WORKING PAPER
ALFRED P. SLOAN SCHOOL OF MANAGEMENT

U.S. Governmental Policies Toward Technology Transfer by U.S. Business to Developing Nations: Should the U.S. Government Do More?

by
Susan Swannack-Nunn

MASSACHUSETTS
INSTITUTE OF TECHNOLOGY
50 MEMORIAL DRIVE
CAMBRIDGE, MASSACHUSETTS 02139

WP 1226-81 June 1981
U.S. Governmental Policies Toward Technology Transfer by U.S. Business to Developing Nations: Should the U.S. Government Do More?

by

Susan Swannack-Nunn

WP 1226-81

June 1981
International technology transfer, "the process of transferring a product and/or the know-how and capability needed to use a body of existing technical knowledge," has become an increasingly important topic in recent years. Although the subject has been a concern since World War II, it was usually discussed with different terminology and within a military strategic context. However, as the U. S. became more involved in international economic relations, the term assumed broader implications. Today, the subject is discussed within the context of (1) national security or the East-West aspect of technology transfer to American adversaries, (2) U. S. economic competitiveness, sometimes entitled the North-North aspect of technology transfer among the industrialized nations, and (3) assistance to developing nations or the North-South aspects of technology transfer from the industrialized nations to the Third World. The technology transfer process is embedded in trade, investment, and foreign assistance programs.

The national security focus dominated most U. S. government discussions of technology transfer until recent years when the emerging Third World and the North-South dialogue forced the third perspective to the forefront of much international public debate. Although detente may have diminished military-strategic concerns, the get-tough stance of the Reagan Administration vis-a-vis the Soviet Union, may reemphasize this aspect at the same time that
economic-social concerns have become more important in the discussion of technology transfer.

**Technology Transfer in the North-South Debate**

This study focusses on an aspect of the third context of technology transfer - that of North-South relations. Specifically, it is focussed on the role of U.S. business in the international transfer of technology, and the policies of U.S. government agencies toward the commercial transfer of technology.

As the economic and technological gaps widen between the richest developed countries and the poorest developing nations, developing nations are mounting pressures to close the gaps and create a New International Economic Order. They desire a transfer of technology, both public and private, which is greater in volume, appropriate to their positions, and fairly priced. At the same time, foreign aid, a major source of technology transfer from the developed nations, is declining. As noted in the third World Development Report published by the World Bank in 1980, Official Development Assistance (ODA) from the OECD countries, although increasing in constant 1978 dollars from U.S. 13.1 billion dollars in 1960 to U.S. 20.2 billion dollars in 1980, has declined as a percentage of GNP from .51% in 1960 to .34% in 1980.¹

It has been recognized that private business enterprise, multinational corporations (MNCs) being the most conspicuous form, has been responsible for the greatest proportion of technology transferred
to LDCs in the past. And if trends in overall foreign aid continue, private enterprise will continue in that role of major technology supplier in the foreseeable future.

How Business Transfers Technology

Machine-embodied and man-embodied technologies are transferred to LDCs via private enterprise by various contractual modes, ranging from Foreign Direct Investment (FDI) in wholly owned subsidiaries or by assuming majority or minority equity positions in joint ventures, to various nonequity modes, including contractual joint ventures, licensing, technical assistance or management contracts, coproduction or compensation agreements, and exporting. There are also philanthropic or voluntary actions by U.S. business which transfer technology to developing nations, such as offering managerial and technical assistance through participation in such private voluntary organizations as the International Executive Service Corps (IESC) and the Industry Council for Development (ICD).

Those concerned with development of the scientific and technological infrastructure of developing nations, are concerned that the transfer process involve more than the mere export of product or service from developed to developing nations. An effective transfer requires building of institutional and procedural capabilities in the recipient country to absorb, adapt, sustain or improve the body of transferred knowledge. The previously mentioned transfer mechanisms vary in effectiveness, when considered in terms of an expanded defi-
nition of technology transfer. The critical factors are the nature of the technology, capabilities and incentives of suppliers and recipients, the socioeconomic infrastructure of the receiving nation, and transfer terms. For example, a poor developing country with minimal managerial and technical manpower, may find FDI or management contracts the most effective transfer mode. A higher income developing country with more experience and capable manpower may be able to most effectively utilize licensing or importation of technology. 2 Direct investment has been the preferred mechanism for U.S. private technology transfer in the past. But as the bargaining power and sophistication of LDCs have increased and the number of competing technology suppliers worldwide from the U.S., Europe, Japan, and the most developed of the developing nations has multiplied, new transfer modes have proliferated, foreshadowing a possible trend toward joint equity and nonequity type transfers.

The Effects of Commercial Technology Transfer

In recent years, following the surge of FDI in LDCs during the 1960s, the contributions of MNCs have been questioned in both developed and developing nations. Various models of international relations, such as the neoimperialist, neomercantilist, sovereignty-at-bay, and global-reach schools, have been used to describe the dominance of multinational corporations in the world today. 3 The developing nations cite their negative balance of payments effects, transfer of inappropriate capital intensive production, unfair pricing of techno-
logies, promotion of unequal income distribution and inappropriate consumption patterns, and lack of input to local R&D. Some elements in developed nations say that MNCs export jobs, export capital which reduces domestic R&D, adversely affect the balance of payments, and export American technological advantages which reduces American competitiveness and harms the trade balance. The methodological problems of general studies assessing multinational corporations are many. While specific negative effects have been noted in particular industries and countries, there is great variability within country and industrial sectors, and the emphasis upon monetary statistics (national income and balance of payment data) excludes externalities which may benefit countries in the longer term.

Overall, economic theory and empirical work to date suggest that the aggregate effects of technology transfer via FDI in LDCs are usually positive in both developing and developed nations in relation to national income, jobs, and government revenue. Even the socialist countries have accommodated theory and moved to attract FDI in their quest to close the technological gap. Further, many of the negative studies and statements neglect to note the dynamics of the situation, the changing modes of technology transfer which are working to alleviate the negative aspects and redefine the process itself.

Developing nations have shifted in their attitudes toward technology transfer modes, reflected in the varying strategies adopted
by governments toward foreign investment and imports. Countries such as the Andean Pact nations have softened in their receptivity since the early 1960s, while others have evolved toward a more strict negotiated entry of foreign technology (exemplified by Indonesia, Mexico, Philippines, Venezuela, Brazil, and others). Public posturing in international fora, such as UNCTAD, often significantly contrasts to actual governmental policies.

United States Development Policy and Commercial Technology Transfer

Since the post World War II era, official U.S. government policy has espoused development within the LDCs as a foreign policy goal. Foreign assistance legislation evolved specific objectives as more was learned about the subtleties and problems of the development process. One example is the "New Directions" development strategy adopted by Congress in 1973, which shifted the emphasis in U.S. bilateral economic assistance from capital intensive development projects to programs designed to provide assistance directly to the poorer majority in food production, health, and education. The U.S. foreign assistance programs have traditionally focussed on agricultural, health, and energy technologies rather than industrial technology.

The U.S., reflecting traditional economic theory which posits that FDI contributes positively to development, officially promoted FDI by U.S. business as a major aspect of its foreign assistance program. Beginning in the late 1940s, business was "induced" to
participate in development through FDI.

There is probably no other area of foreign economic policy in which there has been more consultation of business by the U.S. government. Beginning with the Gordon Gray report in 1950 and ending in 1969 with the report of the International Private Investment Advisory Council urging an Overseas Private Investment Corporation, there have been at least twelve thorough reviews, with policy recommendations made by businessmen.⁷

Other forms of technology transfer were also encouraged through tied aid; the largest portion of aid assistance has been commodity and capital assistance and some 90% or more of the products in commodity aid were purchased in the United States during the 1962-73 period. During the 1971-77 period, approximately 75% of the funds channeled into development assistance and the Economic Support Fund were used for procurement of U.S. commodities and services.⁸

It must be noted that the context for encouragement of U.S. business participation in technology transfer to developing nations has shifted from the immediate post World War II period to reflect changes in international political and economic conditions. During the 1945-60 period, American foreign policy concerns and those of U.S. business overseas were synonymous. Open economic borders contributed to world welfare and national welfare. The U.S. maintained a healthy balance of payments and trade account. After 1960, and the expansion of U.S.-based multinational corporations became more evident, there was a new questioning of the effects of MNCs on U.S. national welfare and the welfare of other nations. American interests were not necessarily equated with those of U.S. business. In the
1960s, the U.S. balance of trade deteriorated and the U.S. balance of payments remained in deficit, a situation sometimes attributed to the expansion of U.S. MNCs. The resurgence of national economies throughout the world also provided more geographical and functional options to recipient countries, contributing more competition among and alternatives to U.S.-based MNCs.

The most recent articulation of U.S. policy concerning technology transfer to developing nations was the U.S. national paper and preparatory documents presented at the United Nations Conference on Science and Technology for Development in 1979. In those documents, U.S. policy encouraged direct and indirect linkages between U.S. business and technology transfer to LDCs.

Although concern is sometimes raised that the transfer of technology can have adverse effects on domestic employment in the United States, as well as other negative short-term economic impact, in the long run such transfer provides important opportunities and benefits to the U.S. economy, its businesses, and overall employment. ...President Carter has expressed the policy objective of making scientific and technological cooperation with developing countries a key element in our relationships. ...Although the U.S. Government has generally been neutral toward commercial transactions of U.S. private firms, it has taken steps to facilitate foreign investment and technology transfer to developing countries... [The proposed Foundation for International Technological Cooperation] would work with the private business community to promote cooperative arrangements for management training and other programs which will improve the environment and process of technology transfer. ...Other direct collaborative arrangements between U.S. business and industry and developing nations will continue to be encouraged...9

While the policies of the Reagan Administration are not yet formulated in this area, statements by various appointees as well as proposed budget cuts indicate a possible retrenchment in time and
resources devoted to the problems of technology transfer to developing nations. Reliance will be placed on pure market forces, rather than offering government incentives.

Trends in U.S. Technology Transfer to LDCs

There is no comprehensive data base which identifies and measures public and private technology flows. Principal indirect and highly aggregated indicators are statistics on private and public resource flows to the developing countries. But trade and investment statistics only give a rough indication of the parameters of U.S. business involvement in the LDCs. Looking at international payments for royalties and management assistance neglects payments for technology which are included within profit remittances to parent firms, while looking at export statistics for technology-intensive goods obscures the relationship between trade and investment. For example, trade in particular goods may decrease when manufacturing operations are established abroad; thus, a decline in export statistics may not necessarily mean a decline in technology transfer. In fact, this may result in an overall increase of technology transfer.

U.S. FDI abroad totalled $192.6 billion in 1979, $47.8 billion or approximately 25% in the developing nations. During the 1966-1979 period, average annual growth in U.S. FDI in LDCs was 8.2%, compared to 11.1% in developed countries. Despite an expansion of the growth rate during the 1975-1979 period, proportional FDI in the LDCs
as contrasted to that in developed areas, has decreased from 27% in 1966 to the current level of 25%. However, the overall rate of return is higher in the developing areas, due primarily to large returns in the petroleum sector. Our trade with developing nations has increased at a faster rate than with developed nations, in 1979 accounting for 34.7% or more than $51 billion of our exports and 44.6% or $74 billion of our imports (excluding communist areas in Europe and Asia). However, excluding those developing countries which are capital-surplus oil exporters, our share of merchandise trade with the developing countries has declined over the past two decades. Developing countries in 1979 accounted for 18% of payments for U.S. technology worldwide, calculated as fees and royalties, compared to 24% in 1966.

Government Incentives for Commercial Technology Transfer to LDCs

Direct incentives provided by the government for technology transfer to LDCs via various modes include: government insurance and guarantees, specific tax, trade, and monetary policies, contract opportunities in the foreign assistance program, and intelligence gathering and protection services. Indirect incentives encompass the overall foreign assistance program, including participation within multilateral development organizations and funding of private voluntary organizations (PVOs) and development corporations, which have bolstered infrastructural development within LDCs.

Some would argue that these incentives, in aggregate, have
created a neutral position with regard to U.S. business and technology transfer to LDCs, and that there is no overall policy regarding technology transfer to these countries. Rather, it should be argued, there is a situation akin to the "governance of complexity" in which some ten to twenty government agencies (State, AID, Commerce, OPIC, Treasury, Justice, Export-Import Bank, ITC, etc.) hold varying positions, reflecting the conflicting interests of business, labor, bureaucrat, development specialist, and statesman.

Organized labor generally favors export promotion over FDI, while management and government interests often promote both. Some academic and development groups oppose both FDI and exports, due to the alleged inappropriateness of U.S. technology. The political sensitivity of the issue of technology transfer is particularly acute in FDI and has been increasingly felt in the various government programs. As FDI in LDCs has increased, government policy in some areas has indeed tended to retreat from more positive incentives to neutrality.15 Political forces tug in opposite directions: industrial management, facing international competition, requests greater incentives and a policy of "competitive neutrality" from the international perspective; organized labor and inefficient or noncompetitive domestic industries fight for protection and fewer incentives for investment abroad. An AID or State Department bureaucrat may feel the government or nonprofit voluntary organization is more capable to transfer appropriate technology than private enterprise, and may oppose incentives.16 Commerce or OPIC
can visualize business contributions to development, while Treasury suspects business motives and may resist calls for incentives.

The situation raises two important questions about U.S. policy. First, while the U.S. government has consistently advocated a policy of technology transfer to developing countries, via public and private means since the late 1940s, is the policy of advocacy in fact neutralized in operation? Second, assuming that the U.S. continues its positive policy position toward the transfer of technology, what alternative policies would further improve the utilization of U.S. business in technology transfer to LDCs? The following sections describe and analyze various U.S. government mechanisms which act as incentives or disincentives to technology transfer by U.S. business to LDCs. And, alternative incentives to improve technology transfer are examined.

Insurance and Guarantees

The Overseas Private Investment Corporation (OPIC) was created by the U.S. government in 1969 "to mobilize and facilitate the participation of United States private capital and skills in the economic and social development of less developed friendly countries and areas, thereby complementing the development assistance objectives of the United States." It is the most direct manifestation of U.S. policy toward the involvement of U.S. business in technology transfer to LDCs. Its legislative history reflects the underlying forces shaping that policy. Modifications and restrictions in OPIC's
basic authority reflect domestic political concerns and residual doubts about the proper relationship between the U.S. government and international operations of large U.S. corporations.  

OPIC provides political risk insurance and financing for projects in manufacturing, agribusiness, banking and finance, services, construction, minerals and energy, and tourism in some eighty developing nations. Recent developments reflect a preoccupation with domestic economic concerns, rather than concern for U.S. aid policy. In response to business, Executive, and Congressional pressures regarding the transfer of technology via modes other than FDI, OPIC services have been expanded to distributorship projects and service contracts in addition to overseas production. Congressional fears that OPIC favors large MNCs, and Executive concern over the erosion of the international competitive position of U.S. producers, culminated in special programs to promote small U.S. business. Labor concerns have required procedures to detect and reject projects deemed to have negative effects on U.S. employment or balance of payments. New directives have emphasized the poorest LDCs and energy projects, yet the proportion of insurance directed to the poorest nations has declined.

It is difficult to assess the overall impact of OPIC in the rate of technology transfer to LDCs; aggregate statistics concerning private direct U.S. investment in LDCs are not comprehensive nor collected in suitable form either in the U.S. or OECD. Thus, we cannot determine the percentage of investment eligible for insur-
ance that was actually insured. A GAO study and Congressional testimony by business and academia indicate that perhaps 2/3 of OPIC insured investments would not have been made without insurance.22 Total outstanding coverage through fiscal year 1978 totalled over $6 billion, representing over 1000 investments by over 450 investors in 79 countries (largely by Fortune 500 firms, reflecting the overall pattern of U.S. FDI).23 Another study reported that during the 1965-1978 period, U.S. companies "having investment potential" insured 35-50% of their projects through OPIC.24 OPIC's impact can be more visibly seen in particular countries, in Korea where 89% of total eligible U.S. investment was insured by OPIC during the 1962-1972 period, in Indonesia where 86% of total eligible nonpetroleum investment was OPIC-insured, and in Afghanistan and Rwanda.25

Business interests have advocated greater incentives, in response to more competitive programs abroad.26 Belgium, Italy, and the Netherlands provide insurance for certain commercial and currency fluctuations, while West Germany, Ireland, and Japan insure production risks, forcing U.S. firms to factor self-insurance into their contractual bidding, sharply increasing U.S. prices. Additional incentives that have been recommended include: extended royalty coverage beyond currency inconvertibility to blockage, adjusting coverage for inflation in the case of expropriation and war risk, availability of insurance loans advanced to meet local fade-out requirements, and further definition of "what constitutes expropriation" (i.e. limitations on remittances causing loss of control,
or certain taxes causing an expropriationary act). C. Fred Bergsten, Assistant Secretary of the Treasury for International Affairs in the Carter Administration, has advocated a policy of aiding only nonequity modes of technology transfer in the natural resource sector, by restricting OPIC guarantees and services to U.S. firms willing to forego direct investment and opt for service contracting. He feels this would reduce tensions between the U.S. and the developing world, and would benefit American consumers. Another consideration might involve the U.S. taking an equity position along with U.S. firms in a developing country venture, a policy which has been enacted by eight OECD countries to promote technology transfer via FDI in some of the poorer LDCs.  

Tax Policy

Currently, there do not appear to be tax incentives offered by the U.S. government for technology transfer to LDCs. In fact, business may encounter disincentives which apply to general investment abroad, and extra burdens when calculating the uncertainty of changing tax laws in LDCs. According to a knowledgeable Treasury official and tax specialist, tax policy is probably the slowest government mechanism in responding to general changing conditions. Direct incentives for technology transfer to LDCs proposed by both Republican and Democratic administrations have not been enacted. Rather, exemptions from certain tax policies have even been rescinded.

The two elements of tax policy affecting FDI are: (1) tax
deferral instituted with the corporate income tax in 1913, referring to the taxation of foreign income only upon repatriation; and (2) the foreign tax credit instituted in 1918, where foreign taxes are credited directly against the U.S. income tax liability. While there have been movements during the 1960s and 1970s to abolish both of these tax policies by the AFL/CIO as well as by the Kennedy and Carter Administrations, they have generally remained intact. The Commerce Department has argued that competitive neutrality is important, especially if an objective is to strengthen FDI in LDCs, or if international investments help expand U.S. exports. Specific incentives for investment in LDCs were terminated by the Tax Reduction Act of 1975 and Tax Reform Act of 1976, although their value as incentives has been questioned. Investment tax credits, periodically instituted since 1962 for U.S. based companies, have been denied to foreign investment, despite efforts by both the Kennedy and Johnson Administrations to extend them to LDCs.

Two elements of U.S. tax policy which have come under intense criticism by both business and certain academic and government groups have particular relevance to LDCs: (1) burdensome treatment of U.S. expatriate income; and (2) arbitrary treatment of R&D expenses. Both in my own survey work and that of others, treatment of expatriate income has often been mentioned as a barrier to technology transfer. Between 1926 and 1962, U.S. tax policy was similar to that of other countries in not taxing expatriates on overseas income. Since 1962 expatriates have been allowed varying levels of overseas
income to be excluded from taxation. Many U.S. expatriates in fact pay a double tax on major portions of their income because indirect taxes in foreign countries are not allowed as a tax credit and they receive fewer allowable deductions. Since people are regarded as the most important "gatekeepers" in technology transfer, it can be argued that there should be incentives for U.S.-based firms to send more U.S. managerial/technical personnel to the least developed countries. Firms reportedly hardest hit by the tax changes are construction and service firms, individual entrepreneurs, and consultants, which must factor additional costs of sending U.S. employees in their contract bids. Since it has been argued that services are the fastest growing type of U.S. technology being transferred abroad, representing approximately 52% of total exports in 1978, tax policy on expatriate income may be a major factor in determining U.S. competitiveness. 31

There also appears to be a disincentive for foreign-based R&D, an issue central to LDCs which desire to develop an R&D capability. The 1977 Tax Regulations place a disproportionately heavy allocation of U.S.-based R&D expenses to foreign source income of U.S.-based MNCs which have progressed to the stage of performing foreign-based R&D. 32 Expenses of foreign R&D activities do not affect these allocations; thus there are disincentives for such activities.

Tax incentives for U.S. exporters, provided in Domestic International Sales Corporations (DISCs) since 1971 but eased out by
Carter, reduced U.S. taxation of export earnings of firms located in the U.S. by about 25%. Their value as incentives for technology transfer to LDCs, however, had been questioned. 33

Overall, an objective of "capital export/import neutrality," espoused by the government, does not seem to characterize U.S. tax policy in regard to FDI. And there does not appear to be a national policy favoring economic development/technology transfer to LDCs as incorporated within U.S. tax policy. The advantage of tax deferral may be offset by denial of the investment tax credit and Asset Depreciation Range (ADR) accelerated depreciation, and the tax burden on expatriates and foreign-based R&D.

Alternative incentives to enhance technology transfer to the poorest developing nations that deserve further consideration include: (1) an investment tax credit to activity in the poorest LDCs, proposed by the Kennedy and Johnson Administrations and by the OECD Fiscal Committee, but rejected by Congress; (2) tax sparing (exemption from taxation rather than deferral) through bilateral tax treaties with the poorest LDCs, favored by UN groups and many European countries and supported by the Eisenhower Administration but rejected by Congress; (3) more equitable treatment of U.S. expatriate income in the poorest LDCs; and (4) more equitable treatment of R&D based in the poorest LDCs. A major effort might also be made to negotiate bilateral tax treaties with LDCs, including a more general understanding regarding the treatment of royalties which often are exposed to double taxation. 34
While the latest official U.S. pronouncements on tax incentives reaffirm a neutral position in regard to technology transfer to LDCs,\textsuperscript{35} sentiments favoring more incentives for business involvements in the poorest LDCs, expressed by different government and Congressional groups as well as private interests, might be exploited. Efforts to legislate these tax incentives should be specifically directed to the poorest LDCs, allaying the fears and mistrust toward MNCs which have engaged in transfer pricing to evade certain high tax countries.

\textbf{Trade and International Monetary Policies}

U.S. trade policy affects technology transfer to LDCs via U.S. business primarily through: (1) import policy regarding LDC products; (2) financing and guaranteeing American exports through the Export-Import Bank; and (3) general international trade policy as expressed in GATT and MTN. The U.S. is the most important single market for manufactured exports from the LDCs.

While the U.S. has pursued a general policy of reducing and removing trade barriers over the past 35 years, import barriers to LDC products remain a central and contentious issue at international fora, such as UNCTAD. One incentive for subsidiary operations of U.S. firms which export products into the U.S. market is the Generalized System of Tariff Preferences (GSP), implemented in 1976 for ten years. A zero tariff is accorded some 2750 products from 138 independent countries and territories; however, its restrictions and uncer-
tainty limit its impact as an incentive for FDI, according to LDCs and U.S. firms surveyed by the Commerce Department. For example, the GSP is rescinded when U.S. imports of a particular product from one LDC exceed $1 million or 50% of all U.S. imports of that product. In addition, products may be removed if they are "import sensitive" or if domestic firms pass a "competitive needs" test. In 1978, one-third of U.S. imports eligible for GSP were denied duty-free entry because of competitive needs limitations.

Greater incentives for technology transfer to LDCs by U.S. firms are probably Sections 806.30 and 807 of the Tariff Schedule, which limit the application of U.S. tariffs to the value added portion of imported commodities with U.S. components. These sections benefit U.S. firms which operate labor intensive assembly operations in LDCs, particularly in the assembly of electronic products, motor vehicles, and metal products in Mexico, Korea, and other Asian countries. U.S. imports under this section grew from $953 million in 1966 (3.8% of total U.S. imports) to $9.7 billion in 1978 (5.6% of total U.S. imports), an increasing share coming from the LDCs (81% of the total in 1978). It could be argued that 806.30 and 807 are stepping stones for FDI in the LDCs, since assembly operations allow development of a "learning curve" in production conditions within LDCs.

The general policy of GATT of reducing trade barriers may reduce certain incentives for FDI as a mode of technology transfer, since tariffs often are one factor in company decisions to invest
abroad. On the other hand, trade adjustment assistance, in existence since the Trade Expansion Act of 1962, which is extended to workers laid off due to imports or relocation of U.S. manufacturing operations abroad, is one factor facilitating certain technology transfer abroad. Trade adjustment assistance is scheduled for reduction by the Reagan Administration.

The Export-Import Bank of the U.S., instituted in 1934, creates an incentive for U.S. business and technology transfer to LDCs by providing: (1) buyer credit or project financing with long-term fixed interest rates, and financial guarantees of private source loans; and (2) supplier credit, including medium-term commercial bank guarantees, short and medium-term export credit insurance, and discount loans. The largest portion of Ex-Im's direct project financing (as much as 70%) assists in financing U.S. exports to LDCs. Reagan has proposed cutbacks in Ex-Im Bank financing.

American trade and export controls and policies act as constraints on technology transfer to other countries in matters of national security, non-proliferation of nuclear weapons, and occasionally boycotts imposed for foreign policy objectives. The Export Control Act of 1949 and additional legislation passed thereafter prevented the transfer of technology which would enhance the military or economic potential of certain nations. Licensing has generally been administered by the Commerce Department, with input by State and Defense. However, Treasury, the Nuclear Regulatory Commission, Departments of Agriculture, Interior, and Justice, and
the Federal Power Commission all have some responsibilities in overseeing technology export. These export controls have primarily affected high technology exports such as computers, telecommunications equipment, and integrated circuits, "dual-use" technologies which have encountered delays or prohibition in technology transfer to such developing countries as China. While there are suggestions made regarding streamlining of licensing procedures, American trade and export controls do not significantly impede technology transfer to developing countries, according to business surveys. Export controls on dangerous products or substances, such as certain chemicals, pharmaceuticals, pesticides, and foods, are negligible. Such controls, if instituted, should be viewed for their long term costs and benefits, rather than their short term reductions in trade.

Balance-of-payments policies, such as capital export controls in force from 1965 to 1974, have been implemented to reduce deficits in the U.S. BOP. They may in fact have increased technology transfer via FDI, since the overvalued dollar made FDI more competitive. Exports may have been less competitive. The adoption of flexible exchange rates restored equilibrium in national competitive positions.

Alternative policies in the trade area include expansion of Ex-Im services. Critics focus on the more competitive programs of other countries such as France which offer "mixed credit" or concessionary exports to LDCs as part of aid programs and financing of services which is generally excluded by Ex-Im. Other criticisms involve the discount rates and the exclusion of project or export
financing involving royalties figured as a percentage of profits. While the Bank has made some exceptions in mixed credits and financing of services, its self-supporting status and statutory ceilings on liabilities imposed by Congress restrict its growth.

Other suggestions involve modifications of GSP to increase the advantages that the least competitive countries derive from the program, modifications that might encourage certain industries to transfer technology to LDCs. However, since these modifications involve increasing product coverage into such areas as textiles and electronics, other American industries oppose the move. Quantitative restrictions on LDC trade, such as quotas on footwear and textiles, may restrict technology transfer to LDCs and should be reduced or eliminated. Trade adjustment assistance should be extended to affected American industries.

The U.S., in general international trade and monetary negotiations which aim to prohibit or reduce government investment incentives and performance requirements of foreign firms, should exempt the poorer developing nations. Thus, certain trade or investment subsidies offered by poorer developing nations to attract U.S. suppliers should be allowed.

Antitrust Policy

U.S. antitrust policy affecting technology transfer to LDCs, is implemented through the Sherman Act of 1890, Clayton and Federal Trade Commission Acts of 1914, Robinson-Patman Act of 1936, and
Celler-Kefauver Act of 1950. These acts prohibit (1) contracts in restraint of trade, (2) monopolization of trade within the U.S. or between the U.S. and foreign countries, (3) price discrimination that lessens competition or creates a monopoly, (4) tying clauses and mergers that adversely affect competition, and (5) interlocking directorates among competing firms. Research indicates that foreign investment by U.S. firms, as well as other forms of international technology transfer, enhance the domestic power of these firms. Consequently, there has been a trend in U.S. antitrust policy of extraterritoriality to cover the international operations of firms when they affect U.S. commerce, a trend considered by many business elements as inhibiting to technology transfer arrangements.

It is felt, however, that domestic antitrust policy has probably increased the level of FDI by U.S. firms, because they were prevented from further market expansion in the U.S. The only foreign acquisitions likely to meet antitrust challenges are those in which large American corporations acquire foreign firms which might be credible entrants into the U.S. Further, FDI in the form of subsidiaries or joint ventures, which may eventually drive out local foreign competition abroad and restrict trade to the U.S., is generally not subject to charges of monopolization.

One of the major areas where U.S. antitrust law is applied is in questions regarding licensing and technology assistance agreements which would limit competition in the U.S. economy beyond a "reverse engineering period" (an arbitrary standard established for
reasonable license restrictions), and clauses creating "tie-ins," "grant-backs," or territorial or re-export restrictions. Patent rights allow only a partial exemption from antitrust prosecution. Such antitrust rules on technology transfer are widely accepted by developing countries and advocated by LDCs as part of an International Code of Conduct on Technology Transfer. While U.S. business argues such rules hinder technology transfer, the Justice Department cites recourse to the Tariff and Anti-Dumping Acts as protection for U.S. technology suppliers who fear premature competition from their licensees.

U.S. Policy regarding protection of property rights such as patents and trademarks, promotes expanded international cooperation, as exemplified in ratification of the Patent Cooperation Treaty in 1975. This treaty calls for the provision by the World Intellectual Property Organization (WIPO) of patent information and technical services to LDC contracting states. The U.S. supports voluntary controls in the context of the proposed Code of Conduct for Technology Transfer being discussed among UNCTAD members, a policy endorsed by the business community. LDC demands would institutionalize U.S. domestic rules of antitrust and their international extensions but broaden their scope to include flat prohibition of field licensing and grantbacks, limitations on power of trademark licensors to carry out quality control on licensees, specified periods of protection, and maximum fees and preferential treatment for LDCs. While there is considerable room for international cooperation in the area of
antitrust policy, especially between developed and developing nations, the U.S. advocates voluntary controls for valid reasons. Often U.S. firms resort to tying clauses and export restrictions on licensees because they are prevented from receiving adequate returns by LDC royalty limitations.

The problem is finding a balance between the needs of business to obtain a fair and reasonable return on technology, possible abuse by large firms in preventing fair competition, and criticisms by LDCs which feel cheated by technology suppliers. It is generally felt that U.S. antitrust policy has not adversely affected the volume of international technology transfer by U.S. firms to developing nations. It is also felt that U.S. antitrust laws are infrequently applied to international technology transfer arrangements.

Aid Policy

U.S. governmental involvement in aiding infrastructural projects in LDCs is primarily carried out by the Agency for International Development (AID), through loans, grants, and technical assistance. Tied aid, requiring purchase of U.S. products and services, has been a central element in the U.S. assistance program. Funds distributed through development assistance and the Economic Support Fund (ESF) during the 1971-77 period averaged $2 billion annually, 75% of which were used for procurement of U.S. commodities and services. P.L.480 food aid, averaging $1.1 billion annually during the 1962-78 period, may also lead to technology transfer in
food processing. Funding of private voluntary organizations, the Peace Corps, and multilateral organizations such as multilateral development banks (MDBs) have also been key elements in U.S. aid policy. According to U.S. government officials, MDB-financed projects appear to purchase proportionally more goods and services from the U.S. than from other countries. In fact, expenditures on U.S. goods and services is calculated to be in excess of U.S. contributions to the banks. All of these elements of U.S. aid policy provide direct and indirect incentives to U.S. business.

As articulated in the U.S. national paper presented at the UN Conference on Science and Technology for Development, the government, and specifically AID, can "play a significant role as a facilitator and enabler of technology transfer for development." Three basic approaches characterize U.S. governmental transfer of science and technology to LDCs: (1) the building of indigenous infrastructures with the capacity to carry out and continue effective development work after termination of outside assistance; (2) the direct transfer of capital goods, products and operational systems, through concessional sales and grants for the purchase of equipment and services for the purpose of stimulating indigenous productive capabilities; and (3) the provision of technical personnel and scientific knowledge to address development needs of specific nations.

At the UN conference, the U.S. recommended as the first norm in the global transfer of science and technology that "the transfer must be a cooperative and joint effort of governments and the private
sector in which development priorities of the recipient countries are respected and in which private industries and organizations enjoy due protection and due returns on their investment and inventiveness." While acknowledging the pluralistic nature of American society and the essential support of Congress and the private sector in improving U.S. policies and programs to promote application of science and technology for development, the U.S. delegation indicated that:

most of the science and technology transfer and the indigenous capabilities will...be decisively influenced by the active cooperation of the private sector, industries, banks, research firms, foundations, universities, and voluntary organizations.50

A major policy initiative was the establishment of the Institute for Scientific and Technological Cooperation (ISTC) in 1979, which would have involved the private sector in building the needed managerial infrastructure in developing nations. "The Institute is to facilitate private sector participation, including institutions, businesses, and individuals, in scientific and technological cooperation with developing countries." Envisaged as the principal central research and new technology development agency within the U.S. development assistance community, it would have focussed sustained attention on important development problems affecting many regions. Unfortunately, ISTC never received Congressional funding.

The UN paper was more explicit than ISTC legislation in identifying the private industrial or business sector:
Continuing efforts will also be made to insure an effective, equitable role by private industry. To this end, the United States has already initiated, for example, a project to familiarize small- and medium-sized firms in the United States with opportunities so that they may play a more active role, possibly through building relationships of similar size in developing countries. Other direct collaborative arrangements between U.S. business and industry and developing nations will continue to be encouraged, since these relationships provide the most likely stimulus to technology that is newly created or adapted to the specific needs of these countries.

Throughout the UN national paper, the contribution of U.S. private companies in the development process is recognized and encouraged. Mechanisms to encourage expansion are not so clear. For example, it was not clear how ISTC would have involved U.S. business; many of the organizations funded by the U.S. government, such as PVOs and Appropriate Technology International are skeptical about the involvement of U.S. business, often not recognizing the value of smaller firms with more "appropriate" technologies for LDCs.

The Reimbursable Development Program (RDP) restructured as the Trade and Development Program (TDP) under IDCA in 1980, partially reimburses middle and upper income LDCs for technical services and planning assistance by U.S. firms. Through TDP, U.S. agencies and firms participate in early planning of development projects through feasibility studies with the expectations that U.S. goods and services will be used in implementation.

Some additional alternatives for promoting technology transfer include a current review, by AID, of forms of cofinancing that could be directed toward LDCs, including government-guaranteed loans.
by the private sector for use in AID projects and a nonguaranteed program of cofinancing by AID and the private sector. Recent discussions with AID personnel reveal policy initiatives to increase the participation of U.S. business in technology transfer to LDCs, including a Center for Intermediary Services which will act as a broker for U.S. firms in providing technical assistance, and the establishment of an International Small Business Investment Corporation, AID providing partial funding and guaranteed loans to foster development of small business both in the U.S. and LDCs. The Reagan Administration has proposed cutbacks in both U.S. bilateral and multilateral aid programs.

Other Governmental Policies

In addition to direct incentives/disincentives for U.S. business in the transfer process, there are services which may be classified as indirect incentives or the lack thereof. Continuing services provided by the U.S. government which generate an atmosphere conducive to technology transfer to LDCs include: intelligence gathering and dissemination concerning opportunities and conditions abroad (Commerce, State, AID), official representation of business interests, and protection against harmful acts by foreign governments.

The Department of Commerce's authority in international business has been diluted in the proliferation of agencies claiming distinct jurisdictions, so that State has periodically tried to fill the
vacuum of overall policy representation for business. However, there is some feeling among business that State and AID abroad do not fully appreciate business contributions in LDCs, and business bemoans the lack of continuing dialogue with the government as to their appropriate relationship abroad.\textsuperscript{58} There is suspicion that periodic advisory groups such as the Advisory Committee on International Business Problems, instituted by State in 1963, are State Department tactics to seek information on emerging problems rather than a forum for mutual problem-solving and policy formation.

Overall, representation of U.S. business interests has been uneven; activity has intensified in periodic export drives such as during the early and late 1960s and in the late 1970s, but generally has been considerably less than that of other countries. State Department personnel support entire systems or standards which favor U.S. business, such as standards for communications equipment or particular transmitting systems which lock in an entire range of products, rather than particular U.S. companies. Discussions with the Science and Technology Office of Commerce, however, indicate that efforts have even lagged in the area of standards.\textsuperscript{59}

During the Carter Administration, U.S. government missions to LDCs apprised LDC governments of technical assistance activities to be provided by U.S. government agencies, an indirect incentive to U.S. business in the longer term.\textsuperscript{60} For example, Commerce initiatives include training programs in patent search and metrology, and computerized searches for expired patents. Commerce will also be
addressing problems of market imperfection in the U.S. by providing more information to business on how to transfer technology, and more LDC access to appropriate U.S. businesses. Bilateral scientific and technological agreements signed by the U.S. government with developing countries indirectly enhance technology transfer by U.S. firms by providing trade opportunities.

In protection against harmful acts of foreign governments, the U.S. government has been both applauded and criticized by business and other groups. U.S. negotiations have been positive in some situations (i.e. Brazil, Peru, India), but questionable in others (Ceylon, Indonesia, Argentina, Chile). The Hickenlooper Amendment of 1962 forced withdrawal of aid from any country expropriating U.S. properties without prompt, equitable, and adequate compensation, while the Gonzalez Amendment required American representatives in the Inter-American Development Bank to vote against loans to countries that expropriate American property. Although both amendments were lobbied by business, they proved ineffective and counterproductive. They created political tension between the U.S. and the developing nations and did little to protect the private interests of American investors. Their repeal is advocated.

It should also be noted that domestic policies not specifically linked in the public debate to technology transfer to LDCs, may also indirectly affect that process. Macroeconomic policies pursued by the U.S. government affect this process merely because of the growing interrelationships of the U.S. and international economies. A tight
monetary policy may lead to an appreciating dollar relative to foreign currencies and contribute toward more technology transfer via FDI (assuming capital mobility), while an expansionary monetary policy and a depreciating currency may increase technology transfer via exporting and nonequity modes. Domestic supply side economics (such as investment tax credits and accelerated depreciation most recently proposed by Reagan) may foster domestic rather than foreign expansion within U.S.-based MNCs. Protectionist policies to aid U.S. industries may foster retaliation abroad which may attract technology transfer via FDI to compete behind tariff walls or non-tariff barriers. Agricultural price supports may raise domestic prices of certain crops, contributing to technology transfer by U.S. agribusiness to grow crops in LDCs for the U.S. market. Government regulatory action affecting U.S. production facilities or products may contribute to a firm's decision to locate abroad or to remain in the U.S., thereby influencing the mode of technology transfer (via FDI or export) and the type of technology being transferred (i.e. products with or without certain safety or environmental features, or entire categories of products such as hazardous chemicals). Thus, when specific policies toward technology transfer by U.S. business to LDCs are analyzed or formulated, more general domestic policies that may affect that process must be included in the calculus.

Policy Coordination

Until 1979 it was generally felt that while the U.S. govern-
ment had never articulated or implemented a technology transfer policy, its regulations generally had not constrained its occurrence. Different governmental agencies expressed different attitudes and missions in regard to technology transfer in general, and to technology transfer to LDCs in particular. However, a need has been felt and articulated to coordinate the various governmental actors, and in turn for government to coordinate U.S. business, PVOs, and S&T institutions in technology transfer efforts, a "coalition of forces" approach to break the subsistence cycle in the poorest developing areas and to meet human needs of all developing countries.

Hubert Humphrey's initiation of legislation to reorganize the disparate U.S. development assistance programs into an International Development Cooperation Administration was realized in the authorization of the International Development Cooperation Agency (IDCA) in July 1979. This agency was envisioned to:

bring coordination and coherence to U.S. development assistance efforts, to improve the effectiveness of the implementation of those programs, and to create a strong voice for development considerations in the Executive decision making process on issues related to development, such as trade and international monetary matters.64

IDCA now coordinates AID, OPIC, and the Trade and Development Program. Some Congressional elements suspect that its small staff of 28 was an attempt to "sabotage the effort,"65 and its demise is expected under the Reagan Administration. The future for a coordinated U.S. development policy is uncertain.
Conclusions

U.S. business transfers technology for varying reasons including tariff and nontariff barriers, effects of the product life cycle, diversification, internal firm structure, personal contacts, lower production costs, market penetration to meet competition despite possible lower returns on investment; and the transfer is as much dependent on LDC as U.S. policy.

The U.S. government has advocated U.S. business involvement in technology transfer to LDCs since the late 1940s, as part of its overall foreign policy objectives which encouraged economic development in the poorer areas of the world. However, this policy is schizophrenic, as indicated in this study. Incentives in trade policy, aid policy and insurance exist at the same time as certain disincentives within tax policy. Incentives for certain types of technology or industrial sectors have been evident in the foreign assistance program, which has emphasized agricultural and health rather than industrial technologies. Other government departments have provided incentives to technology transfer in sectors vital to domestic security, such as energy or in other favored sectors (i.e. automobile and electronics assembly operations), or disincentives to technology transfer in sectors which might disrupt the domestic technological base (i.e. OPIC or GSP programs geared to protect certain U.S. industries such as textiles). Incentives for certain modes of technology transfer such as foreign direct investment exist alongside disincentives for nonequity modes.
The increasing volume of technology transfer and differentiation among its various mechanisms and modes, parallel the increasing differentiation in attitudes within the U.S. to the phenomenon. The U.S.-based multinationals continue to be the primary actor in this process. Various interest groups within the U.S., such as the MNCs, labor, and liberal free traders (and their various factions), account for the differentiation in attitudes and the existence of various combinations of incentives and disincentives.

While U.S. policy statements reflect an overall U.S. objective of economic development in the Third World, and support for commercial technology transfer as part of that process, neutrality has also been espoused as a policy toward U.S. commercial transactions. In fact, an analysis of the programs and policies of various government departments reflects contradictory policies. There is no one overall governmental policy toward technology transfer by U.S. business to developing nations.

Should the U.S. government formulate a more coordinated policy and should it do more? The answer to these questions lies in a basic reassessment of U.S. national goals. The U.S. needs to more fully articulate its objectives and priorities for economic development in the developing nations, distinguishing between the poorest developing nations. If economic development within these poorest 39 nations, with GNP per capita of $360 and below per annum, comprising over half the world's population, is considered to be a high priority and essential to national security, then the U.S. government
should do more. I believe it should.

To do so, however, requires top-level leadership in this area, from the White House, Secretary of State, and the rest of the Executive Office. There must be interaction between business, labor, and development communities in articulation and coordination of policy incentives. The interface between government and business has not evolved much beyond the business advisory committee system and straight contractual involvement of U.S. firms in foreign assistance. Preparatory discussions and dialogue for the U.N. Conference on Science and Technology for Development were a step in the right direction. There needs to be coordination between the various government departments, beyond the scope of IDCA. By focusing on the poorest LDCs and by looking at specific industrial sectors, specific policies in the trade, tax, antitrust, and aid areas can be formulated, and then coordinated with LDC governments. Because the technology transfer process is dynamic, measurement is incomplete and effects both in home and host countries not well understood. But this should not be an excuse for doing less, but rather an impetus for more analysis.

Organizational structures developed over the years, such as AID, OPIC, IDCA, and ISTC, reflect the increasing awareness and articulation of needs for increased technology transfer to LDCs, their constituencies, and the need for coordination. Their legislative histories also reflect the evolving conflict of interests. The failure to implement certain incentives oriented to involvement
in the LDCs can be attributed as much to business and its governmental allies as to opposing interests. Incentives have not always been directed to the poorest LDCs, which would have the most favorable reception among interest groups and in Congress.

There are alternatives to current policies, and innovative ideas and people inside and outside the government. European countries have experimented with new policies in the areas of commercial technology transfer to LDCs. Creative involvement of small and medium business, government subsidized industrial exchange programs ("firm-to-firm" incentives), government equity participation in LDC projects, and creative tax policies are only a few of the policy initiatives which should be fully analyzed. Incentives to firms involved in particular technologies or sectors, such as energy and raw materials, or to firms manufacturing technologies appropriate to particular LDCs, should be considered. If certain modes of technology transfer are deemed more effective than others (on political, economic or social grounds), then particular incentives or disincentives should be explored. Other complimentary programs involve agencies which assess domestic effects of technology transfer to LDCs and develop programs of adjustment (compensation to affected parties and assistance to firms developing new technologies.)

The failure of ISTC, the expected demise of IDCA, and cutbacks in Ex-Im financing and adjustment assistance, are only a few of the recent developments which must be met with a reassessment of the need for international development and the transfer of technology. A
positive program for development must incorporate business in formu-
lating development policy. It must also have a strong, articulate
leadership to promote development policy recommendations. Given
the nature of the political process and its conflicting interests, a
coordinated set of policies toward technology transfer and develop-
ment will be difficult -- but not impossible. A start can be made
by focussing on the compilation of more specific and disaggregated
data on technology transfer, which will allow more careful analysis
of the various types of technology being transferred, the various
modes of technology transfer, and the effects of technology transfer
on both supplier and recipient nations. This in turn will contribute
to the formulation of specific incentives and mechanisms to promote
specific technology transfer by U.S. business to specific LDCs. The
commonality of the program need not be in policies that are cross-
national regardless of conditions in various countries, but in a
commitment to use technology transfer as a positive tool for develop-
ment.
Notes


2. Recent research has attempted to show that the composition and organizational mode of a technology transfer between firms is a function of the recipient company's technical absorptive capacity and of the recipient nation's level of development. The lower the capability and level of development in a recipient company or recipient nation, the greater is the amount of firm-specific and general technology that needs to be transferred. Some initial data by Contractor indicates a greater amount of technical and managerial assistance in addition to the conveyance of patents, trademarks, and other rights in the less developed countries. Also, in the more developed countries, there appears to be more nonaffiliate than affiliate licensing, since the licensees are more able to assimilate the technology without long-term equity involvement. See Farok J. Contractor, "The Composition of Licensing Fees and Arrangements as a Function of Economic Development of Technology Recipient Nations," Journal of International Business Studies (Winter, 1980), pp. 47-62. The data, however, is subject to various limitations, including other important variables such as government policy which opposes FDI despite low levels of development, payment being received as dividends rather than licensing fees, market size in the recipient countries, internal firm characteristics of the licensor, etc. Other studies site other variables as the dominant ones in determining technology transfer mode. For example, see Raymond Vernon and W. H. Davidson, Foreign Production of Technology-Intensive Products by U.S.-Based Multinational Enterprises (Boston: a study funded by the National Science Foundation, January 1979), for importance of firm structure as dominant variable in determining whether technology is transferred via license rather than foreign subsidiary.

4. Numerous studies have looked at both positive and negative effects of FDI in LDCs (at effects on jobs, income distribution, balance of payments, aggregate growth). A recent study, published by Business International ("Effects of U.S. Foreign Investment 1960-1977"), looks at the "job export" theory as it relates to U.S. business. Based on survey data from 124 U.S.-based MNCs, the study showed a significant correlation between investment growth abroad and increase in U.S. jobs. During the seven year span, the companies that invested the most abroad (as a percentage of worldwide investment) increased the net number of U.S. jobs at a faster rate (2.3%) than those with the least foreign investment which showed a decrease of 4.1%.

5. Yugoslavia is the star example in Eastern Europe which permits joint equity ventures; the People's Republic of China is the most recent entrant with its new Joint Venture Law. In my discussions with the Chinese Management Delegation touring the United States in 1979, I was told that joint equity ventures were probably more attractive than licensing arrangements, because of the continuing commitment which probably influences the success of a technology transfer.

6. In personal interview at Department of Commerce, Office of the Assistant Secretary for Science and Technology (November, 1979), the view was expressed that the appropriate technology advocates on Capitol Hill had development assistance elements scared of anything that doesn't fit "human needs" argument.


10. This data problem has been noted in the development and management literature. See Henry R. Nau, *Ibid.*, Chapter 4; and discussion in Stefan H. Robock, Robert D. Calkins, in cooperation with Committee on Technology and International Economic and Trade Issues of the Assembly of Engineering, National Research Council and Office of the Foreign Secretary, National Academy of Engineering, *The International Technology Transfer Process* (Washington, D.C.: National Academy of Sciences, 1980). There is lack of agreement on the volume of technology transfer, the types of technology being transferred, the modes or mechanisms by which technology is being transferred, and the effects of the transfer. For example, some macro studies say nonequity transfers have increased at a much faster rate than equity transfers or FDI during the 1965-75 period (United Nations Economic and Social Council, Commission on Transnational Corporations, *Transnational Corporations in World Development: A Re-examination* (New York: United Nations, 1978), while other micro studies cite a continuing high rate of transfer of innovations by subsidiary or FDI rather than by nonaffiliate licensing (see Vernon, *op. cit.*).


12. *Ibid.* For example, the overall rate of return for U.S. FDI in developing countries for 1979 was 28.9% (petroleum-106.6%, manufacturing-15%, other-18.5%), compared to a rate of return for U.S. FDI in developed countries of 18.9% (petroleum-23.2%, manufacturing-17.9%, other-17.3%).


16. Behrman, *op. cit.*, notes this attitude, p. 240. "This skepticism is deep-seated and ingrained, but it may be partly a reaction to a threat to the position and precedence of the government (or the government official himself, who gains in importance if his job cannot be accomplished outside government). Behrman is particularly concerned about the lack of cooperation between business and government in the international area.


19. See various OPIC publications and Annual Reports.

20. Congressional legislation in 1977 mandated that OPIC give preferential consideration to U.S. small business, requiring that OPIC seek to increase the proportion of small business investment projects insured or guaranteed annually by OPIC to 30% of the total, and authorized use of up to 50% of net income for special small business development projects. As discussed in interviews with OPIC personnel, there is considerable skepticism about the potential role of U.S. small business in FDI in LDCs. I am involved in a project to assess the record of U.S. small businesses which have already been involved in technology transfer to LDCs, since there is no data available on small U.S. firms abroad (in LDCs) to date. There is considerable advocacy around concerning U.S. small business, but no empirical studies on their record to date.

21. The role of Fred Bergsten, former Assistant Secretary (International Affairs), Department of the Treasury, is noted for the changes in OPIC policy. He has long advocated an emphasis upon the poorest LDCs, in his writings at The Brookings Institution. Two of his studies are particularly relevant to the various issues involved in U.S. business and technology transfer to LDCs (particularly FDI): C. Fred Bergsten, Thomas Horst, and Theodore H. Moran, American Multinationals and American Interests (Washington D.C.: The Brookings Institution, 1978), and C. Fred Bergsten, An Analysis of U.S. Foreign Direct Investment Policy and Economic Development, AID Discussion Paper No. 36 (November 1976).


24. Franklin & West, op. cit., p. 16.

25. Franklin & West, op. cit., pp. 16-17.

26. Public Policy and Technology Transfer: Viewpoints of U.S. Business. Volume 4: U.S. Environment and Technical Assistance Programs, pp. 423-461 on Financing and Insurance. This is one volume in a set of four, as part of a study funded by the U.S.
Department of State to gather the perspectives of U.S. business on issues of technology transfer and development, in preparation for the UN Conference on Science and Technology for Development. The study was sponsored by the Fund for Multinational Management Education, Council of the Americas, United States Council of the International Chamber of Commerce, and The George Washington University. It probably represents the most up-to-date compendium of U.S. business viewpoints (120 corporations participated), although there may be a bias toward the larger MNCs (list of all participants not included). There was also a series of conferences held in Mexico, Venezuela, Brazil, Colombia, and India (proceedings available), involving LDC governmental and private representatives.

27. When OPIC was in the planning stage, the option of government equity was discussed but rejected. In Europe, the idea has met with more success; the longest running program is the Commonwealth Development Corporation in the UK, in operation since 1948. The German program, DEG or German Development Company, is one of the largest with DM 1 billion of share capital in the developing countries in 1978. This idea should be extended to the poorest developing countries and in specific industrial sectors.


29. See Bergsten, op. cit., An Analysis.

30. In surveys to U.S. small business (sales under $100 million annually) which have utilized OPIC insurance in technology transfer projects in LDCs, this factor was mentioned as a significant barrier to U.S. personnel serving in overseas projects. Interviews at Commerce Department reaffirm this concern among U.S. business.


33. Some analysts, such as Bergsten, feel that DISCs probably had an adverse effect on FDI in LDCs. Others feel it had little impact in creating new U.S. exporters or in creating U.S. jobs. Some feel it was particularly advantageous to small and medium U.S. firms.


36. Conversation with Commerce Department personnel who were preparing five year review of GSP due January 1, 1980.


39. Interview with official at Export-Import Bank, November 1979; also see Public Policy and Technology Transfer, op. cit., and Report to the U.S. Congress on Export Credit Competition and the Export-Import Bank of the United States (Washington, D.C.: Export-Import Bank of the United States, March 1979). Increased competitiveness was noted during the April-September 1978 period in areas over which Bank has substantial discretion and control (interest rates, repayment terms, credit share).

40. See discussions in Congressional Budget Office, Assisting the Developing Countries, op. cit. There is considerable concern that nontariff barriers (NTBs) such as "orderly marketing agreements" present a greater threat to the future of semi-manufactures from LDCs than existing tariff or freight structures in OECD countries. For example, see Deepak Lal, Market Access for Semi-manufactures from Developing Countries (Washington D.C.: World Bank Reprint Series, Number 130, 1979).


42. Public Policy and Technology Transfer, op. cit., pp. 393-421.


44. Congressional Budget Office, Congress of the United States, Assisting the Developing Countries, op. cit., p. 32.

45. Ibid, p. 35. A study by the Overseas Development Council concluded that P.L. 480 goods distributed through U.S. firms' sales offices in developing nations may lead to those firms investing
locally. Other U.S. agribusinesses may decide to invest in food processing operations in LDCs if they are more certain of grain inputs through the P.L. 480 program.

46. Ibid, p. 53. According to a statement of Secretary of the Treasury, G. William Miller, in hearings before the Subcommittee on International Development Institutions and Finance, House Committee on Banking, Finance, and Urban Affairs (March 1980), cumulative U.S. paid-in contributions to the banks totalled $7 billion, while the cumulative current account surplus of the U.S. directly attributable to MDB activities totalled $11 billion.


49. Ibid, p. 32.

50. Ibid, p. 33.


54. In interviews with officials at OPIC and Commerce, skepticism was expressed concerning the utilization of U.S. business in the activities of ISTC. Conversations with others affiliated with IDCA and ISTC indicated the issue had not been resolved.

55. In previous survey work of private voluntary organizations in the United States (Swannack-Nunn, "U.S. Business and the Transfer of Intermediate Technology: Agricultural Equipment and the Developing Nations," Journal of International Business Studies (Winter 1978), pp. 119-124), I discovered an unawareness of U.S. firms which produce more appropriate technologies (i.e. less energy-consumptive, more labor-intensive, not unsophisticated) and a general antipathy toward and lack of communication with U.S. firms (other than in obtaining funding). At development conferences (such as the Appropriate Technology Conference held at MIT in November 1979) one encounters the same unawareness (especially of new movements even among the MNCs for technology adaptation in LDCs) and some hostility toward the involvement of business, much less an opening dialogue.


59. Interview with Department of Commerce official, November 1979. Noted that in Brazil, West Germany had already made significant inroads in establishing its standardization with tremendous future implications.


61. Interview with official at Department of Commerce, op. cit. Joint programs with SBA and OPIC have involved seminars in various cities, explaining the services of those agencies to U.S. small businesses which might be interested in the international market. After attending one of these seminars, I feel there should be a concentrated effort to improve the overall quality (the most useful speakers were those small firms which had already taken the plunge in technology transfer to LDCs). My previous survey work (see note 55) indicated a general need among small firms in the techniques of technology transfer (which Commerce is now addressing) and a need among LDCs for contact with appropriate U.S. firms (an intermediary role which Commerce also says it will address).


65. Personal interview with staff, House Committee on Foreign Affairs, November, 1979.
