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The Impact of the Caribbean Basin Economic Recovery Act on Caribbean Nations' Exports and Development: A Comment on Pelzman and Schoepfle's Estimates*

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In a recent article in this journal J. Pelzman and G. Schoepfle (hereafter PS) provide estimates of the trade effects of the Caribbean Basin Economic Recovery Act (CBERA).[1] They use two models to estimate the increase in CBERA export earnings. The first is a traditional partial equilibrium trade creation/trade diversion model and the second is a shift-share model. In the first part of this comment we show that they use an incorrect equation in their partial equilibrium model and that they compound this error by making incorrect use of empirical import demand elasticities. As a result, the estimates they report are not valid. In the second part of the comment, we provide more reasonable estimates of the economic impact of the CBERA.

I. Estimating Methodology

Pelzman and Schoepfle set forth a standard partial equilibrium model to estimate the trade impact of the CBERA. This model results in the simple equation (p. 778):

$$R^* = \eta\,[(1 + \epsilon)/(\epsilon - \eta)]t^*, \qquad (1)$$

where R^* is the percentage change in CBERA export earnings resulting from tariff preferences, η is the U.S. elasticity of demand for imports from CBERA countries (defined as negative), ϵ is the elasticity of supply of CBERA exports to the United States, and t^* is the percent-

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age change in price resulting from the preferential tariff reductions (i.e., $t^* = -T/[1 + T]$, where T is the ad valorem tariff rate).[2] R^* ranges in value between $-t^*$ (for $\epsilon = 0$) and ηt^* (for $\epsilon = \infty$); since t^* and η are both negative, R^* must be positive (except in the extreme case of $\eta = 0$).[3] More will be made of this point later when we discuss their actual estimates.

Citing difficulties in obtaining reliable estimates of ϵ and η, PS estimate the impact of the CBERA using their equation (p. 780):

$$\Delta M = M\eta t^*, \tag{2}$$

where M is the value of U.S. imports from CBERA and η is now the U.S. aggregate import demand elasticity (i.e., from all supplying countries rather than just CBERA countries).[4] They claim that equation (2) is a reduced-form equation derived from their initial partial equilibrium model. In fact, it is the traditional equation used to estimate the trade creation effects of preferential tariffs; it does not include trade diversion.[5] Thus, their estimates of "gross trade creation" include only the net increase in U.S. imports from CBERA; they do not include the extent to which preferential tariffs result in imports from CBERA displacing imports from other countries. As such, the PS estimates are biased downward. We now turn to the actual estimates reported by PS.

Using equation (1), PS calculate (p. 782) that trade expansion would be $24.7 million if the CBERA supply elasticity were zero. With the bounds for equation (1) as discussed above, this figure will understate (overstate) the true gross trade expansion effects if the own-price elasticity of U.S. demand for imports is greater than (less than) unity. Pelzman and Schoepfle go on to estimate the upper bound estimates using Stern's "best guess" elasticity estimates plus or minus one standard deviation.[6] The results of this exercise are reproduced in table 1. Although it is impossible for a preferential tariff program to cause imports from preferred countries to decrease, assuming normal sloping demand and supply curves (under such conditions the CBERA countries would refuse to use CBERA preferences and continue to send goods to the United States under normal tariff treatments), PS nevertheless report negative estimates of gross trade creation for 10 CBERA countries.[7] In fact, their low-range estimates for all CBERA countries combined is a negative $164 million—a decline in CBERA exports to the United States of more than 100%. This is truly an absurd result. Instead of examining these results for reasonableness, they simply added, or allowed the computer to add, one standard deviation to the demand elasticity estimates even if the result is an upward sloping demand curve, thereby producing negative impact estimates.

TABLE 1

ALTERNATIVE ESTIMATES OF THE EFFECTS OF THE CBERA, 1983
(Thousands of U.S. Dollars)

SIC CODE AND DESCRIPTION	PELZMAN-SCHOEPFLE Low	PELZMAN-SCHOEPFLE High	BALDWIN-MURRAY Trade Creation	BALDWIN-MURRAY Trade Diversion	BALDWIN-MURRAY Total
01—Agricultural products	$ 2,088	$ 2,611	$ 2,350	$ 402	$ 2,752
08—Forestry products	6	8	7	3	10
09—Fishery products	2	2	2	3	5
20—Food products	789	1,818	1,304	54	1,358
21—Tobacco products	(27,028)	43,557	8,265	38	8,303
24—Lumber and wood products	63	103	83	8	91
25—Furniture and fixtures	0	1	1	0	1
28—Chemicals	23	29	26	2	28
29—Petroleum refinery products	11	35	23	2	25
32—Stone, clay, and glass	18	72	45	4	49
33—Primary metal products	587	855	721	161	882
34—Fabricated metal products	1	1	1	0	1
35—Machinery, except electrical	4	7	6	1	7
36—Electrical machinery	(141,335)	216,710	37,688	9,159	46,847
37—Transportation equipment	(1)	2	1	0	1
39—Miscellaneous manufactures	510	1,096	803	408	1,211
Total	(164,262)	266,907	51,326	10,245	61,571

SOURCES.—See n. 9.

II. Trade Benefits of the CBERA

In table 1 we provide reestimates of the results reported in table 11 (p. 794) of PS. The first two columns are a replication of PS's low and high estimates by two-digit SIC code and in total. The third column contains correct estimates of trade creation. These estimates were calculated by using PS's "best" estimates, which are an average of their low and high estimates. This represents a reasonably accurate measure of trade creation. The Baldwin and Murray method was used to obtain the estimates of trade diversion shown in the fourth column.[8] The correct total effects of the CBERA are shown in the final column, which is the sum of trade creation and trade diversion.

Pelzman and Schoepfle's total estimates of "gross trade creation" range from a negative $164.2 million to a positive $266.9 million. In percentage terms this works out to a range of negative 104% to a positive 169%.

A corrected estimate of total trade creation is calculated to be $51.3 million. Using the Baldwin and Murray technique, our estimate of trade diversion is $10.2 million.[9] The estimated total impact of the CBERA on exports from the region is $61.6 million. These corrected estimates would represent a 33% increase in exports from the CBERA countries due to trade creation and a 6% increase due to trade diversion. The projected overall increase of 39% would seem to be a more reasonable estimate of the effects of the CBERA than the PS estimates.

III. Conclusions

All estimates of changes in trade flows caused by tariff reductions are of necessity "rough orders of magnitude." Some estimates, however, are rougher than others. The original estimates presented by PS range from the totally implausible (a drop in CBERA countries exports) to the merely unlikely (exports more than double). Since the results reported by PS are based on the misapplication of an inappropriate model, this is not surprising. The corrected estimates presented here indicate that the exports of the CBERA countries may rise by approximately $51.3 million due to trade creation and $10.2 million due to trade diversion. These results are both conceptually correct and, unlike the PS results, are at least plausible.

Notes

* We would like to thank Tracy Murray and Don Rousslang for comments on an earlier draft. The usual caveat applies.

1. J. Pelzman and G. Schoepfle, "The Impact of the Caribbean Basin Economic Recovery Act on Caribbean Nations' Exports and Development," *Economic Development and Cultural Change* 38 (July 1988): 753–96.

2. Subscripts denoting countries and commodities have been suppressed.

3. Pelzman and Schoepfle address the sensitivity of their estimates of R^* to values of η and ϵ using a table on p. 780. A table very similar to this was used by D. Rousslang and J. Lindsey, "The Benefits to the Caribbean Basin Countries from the U.S. CBI Tariff Eliminations," *Journal of Policy Modeling* 6 (1984): 513–30.

4. Pelzman and Schoepfle state, "Consequently the analysis assumes that import elasticities estimated for total U.S. imports also represent the response of domestic buyers to changes in the price of imports from the CBERA nations" (pp. 780–81). This assumption is not a neutral one. The aggregate U.S. import demand is less elastic than the average of U.S. demands for imports from individual countries or country groups if imports from these different sources are substitutes for each other, which is the reasonable assumption. Thus, PS need some justification for their implicit assumption that the U.S. demand for imports from CBERA nations is less elastic than the average of U.S. demands for imports from other sources. Stated this way, their implicit assumption seems quite implausible, particularly since it is applied uniformly across all products.

5. For a recent detailed examination of the partial equilibrium model to estimate trade creation and trade diversion generated from preferential tariff reductions, see W. C. Sawyer and R. L. Sprinkle, "Alternative Empirical Estimates of Trade Creation and Trade Diversion: A Comparison of the Baldwin-Murray and Verdoorn Models," *Weltwirtschaftliches Archiv* 125 (1989): 61–73.

6. The source of these elasticities is confusing. The note to table 10 refers to Stern's "best guess" elasticities, which presumably come from R. M. Stern, J. Francis, and B. Schumacher, *Price Elasticities in International Trade: An Annotated Bibliography* (London: Macmillan, 1976). However, these elas-

ticities do not come with standard deviations. "Best guess" estimates from Stern et al., updated elasticities estimates, and standard deviations for these latter estimates are presented in table 4 (p. 515) of C. R. Shiells, R. M. Stern, and A. V. Deardorff, "Estimates of the Elasticities of Substitution between Imports and Home Goods for the United States," *Weltwirtschaftliches Archiv* 122 (1986): 497–519. On the other hand, in n. 10, PS attribute the elasticity coefficients to Baldwin and to Shiells, Stern, and Deardorff.

7. See their table 10, p. 783.

8. See R. E. Baldwin and T. Murray, "MFN Tariff Reductions and Developing Country Trade Benefits under the GSP," *Economic Journal* 87 (1977): 30–46. For an application of the Baldwin and Murray technique in the context of the CBERA, see W. C. Sawyer and R. L. Sprinkle, "Caribbean Basin Economic Recovery Act: Export Expansion Effects," *Journal of World Trade Law* 18 (September–October 1984): 429–36.

9. Data to calculate trade diversion were obtained from selected issues of the following sources: U.S. Department of Agriculture, Economic Research Service, *U.S. Foreign Trade Agriculture Statistical Report* (Washington, D.C.: Government Printing Office, 1987); U.S. Department of Commerce, Bureau of the Census, *Annual Survey of Manufactures: Value of Shipments* (Washington, D.C.: Government Printing Office, 1988); U.S. Department of Commerce, Bureau of the Census, *U.S. Exports/Domestic Merchandise SIC-Based Products by World Area,* Report no. 610 (Washington, D.C.: Government Printing Office, 1987); U.S. Department of Commerce, Bureau of the Census, *U.S. Imports for Comsumption and General Imports SIC-Based Products by World Area,* Report no. 210 (Washington, D.C.: Government Printing Office, 1987); U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* (Washington, D.C.: Government Printing Office, 1987); U.S. Forest Service, *U.S. Timber Production, Trade, Consumption, and Price Statistics* (Washington, D.C.: Government Printing Office, 1985); and U.S. National Oceanic and Atmospheric Administration, National Fisheries Service, *Fishery Statistics of the United States* (Washington, D.C.: Government Printing Office, 1987).