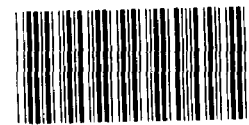

BY THE U.S. GENERAL ACCOUNTING OFFICE

Report To The Chairman, Subcommittee
On International Economic Policy,
Oceans and Environment,
Senate Committee On Foreign Relations

The Difficulty Of Quantifying Non-Tariff Measures Affecting Trade

GAO found that researchers have had great difficulty in quantifying the effects of non-tariff measures (NTMs), such as health and safety standards, on trade. Although researchers have been able to quantify the effects of some NTMs, such as quotas, most of these estimates have not been widely accepted.

GAO believes, nevertheless, that research efforts should be continued so that techniques used to estimate the effects of NTMs can be refined and more accurate estimates obtained. Such information should prove useful, both in helping a country decide what NTMs to try to eliminate and in providing negotiators with a rough comparison of the effects of some NTMs.



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NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-219776

The Honorable Charles McC. Mathias, Jr.
Chairman, Subcommittee on International
Economic Policy, Oceans and Environment
Committee on Foreign Relations
United States Senate

Dear Mr. Chairman:

This report is part of our response to your request that we examine the effectiveness of the General Agreement on Tariffs and Trade and compare the trade practices of the United States and its major trading partners. Our objective was to compile information on and analyze efforts to quantify the effects on trade of non-tariff measures (NTMs), such as quotas and export subsidies. We reviewed the available literature on this topic and analyzed the strengths and weaknesses of the various methods used to quantify their effects on trade.

Researchers have had great difficulty in quantifying the effects of some NTMs, such as health and safety standards. These NTMs tend to affect trade in most sectors of the economy, and the effect tends to vary greatly across sectors. Although researchers have been able to quantify the effects of other NTMs, such as quotas, these estimates have not been widely accepted; each technique used to estimate the effects of these NTMs has some problems associated with it that open the estimated effects to criticism. In some cases, when different techniques have been used to estimate the effect of the same NTM, the results have been markedly different. When a new round of trade talks is held, these problems in quantifying the effects of NTMs will probably help make the negotiations more contentious than prior negotiations that centered around lowering tariff rates, which are easier to quantify. Because no agreement has been reached on the best method of calculating the effects of NTMs, negotiators will undoubtedly place more reliance on other factors in their discussions to reduce NTMs.

Nonetheless, we believe research in this area should be continued so that the techniques used to estimate the effects of NTMs can be refined and more accurate estimates obtained. The results of this research provide negotiators with an idea of the approximate effect of some NTMs on a country. Such information should prove useful both in helping a country decide what NTMs to try to eliminate and in providing negotiators with a rough comparison of the effects of some NTMs.

We did not obtain agency comments on this report. The efforts to quantify non-tariff measures that we assessed were primarily carried out in private research and academic institutions. Accordingly, the draft was reviewed by recognized experts, and their comments were considered in completing this report.

Detailed information on these issues is contained in the appendix. As arranged with your office, unless you publicly announce its contents earlier, we will be distributing the report to other Members of Congress and representatives of the administration 30 days following issuance.

Sincerely yours,

A handwritten signature in black ink, reading "Frank C. Conahan". The signature is written in a cursive style with a large initial "F".

Frank C. Conahan
Director

THE DIFFICULTY OF QUANTIFYING NON-TARIFF
MEASURES AFFECTING TRADE

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ABBREVIATIONS

GAO	General Accounting Office
GATT	General Agreement on Tariffs and Trade
NTM	Non-Tariff Measure
VER	Voluntary Export Restraint

**THE DIFFICULTY OF QUANTIFYING NON-TARIFF MEASURES
AFFECTING TRADE**

Since the end of World War II, seven rounds of multilateral negotiations to reduce international trade barriers have been conducted under the General Agreement on Tariffs and Trade (GATT). Even though the most recent round of negotiations, the Tokyo Round, had significant discussions on reducing the number of non-tariff measures (NTMs), these negotiations have generally concentrated on lowering tariff rates. When all the tariff reductions agreed to in the Tokyo Round are implemented in 1987, the average tariff rate on industrial products in the industrialized countries, which was 7.8 percent in 1979, will fall to 5.8 percent.¹ Tariff rates are now at such low levels that reducing the number of NTMs will probably be a more important concern than lowering tariff rates in the next round of multilateral trade negotiations. In the discussions to reduce NTMs, it would be helpful if their effects were quantified using some common measure so that the concessions of one country could be compared with the concessions of others. Unfortunately, because researchers have had great difficulty in quantifying the effects of some NTMs and because the estimated effects of quantifiable NTMs can vary significantly, any such comparisons would only be very rough approximations, adding considerable uncertainty into the negotiations.

OBJECTIVES, SCOPE, AND METHODOLOGY

The Chairman of the Subcommittee on International Economic Policy, Oceans and Environment, Senate Committee on Foreign Relations, requested that we examine the comparative trading practices of the United States and its major trading partners. As a result of discussions with Subcommittee representatives, in partial response to the Chairman's request, we agreed to assess efforts to estimate the effect of non-tariff measures. We also have issued two other reports in response to the Chairman's request, one examining the value of the GATT and one evaluating emerging issues in export competitiveness.

We reviewed available articles in professional journals and government and academic publications that estimated the effect of NTMs. We examined the methodologies used in these studies to evaluate the accuracy of the results. From the relatively few studies that we found, it appears that the number of studies that tried to rigorously estimate the effect of NTMs is

¹Alan V. Deardorff and Robert M. Stern, "Economic Effects of the Tokyo Round," Southern Economic Journal, Jan. 1983, Vol. 49, No. 3, p. 606.

rather limited. In this report, we incorporated comments from private sector officials who have done research in this area. Our work was conducted in Washington, D.C., between August 1984 and April 1985.

ROLE OF NON-TARIFF MEASURES

NTMs essentially are defined by what they are not: they consist of all government policies, other than tariffs, that affect international trade. NTMs include policies that restrict imports, such as quotas and variable levies, as well as policies that stimulate exports, such as export subsidies. NTMs also include such policies as antitrust regulations and price controls that are not necessarily designed to affect international trade but that have such wide-ranging effects that they indirectly affect trade. The list of NTMs is large and diverse, ranging from narrowly conceived programs targeting a particular industry or country, such as the embargo on Soviet purchases of U.S. grain in 1980, to more general programs that affect trade in nearly all industries and most countries, such as health and safety standards.

As tariff rates have fallen since World War II, NTMs have increased in importance. Before the GATT was established in 1947, countries generally raised tariff rates to reduce imports. Today, however, countries are more likely to use NTMs to reduce imports. The increased use of quotas and foreign exchange controls in recent years illustrates this trend.

The slowdown in economic growth in recent years has increased pressures on governments to protect domestic industries. Using NTMs to reduce imports may violate the spirit of the GATT but does not necessarily violate the letter of the GATT, and establishing them can be at least as effective as raising tariffs in restricting imports.

Another reason NTMs have increased in importance is that they are usually less visible and more easily imposed than tariffs. Unilaterally raising tariffs may violate previously negotiated international agreements and also generally requires lengthy legislative action. In contrast, NTMs generally can be imposed by a wide variety of government agencies without legislative approval. Furthermore, lower tariff rates have made the effects of existing NTMs more pronounced; NTMs that had little effect on trade when tariffs were high may now be binding constraints on trade because tariff rates are significantly lower.

Because NTMs have become important barriers to international trade, researchers have been trying to estimate the

effects of NTMs. The effects of some NTMs have been estimated, but researchers have used different methodologies and thus produced different estimates for the same NTM. Because all the methodologies seem reasonable, it is difficult to obtain one widely accepted estimate of the effects of an NTM. For other NTMs, such as market access limitations or health and safety standards, effects have proven almost impossible to estimate, because they are so pervasive that researchers have not yet devised a method to accurately estimate them.

Discussions to reduce NTMs will probably be much more contentious than discussions to reduce tariffs, because disagreements between nations about the effects of NTMs will almost certainly occur. In addition, because many NTMs are designed to solve domestic problems and have a small effect on international trade relative to their effect on the domestic economy, countries may view attempts to reduce such NTMs as impinging upon their sovereign rights and may be reluctant to remove these NTMs.

TARIFF EQUIVALENTS CAN BE USED TO
COMPARE THE EFFECTS OF SOME NTMS

Even though the next round of trade negotiations will probably consist of significant discussions to remove or reduce NTMs that are essentially nonquantifiable, it would be useful for negotiators to have an idea of the effects of quantifiable NTMs expressed in a common measure so that the effects could be roughly compared. Tariff equivalents, a commonly used measure for quantifying the effects of NTMs, are probably the best measure for this task. They can be estimated in two ways, which generally yield similar but not identical results.

1. Estimate the incremental tariff rate that would cause the level of imports to fall by an amount equal to the difference in the level of imports with the NTM in place and the level without the NTM.
2. Estimate the percentage difference in the price of a domestically produced good both with and without the NTM in place.

Two measures that are related to each other, the deadweight loss and the cost to consumers, can also be used to indicate the effects of NTMs. The deadweight loss measures the cost to society of allowing relatively inefficient producers to make goods for which they do not have a comparative advantage. The cost to consumers measures the added costs to consumers resulting from NTMs and equals the sum of the deadweight loss and the increase in producers' profits.

But both of these measures are more useful to economists in discussing the relative merits of protection provided by NTMs than to negotiators trying to equalize concessions across countries. In addition, these measures suffer from the same problem of all techniques that attempt to estimate the effects of NTMs--a lack of general agreement on the accuracy of the estimated effects of the NTMs.

GENERAL PROCEDURES FOR ESTIMATING THE EFFECTS OF NTMS

To measure the effects of NTMs, economists have used two different procedures. The first estimates the combined effects of NTMs on an industry without estimating the effects of individual NTMs. Because several NTMs may affect an industry, the results of these studies cannot be used to estimate the effect of an individual NTM on an industry. The second procedure estimates the effects of individual NTMs without estimating the combined effects of NTMs on the industry. The results of these studies can be aggregated to get an estimate of the total effect of NTMs on an industry. Such an approach, however, is suspect because it may be difficult to (1) identify all NTMs that affect the industry and (2) quantify some of the identified NTMs that affect the industry. Also, because the effects of different NTMs may interact with each other, the total effect of NTMs on an industry may not equal the sum of the effects of the individual NTMs.

The two procedures provide different types of information for negotiators. Estimating the overall effect of NTMs on industries is useful in pinpointing which areas are affected by NTMs, and after the negotiations are completed such estimates will be invaluable in determining whether removing the NTMs had the desired effect on trade. But because the negotiations will probably concentrate on the removal or reduction of individual NTMs, research on estimating the effects of individual NTMs would probably be more useful in the negotiations.

An ambitious and useful 1983 study by Peter Morici and Laura L. Megna examined the relative effects of tariffs, NTMs, and transportation costs on U.S. trade in manufactured goods.² To estimate the total effect of NTMs, the authors aggregated the effects of individual NTMs. Some of the estimated effects came from previously published studies and some were provided by the authors. The authors could not identify all NTMs and said that it was impossible for them to quantify the effects of a few NTMs that could be identified.

²U.S. Economic Policies Affecting Industrial Trade: A Quantitative Assessment, National Planning Association, NPA Report #200, Washington, D.C., 1983.

The study is believed to be the first to aggregate the effects of individual NTMs for a large section of the U.S. economy. The accuracy of the authors' estimates obviously is directly related to the accuracy of the estimates in the other studies.

The authors present estimates of the effects of NTMs that may not have been quantified elsewhere. In several cases the authors admit that their estimates are only "order of magnitude" estimates, but their methodology illustrates how difficult it is to quantify some NTMs.

The study found that tariffs have a much greater effect than NTMs on international industrial trade; it estimated that the combined effect of tariffs gave U.S. industrial products about 4-1/2 times more protection than the combined effect of NTMs. In certain industries, such as publishing and printing, it found that NTMs provide a high degree of protection relative to tariffs, whereas for other industries, such as tobacco, NTMs have little effect relative to tariffs. One possible reason the study found that tariffs have a much greater effect than NTMs is that it did not include the effects of some NTMs.

ESTIMATING THE OVERALL EFFECTS OF NTMS ON AN INDUSTRY

Three procedures can be used to estimate the overall effects of NTMs on an industry: (1) frequency measures, which are based on surveys, number of complaints, or percent of trade affected by NTMs, (2) price measures, which calculate tariff equivalents directly, and (3) quantity measures, which use econometric models to estimate tariff equivalents.³

Frequency measures

The U.N. Conference on Trade and Development and the GATT collect commodity- and country-specific data on NTMs that show how frequently they occur. These data can be used to show the percentage of either the value or number of products subject to NTMs in a given trade classification. Such information can be helpful in determining which industries are affected by NTMs. These measures, however, do not provide an estimate of the effect of NTMs on trade; they merely show how frequently they occur. Because such frequency is not always related to the degree of protection, frequency measures may convey an inaccurate impression about the importance of NTMs in various industries.

³This procedure is used by Alan V. Deardorff and Robert M. Stern in Methods of Measurement of Nontariff Barriers, UNCTAD/ST/MD/28, Geneva, United Nations, Jan. 2, 1985.

Price measures

The effect of NTMs on an industry can be estimated by comparing the price of a domestically produced good with some reference price. The ideal reference price would be the price of the domestic good if the NTMs were removed. Because this price is unknown, however, researchers generally compare the price of the domestically produced good with either the price of the imported good or price of the good in a foreign country. The percentage difference between the two prices is considered to be the tariff equivalent. Calculating the price effects of NTMs based on observed differences in the prices of domestic goods and imports of foreign goods has the advantage of capturing the effects of all NTMs that affect the industry, even those that are individually difficult to measure. If the domestic good is priced lower than the foreign good, however, this analysis is meaningless.

A major problem with this approach is that, at a manageable level of aggregation, the mix of goods that a particular industry produces domestically will differ from the mix of goods that the same industry produces abroad or that are imported. Thus, comparing prices of the goods produced by the domestic and foreign industries will involve comparing prices of different mixes of goods.

A problem with comparing the prices of domestic goods with the prices of imported goods is that domestic price indices often do not distinguish between domestic and imported goods. Thus, comparing the average price of a mix of domestically produced goods with the average price of a mix of imported goods is often impossible.

Comparing the prices of domestically produced goods with the prices of the goods in a foreign country presents even greater problems. Researchers have found that the price of a particular good in two countries may not be the same even if the good is freely traded. To attribute the difference between the domestic and foreign prices to NTMs will tend to yield inaccurate estimates of the effects of NTMs.

Quantity measures

Quantity measures determine the extent to which NTMs reduce the volume of trade and then use this information to estimate tariff equivalents. Quantity measures are more difficult to apply than price measures; whereas domestic prices can be compared with import prices or foreign prices, there is usually no observable quantity against which to compare the level of imports.

Researchers have attempted to get around this problem by using econometric models to determine the quantitative effects of NTMs on an industry. These models generally predict trade flows on either a country-specific or commodity-specific basis. Deviations between the predicted and the actual levels of trade are attributed to NTMs.

Studies of this sort indicate the effect of NTMs by industry and by country. A particularly useful aspect of these studies is that they implicitly take into account the interaction of tariffs, NTMs, and other factors.

Despite these attributes, however, these studies have significant drawbacks. The approach places a tremendous burden on econometric models because all departures of trade from what the models can explain are attributed to NTMs. The worse the model is at explaining trade flows, the greater will be the estimated effects of NTMs. Thus, the effect of NTMs can be significantly overestimated if a poor model is used.

ESTIMATING THE EFFECTS OF INDIVIDUAL NTMS

Attempts to determine the effects of particular NTMs on the price and quantity of imports have succeeded in varying degrees. Estimating the effects of an NTM that affects only one industry, such as a quota on a specific product, is generally easier than estimating the effects of an NTM that affects most industries, such as foreign exchange controls.

The difficulty in quantifying wide-reaching NTMs, however, may not turn out to be very significant for negotiations, because many of these NTMs will probably be considered non-negotiable. As mentioned earlier, these NTMs are generally designed to regulate the domestic economy, not to affect international trade, and countries may not be willing to negotiate their removal.

NTMs that are imposed strictly to affect international trade, such as quotas or voluntary export restraints, are much more likely to be negotiated away than NTMs that result from domestic policies that spill over into the international sector. A country may view the costs of changing what is basically a domestic policy as being much greater than the gains from freer trade.

Econometric models are often used to estimate the effect of an individual NTM. By using dummy variables, these models can predict the volume of trade if the NTM was eliminated. From the results of these models, the tariff equivalent of an NTM can be estimated by using a formula that looks at the sensitivity of

imports to price changes and the predicted change in the volume of trade caused by the NTM.

A problem with using this formula is that the sensitivity of imports to price changes can vary greatly, depending on the methodology used in the estimation. This large variance reduces the accuracy of the tariff equivalent estimates.

The econometric approach works best when the NTM has recently been imposed and when enough pre-NTM data are available to allow for meaningful analysis; the longer the NTM has been in place, the less likely the approach will accurately estimate its effect. The approach generally relies upon pre-NTM data, and when these data are quite old, it is likely the relationship between the volume of imports and the explanatory variables has changed. For example, estimates of the level of imports if the Multifiber Agreement (MFA) were abolished, based on pre-MFA data, would probably be very inaccurate because the MFA and its predecessors have been in place since 1961, and trading patterns have changed significantly in the last 20 years. Similarly, estimating the effect of eliminating the voluntary export restraint on carbon steel with the European Community would be difficult because the U.S. carbon steel industry has been protected by a series of measures over the past 15 years, including voluntary export restraints and the Trigger Price Mechanism.

Estimates of the effects of an NTM can vary significantly depending on the methodology used. This is illustrated in a recent survey article⁴ presenting the results of four studies that estimated the cost to consumers of the orderly marketing agreement negotiated by the United States with Japan on U.S. imports of color televisions. Two of the studies found that the agreement did not affect consumers, one estimated that it cost consumers \$251 million, and one estimated that it cost consumers \$600 million.

The problems associated with estimating the effects of particular NTMs are discussed in the following sections.

Quotas

Under a quota, the government of an importing country restricts the quantity of imports of a particular good. To estimate the tariff equivalent of an existing quota, the actual

⁴Michael C. Munger, The Cost of Protectionism: Estimates of the Hidden Tax of Trade Restraint, Center for the Study of American Business, Working Paper No. 80, Washington University, St. Louis, July 1983.

situation must be compared with the hypothetical one that would exist if the quota was removed. This hypothetical situation can be roughly estimated in various ways. A popular method uses regression analysis to estimate the volume of imports, using a dummy variable for the quota period. Other methods include extrapolating pre-quota trends or using either trends in other countries or in U.S. imports that are not subject to quotas to estimate the effect on trade. These methods are seriously flawed because they do not take into account changes in other factors that affect trade in the specific industry under study.

A problem in trying to quantify the effects of a quota is that a quota on differentiated products, such as autos, generally results in exporters upgrading their product lines. This means that part of an increase in the price of the good is due to a higher quality product and part is due to a lower supply of the product caused by the quota. Models developed by economists to account for increases in quality have not always been successful.

The effects of a quota will also depend on how the quota is administered. If the government auctions licenses that give importers the right to import the good, the domestic government would get the price difference as added revenue and the price of the license would equal the anticipated difference between the price of the good in the domestic market and in the world market.

If the quota is filled on a first-come, first-served basis, the price that importers pay for the good will probably be higher than if there was no quota but not as high as if the licenses to import were allocated to specific foreign producers. Competition among importers should raise the import price, but competition among foreign suppliers should prevent the price from rising as high as it would if foreign suppliers did not compete with each other. The price that consumers pay for the imported good, however, should rise to the same level as if the quota amount was allocated, because the supply of the product in the country has fallen. Thus, if the quota is administered on a first-come, first-served basis, the importers and foreign exporters would probably share the added revenue.

If licenses to supply imports are allocated to specific foreign suppliers, those suppliers will be able to raise the price of the product without worrying about losing market share to competitors and would keep the added revenue. Foreign governments would be less anxious to remove the quota under this system because foreign firms would be enjoying the benefits of higher per-unit profits in their exports to the protected market.

Voluntary export restraints

Under a voluntary export restraint (VER), the government of an exporting country restricts exports of a particular good to a particular country, generally at the request of the government of the importing country.

If a country negotiates VERs with all suppliers of a product, the effects of the VERs are almost identical to the quota. If, however, VERs are negotiated only with a subset of foreign suppliers, they can cause the level of imports from countries that are not subject to VERs to increase. To estimate the effects of these VERs, assumptions must be made about the behavior of imports from countries that are not subject to VERs.

Variable levies

A variable levy sets a minimum price for an imported good and imposes a duty on imports of the good that raises the price of low-priced imports to the minimum price. The levy rises when the exporter's price falls and falls when the exporter's price rises. It also varies when the government changes the minimum price. Variable levies are primarily used by the European Community and Sweden to protect agricultural products.

When variable levies are in place, importers lose the incentive to purchase from lowest-cost suppliers because the lowest price that importers can pay is the minimum price set by the government. As long as the exporter's price is below the minimum price, importers will be indifferent about which foreign supplier they buy their goods from. As a result, foreign suppliers have little incentive to sell their goods at prices below the minimum. Because of this, the size of the levy will tend to underestimate the price effect of a variable levy and will not be a good proxy for the cost of the protection.

The size of the levy may change considerably from period to period, depending on the level of world prices. Determining the average effect of a variable levy over time thus depends critically on the time period chosen.

Government procurement regulations

Government procurement regulations require government agencies to purchase domestic goods rather than imports unless the imports are significantly cheaper. Although some governments do not grant explicit procurement preferences for domestic goods, most governments favor domestic over foreign suppliers to some extent. Because governments purchase a wide variety of products, government procurement regulations can affect many different industries.

The GATT Government Procurement Code that was included in the Tokyo Round negotiations has reduced the effect of this NTM somewhat. But because the Code covered only a small portion of government purchases, it has had a limited effect and government procurement regulations are still an impediment to free trade.⁵

The regulations affect a wide variety of industries, so they are difficult to model econometrically. The large number of industries involved creates an aggregation problem that makes it impossible to get a meaningful price variable to use in an econometric equation. In addition, government procurement regulations have always existed in one form or another, so a dummy variable could not be used to estimate the effect of the regulations on trade.

A common approach to estimating the effects of government procurement regulations is to assume that if the regulations were removed, the government would purchase domestic goods and imported goods in the same proportion that the private sector does.⁶ By subtracting the actual level of imports from the predicted level, the quantitative effect of the regulations can be estimated. This approach has an obvious flaw--the government purchases a different mixture of goods than the private sector, and there is no reason the share of government import purchases should be the same as the private sector share.

Domestic subsidies

Governments subsidize domestic industries in a variety of different ways, including direct cash payments, special tax exemptions, below-market interest rates, loan guarantees, price ceilings, and technical assistance. Domestic subsidies affect international trade by making domestic firms more competitive with imports. Some subsidies, such as natural gas price regulation and Small Business Administration loans, affect many different industries; others, such as the Chrysler loan-guarantee program and cash subsidies to U.S. shipbuilders, affect only one industry.

⁵See our report, The International Agreement on Government Procurement: An Assessment of its Commercial Value and U.S. Government Implementation, (NSIAD-84-117) July 16, 1984.

⁶See, for example, Thomas C. Lowinger, "Discrimination in Government Procurement of Foreign Goods in the U.S. and Western Europe," Southern Economic Journal, Jan. 1976, Vol. 42, No. 3, pp. 451-460.

Estimates of the value of the benefits provided by U.S. domestic subsidies are generally available from the agencies administering the programs, the Office of Management and Budget, or the Congressional Budget Office. These estimates can be divided by the value of domestic production to get an estimate of the value of the benefits as a percentage of the value of production.

The accuracy of the estimates obviously hinges on the accuracy of the agencies' estimates of the value of the subsidies. A possible source of error in the agencies' estimates is in choosing an interest rate with which to calculate the effects of credit programs. Because interest rates have been quite volatile in recent years, choosing the correct rate is not an easy task. And the estimated effects of the credit program depend critically on the interest rate chosen. For example, one study estimated that the trade effect of loans from the Small Business Administration, Economic Development Administration, and Farmers Home Administration would increase fourfold if the interest rate used in the calculation was increased by 2 percentage points.⁷

Performance requirements

Performance requirements interfere with the free flow of long-term investment funds, which finance the building of plants that increase a country's exports or reduce its imports. The two main types of performance requirements are import maximums, which limit the foreign content used in the local production of final goods, and export minimums, which require foreign firms that build a plant in a country to export a specified portion of the plant's production.

Estimating the trade effects of performance requirements is difficult because of the problems in determining what the investment patterns of multinational corporations would be if the NTM was not in place. This NTM is just one of many factors that firms consider when they decide where to build plants. In some situations, performance requirements may dominate the other factors, causing a firm to build a plant that transforms a country from an importer of a product into an exporter. In such cases, estimating the NTM's effects may be relatively simple; in other cases, the effects will be much less clear.

⁷See footnote 2 on page 4.

Embargoes

The government of an exporting country uses an embargo to restrict exports of a particular product or set of products to a particular country. Embargoes can be thought of as VERs that are not undertaken at the request of the importing government and can be estimated in a similar way to VERs. As such, they will be subject to the same estimation problems as VERs.

Product standards

Governments impose product standards to ensure that buyers can make informed decisions and that the products will not injure their users. Product standards include labeling and safety requirements and food grading and drug standards.

Product standards are difficult NTMs to quantify, because they are so widespread and because quantifying them generally involves estimating the effects of a large number of small qualitative changes on the supply and demand for a product. Estimating the cumulative effect of so many small changes, each of which must be estimated independently, has so far proven extremely difficult for researchers.

Export subsidies

Most governments subsidize domestic exporting industries. In the United States, programs such as the Export-Import Bank and the Overseas Private Investment Corporation provide such assistance.

Export subsidies cannot be expressed as tariff equivalents because they have a different effect on trade than tariffs; they encourage exports, whereas tariffs discourage imports. Thus, it is impossible to come up with a tariff equivalent that can be used to directly compare the effects of export subsidies and import-reducing NTMs.

Many export subsidies provide assistance through loans and loan guarantees. The value of U.S. credit programs can be estimated by comparing the discounted present value of payments required to service loans at market interest rates and at subsidized rates. The rates of subsidy can then be calculated by dividing the estimated value of the subsidy by the value of exports. As in the case of domestic subsidies, the interest rate used in the analysis is crucial and is a possible source of error.

CONCLUSION

Researchers have had great difficulty in estimating the effects of some NTMs and some success in estimating the effects of others. Success, however, has generally been limited to "order of magnitude" estimates that provide useful information but probably are not precise enough to avoid contentious negotiations over the removal of these NTMs. Although additional research will never be able to provide unambiguous estimates or resolve all the problems involved in the negotiations, research on quantifying NTMs should continue so that methodologies can be refined and the estimated effects of NTMs can gain more widespread approval.

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