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Who Gains from Tariff Escalation?

Basudeb Guha-Khasnobis*

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Abstract

With the help of a simple model of production and trade, we examine the differential impact of tariff escalation on skilled and unskilled wages in an economy. Our findings provide a lobbying-based explanation of the prevalence of tariff escalation in developed countries. It also predicts the possible response of a developing country and shows how similar lobbying activity in that country can slow the pace of liberalization of service sector trade.

* Research Fellow, UNU/WIDER, Helsinki, Finland.

Introduction

Tariff escalation is a protectionist measure where relatively higher rates of import duties are levied on processed commodities compared to those on unprocessed commodities or raw materials. For instance, a country may choose to impose no tariff on the import of raw leather, but a positive tariff on the import of leather manufactures such as shoes, garments or accessories. Tariff escalation has been the subject of a long drawn out war between developed and developing countries because the tariff structures of the former have historically displayed significant escalation favouring their domestic producers in the 'processed' stages of a large number of sectors. Developing countries feel that, by and large, the tariff commitments in the Uruguay Round (UR) have failed to correct escalation by forcing developed countries to apply relatively higher tariff cuts to finished goods. Some studies have confirmed that tariff escalation has continued after the UR in a large number of sectors, particularly, metals, textile and textile products, leather and rubber products and to some extent in wood and wood products. For example, prior to the Uruguay Round, copra, cotton, castor seed, palm nuts and soybeans have been all imported into some OECD markets duty-free. However, once these items were processed into vegetable oils, they encountered average nominal tariffs of 7-9 per cent (Safadi and Yeats 1994). UNCTAD (1979), the Commonwealth Secretariat (1982) and the World Bank (1981 and 1987) have also viewed tariff escalation as a problem for developing countries. A study prepared jointly by the IMF and the World Bank (IMF-World Bank 2001)[1] notes that even though the Uruguay Round reduced tariff escalation for bound rates, such reductions in tariff escalation are not uniform. Large variations exist among different production chains and among different importing countries. Table 1 summarizes the picture for world imports of all industrial products.

Table 1
Tariff escalation

	Imports (US$b)	Bound tariff rates		
		Share of each stage	Pre-UR	Post-UR	Absolute reduction
All industrial products					
Raw materials	36.7	22	2.1	0.8	1.3
Semi-manufactures	36.5	21	5.4	2.8	2.6
Finished products	96.5	57	9.1	6.2	2.9
All tropical industrial products					
Raw materials	5.1	35	0.1	0.0	0.1
Semi-manufactures	4.3	30	6.3	3.4	2.9
Finished products	4.9	34	6.6	2.4	4.2
Natural resource-based products					
Raw materials	14.6	44	3.1	2.0	1.1
Semi-manufactures	13.3	40	3.5	2.0	1.5
Finished products	5.5	17	7.9	5.9	2.0

Source: Blackhurst *et al.* (1996).

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[1] Laird and Yeats (1987) is an important earlier study of tariff escalation.

The IMF-World Bank study (IMF-World Bank 2001) also estimated the extent of tariff escalation in various groups of importing countries. Figure 1 presents those estimates.
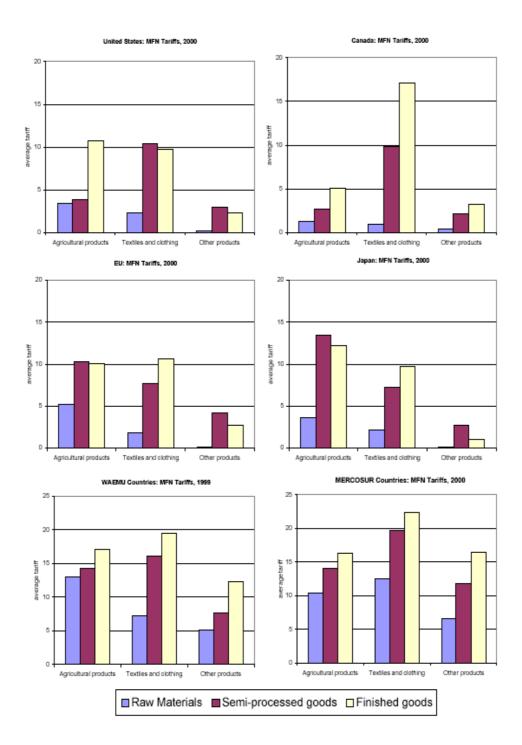
Figure 1
Escalation in different importing-country groups

Source: IMF-World Bank (2001).

It is evident from Figure 1 that in all the product categories as well as in all the country groups, raw materials face the lowest tariff rates. The tariff rates for the two subsequent processed stages are considerably higher.

Tariff escalation has an important implication for the 'effective rate of protection' of an importable sector comprising multiple products which differ by the degree of processing (and hence, value-added). Consider a simple example where a country imports both cotton yarn as well as cotton garments (produced from the yarn). Let the unit price (P) of cotton garment be USD 1 and the unit price (p) of yarn be USD 0.6. Let T and t be the (*ad valorem*) tariff rates applied to garments and yarn, respectively. The effective rate of protection (ERP) is defined as:

$$\text{ERP} = \frac{T - (p/P)t}{1 - p/P}$$

Two alternative scenarios can be imagined. In the first, the tariff on yarn is 10 per cent while that on garment is 20 per cent. In the second scenario, let there be no tariff on yarn, but a 20 per cent tariff on garments. Both scenarios imply escalation. However, the degree of escalation is higher in the second case, where there is a jump from zero tariffs at an intermediate (yarn) stage to a 20 per cent tariff at the final (garment) stage, compared to a jump from 10 per cent to 20 per cent between the same stages in the first case. The ERP in the second case is .50, while that in the first case is .35. Thus, the higher the degree of escalation, the greater is the effective rate of protection enjoyed by the final-good industry.

A study by WTO/UNCTAD (1998) has estimated ERP's for a large number of commodity-country pairs and reported high tariff escalation, resulting in high ERPs, in the clothing and footwear sectors in the US, Japan, Malaysia and Korea. In the case of the EU, significant tariff escalation has been noticed in sectors such as textile, leather products, wood products, industrial chemicals and rubber products.

A theoretical model

Admittedly, average tariff rates are on the decline in the WTO regime. However, governments of both developed and developing countries seem to find it difficult to cut tariffs across the board for all products in particular sectors. Instead, they seem compelled to reduce tariffs at differential rates, depending on the extent of product processing. Thus, a particular weighted average tariff rate for the sector may show a decline, but important products within the sector may continue to enjoy high levels of protection. Also, the resultant ERP for the final good of the sector may actually increase, even if an average tariff measure for the sector as a whole shows a decline.

In this section, we present a simple model of production and trade to track changes in factor prices, mainly wages, that result from tariff escalation. We show that, under plausible assumptions, tariff escalation has different implications for the rewards to skilled and unskilled workers in the importing country. Since protectionist measures, are to a large extent, affected by domestic lobbying activities by various stakeholders, it is important to try and understand the underlying economic rationale of such lobbying. The model not only provides an explanation of lobbying in the developed country, it

also predicts the nature of response that is likely to emerge from the developing (exporting) country as a result of similar lobbying by influential groups.

We consider a model that has two countries, one developed and the other developing. The importables of one country are the exportables of the other country. A model featuring tariff escalation must rank the importables of a country according to the 'degree of processing'. We use the minimal version of a production model with only two import goods in each country, and make the standard assumptions of classical trade theory about technology, competition and mobility.[2] The developed country imports goods M_1 and M_2 which are different with respect to the degree of processing. While both are produced with raw materials, R, and capital, K, M_2 is capital-intensive compared to M_1. For example, M_1 can be 'coffee beans' and M_2 'instant coffee'. The developing country exports the M-goods. Let P_i denote the world price of the i-th good. Also, let t_1 and t_2 be the tariffs applied to imports of M_1 and M_2 respectively, in the developed country. We assume that both the developed as well as the developing countries are 'small' in the sense that they take prices of traded goods as given. For simplicity, nominal exchange rates in both the countries are normalized to unity.

Let a_{ij} denote the amount of the i-th factor required to produce one unit of the j-th good. The competitive profit conditions in the importable sector of the developed country may be written as:

$$1.\ a_{RM_1}r + a_{KM_1}k = P_{M_1}(1+t_1)$$

$$2.\ a_{RM_2}r + a_{KM_2}k = P_{M_2}(1+t_2)$$

where r and k denote the rewards to raw materials and capital, respectively.

The developed country exports manufactures and services to the developing country. X_1 (manufactures), is produced with capital and unskilled labour. X_2 (services), is produced with capital and skilled labour. The wages of unskilled and skilled labour are, respectively, w_1 and w_2. The competitive conditions for the exportable sector of the developed country are:

$$3.\ a_{L_1X_1}w_1 + a_{KX_1}k = P_{X_1}$$

$$4.\ a_{L_2X_2}w_2 + a_{KX_2}k = P_{X_2}$$

The following comparative static analysis encapsulates the scenario in which the developed country is making changes in its existing tariff rates, due to WTO obligations. We envisage the case where tariffs in both the importable sectors are being reduced. However, the rate of reduction in tariff in the processed (M_2) sector is less than that in the primary sector. The analytically equivalent case is where tariff rates are being *raised* and the rate of increase is higher in the processed sector. In the algebra to follow, we present this analytically equivalent case in order to keep the notations relatively simple. Both the cases produce the same qualitative results.

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[2] Technology exhibits constant returns to scale, perfect competition prevails in all the markets. Factors of production may be mobile across sectors in the domestic country but do not move across borders.

With world prices of traded goods unchanged, total differentiation of equations 1 and 2 yields:

5. $\theta_{RM_1}\hat{r} + \theta_{KM_1}\hat{k} = \hat{t}_1$

6. $\theta_{RM_2}\hat{r} + \theta_{KM_2}\hat{k} = \hat{t}_2$

where θ_{ij} is the share of the *i*-th factor in the *j*-th industry (Jones 1965). For instance, θ_{RM_1} represents the share of raw material *R* in the M_1 sector. In general,

$\theta_{ij} = (a_{ij}p_i)/P_j$

where p_i is the remuneration of the *i*-th factor and P_j is the price of the final commodity, *j*. Thus, the numerator denotes the total payment to factor *R* that must be made in order to produce a unit of good *j*. The denominator denotes the revenue from selling one unit of good *j*. The more intensively a factor is used to produce a particular good, the higher is the corresponding θ. Also, a '^' over a variable denotes a proportional change. For example, $\hat{t}_1 = dt_1/t_1$.

Equations 5 and 6 can be solved to obtain:

$$\hat{k} = \frac{(\hat{t}_2 - \hat{t}_1)}{(\theta_{RM_1} - \theta_{RM_2})}$$

M_1 being 'raw' imports, is *R*-intensive, and, M_2 being 'processed' imports is capital-intensive, making the denominator positive. The numerator is positive too, since escalating tariffs implies raising the rate of duty for the processed imports at a faster rate, relative to raw imports. Therefore, $\hat{k}$ is positive. Capital-owners gain due to tariff escalation.

Next, we totally differentiate equations 3 and 4 to obtain:

7. $\theta_{L_1X_1}\hat{w}_1 + \theta_{KX_1}\hat{k} = 0$

8. $\theta_{L_2X_2}\hat{w}_2 + \theta_{KX_2}\hat{k} = 0$

After substituting for $\hat{k}$ we can solve equations 7 and 8 for the relative change in skilled *versus* unskilled wages as:

$$\hat{w}_1 - \hat{w}_2 = \hat{k}\left(\frac{\theta_{KX_2}}{\theta_{L_2X_2}} - \frac{\theta_{KX_1}}{\theta_{L_1X_1}}\right)$$

A plausible assumption is that the service sector X_2 is intensive in skilled-labour and the manufacturing sector X_1 is intensive in capital, implying that the expression on the right-hand side is negative. Thus, skilled labour stands to gain relative to unskilled labour if the developed country government preserves tariff escalation. Hence, given the

opportunity, skilled labour as well as capital owners will lobby for tariff escalation in their home country. We conjecture that the prevalence of tariff escalation in developed countries may, at least partly, be ascribed to the lobbying success of these two groups, relative to that of unskilled labour.

We now shift attention to the developing country, where the mirror-image situation may be described as follows. The *M*-goods are exportable and the *X*-goods are importable for the developing country. With world prices given, the competitive profit conditions are:

$$9.\ a^*_{RM_1} r^* + a^*_{KM_1} k^* = P_{M_1}$$

$$10.\ a^*_{RM_2} r^* + a^*_{KM_2} k^* = P_{M_2}$$

$$11.\ a^*_{L_1X_1} w^*_1 + a^*_{KX_1} k^* = P_{X_1}(1 + t^*_1)$$

$$12.\ a^*_{L_2X_2} w^*_2 + a^*_{KX_2} k^* = P_{X_2}(1 + t^*_2)$$

Whether or not technologies are *identical* in the two countries makes no difference in our analysis. We continue to assume, however, that the technology in the developing country also exhibits constant returns to scale, perfect competition prevails and factors of production move within, but not across, countries. For generality, we have assumed that the input coefficients are different. Symbolically, the developed country variables are marked with an asterisk (*).

With no change in the domestic prices of the *M*-goods, $\hat{k}^*$ (and $\hat{r}^*$) will be zero. Given that $\hat{k}^*$ is zero, total differentiation of equations 11 and 12 yields:

$$\theta^*_{L_1X_1} \hat{w}^*_1 = \hat{t}^*_1 \text{ and } \theta^*_{L_2X_2} \hat{w}^*_2 = \hat{t}^*_2. \text{ Thus,}$$

$$\hat{w}^*_1 - \hat{w}^*_2 = \frac{\hat{t}^*_1}{\theta^*_{L_1X_1}} - \frac{\hat{t}^*_2}{\theta^*_{L_2X_2}}$$

Since X_2 (services) is skilled-labour intensive, and X_1 (manufactures) is capital-intensive, $\theta^*_{L_2X_2} > \theta^*_{L_1X_1}$. Suppose that the country raises tariffs in both the sectors at the same rate, say, $\hat{t}$. It follows that:

$$\hat{w}^*_1 - \hat{w}^*_2 = \frac{\hat{t}}{\theta^*_{L_1X_1}} - \frac{\hat{t}}{\theta^*_{L_2X_2}} > 0$$

In other words, the wages of unskilled workers will rise relative to that of skilled workers if the developing country retaliates by raising tariff rates uniformly, without escalation. However, if skilled workers are a more influential lobbying group, they would press for a relatively higher rate of protection in the services (M_2) sector, relative to the manufacturing sector (that is, $\hat{t}^*_2 > \hat{t}^*_1$), so that skilled wages rise relative to unskilled wages. Therefore, if skilled labour turns out to be relatively more successful in

lobbying in the developing country as well, it will oppose the opening up of its service sector.

Conclusions

Average tariff for a particular sector is not a reliable indicator of the degree of 'openness' of that sector. Among other limitations, it conceals information about the degree of escalation of tariff rates between products of that sector which go through different levels of processing. Even though available trade statistics indicate that average tariff rates are mostly declining in all countries, a closer examination reveals the continuation, often deepening, of tariff escalation. Given that trade liberalization (tariff reduction, to be precise) is heavily dependent on political and lobbying pressures within the domestic economy, this paper examined the implications of tariff escalation on factor rewards, especially, relative wages, in a stylized economy and found that skilled labour and capital owners are likely to gain from it. It seems reasonable to imagine that these two groups in any country have greater lobbying power, relative to unskilled labour. Therefore, one of the reasons why governments of developed countries may feel compelled to preserve such differential rates of protection between stages of production, is lobbying by skilled labour and capital owners. If skilled labour groups are equally influential in developing countries, the stylized model predicts that liberalization of the service sector in these countries may be slow and difficult. Thus, an important implication of the model is that lobbying by selected groups in developed countries may divert attention away from the fact that the removal of tariff escalation is a 'win-win' strategy. It can help promote processed exports from developing countries, benefit unskilled workers in the North and simultaneously, generate support for liberalization of the service sector in the South. All three issues are central in trade debates at the present time.

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