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DISCUSSION PAPER

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William G. Tyler

Federal Government of Brazil

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RECENT EFFECTIVE TARIFF PROTECTION
FOR BRAZIL

by
William G. Tyler*

I. INTRODUCTION

There have been various studies of commercial policy and effective tariff protection for Brazil (Bergsman, 1970; Bergsman and Malan, 1971; Bergsman, 1972; Tyler, 1976; Neuhaus and Lobato, 1978). All of these studies have used tariff rates to approximate the differences between domestic and international prices afforded by commercial policies. Widespread tariff redundancy, non-tariff barriers, and the existence of tariff-reducing industrial policy schemes all impose limitations on the validity and interpretation of the effective protection estimates from these studies.

In order to take the tariff reductions into account, the Neuhaus and Lobato study employed realized tariffs, i.e., actual tariff collections divided by imports, as a proxy for nominal protection, on which the effective protection estimates were subsequently based. Because of the comprehensive nature of the industrial policy fiscal incentives, the tariff reductions permitted under different schemes, such as the CDI programs, have been extensive, as reflected by the differences between the full legal and realized tariffs. This is particularly the case for capital goods and intermediate products. It has

* INPES/IPEA and the University of Florida. This paper is part of a larger, on-going INPES study of Brazilian commercial policy with Wilson Suzigan. In addition to the latter's collaboration, the author also expresses his thanks to a referee for useful comments and to Maurício Santos de Miranda and Ana Isabel da Costa Martins their competent assistance with the statistical materials. The normal caveats apply.

been argued that this system, allowing tariff reductions for approved projects, represents a kind of tariff quota mechanism (Tyler, 1980 a). Certain amounts of a product are admitted under a privileged, low tariff arrangement, while remaining imports are subjected to the full legal tariffs. The realized tariffs reflect the extent to which tariff reductions or exemptions are granted, but they in no way can be interpreted as representing the differences between domestic and international prices. Using realized tariffs frequently understates the level of protection because of (1) the failure to consider the de facto quota effects under the protective system, (2) the reliance on implicit import weights to compute nominal protection and (3) the omission of non-tariff barriers.

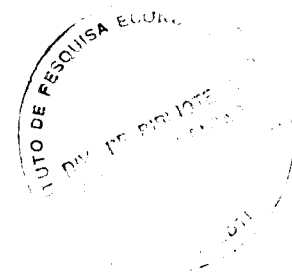
The economic policy reforms of December 1979 restored the tariff as the main protective instrument for domestic industry. Except for a few programs (e.g., SUDENE, SUDAM, NUCLEBRAS, BEFIEX) the tariff reductions have been eliminated. The CDI, for instance, can no longer provide tariff reductions as a part of industrial promotion schemes. The full tariff burden has been restored for imported products. As such, beginning in December 1979 the realized tariffs will much more closely approximate the full legal, import weighted tariffs. With a return of emphasis to the tariffs in the protective system, questions arise as to the prevailing level and structure of the tariff system. In addition to providing information on nominal tariffs computed at the disaggregated 4 digit level, this paper presents estimates of possible effective tariff protection as existing in January 1980. As such, this study provides a picture of the existing tariff protection and incentive system as seen after the December 1979 economic policy reforms. The departures from previous studies include a greater level of disaggregation and a different procedure for computing nominal tariff protection. Moreover, our estimates

are the first, to my knowledge, to be based on the complete IBGE input-output table from the 1970 economic census.¹

II. METHODOLOGY AND ESTIMATING PROCEDURES

The procedures used to estimate effective tariff protection are the standard and well known ones.² Accordingly, the formula employed to estimate the effective rate of protection (g_j) for product j is written as

$$(1) \quad g_j = \frac{t_j - \sum_i a'_{ij} \left(\frac{1+t_j}{1+t_i} \right) t_i}{1 - \sum_i a'_{ij} \left(\frac{1+t_j}{1+t_i} \right)}$$



where

t_i = the nominal rate of protection for input i .

t_j = the nominal rate of protection for product j .

a'_{ij} = the technical coefficient for input i used in the production of final product j , as measured domestic price and value information.

The technical coefficients used in the estimation of the effective tariff rates were derived from the 1970 IBGE input-output accounts (IBGE, 1979). This makes our effective tariff exercise a precarious one because of (a) the substantial industrial growth and change and (b) important relative price changes taking place between 1970 and 1980. Unfortunately, an up-dating of the

¹The competent and painstaking Neuhaus and Lobato study employed the early version of the 1970 IBGE matrix, which included only the industrial sector. The same can be said for subsequent FUNCEX research extending the Neuhaus and Lobato work (e.g. Savasini et al., 1979). The complete matrix only became available in 1979. See IBGE, Matriz de Relações Intersetoriais: Brasil 1970, Versão Final (Rio de Janeiro: IBGE, 1979).

²See Balassa and Associates (1971) and Corden (1971).

technical coefficients, reflecting structural change and relative price changes during recent years, is not yet available. Since the 1970 IBGE matrix is the only one of its kind in existence for Brazil, any estimates of effective protection, using Brazilian technical coefficients must be based upon it. Of the 89 sectors in the A' matrix 73 are tradable goods sectors. A greater level of disaggregation did not prove possible.³ The Corden method was employed to deal with the problem of non-traded inputs by including those sectors in value added.

Tariff rates were computed at the 4 and 5 digit levels through alternative methods.⁴ Our preferred method, on which the effective tariff estimates are based, involved computing a simple average of the tariff rates for all items listed in the tariff schedule (Tarifa Aduaneira do Brasil, or TAB) as of January 1980 for a particular industry or product group.⁵ For comparison purposes nominal tariff rates were also estimated from the 1978 import data, which include information on tariff payments and exemptions. These estimates necessarily reflect import weights. This procedure, while illustrative, imparts a downward bias in the resulting tariff estimates, because truly import prohibiting tariffs are not included unless the product is imported with a tariff reduction. Realized tariffs were also computed from the 1978 import information. These realized tariffs, it should be noted, reflect the tariff

³ The IBGE 87 x 87 A' matrix is estimated as the product of two rectangular matrices. Conceivably, through changing the order of multiplication, an A' matrix of 160 x 160 could be estimated. This, however, proved impossible because of the nature of one of the rectangular matrices and the necessary adjustments to it.

⁴ Only the 4 digit level tariff information is published here in Appendix Table 1. A table with comparable 5 digit level information can be obtained by writing the author.

⁵ It would be preferable to use consumption or value added weights at the product level in the computation of the tariff averages at the 4 and 5 digit levels, but such information, as in most countries, is simply not available for Brazil. Consequently, simple averages were chosen as superior to import weights or some other arbitrary weighting scheme.

reductions granted under the auspices of industrial promotion, and other tariff reducing, schemes.

III. RESULTS OF ESTIMATIONS

Examining first the tariff information itself, it is seen that the 1978 realized tariff rates are frequently quite low, averaging 17 percent for all manufacturing products. (Appendix Table 1). Yet, for the reasons indicated above, this provides a mistaken notion of the levels of protection actually in force. For their part, the 1978 import-weighted full legal tariff rates averaged 72 percent for manufacturing, considerably higher than the realized tariffs. While tariff rates have crept upwards between 1978 and 1980 as a result of piecemeal changes administered by the CPA (Conselho de Política Aduaneira), it is felt that most of the differences between our 1978 and 1980 nominal tariff estimates can be explained by the distorting, import weights for the 1978 information. The unweighted 1980 averages, computed directly from the TAB, present a different, and striking, picture of tariff protection in Brazil.

From the nominal tariff information presented in Appendix Table 1 it is apparent that current tariff rates are very high. The average nominal tariff for manufacturing, as computed from the tariff schedule, was 101 percent in January 1980. As is evident, there are many sectors with extremely high tariffs, e.g., over 100 percent. Among the sectors receiving the heaviest nominal tariff protection are glass products, electrical appliances, automobiles, food products, furniture, paper products, cosmetics, textile products, apparel, footwear, and various food products. In many instances it is evident that tariff redundancy is considerable. Yet, with the December 1979 economic policy reforms, drastically reducing permissible tariff exemptions, it is these

tariffs which are in force.⁶ Redundancy, while keeping imports out, also gives rise to possible abuse in the domestic market.

While the nominal tariff estimates based upon the actual tariff schedule are higher than the import-weighted full legal tariff rates, the structures of protection implied by either measure are quite similar. Table 1 presents rank order correlation estimates between the various tariff measures. In all possible combinations presented the correlations are positive and statistically significant at at least the 3 percent level of confidence. In the rank order correlations between nominal tariff rates and realized tariff rates, the coefficients are reduced because of the nature of the tariff-reducing incentives.

Based upon the unrealistic implicit assumption that the nominal tariffs reflect the differences between domestic and international prices, the estimates of effective tariff protection are presented in Appendix Table 1, along with the computed tariff rate information. Because of redundancy the estimates should be viewed as upper bound estimates of protection.⁷ They represent the possible effective protection available to domestic producers if all price differences were reflected in the tariffs. Not surprisingly, the estimates are very high. The average rate of possible effective tariff protection for manufacturing is 169 percent. For some individual industries the rates are breathtakingly high, such as for automobiles, wood products, paper products, cosmetics, textile products, apparel, and many individual food product industries.

As has also been witnessed in earlier studies, there appears to be a cascading in the structure of protection. Consumption goods receive the highest possible effective tariff protection (an average of 255 percent), followed by intermediate products (131 percent). Capital goods in general, received the

⁶ In March 1980 the government announced a series of tariff increases affecting the capital goods industries and some chemical products.

⁷ On the other hand, the omission of non-tariff barriers from the estimates serves to understate the protection afforded through commercial policies.

Table 1

SPEARMAN RANK CORRELATIONS BETWEEN DIFFERENT TARIFF MEASURES FOR MANUFACTURING INDUSTRIES

(n = 67)

	Nominal Tariffs January 1980 (Simple Averages from TAB)	Possible Effective Tariff Protection Rates, January 1980	Import Weighted Nominal Tariffs, 1978	Realized Tariff Rates, 1978
Nominal Tariffs, January 1980 (Simple Averages from TAB)	-			
Possible Effective Tariff Protection Rates, January 1980	.94 (.001)	-		
Import Weighted Nominal Tariffs, 1978	.75 (.001)	.78 (.001)	-	
Realized Tariff Rates, 1978	.26 (.018)	.25 (.022)	.37 (.001)	-

Source: Author's computations from information contained in Appendix Table 1.

Note: Numbers in parentheses beneath the correlation coefficients indicate the level of significance.

lowest rate of effective tariff protection (an average of 75 percent in January 1980). This cascading structure effect is also evident from the nominal tariff information, although not as pronounced.

Reflecting the cascading structure of protection, it is not surprising to find that only one manufacturing industry (tractors and road building equipment) possesses a negative rate of effective tariff protection. (Appendix Table 1) Some others do, however, have low effective tariff protection, such as chemical products, coal products, bulk vegetable oils, pharmaceuticals, and agricultural machinery and equipment. In each of these cases the effective tariff is low because of the relative lowness of the nominal tariff for the final product, rather than because of the discrimination against the industry resulting from high priced inputs.⁸

While the estimates presented for possible effective tariff protection are beset with conceptual and statistical problems, it is of interest to note that there are striking similarities in the rank order between the nominal tariff rates and our estimated effective tariff rates. (Table 1) The structure of protection implied by both is quite similar. This result is highly consistent with the empirical evidence from other countries, which also suggests that analyses of nominal protection may provide a reasonable approximation for an understanding of the structure of protection.

As noted, our estimates do not take into consideration either non-tariff barriers or tariff redundancy. While to some extent the existences of these two complications offset each other, redundancy constitutes a major difficulty

⁸ As a part of the analysis, a breakdown was undertaken dividing the possible effective tariff rate into subsidy and tax components for the activity in question.

in the undertaking of any study of commercial policy in Brazil. With tariffs established in the past for infant industry and balance of payments reasons at very high levels, redundancy has developed in many industries as a result of technical progress and the realization of economies of scale. In addition, one can not fully understand the development of tariff redundancy for an industry outside of the context of the market structure and organization. A competitive market, for instance, is more likely ceteris paribus to develop tariff redundancy than one dominated by a small number of firms. To adequately account for redundancy, as well as non-tariff barriers, in an examination of protection and incentives direct comparisons are necessary between domestic and international prices. Nevertheless, the level of nominal tariffs, with redundancy, does indicate protection afforded from import competition to domestic producers for their products. It may be, however, that this protection is not fully reflected in price differences and as such consists of a partly superfluous element.

IV. IMPLICATIONS

The purpose of this note has not been to provide a comprehensive, or even exploratory, study of effective protection or incentives in Brazil. To do that would require information involving direct price comparisons. Our purpose has been much more modest - to simply provide some up-to-date information on tariff levels, which can hopefully contribute to a debate on commercial and industrial policies in Brazil.

In Appendix Table 1 it is demonstrated that the levels of nominal and possible effective tariff protection in Brazil are very high and possess a large variance over industries and products. While continuing exchange rate overvaluation offsets some of the import protection, the net effect is that most industries receive tariff protection of such a magnitude that it can only

be considered as excessive. To be sure, many tariffs are redundant and could be trimmed with little effect on imports. As a rule, tariff reductions would serve to increase productive efficiency and diminish the emphasis of price affecting incentives in favor of domestic market production, as opposed to exports. This latter reduction of what appears to be a heavy anti-export bias would have important export increasing effects.⁹

⁹ See Tyler (1980 b) for an examination of the effects of changes in the anti-export bias on export performance.

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APÊNDICE TABELA 1
TARIFAS REALIZADAS, NOMINAIS E EFETIVAS POR SETOR NO NÍVEL DE 4 DÍGITOS, 1978-80

NÚMERO DE SUBSEÇÃO (Classificação do IBS)	DE denominação DO SETOR	TARIFA REALIZADA, A (R)	TARIFA NOMINAL, B (ponderada pelas importações) (R)	TARIFA NOMINAL, C (MÉDIA SIMPLES DE TAB) (R)	TARIFA EFETIVA POSSÍVEL (R)
0101	Extração Vegetal	19,7	70,7	54,6	55,5
0201	Lavoura	2,2	51,5	87,8	98,1
0301	Pecuária	0,0	15,0	37,3	33,4
0401	Agropecuária e Ind. Rural	0,0	0,0	0,0	-9,3
0501	Extração Mineral	1,2	10,8	27,7	26,5
0502	Extração e Combustíveis Minerais	0,0	0,0	36,7	36,4
1001	Fabricação de Cimento	2,9	33,4	51,2	50,5
1002	Fabricação de Vidro	33,9	93,4	126,3	162,7
1003	Produtos Minerais Não-Metálicos	23,9	49,4	139,3	179,0
1101	Gusa e Lingotes	9,7	24,1	54,1	77,7
1102	Fabricação de Laminados de Aço	1,3	31,0	28,9	15,9
1103	Fundidos Ferrosos	9,9	63,3	80,5	113,2
1104	Metallurgia Não Ferrosa	3,4	27,0	47,6	47,4
1105	Outros Produtos Metálicos	25,8	66,8	91,0	140,0
1201	Bombas e Motores	14,8	50,3	53,1	46,2
1202	Peças e Acessórios p/Máquinas	26,8	52,3	53,2	53,2
1203	Máquinas e Equipamentos Industriais	9,0	39,1	26,8	27,5
1204	Máquinas e Equipamentos p/Agricultura	12,1	27,1	24,9	13,0
1205	Máquinas e Equipamentos p/Escrelório	22,3	60,7	113,6	154,0
1206	Tratores e Máquinas Rodoviárias	6,8	29,7	20,0	-1,2
1301	Equipamentos p/Energia Elétrica	12,2	69,0	59,2	60,0
1302	Condutores Elétricos	20,2	73,4	65,5	69,0
1303	Material Elétrico	24,7	65,5	76,4	83,0
1304	Aparelhos Elétricos	7,8	24,8	50,9	42,8
1305	Material Eletrônico	19,8	47,9	43,5	35,1
1306	Equipamentos e Comunicação	20,3	100,8	132,0	189,4
1401	Fabricação de Automóveis	0,0	115,0	141,0	246,8
1402	Caminhões e Ônibus	0,5	45,5	79,3	62,4
1403	Fabricação Motor e Peças p/Veículos	13,5	85,9	113,0	142,8
1404	Indústria Naval	0,3	8,2	30,8	28,9
1405	Veículos Ferroviários e Outros	5,1	45,6	64,6	66,1
1501	Indústria de Madeira	3,3	143,8	147,7	301,4
1601	Mobiliário	3,8	112,9	131,2	160,5
1701	Celulose	7,8	21,1	34,5	29,0
1702	Papel e Papelão	5,8	17,3	75,5	89,8
1703	Artesfatos de Papel e Papelão	58,2	87,8	150,2	269,9
1801	Indústria de Borracha	31,5	68,8	118,8	154,4
1901	Indústria de Couros e Peles	3,1	149,2	124,7	145,2
2001	Elementos Químicos	9,0	21,9	18,8	10,1
2002	Produção de Alcool	7,7	163,6	160,0	250,8
2003	Refinaria Petroquímica	6,3	11,5	32,1	30,8
2004	Derivados de Carvão	14,5	19,8	17,4	12,9
2005	Resinas, Elastômero	27,5	40,1	53,7	55,5
2006	Óleos Vegetais em Bruto	6,4	49,0	26,6	8,7
2007	Pigmentos, Tintas	44,6	62,2	88,2	103,9
2008	Produtos Químicos Diversos	5,8	20,7	44,2	42,1
2101	Indústria Farmacêutica	14,4	18,1	23,4	19,4
2201	Indústria Perfumaria	47,9	61,2	170,0	458,8
2301	Indústria de Matérias Plásticas	34,7	203,3	202,5	314,1
2401	Benef. Têxteis Naturais	19,8	45,3	59,5	53,7
2402	Fiação Tec. Artificial	18,9	67,3	193,8	407,7
2403	Fiação de Tecidos de Fibra Natural	1,5	195,0	159,2	335,4
2404	Outras Têxteis	25,8	87,5	172,4	223,9
2501	Vestuário	10,2	165,0	180,6	197,0
2502	Calçados	0,4	170,4	170,0	233,4
2601	Benef. do Café	0,0	0,0	60,0	93,1
2602	Torrificação e Moagem de Café	0,0	0,0	70,8	29,8
2603	Benef. de Arroz	0,0	54,7	50,0	60,4
2604	Moagem de Trigo	0,0	45,2	110,0	176,7
2605	Benef. Outros Vegetais	15,1	128,7	146,2	609,4
2606	Abate, preparo de Carnes	3,5	35,3	65,7	227,2
2607	Abate, preparo de Aves	0,0	0,0	127,8	-433,2
2608	Preparo do Pescado	1,7	70,5	155,3	572,3
2609	Laticínios	13,5	110,0	118,3	-1 016,7
2616	Usinas de Açúcar	66,7	166,7	155,0	912,1
2611	Refino de Açúcar	0,0	0,0	70,0	6,7
2612	Panificação e Massas Alimentícias	7,8	184,4	176,6	409,5
2613	Refinação de Óleos Vegetais	19,3	53,7	75,2	-534,0
2614	Outras Indústrias Alimentícias	10,7	59,2	156,7	268,8
2701	Indústria de Bebidas	41,1	61,0	178,3	267,9
2801	Indústria de Fumo	143,0	155,7	177,8	347,1
2901	Indústria Editorial e Gráfica	3,1	6,1	63,9	61,8
3001	Fabricação de Produtos Diversos	18,8	45,1	81,2	86,0
MÉDIAS ^{1,2}					
Todos os Setores		12,7	59,1	84,8	130,8
Indústrias de Transformação		16,9	72,1	101,2	166,9
Bens de Consumo		18,5	91,0	139,5	255,1
Bens Intermediários		17,6	67,7	93,1	131,2
Bens de Capital		13,3	56,0	66,9	75,0

NOTAS: ¹ Tarifa nominal calculada para 1978 usando ponderações das importações daquele ano.
² A tarifa nominal de Janeiro de 1980 foi calculada como média simples baseado nos itens individuais listados na Tarifa Aduaneira Brasileira (TAB).
³ A tarifa realizada foi calculada como a receita do imposto de importação arrecadada dividida pelo valor das importações.
⁴ Médias calculadas usando ponderações do valor adicionado do ano 1970 segundo as contas do Insumo-Produto do IBGE.
⁵ Para os setores com tarifas efetivas os setores com valor adicionado negativo em preços internacionais foram excluídos das médias. Estes setores indicados com * demonstraram tarifas efetivas muito elevadas.

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