**Latin America/Caribbean and Asia/Pacific
Economics and Business Association**

An initiative of the Inter-American Development Bank and the Asian Development Bank Institute

Third LAEBA Annual Meeting
Seoul, South Korea – November 16, 2006

Trade Facilitation: What, Why, How, Where and
When?

*Philippa Dee – Crawford School of Economics and
Government*

Sponsored by

IDB

Inter-American Development Bank
Integration and Trade Sector
Institute for the Integration of Latin
American and the Caribbean (INTAL)

Trade Facilitation: What, Why, How, Where and When?

Philippa Dee
Crawford School of Economics and Government
Crawford Building (13)
Australian National University
Canberra ACT 0200
Australia
philippa.dee@anu.edu.au

Christopher Findlay
School of Economics
University of Adelaide
Adelaide SA 5005
christopher.findlay@adelaide.edu.au

October 2006

Abstract:

This paper surveys recent developments in the literature on trade facilitation, defined broadly as reform of non-tariff barriers. The paper looks at what trade facilitation is, why it matters, how to measure it, the gains from reform, and ways to implement it at the global, regional and unilateral level.

JEL Classification: F13, F15.

Keywords : Trade facilitation, non-tariff barriers, regulatory barriers.

The views expressed in this paper are the views of the authors and do not necessarily reflect the views of policies of the Asian Development Bank (ADB), or its Board of Directors, or the governments they represent. ADBI does not guarantee the accuracy of the data included in this paper and accepts no responsibility for any consequences of their use. Terminology used may not necessarily be consistent with ADB official terms.

1 What

Trade facilitation is, according to the definition used in the WTO

... the simplification and harmonization of international trade procedures, including the activities, practices and formalities involved in collecting, presenting, communicating and processing data and other information required for the movement of goods in international trade.

This definition of the scope of trade facilitation focuses on administrative processes at the border. While its focus on administrative process is welcome, since business commentators or survey respondents often stress the significance of those matters for their business relative to other barriers to international commerce such as tariffs, it is a relatively narrow definition. A wider definition is suggested by the economic significance of these processes: they affect the time and cost of delivery of goods in the international trading system. The narrow definition of trade facilitation is relevant in those respects, but other factors outside its scope are also relevant to the performance of the trading system. These factors, too, could be added to the set of measures relevant to trade facilitation. They include, for example, the quality and efficiency of port infrastructure and associated services, including transport.

The supply chain links production processes with final consumers. The transition of products around international borders is certainly part of this supply chain. However, the processes associated with that transition are not the only ones that affect the full cost (that is, money cost plus time cost) of delivery in the supply chain. The full cost of delivery along the whole chain is the more important concern of business. Various aspects of domestic infrastructure and regulatory practices in both exporting and

importing countries also affect the performance of the supply chain. Indeed, when questioned about impediments to ‘international business’, exporters will often respond with a litany of concerns about domestic policy, transport policy or local infrastructure quality rather than matters of tariffs or licences in their export markets!

From this perspective, many of the determinants of the performance of the supply chain, and therefore the extent to which trade is ‘facilitated’, are related to measures that traditionally were thought of as non-tariff barriers. For example, The UNCTAD Coding System of Trade Control Measures defines over 100 measures under the classifications of:

- para-tariff measures — customs surcharges, additional taxes and charges, decreed customs valuation;
- price control measures — administrative pricing, voluntary export restraints, variable charges;
- finance measures — advance payment requirements, regulation concerning terms of payment for imports, transfer delays and queuing;
- quantity control measures — non-automatic licensing, quotas, prohibitions, export restraint arrangements, enterprise-specific restrictions;
- monopolistic measures — a single channel for imports, compulsory national services; and
- technical measures — technical regulations, pre-shipment inspection, special customs formalities.

Some of these measures have effects similar to those of a tariff, creating rents for local interests or fee and tax transfers to government. Others are outright quantity controls, akin to quotas, which are also rent-creating measures. However, many of these measures are ‘cost-escalating’, in that they have the effect of slowing down the movement of goods or adding to the costs of that movement (for example, as a consequence of cargo inspections).¹ Compliance costs also increase the cost of delivery (for example, compliance with technical measures). Further, various administrative procedures may be associated with the application of quantity controls or other charges, and those administrative procedures can add to the full cost of delivery of goods (for example, the time and money costs of applying for an import licence).

As noted, a key determinant of supply chain performance will be the quality and price of infrastructure and other related services, including transport. The empirical evidence which we review below suggests infrastructure quality has significant effects on trade volumes, especially compared to the effects of tariffs on the same goods being traded, although the sensitivity of various types of goods to infrastructure quality varies. The quality and price of infrastructure services is linked to policy choices in those sectors, including the extent and terms on which new entrants can join the market. The relevant group of potential new entrants include both domestic and foreign suppliers, and the policy environment in which they operate is linked to the services reform program, including its international dimensions. The services liberalisation program is therefore also connected to the trade facilitation agenda.

¹ Costs include those of the lack of reliability, or variations in delivery times, associated with these measures.

The definition of trade facilitation is usually worded with reference to trade in goods. Similar measures apply to trade and investment in services, with similar effects, so the discussion here also refers to those sectors.

Finally, the matters of trade facilitation are the topics of international trade negotiations, both in the WTO and in preferential agreements. We show below how a proper understanding of the economic effects of trade facilitation measures has implications for the design and implementation of these negotiations.

In summary, our interest in this paper therefore extends beyond the matters of administrative processes at the border. We extend the label of trade facilitation to include a range of measures that affect supply chain performance in terms of cost and time of delivery of goods and services. Many such measures traditionally were classified as non-tariff barriers, and we aim to look at those measures in a new light. Some of those, such as outright controls of quantities of imports, might appear to be not associated with our notion of matters for consideration under ‘trade facilitation’, but the manner of their administration is directly relevant. We argue the case below for taking this broader view of the whole group of non-tariff measures, but we also note the value of being careful to try to separate the rent-creating and cost-escalating effects of these measures. The latter are the traditional target of trade facilitation, and as we explain in the next section, this distinction is also critical for assessment of the welfare effects of policy in this area.

2 Why

Why the interest in trade facilitation? The answer is that the reform of measures to support trade facilitation most likely will be significant for economic welfare. Later, we

review some studies that suggest this result but in this section we discuss some of the analytical issues.

As noted in the previous section, some regulatory trade restrictions, particularly quantitative restrictions, create artificial scarcity, and will inflate prices because incumbent firms are able to earn economic rents — akin to a tax, but with the revenue flowing to the incumbent rather than to government. Other trade restrictions increase the real resource cost (including costs associated with delay) of doing business, and will inflate prices because costs are increased.

The two types of restrictions can have vastly different welfare and distributional effects, even if they create the same vertical shift in supply curves. Liberalisation of rent-creating barriers will yield ‘triangle gains’ in producer and consumer surplus associated with improvements in allocative efficiency (the shaded area in figure 1a), but would also have redistributive effects associated with the elimination of rents to incumbents. Alternatively, liberalisation of cost-escalating barriers would be equivalent to a productivity improvement (saving in real resources), and yield ‘roughly rectangle’ gains associated with a downward shift in supply curves (the shaded area in figure 1b). This could increase returns for the incumbent service providers, as well as lowering costs for users elsewhere in the economy.

The distinction is critical, for two reasons. First, in a unilateral or multilateral setting, rectangle gains are likely to exceed triangle gains by a significant margin. Secondly, in the context of preferential trade agreements, the danger of net welfare losses from net trade diversion arises only if the relevant barriers are rent-creating (see also Baldwin 1994).

Theory can provide some guidance. Rents are likely to be created by quantitative and other barriers that limit entry (or exit, though this is far less common). Some red-tape measures may add to resource costs. There are also many ways in which rents can be dissipated or capitalised. So non-tariff barriers that may once have been rent-creating for the initial incumbent become cost-escalating for subsequent incumbents.²

In the following section we review the methods that have been used to measure the economic effects of measures that are relevant to the trade facilitation policy agenda.

3 How to measure economic effects

Measuring the economic effects of non-tariff barriers requires a counterfactual — a representation of how economic performance would differ if the non-tariff barriers were not in place. Measurement techniques have followed one of two strategies for obtaining a measure of the counterfactual, depending on whether the traded good or service can be seen as homogeneous across different markets (figure 2).

If the good or service is homogeneous, the counterfactual can be obtained by observing the characteristics (typically the price) of that good or service in some other market where non-tariff barriers do not apply. Often this involves price comparisons between domestic and foreign markets. Sometimes it involves price comparisons of similar goods within a domestic market. Deardorff and Stern (1997) give the most detailed description of this approach. Recent applications are by Ando (2005), Bradford (2005), Dean, Feinberg and Ferrantino (2005) and Yoo (2005). Homogeneity ensures that the relevant counterfactual is directly observable.

² For example, Kalirajan (2000) provides indirect evidence that some of the zoning and other restrictions in the wholesale and retail sector have created rents that are subsequently capitalised into the price of commercial land. See Tullock (1975) for a general discussion of this issue.

If no similar good or service can be found, then the counterfactual cannot be observed — it needs to be constructed. Econometric methods are used to estimate the effects of some measure of non-tariff barriers (*NTB*) on some measure of economic performance (Y) in a market, controlling for all the other factors (Z) that affect economic performance in that market. The estimated model is then used to construct the value Y' that would obtain in that market if there were no non-tariff barriers (normally, if *NTB* took a zero value). This is often called the *antimonde*.

One particular application of this second approach is the well-known gravity model. In that model, the measure of economic performance Y is bilateral trade volumes, and the control variables Z include the sizes of the trading partner economies and the distance between them. Recent applications of the gravity model framework to quantifying the effects of trade facilitation include Estevadeordal and Suominen (2005), Wilson, Mann and Otsuki (2005), Otsuki, Wilson and Sewadeh (2001), Guasch and Spiller (1999), Moenius (1999), and Swann et al. (1996). We review some of these studies in more detail in a later section.

Another application of the *antimonde* approach is measurement of regulatory barriers to services trade. Since services are highly differentiated to the needs to individual consumers, non-homogeneity is acute. Further, the regulatory barriers operate behind the border. So the measures of economic performance are typically behind-the-border measures of price (P), cost (C), profit (Π), or productivity, while the controls are other industry characteristics. Dee (2005a) gives a brief survey of the recent literature.³

³ See also Bagai and Wilson (2006).

The antimonde approach

While the antimonde approach does not require an observable measure of the counterfactual, it does require a quantifiable measure of the non-tariff barrier (*NTB*). Unlike tariffs, these do not come with a ready number attached. There have been a number of approaches to this problem.

An early approach was to avoid quantifying *NTB* directly, but to attribute the residuals from a regression of outcomes *Y* on controls *Z* to the presence or absence of non-tariff barriers. This was the approach taken in the gravity model estimation by Francois and Hoekman (1999), for example, in their early work on quantifying services trade barriers. A number of writers (eg Whalley 2004) have criticised this indirect approach as risking misattribution of the effects of other omitted variables to non-trade barriers, and of leading to paradoxical results, such as negative impacts of non-tariff barriers.

A second approach has been to use frequency counts of non-tariff measures as quantifiable regressors. For example, Swann, Temple and Shurmer (1996) use simple counts of the stocks of idiosyncratic or international standards in Britain and Germany in their study of the effects of standards on trade volumes. Frequency measures have featured in previous surveys of non-tariff quantification (Deardorff and Stern 1997, Bora, Kuwahara and Laird 2002) as measures of economic effects in their own right, and have been rightly criticised as measuring prevalence, rather than economic significance. But they can play a vital role as explicit measures of policy in an antimonde estimation, where the estimation process is the extra step that establishes economic significance.

Recently a more sophisticated frequency count approach has been used to quantifying the presence of NTBs. This involves compiling an index measure, taking account of the severity of non-tariff barriers as well as their prevalence. Index measures can be compiled to capture a single dimension of policy. For example, in measuring the policy determinants of port efficiency, Clark Dollar and Micco (2004) included an index measure, ranging from 1 to 7, that measures the absence of organised crime. Data on this were taken from the Global Competitiveness Report, based on surveys of representative firms about whether organised crime did not impose significant costs on business and was not a burden.

Alternatively, to conserve degrees of freedom, an index can be compiled that weights together more than one dimension of policy. This requires judgements, not just about the relative severity of each policy, but also about the relative severity of the different policies against each other. For example, Kalirajan et al. (2000) use an index measure of policy barriers to trade in banking services that weights together licensing restrictions, foreign equity limits, restrictions on lending, restrictions on raising funds, prohibitions on other lines of business (eg insurance, securities), limits on the number of banking outlets, and restrictions on the temporary movement of people.

In some cases, the different dimensions of policy are weighted together using judgemental weights assigned by the researcher. In other cases, factor analysis is used to determine linear combinations of individual policies that best ‘span’ (in the technical, mathematical sense) the total policy space. Neither approach is entirely satisfactory. The quality of judgmental weights depends on the extent to which the researcher has specialist knowledge of the industry under study. Factor analysis confuses in-sample

variation with economic significance. Better than either approach is to enter indexes of each policy dimension separately into the antimonde estimation. Using principal components here, rather than factor analysis in a prior step, could help to conserve degrees of freedom, while showing which combinations of policy measures best ‘spanned’ the economic outcome space — a truer measure of economic significance.

The quality of the measures derived using antimonde estimation also depends on the quality and comprehensiveness of the control variables Z . There has been a recent revival of interest in the theoretical foundations of the gravity model, which determine the control variables in that context (eg Deardorff 1998, Baier and Bergstrand 2001, Feenstra, Markusen and Rose 2001, Evenett and Keller 2002). Anderson and van Wincoop (2003) have showed that many empirical implementations have strayed from the theoretically derived reduced form, by omitting measures of relative trade resistance. Harrigan (2004) shows how the effects of relative trade resistance (or relative distance, in his interpretation) can be controlled for using country fixed effects.

In the services trade literature, the empirical models of sectoral performance have typically been drawn from the industrial organisation literature on structure, conduct and performance, and the relevant control variables Z have varied widely from one sector to the next. For example, in banking they have included interest rate volatility and measures of the extent of prudential regulation (Kalirajan et al. 2000, Barth, Caprio and Levine 2004), in telecommunications they have included household density and the length of waiting lists for a fixed line connection (Warren 2000), while in electricity generation they have included the proportion of electricity generated from hydro or nuclear sources (Steiner 2000). Recent empirical support for the structure-conduct-performance approach

has been provided by Slade (2004). Some authors have used a plethora of fixed effects in lieu of structural controls (eg Moenius 1999).

As will be seen, when estimates of non-tariff barriers are used in modelling exercises of trade liberalisation, the question discussed earlier of whether they are rent-creating or cost-escalating is often argued by assertion. But the antimonde estimation can provide some guidance. Estimation that uses price-cost margins as a performance measure can identify whether barriers are rent-creating. Estimation that uses cost or productivity as a performance measure can identify whether barriers are cost-escalating. Ideally, more than one performance measure should be used.⁴

The aim of antimonde estimation is to measure the extent to which non-tariff barriers cause a vertical shift in the supply or demand curve.⁵ So ideally, the econometric models of sectoral performance should be both developed and estimated at the structural level — that is, supply and demand side influences should be separately identified and estimated. In practice, some models are developed structurally but then estimated in reduced form, as in the model of financial intermediation used by Kalirajan et al. (2000). Other models are both developed and estimated in reduced form, as with the model of electricity prices used by Steiner (2000). Hence it is not always clear that the estimated price or cost wedge corresponds to a vertical shift in the supply or demand curve. On this score, the direct effects of non-tariff barriers may be underestimated.

⁴ See Dee (2005a) for a summary of the performance measures used in the context of estimating barriers to services trade.

⁵ Quantity effects can be turned into price effects using an estimate of the elasticity of demand (eg Warren 2000).

Price comparisons

Price comparisons rely on the assumption of homogeneity for a directly observable measure of the counterfactual, and do not require a quantifiable measure of the non-tariff barrier (*NTB*). But for that reason, they do not provide information about which particular non-tariff barriers are responsible for the price gap. As noted, Deardorff and Stern (1997) give a thorough overview of this approach, so the focus here is on recent developments.

When the prices being compared are at different stages in the distribution chain, corrections have to be made to account for transport and other distribution costs (perhaps including tariffs) between the two stages. Bradford (2005) makes this correction using direct data on distribution margins, transport costs and indirect taxes from input-output sources, as well as direct tariff data. But Dean, Feinberg and Ferrantino (2005) use econometric techniques to control for the influence of transport costs and wholesale and retail margins, using proxy measures of these variables.

Ando (2005) also mixes price comparisons with antimonopoly estimation techniques. She uses price comparisons (net of tariff levels) to estimate overall tariff equivalents of non-tariff barriers, and then econometrically estimates a relationship between these tariff equivalents and by-type frequency ratios (with other control variables), to decompose the tariff equivalents into price effects by type of measure. Thus several recent applications of price comparisons have used the same econometric techniques as in the antimonopoly literature, both to control for other factors, and to attribute economic effects to particular policies.

4 With what result — the gains from reform⁶

The recent empirical literature has confirmed that non-tariff barriers are significant. A wide variety of measures have been examined and we begin with studies that focus on policies related to infrastructure services.

Infrastructure and trade

Table 1 summarises a number of papers that examine links between infrastructure and transport or logistics services and trade. Generally, these papers find that infrastructure quality can have a significant effect on trade, and relatively significant effects compared to reductions in other impediments.

The studies in Table 1 generally try to explain variations in trade volumes. For example, Wilson, Mann and Otsuki (2005) examine the effects of four different dimensions of trade facilitation — port efficiency (both water and air), the customs environment (prevalence of hidden import barriers and bribes), the regulatory environment (transparency and control of corruption), and what they call services sector infrastructure (internet access and use). Using simulations based on their gravity model, they find the total gain in trade flow in manufacturing goods from trade facilitation improvements in all four areas is estimated to be \$US 377 billion: all regions gain in imports and exports. Further, the most important ingredient in achieving these gains, particular in the OECD market, is a country's own trade facilitation efforts.

Clark, Dollar and Micco (2004) is the exception in the table, since they try to explain variations in trade costs. They find that improving port efficiency from the 25th to the 75th percentile can reduce shipping costs by 12 per cent. They find port inefficiency is

⁶ Parts of this section draw on Dee and Ferrantino (2005).

linked to excessive regulation, the prevalence of organised crime and the general condition of the country's infrastructure, so improvements in these areas would help to generate the reductions in shipping costs.

Rules of origin, standards and barriers to trade in services

Estevadeordal and Suominen (2005) draw the following conclusions from their gravity model analysis of the impact of rules of origin: restrictive product-specific rules of origin undermine aggregate trade; regimes that allow flexibility in the application of product-specific rules boost trade; high levels of sectoral selectivity in rules of origin undermine trade; and the restrictiveness of rules of origin in final goods encourages trade in intermediate products.

Chu and Prusa (2005) document the rapid rise in anti-dumping cases filed against Chinese exporters, the high probability that anti-dumping duties are imposed, and the high rates that are imposed. They note that as FDI has flowed into China from the four East Asian Tigers, Chinese-sourced exports have replaced exports from the parent company home markets. They speculate that anti-dumping filing against China may be replacing filings against those countries. They use econometric analysis to confirm a positive association between anti-dumping cases filed on Chinese exports and inward FDI flows to China, although they are unable to fully explore the 'anti-dumping triangle' hypothesis. They also cite evidence of low concentration ratios on Chinese industries that have contributed to the competitive price and low profit margins. Their review of anti-dumping filings against China confirms that anti-dumping practice can be a very convenient and effective tool to deter trade.

Moenius (1999) finds that bilaterally shared standards are favourable to trade — a one per cent increase in bilaterally shared standards between the United States and its trading partners could increase US trade volumes by about \$US 6 billion. But Moenius does not find country-specific standards to be a barrier. While country-specific standards of importers reduce imports for non-manufactured goods, they promote trade in the manufacturing sector. Information costs explain this latter finding. If goods have to be adapted to a foreign market, then country-specific standards of the importing country offer valuable information for adapting the product to that market.

Kalirajan et al. (2000) find that the barriers to trade in banking services that prevailed in 1997 may have raised the price of banking services by around 5 per cent in countries such as Argentina, Canada, the European Union and Switzerland, by 15 per cent in Japan, by over 30 per cent in Chile, Korea, Singapore and Thailand, and by up to 60 per cent in Malaysia. Extending the methodology of Kalirajan (2000) and others, Copenhagen Economics (2005) find that the EU's proposed Directive on Services in the Internal Market could more than halve the burden of non-tariff regulatory measures in accountancy, IT services and wholesale and retail trade. For example, the total price burden on foreign accountancy services would be reduced from 22.8 per cent to 8.1 per cent, partly because costs would be reduced, and partly because markups would be squeezed.

Policy priorities

While these results confirm that non-tariff barriers can have significant direct effects, they do not always give clear guidance on policy priorities. With tariffs, the height of the tariff barrier already conveys a great deal about the likely welfare effects of

tariff removal, subject to a number of qualifications about tariff dispersion, intersectoral linkages, trade shares of GDP, and so on. But with non-tariff barriers, measures that imply similar vertical movements in supply curves can have vastly different welfare effects, as figures 1a and 1b demonstrate. So a proper evaluation of the economic effects of non-tariff reform requires that measures of their direct effects be used in a modelling framework that can take into account whether they are rent-creating or cost-escalating.

Some of the literature on trade facilitation seems to *define* trade facilitation measures as those that eliminate cost-escalating barriers (Elek 2006). In this view, the trade facilitation agenda can deliver ‘gains all round’, with few of the problems of trade diversion or other awkward redistributive effects that can sometime beset tariff liberalisation. But Walkenhorst and Yasui (2005) argue that even with the measures generally agreed to be at the core of this more narrow trade facilitation agenda, the assessment is not straightforward. They argue that indirect trade transactions costs, such as longer border waiting times, are best thought of as being cost-escalating. But the direct trade transaction costs, such as form filling, while being a cost to the exporter or importer, are a source of income for the form processors. These costs are best modelled as being tax-like, recognition that they have a large transfer component rather than a wastage component. They argue that previous modelling assessments of the effects of trade facilitation may be overstated, by treating all measures as cost-escalating. And according to their analysis, the biggest policy impact would come from reducing *indirect* trade transaction costs.

Bradford (2005) instead assumes that all non-tariff barriers are tax-like, rather than creating waste or adding to the real resource cost of doing business. Not

surprisingly, he finds that reform of non-tariff barriers has similar effects to tariff reform. Across the eight countries in his modelling analysis,⁷ the correlation between the height of non-tariff barriers and the welfare gains from their unilateral removal (expressed as a percentage of GDP) is 0.83. The correlation between the height of total (tariff plus non-tariff) barriers and the welfare gains from their removal is very similar, at 0.81. Further, he finds that non-tariff barriers are about as high as tariff barriers in Canada, but up to eight times higher in Japan. The gains from reform of non-tariff barriers tend to exceed the gains from tariff reform accordingly.

By contrast, Hertel, Walmsley and Itakura (2001) consider three elements of the ‘new age’ agreement between Japan and Singapore — customs automation, security and harmonisation measures in e-commerce, and liberalisation of trade in business and construction services — and assume that all would remove barriers that create waste and add to real resource costs, rather than being tax-like. They find the new age measures to be virtually the sole source of gains from agreement, because they do not produce trade diversion in the way that the preferential tariff cuts do. This follows directly from their treatment of the non-tariff barriers as being cost-escalating.

This modelling evidence suggests that possibly the single biggest determinant of the projected gains from removing non-tariff barriers is whether they are modelled as being rent-creating or cost-escalating. This ‘treatment’ effect can dominate the estimated ‘height’ of the trade barrier, and play a crucial role in determining the apparent policy priorities.

⁷ The countries are Australia, Canada, Germany, Italy, Japan, the Netherlands, The United Kingdom and the United States.

There is very little modelling literature to date that has evaluated the effects of removing non-tariff barriers, while taking seriously the available empirical or theoretical evidence about whether they are rent-creating or cost-escalating. One of the few examples is Walkenhorst and Yasui (2005), above. Another is Andriamananjara, Ferrantino and Tsigas (2005). They model non-tariff barriers in three different ways — as import tax wedges in footwear, as export tax wedges in apparel, and as what they call ‘sand in the wheels’ (or waste) in food processing. This treatment is based on careful consideration of the types of non-tariff measures applying in each sector. Although the height of the barriers in processed food is lower than in footwear, the global welfare gains from liberalisation are greater, in part because of the difference in treatment. The gains from liberalising non-tariff barriers in apparel swamp both, however, because of the much greater prevalence of barriers in this sector around the world.

Another modelling example that takes into account whether non-tariff barriers are rent-creating or cost-escalating is the study of the EU’s proposed services directive by Copenhagen Economics (2005). Their modelling results suggest that total consumption in the European Union could increase by approximately 0.6 per cent, or 37 billion euros, both because markups would be squeezed and real costs reduced.

Finally, Dee (2005b) uses the available evidence on the nature of barriers to services trade to look at the effects of various East Asian economic integration initiatives. She finds that the biggest gains would be achieved from reforming on a unilateral basis those behind-the-border restrictions on competition that affect both foreigners and domestic new entrants equally. Such initiatives would provide economic gains of more

than five times those that might be available through an East Asian preferential trade agreement.

5 Where and when to implement

We conclude with some brief remarks on the design of reform agendas to capture the gains from trade facilitation. Our theme is that policy measures may have both cost-escalating and rent-creating effects, and that matters of trade facilitation have tended to be associated with the former effects. The complication arises that a single policy measure may have both effects, and therefore the classification of measures to the trade facilitation or the liberalisation agenda is not straightforward. However, if aimed at cost-creating effects, a program of reform designed to deal with trade facilitation issues is likely to have significant welfare effects. The arguments of Walkenhorst and Yasui (2005) and Dee (2005a) suggest that such a reform program should target indirect or behind-the-border transaction costs, including measures to improve the efficiency of ports and the extent of competition in wholesale and retail distribution chains.

One implication of this perspective is that the political economy of managing reform designed to achieve trade facilitation objectives is less likely to involve significant transfer effects, since its impacts are on costs and resource savings. Dee and Sidorenko (2006) argue that in this environment there is less case for reciprocity, for the purpose of mobilising countervailing political interests to offset the resistance to reform. This insight is born out by Wilson, Mann and Otsuki (2005), who find that the biggest gains come from a country's own trade facilitation efforts. However, as noted, some measures have both rent and cost effects and this situation may not always apply.

A second implication concerns the role of international negotiation and commitments to deal with trade facilitation matters. The political economy issues to be resolved in dealing with the origins of trade facilitation problems (by improving infrastructure quality for example) may not so much to with domestic versus foreign interests, but rather incumbent versus new entrant interests. This political debate may be best managed domestically, away from the international arena.

A third point relates to the use of preferential trade agreements to deal with trade facilitation matters, which is a popular argument for signing such agreements. Dee (2005b) argues that for reasons of political economy, 'new age' trade agreements tend to be limited to measures that can be liberalised on a preferential basis, and tend to target only those provisions that explicitly discriminate against foreigners. But the available empirical evidence is that these types of provisions tend to be rent-creating rather than cost-escalating. So the gains from even the 'new age' trade agreements are trivial, compared with the gains from comprehensive reform of non-discriminatory impediments to competition, as part of a thorough-going program of unilateral domestic regulatory reform. It is the latter which is more likely to deal with the issues of trade facilitation.

Further, a focus on the terms of foreign entry into these protected sectors may lead to a redistribution of existing rents, including transfers offshore to the detriment of domestic welfare, rather than their reduction and increases in efficiency. For example, suppose in infrastructure services a licensing scheme is used to manage access to the market. An allocation of an additional license to a foreign entrant, rather than opening the sector more widely to competition, would have this effect.

Finally, much of the debate about trade facilitation concerns actions of governments and the ways in which they add to costs in the trading system, but sometimes what matters more is what governments are not doing, rather than what governments are doing. This concern is especially relevant to matters related to infrastructure services, as the example in the previous paragraph suggests. Competition might be introduced in that example by separation of the bottleneck facility from the rights to operate in that facility, via an access regime. The absence of effective competition policy regimes to constrain monopoly power and remove barriers to entry lead to higher-price services, lower volumes of transactions (of domestic and foreign origins), and reductions in welfare.

References

- Anderson, J. and van Wincoop, E. 2003, 'Gravity with gravitas: A solution to the border puzzle', *American Economic Review*, 93(1), pp. 170–92.
- Ando, M. 2005, 'Estimating tariff equivalents of core and non-core non-tariff measures in the APEC member economies', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 235–87.
- Andriamananjara, S., Ferrantino, M. and Tsigas, M. 2005, 'Alternative approaches in estimating the economic effects of non-tariff measures: results from newly quantified measures', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 525–40.
- Bagai, S. and Wilson, J. 2006, 'The Data Chase: What's Out There on Trade Costs and Nontariff Barriers?', World Bank Policy Research Working Paper 3899, Washington DC.
- Baier, S.L. and Bergstrand, J.H. 2001, 'The growth of world trade: Tariffs, transport costs and income similarity', *Journal of International Economics*, 53(1), pp. 1–27.
- Baldwin, R. 1994, *Towards an Integrated Europe*, Centre for Economic Policy Research, London.
- Barth, J., Caprio, G. and Levine, R. 2004, 'Bank Regulation and Supervision: What Works Best?', *Journal of Financial Intermediation*, 13, pp. 205–48.
- Berthelon, M. and Freund, C. 2004, 'On the Conservation of Distance in International Trade', World Bank Policy Research Working Paper 3293, Washington DC.

- Bora, B., Kuwahara, A. and Laird, S. 2002, 'Quantification of Non-Tariff Measures', UNCTAD Policy Issues in International Trade and Commodities Study Series No. 18, United Nations, New York and Geneva.
- Bradford, S. 2005, 'The extent and impact of final goods non-tariff barriers in rich countries', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 435–81.
- Chu, T. and Prusa, T. 2005, 'The reasons for and the impact of antidumping protection: The case of People's Republic of China', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 411–33.
- Clark, X., Dollar, D. and Micco, A. 2004, 'Port efficiency, maritime transport costs, and bilateral trade', *Journal of Development Economics*, 75 (2), pp. 417–50.
- Copenhagen Economics 2005, 'Economic Assessment of the Barriers to the Internal Market for Services', Copenhagen Economics, Copenhagen.
- Dean, J., Feinberg, R. and Ferrantino, M. 2005, 'Estimating the tariff-equivalent of NTMs', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 289–309.
- Deardorff, A.V. 1998, 'Determinants of bilateral trade flows: Does gravity work in a neoclassical world', in Frankel, J.A. (eds), *The Regionalization of the World Economy*, The University of Chicago Press, Chicago and London, pp. 23–28.

- Deardorff, A.V. and Stern, R.M. 1997, 'Measurement of Non-tariff Barriers', Economics Department Working Papers No. 179, OCDE/GD(97)129, OECD, Paris.
- Dee, P. 2005a, 'Measuring and modelling barriers to services trade: Australia's experience', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 71–105.
- Dee, P. 2005b, 'East Asian Economic Integration and its Impact on Future Growth', Pacific Economic Papers No, 350, Australia-Japan Research Centre and the Asia Pacific School of Economics and Government.
- Dee, P. and Ferrantino, M. 2005, 'Introduction', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 1–12.
- Dee, P. and A. Sidorenko, 2006, 'The rise of services trade: regional initiatives and challenges for the WTO', in H. Soesastro and C. Findlay (eds.), *Reshaping the Pacific Economic Order*, Routledge, London and New York.
- Djankov, S., Freund, C. and Pham C. 2006, 'Trading on Time', World Bank Policy Research Working Paper 3909, Washington DC.
- Elek, A. 2006, 'APEC in the emerging international economic order: lame duck or catalyst', in H. Soesastro and C. Findlay (eds.), *Reshaping the Pacific Economic Order*, Routledge, London and New York.
- Estevadeordal, A. and Suominen, K. 2005, 'Rules of origin in the world trading system and proposals for multilateral harmonisation', in P. Dee and M. Ferrantino (eds),

- Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 337–409.
- Evenett, S.J. and Keller, W. 2002, ‘On theories explaining the success of the gravity equation’, *Journal of Political Economy*, 110(2), pp. 281–316.
- Feenstra, R.C., Markusen, J.R. and Rose, A.K. 2001, ‘Using the gravity equation to differentiate among alternative theories of trade’, *Canadian Journal of Economics*, 34(2), pp 430–47.
- Francois, J. and Hoekman, B. 1999, ‘Market access in the services 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.
- Freund, C. and Weinhold, D. 2004, ‘The effect of the internet on international trade’, *Journal of International Economics*, 62, pp. 171–89.
- Guasch, J.L. and Spiller, P. 1999, *Managing the Regulatory Process: Design, Concepts, Issues, and the Latin American and Caribbean Story*, World Bank, Washington DC.
- Hanson, G. and Xiang, C. 2002, ‘The Home Market Effect and Bilateral Trade Patterns’, NBER Working Paper Series Working Paper 9076, Cambridge MA.
- Harrigan, J. 2004, ‘Specialization and the volume of trade: Do the data obey the laws?, in E.K. Choi and J. Harrigan (eds), *Handbook of International Trade, Volume 1*, Blackwell.

- Hausman, W., Lee, H.L. and Subramanian, U. 2005, 'Global Logistics Indicators, Supply Chain Metrics, and Bilateral Trade Patterns', World Bank Policy Research Working Paper 3773, Washington DC.
- Hertel, T., Walmsley, T. and Itakura, K. 2001, 'Dynamic effects of the "new age" free trade agreement between Japan and Singapore', *Journal of Economic Integration*, 16(4), pp. 446–84.
- Kalirajan, K. 2000, *Restrictions on Trade in Distribution Services*, Productivity Commission Staff Research Paper, Ausinfo, Canberra.
- Kalirajan, K., 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.
- Moenius, J. 1999, 'Information Versus Product Adaption: The Role of Standards in Trade', mimeo, University of California, San Diego.
- Nordas, H. and Piermartini, R. 2004, 'Infrastructure and Trade', WTO Economic Research and Statistics Division Staff Working Paper ERSD-2004-04, WTO, Geneva.
- Nordas, H., Pinali, E. and Grosso, M. 2006, 'Logistics and Time as a Trade Barrier', OECD Trade Policy Working Paper No. 35, Paris.
- Otsuki, T., Wilson, J.S. and Sewadeh, M. 2001, 'What price precaution? European harmonisation of aflatoxin regulations and African groundnut exports', *European Review of Agricultural Economics*, 28(2), pp. 263–83.

- Shepherd, B. and Wilson, J. 2006, 'Road Infrastructure in Europe and Central Asia: Does Network Quality Affect Trade?', preliminary draft.
- Slade, M. 2004, 'Competing models of firm profitability', *International Journal of Industrial Organisation*, 22(3), pp. 289–308.
- 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.
- Swann, P., Temple, P. and Shurmer, M. 1996, 'Standards and trade performance: The UK experience', *The Economic Journal*, 106(438), pp. 1297–1313.
- Tullock, G. 1975, 'The transitional gains trap', *Bell Journal of Economics*, 6(2), pp. 671–78.
- Walkenhorst, P. and Yasui, T. 2005, 'Benefits of trade facilitation: A quantitative assesment', in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 161–92.
- 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.
- Whalley, J. 2004, 'Assessing the benefits to developing countries of liberalisation in services trade', *World Economy*, 27(8), pp. 1223–53.
- Wilson, J.S., Mann, C.L. and Otsuki, T. 2005, 'Assessing the potential benefit of trade facilitation: a global perspective', in P. Dee and M. Ferrantino (eds), *Quantitative*

Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation,
APEC Secretariat and World Scientific, Singapore, pp. 121–60.

Yoo, J. 2005, ‘Estimation of nominal and effective rates of protection’, in P. Dee and M. Ferrantino (eds), *Quantitative Methods for Assessing the Effects of Non-tariff Measures and Trade Facilitation*, APEC Secretariat and World Scientific, Singapore, pp. 311–35.

Figure 1a **Rent-creating non-tariff barriers**

Figure 1b **Cost-escalating non-tariff barriers**

Figure 2 **Measurement methods**

Table 1 Summary of studies of infrastructure, transport and logistics services

Paper	Empirical Model	Dependent Variable	Data	Key Variables	Main Findings
Berthelon, Freund (2004)	Regression of Trade growth on distance	Trade growth	4-digit data from the COMTRADE database for periods 1985-1989, 1990-1994, 1995-2000	Distance	The effect of distance is decomposed into the composition effect (trade shift toward more distance sensitive industries) and distance sensitivity effect(industries have moved toward distance sensitive practices). The empirical evidence favors the increase of distance sensitivity across industries instead of a compositional shift of trade toward more distance sensitive industries
Clark, Dollar and Micco (2004)	IV Regression equation on maritime charges	Charges per unit of weight	US Import Waterborne Databank (US Department of Transportation) for years 1996, 1998 and 2000	Distance, level of containerization, trade imbalance, port efficiency	Doubling in distance generates an 18% increase in transport costs. level of containerization presents a significant negative effect on transport costs and improvement of port efficiency from the 25th percentile to 75th percentile reduces transport costs by 12%
Djankov, Freund and Pham (2006)	Difference Gravity Models	$\ln(\text{Exports}_{jk}/\text{Exports}_{hk})$	World Bank data on the days it takes to move standard cargo from the factory gate to the ship in 126 countries	Added export time in the gravity equation	10% saving in exporting time increases exports by 4% or each additional day delayed reduce trade by 1%
Freund and Weinhold (2003)	Panel gravity model and cross section gravity model	Export growth/exports	Constructed from various sources	Internet domain host counts	Evidence supporting the theory that internet growth reduce trade cost and hence increase trade
Hanson, Xiang (2002)	Difference in difference gravity model	Ratio of high mark-up good export over Ratio of low mark-up good export	World Trade Database for 1990 for bilateral trade flows for 3 or 4 digit SITC revision 2 product classes.	Ratio of two country's GDP to detect home market effect	The home market effect is strongest in the high transportation cost industries
Hausman, Lee and Subramanian (2005)	Augmented Gravity Models	Total bilateral exports	Compiled by World Bank in 2005 containing detailed country-level data on the time and cost of moving a typical 20-foot FCL container from the port of entry to a firm in the most populous city.	Added various measures of logistic friction, later constructed a logistics index to replace individual measures	Logistics performance significantly affects the level of trade

Nordas, Piermartini (2004)	Gravity Models	Imports	Tariff data are derived from TRAINS(Trade Analysis and Information System), Bilateral trade flows are extracted from COMTRADE (Commodity and Trade Database). Trade cost indicators are derived from various World Bank data source all in year 2000	Applied tariff rate and infrastructure quality measures	10% reduction in tariff increases trade by 12.5%, quality of infrastructure has significant and large impact on trade, especially for port efficiency, 10% improvement in port efficiency increases bilateral trade by 6%
Nordas, Pinali and Grosso (2006)	Gravity/Probit	Probability that a firm in country i will export to country j	A panel of 192 countries exporting intermediate inputs, clothing and electronics to Australia Japan and UK in 1996-2004	GDP, relative distance(GDP weighted), relative time	Support for scale effect (indicated by GDP), time is important factor on market entry, even taking away some influence from distance, which remains important
Shepherd and Wilson (2006)	Gravity model with importer and exporter fixed effects	ln(Export)	Constructed from various sources	A set of trade costs determinant variables	Trade flows may be more sensitive to upgrades of infrastructure than to reductions of tariff barriers.
Wilson, Mann and Otsuki (2004)	Gravity Model	Exports	Trade flow data from COMTRADE of UN Statistics Division for 2000-2001 in the manufactured goods	Tariff and trade facilitation measures(port efficiency, regulatory environment, service sector infrastructure)	1% reduction in ad valorem tariff will increase the trade flow by 1.1%, similar to the effect of distance. Improvement of port efficiency, customs improvement, improving regulatory environment and improving service sector infrastructure all improve trad