Chapter 8

Off-Shore Office Work

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While the cost of electronic office equipment declines, the cost of employing Americans to perform routine office tasks is rising both per employee and in the aggregate. Some U.S. firms have established off-shore offices in order to take advantage of lower cost labor. Some of these offices involve manual clerical work such as coupon sorting. However, advances in information and communication technologies make it increasingly attractive to move data-entry operations off-shore. Data entry means converting information from 'hard' or paper form into digital form so it can be stored electronically. This entry phase of data processing is commonly referred to as "keypunching, "keyboarding," or "keying."

High domestic labor costs could lead to an international division of labor in data processing. Data-entry clerks in Caribbean countries, for example, typically earn weekly wages that range from about $15 (U.S. equivalent) to approximately $60, while their counterparts in the United States may earn at least six times the latter figure per week. Even with transportation, communications, and other costs accounted for, total expenses for keypunching data off-shore may still not equal the cost of carrying out the process domestically. [2]

Several data-entry facilities are presently operating in the Caribbean region, and their number is expected to increase. Labor costs are low and the region is easily accessible and close to the United States. Transportation and communication networks are reasonably well developed, literacy rates are high, and there are favorable tax provisions for foreign investors. The Caribbean is only one region, however, in which off-shore offices could proliferate.

These operations can be simple to implement. The tools and raw materials are light, relatively inexpensive, and easy to transport. If full advantage is taken of communication technologies, distance and time become almost incidental factors when choosing sites at which to locate off-shore offices.

[1]This chapter draws heavily from an OTA contractor report: (Christopher P. Astriab, *An Assessment of Off-Shore Office Work*, prepared for the U.S. Congress. Office of Technology Assessment, contract No. 583-0630, Feb. 28,1985; and from an additional report from Consultant Anne Posthuma.

[2]Figures derived from Caribbean Central American Action data (Washington, DC, 1982).

THE PRESENT AND FUTURE STATUS OF OFF-SHORE OFFICES

While off-shore offices have existed for the better part of two decades, the arrival of electronic communication and information technologies has set the stage for new and possibly rapid growth in the near future. The number of companies entering data at off-shore sites are still few, and the impact of the phenomenon on foreign and domestic employment and economic situations is at present insignificant.

Off-shore data processing facilities are predominantly located in the Caribbean region. Currently, there are at least 12 U.S. firms with data processing operations in the Caribbean. Barbados hosts seven such firms, while Jamaica hosts at least three, and St. Christopher-Nevis and Haiti each host one. In these four countries, approximately 2,300 workers are directly employed in off-shore offices. The largest such office in the region is a coupon-sorting operation that employs approximately 1,200 people in Haiti.

At least three off-shore offices in St. Vincent, Haiti, and Grenada closed down in recent years. Managerial and transportation problems were the causes; the ability of the

employees to carry out the operations were apparently not in question.[3] In the case of Grenada, which hosted a firm for some 10 years, recent "unsettled conditions" there were cited as the cause.[4]

Other countries including India, Singapore, the People's Republic of China, and Ireland also host at least one data-entry firm each. Approximately 27 coupon-sorting operations are located in Mexico, one of the first countries to host off-shore offices. The total number of people employed by these firms is not known.

There are generally two types of firms involved in establishing off-shore offices. The first perform only their own clerical work offshore in order to reduce labor costs. The second group are vendors who have established off-shore offices to provide data processing orword processing services to clients in the United States.

All signs indicate that off-shore data entry could undergo rapid growth over the next 10 to 15 years. The vendors who provide these services are optimistic about the future of the industry:

> In 3 to 5 years we expect to have 300 to 500 people (keying) in different locations (in Jamaica). This is a large market, perhaps $50 billion by 1990.[5]

> The growth industry in Barbados has to be information services and data processing . . . As Barbarians acquire data processing skill, Barbados, with its investment in telecommunications, can develop software and other applications. The industry in Barbados . . . has tremendous opportunity to grow and evolve, especially given. . . the government's commitment to it. [6]

> For now, any softening of data-entry markets is being offset by explosive growth of data-base services. Such growing needs will give (data-entry firms) a big market to shoot at . , . [7]

In view of dramatic growth in data processing and expanding needs for digital data, these observations may be justified. There is considerable interest in establishing new data processing facilities abroad and some companies already in the business have cited expansion plans.

Several companies are now studying the possibility of setting up keying operations in the Caribbean. Barbados, St. Lucia, St. Kitts-Nevis, Dominica, Jamaica, Trinidad-Tobago, and Grenada are all possible sites for further growth.[8]

Firms already in the region maybe expected to expand, but the scale of this expansion is uncertain. A firm in Jamaica that presently employs approximately 60 plans to expand to about 500 employees over the next several years. This growth-approximately 700 percent—is probably exceptional, however. The whole industry now employs about 500 people in Jamaica. The Jamaican Government encourages this industry, and ,Jamaica Investment Promotion, Ltd.—the government development agency—has reportedly secured contracts for another company that would require it to expand "significantly.

While the industry has existed m the Caribbean for some time, investors are showing renewed interest since the passage of the Caribbean Basin Initiative Act by the U.S. Congress.[10] While no specific provisions in the act deal with data processing, the act does express the commitment of the U.S. Government to assist in the development of the region. Early signs of success in using satellites to trans-

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[3] Donald Marsden, Coopers, and Lybrand, St. Kitts-Nevis. Personal interview, Miami, Dec. 7, 1984.

[4] Ibid.

[5] Mary Ramond, "Jamaica On the Move, " *Business Week* special advertising section, Sept. 17, 1985. (Gary Bechtel, president of Telemar Data Systems, Fairfield, NJ, is quoted.)

[6] Mary Ramond, "Barbados - 1984, " *Business Week,* special advertising section, Apr. 16, 1984.

[7] "The Instant Off-Shore Office, " *Business Week,* Mar. 15, 1982, p. 136.

[8] "Anecdotal information from various interviews, U.S. Department of Commerce, Caribbean Basin Business Information Center, and others.

[9] Audley Shaw, Director, North America, Jamaica National Investment Promotion, Ltd., New York, personal interview, New York, Jan. 14, 1985.

[10] Gary Bechtel, President, Telemar Data Systems, Fairfield, NJ, personal interview, and presentation given at the Miami Conference on the Caribbean "Off-Shore Key Punch Operations" square table discussion, Miami, Dec. 7, 1984.

mit data from the region are also attracting attention. Based on observations of people knowledgeable about the industry, it is probably safe to assume that at least l,000 to 2,000 additional data-entry jobs could be created in the Caribbean region over the next decade.

In Mexico, the growth potential of data processing is high. An estimated annual growth rate of 10 percent has been cited, but competition from the Caribbean region is anticipated. [11]

In other areas of the world, growth is dependent on: 1) companies' willingness to establish operations at great distances from the United States, 2) the type of data they are dealing with (i. e., the lead time available for data-conversion work), and 3) the mode of operation being used (i.e., air transportation or electronic transmission). At the present time, the practice of flying hard copy to off-shore sites and returning the data on magnetic media is the predominant mode of operation. Only a few firms are using two-way satellite links to any extent, and the oldest has been operating for about 3 years. Unless satellites are used, it seems unlikely that time-sensitive work would be exported to areas such as the Far East or India. Air transport to these areas can be relatively slow and complicated, particularly if time is of the essence.

Wage rates in these areas, however, can be much lower than in the Caribbean. In the People's Republic of China, a figure of $2.00 per week for clerical workers was cited.[12] In India, the labor rate for keyers may be as little as one-tenth to one-fifteenth of the U.S. rate, which more than compensates for transport costs, '3 The president of one firm operating there estimates that it would cost approximately $65 to key 10,000 characters in the United States, while he can get the same job done in India for about $7 to $10, and the quality is higher. '4

At least one U.S. firm keys data in Singapore, but this site may have been selected because the data is then relayed to the firm's office in Australia. Presumably, transmission costs also were an important factor. However, a World Bank report says that two-thirds of Singapore's total output is services and over 35 percent of these services were devoted to the production and distribution of information. The primary information sector in Singapore contributes over 24 percent of gross domestic products.[15] In the Far East, therefore, Singapore would be a promising site for expansion of data processing work.

As to the future of off-shore keying, there may be inherent limitations on growth. International telecommunications to link off-shore offices with the United States may not be available everywhere or may not have the tremendous growth in capacity that some expect. Not all "raw" information (i.e., hard copy) can be readily transmitted abroad for keying. Facsimile clarity is still a significant problem, particularly if operators must process large volumes of data. The use of facsimile equipment does not appear to be cost effective as yet. Facsimile transmitters may take as long as 6 minutes per page, ". . . far too long to let overseas operators compete for time-sensitive jobs, " according to one firm.[16]

Advances in facsimile technology will, presumably, solve these problems. But the very fact that such advances are being made may drastically reduce the need to hire operators for many kinds of data-entry work.

Perhaps the most important technological consideration when assessing the future growth of the industry regards optical character readers (OCRs). As advances in the field permit the widespread use of scanners, and the use of machine-readable documents increases, the need for human intervention in data entry will be reduced considerably.

[11] Mollie Shields, Commercial Officer, U.S. Embassy, Mexico City, Mexico. Telexed response to inquiry.
[12] Posthuma, op. cit., p. 5.
[13] Nick Page, General Information Services, Philadelphia. Telephone interview, July 3, 1984.
[14] Ibid.
[15] World Bank, *World Development Report, 1982, New* York, 1982.
[16] "The Instant Off-Shore Off ice," p. 136.

Most of the experts consulted on behalf of this study agreed that the arrival of cost efficient, highly capable optical scanners would mean the end of off-shore data-entry work. For example, an executive of one company believes that his firm will stay as long as the cost-effectiveness of satellite transmission is not outpaced by advanced technologies that could eliminate the need for a majority of data-entry jobs altogether: "To say that we'll be doing this for the rest of our lives is not accurate; but to say that we'll pull out in the near future is also not accurate. "[17] Others in the industry agreed. It is thus reasonable to expect that off-shore keying may have an effective lifetime of only 15 to 20 years, but during that period it could grow rapidly and have a significant effect on U.S. clerical employment.

[7] Posthuma, op. cit., p. 18. (James Marston, vice president of data processing for American Airlines, is quoted.)

HOW OFF-SHORE OFFICES OPERATE

Linkage Arrangements

There are three principal methods of linking off-shore data-entry sites with data sources and end users in the United States. All three use some combination of air shipment or electronic transmission to move data back and forth between sites.

The least sophisticated approach is to ship information by air in both directions. Typically, paper documents, microfiche, magnetic tapes, cards or discs, or audio recordings are collected at one or more U.S. sites for packaging. In the case of paper documents some preliminary hand sorting may occur at this time. A major U.S. airline, for example, sorts ticket stubs according to station, flight number, and passenger class before shipping them abroad,

Documents are then packaged and shipped to the off-shore site via regular air freight or overnight courier services. On arrival at the host country airport, the packages are cleared through customs and delivered to the processing site by courier services or employees of the user firm. At the processing facility each keyer has a video display terminal that is typically linked to an onsite computer central proc essing unit. The information on the documents is keyed into the computer, the data is recorded on magnetic tapes, disks or cards, and shipped back to the United States, where the data can be stored, printed on paper, or fed into a computer program for analysis.

The second method of linking sites involves air shipping documents from the domestic point of origin to the processing site and then electronically transmitting the digitized data back to its source or to other end users. Typically, the data processing sites are linked via terrestrial telephone lines to satellite Earth stations. The use of this method is, of course, limited by the availability and proximity of earth stations, but permits shorter turnaround times. Where satellite communication facilities are not available it maybe possible to use submarine cable links to the continental United States. Theoretically, the reverse of this process (i.e., transmitting data to the off-shore site and shipping hard documents back to the United States) is also possible, but OTA found no instances of such use.

Finally, electronic links may be used to transmit data in both directions. Documents are facsimilied in the United States and transmitted to the off-shore site, keypunched, and then retransmitted back to end users. Information that has already been digitized, but requires further processing or revision may also be sent abroad by simply "playing back" data on magnetic media and transmitting it from the United States to the off-shore site.

Two-way electronic links offer the shortest possible turnaround times, and may, in fact, be the only practical method of processing data off-shore when the ability to deliver it to end users within a very short time is essential. A

major U.S. printing house that must process and deliver financial data to end users in as little as 15 hours is presently exploring the feasibility of establishing data processing facilities off-shore.

Types of Data Processing

The kinds of data processed off-shore and the types of processing they require are many and varied. Documents sent abroad for processing include manuscripts; legal documents; insurance or medical records; statistical data; financial statements; coupons for food and other products; order or subscription forms; business documents such as ledgers, payrolls and the like; ticket stubs; mailing lists; contest or sweepstakes entry forms; and audio recordings. In most cases, the documents are produced in large volumes on a relatively continuous basis, and their conversion to electronic form is essential to the end users.

Processing in many instances is limited to converting textual or tabular information on hard copy into digital form so it may be more readily reproduced, stored, manipulated, or analyzed. One company, for example, keys in mailing lists and contestant entry forms, while another concentrates on keying textual and financial data for a Fortune 500 client base.

Processing may also involve reformatting documents or revising and correcting texts that have already been proofread or edited and digitized in the United States. The printing firm noted previously may transmit to an off-shore site "rough' copy that had already been keyed. The off-shore facility would key in the necessary revisions to make copy ready for typesetting. [18] Another firm reformats financial data at its off-shore facility into standard forms for use in the United States. 'g

Examples of Off-Shore Offices

The following capsule descriptions exemplify the types of off-shore offices and the methods by which they operate.

'Keith Adams, R.R. Donnelly & Sons Co., Chicago. Personal interview, Miami, Dec. 5,1984.
[19]Bechtel, op. cit.

from airline ticket stubs for a major U.S. airline, the keyed information is returned to the United States via satellite

- A California-based firm air-freights batches of paper copy to its keying facility in Singapore. From there, the keyed data is sent to its branch office in Australia via satellite. This allows the company to update the files of its Australian clients on a daily basis.
- A Texas businessman has an arrangement with students at Tsinghua University in the People's Republic of China to key in numerical and narrative information from surveys. Magnetic tapes containing the information are then flown to the United States for analysis.
- In Limerick, Ireland, a major U.S. market research firm keys magazine subscription information. The same firm has branches in Port-au-Prince, Haiti, and Chihuahua, Mexico, where product coupons are sorted and rebate lists are developed.
- A major U.S. international airline collects ticket stubs from its operating bases throughout the United States and flies them to its keying facility in Barbados. There, information on passenger class, point of embarkation, and destinations, etc., is keyed by a staff of almost, 300. The revenue database is sent over private leased lines via satellite to its data processing office in the United States on a

daily basis. The company transmits about 2.25 million characters to the United States every month. Information on data entry personnel efficiency is transmitted back to Barbados for analysis by managerial staff. The airline is now soliciting contract work in order to make its keying operation into a profit center.

- A New Jersey company has entered into a joint venture with a Jamaican firm to key financial data for approximately two dozen Fortune 500 clients. The data--about 50 percent textual and 50 percent tabular-is used for financial reports. The firm cited a document turnaround time of 1 to 2 weeks. It presently flies hard copy to the facility for keying, but anticipates using facsimile equipment in the United States to transmit information to Jamaica, and then return it to the United States via satellite. Approximately 60 people are employed in the firm. It expects to double its size sometime in 1985.
- A firm in Montego Bay, Jamaica keys in mailing lists for such companies as The Great American Sweepstakes and Publisher's Clearinghouse. The responses to mass mailings are flown to Jamaica and mailing lists on magnetic media are flown back to the United States.

A small, Philadelphia-based firm operates a joint venture data-entry service that employs about 20 people in Madras, India. The company concentrates on keying in past records, and disk-to-disk conversion of data for clients shifting from one kind of computer system to another. It had originally used a Kurzweil optical scanner that translates printed characters into digital form for storage on magnetic media. It found that use of the machine was not cost effective, and also encountered technical problems regarding the capability of the machine to read accurately. It gave the machine to a university and now uses data-entry workers exclusively to key in information.

Factors in Moving Data Entry Off-Shore

Several general factors encourage American companies to establish off-shore offices:

- growth in information processing and increased need to convert information from hard copy to digital form;
- rising domestic labor costs and the availability of lower cost labor off-shore;
- the availability of good communication infrastructure;
- the existence of suitable office space, transportation facilities, electrical power, and other support infrastructure;
- the availability of measures that can be taken to ensure the security of information in transit;
- the general absence of regulatory impediments to the exportation or to the flow of data across international borders; and
- the existence of politically stable and economically attractive environments in other countries.

The Information Market

The director of one foreign government industrial development corporation says:

> In today's world, information resources have become abundant. . . and more efficient as a result of the progress stimulated by the new electronic technology. It seems fairly clear, to me at least, that as the U.S. economy continues its transformation from industrial activities toward information creation and distribution, that the demands for information services will continue.[20]

The need for rapid access to information helped to stimulate the creation of electronic data storage and retrieval systems. Their existence, in turn, has accelerated the speed at which information must be generated, and in-

[20]['Fred Gollop, Chairman, Barbados Industrial Development Corp., Bridgetown, Barbados. Gollop moderated the "Off-shore Key Punch Operations" square table discussion at the Miami Conference on the Caribbean, Miami, Dec. 7, 1984.

creased the volume of data needed to enter into computerized information systems, The president of a U.S. firm, presently engaged in off-shore keying, notes that ". . . the history of the world, which is in writing, is about to be put into electronic databases throughout the world. [21]

The capability and need to generate information in large volumes and on a relatively continuous basis is essential for the move to off-shore data-entry operations. It is the strength of this growing information market that makes owners of off-shore keying operations enthusiastic about their future. In the absence of an expanding information market, the viability of off-shore operations would be doubtful. Attracting workers would be difficult if work were sporadic, and cost efficiency could decline rapidly, thus defeating the purpose of establishing such operations in the first place.

Domestic and Foreign Labor Costs

In the recent past, there has been a trend toward an international division of labor, in which labor intensive manufacturing work has moved to countries where wages are significantly lower than in the United States. This has allowed many American manufacturing firms to maintain their competitiveness in international markets. The exportation of data-entry work—one of the most labor intensive phases of data processing—is now occurring for the same reasons.

The hourly wage rate for keyers in other countries may range from one-fourth to as little as one-fifteenth of rates paid to U.S. keyers.[22] One U.S. firm reports that it was paying domestic keyers $9.50 per hour, whereas average hourly rates at its off-shore facility in Barbados are approximately $2.10.23 This is a savings of 78 percent in labor costs alone. While companies use different methods of estimating their savings by moving off-shore, those questioned indicated that it is costing them about 75 percent less off-shore than it would in the United States to obtain a comparable level of labor output.

The availability of trained workers is a major consideration in choosing an off-shore site. Because the bulk of the work done at data-entry sites involves typing (typically, 60 to 90 percent of the employees of data-entry operations may be keyers), a pool of trained typists must be assembled. Companies located in Jamaica and Barbados report no apparent shortage of trained clerical workers; they invariably had more job applicants than positions.[24] Young women comprise about 99 percent of the workers. One firm reported that the average age of its keyers is 26.[25] Most of them have at least a secondary school education, while many have completed at least some post-secondary training.

A keying rate of 10,000 keystrokes per hour is cited as an industry standard.[26] Higher rates may be achieved if conversion is limited to keying tabular data on a numerical ten-key pad, while rates may average somewhat lower if text data is being keyed.

All companies surveyed indicated that a high literacy rate was a primary consideration. Literacy in English is strongly preferred to avoid the complications of crossing a language barrier, although language barriers may not be critical if keying is limited to numerical data.

However, other firms have experimented with using non-English speaking workers for keying text, and report excellent results. The workers do not need to understand words to key the right letters. Workers can learn to recognize up to 100 characters without any prior knowledge of them, and to respond by hitting the correct key. Because thousands of ideograms are used to write many Oriental languages, workers literate in these languages may be particularly adept at character recognition.

Bechtel, op. cit.
'-Page, op. cit.
-'Jordan, op. cit.

[24]Bechtel, op. cit.; and Jordan, op. cit.
-[c]Jordan, op. cit.
"Bechtel, op. cit.

The ability to achieve high accuracy rates seems to be a direct result of employing low cost labor. In order to assure high standards of quality control, two or three keyers may be given the same information to key, on the theory that no two people will make the same error. After copy is "double-" or "triple-stroked, ' parity checks may be conducted to spot errors. The original copy is then checked in order to correct those errors .27 It has been reported that by using this technique firms have been able to obtain very high accuracy rates even using non-English speaking keyers.

It would obviously be expensive to achieve quality control in this manner in the United States. Using the hourly wage comparison cited earlier as an example, copy triple-stroked for one hour in the United States would cost $28.50, while the same task off-shore would cost $6.30. This estimate is for Barbados, where wage rates are higher than those for most developing countries.

Some firms have noted that it is more difficult to find skilled managers locally than it is to find clerk-typists. However, this was usually overcome through programs to promote and train supervisory personnel, sometimes by sending them to the U.S. office for training.[28]

The size of available off-shore labor pools may be an important consideration for large operations, especially in countries with small populations, such as many of those in the Caribbean. U.S. off-shore offices in the Carib~-bean presently employ from 10 to as many as 1,200 personnel each. At least one firm chose to locate in Jamaica because keying operations companies already were absorbing most of the available labor pool in Barbados, and bidding for such labor "might get a little steep . . . particularly for a start-up company. "[29]

In sum, countries most apt to attract U.S. firms to off-shore offices are those with low-wage rates and a highly literate, skilled labor force of a size sufficient to support proposed operations. The degree to which these characteristics are present promotes establishment of off-shore data conversion.

If English literacy is not critical, then virtually any developing country willing to provide the necessary infrastructure and having a large pool of unemployed people could host an off-shore data-entry operation.

Communication Technology

Advances in telecommunication, in particular, the advent of satellite communication, have encouraged the operation of off-shore offices. Unlike manufacturing industries, which face high costs and pay a time penalty for transporting raw materials and products, the information industry may "ship' its raw materials and products thousands of miles in seconds when in electronic form.

International communications usually take place by satellite or by undersea cable. The use of satellites appears to predominate, but the use of international submarine cables cannot be discounted, and the desire for greater security and reliability of data transmissions may prompt some firms to maintain access to both.

A number of technologies are used to provide access to the international communication networks. Some firms have satellite earth stations on their own premises. Most, however gain access to common-use earth stations or to undersea cable terminals as subscribers to the local telephone system or by leasing dedicated lines. Firms transmitting large quantities of data generally find dedicated lines more economical since they can be designed to accommodate high-data transmission speeds. Thus, one criterion for locating off-shore data conversion facilities is the existence of a communication infrastructure with sufficient capacity to provide dedicated lines to large users.

Microwave transceivers are widely used for private line communications in the Caribbean where an extensive microwave system is already in place. It has been suggested that cellular telephony could also offer the capability of providing data links between off-shore

[28] Adams, op. cit.
[29] Becker, op. cit.; and Jordan, op. cit.
[30] Bechtel, op. cit.

offices and international communication terminals. Cellular telephony allows voice or data communications without the use of land lines. It could play a significant role in bringing the information age to Third World countries, allowing them to not only catch up, but perhaps also even surpass the phone networks that presently exist in the developed countries.'" According to a representative of a U.S. cellular telephone company:

> Cellular will provide nationwide data network capability and needed mobile and fixed services to all segments of an emerging nation. It may well assume the role of the wireline system replacement in smaller cities and in isolated rural areas. Cellular could be utilized to remove isolation, encourage dispersal of industry and increase the efficiency of projects located far from the urban concentrations of industry.[1]

Costa Rica is expected to begin installation of a cellular system in early 1985, which will probably make it the first Third World country to use cellular technology as an integral part of its telecommunication systems. Installation of cellular systems in several countries could increase the options of firms looking for off-shore office sites.

Of importance to operators of many off-shore offices are the telecommunication regulations in the host country. In many developing countries, communication networks are owned and operated by the government in order to generate public revenue. In some cases, all phone equipment and services must be purchased or leased from the government, thus limiting users' options with regard to the availability, type, and capabilities of equipment.

A country's reputation for providing hookup and maintenance service also deserves consideration. Clearly, it would not be desirable to establish an off-shore office where bureaucratic problems or lack of well-trained technical personnel caused significant delays in service, or impeded the timely and proper maintenance of the phone network.

Facilities, Transportation, and Electrical Power

By and large it does not appear that U.S. firms have had serious difficulties in locating facilities in which to set up shop, especially in the Caribbean. Many governments have developed industrial estates that rent or lease factory space at very low rates to foreign investors. In Jamaica, for example, the average rent for such space is a mere $.42 per square foot per month, or about $5 (U. S.) per square foot per year (1982 figures)." The leasing of space at off-shore sites is considerably cheaper than in the United States, and in some cases so much cheaper that leasing costs may be a minor consideration in the course of site selection.

Space may be leased or purchased outright from the private sector, depending on foreign ownership restrictions imposed by government. Or, it may be possible to expand existing locally owned data processing facilities, if, for example, a U.S. firm enters into a joint venture with an existing host country firm.

The quality of available facilities in developing countries may vary considerably. Some

[1]-Caribbean Central American Action, op.cit.

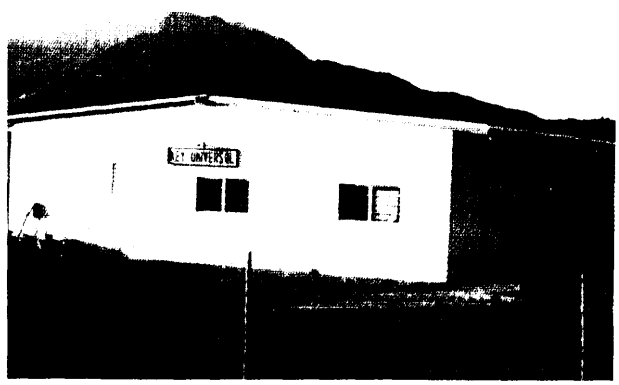

Photo credit Ministry of Trade Industry and Development St Christopher and Nevis

Off-shore data processing offices occupy a wide range of fact l i ties from modern office buildings to converted factory shells. This one is In St. Christopher and Nevis

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Charles T. Hagel, *Application of Cellular Technology for Developing Countries,* presented at the Miami ('conference on the Caribbean "Communications I nfrastructures" squaretable discussion, Miami, December 1984.

[1] I hid.

office buildings may be on equal footing with those commonly found in the United States, while others may be simple corrugated metal or concrete block shells adaptable to many uses. One U.S. firm adapted such a shell for its data conversion operation in St. Kitts-Nevis. Another spent approximately $1 million (U. S.) to upgrade an existing office building in Barbados. Its facility is regarded by the company, the Barbados Government, and the company's competitors as a "showcase operation" equal to the best facilities in the United States.[33]

The availability of international air transportation may be essential if electronic linkage arrangements are not being used in both directions. Both regular air freight and overnight courier services are used. One reason for the proliferation of off-shore offices in the Caribbean is the availability of frequent, direct flights of relatively short duration to many of the islands from major cities in the United States. Time in transit from New York to Barbados, for example, is about 4.5 hours. This is particularly attractive if time-sensitive documents are being dealt with. It also makes it easier to manage off-shore facilities, since U.S. personnel may get to the sites relatively quickly if necessary.

Companies generally indicate that availability and reliability of electrical power are not major concerns in their site selection. Some firms use on-site back-up electrical generators because power grids in some countries experience sporadic brownouts (i.e., voltage drops below specified levels) or blackouts. The cost of electrical power is not a major concern; in Jamaica for example electrical rates are comparable to those on the eastern seaboard of the United States.[34]

In general, facilities are less costly off-shore, although infrastructures in many countries lack the reliability and redundancy that is taken for granted in the United States. The growth of foreign investment in less developed countries has, in many cases, spurred government efforts to enhance their infrastructures with a view toward attracting still more foreign capital, technology, and expertise.

Security of Data Shipments and Transmissions

With large amounts of data being transferred across international boundaries, security of data shipments and transmissions is a concern, but has so far been a minor problem in off-shore sourcing. None of the firms interviewed for OTA identified any special measures that they take to ensure the security of shipments. Yet the loss or interception of documents containing sensitive information could conceivably cause serious damage, particularly if, for example, information on stock offerings or other financial information were made known prematurely, or if private, intracorporate communications are intercepted.

Interception of such shipments is not without its difficulties. One would need to know in advance about the nature and timing of shipments. If particularly sensitive documents are being shipped, air courier services may be used to ensure their safety. One courier firm in the Caribbean region indicated that its shipments are accompanied and monitored by their personnel on a continuous basis.[35] The companies shipping the information, as well as their clients, appear to be satisfied with its security.

Intercepting electronic data transmissions is another matter; it requires technical knowledge, and may not necessarily yield usable, understandable data because encryption can be used. Even if unscrambled transmissions were intercepted, strings of characters may not be useful unless one knows what to do with them.[36] In some industries such as airlines, much information is already shared, so the value of information transmitted may be negligible to another airline.

Nevertheless, wires *can* be tapped, and satellite transmissions can be picked up by parties other than the intended ones. Wiretapping

[33] Gollop, op. cit.
[34] Ibid.
[35] The firm referred to has operating bases in Miami, New York, and other cities in the United States and the Caribbean.
[36] Jordan, op. cit.

can be detected fairly easily because the amplitude of an electronic signal is attenuated when a third-party taps the line.[37] Identifying unintended recipients of satellite transmissions can be far more difficult. In either case, however, it would seem that a considerable amount of technical ingenuity would be required to not only intercept transmissions, but make them usable as well.

Rules and Regulations

At the present time, regulations of any sort that bear directly on the establishment or operation of off-shore data-entry services appear to be so few and/or minor that firms involved have expressed relatively little concern over them.

Laws that generally affect off-shore keying operations are those concerning telecommunications. Such laws often mandate the use of government-owned Post, Telephone, and Telegraph (PTT) networks and equipment, since the PTTs of developing nations typically generate revenues needed for other government functions. Firms report that these regulations have been more of an annoyance than a major obstacle to off-shore sourcing.

Foreign customs regulations also do not appear to have been a problem for data-entry operations. Many firms investing in developing countries are granted concessions including the privilege of importing raw materials and equipment duty free. The only notable complaints have to do with the difficulties in getting documents and other items cleared quickly through customs, especially on weekends, which can be a problem for firms keying time-sensitive documents. However, serious customs problems would probably spur authorities to make remedial actions to avoid losing sizable foreign investments.

U.S. telecommunications and customs regulations at present raise no obstacles to off-shore keying. Customs laws govern the importation of documents and magnetic recordings, but tariffs are extremely low or not levied at all.[38] U.S. companies keying their own business data (e.g., payroll, inventory, archives, etc.) may import these records duty free. These are classified under schedule 8, pt. 7 of the Tariff Schedules of the United States Annotated (TSUSA) (1981) as item 870.10– "records, diagrams and other data with regard to any business . . . operation conducted outside the United States, whether on paper, cards, photographs, blueprints, tapes or other media. 39

Ordinarily, recorded magnetic tapes, cards, or discs are classified under TSUSA schedule 7, part 2, subpart G as item number 724.40– "recordings on magnetic tape or any medium other than wire. ' '[40] A duty of 9@ per square foot of recording surface is specified. Thus, a duty of only $9 would be payable for a recording on a standard 2,400 foot reel of .5" inch computer tape (which contains 100 square feet of recording surface). Even this duty may not be imposed if the recordings originated in a country that is beneficiary to the Generalized System of Preferences. Such countries may export most or all of their goods to the United States duty free. In any event, recorded media from data-entry operations are, by and large, regarded as returned U.S. goods and not subject to duties.[41]

While the physical characteristics of the media itself are not "advanced or improved" *at* keying operations, it can be argued that such media has an intangible good—information—added to it, and is, accordingly, increased in value. There has been sharp criticism in this regard, particularly by U.S. labor representatives. As one union spokesman says, "You may

Hough, op. cit.

[37] John R. Gray, Chief, Classification and Value Division, U.S. Customs Bureau, Miami, personal interview, Miami, Dec. 6, 1984.

[38] *Tariff Schedules of the United States Annotated 1980*, Washington, 1980, p. 774.

[39] Ibid.

[40] The Instant Off-Shore Office, " p. 136. Specifically, they are listed under TSUSA schedule B, pt. 1 as item number 800.00—"products of the United States when returned after having been exported, without having been advanced in value or improved in condition by any process of manufacture or other means while abroad. "

be importing a $10 tape with $50,000 worth of information on it. "[42]

Such claims do not appear to be exaggerations in view of the prodigious volume of data that can be recorded on a given amount of magnetic media. If recorded at maximum density (data density is dependent on the type of recording equipment used), a .5" inch wide nine-track computer tape can hold 6,250 bytes or characters of data per linear inch. A 2,400 foot reel of tape holds up to 94 megabytes (i.e., 94 million characters). To put this in perspective, a commercial directory listing the names, addresses, telephone numbers, chief executives, Standard Industrial Classification numbers, sales levels, and number of employees of the top 51,000 U.S. corporations comprises only about 30 million characters.[43] This equals approximately 1,500 pages of high-density text in very small print.

The president of a domestic data-input company has argued that duties should be payable at least on the labor value added to processed tapes and disks. The directory mentioned above, for instance, probably took at least 3,000 person-hours to key at 10,000 keystrokes per hour. Using the $2.30 per hour wage for Barbados, it would cost roughly $6,900 to enter all of the data in the directory. His concern stems from the fact that his firm has lost "millions of dollars in contracts to off-shore firms. '[44]

Certain countries have erected tariff and non-tariff barriers to regulate the content and operation of data banks, and designate the methods and routes by which data can be transferred across international borders. Where these regulations exist, they usually stem from governments' concerns over the privacy of their citizens, national security, perceived loss of cultural independence, and concern that unrestricted data transfers could lead to loss of control over economic development and growth.[45]

Off-shore data-entry operations have not been significantly affected by such laws because they have generally been established in the countries that have not enacted such laws. Many countries have not yet addressed the issues surrounding data and its transfer, and these countries tend to be less developed, have wage rates that are generally lower, and want the jobs, training, and capital that data-entry operations can provide. They view data entry as a basis for the development and advancement of computer and computer-related industries and capabilities.

Thus, data-entry firms presently operate in a very lenient regulatory environment. Developing host countries are not inclined to kill the proverbial "goose that laid the golden egg" by legislating against the data-entry industry. The benefits they obtain from it far outweigh any gains to be had by levying discriminatory taxes or imposing other restrictions. Undoubtedly, any moves in this direction would quickly cause firms to relocate to countries with more favorable business environments—of which there are many. U.S. laws impose virtually no burden on off-shore sourcing. Vigorous debate over regulatory matters can be expected to continue, however, as labor unions and domestic firms pressure authorities to extend tariff treatment to international trade in data and data processing services.

Political Stability and Investment Climate in Foreign Countries

The reason most frequently cited by U.S. firms in all sectors for not investing abroad is perhaps that they must deal with too many unknowns. Political stability of a foreign country and its policies regarding foreign, private investment are foremost concerns of U.S. businesses thinking about establishing off-shore enterprises.

"Dennis Chamott, Assistant Director, Professional Workers Division, AFL-CIO, Washington, DC, personal interview. Washington, DC, Dec. 17, 1984.

"The listing referred to is *Ward's Directory of 51,000 Largest U.S. Corporations,* vol. 1 (Petaluma, CA: Baldwin H. Ward Publications, 1984). The directory consists of "1,504 pages, 11 " x 9¼ " over 30 million computer data bytes. "

[44]"The Instant Off-Shore Office, " op. cit., p. 136.

[45]James R. Basche, Jr., *Regulating International Data Transmission: The Impact on Managing International Business,* Washington, DC, 1984, p. 16.

Despite these problems, U.S. firms have found that the Third World presents an abundance of business opportunities for those willing to assume the attendant risks. Many developing countries recognize the advantages of permitting foreign investment to enhance private sector development. Not only does it expand their capital base, but it also provides new opportunities for host-country owned businesses, brings in foreign technology and expertise, and provides training for their people, which in many cases is their most abundant resource.

The host country's investment policies are also instrumental in attracting off-shore business. Specific investment incentives differ depending on the country, but various forms of tax relief and import duty exemptions are commonly used. The investment incentives provided by many developing countries are helpful to investors, and their existence is generally a good indicator of a country's need for such investment and recognition of its importance. Such incentives may, at the very least, provide an appearance of political stability and continuity, and an indication that foreign governments are aware of the need to create favorable business environments for investment by industrialized nations.

The U.S. Government and the governments of other countries have encouraged investment in developing nations by helping firms to locate business opportunities, guarding them against the effects of adverse political developments, and providing attractive business incentives. At least one American company notes that both United States and foreign government assistance was instrumental in the establishment of its data-entry operation in Jamaica. Of significant importance to the firm was assistance provided by the Overseas Private Investment Corporation (OPIC). OPIC is a self-sustaining, profit-making Federal agency (a component of the U.S. International Development Cooperation Agency, which also includes the Agency for International Development) whose mandate is 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. To do this, the agency provides political risk insurance, direct loans and loan guarantees, and other service, "All (of which) are designed to reduce the perceived stumbling blocks and risks associated with overseas investment. [46]

[46] *Overseas Private investment Corporation,* corporate brochure, Washington, DC 1984, p. 1.

DIFFERING VIEWS OF OFF-SHORE OFFICE WORK

U.S. Off-Shore Companies

For the most part, U.S. companies cite savings in labor costs, as much as 75 percent, as their primary motivation for seeking off-shore sites for data processing.[47] None of the companies questioned thought that this trend would have a very significant detrimental impact on U.S. employment, and some suggested it would create many new marketing jobs in the United States.[48]

Some companies have found that productivity off-shore is often higher than in the United States, and standards of accuracy and employee conscientiousness are generally higher. One company had originally underestimated the capabilities of foreign workers, and anticipated a standard of performance 70 percent of that attainable in the United States. After only 1 year in operation, the company's foreign employees keyed *better* than its U.S. keyers who, on the average, had over 5 years seniority over their foreign counterparts. [49] At least two other companies confirmed the claim of higher productivity .50 As noted earlier, high-

[47] Answers were in response to interviews conducted by the contractor primarily at the Miami Conference on the Caribbean, Miami, Dec. 3-7, 1984. Other interviews were carried out in New York and Washington in early 1985. Astriab, op. cit.

[48] Bechtel, op. cit.

[49] Jordan, ;p. cit.

[50] Bechtel, op. cit.; and Becker, op. cit.

er accuracy rates for converted data can also be obtained abroad because low-labor cost permits redundant keying.

Another argument raised in favor of off-shore data processing is that in some cases the work will not be done otherwise. One company official pointed out that his firm is doing massive archival work for several major customers. The customers had considered doing it in-house, but finding the work too costly, they postponed it until they could find a company like his to do it at an economical rate.[51]

U.S. Labor Organizations

Representatives of U.S. labor unions argue strongly against the movement of data-entry operations off-shore. While the AFL-CIO has not yet adopted an official position, their general opposition to moving any type of work off-shore is based largely on the following points:

- The creation of off-shore work represents a direct displacement of U.S. workers which is detrimental to our domestic employment situation, and does not always have a permanent, positive effect on the development of needy countries.
- Labor competition for jobs based on wage rate differentials is not fair or equitable, and is inherently exploitative of labor in less developed nations.
- Moving operations of any kind off-shore reduces effective control of our economy, and threatens our economic security.

U.S. labor organizations argue that for every job created off-shore, one is lost in this country. Exporting clerical work to low-wage countries is the latest phase in a trend that has been going on for a long time in U.S. manufacturing industries. While the number of people employed in off-shore offices has had, as yet, no discernible impact on U.S. labor, this should not preclude our taking steps to stop this trend.

Further, it is argued, creating such work off-shore does not always have a permanent developmental impact on poorer countries, because companies always seek areas where wage rates are lower. As a country develops and its wage rates rise, companies located there may move to still less developed and less costly areas in which to operate.[52]

Union representatives argue that because our economy is becoming more heavily dependent on information and white-collar work, as opposed to manufacturing or blue-collar work, and as white-collar work becomes more automated, we could be "taking away the last large group of jobs that the economy is supposedly going to have available. "[53]

Others argue that locating more and more jobs off-shore may jeopardize our economic security because: 1) investment in the economy is lost, and 2) off-shore operations exist in environments that cannot be controlled, thereby making the investments vulnerable to adverse political developments. The continued relocation of work out of this country is economically unsound because we are foregoing opportunities to create domestic jobs and new business enterprises.[54] Also, our dependence on foreign labor further diminishes the ability to function economically and independently, and, therefore, weakens the United States. There have been repeated nationalizations of U.S. investments abroad in recent years. Off-shore office work is particularly worthy of special consideration:

> What (we're) doing now with shipping jobs overseas (via the use of) electronic transmission. . . is making (companies) even more vulnerable. Work that they have to have for (their) company to function, they are placing outside the realm of their control. In terms of control, what do you do if you're not

[51] Bechtel, op. cit.

[52] Chamot, op. cit. This argument is also presented in *The Electronic Sweatshop: The Use and Misuse of Work Stations in the Home,* a presentation given by Dennis Chamott and John 1,. Zalusky to the National Executive Forum: Office Work Stations in the Home, November 1983.

[53] Chamot, interview,

[54] Barbara Hutchinson, Director, Women's Bureau, AFL-CIO, Washington, DC, personal interview, Washington, DC, Nov. 19, 1984.

duplicating that system here, and that system shuts down?[55]

Off-shore offices would be very easy to shut down, because they tend not to be very large, do not have a major impact on host country economies, and are heavily dependent on vulnerable communication and transportation networks.

Foreign Government Officials

The direct impact of off-shore data entry on increased employment in developing countries may be significant and quite rapid. One company began interviewing prospective employees in Barbados in May 1983, commenced training on August 1, and began production in October of the same year. The operation presently employees 275 people, 80 of them managerial, technical, and supervisory personnel. This suggests that keying operations, especially larger ones, may provide significant job opportunities not only for clerical workers, but also for more highly trained workers. The same firm let approximately $1 million in contracts to local firms to refurbish its building. Thus, business opportunities and jobs may also be created in other economic sectors.

Reactions of foreign government officials to off-shore office work are very positive. Those countries that already host such operations are pleased with the results, while those that do not yet have such operations want them. In an informal survey, representatives from more than 20 Caribbean and Central American countries unanimously claimed that such investment projects would aid their economies and would be welcomed.[56]

Barbados has gone so far as to single out information services as a sector to receive major emphasis for development. At the other end of the spectrum, representatives of some countries know little about the phenomenon, but are eager to learn more about it.

The work is labor intensive, requires only a moderate capital outlay, and can generate employment rapidly. It is a "clean' industry, without the heavy equipment, large space requirements, and pollution often associated with other industrial enterprises. The industry provides, at the very least, rudimentary training in computer use—a rare opportunity for workers in less developed nations. Finally, it establishes a foundation on which further advancement in computer-related industries such as software development, technical services, and data transmission may grow. The Director of the Barbados Industrial Development Corporation (BIDC) elaborates:

> 1 know from experience in Barbados . . . that we can offer a lower cost location (for the industry), and answer the needs of many industrial companies in the United States. I know too that the countries in the Caribbean can benefit from increased employment, and in the case of off-shore keypunch operations, this can be fairly rapid. And I also think we can benefit from technical education which would ultimately set us on the path to higher levels of technology in the computer services industry .57

Barbados has targeted information services as an industry group that is expected to have a major impact on the objectives of the Barbados Industrial Development Corporation and the Barbadian economy. According to its 1983-87 Development Plan:

> The Information Services industry can be expected to generate substantial employment in the short term . . . linkages with the more technically proficient computer industry . . . will be sought as a means of expanding the sector's contribution to the economy . . . Local participation in the Information Services Industry can come about through the establishment of service bureaus to perform off-shore data processing for North American companies.[58]

Ibid.

' Answers were in response to informal interviews conducted by the contractor at the Miami Conference on the Caribbean, Miami, Dec. 3-7, 1984. Representatives of approximately 20 Caribbean and Central American countries were queried, Astriab, op. cit.

Gollop, op. cit.

'Barbados Industrial Development Corp., *Industrial Development Plan, 1983-1987,* Bridgetown, Barbados, 1983.

Development officials interviewed for OTA all agreed that foreign data-entry workers view their jobs and status in a considerably more positive light than their American counterparts. While keying in the United States is sometimes pictured as a low status, boring job, foreign workers often consider it a gateway to opportunities that did not formerly exist (as do many minority workers in the United States–see chapter" 12).

Over-dependence of countries on information services is not seen as a problem at this point because the industry is presently so small. In addition, many developing nations opt for diversification of industrial development as a key ingredient of a more stable economy. They want to avoid heavy dependence on traditional industries such as tourism or agriculture, with their characteristic seasonal fluctuations in income and employment.

Economic Development Organizations

Development organizations are in essence the 'middlemen" in regard to the development of off-shore office work. They view the expansion of the sector in the much larger context of economic development, are supportive of its growth, and reaffirm the arguments put forth by U.S. companies and foreign governments in favor of such growth. "The sheer number of jobs (off-shore data processing) creates is the main attraction of the industry in the view of developing countries, " says one official of a private, nonprofit development organization .59

This development expert claims that negative reactions, if any, in developing countries usually come from the more educated sectors and the labor movement, or, as he put it: "people who are not worried about having a job. [60] Those citizens of developing countries who view U.S. investment as exploitative are those who are generally of higher economic status and are not in need of the job opportunities that result from such investment.

Some experts favor investment in developing country private sectors as opposed to just public-infrastructural development projects." According to this argument, in many cases developmental aid programs have not achieved their intended purposes. For example, while good roads may indeed have been built, private businesses along those roads are necessary for the general advancement of the economy. While the wages paid to workers in these businesses may be extremely low by U.S. standards, this should not be considered exploitative.

Rebutting arguments from U.S. labor that the flow of clerical work out of the United States should be stopped, development organizations point to the great impetus of increased international economic interdependency and the disadvantages of impeding capital flows. "Business goes where business can be done, " as one development organization official said, "The flow of capital cannot be stopped unless one wishes to control the economy, and this runs against the whole tradition of free trade. [62]

Answering U.S. labor's claim that wage competition is the only focus when selecting business sites, a development official countered that it has never been a case of just wage rates: "If that were the case, there wouldn't be a bit of work done but in China and India. [63] While this is, of course, an overstatement, higher profits are not the only motivation for many businesses off-shore. For some, it may simply be a matter of survival. Viewing the exploitation argument in a different light:

> You will certainly get cases of exploitation, but it is far more exploitative to say (that we will) keep those jobs here, and pay an unacceptably high level of wage which will make our products unacceptable anywhere other than in our own economy. Plus, by doing so

"'Gordon Hunt, Director, Investment Services, Caribbean/Central American Action, Washington, DC, personal interview, Washington, DC, Dec. 18, 1984. This claim was also affirmed by Gooch, op. cit.

"'Ibid.

[61] Ibid.

"Ibid.

"Ibid.

> we will 'starve' (the people in less developed countries). [64]

There has been massive legal and illegal immigration to the United States from the Caribbean. Many countries in the region have their second largest, and in some cases their largest population centers in the United States. Some see it in the best interest of the United States to create jobs for people in their own countries to stem this tide of immigration:

> Do you employ those people in their own countries or do you employ them (in the United States)?, because that's where they're all coming. Do they *come* up here and work illegally for sweatshop wages , . . or do they stay in their *own* countries, where they would rather be to begin with if they could make a decent wage?[65]

[64] Ibid.

[65] Ibid.

PUBLIC POLICY ISSUES

Off-shore office work does not have a significant influence on the U.S. economy at present. Only a few dozen firms and a few thousand employees are involved. Nevertheless, it could grow. If domestic wage rates remain comparatively high and telecommunication and transportation costs continue to fall, market forces will encourage more firms to investigate the off-shore alternative. Growth could be quite rapid, at least in the short- to medium-term future.

In the long term, technological advances in input technology, especially optical scanning, are likely to undermine the cost advantages of off-shore data-entry work. Thus, off-shore offices are likely to be a temporary phenomenon, unless some other technological advances or economic conditions make it feasible to move other types of office work off-shore—for example, telephone reservations or order processing.

Assuming that it is temporary, the question remains how U.S. public policy should deal with off-shore offices. The alternatives include prohibiting, regulating, or encouraging it.

Regulating or Prohibiting Off-Shore Offices

Methods for limiting the growth of off-shore offices could include such government actions as:

- imposing regulation on the types of data that can be imported,
- imposing restrictions on the hardware and software used off-shore,
- using taxes to discourage off-shore work or encourage that work be done domestically, and/or
- imposing restrictions on the use of private telecommunication lines.

Regulation of Data

Many nations have imposed restrictions on transborder data flows for the purpose of protecting the privacy of their citizens, for example, prohibiting transmission of name-linked information to countries with less stringent privacy laws.

The United States has data protection laws designed to restrict the uses of name-linked data and assure access to the data by persons referenced in them. These laws do not, however, address the "front-end' issue of how or where information may be entered into electronic databases. Nor does U.S. law restrict the flow of data across international borders.

It is not clear that privacy protection is necessarily a good motivation for U.S. regulation of off-shore offices. Even if it were, the enactment of privacy protection laws governing transborder data flows would affect other industries, such as banking, and the internal

operation of many multinational corporations, as well as off-shore keyers.

A more direct approach to discouraging establishment of off-shore offices is to simply designate data entry as a phase of processing that U.S. companies must, in virtually all circumstances, carry out within our own borders if the data is destined for eventual sale. This would, in effect, constitute a local content requirement.

Because such a requirement implies that the data being entered is a commodity, this type of restriction may not be applicable to certain types of data—e.g., revenue, personnel, payroll information, and the like-reserved for the exclusive use of a business, and not meant to be sold. "Buy national" requirements could fill this gap by mandating that off-shore data entry could not be resorted to unless domestic alternatives were unavailable. Brazil and Canada for example, have imposed regulations that require certain phases of data processing to be conducted within their own borders.[66]

If viewed in a broad context, however, imposition of such regulations may serve to stimulate reciprocal actions by other countries. Thus, more harm could be done to the U.S. data processing industry than could be counter-balanced by benefits of restricting a particular phase of data processing to our own shores.

Restrictions on Hardware and Software

In lieu of limiting the kinds of data that could be entered off-shore or requiring that data entry be carried out domestically, requirements that U.S. equipment be used could be imposed. In essence, this would constitute another "buy national' requirement. This might effectively preclude the establishment of keying operations in some countries, since, as previously mentioned, foreign communications authorities often monopolize telecommunication equipment markets and require that *their* locally manufactured equipment be used. However, many countries do not even have a computer industry, and U.S. computers and modems are already usually the equipment of choice for off-shore firms.

Taxation Alternatives

In theory, duties could be imposed on the data that is keyed off-shore and subsequently imported into the United States by physical or electronic means; the data could be treated as a commodity or primary good imported for consumption. Alternatives might be to levy duties on the labor value added to data keyed off-shore, or to impose a trigger price tariff that would keep the price of off-shore keying above domestic levels.

In practice, however, levying any such tariffs would be fraught with difficulty. First, this shotgun approach to regulation would probably affect all data importers, of which off-shore keyers area very small minority. In addition, a method for determining the value of data would have to be developed. Value might be related to proposed end use or might be based simply on the basis of the volume of data imported (e.g., a duty might be levied for every kilobyte—one thousand characters-of data). The latter seems inherently inequitable, since some kinds of data are much more valuable then others. The former seems nearly impossible to enforce, unless customs officials are going to play back and analyze every computer tape.

Imposing duties on data imported via telecommunication presents even more onerous technical and political problems. The sheer volume of transmissions to the United States and the many routes they may follow present logistical problems of inestimable proportions for monitoring. In the future, the increased use of direct satellite links between off-shore installations and domestic offices will make the imposition of border controls on data flows extremely difficult, if not impossible.[67]

In any case, it seems clear that on-site monitoring by government authorities and/or wiretapping on a grand scale would be necessary

[66] Joan E. Spero, "Barriers to International Information Flows," Telecommunications, November 1983, p. 68.

[67] Ibid.

to police electronic data flows. Even if this were technically feasible, it is doubtful that revenues accrued by a government could justify the efforts made to collect them.

Putting technical and economic considerations aside, moves toward monitoring data flows in the United States would undoubtedly encounter many political obstacles. The practice would cast a clear shadow of authoritarianism, and have a very inhibitive effect on business and communications in general. A far greater purpose than stifling a minor industry would obviously be in order if the practice were adopted. In sum, while the objective to curtailing off-shore keying could readily be attained through tariff legislation, a more tightly focused approach would seem more appropriate.

Restrictions on Dedicated Telecommunication Lines

Limiting the availability of leased private telecommunication lines to off-shore keying operations or prohibiting their use for this purpose would unquestionably deter the establishment of such operations, because it would directly effect one of the lifelines of the industry. Since leased lines appear to be the most cost effective way to transmit large volumes of data across international borders, off-shore keyers relying predominantly on telecommunication capabilities to operate would be acutely effected by any such restrictions.

Regulations of this sort could, of course, be applied only to the U.S. side of any communication link (e.g., the down-link from a satellite sending data to the United States, a terrestrial cable in U.S. territory, etc.), since the foreign ends of such links are out of American jurisdiction. Nonetheless, this strategy could be effective since the regulations could be applied specifically to off-shore data-entry firms without impinging on the rest of the data processing industry.

Restricting access to dedicated lines might be accomplished by specifying a limitation on the number of lines available to off-shore keyers in different regions. Implicit limitations might be achieved by imposing stiff tax penalties or surcharges on data-entry firms leasing such lines.

Several countries already use this strategy to protect their internal data processing industry and it is quite effective in curtailing undesired activities. In Japan, the Ministry of Posts and Telecommunications, through the international telecommunication authority, KDD, kept two large U.S. data processing firms out of the country's market by first denying them dedicated lines, and then restricting their use so that the firms could not market all of their services." The Deutsche Bundepost in West Germany requires users of leased lines to use the public-data network. In 1982, the authority declared that it would permit the use of international leased lines only if some phase of data processing were conducted in Germany before data was transmitted out of the country.[69] Brazil has enacted many restrictions on the use of leased lines. For instance, firms may not use them to access databases located outside the country.'"

Short of limiting access or prohibiting off-shore data-entry companies from using leased lines, legislation could require telecommunication carriers to impose usage-sensitive rates on these firms. A number of foreign governments have expressed interest in usage-sensitive rates, since they fear the loss of revenues that could result from reduced use of their public networks." One international data processing service estimated that the introduction of usage-sensitive rates would raise its operating costs by 700 percent.[72] In the face of such cost increases, many off-shore data-entry firms would probably have to close up shop.

Regulations on leased lines could, therefore, offer a relatively "clean" approach toward discouraging off-shore keying; impeding other types of data flows could be avoided because restrictions could be tightly focused. To be

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''Spero, op. cit., p. 68.
''Ibid.
Ibid.
Jussawalla and Cheah, op. cit., p. 292.
Spero, op. cit., p. 68.

truly effective, however, such restrictions would probably have to go hand-in-hand with some form of customs regulations so that control could be extended over firms who import data recorded on magnetic media.

Encourage or Do Nothing About Off-Shore Office Work

Encouraging off-shore offices is discussed in the same section as a "do nothing alternative" because the current status of telecommunication and customs regulation already favor the growth of this industry. Inaction will undoubtedly assure the continued export of data processing work for so long as the marketplace provides the needed incentives.

Further encouragement might be achieved through increased activity of international development agencies. For example, the Overseas Private Investment Corporation could make more loans available and otherwise step up efforts to help U.S. firms find suitable locations and establish keying operations off-shore.