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PROTECTION, CONCENTRATION, AND THE DIRECTION OF FOREIGN INVESTMENTS

By Emmanuel S. de Dios*

This paper attempts mainly to substantiate the hypothesis that the pattern of tariff protection in the past contributed to the oligopolistic structure of Philippine manufacturing, and that such concentration included a distinct foreign element.

Firstly, the paper presents a theory to illustrate the effects of foreign capital inflows on the country's resource allocation assuming their tendency to be monopolistic. It then tested the following relationships: 1) between value-added concentration ratios and effective rate of protection as well as other standard variables explaining industrial concentration, 2) between levels of concentration and levels of industrial or firm profitability, and 3) between foreign capital and seller concentration.

The findings imply that, for the periods covered, effective tariff protection did exert an influence in promoting seller concentration. Results also suggested that it influenced the degree of international investments as well; as significant degree of association emerged between those sectors which were characterized by heavy seller concentration, and those in which foreign capital found a hospitable niche. The study interprets these findings for their significance to policy making and development theory.

I. Introduction

There is a strong presumption in the literature on industrial organization that tariff protection, or the insulation of the domestic market from import competition in general, contributes towards seller-concentration. In addition traditional trade theory would suggest a close connection between tariff protection and inflows of foreign capital, with recent hypotheses arguing that such flows tend to have a monopolistic element.

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While the web of the theoretical argument appears strong, there have been few attempts to test the suggested relationship for developing countries. This is somewhat surprising, considering the comparable magnitude of empirical work that have been done on the resource-allocation effects of the so-called "import-substituting industrialization" strategy adopted by many of these countries for several years and, on the other hand, the concern often expressed regarding the prevalence of "rent-seeking" and departures from competition that occur in these countries. This paper aims mainly to substantiate the hypothesis that the pattern of tariff protection in the past did contribute to the oligopolistic structure of Philippine manufacturing, and that such concentration included a distinct foreign element.

The second part of this paper attempts to present a theory around which the standard working hypotheses may be organized. The third part is devoted to a discussion of the empirical results themselves. The concluding portion goes some length in interpreting the findings for their significance to policy making and to development theory.

2. Theoretical Notes

Suppose the inverse demand function for a good is given by $P = P(q)$ where $P'(q) < 0$, P is the domestic price, and q is the quantity demanded. Let P^w be the exogenously given world price and t the applicable tariff rate, so that without monopoly, the domestic price P would equal $P^w\ (1 + t)$. Depending on the shape and position of their marginal cost curves, domestic producers would then sell at price $P^w\ (1 + t)$, the difference between domestic supply and demand being filled by imports.

Let the monopolist now be characterised by some cost function, $C = C\ (q)$ where $C'\ (q) > 0$. The presence of the monopoly implies it confronts some revenue function $R = R\ (q)$, which has the following composite form:

$$R(q) = \begin{cases} p^w(1+t)q & \text{for } q \leq \bar{q} \\ P(q)q & \text{for } q > \bar{q} \end{cases}$$

where $(\bar{q})$ solves the equation $P(\bar{q}) - P^w\ (1 + t) = 0$. That is to say, $\bar{q}$ is the level of quantity demanded at which domestic price is equal to the border-price cum tariff. Straightforward implicit differentiation will show that q falls as both P^w and t increase.

As Bloch (1974) has suggested in a related context, profit-maximisation by the protected monopolist may be characterised by one of three conditions, depending on the position of the monopolist's cost curve in relation to the domestic demand curve, the world price, and the tariff. (The following discussion is conducted entirely on the basis of first-order conditions, it being assumed that the relevant second-order conditions are always fulfilled when required. The reference is to Figure 1.)

Considering the first branch of the revenue function $R(q)$ alone, the equation of marginal revenue and marginal cost yields:

Case A. $P^w\ (1 + t) = C'(q)$ as a necessary condition for a maximum, such as if the monopolist's marginal cost curve were $C'(q)$ in Figure 1. In this event, however, the monopolist's behaviour is indistinguishable from that of a group of competitive producers, the summation of whose marginal cost curve is also $C'(q)$. Here one might say that the monopolistic organisation of the industry is ineffective in the sense that it results in no distinct difference in the price-quantity behaviour of the market.

Domestic price is equal to $P^w\ (1 + t)$, while quantity is given by some q_α which solves the equation $P^w\ (1 + t) - C'(q_\alpha) = 0$. Profits are given by $z(q_\alpha\ (t, P^w), t, P^w) = P^w\ (1 + t)q_\alpha\ (t, P^w) - C\ (q_\alpha\ (t, P^w))$. It is not difficult to see that, assuming $C''(q) > 0$, profits increase with increases in either t or P^w.[1]

Turning now the second branch of the revenue function R, and equating marginal revenue and marginal cost, one obtains:

Case B. $P\ (q) + qP'(q) = C'(q)$, or $P\ (1 - 1/\eta) = C'(q)$, where η is the elasticity of demand with sign reversed, whose value is greater than unity, since $C'(q)$ is assumed to be positive. Solving the above equation for q yields some value, say, q_β, which when plugged into the demand function $P\ (q_\beta)$, determines domestic price P_β, as is depicted in Figure 1, when the marginal cost curve is $C'(q)$. This is, of course, the classic monopoly case, with marginal cost being less than price.

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[1] More exactly, $dz/dt = P^w q > 0$ and $dz/dP^w = (1 + t)\ q > 0$. This is obtained by first differentiating q_α implicitly with respect to t and P^w, respectively in $P^w\ (1 + t) - C'(q_\alpha) = 0$, to obtain:

$dq_\alpha/dt = P^w/C''(q)$; $dq_\alpha/dP^w = (1 + t)/C''(q)$, which are both positive. Substituting these into the relevant expressions for dz/dt and dz/dP^w yields the answers given.

From the definition of $R\ (q)$, however, one sees this case will prevail only for $q > \bar{q}$, where $\bar{q}$ solves $P^{W}\ (1 + t) = P\ (\bar{q})$. Therefore we must have $q_{\beta} > \bar{q}$, and likewise, $P_{\beta} > P^{w}\ (1 + t)$. That is to say, the domestic price under monopoly will be less than the world price cum tariff, so that there is some redundancy in the level of protection.

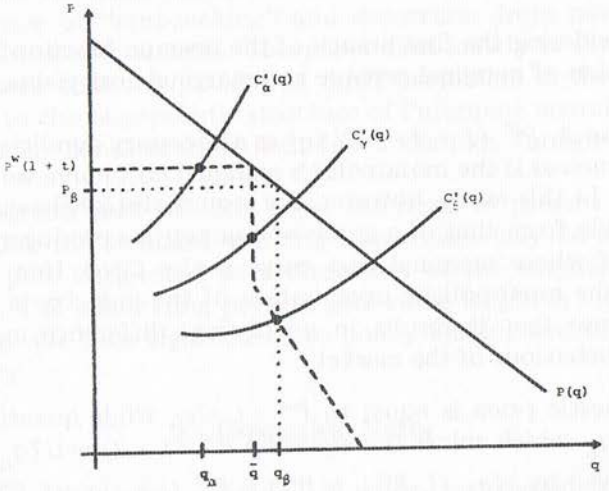

Figure 1

For the same reason, changes in the tariff rate or in the world price have no effect on domestic price and quantity sold (an implication being that the monopolist supplies the entire domestic market), nor on monopoly profits. That is, of course, unless the changes are so large that they alter the regime confronted by the monopolist to either Case A, or to Case C discussed below. The effect of the tariff, in this case, has clearly been to insulate the domestic market from competition abroad, and allow the monopolist to exploit its power. What is still true, in any event, is that the level of the tariff defines an upper bound to the price which the monopolist may charge.

A final possibility is raised by the following:

Case C. $R'(q) < C'(q) < P^{w}\ (1 + t)$. This may occur because of the discontinuity in the marginal revenue function at $\bar{q}$, presenting the fulfillment of the usual first-order conditions for an interior maximum. In Figure 1, this is illustrated in the situation where the marginal cost curve is $C'_{\gamma}(q)$.

Profits are maximised when quantity supplied is $\bar{q}$, while domestic price is $P^w (1 + t)$. As in Case A, the monopolist's profits and the domestic price are functions of P^w and t. Domestic price changes directly as either the world price or the tariff rate changes, since $P = P^w (1 + t)$. Profits of the monopolist also increase as P^w or t changes[2].

From the preceding discussion of partial equilibrium, we are able to make the following broad conclusions. First, regardless of whether it allows firms in the protected industry to behave monopolistically or not (i.e., Case A as distinguished from Cases B and C), the tariff will have a nonnegative effect on domestic price and on the profits of the industry. At all events, the tariff-ridden price sets an upper bound to the domestic price which firms may charge; the reduction of the tariff has a nonpositive effect on the domestic price and on the profit of firms (i.e. in Case B it has a zero effect). Secondly, if set "high enough", the tariff may facilitate the exercise of monopoly power on the domestic market by cutting it off from competing imports (i.e., Cases B and C). This is the more likely if the industry's capacity is large in relation to the domestic demand, and if the tariff is higher.

The effect which tariff protection has in inducing foreign capital inflows has been known and well-discussed at least since Mundell's (1957) article. The article's main content, however, was to show how, under perfect capital mobility, movements of goods and movements of factors were substitutes for each other and led to the same welfare results.

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[2] This last proposition may be demonstrated as follows: if quantity supplied is equal to $\bar{q}$, while price is $P^w (1 + t)$, then the monopolist's profits will be equal to:

(1) $z(t, P^w) = P^w (1 + t)\, \bar{q}(t, P^w) - C(\bar{q}(t, P^w))$

Taking derivatives with respect to t and P^w respectively:

(2) $dz/dt = P^w \bar{q} + P^w (1 + t)(dq/dt) - C'(\bar{q})(d\bar{q}/dt)$

(3) $dz/dP^w = (1 + t)\bar{q} + P^w (1 + t)(d\bar{q}/dP^w) - C'(\bar{q})(d\bar{q}/dP^w)$.

On the other hand, recalling that $\bar{q}$ solves $P(\bar{q}) - P^w (1 + t) = 0$, one obtains:

(4) $d\bar{q}/dt = P^w/P'(\bar{q})$, and $d\bar{q}/dP^w = (1 + t)/P'(\bar{q})$, which are both negative.

Substituting the expressions in (4) into (1) and (2):

(5) $dz/dt = [P^w/P'(\bar{q})][P'(\bar{q})\bar{q} + P^w (1 + t) - C'(\bar{q})]$

(6) $dz/dP^w = [(1 + t)/P'(\bar{q})][P'(\bar{q})\bar{q} + P^w (1 + t) - C'(\bar{q})]$.

It will noted that both first factors in (5) and (6) are negative, since $P'(q)$ is negative. On the other hand, the common second factor in both is simply the difference between marginal revenue and marginal cost, since $P^w (1 + t)$ is simply $P(\bar{q})$. Now, in accord with the conditions of the problem, marginal revenue is less than marginal cost, therefore the second factor is negative, and the two derivatives (5) and (6) are positive, as was to be shown.

Later work both in trade theory itself and in the industrial organisation literature — as well as the actual experience of many developing countries with import-substitution regimes — has led to a less sanguine attitude towards the welfare effects of international capital movements generated by protectionism.

Brecher and Diaz-Alejandro (1977) have shown, using the traditional two-by-two trade model, that an inflow of foreign capital induced by tariff protection can be "immiserising" (Bhagwati's phrase) when the country continues to import the protected commodity (i.e., the tariff and the consequent expansion of the production possibility set are not enough to put the country in the autarky position), and foreign capital is paid the full (tax-free) marginal product.

The argument is summarised in Figure 2. Suppose after a tariff is imposed the country's position is given by the production point P^O and the consumption point C^O. As is well-known, this already rep-

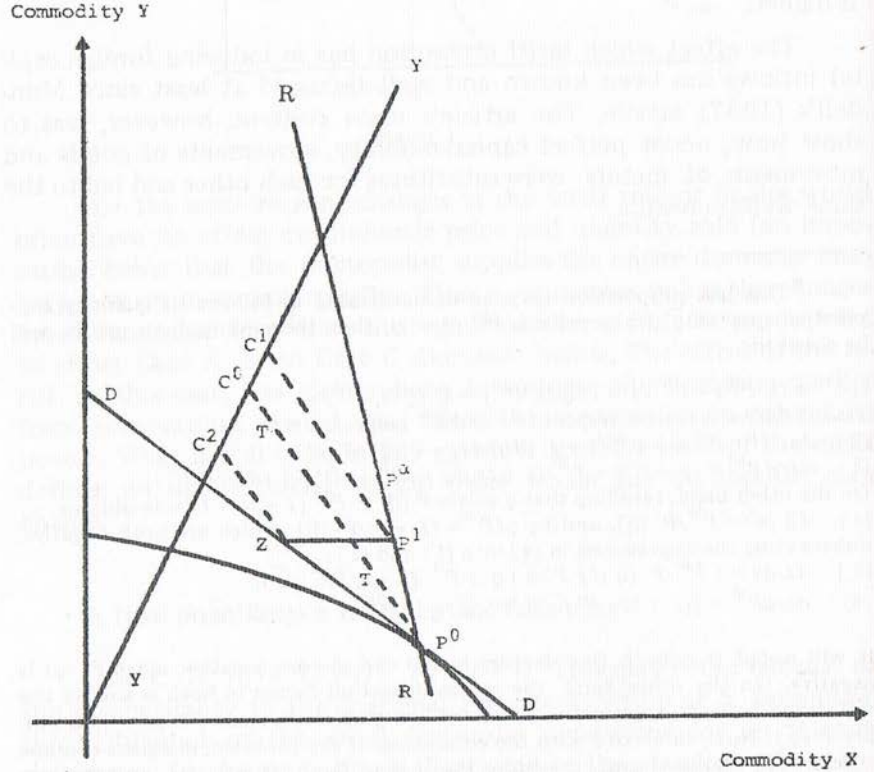

Figure 2

resents (under the small country assumption) some deterioration in welfare over the free trade position, which is not shown. The line TT connecting the two points has a slope equal to the ratio of international prices. DD is the tariff-ridden domestic price line. YY is the income-consumption path (assumed linear for simplicity) when prices are DD, and RR is the Rybczinski line, showing the locus of points at which successive production-possibility curves are tangent to lines with slope DD, as additional doses of capital push such curves outward. Rybczinski (1955) showed that this line was necessarily downward sloping, in the manner shown.

Let foreign capital now flow in, induced by the presumed differential in profit rates brought about by the protection of industry Y (assumed to be more capital-intensive), a standard application of the Stolper-Samuelson result. This causes the production point to shift, say to P^1. One is prevented from reaching P^α by the hypothesis that the country should continue to import commodity Y even after foreign capital shall have flowed in. Without payments being made to foreign capital, consumption would take place at C^1, the intersection of YY and the TT line originating at P^1. This is an obvious improvement in welfare over the previous point C^O and — since the domestic product valued at world prices is even higher than under free trade — might even dominate the free-trade consumption point (not shown).

When foreign capital is paid the full value of its marginal product, however, foreign profits absorb the entire increase in output, valued at domestic prices. If profits are paid in the form of importables Y, this means, after foreign payments are made, national product will be represented by the point Z, obtained as the intersection of a horizontal from p^1 and the domestic price line DD. Consumption is determined at C^2 after the endowment Z is traded at international prices. C^2 is obviously inferior to C^1, C^0, and a *fortiori*, the implied consumption point under free trade. Hence the conclusion that foreign investment immiserises the country, a conclusion that may be modified, however, if taxation of foreign profits is allowed.

The partial equilibrium has shown that the tariff-ridden price line sets an upper bound to the domestic price of the protected and monopolised industry. Furthermore, where the monopolisation has any distinct effect as compared to the perfectly competitive case (i.e. Cases B and C versus Case A) the price faced by consumers is greater than marginal cost of the monopolist; the whole market is also supplied by the domestic producer. In the context of the traditional trade model, this implies the final equilibrium attained must be an autarchic one.

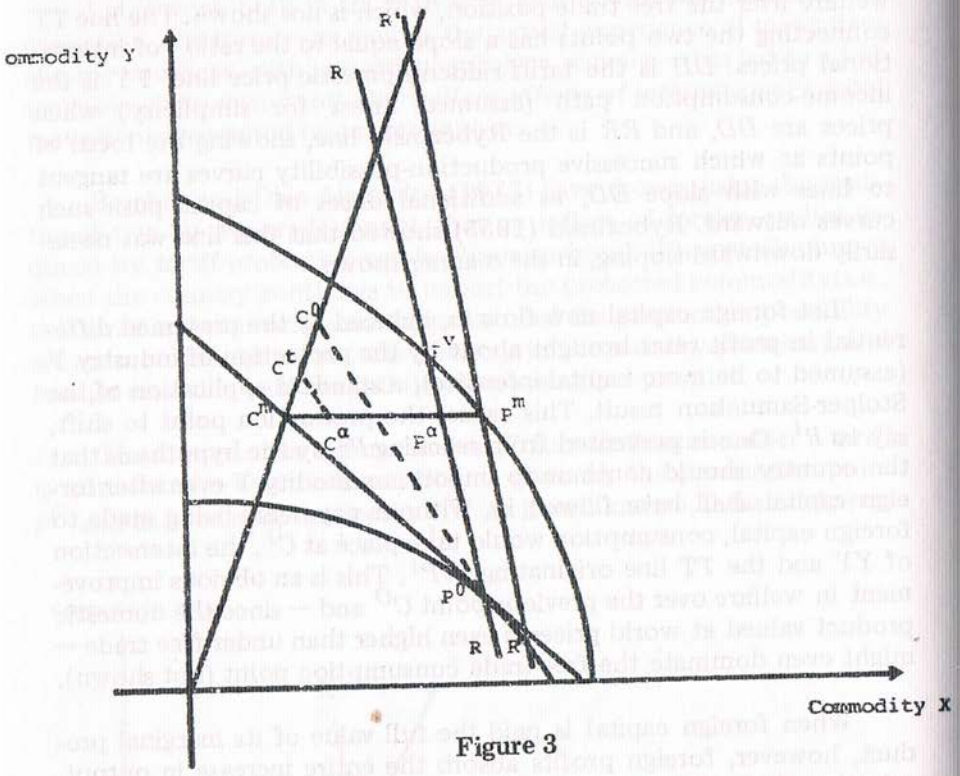

Figure 3

Letting Y be the protected and X be the unprotected industry, respectively, we have:

$$MRS = P_x/P_y = P_x^w/P_y^w(1 + t);\ MRT = MC_x/MC_y$$

Now, since $MC_x = P_x^w$, and $MC_y < P_y^w\ (1 + t)$, one obtains $MRS > MRT$, under the monopolistic equilibrium. In addition, we are supposing that the monopolist is foreign, so that after foreign payments have been made, the country should be in autarky with the relative price MRS prevailing.

All these considerations are illustrated in Figure 3, which is a reworked version of Figure 2. Once more RR is the Rybczynski line corresponding to the tariff-ridden relative price line $P_x^w/P_y^w\ (1 + t)$, while YY is the income-consumption line which accords with the same price ratio. On the other hand, $R'R'$ is the Rybczynski line representing points of tangency with the marginal cost-ratio, MC_x/MC_y which, from previous discussion, is less than $P_x^w/P_y^w(1 + t)$.

Under competitive conditions and without capital inflows from abroad, protection of industry Y would put the country at P^0 in production and C^0 in consumption, where the international price ratio corresponds to the slope of the broken line. Capital does flow in, however, and the question is, to what extent? If, as a result of foreign investment, industry Y is monopolised, the answer is: up to the point where the country is able to make payments to foreign capital and achieve autarchy. Under competitive conditions the country might receive inflows of capital until point P^α and, after payments of $C^m - P$ are made, corresponding to foreign capital's marginal product, the consumption point C^m would be an autarchic equilibrium.

This does not solve the problem, however, since under monopolistic conditions, the relevant production point should be on the line $R'R'$ and not on RR. Indeed P^m on $R'R'$ is the equilibrium production point that corresponds with the consumption point C^m. At C^m, P^m, $MRS = P_x^w/P_y^w\ (1 + t)$, $MRT < MRS$, and autarchy is attained after payments corresponding to $C^m - P^m$ are made to foreign capital. The increase in foreign profits as a result of the monopolisation of the protected industry is equal to the length of the segment $P^\alpha - P^m$. Of course it is understood that the transformation curve has shifted much further along RR, beyond P^α, to P^v, to accommodate the monopolistic equilibrium. The segment $P^\alpha - P^m$ may be considered a measure of monopolistic profits, since without the monopoly, the same consumption point C^m could have been sustained with a smaller inflow of foreign capital (i.e., the transformation curve corresponding to P^v rather than P^c along RR). Taxation of the amount $P^\alpha - P^m$ is always possible, and this would yield a consumption point C^t, obtained by measuring off the length $P^\alpha - P^m = C^m - C^\alpha$ to obtain the new national income, then trading it off along an international price line.

The preceding analysis is still admittedly inadequate in modelling the causes underlying the tendency of foreign capital inflows in developing countries to become monopolistic. This is especially true for inflows initiated by transnational corporations, as noted by Hymer. On the other hand, from our present viewpoint, such concerns are not entirely germane. Our purpose, after all, has been to illustrate the effects which such capital inflows may have on the country's resource-allocation assuming that they have a tendency to be monopolistic. And for that the present discussion will suffice, though admittedly it proceeds from a view of foreign capital flows which abstract from the internal organisation considerations which have recently been adduced to explain the monopolistic character

of foreign investments, or why they concentrate in markets which tend to be oligopolistic.

The stipulation that foreign capital flows do not bring the country back to the point where the precapital-flow autarky equilibrium is attained (as a result of tariff protection) is consistent with the condition of the problem that those foreign capital inflows *are* monopolistic in nature. For otherwise foreign capital should continue to flow in until marginal products across countries are equalised. That they are not — and that foreign capital should flow in only up to a certain point – jibes with the notion that investment is not made competitively but with an eye to maximizing worldwide profits for some firms, precisely by maintaining monopoly (e.g. by restricting production) in some markets.

3. Empirical Findings

Empirical material dealing with the degree of industrial concentration and the degree of protection in the Philippines exists mostly as largely separate bodies of literature. An investigation of the synergy between protection, industrial concentration, and foreign investment has heretofore not been explicitly made. Substantial work already exists on the structure and costs of protection (most definitively in the volume by Bautista, Power, *et al.*, 1979), which does not address, however, the question of how the structure of protection may have an effect on industrial organisation. Typically the assumption is implicitly made that the industries investigated are competitive in structure both before and after protection has been afforded. On the other hand, research on industrial concentration and foreign investments has been accomplished (e.g. Lindsey, 1976; Lindsey and Valencia, 1981; and the literature cited there) without explicitly drawing a link to protection, although as much is loosely suggested in some cross-section interviews (e.g. Lindsey, 1981). The closest attempts to test the extent to which tariff protection affects the industrial structure was made by Lindsey, using the share of imports in total supply as one variable to explain value-added concentration in manufacturing for 1970 (Lindsey, 1976). This proxy for import-competition turns out to be statistically insignificant, however, thus leaving the matter unsettled.

Using the import-share as a measure for the degree of protection leaves much to be desired, however, since it is not obvious that this variable will have a uniform meaning across all industries. A given percentage share may be compatible with greatly differing levels of

protection. This would obviously weaken the test where cross-section data are used. One might, for this reason, be better advised to use the effective rate of protection (ERP) as the variable measuring the level of protection, since this has a standard meaning across industries. It is also a fortunate circumstance that estimates of ERPs already exist, from the impetus given by the Bautista-Power studies. One might postulate, therefore, that together with other standard variables, the effective rate of protection makes an additional contribution to explaining the degree of industrial concentration.

The ERPs used in this study come from Tan's paper, found in the Bautista-Power volume. Since the ERPs there are based on 1974 I-O classifications, there was a need to reclassify them to conform with the data on concentration, which were based on the ISIC aggregations used by NCSO in their annual survey of establishments, the latter being generally broader than the former. The transformation was accomplished by weighting the I-O based ERPs with the value-added share of the industries and then adding them up to obtain the computed ERPs for the ISIC sectors.

The concentration variable used is the three-establishment value-added concentration ratio, for which two sets were available: one the set for 1970 as reported by Lindsey, and the other the set for 1979, which was a special tabulation made for this study.[3] The 1974 ERP levels are used to explain both the 1970 and 1979 concentration levels. This is justified in that it is generally agreed that between 1970 and 1979 there were no substantial changes in the protective structure, so that for a study at this level of aggregation, the industrial rankings in terms of ERP levels would not have substantially changed in the interim. The most significant changes in the tariff structure have come only since 1980, in the context of the tariff-reform programme financed by a structural adjustment loan from the World Bank. The availability of two data sets is also congenial to the methodological standpoint that econometric evidence should not be treated as final, but repeatedly tested.[4]

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[3] The data on total industrial value-added used to compute concentration ratios were taken from the *1979 Annual Survey of Establishments (Manufacturing), Preliminary Report* put out by the National Census and Statistics Office.

[4] As Blaug (1980, p. 21) paraphrases and endorses Mayer: "He (Mayer) deplores the tendency to treat econometric results as evidence from a 'crucial experiment,' which is never to be repeated; on the contrary, most applied econometrics should seek to replicate previous results using a different data set; as we come to rely increasingly on the weight of many pieces of evidence, rather than a single crucial experiment, periodic surveys should pull the evidence together with a view to resolving contradictions between them."

Table 1 Regression Results:
Three-Firm Value-Added Concentration Ratio (ln VACR)

	Constant	*ln* EFPR	*ln* VADD	*ln* VAEM	*ln* VEST	*ln* KAPL	*ln* VACR
I. 1970 VACR; 1974 EFPR: N = 18.							
Equation 1.	5.610	-0.065	-0.554†††	0.354††	0.559†††	-0.210†	0.004
$\bar{R}^2$ = 0.8783	(11.75)	(-0.97)	(-6.97)	(2.59)	(3.51)	(-2.08)	0.37
Equation 2.	5.778	0.052††	-0.325†††	0.125†††			
$\bar{R}^2$ = 0.6580	(9.30)	(2.28)	(-4.99)	(4.78)			
Equation 3.	5.199	0.229††	-0.208††			0.262†	
$\bar{R}^2$ = 0.2983	(6.02)	(2.87)	(-2.51)			(1.99)	
II. 1979 VACR; 1974 EFPR: N = 46.							
Equation 4.	4.676	0.340†††	-0.211†††	0.178	0.077	0.043	
$\bar{R}^2$ = 0.4021	(5.40)	(3.40)	(—3.03)	(1.09)	(0.82)	(0.37)	
Equation 5.	4.785	0.337†††	-0.206†††	0.322†††			
$\bar{R}^2$ = 0.4138	(5.74)	(3.63)	(-2.99)	(4.05)			
Equation 6.	4.723	0.325†††	-0.205†††		0.172†††		
$\bar{R}^2$ 0.4124	(5.66)	(3.49)	(-2.97)		(4.04)		
Equation 7.	4.319	0.431†††	-0.147†			0.246††	
$\bar{R}^2$ = 0.2792	(4.58)	(4.13)	(-2.00)			(2.40)	

††† = significant at the 1 per cent level.
†† = significant at the 5 per cent level.
† = significant at the 10 per cent level.

The theoretical framework developed in the previous section suggested that a relationship should be expected between value-added concentration ratios (VACR) as a measure of monopoly power, and the effective rate of protection (ERP) as well as other standard variables explaining industrial concentration. One of the important variables suggested there was the size of the market relative to capacity. In this paper a proxy used for this is the value-added for the industry (VADD), which one expects to influence concentration negatively, for the same reason one should expect growth of value-added (VARG) to influence growth negatively. Other variables which might represent barriers to entry and have a positive influence on concentration are also included, among them: the degree of capital intensity or the capital-employment ratio (KAPL); value-added per establishment (VEST) which is loosely related to minimum efficient scale; and value-added per employee (VAEM), which is related to working capital requirements, possibly a significant entry barrier where capital markets are imperfect. Data are taken from the NCSO's *Annual Survey of Establishments* (1979) and data reported in Lindsey's work for the 1970 series. One note of caution should be sounded, however, in that in practice, many of these other variables are closely related, and that therefore some degree of multicollinearity should exist in estimates which rely on too many of them at the same time.

In any event, we attempt to test various versions of the following relationship:

(1) $VACR = F(ERP, VADD, VAGR, VAEM, VEST, VAGR)$

where F_1, F_4, F_5, and F_6 are positive, while F_2 and F_3 are negative

After attempting different specifications (for details of which the reader is referred to Table 1), and using data for 1970, the following equation is finally selected:

$$\ln VACR = \underset{(9.3)}{5.778} + \underset{(2.3)}{0.052} \ln (1 + ERP) - \underset{(-5.0)}{0.325} \ln VADD + \underset{(4.8)}{0.125} \ln VAEM$$

$$\bar{R}^2 = 0.6580; \quad F = 11.9; \quad N = 18$$

(Figures in parentheses are t-statistics.) This is Equation 2 as reported in Table 1, and it shows the protection variable with the correct sign and significant at the five per cent level.

The inclusion of *VAEM* and *KAPL* as separate variables can be seen to lead to collinearity problems, as in the following:

$$\begin{array}{l} ln\ VACR = 5.610 - 0.065\ ln\ (1 + ERP) - 0.554\ ln\ VADD + \\ \qquad\quad (11.8)\quad (-1.0)\qquad\qquad\quad (-7.0) \end{array}$$

$$\begin{array}{l} 0.354\ ln\ VAEM + 0.559\ ln\ VEST - 0.210\ ln\ KAPL + \\ (2.6)\qquad\qquad (3.5)\qquad\qquad (-2.1) \end{array}$$

$$\begin{array}{l} 0.004\ ln\ VAGR \\ (0.4) \end{array}$$

$$\bar{R}^2 = 0.8783;\ F = 13.2;\ N = 18$$

In this specification, which is the same as Equation 1 in Table 1, it will be noted that *KAPL* has a preversely signed coefficient which is statistically significant, while the protection variable also has a perverse although insignificant coefficient. The determinant of the correlation-coefficients matrix is close to zero, indicating multicollinearity. The variable *ln VEST* is colinear with *ln (1 + ERP)* and *ln VADD*, the coefficients of correlation being 0.5468 and 0.8546, respectively. *ln KAPL* has some colinearity with *ln VAEM* (correlation coefficient: 0.5940). If we drop *VEST* and *KAPL*, we obtain Equation 2, as previously reported. If instead *VEST* and *VAEM* are dropped, then the capital-labour ratio *KAPL* turns out to have a correct and significant sign (Equation 3 in Table 1). In both Equations 2 and 3, of course, the protection variable has a significant coefficient with the expected sign. The determinants of the correlation matrices for the two equations are 0.4560 and 0.6316, respectively. For reasons both theoretical and statistical, therefore, one might select Equation 2, or even Equation 3, over Equation 1, in spite of the latter's "better fit".

Such a hypothesis is vindicated when one attempts to estimate the same sort of relationship using 1979 concentration ratios, as in Equations 4-7 in Table 1. When all variables are simultaneously included, as in Equation 4 reproduced below, only *ln (1 + ERP)* and *ln VADD* are significantly different from zero:

$$\begin{array}{l} ln\ VACR = 4.676 + 0.340\ ln\ (1 + ERP) - 0.211\ ln\ VADD + \\ \qquad\quad (5.4)\quad (3.4)\qquad\qquad\quad (-3.0) \end{array}$$

$$\begin{array}{l} 0.178\ ln\ VAEM + 0.077\ ln\ VEST + 0.043\ ln\ KAPL \\ (1.1)\qquad\qquad (0.8)\qquad\qquad (0.4) \end{array}$$

$$\bar{R}^2 = 0.4021;\ F = 6.9;\ N = 45.$$

On the other hand, when *VAEM*, *VEST*, and *KAPL* are included one at a time, (Equations 5-7), each is assigned a coefficient that is significant and of the expected sign. Equation 5 is the best-fitting, superior even to Equation 4 above, and is what is selected:

$$\ln VACR = \underset{(5.7)}{4.785} + \underset{(3.6)}{0.337} \ln (1 + ERP) - \underset{(-3.0)}{0.206} \ln VADD + \underset{(4.0)}{0.322} \ln VAEM$$

$$\bar{R}^2 = 0.4138; \; F = 11.4; \; N = 45.$$

The circumstance that, when 1979 data are used the protection variable is invariably significant with a coefficient of the correct sign, gives us a stronger reason (apart from theoretical reservations) to reject the implication in Equation 1 that protection did *not* influence concentration levels in 1970. As a corollary it also bolsters the selection of Equation 2 to explain 1970 concentration. As it turns out, moreover, the specification in Equation 2 is identical to that of Equation 5, which in turn is the "best fit" for 1979 data. This allows one to conclude that the stated relationship is robust, and effective protection does exert a positive and significant influence on industrial concentration.

Another link that must be explored is whether levels of concentration affect levels of industrial or firm profitability. This is a standard hypothesis in the structure-conduct-performance literature (e.g. Scherer, 1980, pp. 267-295). In the theoretical exposition developed above, moreover, it was a hypothesis that higher levels of protection resulted in higher levels of profits. Having shown that protection indeed contributes to "structure" through greater concentration, what is left is to show that differing "structure" leads to differing "performance" as measured, say, by profitability.

We wish to test some form of the following relationship:

(2) $PCM = F(VACR, ERP, KAPL)$

where *PCM* is some measure of profitability, the other variables are as previously defined, and we expect F_1 and F_2 to be positive and F_3 negative. While it is true that in the testing of (1) *ERP* and *KAPL* were shown to influence *VACR*, there is still some basis for including them in (2) separately. Apart from its effects on *VACR*, the capital-employment ratio *KAPL* will have an effect on profitability: when interpreted straightforwardly (e.g. as in well-behaved neoclassical production function) one should expect it to have a

negative coefficient. When interpreted as an entry barrier, however, the expected sign of the coefficient becomes more ambiguous. In most studies in the literature, the expected sign is positive. On the other hand, it may be argued that, where the entry barrier is in effect, its positive contribution to profitability may already be captured by the effect of concentration on profitability. Therefore where concentration *and* the capital-labour ratio are separately included, one could expect the coefficient of the latter to be negative. This may occur, for example, where firms invest in excess capacity to deter entry. To the extent excess capacity prevents other firms from entering the market, concentration is preserved and profitability increases. However, the existence of excess capacity in itself should have a negative impact on profitability, although of course for this to be a viable strategy in the long run, the losses from maintaining excess capacity should be outweighed by the gains from continuing monopoly.

The separate inclusion of the protection variable, in spite of the established contribution it makes towards increasing concentration, is in recognition of the possibility that it may increase profitability even where concentration is not heavy, i.e., even in those sectors where firms do not behave monopolistically. This much was suggested in the theoretical exposition in Part II, Case A. On the other hand, a related strand in the literature suggests that seller-concentration may lead to above-average profits only where imports are restricted (or, in our case, where effective protection is high), so that it is really the interaction between protection and concentration which directly explains profitability (see, e.g., studies mentioned in Caves, 1979, p. 57). According to this view, one should not expect a significant effect on profitability in industries where high protection is diluted by low seller-concentration or, vice versa, where high concentration is nullified by low protection. On the other hand, the effect on profitability is magnified where both concentration and protection are high. We might as a result postulate a relationship of the form:

(2') $PCM = F((VACR)(EPR), (KAPL)$

with all partial derivatives positive.

Testing data for 1970, Lindsey found a significant relationship between average industry profitability, defined as the "price cost margin", and value-added concentration. The price-cost margin is computed as value-added less compensation, divided by value of gross ouput. Since data on the first three firms in each industry are

available to us for 1979, however, we may devise a closer test. One may argue that if three-establishment concentration is to have an effect on profitability at all, the benefits will be largely captured by the top three establishments themselves. Therefore the price-cost margin statistic we use will be that defined only for the first three establishments in each industry. This is obtained, again, by summing up census value-added for the three firms, subtracting employees' compensation, then dividing by gross output for these firms.

The regression results are displayed in Table 2, Equations 1-8. The best-fitting equation is Equation 2, which simply shows the price-cost margin as a linear function of the concentration ratio and the asset-employment ratio:

$$PCM = 23.265 + 0.237\ VACR - 0.033\ KAPL$$
$$(3.38) \qquad (-1.56)$$

$$\bar{R}^2 = 0.1978;\ F = 6.55$$

In this specification, the coefficient of *VACR* is significant at the 1 per cent level, while that of *KAPL* is not significant at any level less than 20 per cent. A log-linear specification using the same two variables gives the next best-fitting line, Equation 6:

$$ln\ PCM = 3.127 + 0.256\ ln\ VACR - 0.197\ ln\ KAPL$$
$$(2.55) \qquad (-2.47)$$

$$\bar{R}^2 = 0.1602; \quad F = 5.29$$

Coefficients are significant at the 5 per cent level. The significance of the concentration variable in all specifications lends strong support to the hypothesis that the industrial structure influences performance, and that in particular establishment-concentration permits the earning of monopolistic profits.

In none of the specifications does the protection variable attain an independent significance. Only when it is included in its interaction with the value-added concentration ratio in a log-linear specification (Equation 8) does it make a showing. Even this, however, is inferior to a simple regression of the price-cost margin on the concentration ratio (Equation 3). This result suggests that the action of protection in increasing markups takes place primarily through its effects in establishing market power, and that it would hardly benefit firms in industries where there are many domestic sellers to begin with.

Table 2 — Regression Results:
Price-Cost Markups of First-Three Firms, 1979.

	Constant	VACR	(1 + ERP)	KAPL	(VACR) (1+ ERP)
I. Dependent Variable: PCM N = 46.					
Equation 1. $\overline{R}^2$ = 0.1788, F = 4.27	23.247	0.238 ††† (3.277)	-0.007 (-0.099)	-0.033 (-1.547)	
Equation 2. $\overline{R}^2$ =0.1978; F = 6.55	23.265	0.237††† (3.383)		—0.033 (-1.562)	
Equation 3. $\overline{R}^2$ = 0.1518; F = 9.05	21.914	0.226 ††† (3.009)			
Equation 4. $\overline{R}^2$ = —0.0059; F = 0.867	32.940			-0.026 (-1.114)	0.001 (0.648)

Table 2 (Continued)

	Constant	ln VACR	ln(1 + ERP)	lnKAPL	ln (VACR) (1+ ERP)
II. Dependent Variable : ln PCM N = 46					
Equation 5. $\bar{R}^2$ = 0.1411; F = 3.46	3.141	0.245†† (2.095)	0.019 (0.204)	-0.192†† (-2.286)	
Equation 6. $\bar{R}^2$ = 0.1602 ; F = 5.29	3.127	0.256†† (2.548)		-0.197†† (—2.468)	
Equation 7. $\bar{R}^2$ = 0.0574; F = 3.74	2.606	0.206†† (1.937)			
Equation 8. $\bar{R}^2$ = 0.1298; F = 4.36	3.428			-0.157† (1.970)	0.144†† (2.182)

††† = significant at the 1 per cent level.
†† = significant at the 5 per cent level.
† = significant at the 10 per cent level.

The final strand that we take up in the argument is the relationship between foreign capital and seller-concentration. The framework being followed thus far suggests that, first, following Mundell, those industries which are recipients of heavy protection would receive inflows of foreign capital, in order to take advantage of the resulting higher returns to the scarce factor, capital. The Hymer thesis would add, moreover, that direct foreign investment is more likely in industries where some monopolistic advantage could be built up and secured by foreigners. In theory, therefore, one would pose a relationship given by:

(3) $FCONC = F(VACR, ERP)$ $\quad F_1, F_2$ positive

(3') $FCONC = F(\ (VACR)(ERP))$ $\quad F'$ positive

where FCONC is some appropriate measure of foreign concentration. The formulation (3') is intended to take into account the hypothesis that effective protection may not serve to induce foreign capital in areas where the possibilities for monopolistic gain (as measured by the concentration ratio) are limited. This is consistent with Hymer's theory.

Before moving on to the regression results themselves, however, it is prudent to say something about the data set adopted. The measure of foreign concentration utilised *(FCONC)* is the share in census value-added per industry of a set of firms identified as having a degree of foreign participation. A measurement problem is, of course, always present when one attempts to define such terms as "foreign firms" or "transnationals", and even if one were able to evolve a theoretically satisfactory definition, it is another question whether the data themselves exist which correspond to such a definition. In practice, for example, it is difficult to distinguish between transnationals as normally understood and firms which are foreign-owned. Another fuzzy concept is the notion of control, which is not readily or uniquely related with shares in ownership.

Mindful of these and other conceptual difficulties, we nonetheless proceeded to construct a list of firms which may be identified as having an appreciable degree of foreign ownership, arbitrarily set at no less than 40 per cent. The list was culled from two sources: first, the list found in *Business Day's Top 1,000 Corporations 1979* of firms with 100 per cent foreign ownership; second, the list found in the work by Tsuda, Tiglao and Atienza (1978), which has the widest coverage thus far of corporations with any degree of foreign participation. Entities with foreign participation of less than 40 per cent were then struck from the list, as well as those for which data on cen-

sus value-added could not be computed. This procedure resulted in a list of 118 manufacturing establishments for which data could be obtained and whose contributions to value-added were aggregated according to the classifications in the NCSO's annual survey of establishments. The variable *FCONC* was then constructed as the share of the sample firms in the value-added of the industry to which they belonged.

The estimated versions of equations (3) and (3') are shown in Table 3. The following forms appear promising:

$$(1 + FCONC) = 1.026 + 0.003\ VACR \qquad (2.6)$$

$$R^2 = 0.1319;\ N = 46.$$

$$\ln\ (1 + FCONC) = -\ 0.162 + 0.035\ \ln\ VACR \qquad (2.4)$$

$$R^2 = 0.1184;\ N = 46.$$

The coefficients of value-added concentration are in both cases significant at the 5 per cent level. This lends support to the hypothesis that the pattern of concentration of foreign investments is at least partly determined by the opportunities for monopolistic advantage. Interestingly enough, none of the specifications involving effective protection as a separate variable yield a statistically significant coefficient for it; on the other hand, concentration is consistently important. (See Equations 1 and 3). On the other hand, when combined with value-added concentration, effective protection becomes significant in a log-linear form:

$$\ln\ (\ 1 + FCONC) = 0.0112 + 0.032\ \ln\ (VACR)\ (\ 1 + ERP) \qquad (1.7)$$

$$R^2 = 0.0624;\quad N = 46.$$

The coefficient is significant at the 10 per cent level. This, once more, is in conformity with the view of foreign investments being attracted to areas which offer monopolistic opportunities; tariff protection, from this angle, would be a necessary but not sufficient condition for foreign capital to flow in.

Table 3 [illegible]

Share of Sample Foreign Firms in Industry Value-Added (FCONC), 1979

	Constant	VACR	(1 + ERP)	
Dependent Variable: (1 + FCONC)				
N = 46.				
Equation 1.	1.0207	0.0038†††	-0.0015	
$\bar{R}^2$ = 0.1189; F = 4.03		(2.788)	(-1.155)	
Equation 2.	1.0265	0.0035††		
$\bar{R}^2$ = 0.1319; F = 6.68		(2.586)		
	Constant	***ln* VACR**	***ln* (1 + ERP)**	***ln* (VACR) (1+ ERP)**
Dependent Variable: ln (1 + FCONC)				
N = 46.				
Equation 3.	-0.1790	0.0930††	-0.01145	
$\bar{R}^2$ = 0.0801; F = 2.69		(2.316)	(-0.360)	
Equation 4.	-0.1625	0.0866††		
$\bar{R}^2$ = 0.1184; F = 5.91		(2.430)		
Equation 5.	0.0112			0.0326†
$\bar{R}^2$ = 0.0624; F = 2.93				(1.712)

††† = significant at the 1 per cent level.
†† = significant at the 5 per cent level.
† = significant at the 10 per cent level.

4. Conclusions

A conclusion that emerges from the findings is that, for the periods covered, effective tariff protection did exert a distinct influence in promoting seller concentration. There is also evidence to suggest it influenced the direction of international investment as well; there was a significant degree of association between those sectors of manufacturing which were characterised by heavy seller concentration, and those in which foreign capital found a hospitable niche. These propositions, by themselves, are quite unremarkable; they are the least that might be suggested by simple economic reasoning. This paper has merely attempted to bring to light hitherto unexplored evidence and, in so doing, perhaps carry the policy discussion a step forward.

There are at least two levels at which one may interpret these findings. A cursory, and indeed facile, manner of viewing them is to relate them to ongoing discussions of trade and industrialisation regimes (by now shopworn but, in this country, nonetheless relevant). The results suggest that, in addition to its well-discussed adverse effects on resource allocation, the existing tariff structure has imposed an additional cost to the economy in its promotion of industrial concentration, thus giving the ring of truth to the old saw that "the tariff is the mother of the trusts." What is perhaps even more ironic from the viewpoint of those who advocate greater tariff protection as a tool for nationalist industrial policies, there is some evidence to show that (as predicted by economic theory) effective protection, in combination with the concentration it engendres, may have benefited foreign capital as well. To the extent inflows of foreign capital were mostly in the nature of "tariff-jumping" activities[5] induced by no more than the system of protection itself, there is a strong presumption that their occurrence was likely to have been welfare-reducing.

From this one is only too tempted to conclude that, in tariff policy, one has gained a handle on both the industrial structure and the composition of trade; that a mere lowering of the tariffs would, therefore, have a favourable impact, not only by changing the output mix towards the direction indicated by comparative costs, but also by reducing the level of industrial concentration. Heretofore, after all, industrial concentration in developing countries has been regarded as resulting from more "structural" causes (e.g., the nature

[5] This is at least what is suggested in historical accounts of the import-substituting experience in the 1950s and 1960s, when the highest growth of foreign investments was observed. See for example Valdepenas and Bautista (1977 : 179-182).

of modern technology, the size of the market) which do not respond easily to the manipulation of individual policy instruments. The association between tariff protection and concentration would then at least suggest that part of the existing industrial organisation is not "structural" in origin but simply "policy-induced". If, moreover, the relationships uncovered are to any degree reversible, the negative effects can be mitigated simply by reversing the direction of the policy-variable, the tariff structure in this case.

Upon closer reflection, however, some doubts may be raised whether the problem of industrial concentration in developing countries may be put down as a simple case of "failing to get prices right". In the standard description of "rent-seeking" activities (e.g. Krueger, 1974) it is often taken to be the case that some law or policy is exogenously set which provides the opportunity for rents being extracted. This view then takes the formation of coalitions which seek to capture such rents to be an endogenous process, possible only because markets were not allowed to function to begin with. The removal of the distortions is then sufficient to make the game impossible to play and, by implication, also sufficient to dismantle such coalitions as may have been formed. In the case being discussed, this would imply that the institution of the protective structure was conceptually and historically prior to the formation of the groups that benefited from it, and the revamp of such a structure would more or less dissolve such groups.

What the standard account of rent-seeking leaves out, however, is how the rules become set in the first place, and why the game does not exist, whose value to the participants is the right to set the rules, together with all the benefits that would entail. This is, indeed, not far from how historians, sociologists, Marxists, as well as institutional and development economists might perceive the process. It is not the rules themselves, but rather the coalitions which set the rules, which manifest the greater stability. While the forms of rules may vary, say, in response to changes in the environment, what abides is their overall congruence with the interest of the dominant coalition. If this second viewpoint is adopted, there is less cause to be sanguine about the chances that "getting prices right" will suffice to redress the problem of market power. On the contrary, one could as well expect that the same concentration of social influence which underlies and is reinforced by market power could bias any contemplated changes in the rules, if any changes do become implemented at all. For example, there is some evidence to show that, in the current tariff-lowering programme, the phasing by industry has been influenced by the degree of economic concentration, with more con-

centrated industries (presumably also those with stronger political constituencies) being liberalised last (Alburo, 1985). This would be hardly surprising if one accepts the second view just outlined. Indeed, given sufficient opportunity to build its influence under tariff protection, a firm may in time become so dominant that it finds such protection redundant in maintaining its market power. This may be especially true in regard to transnationals.[6] This raises the possibility that the concentration-protection nexus may not necessarily be reversible, i.e. that a lowering of protection need not lead to reduced concentration, since other entry barriers may have been erected in the interim.

The point being made, therefore, is that simple price-adjustments may not in themselves succeed in addressing the issue of economic concentration. Rather more direct measures -- such as antitrust policies, or those aimed at directly redistributing assets — may have to be utilised. Such measures might, of course, presume a broader constituency and more determined political will than those upon which current privileged interests rest. But then it would really be too much to ask that important changes also be easy to implement.

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[6] As Caves (1976:61) puts it: "If the multinational company is good at scaling existing industrial barriers to the entry of new firms, it is also good at building up such barriers. The resources required to contrive such barriers (maintaining excess capacity, integrating forward to control distributive outlets, advertising heavily, accelerating the frequency of 'model changes,' etc.) are often found in the portfolios of multinational companies. It is also true that the multinational possess the 'long purse' that might drive out single-market rivals."

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