

BARGAINING AND THE DISTRIBUTION OF RETURNS IN THE
PURCHASE OF TECHNOLOGY BY DEVELOPING COUNTRIES

by Constantine V. Vaitsos*

The intellectual tradition of most modern economists (at least in the "Western" world) is such that they explicitly or implicitly associate the allocation of resources and distribution of returns with the market mechanism and a price system. Aside of issues that arise with respect to the degree of "purity" and "perfection" of the market-price system (a subject that has long been discussed) economists who accept it implicitly assume, among other things, that (a) goods, services and factors of production are "individually owned" (by persons or firms) and (b) the parties participating in an exchange are able to assess the values of the economic units transacted. The market within which technology is being commercialized violates both assumptions related to the price system, as it is traditionally defined. Consequently, technology commercialization can best be described through other mechanisms, and one that appears most appropriate is that of bargaining. Policy makers, therefore, who concentrate on the "price mechanism" (as taught to us by traditional economic theory) in order to maximize their country's interests when technology is being purchased are misorienting themselves completely.

The reasons are the following. Technology, being a form of information, is "non-exhaustible". Its use contrasts with the usage (or consumption) of an item which is "individually owned", in which case the availability to others (or to the same person in the future) is at least partially reduced through wear and tear. Technology, then, is by nature "jointly" and not "individually" owned. The usage of information by a person or firm does not in itself reduce its present or future availability. Information is "non-exhaustible"; the price mechanism that could satisfy the efficient transfer of "individually" owned goods is inappropriate in this case.

The marginal cost of using or selling an already developed technology is zero for the owner of that technology. Where cases of adaptation arise the owner incurs certain costs which can be estimated and usually do not exceed a figure in the tens

* C. V. Vaitsos works in Lima, on technical assistance contract to the Andean Pact Group.

of thousands of dollars.¹ In several industries the sellers of technology to developing countries have themselves copied such technology from the originators who incurred the R. & D. expenses. (A systematic study undertaken in the petrochemicals industry indicated that during the period after original development when technology sales to developing countries were most likely to occur the original producers of a product or process accounted only for 1% of the total licensing. The remaining 99% was divided between "followers" of commercial producers (52%) and engineering firms (47%).² On the other hand, from the point of view of the purchaser the marginal cost of developing an alternative technology with his own technical capacity might amount to millions of dollars. Or he might be unable to develop it, or at least think so, in which case his relative marginal cost is infinite. Given market availabilities, the price between zero or tens of thousands of dollars, and millions of dollars or infinite is, in turn, determined solely on the basis a crude relative bargaining power. There is no price which a priori can be claimed to be more or less appropriate within the two limits specified.

A further consideration arises as to whether information, technology or ideas are "owned", to start with, in accordance with the traditional definition of property. Ideas can certainly be captive either legally (i.e. patent privileges) or technically (i.e. in case they are kept secret, or when a potential user does not have the knowledge to absorb and use certain information). But can they be "owned"? It has been argued that "... property in ideas once published is an insoluble contradiction.... (He who argues that his ideas have been stolen)... complains that something has been stolen which he still possesses, and he wants

¹ For an analysis of marginal versus full cost considerations in the development of new as well as the sale of already developed technology that is purchased by the "non-industrialized" world see C.V. Vaitos: "Transfer of Resources and Preservation of Monopoly Rents", paper presented at the Dubronik Conference of the Development Advisory Service of Harvard University, June 20-26, 1970, pp. 18-21.

² R. Stobaugh "Utilizing Technical Know-how in a Foreign Investment and Licensing Program", paper delivered to the National Meeting, Chemical Marketing Research Association, 1970, p.5.

back something which, if given to him a thousand times, would add nothing to his possession".¹ Furthermore, how can "ownership" be claimed in inventions or ideas when any advancement in thought is a result of dependence on and further elaborations of previous inventions or ideas?² The distinction between "ownership" and "captivity" leads us to the following consideration. In part of the market of technology commercialization an external mechanism is interposed so as to create, artificially, a scarcity which in turn results in a price system. Such interposition is achieved through patents. "Clearly the patent system is our attempt to include the production of inventions in the same framework of pricing as the production of other things, and to do this by creating scarcity - by limiting the use of the invention.... So far as inventions are concerned a price is put on them not because they are scarce but in order to make them scarce to those who want to use them".³

The second assumption made about the price system as an efficient means of allocating resources implies that "the parties participating in an exchange are able to assess the values of the economic units transacted". Here again the existing market of technology commercialization not only differs from that of the price system, but also places the purchaser in a structural position of basic weakness. In the formulation of the demand for technology, or for information in general, the prospective buyer needs information about the properties, potential results, alternative offers, etc. of the item he intends to purchase. In this respect the technology market is no different from all other

¹ Hermann Rentzsch, "Geistiges Eigentum" Handwörterbuch der Volkswirtschaft, Leipzig 1866, p. 333.

² "It is little short of absurdity to call any one of the inter-related units the invention, and its 'creator' the inventor. The man who brought to a certain stage of fruition the efforts of myriad successors, and whom therefore we call the inventor, may have made a great contribution. But seen in its proper setting & perspective, the contribution is something less than cataclysmic" Alfred E. Kahn "Fundamental Deficiencies of the American Patent Law", American Economic Review, v. 30 (1940) p. 478.

³ Edith T. Penrose The Economics of the International Patent System, The John Hopkins Press, 1951, p. 29.

markets. Yet quite often, the item itself that one needs to purchase (i.e. technology) is at the same time the information that is needed in order to make a rational decision to buy it. What is needed is knowledge about knowledge, which could effectively be one and the same thing. As a result the assumed roles of an efficient market mechanism break down, at least on the part of the buyer. In evaluating contracts of technology purchase by developing countries one is immediately struck by the total vagueness by which technical assistance is being acquired contractually. The licensor is quite generally left with complete freedom to transfer whatever he decides while the purchaser has explicit and fixed conditions with respect to payments, terms of obligations, etc. The buyer, quite often, does not know what to ask.

The properties of the market of technology transfer are therefore, such that the mechanism that best describes its functioning is the process of bargaining (and not the traditionally defined market-price system). The buyer is, moreover, placed in a position of structural weakness in the formulation of his demand for information. We now have to consider why developing countries confront, in addition, other problems which further diminish their relative bargaining power and hence increase the cost of technology acquisition. I shall be briefly treating three general aspects.

I. The process of industrialization through final product import substitution of the "late-late comers" has been such that developing countries basically confine themselves to the transformation (and not properly the production) of products that have been imported from abroad. Within this context technology purchase involves, to a great extent, know-how embodied in intermediate products and capital goods. As a result purchases of the latter are tied-in with the purchase of technology. A study undertaken in Colombia showed that all the contracts of technology commercialization that provided information on intermediate product purchases, explicitly required the purchase of such products from the seller of technology.¹ In addition, even if contractual terms do not so specify, the know-how purchase often defines (sometimes quite uniquely) the origin of intermediate products. As a result the market of such products becomes monopolistic (i.e. the licensee of Pfizer Co. has to buy tetracycline from Pfizer since the latter is the only one that can export the product to a country if it

¹ The following discussion is based on C.V. Vaitsos, op. cit. pp. 10ff. The quotation is from p.11.

owns the patent that covers the product. A licensee of Toyota has to import components from the licensor since the technology embodied in the chassis and assembling of Toyota cars requires specific Toyota components). From research in Colombia and extrapolating from a sample that included 25% of the imports of 40%-50% of the pharmaceutical industry, it was estimated that the country paid for intermediate products in 1968 close to US\$... 20,000,000 solely due to price differentials above those available in the "international" market for the same products. Price differentials were observed in each one of the sectors studied which included chemicals, electronics and rubber products. "Defining as effective returns to the parent corporation the sum of reported profits of the subsidiary, royalty payments and intermediate product overpricing, the following data can be inferred from our sample of the Colombian pharmaceutical industry. Reported profits constituted 3.4% of effective returns, royalties 14.0% and 'overpricing' 82.6%". In view of such overpricing the basis for costing technology and/or capital (in case of foreign direct investment) cannot be found in royalty payments or in declared profit repatriation, but has to rest on the prices paid for intermediate products and capital goods. Tie-in arrangements resulting from contractual terms and/or technical requirements and/or ownership ties, have properties which make the market price system a poor mechanism to distribute benefits while protecting the interests of developing countries.

II. Markets where prices are settled through bargaining, like the labor market, have generally developed explicit institutional methods and rules upon which negotiations are settled. Such methods enable the participating parties to protect their interests by the proper definition of the negotiable elements, maximum and minimum positions of bargaining, identification of areas where the other party is most or least likely to "give-in" etc. Industrialized countries, both because of the sophistication and size of their companies, and because of the existence of specialized government agencies (cf. MITI and JETRO in Japan) have enabled their technology buyers to negotiate with considerable knowledge and intelligence. Developing countries, however, in spite of being highly dependent upon foreign technology, have not yet shown an awareness of the critical problems involved.

To start with a large part of foreign know-how is introduced through the establishment of foreign owned companies. Such subsidiaries lack even a minimum negotiating position since their interests are, presumably, identified with those of their parent corporation and not with the host country. (For example, it is not uncommon to encounter cases where a foreign wholly-owned

subsidiary has capitalized in its books technology that originated from the parent corporation. As a result it could be (a) paying royalties, (b) reducing its tax payments through depreciation "charges" of intangible assets, (c) having lower tax coefficients in countries where taxable profits are related to "invested" capital and (d) claiming higher capital repatriations in countries with exchange controls, all for the same know-how. Clearly a foreign owned subsidiary does not need to capitalize technology since 100% of its capital is already owned by its parent).

Institutional mechanisms and procedures to handle adequate bargaining of foreign technology purchases are lacking not only in cases of parent-subsidiary situations, or with respect to the proper definition of implicit costs that result from intermediate product overpricing (an item which is usually left out of the negotiating process). Procedures are also inadequate for the evaluation of even the explicit, negotiable elements in technology purchase such as royalty payments. They are usually negotiated on the basis of sales, and not with respect to the income generating effects of technology, such as profits for firms and domestic value-added for countries. As a result of this mis-specification of the "economic effects" of a particular know-how purchase one encounters cases where royalty payments, which appear quite "reasonable" with respect to sales, amount to a multiple of profits or value added. (One result of the present system is that a country's payments on technology that originated from abroad rise proportionately with its final product tariffs).

The inadequacy of the present bargaining system stems partly from the lack of any adequate specifications of what is meant by technology importation. When evaluating contracts in developing countries one generally encounters the tautological definition that technological purchase implies the importation of know-how. The issue arises as to what, at least operationally, is the technology that a country is importing for a given industry, or process or product. Is it technical assistance which is transmitted through personnel, or a manual with production specifications, or a license of a patent (which clearly is not technology but the legal permission to use technology), or know-how already embodied in intermediate products and machinery, or factory layouts, or what? Each of these different types of technology importation has different potential alternative sources of supply and hence different alternative prices; expresses different types and degrees of dependence between technology supplier and receiver; has attached to it different types of obligations and rights for the contracting parties, etc. The type of technology needed by

developing countries in their present industrial stage is amply available around the world. Therefore, the breakdown of what is collectively referred to as technology importation and the exact specification of each of its parts would make it possible to transform a market which is at present almost totally monopolistic, into a competitive one. The degree of this competitiveness will depend on the amount of information a potential buyer has in the pursuit of information purchase.

III. It is not surprising that a market whose basic properties have been left so inadequately defined is also characterized by a totally inappropriate legal framework at least as far as developing countries are concerned. The contractual terms by which technology is being sold to developing countries violate the basic principles of anti-monopoly or anti-trust legislations through which developed countries attempt to protect the interests of their national economies. For example, a clause which is most common in technology sales is that of export prohibition. In the already referred to sample of nationally owned firms and joint ventures in the Colombian chemical, textile and pharmaceutical sectors, 85% of the contracts studied explicitly prohibited exports of products manufactured with the use of imported technology. Also 33 out of 35 contracts that were concerned with making information available, explicitly required the purchase of intermediate products from the technology supplier. Similar clauses exist for the purchase of capital goods, hiring of key personnel, level and structure of production, price fixing for sale or resale of goods etc. Legal and administrative procedures have been set up in developed countries to regulate such practices. The basic legislation that exists in developing countries with respect to the impact and ramifications of technology importation is mostly related to the limits imposed on the business practices of their own nationals and not those of the sellers of technology. For example, legislation on technology importation in developing countries is mostly identified with industrial property legislation such as patent laws. No relevant economic analysis is being pursued as to whether patents really protect the interests of the "non-industrialized" countries, while legal systems are transplanted

¹ Examples of legal procedures are Section 1 of the Sherman Act, Section 3 of the Clayton Act, article 85 (1) of the Rome Treaty, article 37 of the Price Ordinance of France, the Economic Competition Act of 1958, Netherlands, etc.; of administrative procedures: US Internal Revenue Service, Code 492.

from developed nations whose needs and interests are totally different.¹

Concluding Remarks

Countries do not make resource allocation on education, defense, space programs, public health, etc. on the basis of the market-price system. The particular characteristics of the "markets" in these areas are quite distinct from the properties and image we inherited from the "economic liberalism" of the previous century. Nations have, thus, attempted to introduce other means in order to allocate resources and distribute benefits. (Some of them, like the voting process, do not even fall within the strict definition of economic market system). Technology importation has structural properties that make the market-price mechanism totally inadequate in the process of defending the interests of the receiving countries. Once this has been understood, a new system, long overdue, can be developed which enables developing countries to take advantage of technology.

¹ "...Provisions (of the modern international patent system), it is evident, have altered the complexion of the patent grant from one designed primarily to stimulate domestic industry to one in which the foreign patentee has an increased chance of producing where he chooses and retaining his patent monopoly" United States Government, Committee of the Judiciary, U.S. Senate, 85th Congress, 1st Session, study on "The International Patent System and Foreign Policy", Washington, 1957, p.3.