382.7
G967

PN-ABI-404

III-316

ISN 72262

THE USE OF EFFECTIVE TARIFFS
A COMMENT

Stephen Guisinger
Daniel M. Schydlowsky

PROJECT FOR QUANTITATIVE RESEARCH
IN ECONOMIC DEVELOPMENT
Center for International Affairs,
Harvard University,
Cambridge, Massachusetts.

A.I.D.
Reference Center
Room 1656 NS

Portions of this research were supported by the Development Advisory Service through funds provided by the Agency for International Development under Contract CSD-1543. The views expressed in this paper do not, however, necessarily reflect the views of A.I.D.

The Use of Effective Tariffs:
A Comment

Stephen Guisinger
Daniel M. Schydlowsky

Benjamin Cohen's recent review of the uses of effective tariffs concludes that effective rates of protection provide little information about the structure of protection that cannot be inferred from the structure of an economy's nominal rates of protection. In a previous article in this Journal, William P. Travis critically examined the theoretical foundations for the concept of effective protection and found them to be inadequate (see Travis [ ]). While being perhaps less concerned than Travis with Theoretical validity, Cohen examines the empirical information contributed by the calculation of effective rates and simply finds it ~~to be~~ redundant. After surveying the close statistical association which he finds between measures of nominal and effective tariffs, Cohen concludes that, "if we want rather broad notions about either the relative average height of a country's tariffs on 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 [of industries] by nominal tariffs." (Cohen [ ],p.14)

In view of the number (and cost!) of studies of effective protection already performed and currently being contemplated, Cohen's ~~assertion~~ evaluation of about the marginal intellectual productivity of research on effective protection deserves close attention by economists, whose research cannot be exempted from the scrutiny of the cost-effectiveness calculus which they so

often recommend to others. Assessing the benefits and costs of measuures of effectiue protection is obviously a task far exceeding the scope of this comment. Nevertheless, several issues nnnx should be raised in connection with Cohen's methodological approach and empirical evidence so that an accurate appraisal of the effective rate measure can be made.

Cohen states that "the measurement of tariff levels [both effective and nominal] can be of at least two practical uses: as a means of comparing the level of protection among various countries (either on the "average" or for a particular industry) and as a way of studying the effect of the tariff structure on resource allocation within a country." (Cohen [ ],p3). Rephrasing this slightly, Cohen seems to be saying that we can use both nnnx absolute and relative indexes of protection: absolute indexes for making inter-country comparisons nnd relative indexes for making intra-country comparisons among industries. Curiously, Cohen finds no other important use for the absolute level of effective protection apart from nnits use in international comparisons, but this is a problem to which we will return shortly.

Levels of Protection

There are two categories of problems which prevent the simple comparison of average tariff levels between countries. One category of problems affects comparisons of both nominal and effective rates while the second applies only to effective rates. In the first category are found the assumptions about the nature of the exchange rate and the appropriate weights to use in calculating averages. To make meaningful comparisons of tariff levels, it is necessary, Cohen states, that the exchange rate be in equilibrium with the present tariff system and furthermore, one must know "how the the country would adjust its exchange rate(or monetary and fiscal policies) to the changes in foreign tarade flows that would occur if the tariff level were changed"(Cohen [ ],p.4). If sector-wide or country-wide comparisons of protection levels are desired, then appropriate weights must be employed and there seems little agreement what weighting scheme would be appropriate.

In the second category of problems are found the assumptions which surround the effective rate concept and make the absolute level of measured rates of protection particularly sensitive to slight variations in these assumptions. Central among these assumptions are the treatment of non-traded goods, depreciation and excise taxes, the possibility of substitution between primary and intermediate inputs, and the definition of an industry

In assessing the validity of the effective rate concept

it is necessary to consider only the problems of the second category. Each of the above mentioned problems has been discussed elsewhere [ ],[ ],[ ]. Opinions about the correct assumption on each of them may vary but there is no reason why studies aimed at making international comparisons could not adopt one set, or even several sets, of assumptions as a basis for making internationally comparable estimates of effective rates. Cohen notes that the fourteen studies included in his Table 1 were not conducted on a consistent basis with respect to these assumptions, but this failure, of course, is not indication that such a consistency could not be imposed.

If the uses of the absolute level of effective protection were limited to their international comparisons of protective levels, then the need to estimate sets of effective rates to supplement the easily available nominal rates would appear questionable. There are, however, uses of the absolute level of effective protection which do not involve direct comparisons with other countries and for which nominal rates of protection are not acceptable substitutes. One of these uses is found in connection with the measurement of the cost of tariff protection. Prior to the development of the effective rate concept, measures of the cost of protection were based on the changes in consumption and production induced by changes in the nominal rate of protection. With the introduction of the notion of effective protection, it was recognized that production responds to the effective rate, not the nominal rate, and that the production cost of the tariff

is a function of the change in production which would occur if effective rates were set to zero and the level of effective protection.

As a variation on the cost of protection theme, M.F. Scott has recently recalculated the national income accounts of Pakistan at world prices[ ]. The formula devised by Scott to adjust sectoral components of national income involves both the average level of protection for the economy and the individual sectoral rates of protection. Although Scott utilizes world prices, he does not make direct comparisons of Pakistan effective rates with those of other countries, eliminating the need to assure that Pakistan's exchange rate maintains equilibrium in the balance of payments.

Thus, the need for an absolute index of effective protection transcends their use in international comparisons of protective levels. Cohen is correct in questioning the sensitivity of the effective rate formula to small changes in key assumptions, but this sensitivity should not invalidate the theoretical soundness of the effective rate concept; rather it should serve as a reminder that emprical estimates of any sort are subject to confidence limits. The goal of empirical research in effective protection should be to reduce these confidence limits through careful specification of the underlying assumptions and continuous sensitivity analysis.

The Relative Level of Protection

Perhaps the most important use of effective tariffs is as an indicator of the direction of inter-industry resource flows caused by the tariff system. For this purpose only a relative ordering of industries is required--not their absolute level--and Cohen offers considerable empirical evidence that the rank order of industries by nominal tariff rates does not differ significantly from the ranking by effective rates. There is, therefore, little need, Cohen implies, for estimating effective rates in as much as the same information already exists elsewhere.

What is most interesting about Cohen's empirical results showing high rank correlations (above .70) between nominal and effective tariffs within 23 of the 26 countries in his sample is the lack of a theoretical explanation why this correlation should exist, because one can easily concoct hypothetical examples showing that a correlation between these two variables could be zero or even negative. There must be some one force(or possible several forces) which causes this apparent high correlation between the two measures of protection. Cohen offers several expanations, though none is particularly convincing.

The least persuasive explanation is that their is an awareness among participants in the political process about effective protection which enables them to bargain over nominal rates in a fashion that leaves the ordering of nominal and effective rates the same (Cohen [ ],p.11). Even if this awareness did exist, and that seems doubtful in itself, it does not follow that the rank order of

industries by the two measures should be ~~thexxxxxx~~ similar. Travis suggests that industrialists may choose to bargain for effective protection using the nominal tariff rate on their output, but it seems equally plausible that they would choose to push for lower tariffs on their inputs because it would apper "fairer" and less venal than lobbying for higher tariffs on their output.

A more likely explanation noted by Cohen is that there is "some sort of economic and/or technical relationship in each economy which produces these results. (Cohen's p. [i.e. the high correlations]) The particular~~xy~~ expaanation suggested by Cohen, that all industries have Cobb-Douglas production functions, does not seem valid. The argument that nominal and effective rates are identical is due to ~~Trxxxxx~~ W.P. Travis [ ] and ~~has~~ its weaknesses have ~~xxxxxdy~~ been pointed out.[1]

---

1. There is little empirical evidence at present to suggest that there exists any substitution between intermediate and primary factors--let alone a substitution of unitary elasticity. Even if such substitution did exist, Corden has shown that the definition of effective protection ~~xxxxxxxxxxxxxxxxx~~ necessary to arrive at this identity between nominal and effective ta. is in fact the wrong definition to use in the presence of substitutable ~~xxxxx~~ inputs. See Corden [ ].

The most likely explanation, again one noted by Cohen, is that the level of aggregation at which most studies of effective rates have been perfommed ~~xxxxxxxxx~~ creates any upward pressure on the correlation coefficient between nominal and effective tariffs. Cohen offers no theoretical explanation why this bias should occur in the correlation studies for individual countries but correctly points out

if the aggegated sectors are so large that the average tariff on their inputs xx does not vary much mmmg from sector to sector, then the effective rate of protection is governed by the nominal tariff on the output, provided that the value added phares at world prices mmmxthmmmmxmmx do not vary mmmmm to any great extent across sectors.

As the Positivists have long emphasized, theoretical ignorance is no bar to useful knowledge whenever a relationship can be empirically verified, and therefore without further inquiries into their origins, the correlation analysis presented by Cohen deserve careful scrutiny. With the caveat already cited above, that the level of aggregation in Cohen's sample is high (with the exception of only Mexico, Korea and the USA), the rank order correlation coefficients are all positive and almost all significant. It does, therefore, seem true that a decision-maker wanting to know only the rank order of an industries effective rate could use the rank order of its nominal rate with only a slim possibility that his estimate would be far out of line. If, however, he wished to know the absolute level of effective protection for an industry, say an infant industry for which tariff protection was being considered by the government, then the procedure would be somewhat different. Short of estimating the effective rate directly, he would have one or two methods available, depending on whether effective rate studies for the country had already been formed. Assuming that such a study already existed, he could use the estimated regression equation between effective and nominal tariff rates to to predict the industry's effective rate on the basis of the nominal rate.

The accuracy of his prediction will depend on the standard error of the estimate, the sample size used in fitting the regression, and the degree to which the nominal rate of the industry being studied varies from the average of the nominal rates for all industries.

If no study of effective protection for the country is available, the decision maker must look to the possibility that there is a common relationship between nominal and effective rates that is found in all countries. Considering the values of intercepts and slope coefficients and their standard errors reported by Cohen in Table 2, it seems unlikely that such a common relationship exists. Consider for example the two following equations drawn from Cohen's sample:in Table 2:

Netherlands,1959	$U = \underset{(-5.95)}{-11.75} + \underset{(8.76)}{2.29 \cdot t}$	$R^2 = .74$
Brazil, 1966	$U = \underset{(5.68)}{21.0} + \underset{(11.0)}{.32}$	$R^2 = .86$

t-tests on the difference between intercepts and the differences between the slope coefficients suggest that the two samples could not have been drawn from the same sample. Admittedly, the two equations shown here are extremen and others could have been selected to show a similarity. Nevertheless, casual observation of the range of values for the slopes and intercepts and their associated standard errors would lead one to suspect that the appropriate statistical test comparing these variables to the similar variables of a pooled regression equations would reveal considerable dissimilarity among the samples. Thus, a decision-maker would be ill-advised to use another country's

regression equation for estimating nominal tariff-effective tariff relationships in his own country unless he had good reason to believe that the economic structures and tariff systems of the two countries were quite similar. He would have little choice but to estimate the effective rate for his own country directly.

The existence of a close relationship between nominal and effective protection may, however, be irrelevant to the goal being sought. The expressed prupose of effective rate is to provide an indicator of the direction in which the tariff system causes resources to flow, but the few studies to have tested for this relationship have found little statistical evidence in its support [ ],[ ],[ ]. Several explanations for the failure to find empirical evidence between effective rates and measures of resource movement are possible, but certainly one of the most likely reasons is that the conditions of supply of the primary inputs--ie. the factors whose inter-industry mobility is being studied--are not considered; in a sense the measured rate of effective protection is only the demand side of a necessary supply-demand equilibrium which isnecessary for determining actual resource allocations.

Obviously, if all factors are in inelastic supply to industries--an unlikely occurrence--a change in the level of effective protection will affect the remuneration of the factors currently in the industry but will not change the pattern of resource allocation. The correlation between effective rates of protection and factor movements will be zero.

Another possibility, one which is perhaps quite frequently found in less developed countries, is that the elasticity of supply of certain factors is perfectly elastic for all industries

receiving effective protection, so that the subsidy afforded by the tariff system accrues only to those factors in each industry that are in inelastic supply.[1] In this situation

---

This possibility was recognized by Corden who argued that effective protection should only be defined in terms of the subsidy granted the inelastic factors in any industry. All studies to date with the exception of Basevi's study of the United States have assumed that all primary factors are in inelastic supply.

---

the correct index for the direction of resource flows will be the ratio of the value of the implicit subsidy granted by the tariff system to the value added contributed by the factors in inelastic supply.

In both of these examples it is evident that the rank order of effective-protection industries according to the effective protection computed on the basis of total value added is not not necessarily the rank order of industries according to the actual incentives and disincentives which they provide to resource movements. This analysis would then suggest that rather than abondoning the measurement of effective rates because the information is already contained in the structure of nominal rates, we should refine and develop the concept of effective protection by incorporating supply or any other effects which jointly determine the flow of resources in response to the price incentives created by the tariff system.