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When economists attempt to measure the gains from trade and costs of protection for industrial countries, the resulting estimates often look small. As Krugman (1990, p. 104) recently wrote:

> Just how expensive is protectionism? The answer is a little embarrassing, because standard estimates of the cost of protection are actually very low. America is a case in point. While much U. S. trade takes place with few obstacles, we have several major protectionist measures, restricting imports of autos, steel, and textiles in particular. The combined costs of these major restrictions to the U.S. economy, however, are usually estimated at less than three-quarters of 1 percent of U.S. national income. Most of this loss, furthermore, comes from the fact that the import restrictions, in effect, form foreign producers into cartels that charge higher prices to U.S. consumers. So most of the U.S. losses are matched by higher foreign profits. From the point of view of the world as a whole, the negative effects of U.S. import restrictions on efficiency are therefore much smaller—around one-quarter of 1 percent of U.S. GNP.

Are the efficiency costs of protection really so small? While the estimate cited by Krugman for the U.S. costs of its own protectionism is a plausible lower bound, I will argue that the rents arising from import quotas should not be thought of as simple, nondistortionary transfers to trading partners. On the contrary, the evidence is that U.S. quotas impose a loss on our trading partners, and that in some cases this loss is comparable in magnitude to the transfer of

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rents. This means that even when foreign firms earn quota rents through higher selling prices in the U.S., the foreign countries gain by less due to the efficiency losses, and in some cases do not gain at all. It follows that the world efficiency losses from U.S. protection are as large as the U.S. costs.

It is quite common to ignore the efficiency costs imposed on foreign countries through U.S. protection. This approach does not reflect the reality that U.S. protection, like that of other industrial countries, occurs at quite restrictive levels in a small number of industries, and also discriminates against particular supplying countries. The U.S. is not a "small" country in the large world market, and its highly selective pattern of protection generates substantial deadweight losses both at home and abroad.

This paper begins from a U.S. perspective, examining the costs to both the U.S. and other countries from U.S. protectionism. It then moves to a more global policy perspective. The emerging free trade areas in Europe, North America and Asia raise the prospect of gains from trade within each region, but also the possibility of global costs from protectionist actions across the regions. To quantify this, Krugman (1990) considers a world split onto three trading regions, where under a hypothetical trade war each region restricts trade with the other regions by one-half. Using a simple triangle calculation, he suggests that the global efficiency losses from this dramatic reduction in trade may be only 2.5 percent of world GNP.

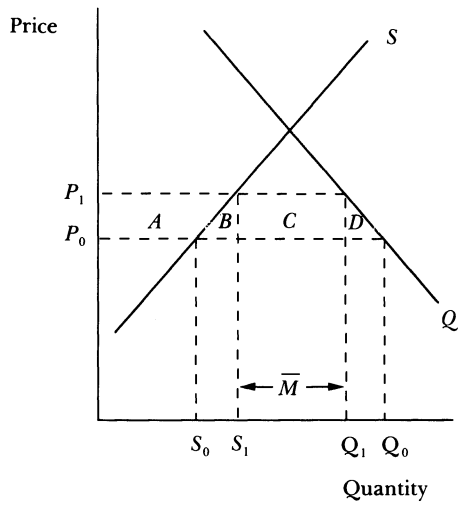
This calculation does not reflect the highly selective pattern of current protection, however, where trade barriers are maintained against specific goods rather than uniformly. Under this form of protection, reducing trade across regions can mean eliminating trade in the varieties of certain goods imported from outside the region, while other internal varieties are still available. This approach is particularly relevant to differentiated manufactured goods such as cars, consumer electronics, footwear, textiles and apparel, and so on. When the *range* of product varieties is reduced in this manner, the global losses can easily be several times larger than Krugman's estimate.

From a policy perspective, our discussion emphasizes the importance of limiting the use of selective and discriminatory trade protection whenever possible. Of course, the General Agreement on Tariffs and Trade aims at this goal, but GATT may be undercut by the movement towards regional free trade areas. The most important determinant of trade protection in the years ahead is likely to be a choice between the GATT approach of multilateral negotiations to lower all trade barriers, and the more recent shift toward agreements which offer free trade within a region, but also risk discriminatory trade barriers against those outside the region.

Costs of U.S. Import Protection

Figure 1 illustrates the effect of an import quota on the U.S. market. Let S be the U.S. supply curve for a particular good, and let Q be the U.S. demand

Figure 1
The Effect of an Import Quota on the U.S. Market

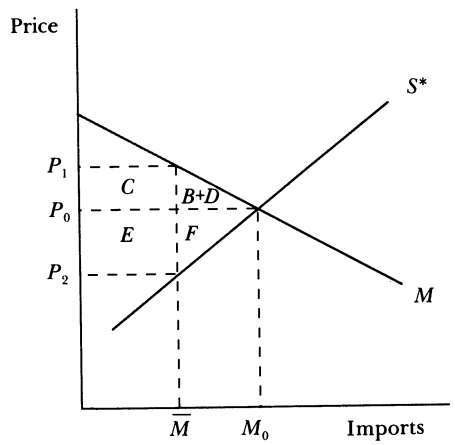


curve. Suppose that imports are initially available at the free trade price of P_0, so that the quantity imported is $M_0 = Q_0 - S_0$. Then if the U.S. limits the amount imported to $\overline{M}$ using a quota, the equilibrium price in the U.S. would rise to P_1. Domestic producers would benefit, of course, and their rise in producer surplus is measured by the area A. In contrast, U.S. consumers would suffer from the increase in the price, and their drop in consumer surplus is measured by the entire area $A + B + C + D$.

If the U.S. were a "small" country, so that its purchases had no effect on the international price P_0, then the area C would be the "rents" associated with the quota $\overline{M}$. In nearly all the cases of U.S. import quotas we shall consider, the quotas are allocated to foreign exporters by their own governments. Under this system, it is the *foreign firms* that earn area C in Figure 1, so that the net U.S. loss from the quota is areas $B + C + D$. In contrast, the global efficiency loss is only $B + D$, since the quota rents C are a redistribution from the United States to the foreign firms.

However, if protectionist actions by the U.S. have some effect on the world prices, then the measurement of global losses is quite different. This is illustrated in Figure 2, where we incorporate the exporting countries. Let M be the U.S. excess demand curve for imports of the good in question (which is the horizontal difference between domestic demand Q and supply S), and let S^* be the excess supply curve from all foreign countries. Under free trade the equilibrium price and quantity of imports are again at P_0 and M_0. With the quota limit of $\overline{M}$, the U.S. price rises to P_1, as before. Foreign firms would have been willing to supply this amount at the reduced price P_2, so that $(P_1 - P_2)$ is the "quota premium" they earn on each unit sold. Then the quota rents they earn are measured by $(P_1 - P_2)\overline{M}$ = area $C + E$ in Figure 2.

Figure 2
When U.S. Protectionism Affects World Prices



However, not all of the quota rent is a welfare improvement abroad. The drop in foreign producer surplus due to the reduced U.S. sales would be calculated as the area $E + F$, which represents the losses of those pushed out of the U.S. market as a result of the quota.[1] These losses must be counted against the rents that the foreign firms earn. The net change in the welfare of the supplying countries is therefore $(C + E) - (E + F) = C - F$. The area F represents the deadweight loss to the foreign countries. These countries are worse off due to the import restriction if this deadweight loss exceeds C, which will certainly occur if the quota $\overline{M}$ is set at a very restrictive level. The efficiency losses to the world as a whole are measured by the areas $B + D + F$.

In summary, the costs of U.S. import protection in the United States can be measured as the sum of deadweight losses $(B + D)$ and that part of the quota rents which represent the increase in U.S. prices (area C). The measurement of the *global* losses due to U.S. protectionism would need to subtract the quota rents from U.S. losses, and add the efficiency losses created in the countries supplying to the U.S. (area F). Table 1 offers estimates of these three categories: U.S. deadweight loss $(B + D)$, quota rents (C or $C + E$), and foreign deadweight losses (F).

U.S. Deadweight Loss

The first column of Table 1 displays estimates of the deadweight loss to the U.S. economy from the major instances of import protection. Other cases of

[1]Note that the foreign excess supply curve S^* is the difference between the supply curve of foreign firms and the demand curve of foreign consumers. Strictly speaking, then, the area $E + F$ represents the difference between the gain to foreign consumers as their prices are reduced from P_0 to P_2, and the larger loss to foreign producers.

Table 1
Annual Cost of U.S. Import Protection
(billion dollars, years around 1985)

	U.S. Deadweight Loss (B + D)	*Quota Rents (C or C + E)*	*Foreign Dead-Weight Loss (F)*
Automobiles	0.2–1.2[a,b]	2.2–7.9[a,c]	0–3[d]
Dairy	1.4[b]	0.25[c]	0.02[e]
Steel	0.1–0.3[a,b]	0.7–2.0[a,c]	0.1[f]
Sugar	0.1[b]	0.4–1.3[c,g]	0.2[g]
Textiles & Apparel	4.9–5.9[a,b]	4.0–6.1[a,c]	4–15.5[h]
Average Tariffs	1.2 – 3.4[i]	0	n.a.
Total*	7.9–12.3	7.3–17.3	4.3–18.8

*In dairy the quota rents are earned by U.S. importers, and so are not included in the total.
n.a.—not available
Sources:
a de Melo and Tarr (1990)
b Hufbauer, Berliner and Elliott (1986)
c Bergsten et al (1987, Table 3.3)
d Feenstra (1988)
e Anderson (1985)
f Boorstein (1987)
g Leu, Schmitz and Knutson (1987)
h Trela and Whalley (1988, 1990, 1991)
i Rousslang and Tokarick (1991)

import protection include machine tools and meat, though the losses involved are much less than those in Table 1, and would not substantially affect the totals. The estimates shown are *annual* costs for years ranging between 1983 and 1987, and are centered around 1985. For each industry, imports are primarily restricted by quotas, though small tariff rates also apply.

The estimates in column one are obtained from two sources: partial equilibrium models estimating the deadweight loss triangles for U.S. consumers and producers (Hufbauer, Berliner and Elliott, 1986); and computable general equilibrium models (de Melo and Tarr, 1990). Both of these methods rely on a wide range of literature for estimates of the demand elasticities, supply elasticities, and the value of the import quota. In some cases the value of the import quotas, or quota premium, is directly observed, while in other cases it is inferred from the reduction in trade and the supply and demand elasticities; some examples will be provided below. The range of estimates in Table 1 is intended to emphasize that the losses are subject to error from both the parameters used and the assumptions imposed.

A few details on each industry should be mentioned. The "voluntary" export restraint on Japanese auto imports was negotiated in 1981, and limited the U.S. sales of each Japanese company. These quotas were increased in 1987, and are still in place today. However, they are not currently binding for most companies, partly because many Japanese firms have established plants in the United States, and sales from these plants are not limited by the agreement.

The estimate of the deadweight loss in column one does not reflect this foreign investment, though we shall discuss later the effect of including it.

Dairy products subject to import restrictions include cheese, butter and powdered milk. These restrictions are used in conjunction with domestic support prices, and are intended to preserve income for U.S. farmers, as is the case with sugar. The deadweight loss of $1.4 billion in dairy is primarily due to the restrictive quotas on cheese imports.

The U.S. steel industry has lobbied for various forms of protection during the past two decades, and since 1985 a "voluntary" export restraint has been in place with nearly every trading partner. The complexity of this arrangement is surpassed only by the Multi-Fiber Arrangement, governing world trade in textiles and apparel. Initiated in 1974, this arrangement imposes extremely detailed quotas on every country and product imported to the United States. The distortionary cost of these restrictions to the U.S. is estimated at $4–6 billion, the largest of the industry deadweight losses shown in Table 1.

While tariffs are low in many industries, there are important exceptions. For example, since 1980 there has been a tariff of 25 percent on compact trucks imported from Japan.[2] Estimates of the cost of the tariffs are not available for most industries, so the last row of column one includes a range of estimates for the deadweight loss due to the average tariff rate (3.7 percent) in the U.S. economy.

Summing the estimates in column one, we obtain $8–12 billion. This estimate should be treated as a lower bound to the actual loss, however, since we have ignored many factors that could lead to additional costs for the U.S. For example, the increase in producer surplus as a result of U.S. protection (area *A* in Figure 1) is many times greater than the deadweight losses, and we might expect some waste of resources as firms attempt to secure this increase in surplus. This waste could occur through lobbying and other "rent-seeking" activities, or more subtly, as firms neglect to modernize their capital equipment to demonstrate the need for continued protection (Matsuyama, 1990).

In addition, it is quite likely that the quotas applied in industries such as autos and steel have allowed U.S. firms to exercise greater market power in setting prices, with associated deadweight losses for U.S. consumers.[3] A simulation model incorporating this idea has been applied to the European car market by Smith and Venables (1991), who find significant costs due to the change in market conduct. Dinopoulos and Kreinin (1988) found that

[2]This unusually high tariff originally applied to truck imports from West Germany, and was a form of U.S. retaliation against the tariff on poultry sales there, in what became known as the "Chicken War" of 1962–63.

[3]The impact of quotas on market conduct is examined in a monopoly model by Bhagwati (1965), and in oligopoly models by Harris (1985) and Krishna (1989). It is noteworthy that these models of imperfect competition lead to additional *costs* of protectionist actions, in contrast to the idea of "strategic trade policy," that tariffs or export subsidies might be in the national interest. At least for the industries listed in Table 1, there is no evidence that U.S. trade policies have provided them with any strategic advantage.

European firms selling cars in the United States increased their prices simultaneously with the U.S. quota on Japanese car imports. This effect is quite plausibly the result of a change in market conduct.

Other areas of U.S. trade legislation can also create deadweight losses. For example, a number of U.S. dumping investigations are settled out of court, thereby allowing the U.S. and foreign firms to raise their prices jointly (Prusa, 1991; Staiger and Wolak, 1991). This outcome should have some added cost to the United States though its magnitude is not known. Finally, the recent literature on trade and growth suggests that protection can have adverse affects on a country's growth rate, leading to welfare losses. While these effects are no doubt important, reliable estimates for the U.S. are not yet available.

Quota Rents

The second column of Table 1 shows estimates of the quota rents. For all the industries shown except dairy products, these rents are earned by foreign firms who are allocated the quotas by an agency of their government. For example, in autos the *total* number of cars intended for export from Japan to the U.S. is determined by the Japanese government, and then the Ministry of International Trade and Industry allocates the quotas to Japanese firms. For textiles, the quotas for each country are determined under the Multi-Fiber Arrangement (MFA), which are then allocated to firms by their governments. In Hong Kong, the firms are permitted to trade these quotas on a secondary market (Hamilton, 1986). In contrast, for dairy products the quotas are allocated by the Department of Agriculture to U.S. importers, who then earn the rents.

In some cases, the studies we draw on measure only the quota rents leading to U.S. losses (that is, only area C in Figures 1 and 2). For example, Hufbauer, Berliner and Elliott (1986) assume that the U.S. is a "small" country facing a horizontal foreign supply curve at the price P_0, though they recognize that this assumption may not be realistic.[4] For a number of industries, the quota premiums they use are inferred from the reduction in trade and domestic supply and demand elasticities under this "small" country assumption, so that only area C is measured. In contrast, de Melo and Tarr (1990) allow for upward sloping foreign supply curves in some industries, and appear to measure the area $C + E$ by using quota premium that reflect the full difference between the U.S. price and foreign marginal cost. This is certainly the case for textiles, where their estimate of the quota premium is taken from the observed market price for the quotas (in Hong Kong), and arguably also the case for

[4]As they state (p. 33): "In real life, foreign supply curves may not be perfectly elastic.... Since the measurement of gains or losses to foreign suppliers is not our main focus, we will adhere to the assumption of perfectly elastic foreign supply curves."

autos.[5] These authors obtain higher estimates of the quota rents in column two, which is explained partly by the quota premium that they use.[6]

Summing the quota rents in column two, we obtain a range of \$7–17 billion. Adding the deadweight losses from the column of Table 1, we obtain an estimate of \$15–30 billion as the cost to the U.S. of its own protection, which can be compared to 1985 U.S. GNP of \$4 trillion. Thus, the costs we have identified do not exceed three-quarters of one percent of GNP. Despite the fact that the quota rents we have used may overstate the U.S. costs in some cases, we would still treat three-quarters of one percent as a lower bound to the actual losses from protection in the U.S., for the reasons discussed above: rent-seeking, market power, effects on growth, and so on. To this list, we can add one other factor often resulting from the application of quotas, with potential costs to the U.S.: the upgrading of imports.

Since U.S. import quotas apply to the quantity sold by foreign firms, a common reaction of the firms is to increase the value of the goods which they send. There are two different arguments for why this phenomena might occur. Under the first (Falvey, 1979), a foreign firm selling multiple types of a product —say, steel—will face a limit on the total tonnage sold in the United States. To maximize profits, the firm will ensure that it earns the same quota premium on the marginal ton of each product sold, regardless of whether that ton is steel bars or speciality steel. This means that each ton will have the same *dollar* premium due to the quota, which corresponds to a lower *percentage* price increase on the highly-processed units. Under reasonable assumptions about the elasticity of demand for various products, relative sales will shift towards the more highly-processed units after the quota.

In principle, the U.S. welfare costs of the quota could be measured by applying Figure 1 to each type of steel imported, and no special adjustment for the upgrading would be needed. In practice, however, the U.S. costs are always measured at a more aggregate level (that is, for total steel imported from each country), and this approach misses entirely the shift in the composition of demand across imports types. Boorstein and Feenstra (1991) have argued that an additional welfare cost can be attributed to this upgrading, and that for U.S. import restrictions on steel from 1969–74, the losses due to upgrading are

[5]Feenstra (1988) estimates the quota premium in autos by pooling data on car and truck imports from Japan, where the latter were subject to a 25 percent tariff. He finds that annual changes in the truck prices, net of the tariff, provide an acceptable estimate of the quota-free changes in car prices. In addition, the evidence from Feenstra (1989) is that Japanese firms absorbed about one-third of the tariff in trucks, meaning that the net of tariff price (P_2 in Figure 2) was lower than that of the free trade price (P_0).

[6]In addition, de Melo and Tarr (1990) include "rents" earned by foreign suppliers of textiles or autos who were not covered by the quota agreements, but who nevertheless increased their prices to the United States. Such price increases by "uncovered" suppliers can be explained by a rise in their costs as they expand production for sale to the U.S., or as an exercise of their market power in the quota-restricted market. In either case, the price increase should be counted as a cost to the U.S. economy.

comparable in magnitude to the conventional deadweight loss. Since changes in the composition of imports due to U.S. quotas have been observed in a number of other industries, including footwear and textiles and apparel, we would expect losses in these cases as well.

A second argument for why upgrading might occur focuses on the quality choice for each particular product, rather than the composition across products. For example, U.S. imports of autos from Japan experienced very dramatic increases in their size, horsepower, and luxury equipment as a result of the "voluntary" export restraint. Feenstra (1988) finds that these additional features added about $1,500 to the average value of Japanese cars over the period 1981–85. Note that this quality upgrading has been *omitted* from the quota premium used in column two of Table 2, and also from the losses in column one. Winston and Associates (1987) find that the deadweight loss to the United States due to the import restriction was about $2 billion, where this amount includes the loss caused by *both* the price and quality changes. Unfortunately, an estimate of the loss due to quality upgrading alone is not reported.

When imports are upgraded through the addition of quality characteristics, it is difficult to make a sharp distinction between the efficiency costs to U.S. consumers and to foreign firms: the upgrading can also be viewed as a form of rent-seeking activity by foreign firms. We shall return to a discussion of the auto case below, after considering the foreign deadweight losses in other industries.

Foreign Deadweight Losses

While foreigners earn the rents from nearly all U.S. quotas, it does not necessarily follow that these firms prefer to have the restrictions in place. When the quotas limits are very tight, the premium that foreign firms earn on sales to the U.S. may not compensate for the sales they have lost, as was explained earlier in Figure 2.

The textile and apparel industry is one case where countries supplying to the United States do suffer from U.S. import restrictions, despite collecting the quota rents. Trela and Whalley (1990) calculate that all developing countries lose $8 billion from the quotas and tariffs applied to textiles by the industrial countries. The reason for this very large loss is the restrictiveness of the MFA quota and tariffs. In earlier work, Trela and Whalley (1988) report that the losses to developing countries from just the U.S. import restrictions are about one-half as large, or $4 billion.[7] This amount represents the area $F - C$ in Figure 2, and therefore underestimates the deadweight loss F.

Moreover, the loss to the developing countries grows if the calculation includes the internal costs of allocating the quotas among suppliers. Trela and

[7]The figure reported in Trela and Whalley (1988) for the losses to developing countries from the U.S. MFA restrictions is actually $6.9 billion, while the losses due to the MFA restrictions in all developed countries was $11.3 billion. The latter estimate was revised downward to $8 billion in subsequent work, but the effect of the U.S. restrictions alone was not calculated again.

Whalley (1991) describe how the allocation schemes within the developing countries creates losses by not granting export licenses to the most efficient producers, and by requiring that exporters with licenses send some of their product to non-quota countries.[8] Including these efficiency costs, the total losses to the developing countries of the Multi-Fiber Arrangement are estimated as $31 billion. The costs from U.S. restrictions alone might be half this amount (as in Trela and Whalley, 1988), which is the basis for the estimate in the third column of Table 1.

The U.S. quotas on sugar may also be so restrictive that foreign countries do not gain, despite receiving the quota rents. Leu, Schmitz, and Knutson (1987) calculate that the foreign deadweight loss is about $200 million. Again, the drop in foreign producer surplus roughly equals the quota rents, so that supplying countries are not gaining from existing quotas. As the authors note (p. 597): "Interestingly, while countries holding sugar quotas once favored a restrictive U.S. sugar policy which generated high quota rents, in lobbying activities related to the 1985 farm bill, they joined with sugar users and consumers groups in support of lower sugar prices as a means of maintaining a market for sugar in the United States."

For both sugar and textiles and apparel, foreign countries do not benefit from U.S. import quotas; in fact, the losses from greater inefficiency may even exceed the quota rents they receive. For other industries listed in Table 1, there is evidence of costs to foreigners through the upgrading of imports, or through the allocation of quotas which attempts to control this upgrading. Rodriguez (1979) argues that the upgrading of imports has an efficiency cost on foreign firms, for the following reasons.

Consider a firm that is choosing the level of some quality characteristic (such as horsepower) to include in its product. In a competitive market with free trade, it can be argued that the firm will choose the level of quality that can be produced with minimum average cost.[9] If the sales of the firm are restricted by an import quota, however, it will have an incentive to raise the quality level, since this will allow it to increase the sales value and quota rents earned on each unit. This means that the quality level is no longer chosen to minimize average costs, and so the firm has some technological inefficiency. This inefficiency is caused by the attempt to increase rents, and in this sense, is analogous to other forms of rent-seeking activity.

To quantify this efficiency cost for Japanese auto imports, we would need to have evidence on the cost function of Japanese producers, and the extent to which the quality upgrading raised the average costs of producing each characteristic. In the absence of this information, we simply use the total amount of

[8]This scheme creates an efficiency cost through encouraging firms to sell to non-quota countries at less than marginal cost. See Bark and de Melo (1988), who also cite evidence that this type of scheme applies to Korean exports of footwear and steel to the United States.

[9]Of course, the competitive case may not be the most appropriate for autos, and the monopoly case has been analyzed by Krishna (1987).

upgrading—$1,500 per car (Feenstra, 1988) times 2 million imports—as an upper bound on the waste of resources associated with adding the extra equipment. Thus, the range $0–3 billion is included as a foreign efficiency cost in the third column. As discussed above, it is difficult to separate the foreign and U.S. losses due to upgrading in this case. The important point is that some additional cost from column three should be added to the U.S. deadweight loss in column one to obtain the global efficiency cost.

Costs of upgrading have also been estimated for the quotas on U.S. cheese imports by Anderson (1985). He finds that the U.S. deadweight loss due to the quota-induced shift in the composition of demand across products (the first reason for upgrading discussed above) is very small at $0.4 million. However, he also finds that the allocation of the quotas across countries promotes supplies from less efficient producers, which results in an excess cost of $22 million, as reported in Table 1. This amount should be treated as a foreign efficiency cost, and would need to be added to the U.S. deadweight loss to obtain the global cost.

In the steel industry, Boorstein (1987) finds that the very detailed, country-by-country allocation of these quotas by the U.S. has led to an increase in the share of supplies from less efficient producers. She argues that this allocation can be seen as an attempt to prevent the upgrading of steel imports which had occurred earlier, particularly in product lines competing closely with U.S. production. Over the 1983–85 period an index of supplier prices rose by 2.3 percent due to this (mis)allocation of quotas. These price increases correspond to a foreign efficiency cost of $110 million, as shown in Table 1, which is also a global loss.[10]

Summing the foreign losses in column three we obtain $4–19 billion, which is comparable to the range of the total quota rents. The implication is that total global losses (columns 1 + 3) are no smaller than the total U.S. losses (columns 1 + 2). Of course, the foreign losses are dominated by the estimates in textiles and apparel, and need to be treated as more tentative than other losses in Table 1. Nevertheless, from the evidence we have presented it is apparent that foreign losses due to U.S. protection are pervasive, and cannot be ignored in any estimate of the global losses.

Foreign Investment

No discussion of the costs of protection would be complete without mentioning the increasing levels of investment by foreign firms within the U.S. economy. The annual value of U.S. businesses acquired or established by

[10]The foreign supplier prices used by Boorstein (1987) actually include the quota rents, so for steel there is some double-counting between the losses in column three and the quota rents in column two.

foreign investors reached $72.7 billion in 1988, while declining slightly to $64.4 billion in 1990. Japan has now replaced the United Kingdom as the largest source country of new direct investment, with 1990 outlays of $20.5 billion (Fahim-Nader, 1991). A rise in foreign investment is intertwined with the costs of protectionism for several reasons.

Most obviously, foreign investment can be motivated by anticipated or actual trade restrictions, as a means of "defusing" the protectionist sentiment. From a global point of view, of course, this sort of "quid pro quo" foreign investment (Bhagwati, 1986, 1988) would not reflect the most efficient choice of location, and so would have some deadweight loss for this reason. The evidence that investment with this motive has occurred in a number of U.S. industries during the 1980s is anecdotal at present, but plausible.[11]

On the positive side, however, investment attracted into industries protected by quotas will increase supplies within the United States, reduce import demand, and thus lower the quota premium earned by firms exporting to the United States.[12] In the auto industry, for example, de Melo and Tarr (1991) reduce their estimated cost of protection by $0.5 billion due to Japanese investment up to 1984. In addition, foreign investment would have additional benefits if it raises local wages or employment, regardless of protection in the domestic industry.

Increasing foreign investment in the U.S. also raises the issue of special regulations applying to these firms. Beyond rules for the reporting of acquisitions, it may seem obvious that foreign-owned firms would be subject to essentially the same regulations as their U.S. counterparts. However, in one surprising and little known case, an import tariff was applied to a foreign-owned firm producing within the United States. This case illustrates the potential for manipulation of U.S. trade laws to suit the goals of domestic firms and regulators.

The case involves the temporary tariff on heavyweight motorcycle imports to the United States that was in effect from 1983–87. This tariff was put in place to protect the only U.S. producer—Harley Davidson—on the grounds that several Japanese producers had large U.S. inventories, and this was judged to be a "threat of serious injury" to the domestic industry (U.S. International Trade Commission, 1983). Since several countries other than Japan supplied heavyweight motorcycles to the United States, the tariff was applied to all of them, but only for imports in excess of a quota limit specified for each country.

[11]The following sort of press report is common and suggestive: "Fearful of trade friction, the Communications Industry Associations of Japan, a trade group, has cautioned its members to avoid explosive increases in exports and to build factories in the United States, according to Haruo Ozawa, its president. 'We have learned lessons in the experience with automobile exports to the United States and semiconductor exports to the United States,' he said in an interview" (*The New York Times*, June 2, 1984).

[12]Note that this reasoning would not apply if the domestic industry was protected with a tariff, since foreign investment may then lower welfare of the host country; see Brecher and Diaz-Alejandro (1977).

However, only for Japan was the quota set low enough to result in any tariff duties being collected.

Moreover, even production by Japanese firms within the United States came under the tariff. During this time, Honda and Kawasaki operated plants in the Midwest to produce motorcycles, both for the United States and abroad. Like much other foreign investment in the United States, these plants were in Foreign Trade Zones, which is a tax status allowing producers to import parts duty-free when the final goods are intended for export. If instead the final goods are sold in the United States, the firms are normally allowed to pay either the tariff on the imported parts, or the tariff on the final good, whichever is less. However, for the U.S. sales of heavyweight motorcycles from the Honda and Kawasaki plants, the U.S. Trade Representative directed that these firms pay the full tariff on the sales of every motorcycle (U.S. International Trade Commission, 1987, Appendix E).

While this is only one case, it does illustrate the potential for discriminatory policy against foreign producers in the United States. Other examples of how U.S. regulations can be manipulated around the issue of foreign investment include: the differential treatment of cars as either domestic or imported, to satisfy U.S. fuel-economy standards and the import quota with Japan; and the recent squabble over whether cars imported from Canada have 50 percent "North American content," and are therefore entitled to duty-free access.[13] The usual view of protection as applying to imports needs to be broadened to incorporate foreign investment. The magnitude and growth of foreign investment has led some to suggest that it will be a more important focus of trade policy than import competition in the years ahead.

Trading Regions

A founding principle of the General Agreement on Tariffs and Trade (GATT) was that all signatories should have "most-favored-nation" status, which means that they should be treated equally when a member country applies any trade restriction. However, exceptions to this principle are becoming more frequent. GATT includes exceptions for agriculture and textiles and apparel, and the quotas in these areas discriminate across supplying countries. The use of "voluntary" export restraints in autos and steel by the U.S. and European countries also discriminate against particular suppliers, with Japan and other Asian exporters frequently being singled out. These export restraints are outside of the GATT framework, but even for actions which follow the GATT guidelines discrimination against particular importers is sometimes achieved, as illustrated by the discussion of U.S. motorcycle imports.

Against the backdrop of these protectionist actions in specific industries, certain groups of countries have been moving toward freer trade within regional areas: Canada and the United States agreed to a free trade area in

[13]*The Wall Street Journal*, November 11, 1991, p. A1; and February 19, 1992, p. A16.

1988 and negotiations are now underway to extend this agreement to Mexico, creating a North America Free Trade Area; barriers to trade within Europe are being dismantled by 1992; and Japan may be creating an economic sphere of influence among its Asian neighbors. While reduced trade barriers in each of the regional areas holds the prospect of gain for the member countries, significant costs may also result if the regional trading areas take steps to reduce or eliminate trade with outside countries.

There are two reasons why the formation of trade regions may lead to efficiency losses. First, as described some years ago by Viner (1950), if two countries form a free trade area but maintain tariffs against the rest of the world, their combined income can fall rather than rise. This is because the additional trade from a partner country can occur at higher costs than the goods were formerly produced at abroad: Viner called this "trade diversion," and it would also imply a loss for the outside country that has reduced demand. In contrast, if the free trade area leads to increased trade from a partner country when the goods were formerly produced at higher costs domestically, then "trade creation" has occurred, and it is likely that both countries gain.

A second reason that the formation of trading regions can be harmful is that each region will have greater influence over world prices than did the individual countries, and may be tempted to apply an external tariff to exploit this monopoly power in trade. Krugman (1991a, b) finds that the potential for protectionist action is greatest when the number of trading regions falls in an intermediate range, and for the simulations he presents, the number that minimizes world welfare is three regions! Despite this negative result, he argues that the costs from protectionist actions across the regions may not be that large.

As an example, Krugman (1990) considers a hypothetical trade war between three trading regions, one centered on the United States, one on Europe, and one on Japan. If each region applied a 100 percent tariff on imports from the other, and this restricted trade by one-half, he then suggests the following calculation of global deadweight losses (p. 105):

> With a 100% tariff, some goods would be produced domestically even though they could have been imported at half the price. For these goods, there is thus a waste of resources equal to the value of the original imports. ... Our three hypothetical trading blocs would, however, import only about 10 percent of the goods and services they use from abroad even under free trade. A trade war that cut international trade in half, and which caused an average cost of wasted resources for the displaced production of, say, 50 percent, would therefore cost the world economy only 2.5 percent of its income (50 percent × 5 percent = 2.5 percent).[14]

[14] In terms of Figure 2, suppose that the foreign supply curve S^* is horizontal. Then if the value of imports P_0M_0 under free trade is 10 percent of world GNP, and the price P_1 is twice P_0 while M_1 is one-half of M_0, it follows that the global deadweight loss $B + D$ equals 2.5 percent of world GNP.

However, this calculation contains an implicit assumption: that the tariff applies to all goods imported from the other trading regions. In view of the selective pattern of current protection against particular industries and supplying countries, it is more relevant to consider a case where trade in one-half of the products from other trading regions is eliminated, while the other half of trade is unaffected. Under this scenario, what would the costs of the trade war be?

To tackle this question, we can use a model of trade with monopolistic competition, as in Krugman (1980). We suppose that each good is produced in many different varieties, which can be either imported or purchased from domestic firms. Consumers do not treat these product varieties as identical, but the expenditure on each variety does fall as its price increases. A decrease in the number of varieties imported from outside the region, as could occur through a trade war, lowers the welfare of each consumer. Our approach is to compare the initial equilibrium with a situation where the import varieties for one-half of the traded goods are not available, but the prices and availability of all other goods are unchanged.[15]

In this framework, the size of the welfare loss will depend on what proportion of income is spent on the varieties that are eliminated, and on the degree of substitution between the imported and domestic varieties. One can derive a simple expression in which the change in the cost of living due to the elimination of import varieties is proportional to the share of income originally spent on those varieties, and inversely proportional to the elasticity of substitution minus one.[16] The elasticity of substitution measures the degree to which consumers are willing to substitute between varieties of traded goods as their prices change, and various estimates are available. For U.S. and imported varieties of autos, Levinsohn (1988) finds elasticities from 1.3 to 2.3. Using data for disaggregated steel and textiles products, elasticities from 1.2 to 4.5 are obtained (Grossman, 1982; Feenstra, 1991), where each country importing to the U.S. is treated as a distinct variety.[17]

[15]This second situation may not be an equilibrium, but can still be used to isolate the drop in welfare due to the elimination of the import varieties. In this second situation, there would be an incentive for domestic firms to expand the range of product varieties to sell in the protected regional market, but an offsetting incentive to contract the range of varieties due to lost export sales. We are ignoring both of these influences.

[16]At a more formal level, the calculation proceeds like this. A reduction in the number of varieties would raise the cost of living—or true price index—for consumers. Let P denote the price index corresponding to the preferences with a constant elasticity of substitution between varieties, denoted by σ. Assume that $\sigma > 1$. Suppose that the share of total expenditure going to the import varieties which will no longer be available is s_m. Then the increase in the cost of living due to the reduction in product varieties is given by $P = (1 - s_m)^{-1/(\sigma-1)}$ (Feenstra, 1991). Thus, the increase in the price index facing consumers is higher if the share of imports that are eliminated (s_m) is larger, or if the elasticity of substitution σ is smaller. Conversely, as the varieties become perfect substitutes so that σ is very large, then the price index P approaches one: the consumer is not affected by the elimination of the imports when they are perfect substitutes with domestic varieties. A slightly simpler form of the equation is obtained by taking logarithms of both sides, and using an approximation which holds when s_m is small: $lnP \approx s_m/(\sigma - 1)$. This approximation is the one referred to in the text.

[17]Note that these estimates are higher than those compiled by Shiells, Stern and Deardorff (1986), which include many elasticities which are less than unity, and are therefore inconsistent with

Measuring the elasticity of substitution for every variety of every good and calculating the amount of variety eliminated by various trade barriers is obviously an enormous task. The simple calculations presented in this section use two shortcuts. First, I use a single elasticity of substitution for the product varieties of every import, although presenting a range of estimates. Second, I suppose that imports from various countries represent different product varieties, which ignores the possibility that some countries produce more similar product varieties than others.

Using only the member countries of GATT, the world was divided into three trading regions: North and South America; Europe and Africa; Asia and Oceania.[18] The share of regional income spent on trade with the other regions for 1988 was calculated using the system of Real National Accounts from Summers and Heston (1991) and the "direction of trade" statistics in GATT (1990). With the world divided in this way, more than half of international trade is internal to the three regions: total trade is 20 percent of world income, while trade with other regions comprises 8 percent of world income. The extent of trade between regions, as a share of each region's income, is shown in column one of Table 2.

The rest of Table 2 presents estimates based on eliminating one-half of the trade between regions, and considering values of 1.5, 2 and 3 for the elasticity of substitution. These calculations give a range 2 to 8 percent for the decline in world welfare caused by the reduction in product varieties available.[19] Thus, estimates at the lower end of this range are close to Krugman's (1990) 2.5 percent loss, but at the upper end of the range the costs are several times larger. Of course, the exact magnitude is quite sensitive to the elasticity of substitution that is used, with lower costs corresponding to the case where consumers gain little from additional product variety.

The estimates presented in Table 2 probably understate the costs of a trade war, however, since they include only the impact on consumers of reduced product variety. There would also be efficiency losses on the production side, and these losses could be substantial if there were economies of scale in production. Computable models incorporating economies of scale were developed to assess the gains from the Canada-U.S. Free Trade Agreement, and the results from these can give us some idea of the order of magnitude of the production efficiency effects.

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pricing under monopolistic competition. These low estimates may arise because many studies first aggregate import countries into groups, and then estimate the elasticity of substitution between the groups of countries. This procedure will lead to a downward bias if, in the language of Chamberlin, the elasticity of the *DD* curve rather than the *dd* curve is being estimated. I thank Avinash Dixit for this suggestion.

[18]Oceania includes Australia, New Zealand, and the Pacific islands. Contrary to the way we divided up the regions, in preliminary proposals for an Asian free trade area, Australia and New Zealand have been excluded (Kreinin and Plummer, 1992).

[19]This calculation uses the formula in note 16, where the share of trade eliminated (s_m) equals one-half of the amounts in column one of Table 2.

Table 2
Trade Shares and Costs of Trade War
(percent of income in each region)

	Trade with Other Regions	*Elasticity of Substitution*		
		1.5	*2*	*3*
North and South America	7.2	7.2	3.6	1.8
Europe and Africa	6.4	6.4	3.2	1.6
Asia and Oceania	11.7	11.7	5.8	2.9
World Average	8.0	8.0	4.0	2.0

Sources: Trade shares calculated from Summers and Heston (1991), and General Agreement on Tariffs and Trade (1990).

The initial work of Harris (1984) gave dramatic estimates of the effect on Canadian welfare—national income rose by 6.2 to 8.6 percent—due to the expansion of outputs and resulting fall in average costs due to economies of scale: the so-called rationalization of production. These gains were obtained by avoiding the duplication of fixed costs across firms, as would occur in a protected market, but did not rely on the presence of product differentiation. Instead, the model used a "focal point" pricing rule, under which Canadian firms set their prices equal to the U.S. price plus any tariff.

Later work has relied on the more familiar monopolistically competitive pricing behavior (or segmented markets across the countries), which lowers the estimates of the Canadian efficiency gains. The Canadian Department of Finance (1988) obtained 2.5 percent of Canadian real income as the calculated gains, while subsequent researchers have obtained estimates of 0.6 percent or less (Brown and Stern, 1989). The message from these studies is that the potential gains due to the expansion of firm outputs in larger markets are substantial, though the exact magnitude of this effect is quite sensitive to the assumptions of the model.

Bilateralism or Multilateralism?

This paper has emphasized the substantial costs imposed on foreign countries by U.S. protectionism. These costs result from the highly selective nature of protection in particular industries and against particular exporting countries. Despite rules to the contrary in the General Agreement on Tariffs and Trade, the use of these discriminatory trade restrictions has been increasing in recent years. Perhaps as a result of the perceived failure of GATT to regulate

these actions, the U.S. and other countries have been moving towards the establishment of regional free trade areas, negotiated bilaterally with chosen countries. While holding the promise of significant gains to the countries included in each agreement, this path holds the risk of greater discrimination and losses for the countries excluded.

Economists differ strongly as to whether bilateral negotiations should, or will, be followed. For example, Krugman (1990, p. 131) foresees "the prospect of a fragmentation of the world into mutually protectionist trading blocs—a costly outcome though not a tragic one. Is there a middle way? Perhaps not. It seems likely that the bashers will more or less have their way, and that this decade will be one of growing economic nationalism." In contrast, Bhagwati (1991) argues for incorporating regional agreements more fully into GATT, which would provide some check on the adverse impact on other countries. On the prospects for the current round of multilateral negotiations, he concludes optimistically (p. 96): "The promise of the Uruguay Round is so considerable, and the downside from its failure would be so unfortunate, that it is hard to see an agreement not finally emerging."

A pragmatic path is one that continues to pursue multilateral agreements as a primary strategy, while adding bilateral agreements whenever needed. Richardson (1991) calls this approach "minilateralism," and describes how it has influenced U.S. trade policy in the 1980s. The bilateral agreements should not be seen as an end in themselves, however, since they are not necessarily better from a global point of view than the current system. Indeed, Bergsten (1991) argues that "trade diversion" is actually a *goal* of recent proposals for trading areas rather than an unintended consequence, and that the costs from reduced world efficiency are substantial. The incentives for regional trading areas to restrict trade from outside countries would very likely lead other nations to pursue free trade areas themselves (as the Asian nations are now being led to consider). The challenge for economists is to ensure that the movement towards regional trading areas also creates the dynamics for a multilateral agreement.

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