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THE CASE AGAINST THE INFANT INDUSTRY ARGUMENT

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THE CASE AGAINST THE INFANT INDUSTRY ARGUMENT

The infant industry argument for protection has long been regarded by economists as the major "theoretically valid" exception to the case for world-wide free trade. What controversy there is over the argument tends to center not on analytical issues but rather on empirical matters. Some writers, for example, maintain that the economic conditions on which the case is based apply to most manufacturing industries in less developed countries, and they believe, therefore, that general protective measures are justified in these economies.¹ Others are much more skeptical about the pervasiveness of these conditions and stress the high costs of making incorrect decisions.² Unfortunately, the views of both groups are based largely on casual empiricism. Careful, detailed investigations of the empirical issues involved in the infant industry case have been rare.³

The purpose of this paper is not to discuss these empirical matters but rather to suggest that economists⁴ have too readily accepted the theoretical arguments set forth for infant industry protection. It is argued that the theoretical conditions under which the infant industry case has validity are much more restrictive than the literature on the subject generally indicates and indeed that the instances where protection of infant industries can be justified are more in the nature of exceptions than a general rule.

I

Part of the explanation for the widespread uncritical acceptance of the infant industry notion is related to the vague manner in which it is often described. Many writers define the argument so broadly that it

covers all possible exceptions to the case for world-wide free trade. This, however, robs the argument of its uniqueness and tends to impede the identification of useful economic distinctions needed for policy-making in the tariff field.

Specifically, there are two important arguments for protection that should not be included under the infant industry case. The first is based on reversible static externalities and the second on market imperfections.⁴ Duties based on the existence of reversible externalities do not fit the infant industry argument because the latter argument states that duties are only needed temporarily. However, if duties can be justified because of reversible static externalities, they will be needed on a permanent basis. To use a traditional example, if the imposition of a tariff on flowers improves the allocation of resources because of the positive effect on an expansion of domestic flower production on the output of a nearby honey industry, the removal of the tariff even after the flower industry has passed "infancy" will not be warranted, since the tariff removal will cause honey production to decrease and the original divergence between private and social productivity to be restored.

Another reason for differentiating between the infant industry case for protection and one based on reversible static externalities is that externalities of this type are not related in any special manner to an industry age. If the infant industry case for protection is worthy of a special name, it should be based on arguments that apply uniquely and generally to the fact that industries are "infants" on the basis of some reasonable measure of the length of time during which production has been in existence. Certainly this is the view held by the originators of the

argument.

Tariffs justified on the existence of imperfect markets should also be excluded from the infant industry notion. It is true that there are circumstances where a market imperfection can be offset by temporary protection. For example, entrepreneurs in particular industries may--because of imperfect knowledge or monopolistic practices--be required to pay more for funds than if capital markets were perfect within the economy. The outcome can be insufficient investment in their industries from a social point of view. Duties on the products of these industries may, by redistributing income in favor of the profit receivers in these fields, increase the level of self-financing and thereby improve social welfare. Once the industries expand to a socially optimum size the duty can then be removed without reversing investment activity in these lines. Other examples where market imperfections impede optimum resource allocation would be when entrepreneurs underestimate the rate of return that can be earned on an industry or when workers over-rate the unpleasantness of moving from one industry to another. Institutional barriers of a monopolistic nature could have the same effect. By raising income prospects in these industries, a temporary tariff may overcome such impediments to needed resource transfers. However, since market distortions of these sorts are not confined merely to "young" industries, this argument for temporary protection--like the one based on static externalities--should not be included in the infant industry argument. It is a quite separate argument for protection.

II

The essential point emphasized by the originators of the infant

industry argument is the relationship between skill and knowledge levels in an industry and the length of time the industry has been in operation. Economists such as J.S. Mill pointed out that firms acquire skills and experience during the production process, and consequently cost curves decline in the early stages of an industry's existence.⁵ Thus, they noted, there may be cases where the only reason production costs in a particular industry are higher in one country than another is due merely to a lack of industry production experience in one of the countries. However, to stress a point not always made clear in the infant industry argument, the fact that a country's costs of producing a newly introduced commodity are initially higher than those of foreign competitors is, by itself, insufficient justification for tariff protection. If costs, after the learning period, are sufficiently lower than those during the learning period to yield a discounted surplus of revenues over costs (and therefore indicate a comparative advantage for the country in the particular line), it would be possible for firms in the industry to borrow sufficient funds to cover their initial losses.⁶ Should this be prevented because of an imperfect capital market, a duty may improve the allocation of resources, but--as has been noted previously--it is better to consider this argument for protection as separate from the infant industry case.

Infant industry proponents would maintain that protection is necessary even under perfect market conditions. The reason for this is because of the existence of dynamic externalities associated with the learning process. Specifically, the knowledge and skills acquired by a firm incurring costs related to the learning process tend to become available to other potential entrants in the same industry without the necessity of their paying similar

learning costs. Under a competitive market structure these other firms then will drive the product's price to such a low level that the firm providing the training function will never recoup its initial deficit. According to the infant industry argument, it is necessary, therefore, to introduce a temporary duty to make profit possibilities sufficiently attractive so that some firm will undertake the learning process. Otherwise, the industry will never be started.

The most frequently cited example of this type of divergence between the private and social rate of return on investment concerns on-the-job training. If--so the argument goes--a firm could count on its workers remaining with it after they have been provided with on-the-job training, the firm could incur the costs of training itself and recoup them later by paying the workers just enough less than their subsequently higher marginal productivity to cover these costs.⁷ However, workers are not slaves in a free market economy, and they will be bid away by new firms after their training period, if they receive less than their marginal productivity. Because of this ownership externality, i.e., a divorce of scarcity from effective ownership, it is argued that temporary protection is justified.

Kemp has already noted an important qualification to this argument.⁸ If the learning process is internal to the firm in the sense that the skills and experiences acquired are not useful to other firms then there are no grounds for government intervention. Each firm can borrow funds to finance the costs of training and recoup these outlays by paying slightly less than the subsequent marginal productivity of the workers. The workers are still being paid at least as much as they can earn in alternative employments and they will not leave.

But what if the skills are not specialized to the particular firm providing the training but can be used by potential competitors in the industry? Is it not true that without government intervention no firm will furnish on-the-job training and thus a socially non-optimum resource allocation will occur? The answer is no. Although no firm will finance on-the-job training, the workers will. This, however, ignores an important adjustment that will take place in the labor market. It is the workers who will benefit over their working lives from this on-the-job training, and it will be in their interest to pay for its cost. They can, for example, work during the training period at a wage rate sufficiently low that the firm's labor costs are not initially higher than foreign competitors, alternatively, they can borrow in the capital market to tide them over this low income period or even pay the firm with these borrowed funds to provide on-the-job training. This will be the rational course for workers to follow (and optimal for the economy) as long as the present value of their net income stream over their working life is greater with the training than under any other income alternatives. Imperfect knowledge or imperfect capital markets can, of course, thwart this possibility but this then would be a quite different argument for protection than the existence of dynamic externalities.

III

Another frequently cited example of dynamic externalities deals with the acquisition of technological knowledge. With respect to many types of knowledge-acquisition, no externality problem exists, since firms are able to keep their knowledge about production or markets from their competitors. Thus they are able to reap exclusively the profit benefits of

their investments in securing knowledge.

There are, however, instances where knowledge that a firm may acquire becomes freely available or available at a nominal cost to other firms in the industry and is also highly valuable to these firms. A firm who incurs costs in order to discover the best way to produce a particular product thus may face the problem that this information becomes freely available to potential competitors who can utilize it at the same time as the initial firm does. In a competitive market the price of the product will be driven to the unit costs of these other firms--a level that does not include any sum for acquiring the knowledge. The initial firm then will not cover its total costs including the sum spent on obtaining the knowledge--assuming its other costs are the same as other firms entering the field. Because of this type of response, individual firms will be reluctant to invest in knowledge-acquisition unless they are sure they can easily prevent others from obtaining the knowledge or can reap a sufficiently high reward during the time it takes others to copy them. Investments in knowledge that are profitable from a social point of view may, therefore, not be undertaken in the economy.

These circumstances could result in a significant divergence between private and social benefits. However, a protective duty is no guarantee that individual firms will undertake greater investments in acquiring technological knowledge. A duty raises the domestic price of a product and from the viewpoint of the domestic industry as a whole makes some investments in knowledge profitable that previously were unprofitable. But the individual firm still faces the same externality problem as before, namely, the risk that other firms in the same industry will copy, without costs to themselves any new technology discovered by the firm and then

drive the price of the product to a level too low for the initial firm to be able to recover the costs of discovering this new knowledge. If there were always some technologically fixed time lag between when an individual firm introduced (say) a new, cheaper production technique and when competition decreased the price of product to the unit cost level of the firms who freely copied the new production method, a duty would operate to make investment in knowledge-acquisition more profitable for an individual firm in an industry. But the speed with which firms respond to market opportunities is in large part a function of the level of profit prospects. A duty will make it worthwhile for firms to incur the costs of acquiring the knowledge discovered by other firms (if it is not completely free) faster and also to move into production faster and with greater output rates. There is no reason to assume as a general rule that any single firm will be more successful in recouping its investment in knowledge with a high duty compared to none at all.

Only if there are no costs involved in acquiring knowledge through experience would a tariff clearly accomplish its purpose of improving the long-run allocation of resources.⁹ Then any firm considering the possibility of initiating domestic production in the industry need not be concerned with the problem of facing competition from subsequent entrants into the field who do not have to incur learning costs that are not as high as those of the initial firm. However, learning through experience is not a costless activity for any firm. Unless a firm experiments on a random basis--a procedure that will not bring about the consistent decline in costs postulated under the infant industry argument, it will be necessary for management to devote resources to analyzing

previous performance before evaluating new productive practices. These are resources that could have been used to increase output under existing techniques. Consequently, as long as these costs are greater than what other firms must pay to acquire the knowledge discovered by a firm following the learn-by-experience route, no firm will, in general, be willing to incur the initial learning costs even if the government imposes a tariff on the product. On the other hand, if the costs of learning by experience are actually less than the costs of acquiring known technology in the industry, all firms will follow the learn-by-experience route. A duty is still not needed in this case, since firms can borrow funds to tide them over the period during which their costs are not competitive with those of well-established foreign firms. In many instances the relationship among the costs of learning, the ease with which potential competitors can take advantage of newly discovered knowledge, and the benefits from this knowledge may be such that individual firms need not be concerned with the problem of recovering their learning costs. But the point is that, when the technological spillover flows from one firm to other firms in the same industry, protecting the entire industry cannot be counted upon to induce firms to incur the volume of learning costs that will be sufficient either to achieve a social optimum or to gain the level of knowledge possessed by foreign competitors.

IV

Consider next those technological spillovers that affect entirely different industries instead of other firms within the same industry. Spillover effects associated with location sometimes take this form. For example, the location of a firm in one industry near a firm in another

industry may increase productivity in the second firm by bringing the market for its product physically closer than before. A situation could exist where investment in the two firms combined is profitable but investment in the first industry will not be profitable if the investors have no ownership interest in the second industry.

Usually investors have no difficulty in realizing the existence of such interrelations and the firms become commonly owned. However, if some institutional barrier prevents this, then a tariff that protects the first industry and thus makes investment more profitable in this industry can serve to improve social welfare. But a duty of this type must be maintained indefinitely. Removing the duty will after a time lead to disinvestment in the first industry and thus to losses and disinvestment in the second industry.

For a temporary duty to be effective in permanently raising social welfare, the spillover must create an irreversible change in factor or market conditions. In addition, the spillover effect must not benefit other firms in the same industry or, alternatively, the domestic market must be only large enough to support one firm.¹⁰ Unless either of the latter conditions is satisfied a duty protecting all firms in the industry will--as was pointed out in the previous section--not be effective in bringing about an increase in social welfare as long as there are costs connected with acquiring knowledge that cannot be internalized by a firm.

Assume, for example, that the knowledge a firm acquires is not useful to other potential firms in the same industry but is useful for raising the level of productivity of firms in an entirely different in-

industry. Also suppose that this knowledge becomes freely available to these other firms. Under the same circumstances described in the location example where the price of the first industry's product is too low to make it worthwhile for any firm in this industry to incur the costs of acquiring experience but where these costs are socially justified taking both industries together, a temporary duty can serve to increase social welfare. Unlike the cases where the spillover benefits other firms in the same industry, a firm will be able in this instance to reap the benefits of investment in knowledge made profitable by the duty.

Just how pervasive and significant are such instances where knowledge acquired by one industry, which is undertaking the production of a commodity already produced in other countries, is both freely available and useful to firms in entirely different industries is difficult to say. It seems evident that at the earliest stages of industrialization the knowledge acquired by the first manufacturing firms concerning such matters as the capabilities and adaptability of rural labor to factory production is highly valuable to industrial enterprises in all fields. However, this knowledge will also be useful to potential competitors in the same industries in which the initial firms are located. Consequently, unless there are increasing returns to scale in these lines so that an industry consists of one firm, a protective duty will not eliminate the spillover problem faced by any firm that bears the costs of obtaining this knowledge. Acquisition of this sort of general knowledge regarding production techniques also is more relevant for an "infant economy" argument than the infant industry case. The establishment of a few manufacturing firms is all that is needed to yield this type of knowledge. Protecting

all "infant" industries cannot be justified on the same grounds.

Aside from general knowledge about productive techniques, there are undoubtedly also many instances where valuable, specific technological knowledge discovered by a particular firm in one industry becomes freely available to firms in an entirely separate industry. As in the case above, however, the knowledge must not be useful to firms in the same industry if a tariff is to be effective in inducing any firm to undertake the costs of obtaining such knowledge. There is little evidence to suggest that knowledge-spillovers that satisfy this special condition are significant and numerous in infant industries.

V

If the infant industry argument is worthy of its special name--to say nothing of its reputation as the major exception to the free trade case--it should be possible to present a clear analytical case, based upon well-known and generally accepted empirical relationships, that establishes the social desirability of protective duties in newly created industries. The contention of this paper is that this cannot be done. With regard to one frequently cited instance where it is alleged that temporary protection is needed, namely, the on-the-job training case, it has been shown that the standard argument is incomplete, since it ignores the market response of the labor force to the benefits from greater training. But, more fundamentally, the infant industry does not stand up because of the divergence between the scope of the subsidy given by a protective tariff and of the spillovers and costs associated with the acquisition of knowledge and training. A duty raises a product's price for all present and potential firms in an industry. Therefore, if knowledge

acquired through experience by any one firm becomes freely available to other firms in the industry and can be used to reduce their costs, there must not be any acquisition costs for the initial firm if a duty is to be effective in encouraging a firm to follow the learn-by-experience route. In other words, if a firm that learns by experience does incur costs which the firms who copy it do not, a temporary duty will not achieve its purpose unless the benefits of the knowledge-spillover fall entirely outside the industry. Since there invariably seems to be costs of learning to individual firms and since the spillover of the knowledge acquired generally seems to benefit firms within the same industry, it appears that the case for infant industry protection is too limited and specialized to serve as the basis of a serious argument against the free trade case.

All this does not mean that no intervention whatever in the free market system is needed to achieve a welfare optimum from a world viewpoint. A tariff will generally not be effective in encouraging individual firms to bear the costs of adapting foreign productive practices to local conditions, but a subsidy on an individual firm basis will be effective and is desirable from a welfare standpoint. There are also many instances where the existence of various types of market imperfections means that world-wide welfare can be increased by import duties.¹¹ However, as Johnson has pointed out, even in these cases import taxes are "second-best" measures when the market imperfections create a divergence between domestic prices and domestic opportunity costs. The use of direct tax or subsidy measures in the domestic sector are better means of correcting for these distortions, although there may be good reasons for protective tariffs, the infant industry argument does not seem to be one of them.

FOOTNOTES

1. For example, G. Myrdal, Rich Lands and Poor (New York: Harper, 1957), pp. 96-97; and P.N. Rosenstein-Rodan, "Notes on the Theory of the 'Big Push'" in Readings in Economic Development, edited by T. Morgan, G.W. Betz, and N.K. Choudhry. (San Francisco: Wadsworth Publishing Co., 1963), pp. 143-150.
2. For example, G. Haberler, The Theory of International Trade (London: William Hodge and Co., 1936), pp. 281-285; and G.M. Meier, Leading Issues in Development Economics (New York: Oxford University Press, 1964), pp. 302-303.
3. The classic but inconclusive study of this subject is F.W. Taussig's, Some Aspects of the Tariff Question (Cambridge: Harvard University Press, 1915).
4. Most writers agree that the existence of static externalities should not be regarded as part of the infant industry case but agreement on the exclusion of market imperfections is less general.
5. J.S. Mill, The Principles of Political Economy, ed. Sir W.J. Ashley (London: Longmans, Green and Company, 1909), p. 92.
6. In other words, internal economies by themselves are not a basis for maintaining that protection is needed.
7. Training costs are the excess of current wage and other costs associated with the new workers over their current marginal productivity. As Haberler has pointed out, for the establishment of the new industry to represent a socially desirable shift in resources, the discounted marginal productivity stream of the workers who transfer into the new industry must be higher than in the industries from which they are drawn. G. Haberler, op. cit., p. 284.
8. M.C. Kemp, "The Mill-Bastable Infant Industry Dogma," Journal of Political Economy, LXVIII, No. 1 (February, 1960), pp. 65-7.
9. Kemp, ibid., seems to be making this assumption in his analysis of the learning-by-experience case.
10. The latter condition requires the special assumption of increasing returns to scale.
11. H.G. Johnson, "Optimal Trade Intervention in the Presence of Domestic Distortions," Trade, Growth and the Balance of Payments (Chicago: Rand McNally, 1965), pp. 3-34.