaller accordingly.

References

- Bagwell, K. and Staiger, R. 1999, 'An economic theory of the GATT', *American Economic Review*, 89(1), pp. 215–48.
- Bahlous, M. and Mustapha, K.N. 2000, 'Financial Liberalisation and Financing Constraints on the Corporate Sector in Tunisia', Working Paper No. 2005, Economic Research Forum for the Arab Countries.
- Barth, J., Caprio, G. and Levine, R. 2002, 'Bank Regulation and Supervision: What Works Best?', mimeo, World Bank, January.
- Benjamin, N. and Diao 1998, 'Liberalising services trade in APEC: A general equilibrium analysis with imperfect competition', *Pacific Economic Review*, 5(1), pp. 49–75.
- Brown, D.K., Deardorff, A.V., Fox, A.K. and Stern, R.M. 1995, 'Computational analysis of goods and services liberalisation in the Uruguay Round', in Martin, W. and Winters, L.A. (eds), *The Uruguay Round and the Developing Economies*, Discussion Paper No. 307, World Bank, Washington DC, pp. 365–80.
- Brown, D., Deardorff, A. and Stern, R. 1996, 'Modelling multilateral trade liberalisation in services', *Asia Pacific Economic Review*, 2(1), pp. 21–34.
- Brown, D., Deardorff, A. and Stern, R. 2000, 'CGE modelling and analysis of multilateral and regional negotiating options', paper presented at conference on Issues and Options for the Multilateral, Regional and Bilateral Trade Policies of the United States and Japan, 5–6 October, University of Michigan, Ann Arbor.
- Brown, D. and Stern, R. 2001, 'Measurement and modeling of the economic effects of trade and investment barriers in services', *Review of International Economics*, 9(2), pp. 262–86.
- Chadha, R. 2001, 'GATS and developing countries: A case study of India', in Stern, R. (ed.), *Services in the International Economy*, University of Michigan Press, Ann Arbor, pp. 245–66.
- Clark, X., Dollar, D. and Micco, A. 2001, 'Maritime Transport Costs and Port Efficiency', Mimeo, World Bank, available at econ.worldbank.org/files/11793_wps2781.pdf (accessed 23 July 2003).
- Dee, P. 2003, 'Services Trade Liberalisation in South East European Countries', mimeo prepared for OECD, June.

-
- Dee, P. and Hanslow, K. 2001, 'Multilateral liberalisation of services trade', in Stern, R. (ed.), *Services in the International Economy*, University of Michigan Press, Ann Arbor, pp. 117–39.
- Dee, P., Hanslow, K. and Phamduc, T. (2003), 'Measuring the cost of barriers to trade in services', in Ito, T. and Krueger, A. (eds), *Services Trade in the Asia-Pacific Region*, NBER-East Asia Seminar on Economics, Volume 11, University of Chicago Press, Chicago, pp. 11–43.
- Doove, S., Gabbitas, O., Nguyen-Hong, D. and Owen, J. 2001, *Price Effects of Regulation: International Air Passenger Transport, Telecommunications and Electricity Supply*, Productivity Commission Staff Research Paper, Ausinfo, Canberra.
- Findlay, C. and Warren, T. (eds) 2000, *Impediments to Trade in Services: Measurement and Policy Implications*, Routledge, London and New York.
- Francois, J.F., McDonald, B. and Nordstrom, H. 1995, 'Assessing the Uruguay Round', in Martin, W. and Winters, L.A. (eds), *The Uruguay Round and the Developing Economies*, Discussion Paper No. 307, World Bank, Washington DC, pp. 117–214.
- Francois, J. and Hoekman, B. 1999, 'Market access in the service sectors', Tinbergen Institute, manuscript, cited in B. Hoekman 2000, 'The next round of services negotiations: identifying priorities and options', *Federal Reserve Bank of St Louis Review*, 82(4), pp. 31–47.
- Gehlhar, M. 1997, 'Historical analysis of growth and trade patterns in the Pacific Rim: An evaluation of the GTAP framework', in Hertel, T. (ed), *Global Trade Analysis: Modelling and Applications*, Cambridge University Press, Cambridge, pp. 349–63.
- Gonenc, R. and Nicoletti, G. 2000, *Regulation, Market Structure and Performance in Air Passenger Transport*, Working Paper No. 254, ECO/WKP(2000)27, Economics Department, OECD, Paris, 3 August.
- Hanslow, K., Phamduc, T. and Verikios, G. 1999, 'The structure of the FTAP model', Research Memorandum, Productivity Commission, Canberra, December.
- Harrison, J.W. and Pearson, K.R. 1996, 'Computing solutions for large general equilibrium models using GEMPACK', *Computational Economics*, 9(2), pp. 83–127.
- Hertel, T. 1997, *Global Trade Analysis: Modelling and Applications*, Cambridge University Press, Cambridge.
- Hertel, T. 2000, 'Potential gains from reducing trade barriers in manufacturing, services and agriculture', *Federal Reserve Bank of St Louis Review*, 82(4), pp. 77–99.
- Hertel, T., Anderson, K., Francois, J. and Martin, W. 1999, 'Agriculture and Non-Agricultural Liberalisation in the Millenium Round', paper presented at the Global Conference on Agriculture and the New Trade Agenda from a Development

-
- Perspective: Interests and Options in the WTO 2000 Negotiations, World Bank and WTO, Geneva, 1-2 October.
- Hoekman, B. 1995, 'Assessing the General Agreement on Trade in Services', World Bank Discussion Paper No. 307, World Bank, Washington DC.
- Jensen, J., Rutherford, T. and Tarr, D. 2003, 'Economy-wide and Sector Effects of Russia's Accession to the WTO', paper prepared for the Allied Social Science Meetings, Washington DC, 3-5 January.
- Kalirajan, K. 2000, *Restrictions on Trade in Distribution Services*, Productivity Commission Staff Research Paper, Ausinfo, Canberra.
- , McGuire, G., Nguyen-Hong, D. and Schuele, M. 2000, 'The price impact of restrictions on banking services', in Findlay, C. and Warren, T. (eds) 2000, *Impediments to Trade in Services: Measurement and Policy Implications*, Routledge, London and New York, pp. 215–30.
- Karsenty, G. 2000, 'Assessing trade in services by mode of supply', in P. Sauvé and R. Stern (eds), *GATS 2000: New Directions in Services Trade Liberalisation*, Brookings Institution, Washington DC, pp. 33–56.
- Konan, D. and Maskus, K. 2002, 'Quantifying the Impact of Services Liberalisation in a Developing Country', paper presented at the Economic Research Forum Ninth Annual Conference, October.
- Malcolm, G. 1998, 'Adjusting Tax Rates in the GTAP Data Base', GTAP Technical Paper No. 12, Purdue University, West Lafayette.
- Markusen, J., Rutherford, T.F. and Tarr, D. 1999, 'Foreign direct investment in services and the domestic market for expertise', paper presented at Second Annual Conference on Global Economic Analysis, Denmark, 20-22 June.
- McDougall, R. 1993, 'Incorporating international capital mobility into SALTER', SALTER Working Paper No. 21, Industry Commission, Canberra,
- McKibbin, W. and Wilcoxon, P. 1996, 'The role of services in modelling the global economy', *Asia-Pacific Economic Review*, 2, pp. 2–13.
- Nguyen-Hong, D. 2000, *Restrictions on Trade in Professional Services*, Productivity Commission Staff Research Paper, Ausinfo, Canberra.
- OECD (Organisation for Economic Co-operation and Development) 1999, 'Internationalisation of Services: Results of the Survey of the Activity of Foreign Affiliates in the Services Sector: an Initial Assessment', DSTI/EAS/IND/SWP(99)14, OECD, Paris, 18-19 November.
- PC (Productivity Commission) 2002, *Review of Automotive Assistance*, PC Inquiry Report No. 25, Ausinfo, Canberra, December.

-
- PC 2003, *Review of TCF Assistance*, PC Inquiry Report No. 26, Ausinfo, Canberra, July.
- Phamduc, T. 2002, 'The Construction of a Bilateral Capital Stocks Matrix for the GTAP Industries', mimeo, July.
- Petri, P.A. 1997, 'Foreign Direct Investment in a Computable General Equilibrium Framework', paper prepared for the conference, Making APEC work: Economic Challenges and Policy Alternatives, 13-14 March, Keio University, Tokyo.
- Robinson, S., Wang, Z. and Martin, W. 1999, 'Capturing the Implications of Services Trade Liberalisation', invited paper at Second Annual Conference on Global Economic Analysis, Ebberuk, Denmark, 20-22 June.
- Steiner, F. 2000, *Regulation, Industry Structure and Performance in the Electricity Supply Industry*, Working Paper No. 238, ECO/WKP(2000)11, Economics Department, OECD, Paris, 12 April.
- USITC (United States International Trade Commission) 2001, *Examination of US Inbound and Outbound Direct Investment*, Staff Research Study, Office of Industries, Publication No. 3383, USITC, Washington DC.
- Verikios, G. and Zhang, X-G. 2001, *Global Gains from Liberalising Trade in Telecommunications and Financial Services*, Productivity Commission Staff Research Paper, Ausinfo, Canberra.
- Warren, T. 2000, 'The impact on output of impediments to trade and investment in telecommunications services', in Findlay, C. and Warren, T. (eds) 2000, *Impediments to Trade in Services: Measurement and Policy Implications*, Routledge, London and New York, pp. 85-100.
- Winters, L.A. 2002, 'The Economic Implications of Liberalising Mode 4 Trade', paper prepared for Joint WTO-World Bank Symposium on The Movement of Natural Persons (Mode 4) Under the GATS, WTO, Geneva, 11-12 April.
- World Bank 2000, *Tunisia: Social and Structural Review 2000: Integrating into the World Economic and Sustaining Economic and Social Progress*, World Bank, Washington DC.
- Zarrouk, J. 2000, 'Regulatory Regimes and Trade Costs', in Hoekman, B. and Zarrouk, J. (eds), *Catching Up with the Competition: Trade Opportunities and Challenges for Arab Countries*, University of Michigan Press: Ann Arbor.
- Zemnitsky, A. 2001, 'Non-tariff Barriers in Russian Services Sectors', mimeo.