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THE USE OF EFFECTIVE TARIFFS

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Use of effective tariffs

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I

In the last few years economists have rediscovered the idea that lowering an import duty on one commodity may increase the amount of protection received by producers of a second commodity.[1] As Meade put it in 1955, "suppose that the Netherlands removes a duty upon the import of German steel without removing a duty upon the import of German machine tools. The reduction in the price of steel in the Netherlands might so reduce the costs of production in the Dutch machine-tool industry that there was some expansion of that industry and so some reduction in the Dutch imports of German machine tools."[2] Hal Lary[3] points out that the Austrian economist and former undersecretary of state, Richard Schüller, presented a concise presentation of the present theory of tariff structures in 1905 in Schutzzol and Freihandel. Taussig illustrated the effects of the U.S. tariff of 1824, which increased the tariffs on both raw wool and

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[1] I have benefitted from discussion of this problem with David Humphrey, John Power, and several members of the Economic Growth Center. I am indebted to several people for letting me use their work in manuscript form and/or for supplying me with their work sheets. Melanie B. Weaver and Susan Eggers ably did the computer work. Errors are my responsibility.

[2] J.E. Meade, The Theory of Customs Unions (Amsterdam: North-Holland Publishing Company, 1955), p. 103.

[3] Hal B. Lary, Imports of Manufacturing from Less Developed Countries (New York: National Bureau of Economic Research, 1968), p. 119.

woolen goods, by calculating the "net protection," which uses selling price of woolen goods as the denominator. Wool, writes Taussig, comprises about one-half the cost of woolen goods and had a tariff of 30 percent, with woolen goods having a tariff of 33 1/3 percent. The net protection is, therefore, 18 1/3 percent on woolen goods; the effective protection (using value added as the denominator) would be 36 2/3 percent. Prior to the 1824 increase in tariffs, the net protection, according to Taussig, was 17 1/2 percent (and the effective protection, therefore, 35 percent), with wool having a tariff of 15 percent and woolens a tariff of 25 percent.[1] In the early 1940's Felix Weil discussed "protectionism in reverse" in Argentina and gave several pages of examples where the "tariff handicaps domestic industry...duties on raw materials are often higher than those on finished or semi-finished goods made from them."[2]

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[1] F.W. Taussig, The Tariff History of the United States, 8th edition (New York: G.P. Putnam's Sons, 1931), p. 75.

[2] Felix J. Weil, Argentine Riddle (New York: the John Day Company, 1944), p. 138. I owe this reference to Carlos Diaz Alejandro, whose recent study concludes "the admittedly partial evidence presented suggests that cases of negative effective protection in the Argentine tariff have been grossly exaggerated." Carlos F. Diaz Alejandro, "The Argentine Tariff, 1906-1940," Oxford Economic Papers, (March 1967), p. 87.

There is some evidence that many businessmen also understand that an industry can increase the amount of protection it receives by obtaining a reduction in certain tariff rates. For example, in Panama the law (of 1957) to promote industrial development indicates that protection to an industry can be given either by raising the tariff on its product or by reducing the tariffs on its inputs. Tariff increases require the approval of the National Assemply; tariff reductions require only Cabinet approval. Between 1957 and 1962, 139 firms in Panama received exemption from tariffs, and only 81 firms obtained higher tariffs on their output.[1] Barber reports in 1955 that in Canada "the sophisticated tariff expert no longer seeks to have the tariff on his product increased but tries instead to obtain duty reductions on parts and components that will increase his industry's effective protection.... While our government's tariff experts are undoubtedly aware of the distinction I have made between the effective and apparent level of protection provided by a tariff rate, there is some reason to doubt whether they fully appreciate its importance."[2]

Recent research, besides helping to clarify some of the theoretical problems and supplying the label "effective protection" (or "implicit protection"), has attempted to measure the extent to which a country's entire collection of tariffs actually protects the value added of a specific industry. The measurement of tariff levels can be of two practical uses: as a means of comparing the level of protection among various countries (either on the "average" or for a specific industry) and as a way of studying the effect of the tariff structure on resource allocation within a country. Section II discusses the first use and Section III the second use.

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[1] Fiscal Survey of Panama (Johns Hopkins Press, 1964), p. 173.

[2] Clarence L. Barber, "Canadian Tariff Policy," The Canadian Journal of Economics and Political Science, 21 (November 1955), pp. 524-529.

II

There are several problems with comparing effective tariffs among countries. First, such a comparison is of little value unless one is prepared both (i) to assume that each country's present exchange rate is in equilibrium with its present tariff system and (ii) to specify how the country would adjust its exchange rate (or monetary and fiscal policies) to the changes in foreign trade flows that would occur if the tariff level were changed.[1] This point, of course, is equally valid for comparing nominal tariffs.

Second, the numerical estimates of the level of effective tariffs are very sensitive to, among other things, the treatment of non-traded inputs. While Balassa's study treated them as traded inputs with a zero tariff, Corden argues they should be included in "value added" because they are not in infinitely elastic supply to domestic producers (as are imports). The elasticity of supply of both non-traded inputs and factors of production depends on the proportion of the country's economy being studied. Skilled labor or electric power may be in very inelastic supply for the entire industrial sector while at the same time being in very elastic supply for one industry. The results of a study originally designed to examine a country's total "average" industrial structure would not, therefore, be appropriate for examining the question, say, of encouraging the expansion of a single industry.

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[1] Corden discusses the theoretical reasons for presuming that the exchange rate would change. W.M. Corden, "The Structure of a Tariff System and the Effective Protective Rate," Journal of Political Economy, LXXIV (June 1966). Basevi has derived a formula for the change in the exchange rate that would leave the balance of trade unaltered as the average effective tariff changes. Girogio Basevi, "The Restrictive Effect of the U.S. Tariffs," American Economic Review (September 1968), pp. 840-852. While Balassa is aware of the problem in his empirical study, he assumes that exchange rates and domestic prices remain unchanged. Bela Balassa, "Tariff Protection in Industrial Countries: An Evaluation," Journal of Political Economy (December 1965) reprinted in Readings in International Economics, eds. Caves and Johnson (Richard D. Irwin, Inc., 1968), p. 580.

The effective tariff of industry I--E_i--depends on value added by industry i when its inputs and output are valued at world prices[1] --WV_i--and on actual value added by industry i in the country being studies--DV_i. Then the formula is

$$E_i = \frac{DV_i - WV_i}{WV_i} \qquad (1)$$

Using this formula, several investigators have found rather extreme positive and negative values for the effective tariffs of some industries. For example, in Korea, effective tariffs were found to range from 56,386 percent to -5,375 percent.[2]

A very large positive value for an effective tariff simply means that the tariff structure allows a large domestic value added in an industry that has small value added in the rest of the world, e.g., the value added by the "pill packing" industry may be very small in the world, but a developing country may allow the industry to import vitamin pills in bulk at world prices, put them in bottles, and sell them at a domestic price greatly above the world price of bottled vitamin pills.

An effective tariff of less than -100 percent implies that WV_i is negative, i.e., that the value of the industry's output, valued at world prices, is less than the value of its purchased inputs, valued at world prices.[3] Basevi

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[1]Sometimes "world prices" are assumed to be synonymous with "free trade prices."Cf. Balassa, op. cit., p. 584. This is true only in the absence of both transport costs and tariffs by all countries except the one being investigated.

[2]Effective Protective Rates of Korean Industries (Korean Development Association, 1967).

[3]The other logical possibility--that WV_i is positive and DV_i is negative--is probably never observed.

and Leith both consider such a negative value added to be "absurd,"[1] and Johnson and Grubel call it a "nonsense result."[2] Power suggests that an effective tariff of less than -100 percent may reflect (1) higher international transport costs for parts shipped separately than for the finished product, (2) greater monopoly power by the foreign supplier of parts than for the foreign supplier of the finished product, (3) failure of the domestic industry to use wastes, scrap, etc., to the same extent as the foreign producer, (4) a higher domestic incidence of theft, breakage, etc., or (5) higher relative costs of non-traded inputs, such as electricity and domestic transport.[3] Soligo and Stern[4] give (3) and (5) as explanations. Lewis and Guisinger suggest that a country's entire price structure can be so "distorted" that a firm can have a positive value added in domestic currency even though its value added is negative when all commodities are valued at world prices.[5]

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[1]Giorgio Basevi, "The United States Tariff Structure: Estimates of Effective Rates of Protection of United States Industries and Industrial Labor," Review of Economics and Statistics (May 1966), p. 150 and J. Clark Leith, "Substitution and Supply Elasticities in Calculating the Effective Protective Rate," Quarterly Journal of Economics (November 1968), p. 579.

[2]Herbert G. Grubel and Harry G. Johnson, "Nominal Tariffs, Indirect Taxes and Effective Rates of Protection: the Common Market Countries 1959," Economic Journal (December 1967), p. 764. The most detailed critique of the finding of negative value added is by Ellsworth. I understand him to say that negative value added is logically "absurd" and empirically "extraordinary." P.T. Ellsworth, "Import Substitution in Pakistan--Some Comments," The Pakistan Development Review (Autumn 1966), pp. 395-407.

[3]John M. Power, "Import Substitution as an Industrialization Strategy," The Philippine Economic Journal, Vol. V, No. 2 (Second Semester 1966), p. 204.

[4]R. Soligo and J. Stern, "Tariff Protection, Import Substitution and Investment Efficiency," Pakistan Development Review (Summer 1965), pp. 249-270.

[5]Stephen R. Lewis, Jr., and Stephen E. Guisinger, "Measuring Protection in a Developing Country: the Case of Pakistan," Journal of Political Economy (November/December 1968), p. 1123.

Assuming that large negative values of effective tariffs are no more biased than small positive values--and are not due to inaccurate measurement of the relevant variables--then formula (1) gives misleading results. Industry A with an effective tariff (E) of, say, -200 percent is actually receiving more protection than industry B with an effective tariff (E) of 200 percent, and one would not want to conclude that the average effective tariff is zero. One can meet this problem by defining the effective tariff industry i (U_i) as Soligo and Stern suggest:[1]

$$U_i = \frac{DV_i - WV_i}{DV_i} \tag{2}$$

Therefore, in percent

$$U_i = \frac{E_i}{E_i + 100} \tag{3}$$

Thus, E of less than -100 percent implies U greater than 100 percent. E between -100 percent and zero implies U of less than zero. E greater than zero implies U between zero and 100 percent. In the above sample, industries A and B have an average effective tariff (U) of 133 1/3 percent, with the effective tariffs (U) being 200 percent for industry A and 66 2/3 percent for industry B .

Another problem concerns the substitution between imports and factors of production. Travis notes that if an industry has a Cobb-Douglas production function, then its observed nominal tariff always equals its observed effective tariff.[2]

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[1]Soligo and Stern, op. cit.

[2]William A. Travis, "The Effective Rate of Protection and the Question of Labor Protection in the United States," Journal of Political Economy (May/June 1968), p. 446.

Some other problems include: (i) how should depreciation be handled, (ii) what weights should be used to aggregate tariffs on products as given in the tariff schedule to obtain the tariff for an industry, (iii) how does one define an industry,and (iv) how should one treat excise taxes and other non-tariff fiscal charges. Leith has shown that the empirical results, at least for Taiwan, are very sensitive to the handling of problem (ii) and to assumptions about the extent of substitution among inputs.[1] Grubel and Johnson have shown that the empirical results, at least for the EEC countries, are very sensitive to the handling of problem (iv).[2]

A final problem in making inter-country comparisons (of either effective or nominal tariffs) is that there is no unique set of weights for averaging the various industry tariffs, especially when the number of industries differs greatly among the various studies.

Despite these problems, it may be of some interest to compare the results of various studies. Table I shows the unweighted average tariff rates for various countries and the EEC. It should be noted that almost none of the authors of these 12 studies handled the numerous empirical problems in exactly the same way. As quotas may be more important than tariffs in determining actual protection in Pakistan and as domestic prices may not equal world prices plus tariffs, the line in Table I labelled "Pakistan prices" measures protection using actual prices rather than tariff rates.

Considering the many cases of industries in developing countries having an effective tariff (E) of less than -100 percent and feeling these observations should not be ignored, I have converted all effective tariffs to U .

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[1]Leith, op. cit.

[2]Grubel and Johnson, op. cit.

Table 1

Country and Year	Number of Industries	Mean Tariff in Percent	
		Effective (U)	Nominal (N')
	(1)	(2)	(3)
Argentina, 1953[1]	29	55.1	37.9
Belgium, 1959[2]	29	14.0	12.3
Brazil, 1966[3]	21	57.7	53.4
Brazil, 1967[3]	21	43.9	36.5
EEC, 1959[2]	29	15.4	11.8
EEC, 1962[4]	36	15.6	11.1
France, 1959[2]	29	23.2	23.3
Israel, 1961[5]	30	30.4	32.5
Italy, 1959[2]	29	15.4	15.4
Japan, 1962[4]	36	22.9	15.1
Korea, 1963-65[6]	218	40.0	35.6
Malaysia, 1963[7]	45	7.9	9.3
Malaysia, 1965[7]	45	10.8	10.2
Netherlands, 1959[2]	29	3.6	6.3
Pakistan prices, 1963/64[8]	32	94.5	53.3
Pakistan, 1963/64[8]	32	45.2	41.7
Philippines, 1961-65[9]	89	71.3	40.6
Sweden, 1962[4]	36	13.4	7.6
Taiwan, 1965[10]	37	48.2	29.0
Turkey, 1960'[11]	7	64.6	43.8
U.K., 1962[4]	36	21.4	13.9

Table 1 (continued)

Country and Year	Number of Industries	Mean Tariff in Percent	
		Effective (U)	Nominal (N')
	(1)	(2)	(3)
U.S.A., 1962[4]	36	16.5	11.1
U.S.A., 1958-60[12]	281	18.1	12.4
West Germany. 1959[2]	29	1.7	7.2

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[1]David B. Humphrey, "Measuring the Effective Rate of Protection: Direct and Indirect Effects," (Journal of Political Economy, forthcoming.)

[2]Herbert G. Grubel and Harry G. Johnson, "Nominal Tariffs, Indirect Taxes and the Effective Rate of Protection: the Common Market Countries 1959," Economic Journal (December 1967), pp. 261-276.

[3]Joel Bergsman and Pedro Malah, "The Structure of Protection in Brazil," Brazil's Industrialization and Trade Policies (Oxford University Press, forthcoming).

[4]Bela Balassa, "Tariff Protection in Industrial Countries, An Evaluation," Journal of Political Economy (December 1965), pp. 573-594, reprinted in Readings in International Economics, eds. Caves and Johnson.

[5]Data supplied by Howard Pack.

[6]Effective Protective Rates of Korean Industries (Korean Development Association, 1967). Nominal tariffs are given for 2~~0~~2 industries and effective tariffs for 218 industries.

[7]Data supplied by John H. Power.

[8]Stephen R. Lewis, Jr. and Stephen E. Guisinger, "Measuring Protection in a Developing Country: the Case of Pakistan," Journal of Political Economy (November/December 1968).

[9]John H. Power, "Import Substitution as an Industrialization Strategy," The Philippine Economic Journal, V. No. 2 (1966), pp. 167-204 and data supplied by the author.

Table 1 (continued)

[10] I-Shuan Sun, "Trade Policies and Economic Development in Taiwan," (Taipei, mimeo, October 1966) and data supplied by author.

[11] Anne O. Krueger, "Some Economic Costs of Exchange Control: the Turkish Case," Journal of Political Economy (October 1966).

[12] Giorgio Basevi, "The United States Tariff Structure: Estimates of Effective Rates of Protection of United States Industries and Industrial Labor," Review of Economics and Statistics (May 1966) and data supplied by the author.

One finds that the effective tariff (U)--column (2) in Table 1--ranges from 1.7 percent in West Germany to 94.5 percent for Pakistan prices. Nominal tariffs as a percentage of domestic prices (N')--column (3)--ranged from 7.2 percent in West Germany to 53.4 percent for Brazil 1966. The mean effective tariff (U) exceeds the mean nominal tariff (N') in all cases except France, Israel, Italy, Malaysia 1963, Netherlands, and West Germany, but only for Israel, Malaysia 1963, Netherlands, and West Germany, does N' exceed U by more than one percentage point. For the 24 observations in Table 1, the rank correlation between size of average effective tariff (U) and size of average nominal tariff (N') is .95.

III

It has been suggested[1] that knowing the structure of a country's effective

[1] Balassa and Schydlowsky recently suggested that in making public investment decisions "the desirability of individual industries should be evaluated by the use of the effective protective measure." Bela Balassa and Daniel M. Schydlowsky, "Effective Tariffs, Domestic Cost of Foreign Exchange, and the Equilibrium Exchange Rate," Journal of Political Economy (May/June 1968), p. 353. Their suggestion assumes that any extra output by the industry under consideration will use inputs purchased at world prices regardless of whether the country already produces these inputs at costs above world prices. It might be more realistic to estimate the time period during which the high cost domestic producer of inputs will continue to operate, to assume that the new industry will buy from the domestic firm during this period and at world prices later on, and then to compare the discounted costs and receipts of the contemplated industry with those of other possible industries. Another problem with their suggested criterion involves the treatment of non-traded inputs. As discussed in Section II, the ranking of industries by effective tariffs is sensitive to the elasticity of supply assumed for non-traded inputs, and the appropriate elasticity might only be known after a country's investment plan was established; this discussion suggests, therefore, an iterative procedure, whereby projects are ranked under alternative assumptions of supply elasticities and one chooses the group of projects whose use of non-traded inputs is consistent with the estimated elasticity of supply. Finally, the simple example used by Balassa and Schydlowsky appears incomplete. They assume a country already has an efficient fabric industry and an inefficient steel industry. Should this country establish a clothing industry--assumed to be inefficient--or a precision equipment industry--assumed to be efficient? They opt for the precision equipment, but apparently ignore the alternative of expanding the (efficient) fabric industry (perhaps for export).

Table 2

Country and Year	Number of Industries	Tariffs: Spearman Rank Correlation	Tariffs: U = a + b N: a (T ratio)	Tariffs: U = a + b N: b (T ratio)	R^2	F
	(1)	(2)	(3)	(4)	(5)	(6)
Argentina, 1953	29	.89	-15.02 (-1.44)	1.15 (9.72)	.78	94.4
Belgium, 1959	29	.83	-6.98 (-2.42)	1.50 (7.75)	.69	60.1
Brazil, 1966	21	.96	21.0 (5.68)	.32 (11.0)	.86	120.4
Brazil, 1967	21	.95	2.78 (.56)	.72 (8.89)	.81	79.0
EEC, 1959	29	.94	- 9.75 -6.85	1.50 (17.2)	.92	296.1
EEC, 1962	36	.85	- 4.60 (-1.81)	1.61 (8.68)	.69	75.3
France, 1959	29	.92	-13.88 (-4.37)	1.22 (12.80)	.86	163.9
Israel, 1961	30	.80	- 3.38 (- .37)	.70 (5.09)	.48	25.9
Italy, 1959	29	.96	-12.95 (-7.20)	1.56 (17.4)	.92	303.3
Japan, 1962	36	.71	3.09 (.97)	1.11 6.65)	.57	44.2
Korea, 1963-65	218	.92	6.48 (2.47)	.61 (17.2)	.58	297.3
Malaysia, 1963	45	.73	3.00 (.50)	.48 (1.44)	.05*	2.1
Malaysia, 1965	45	.86	2.19 (.43)	.76 (3.07)	.18	9.5
Netherlands, 1959	29	.87	-11.75 (-5.95)	2.29 (8.76)	.74	76.7

Table 2 (continued)

Country and Year	Number of Industries	Tariffs: Spearman Rank Correlation	Tariffs: U - a + bN: a (T ratio)	Tariffs: U - a + bN: b (T ratio)	R^2	F
	(1)	(2)	(3)	(4)	(5)	(6)
Pakistan prices, 1963/64	32	.49	53.1 (2.01)	.36 (1.92)	.11*	3.7
Pakistan, 1963/64	32	.72	- .88 (-.08)	.64 (4.96)	.45	24.6
Philippines, 1961-65	89	.92	13.93 (1.63)	.84 (9.08)	.49	82.4
Sweden, 1962	36	.81	1.20 (.67)	1.49 (8.08)	.66	65.3
Taiwan, 1965	37	.80	26.8 (6.05)	.53 (5.68)	.48	32.3
Turkey, 1960's	7	.06	68.3 (3.01)	-.05 (.17)	.01*	.03
U.K., 1962	36	.76	3.03 (.86)	1.13 (5.57)	.48	31.0
U.S.A., 1962	36	.84	.89 (.33)	1.24 (6.54)	.56	42.7
U.S.A., 1958-60	281	.37	2.00 (1.98)	1.14 (17.88)	.53	319.6
West Germany, 1959	29	.93	-10.70 (-12.0)	1.60 (15.1)	.89	228.7

*Not significant at 1 percent level.

Sources: same as Table 1.

tariffs tells us about the allocative impact of the tariff system: that in some way the tariff system is related to the rate of return of various industries. If one knew the input coefficients for an economy in the absence of tariffs, then an examination of tariffs and all other government taxes and subsidies would tell us something about the relative effect of government policies on the allocation of resources among industries. In fact, however, we only observe input coefficients in the presence of tariffs; as Travis notes, using observed input coefficients from a country with low tariffs is not a legitimate way of obtaining free trade coefficients if its trading partners have high tariffs.[1] If all industries have Cobb-Douglas production functions, then calculating effective tariffs with observed input coefficients tells us almost nothing about the impact of the tariff system on the rate of return in various industries, since an industry's effective tariff equals its nominal tariff regardless of the size of the tariffs on its inputs even though its rate of return is presumably lowered by having tariffs on its inputs.[2]

There is no particular reason, in terms of economic theory, why the ex ante ranking of industries by their effective tariffs should be correlated with their ranking by nominal tariffs. Corden argues that "the order [of effective tariffs and taxes] is likely to be quite different from a similar scale based on nominal tariff rates and nominal export subsidies and taxes."[3] On the other hand, if businessmen (and labor leaders) have understood the concept of effective tariffs and if they have believed that politicians use nominal tariffs to give protection, then the political process which generated a particular

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[1]Travis, op. cit., p. 448.

[2]I owe this point to Richard Nelson.

[3]Corden, op. cit., p. 224.

system of protection in a country might in the past have produced a high correlation between observed effective tariffs and nominal tariffs. Or if most industries have a Cobb-Douglas production function, there would be a high correlation between observed effective tariffs and nominal tariffs.

Column 2 of Table 2 gives, for each country, the rank correlation between nominal tariffs as a percent of world prices (N) and effective tariffs (U). The rank correlation is above .70 for all countries except Basevi's study of the U.S.A., Krueger's study of Turkey[1] and Lewis and Guisinger's study of Pakistan prices. The high rank correlation for Brazil was noted by the authors of the study.[2] None of the other authors apparently made this comparison.

The prevalence of high rank correlation may lead one to wonder whether decision-makers follow some simple rule in setting tariffs for an industry, such as

$$\text{Effective tariff} = a + b\ (\text{nominal tariff}) \qquad (4)$$

Table 2 gives the results of such a regression for each country. The percentage of variations "explained" by the regression ranges from 92 percent (in EEC, 1959 and in Italy) to 1 percent for Turkey; R^2 is significantly different from zero at the 1 percent level in all cases except Malaysia 1963, Pakistan prices, and Turkey. Judging from the T ratios, the regression coefficient for nominal tariffs is generally very significant and the constant term is sometimes not significantly different from zero.

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[1]Two remarks may be made about the Turkey study. It covers only 7 industries, and Krueger used interviews and feasibility studies--rather than an input-output table--to estimate effective tariffs.

[2]Joel Bergsman and Pedro Malah, "The Structure of Protection in Brazil," (mimeo, February 1968), p. 20.

Brazil and Malaysia are the only countries with observations at two points in time The relationship between the ranking of Brazilian industries by nominal tariffs and by effective tariffs did not change much between 1966 (.96) and 1967 (.95) despite the imposition of a new tariff schedule in early 1967, which reduced the maximum tariff rate from 150 percent ad valorem to 120 percent and lowered the tariffs on many raw materials and intermediate products.

In Malaysia there is a high rank correlation in both 1963 (.73) and 1965 (.86); the regression "fits" somewhat better in 1965 than in 1963, but even in 1965 is not as significant as in most of the other countries.

One can think of at least three hypotheses that are consistent with these empirical results:

(i) some participants in the political process already understood the concept of effective tariffs, as discussed in Section I, and achieved desired effective tariffs by bargaining over their own nominal tariffs

(ii) the aggregation procedure for estimating effective and nominal tariffs for less than 300 industries from a tariff schedule for several thousand commodities introduces some sort of bias; for example, if one defines only a few industries, one might expect that for each industry the average tariff on inputs would approximate the country's average tariff, and hence the variation in effective tariffs within a country having a few industries would be better explained by the variation in the nominal tariff than a study using many industries.[1] In fact, the size of the R^2 for a country in Table II has a rank correlation of -.46 with the number of industries defined for the country.

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[1]This argument assumes--no doubt unrealistically--that value added is a constant proportion of price for all industries in a country. Vahid Nowshirvani suggested this argument.

(iii) there is some sort of economic and/or technical relationship in each economy which produces these results; for example, all industries might have a Cobb-Douglas production function, and then one would have a perfect rank correlation, since

$$U = \frac{N}{100 + N} \tag{5}$$

Further research is necessary to determine whether these empirical results hold for other countries and, if so, to explain their presence.

IV

It may be appropriate to attempt to derive some simple conclusions on the value of effective tariffs in the light of the theoretical and empirical work of the last few years. The discussion of effective tariffs has undoubtedly enlarged the number of people who understand that selective tariff reductions may increase the level of potential protection afforded some industries. Whether a reduction in the cost of imported inputs leads to a reduction in an industry's selling price or to an increase in its "rents" ("value added") depends on its market structure and the change in the tariffs (and other protective devices) on its output.[1] At the present time data requirements seem to preclude, however,

[1]The Kennedy Round resulted in a weighted average tariff reduction of U.S. manufactured items of about 35 percent; the Council of Economic Advisors asserted "A...major gain from the Kennedy Round will come from the reduction of American tariffs on materials and components used by American manufacturers. Both the imported items and the competing domestic materials will be cheaper, and production costs will thereby be reduced. As a consequence, the competitive position of American manufacturers using these inputs will be improved in both export and domestic markets." Economic Report of the President (Washington: U.S. Government Printing Office, 1968), p. 189. As many commodities already have a zero nominal tariff, any change in existing (positive) nominal tariffs is, of course, a weighted average change of nominal tariffs on all commodities.

any systematic investigation of whether a particular set of tariff negotiations has increased or decreased the level of protection for particular industries. One is forced to rely either on illustrations which tend to deal with only a few inputs[1] or on a relatively high level of aggregation.

The theoretical discussion and empirical work do not seem to disturb the economist's traditional dictum that, if a nation is to have tariffs, there is a strong presumption for a uniform nominal tariff. This confirmation follows from the fact that a uniform nominal tariff yields a uniform effective tariff. If one wants to justify deviations from this uniform tariff for certain industries, one must compare the theoretical superiority of the effective tariff with its far greater sensitivity to assumptions about the nature of the economy and the industry and far greater data requirements. While governments have learned to vary nominal tariffs among, say, 5,000 products, it is not clear that one could collect data in order to set effective tariffs with confidence at such a fine level for industries.

If one wants rather broad notions about either the relative average height of a country's tariffs or the ex post resource allocation effects of the tariff system, my results suggest one learns a lot--but not everything--by looking at the ranking by nominal tariffs (as the studies have actually been done). A "true" ranking by effective tariffs may require more information than we now possess about elasticities of supply of inputs and elasticities of substitution and the definition of industries.

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[1]"To cite only one example, tariffs on a wide range of steel alloying materials will be progressively reduced. This should reduce the costs of producing alloy steels, and of machine tools, machinery and equipment manufactured from such steels, thus strengthening the competitive position of our machinery industries in export markets." Ibid, p. 189.

Finally, one should note Travis' view that while effective tariff calculations *per se* are not of much value, "the calculations require a great deal of information on tariffs, on other forms of protection, and on interindustry flows, and that information is very valuable."[1]

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[1]Travis, *op. cit.*, p. 460.