A Modeling Framework for Assessing the Trade Effects of Technical Trade Barriers

The quantification of the trade effects of the types of technical measures identified and classified above poses several problems for trade policy analysts. That trade is affected by such regulations is clear. But the magnitudes of these trade effects are in doubt, as are the consequent effects on the gains from trade; few studies have attempted to quantify these magnitudes. Without such information one cannot know how significant technical barriers are in international agricultural markets or how best to modify existing technical barriers to reduce unwanted trade effects. Considerably more information is needed to assess the trade effects of technical trade barriers than is needed to assess the effects of standard tariffs and non-technical NTB's. Unlike standard trade barriers, the effects of technical barriers on international flows of goods is mainly indirect, through the additional cost of compliance that producers or traders face. Moreover, to the extent that these regulations affect production functions and consumption decisions, the import demand and export supply curves themselves can shift if such measures are imposed or rescinded.

The task of assessing the effect of technical regulations on trade flows requires detailed knowledge of the regulations themselves, the process by which companies or individuals meet those regulations, and the implications of not conforming to the rules. To put this technical information to use requires a simple economic framework that should be easily understood yet comprehensive enough to satisfactorily answer a range of questions. The framework should yield a modeling structure into which to place empirical data for the calculation of the trade impacts and welfare effects. The framework proposed here is based on a synthesis of the different approaches taken in five papers published since 1996, each of which emphasizes one aspect of the relevant issues. Considering these approaches as separate aspects within the commonality of technical barriers allows them to be combined in any empirical case. This framework, which complements the classification of technical trade measures, integrates the five approaches in a flexible and general model that can be customized to specific measures. The classification criteria illustrated that technical trade barriers must be treated as bundles of characteristics related to goals, instruments, and scope; accordingly, the goals, instruments, and scope can be modeled separately and combined in studying specific cases.

The contributions of the five recent approaches to modeling technical trade barriers can be summarized as follows. Krissoff, Calvin, and Gray examine the tariff and technical trade barriers facing U.S. apples in three different markets, Japan, Korea, and Mexico, and calculate the tariff-equivalent of the technical (phytosanitary) measures that constrain exports. With these estimates, they calculate how much trade is impeded by the phytosanitary measures in addition to the standard trade barriers. Their model is a static partial equilibrium analysis of the three apple markets. Although the authors acknowledge that the technical measures may be justified, the model does not estimate any effect on production in the importing country of removing the trade restrictions.

Sumner and Lee develop a model pitched primarily at the problem of Asian import regulations facing U.S. vegetables. The paper's emphasis is on the different ways in which the regulations can impose costs at different points in the marketing chain. In a trade model this can affect foreign and domestic price levels and foreign exchange flows as well as quantities traded. Although Sumner and Lee mention the possibility of shifts in the supply and demand curves, they do not pursue the matter in their analytical model. Compliance costs are added like tariffs to the relevant excess supply curves in an otherwise conventional trade analysis.[21]

[21] Josling laid out a similar model, using compliance costs of environmental regulations differentiated by whether the producer was a domestic or a foreign supplier. The trade effects were shown to be sensitive to the incidence of the relative costs of compliance with regulations, and to be similar to the trade effects of tariffs representing the difference between foreign and domestic compliance costs. However, this model also allowed for no supply shifts, though there was provision for consumer gains from the information value of the regulation.

Shifts in the supply curve when trade introduces pests or diseases is at the heart of the justification for many SPS trade barriers. Orden and Romano develop a model that focuses directly on the effect of imported pests on domestic production costs. Referring to the U.S. ban on avocado imports from Mexico (since partially rescinded), they model a market for avocados in the United States where domestic supply shifts backwards/upwards when imports are allowed into the country, if the imports result in a pest infestation. As the ban has a consumer cost, the welfare effect of removing it is a combination of trade gains from cheaper avocados and resource losses as the cost of producing any given quantity of avocados at home increases. Compliance costs, such as border inspections, do not play an explicit role in the model.

The consumer reaction to a technical barrier, as opposed to effects on supply, is central to a model of information externalities developed by Thilmany and Barrett. They emphasize the role of regulation of imports in giving consumers confidence in buying a product, thus avoiding the problem of "lemons" or unreliable goods bought by the unsuspecting consumer from foreign producers who may not have to rely on reputation for repeat business. If a regulation requires the provision of information that does not inform consumer choice, there is a welfare loss, but informative regulations can correct market failures and add to social welfare. The authors use the dairy trade between the U.S. and Mexico as an example.

The fifth recent study of technical trade barriers, by Paarlberg and Lee, addresses foot-and-mouth disease (FMD) and trade in beef from countries where the disease is endemic. Using the language of tariff theory, the authors calculate the "optimum tariff" that, when placed differentially on imports from the infected country, would maximize the difference between the gains from trade and the costs to the domestic industry from the spread of the disease. The costs are related to the number of outbreaks, which in turn are related to the volume of imports. By using the concept of an optimum tariff, the authors emphasize that SPS issues involve a trade-off between standard commercial considerations and health and technical considerations, though most countries ban products from infected sources rather than taxing them at the border.

Our framework includes three different but combinable components drawn from the five studies described above. The first component is the element of *regulatory protection*, the fact that a regulation gives some rents to the domestic sector. A purely protective regulation is a special case: most barriers have at least a minimal technical justification. A variant of this model, compensatory protection, assumes that a regulation similar to that faced by domestic producers is imposed on imports solely to keep the "playing field" level: the import regulation has no effect on the domestic supply and demand curves. Such protection is likely to be contrary to multilateral trade rules, however.

The second component of the framework developed herein is a *supply-shift* element that focuses on the effects of imports on the domestic supply and the costs of enforcing compliance at the border (or in the supplying country), which will eliminate the threat of infestation. The supply-shift element introduces the rationale for the trade barrier, though of course it does not follow that the particular measure chosen is always appropriate for the circumstances. The task of the model is to make that calculation.

The third component of the framework for economic evaluation of technical trade barriers is a demand-shift element. If the effect of the regulation on imports, in addition to the cost involved, is to impart information, it may increase consumer demand for the product. The information can be related to quality (that the imported product meets a particular standard) or to geographical origin (which gives consumers additional knowledge about expected characteristics).[22] The same approach may be used when the technical measures cover areas such as packaging that are presumably intended to lower the cost of distribution. An important use of the model covers the case where unregulated imports would have a nega-

[22] The analysis in this report assumes that the imported product sells for the same price as the domestic product on the importer's market. Thus the increase in demand for imports with the provision of information is not captured by an increase in the relative price of imports. The goods are perceived as perfect substitutes by the consumer once the information imparted by the regulation has been absorbed.

Table 6--Scope of measure from importer and exporter perspective

	Regulation imposed on one exporter (specific)	Regulation imposed on all exporters (universal)
Regulation imposed by one importer (specific)	Either can avoid compliance costs by selling to or buying from other markets. "Potential" rather than actual trade impediment.	Importer bears cost of compliance as this cost becomes built in to selling price by all exporters.
Regulation imposed by all importers (universal)	Targeted exporter bears cost of compliance as importers can choose to buy from other sources.	Importers and exporters share the cost of compliance as the world market price adjusts to the cost. Price to buyers goes up and to sellers goes down.

tive impact on consumption, if not through actual harm to consumers then by causing consumers to reevaluate their consumption patterns. The information imparted by the regulation causes consumers to increase demand for the product.

The first of these components, regulatory protection, is similar to the traditional analysis of tariffs where the intervention is assumed to have no other purpose than to protect producers at the expense of consumers. By contrast, the supply-shift and demand-shift components allow for the regulation to have a beneficial impact, even if overdone at times, and again susceptible to political capture of the regulatory process.

Scope of Measures

In addition to modeling the effects of the technical barrier on the parameters of supply and demand in the market in question, a full analysis of the trade effects requires consideration of the scope of those regulations. This is particularly important in the calculation of the incidence of the burden of such regulations. For each of the model elements, we need to consider the situation from the viewpoint of both the exporter and the importer, taking into account the range over which the measures operate. In the classification, we distinguished between technical measures that apply to all exporters (exporter-universal) and those that only apply to particular exporters (exporter-specific). In making economic assessments, technical measures that are applied only by one importer (importer-specific) and those that are generally applied (importer-universal) need to be distinguished as well. These distinctions essentially govern the incidence of the cost of compliance with the import regulations.[23] Table 6 illustrates four possible combinations of scope for the regulations.

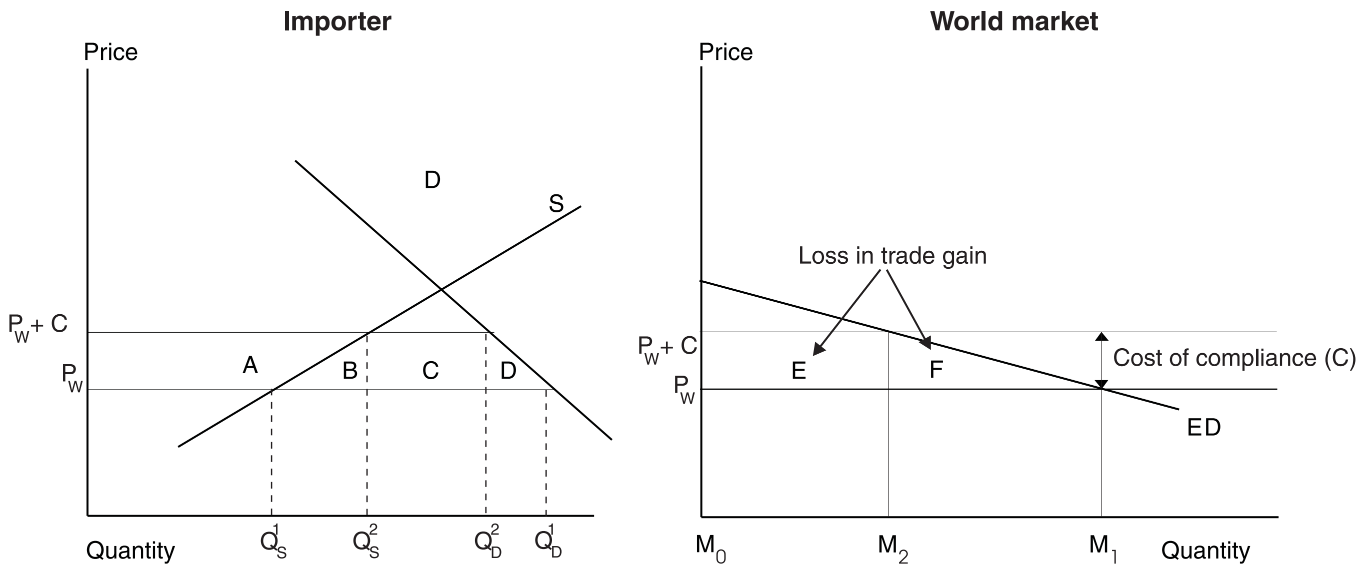
The Regulatory Protection Model

The simple small-country model of regulatory protection postulates a situation where the foreign supplier of the good is required to comply with some form of regulation as a condition of importation—essentially the model used by Krissoff, Calvin, and Gray. Compliance with this regulation is assumed to involve a cost, which acts like a tariff on the quantity of trade (but without tariff revenue). As a result, the importing country suffers a loss, essentially forgoing some of the potential gain from trade. Domestic producers gain and consumers pay both for the producer gain and for the cost of the useless regulation. Consumers also pay indirectly for the distortion in consumption and production decisions, the traditional "welfare triangles" of deadweight losses. The regulatory protection model can be used to gauge the effects of different policy regimes characterized in table 4. One can analyze, for example, the effects of

[23] Similar issues would be relevant in the case of export regulations, but are not pursued here. An exporter may produce to different standards depending upon the import market. In the models that follow, any regulation imposed by an exporter is merely a manifestation of the importer's regulation. The exporter authorities are acting in proxy for the importer authorities. The distinction between specific and universal application of a regulation is not the same as that of few or many suppliers or buyers in the market (conditions of competition). The competition issue is addressed below as a part of the discussion on the world price effects of technical barriers. The incidence of the burden of the technical measure is analytically separate from that of the world price (terms of trade) effect, although both are relevant to the trading countries.

Figure 2

Regulatory protection with no trade externalities: importer perspective



This figure illustrates the trade and welfare effects in the regulatory protection model, viewed from the perspective of the importing country. Assume the "small-country" case for the importer, with domestic producers and consumers facing the world price, P_W. At this price, the quantity demanded by consumers is QD_1 , the quantity supplied by domestic producers is QS_1, and the difference between these two amounts is the quantity imported (seen as QD_1 - QS_1 in the left-hand panel and M_1 in the right hand panel). When this importer alone adopts a universal border regulation intended solely to protect domestic producers, the price in the importing country increases. In this scenario, imports fall to M_2 (seen as QD_2 - QS_2 in the left hand panel), determined by the intersection of the excess demand curve ED and the new compliance cost-inclusive product price P_W + C. Consumer surplus also falls, by the area A + B + C + D, while producer surplus increases by A. The regulation therefore results in net welfare losses (or a reduction in the gains from trade relative to the free trade equilibrium at the intersection of ED and P_W) equal to the area E + F.

a (superfluous) process standard which has the *prima facie* objective of protecting domestic crops. In the regulatory protection model, there are no actual phytosanitary risks associated with imports of the product; the process standard simply exists to raise costs for foreign producers.

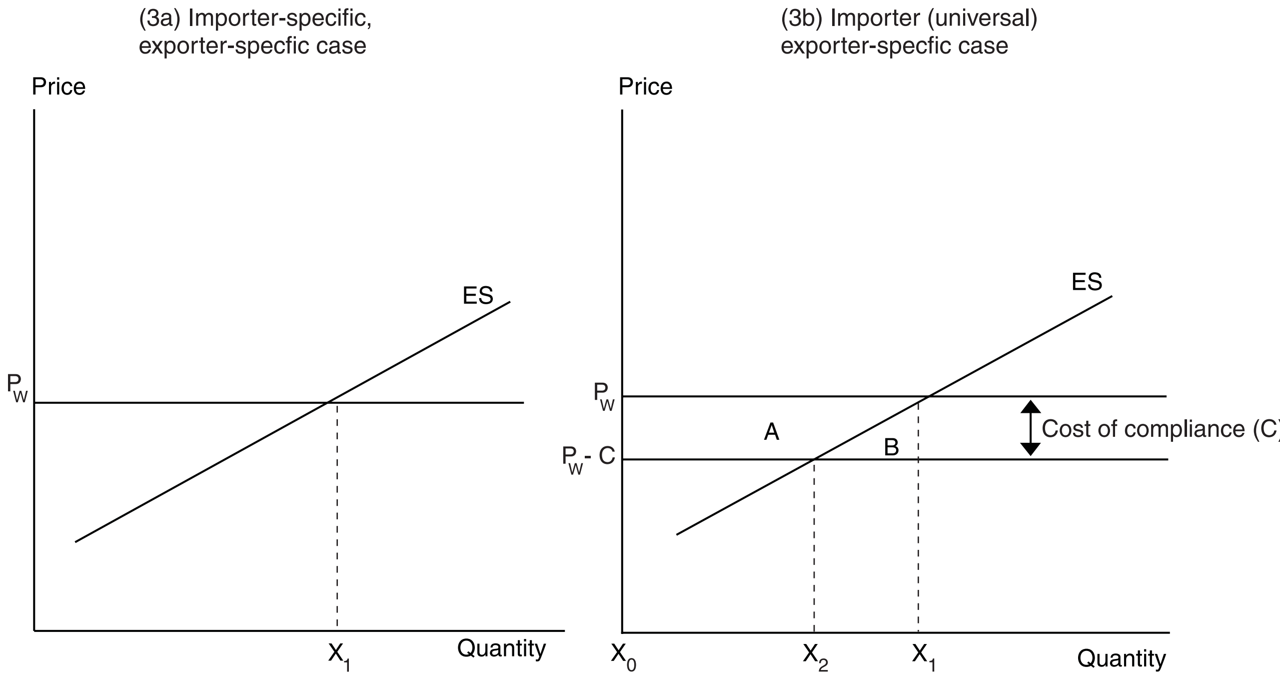
Importer Perspective

The trade and welfare effects in a regulatory protection model that are seen in figure 2 reflect the following assumptions: (1) the regulation applies to all countries exporting to the importing country (exporter-universal), (2) only this importer applies the regulation (importer-specific), and (3) the level of imports is small relative to the total world market (the small country case). A prohibitive regulation on imports, such as a total ban, would lead to trade volume at zero or M_0. Trade in the absence of the regulation would lead to import volume M_1, with the usual gains from trade. With the non-prohibitive regulation imposed on imports, the price of those imports rises and trade shrinks (M_2), reducing the gains from trade by areas E + F. Note that the welfare loss is not just the triangle familiar from tariff analysis but also the rectangular area that depends on the total level of imports and the height of the regulatory compliance cost. Thus we can say with reasonable certainty that the potential welfare losses from unwarranted regulatory protection exceed those from tariffs, which would result in a tariff-inclusive product price equal to P_w + C in the importing country, as tariffs at least generate tariff revenue.

The easiest way to characterize the trade effects of regulatory protection policies is to use the concept of a tariff equivalent (as chosen by Krissoff, Calvin, and Gray). This can be defined as the tariff that would restrict trade to the same extent as the regulatory protection. In the simple example given here, the tariff equivalent is equal to the cost of compliance. This

Figure 3

Regulatory protection with no trade externalities: exporter perspective



This figure illustrates the trade and welfare effects in the regulatory protection model, viewed from the perspective of the exporting country. In the importer-specific, exporter-specific case (3a), one importer adopts a regulation targeted at a single exporter in a small-country case. The exporter continues to export X_1 (the open economy equilibrium at the intersection of the exporter's excess supply curve ES and the world price P_W) by simply shipping the product to other destinations. In the case where all importers adopt a regulation (3b) that targets a single exporter, the compliance costs are borne by the exporter. In this scenario, the exporter faces the world price of P_W - C, exports decline to X_2, and the gains from trade decline by area A.

gives a fair indication of the price support provided to domestic producers. With knowledge of elasticities of supply and demand, the effects on the trade volume of the regulation can be computed. It should be remembered, however, that the welfare effect of a technical trade barrier can be much greater than a tariff equal to C.[24] It follows from the discussion of the incidence of the burden that if all importers impose the same regulation (importer-universal), then the increase in the compliance cost inclusive price, P_W + C, will be less, as the cost of compliance is shared with exporters through the world price change.

Exporter Perspective

Exporters in general should not notice the effect of the technical measure if the technical measure is imposed only by one importer, and if the world market price is not affected by the importer policy. In this case, the world market shrinks, but by an amount too small to be noticeable, as other importers will be willing to buy the displaced goods.[25] Bilateral trade flows are modified and individual firms can be disadvantaged, but the aggregate impact is small (fig. 3a). Although the exporter may protest, there is little real economic cost to the exporting country if other market outlets exist.[26]

[24] An important implication of this is that the tariff equivalent is appropriate only for comparing trade volume effects (not the welfare effects) of technical and standard trade barriers of different types.

[25] Exporters may still experience costs in searching for alternative markets, even if such markets, by assumption, do exist.

[26] In practice, exporters usually are observed to care when even small markets are denied. For each firm wishing to get into the market each barrier appears significant, even though the actual ex post effect on total export earnings may be insignificant. Thus exporter concern may be a political reality even if an economic illusion.

Alternatively, if the technical barrier is differentially applied, aimed by all importers at one exporter alone, the targeted exporter cannot merely switch supply to another market. The exporter alone will bear the compliance costs of the (exporter-specific, importer-universal) regulation because importers can simply buy from other exporting countries at the world price (fig. 3b). This reinforces the importance of knowing whether any particular technical trade barrier applies to all other exporters, or whether other importers also use the same barrier applied to a certain exporter. The incidence of the barrier will depend on these two aspects of universality versus specificity.

The Supply-Shift Model

Many SPS trade barriers purport to protect the domestic farm and food sector from unwanted pests or diseases that might accompany imports. An importing country might initially maintain a ban on the importation of a good from other countries on the grounds that a pathogen is endemic in those countries. Importing the pathogen, along with the traded product, would lead to the spread of the disease domestically. The pathogen's effect on domestic production would increase production costs (shift up the supply curve) or cut production from a part of the country (shift back the supply curve).[27] Assume that the importing country is small in terms of the world market for the product, so its trade volume will not affect the world price; that there are no pathogen-free suppliers, so the same regulations apply to all exporters; and that testing at the border will assure conformity with a product standard (e.g., disease-free status). These assumptions provide the basis for a simple partial-equilibrium model from which the trade and welfare effects of alternative technical measures can be derived. This analysis provides a means for comparing two regulatory regimes characterized in table 4: a total ban versus a product standard to protect commercial crops or livestock.

Importer Perspective

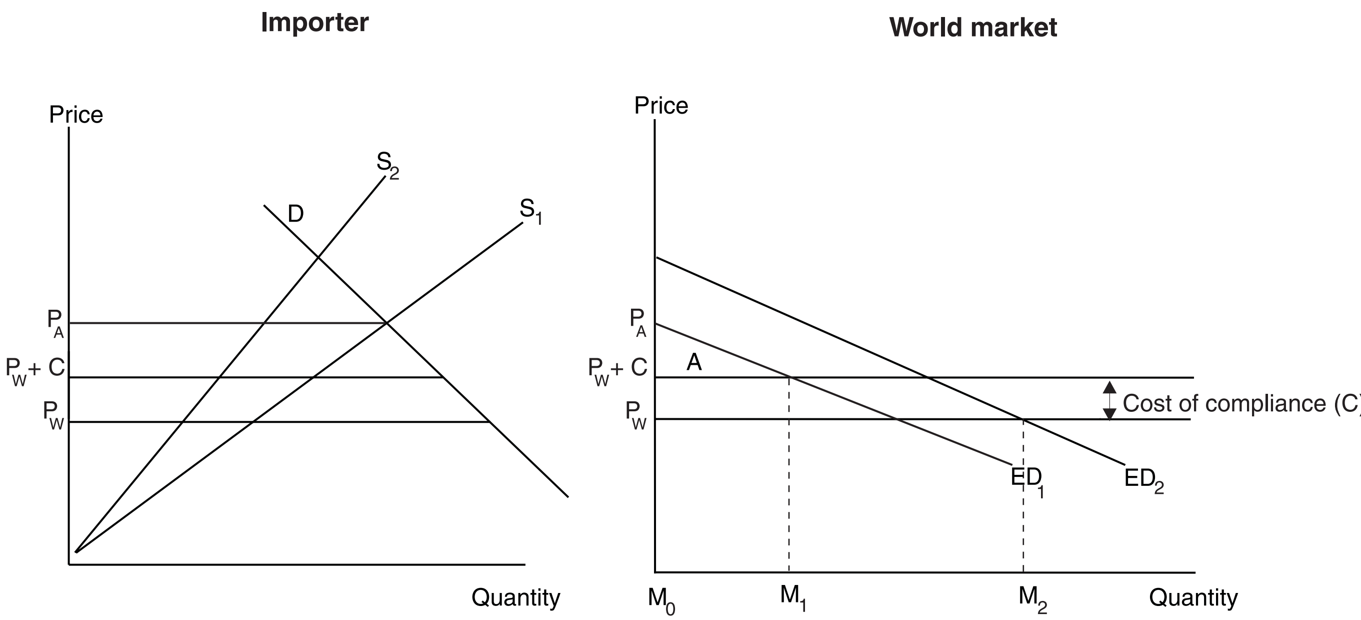
The supply-shift model can be used to compare two potential SPS policy instruments (fig. 4). In this case, testing is less trade-distorting than a ban—when the importer uses testing rather than a ban to mitigate risks, the quantity imported is M_1 instead of M_0. To quantify these effects, assuming the market parameters (supply and demand elasticities) are known, requires additional technical information about the extent to which testing raises the cost of imports, and the extent to which the import of the pathogen would shift the domestic supply curve. With this market and technical information, one could assess the impact on domestic price and trade volume of the alternative SPS measures, as well as the welfare gains and losses from each instrument.

Exporter Perspective

The effect on the exporter in the case of supply shifts associated with pathogens depends on whether the SPS measure is specific or universal and, hence, on the incidence of the cost of compliance. In the example discussed here, the testing is assumed to be exporter-universal, so no one exporter faces all the costs. And if it is assumed that just one importing country imposes the regulation, then the cost will be absorbed by that importer. Therefore, the effect on any (small) exporter is insignificant. The importer makes the calculations, bears the costs, and reaps the benefits. The exporter rationally would just absorb the measure as a quirk of this particular import market, much like characteristics of consumer taste. Alternatively, if the regulation affects only one exporter (exporter-specific) and is applied by all importers (importer-universal) then the calculation is different. The targeted exporter would bear the compliance costs, with an economic loss to the exporting country. If all importers impose the same regulations on all exporters then once again the cost of compliance

[27] The externalities arising from imports can be measured by the cost of avoiding the pathogen by domestic action (such as vaccination), rather than as the effect on production or demand of the domestic release of the pathogen per se. There may indeed be many alternative ways of intervening, each of which should be analyzed separately. However, in each case there will be a change in the relation between price and quantity supplied, i.e. it can be represented by a shift in the supply curve. Paarlberg and Lee decompose the relationship between imports and domestic supply into that between imports and outbreaks of FMD and that between outbreaks and production loss. Such disaggregation is a useful way of formulating the technical information needed to estimate the relationship.

Figure 4
Supply-shift model



S_1 represents the supply curve in the absence of trade. With the ban in place, domestic equilibrium is at P_A. The corresponding hypothetical import demand curve is ED_1, which assumes no shift in supply if imports occurred. Opening up to trade (and not testing) instead will shift the supply curve up (or back) to S_2, corresponding to an import demand curve of ED_2 and imports of M_2. The domestic price level is now P_W, the world price. There is an apparent gain from trade, but this must be offset by the loss due to the pathogen, which is a negative externality that shifts the supply curve adversely. Testing for the pathogen at the border removes this externality but raises the domestic price by the cost of compliance, C. This in essence corrects the externality, so that P_W + C represents the world price for the product without the pathogen. Excess demand for imports is ED_1 again, reflecting the supply that obtains in the absence of the pathogen, and the quantity imported under this import protocol is M_1. This gives a gain from trade equal to A. (Note that the intersection of P_W + C and ED_2 has no meaning as an equilibrium.)

is shared between importers and exporters through the changes in market price.

The Demand-Shift Model

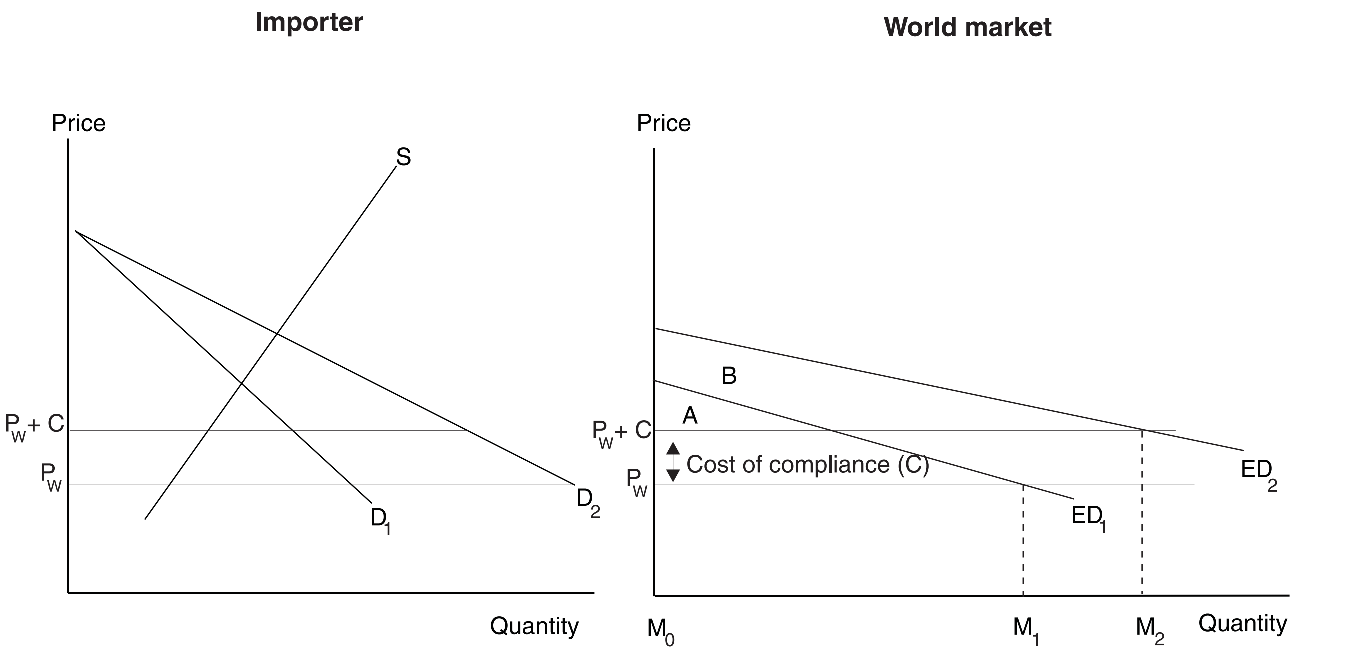
The analysis in the supply shift model was based on the existence of a link between imports of a product and domestic supply conditions. If instead the link were between trade and domestic demand through information imparted by the import regulation, demand would shift outward (as in Thilmany and Barrett) as consumers benefit from knowing what to expect from the imported good as the result of the regulation. In effect, the initial demand curve is assumed to reflect limited information about foreign supplies. This demand shift model could be used to analyze a Quality Attribute/mandatory labeling regime as depicted in table 4—for example, a regulation requiring the identification of the production technology (e.g, confined feeding or free-range) on product labels.

Importer Perspective

In this model, not conforming with the regulation would cause some consumer confusion and, on this account, would lower trade volumes, rather than the spread of disease and higher imports. But there also will usually be a "cost of conforming" to the regulations, which will have much the same analytical

Figure 5

Demand-shift model



Trade in the absence of the informative regulation is given by M_1, corresponding to the import demand curve ED_1, in turn derived from domestic demand D_1 and supply S. Enforcing the regulation raises the demand to D_2, but incurs the cost of compliance C, which raises the domestic price in the importing country to $P_W + C$. This leads to trade of M_2, which can be above or below M_1. The domestic supply curve does not shift, as the regulation does not change the cost of domestic production. The gains from trade are now unambiguously larger (area A + B) than if the compliance costs had been borne with no shift in demand (area A), as would occur in the case of regulatory protection.

effect as the "cost of testing" in the supply-shift case (fig. 5).[28] The net welfare effect of the technical trade regulation (versus trade without the regulation) is ambiguous. The producers at home gain, but on this occasion there is no presumption of distortion: the question is whether the consumer benefits from the information are greater than the cost of providing that information.

The implied assumption made above is that information makes the import more useful to the consumer. This allows one to interpret the model as one of reacting to perceived negative externalities associated with the unregulated import good. If the "true" demand for the product is at the higher level D_2, then imports entering unregulated cause the demand to drop to D_1 as uncertainty spoils the market for both domestic and foreign products. Regulation of imports, through standards or information remedies, restores consumer confidence and, hence, the demand curve returns to its previous level. Thus, the analysis of regulations that relate to trade in agricultural products can take account of consumer "scares." Whether or not there is any credible scientific justification behind the consumer reaction, the demand for food and agricultural products can certainly be affected by such sentiment.

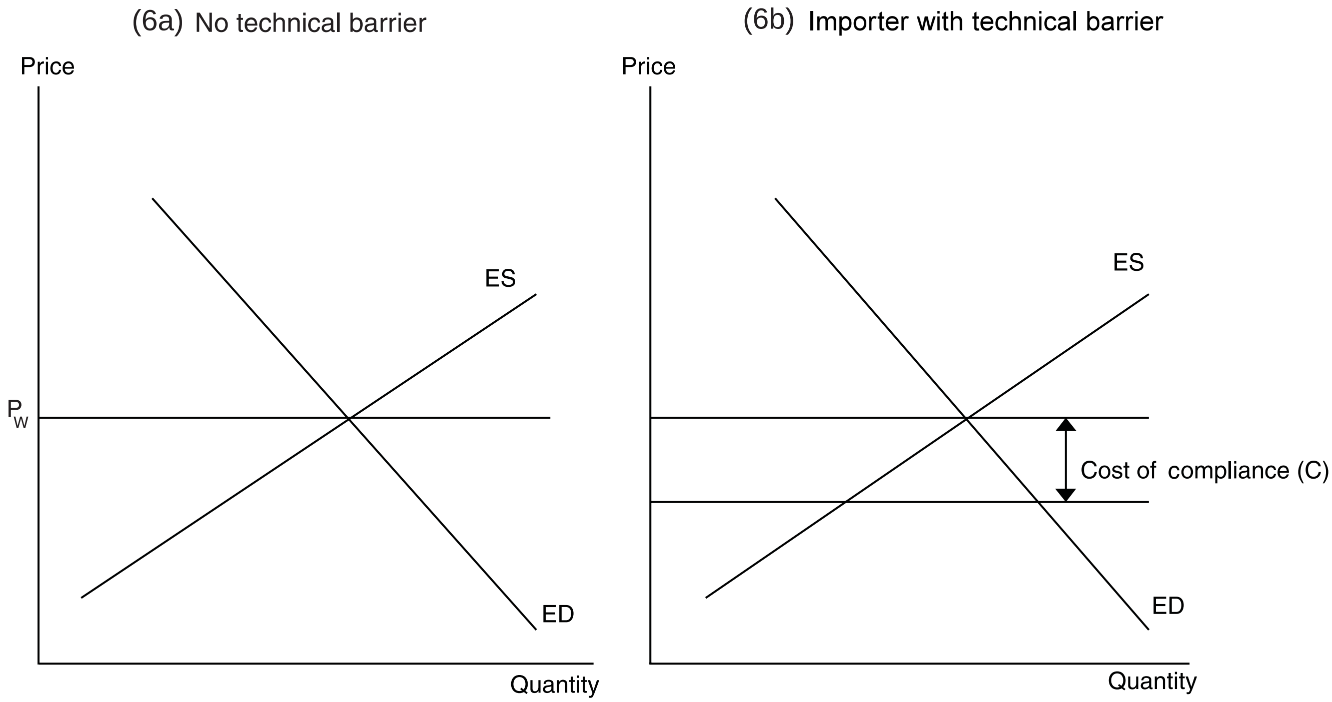
Exporter Perspective

The analytical model for the exporter in the demand-shift case is similar to that of the supply-shift case. When an exporter-universal introduction of information regulations by one country (importer-specific) does not change the world price, then again it has no measurable effect on the exporters; the compliance

[28] For convenience we assume that the cost of conforming is constant per unit sold. Other functional forms for the costs under each of these models can be accommodated with appropriate changes in specification.

Figure 6

Large-county case, sharing of compliance costs



costs are borne by the importing country. If all importers impose the informative regulation on just one exporter (importer-universal, exporter-specific), then that exporter will have to bear the cost.

World Price Effects

The models above assume that no country is, by itself, large enough to influence world prices by its actions. If a country changes the world price by its decision to adopt a measure that affects the quantity of the product it imports, or if importers uniformly impose a barrier against all exporters, then the small country assumption is not appropriate. A terms-of-trade effect, which will affect the gains from trade, must then be included in the analysis. The terms-of-trade effect can be thought of as apportioning the cost of compliance (figs. 6a and 6b). When a single importer is assumed to face a single exporter, the cost of compliance becomes a wedge between the price that the importer pays and the price that the exporter receives, net of compliance costs. The incidence is therefore simply determined by the ratio of the elasticities of excess supply and excess demand. The less flexible side of the market bears the larger part of the cost.

Does the large country case raise the possibility of strategic games to maximize welfare? It is always possible that a country might use its technical barriers to gain a terms-of-trade advantage for the nation as a whole, as opposed to profits for protected sectors, though this seems unlikely. The Paarlberg and Lee case of foot-and-mouth disease assumes a large country, as appropriate for the U.S. case that they explore. However, they postulate the use of tariffs for SPS purposes, rather than the more common use of command and control measures for SPS policy purposes. The crucial difference between tariffs and technical regulations is that the cost of the regulations involves a real resource outlay rather than a financial transfer. Thus the terms-of-trade gain is much less likely to offset the distortion loss, as this loss is much larger than the efficiency loss "triangle" of tariff theory.

For a demand-shift model, if new import regulations cause the world price to change (e.g., the effect on demand increases world price) then there might be some terms of trade effect as well. In general, the effect on world price of informational regulations is likely to be small. This is not always going to be the case where consumer confidence, as opposed to marginal convenience, is concerned.

One possible market structure is monopolistic competition. Products in such markets are differentiated by some characteristic. Assuming such Armingtonian conditions, each supplier has a monopoly on selling a particular differentiated product.[29] Consumers in the importing country will consequently be more affected by their own targeted import regulations as the range of suppliers decreases. If, however, all importers impose the same regulation on one supplier, then, as before, the cost is borne by the supplier who has to meet the importers' standards.

Customizing the Model

Several additional aspects can be incorporated in these basic models of technical trade barriers to make them more specific to particular examples. Two such aspects are the location of testing and the issue of risk assessment.

Testing Location

One aspect of the modeling framework that can affect the incidence of the burden of technical trade barriers is the location of testing.[30] If testing were done by the foreign producer rather than at the border (essentially requiring the foreign producer to adapt all production, not just the amount exported), then foreign consumers would be affected as well. They would not be able to "escape" the testing costs on output retained at home. This testing location requirement would not have any effect in the small country case but would influence the exporter's excess supply curve, and hence modify the terms-of-trade change if the importer is a large country. The point at which the cost is imposed affects foreign exchange flows, as pointed out by Sumner and Lee. If the cost is borne by the importer, the foreign exchange cost of the imports is less than if the exporter has to bear the costs.

Probabilities and Risk Assessment

Most situations of pest and disease control or food contamination involve probabilities of infestation rather than certainties. Uncertainty about an outcome makes it necessary to couch the analysis in terms of expected values. When the risks of producer or consumer effects are slight, the shifts in the supply or demand curves can be reinterpreted as "worst-case scenarios" and the calculations must take into account that, in many instances, the effects will be nil. The costs and benefits from the various SPS policy instruments may then be expressed in terms of means and variances rather than as simple point estimates. Much of the skill in modeling SPS barriers will be in the translation of scientific knowledge of animal and plant health effects into probabilities of loss and valuations of that loss.

[29] The Armington assumption, often used in spatial and general equilibrium models, is that the domestic and imported goods are close but not perfect substitutes.
[30] This issue is not unrelated to the "equivalency" issue (whether a production or processing method regulation can substitute for a product standard) and the question of "mutual recognition of testing methods" (whereby regulatory authorities accept the results of each other's tests).