


UNIVERSITY OF
ILLINOIS LIBRARY
AT URBANA-CHAMPAIGN
BOOKSTACKS



Digitized by the Internet Archive
in 2011 with funding from
University of Illinois Urbana-Champaign



BEBR

FACULTY WORKING
PAPER NO. 1333

THE LIBRARY OF THE

MAY 7 1987

UNIVERSITY OF ILLINOIS
URB

Quest for Self-Sufficiency in Technological
Development: A Cost-Benefit Analysis of the
Withdrawal of IBM from India

Anant R. Negandhi
Aspy P. Palia

BEBR

FACULTY WORKING PAPER NO. 1333

College of Commerce and Business Administration

University of Illinois at Urbana-Champaign

February 1987

Quest for Self-Sufficiency in Technological Development:
A Cost-Benefit Analysis of the Withdrawal of IBM from India

Anant R. Negandhi, Professor
Department of Business Administration

Aspy P. Palia
University of Hawaii at Manoa

Quest for Self-Sufficiency in Technological Development:
A Cost-Benefit Analysis of the Withdrawal of IBM from India

Abstract

The primary purpose of encouraging direct foreign investment is to achieve the transfer of technology and capital. The ultimate aim is to achieve technological and industrial development and to attain self-sufficiency.

The recent case of IBM-India highlights this quest for technological development and self-sufficiency with respect to the computer industry in India. Although there has been discussion concerning cost-benefit analysis with respect to multinational investment both for the multinational corporation and the host countries, research studies have been inconclusive.

This study attempts to analyze the costs incurred and the benefits realized by both IBM and India during the pre- and post-withdrawal periods. The purpose of the study is to examine the costs and benefits with respect to the Government of India's decision to deny IBM 100 percent equity, and IBM's subsequent decision to withdraw from India.

The study concludes that the Government of India did succeed during the post-withdrawal period in securing effective participation in the ownership and control of Indian subsidiaries of foreign computer companies. Further, changes in the structure of the computer market in India indicate that the goal of self-sufficiency was achieved during the post-withdrawal period. Lastly, the Indian computer firms that emerged to fill the void created by the departure of IBM have narrowed the technology gap that existed between Indian and foreign computer firms.

Quest for Self-Sufficiency in Technological Development:
A Cost-Benefit Analysis of the Withdrawal of IBM from India

Introduction

The drive toward self-sufficiency, and the quest for technological and industrial development, have led many developing countries to attract foreign direct investment. The purpose of foreign direct investment is to achieve the transfer of technology, capital, and managerial skills. However, many developing countries, including Argentina, Brazil, India, Mexico and Peru, to name a few, have pursued the goal of attaining self-sufficiency primarily through domestic development. These nation states have used foreign direct investment as a catalyst in the development process.

The recent case of IBM in India highlights this quest for technological and industrial development by the Government of India. IBM's entry into the Indian market in 1952, the multinational firm's withdrawal from India in 1978, and the recent reinstatement of a close working relationship, provide a unique opportunity to study the impact of foreign direct investment.

The purpose of this study is to examine the costs and benefits of the IBM-India episode. The costs and benefits to both players, arising from the Government of India's decision to deny IBM permission to retain 100 percent equity, and IBM's subsequent decision to withdraw from India, are explored.

IBM-India Case

Background. IBM commended operations in India in 1952. The bulk of IBM's total revenues was derived from commercial or trading activities,

and low-technology manufacturing operations. These activities included the leasing of data processing machines, the operations of IBM service bureaus, and the manufacture of IBM cards. However, the leasing of IBM data processing machines included maintenance, systems engineering, education, and other services.

During this period, the Government of India surveyed the Indian operations of foreign-owned and foreign-controlled operations. These firms were making excessively high profits and repatriating large amounts of capital. In addition, they were stifling domestic competition and competing for scarce capital with domestic firms. Further, they were transferring technology that was either obsolete or of minor importance for industrial development.

In 1966 and 1968, the Government of India advised IBM to share ownership of its local operations with Indian nationals. IBM explained that its independent international operations required centralized coordination and control. This precluded sharing ownership with domestic entrepreneurs. Indeed, in 1968 IBM advised the government that it would terminate its operations in India rather than share ownership of its Indian subsidiary. The Government of India decided to let IBM retain full control over its operations.¹ However, changes in the environment altered the relationship between IBM and the Government of India.

During the 1970s the rise of European and Japanese multinational corporations provided host country governments with alternative means to secure managerial and technological know-how, capital, and a market network. The availability of alternative methods to fulfill national

goals, in line with existing national priorities, reduced the level of dependence of developing countries on U.S. multinational corporations.

Taking stock of its developmental priorities and increased bargaining strength, the Government of India formalized its desire to influence the course of foreign direct investment in India. The primary objective was to ensure that foreign direct investment in India fell in line with the nation's developmental priorities. The means adopted to achieve this objective was the Foreign Exchange Regulation Act (FERA), which was legislated on January 1, 1974.

The FERA affected all foreign companies with foreign equity exceeding 40 percent. According to FERA, four levels of foreign equity participation were permitted. First, all trading companies engaged in purely commercial activities and manufacturing enterprises utilizing "non-sophisticated" technology were required to reduce their foreign equity to 40 percent. Second, "high technology" companies, utilizing "sophisticated" technology and/or engaged in "special" activities, as designated by the Government of India, were permitted to retain a foreign equity holding of 74 percent. A third intermediate level of 51 percent foreign equity was established for multi-activity companies engaged in both sophisticated technology fields and other commercial and trading activities. The fourth level of 100 percent foreign equity was permitted only in those instances where foreign firms were engaged in purely export activities.

IBM Withdrawal. The Reserve Bank of India analyzed IBM's activities and past financial details, based upon the FERA guidelines. Based on this analysis they concluded that IBM-India had to dilute its foreign

equity to 40 percent. The Government of India contended that IBM was importing second-hand machines (IBM Systems 1401) into India at very low old book values. These second-hand machines were reconditioned and either leased or sold in India. In the event the reconditioned machines were leased, IBM's standardized worldwide lease rental rates were charged. IBM charged for reconditioned sold units its standardized worldwide sale price. Further, it was alleged that IBM was repatriating the resulting unduly high profits while not providing transfer of any sophisticated technology.

In addition, the Government of India contended that IBM had repatriated additional hidden profits to the parent company. These alleged hidden profits were considered by IBM as legitimate headquarter expenses. According to IBM, these headquarter expenses reflected administrative overhead expenses, research and development expenditures, and other expenses incurred by the parent organization. These headquarter expenses were based upon the particular affiliate's revenues. The Government of India argued that India did not benefit from the research and development by virtue of its contribution to IBM's headquarter expenses. However, IBM claimed that IBM-India had the potential to sell any and all of the new products at the time they were introduced by IBM. The concept of charging headquarter expenses to IBM-India was based upon the right to receive, rather than what actually had been received and sold.

In response to the Reserve Bank of India notification of November 1975, IBM submitted a formal counter-proposal in April 1976. This counter-proposal essentially involved the division of its activities

in India into two companies. According to this counter-proposal, IBM would reduce its equity to 40 percent in the first company covering the operations of its four data centers. However, IBM would retain 100 percent equity in the second company that would be engaged in exports, the supply of computer systems, and the provision of services. Further, IBM proposed to convert its existing manufacturing activity to 100 percent export by March 1978, to conform with FERA guidelines.

IBM's counter-proposal underwent the scrutiny of the FERA committee. Based upon their review of the counter-proposal, the FERA committee concluded that no exception to FERA could be made in IBM's case. This decision was communicated to IBM in November 1977. The final order from the Reserve Bank of India directed IBM to reduce its foreign equity holding to 40 percent, as per the FERA guidelines, in order to continue its business operations in India.

Faced with this directive from the Reserve Bank of India, IBM reluctantly decided to phase out its operations in India in November 1977. IBM parts used in maintenance, and tools and test equipment, were sold under agreement to Computer Maintenance Corporation, a state-owned enterprise. The computing centers and card manufacturing facilities were sold to International Data Management Private Limited, a firm set up by 200 IBM employees. IBM ceased operations in India on May 28, 1978.

Recent Developments. In recent years, the Government of India has set new priorities with regard to the development and modernization of Indian industry through rapid development of the electronics sector in general, and the computer industry in particular.² The new computer

policy, which featured import liberalization and other radical measures, was announced on November 19, 1984.³

As a result of this policy, both the current size and potential growth rate of the computer market in India have attracted a large number of overseas manufacturers. Production in the computer, control and instrumentation sector of the electronics industry has risen from a level of Rs. 3290 million (approximately U.S. \$300 million) in 1983 to Rs. 4270 million (approximately U.S. \$400 million) in 1984, registering a growth rate of about 30 percent. The annual production levels in the computer, control and instrumentation sector from 1978 to 1984, and the corresponding growth rates, are summarized in Table 1.

The total production of electronics in India in 1984 was of the order of Rs. 18,900 million (approximately U.S. \$1,800 million), compared to Rs. 13,600 million (approximately U.S. \$1,300 million) in 1983, and Rs. 12,050 million (approximately U.S. \$1,200 million) in 1982. As shown in Table 2, the growth rate of production in the electronics industry climbed from a modest 12.9 percent during the previous year to a substantial 39 percent.

The rapidly growing computer market in India and the availability of computer systems and software development skills have attracted many computer manufacturers. Other factors that attracted IBM to the Indian computer market included the recent signing of a Memorandum of Understanding between the U.S. and India, and the easing of restrictions by the Government of India. In addition, the slump in the U.S. computer market and the maturing of several overseas computer markets

Table 1

Production in the Computer, Control and Instrumentation Sector

Year	Annual Production (Rs. in Million)	Growth Rate
1978	1190	
1979	1310	10.1
1980	1600	22.1
1981	2010	25.6
1982	2420	20.4
1983	3290	36.0
1984	4270	29.8

Source: Department of Electronics, Government of India.
Various annual reports.

Table 2

Production in the Electronics Industry in India

Year	Annual Production (Rs. in Million)	Growth Rate (Percent)
1976	4100	12.5
1977	5100	24.4
1978	5905	15.8
1979	6465	9.5
1980	8060	24.7
1981	9300	15.4
1982	12050	29.5
1983	13600	12.9
1984	18900	39.0
1985 (estimated)	30650	48.4
1986 (estimated)	40550	32.3
1987 (estimated)	56300	38.8
1988 (estimated)	78100	38.7
1989 (estimated)	108600	39.1

Source: Department of Electronics, Government of India.
Various annual reports.

induced IBM and other computer manufacturers to seek new overseas markets for both offensive and defensive strategic purposes.

In response to the above trends, IBM has reentered the Indian market in recent months and secured contracts for computer systems for the Indian railroads, oil and gas consortium, and to set up a national data communications network.

Cost-Benefit Analysis

An attempt is made to examine the costs and benefits of the IBM-India episode described in the preceding section. Recent developments in the computer industry in India and the changing nature of the IBM-India relationship are explored. The costs incurred and the benefits realized by each party will be assessed prior to and subsequent to the withdrawal of IBM from India.

The following cost-benefit analysis of the IBM-India episode begins with a summary of the priorities and goals of both IBM and the Government of India. An understanding of the priorities and objectives of both IBM and the Government of India is necessary in order to assess the outcome of their policies and strategic responses.

Priorities and Objectives. IBM commenced operations in India with the primary long-term objectives of achieving growth, securing a sizable market share, and maintaining international competitiveness in the world computer and information systems market. Entry into the new and growing Indian computer market helped IBM to sustain and improve upon their rapid growth rate while improving their international competitiveness. IBM was attracted to India by the availability of low-cost skilled labor for its manufacturing operations. In addition, IBM

was aware of the availability of considerable software development and computer systems consultant skills in India. These skills are used to develop software and provide high-skill services, such as systems engineering and education for overseas IBM companies in and around South-East Asia.

The Government of India, on the other hand, had three stated goals in regard to its drive toward self-sufficiency of the computer industry in India. First, Indian participation was sought in the ownership and control of the foreign computer subsidiaries in the country. Second, wholly-Indian producers were to satisfy most of India's computer needs. Foreign computer firms were to supply only very large computer systems using very advanced technology. Third, access to and participation in the manufacture of the most advanced computer systems available was sought by the Government of India.⁴

The following cost-benefit analysis is conducted in the light of the policy and strategic objectives of IBM and the Government of India. The performance of IBM and India are evaluated during the pre- and post-withdrawal periods. The former period extends from the middle 1960s to 1977, and the latter extends from early 1978 to the present.

Pre-Withdrawal Performance of IBM. IBM is a classic growth company and is considered the leading producer of advanced electronic computing equipment in the world. Thomas J. Watson, the late founder of IBM, set the firm on its global expansion path with the motto "World peace through world trade." With great vision and foresight, IBM cultivated foreign markets since World War I. After World War II, IBM's foreign operations were set up as a wholly owned but independently

administered subsidiary, known as IBM World Trade Corporation. By 1960, IBM World Trade Corporation had operations in 87 countries, of which 36 were served by nationally incorporated firms. In 1976, IBM operations expanded and covered 125 countries with 300,000 employees, half of whom were foreign nationals. From the mid-1960s, foreign operations have accounted for approximately 50 percent of IBM's total revenues and earnings. This strategic overseas thrust enabled IBM to prosper even when the vast domestic computer market first matured and later exhibited symptoms of decline.

Soon after entering the Indian market in 1952, IBM rapidly established a good reputation. A dominant market share was secured for typewriters, adding machines, data processing equipment, and computers. Indeed, IBM achieved a 70 percent market share of the Indian office machine market by the early 1970s. This dominant position was achieved through technological superiority and a demonstrated commitment to after-sale service and maintenance. However, only simple manufacturing operations were based in India, while high technology and export manufacturing facilities were located elsewhere. India was seen primarily as a market for sales and service.

The wholly-owned Indian subsidiary contributed only 0.07 percent to IBM's total net income. During the 1952-1977 period, IBM installed nearly 1000 computer systems in India. These computer systems were mostly Systems 1401, reconditioned at the Bombay manufacturing plant. At one point, the Indian subsidiary manufactured a medium-sized computer with 20 percent local content for the domestic market. In

addition, an inexpensive keypunch machine with 70 percent local content was manufactured for export.

The profits generated by the Indian subsidiary were miniscule in relation to IBM's worldwide profits. However, IBM had secured a strong foothold in a market that was still in its embryonic stage. Besides, these profits resulted from reconditioned second-hand machines, relatively simple manufacturing operations, service and maintenance. Tight control over IBM's operations ensured that the latest advances in computer technology were not released to existing and potential competitors. In addition, IBM could use India as a competence center for computer systems consultant skills and software development, and as a base for exporting goods and services. The entire Asian region, which was developing and had future growth potential, could be served from India.

In entering the Indian computer market, IBM sought to derive a number of potential benefits. First, IBM could achieve an adequate, or an above normal, rate of return on its investment in India. Second, IBM could maintain and even improve its market share and competitive position in the world computer market. Third, risk reduction through diversification could be achieved by expanding into the Indian computer market, which was not perfectly linked to its existing operations or markets. Fourth, IBM expected to achieve and sustain a high rate of growth, as the computer industry in India passed through its growth phase. Fifth, IBM may have been able to tap new capital markets, thereby obtaining access to possibly lower cost capital and a more diversified source of funds.

Further, IBM could take advantage of the considerable software development and computer systems consultant skills available in India. Indeed, it is common knowledge that during the last 25 years, trained Indian managers have been widely used in South-East Asia for setting up computer systems, developing software, and managing computer firms. Some IBM-trained Indian managers have set up and expanded their own computer firms, such as Hindustan Computers, which is thriving in Australia and Singapore.

Offsetting the above benefits, IBM faced several potential costs associated with its Indian subsidiary operations. First, there was the possible higher cost of production or doing business in a foreign country located on the other side of the globe. Second, there was a higher business risk associated with operating in a foreign environment. Third, there existed the possibility of expropriation and forced sale of equity to local partners at lower than economic value. Indeed, IBM was in effect directed to reduce its equity to 40 percent if it wishes to continue its operations in India.

Fourth, IBM faced possible restrictions on repatriation of income and capital as well as other forms of interference by the Government of India. A recent report indicated that IBM profits and assets are still frozen in India. IBM's profits are being held on deposit with several banks in India, including Citibank and the Bank of America.⁵

A fifth cost was the risk of incurring losses because of exchange rate fluctuations. Sixth, there was the higher cost of compensating expatriate management personnel or the additional cost of training

Indian nationals. Seventh, IBM faced transportation costs and border taxes incurred in transferring men, materials and capital overseas.

An eighth disadvantage was the possibility of creating and nurturing future competitors. Hindustan Computers, which is operating in Singapore and Australia, was founded by an IBM-trained Indian manager. Yet another cost incurred by IBM was the potential deterioration in relations with U.S. labor unions. The labor unions, as a general rule, oppose the creation of overseas jobs at the cost of jobs at home.

Based on the above cost-benefit analysis of the pre-withdrawal phase of IBM's operations in India, it appears that the benefits to IBM outweighed the costs. Having examined the costs and benefits associated with IBM's operations in India during the pre-withdrawal period, India's performance during the same period is reviewed next.

Pre-Withdrawal Performance of India. The performance of the Indian computer industry is evaluated in terms of the three stated goals of ownership participation and control, self-sufficiency, and technology transfer. The degree to which these goals were met during the pre- and post-withdrawal periods is examined.

In 1966, two overseas computer firms had sales and manufacturing activities in India. These firms were IBM and Britain's International Computers and Tabulators (ICT), which in 1968 became a part of International Computers Limited (ICL).

As discussed earlier, the Government of India was unsuccessful in its initial attempts to induce IBM, in 1966 and 1968, to share ownership of its local activities with Indian nationals. ICL, by contrast,

had split its operations into two units, one for manufacturing and the other for sales. The manufacturing unit involved 40 percent Indian ownership, thereby indicating that ICL was sensitive to the policy objectives of the Government of India. However, the sales unit was appointed as the sole distributor of the manufactured products and made all decisions about the operations of the manufacturing unit, thereby retaining control.

Based on the above, it appears that the Government of India was unable to ensure effective Indian participation in the ownership and control of the Indian subsidiaries of foreign computer firms during this period. However, the negotiating position of the Government of India was strengthened as a result of changes that were taking place in the international business world.

In the 1970s, European and Japanese multinational companies and state-owned enterprises entered the international business arena. These newcomers provided host country governments with alternative means to secure managerial and technological know-how, capital, and a market network. The availability of alternative methods to fulfill national goals, in line with existing priorities, reduced the level of dependence of host country governments on U.S. multinational firms such as IBM.

Many other developments in the international data processing industry worked in favor of India during the 1970s. The emergence of minicomputers and microcomputers, built with increasingly powerful and less expensive components, provided an alternative mode of development. These components could be imported and used as inputs in computer

systems designed in India. Moreover, these components were becoming available from an increasing number of suppliers that were primary suppliers of components and not computer systems. The number of foreign computer firms that India could rely upon had increased during the 1970s. As a result, there was a higher probability that India could establish linkages with one or more foreign computer firms on favorable terms.

Taking advantage of its stronger negotiating position, the Government of India again urged IBM, in 1973-1974, to share its equity in its Indian operations with Indian nationals. In response, IBM offered new and higher levels of manufacturing activities that could generate export earnings and stimulate the transfer of technology. In addition, IBM offered direct technical assistance to India's data processing programs in exchange for an exemption from the Government of India's equity-sharing policy. Further, IBM again indicated that it would withdraw from India rather than be compelled to share ownership and control of its Indian operations. However, the Government of India decided to press its demands on equity-sharing and IBM subsequently withdrew from India.

ICL, in contrast, agreed to merge its two units after intense negotiations with the Government of India. In addition, ICL agreed to dilute its equity to 40 percent, thereby ensuring Indian participation in both the marketing and manufacturing activities. Moreover, the Government of India resisted Burroughs's efforts to establish a wholly-owned subsidiary. Later in 1977, Burroughs agreed to establish a joint venture with Tata Enterprises. Thus, in contrast to the 1960s,

the Government of India achieved its first policy objective. Indian nationals were participating in the ownership and control of Indian subsidiaries of foreign computer firms.

The Government of India's second computer goal was the fostering of indigenous sources of supply for most of the nation's computer needs. In the six years following the announcement of the computer goals in 1966, the country made no progress toward encouragement of indigenous computer suppliers. IBM was the source of almost 75 percent of all systems installed between 1967 and 1972. As shown in Table 3, this dominant market share was not less than IBM had secured from 1960 to 1966, before India's national computer policy was implemented.

The only Indian computer enterprise, for most of the 1970s, was the central government's Electronics Corporation of India Limited. This Indian enterprise was the source of only 8.5 percent of all systems installed between 1967 and 1972. However, between 1973 and 1977, the Electronics Corporation of India Limited became the single largest supplier of computer systems in India. As depicted in Table 3, IBM's market share, by contrast, declined after the implementation of the FERA on January 1, 1974, and ultimately collapsed in 1977, when it decided to withdraw from India.

The third goal of the Government of India's computer policy was to acquire and to fabricate technologically sophisticated computer systems. One indicator of the technological status of a developing country's computer base is the time in years taken to introduce the latest computer technology. The difference in years between a computer model's

Table 3

Computer Market Structure in India, 1960-1980

(Systems installed, by period, in absolute numbers and percentage shares)

	Pre-Policy Period 1960-1966		Pre-FERA Period 1967-1968		Pre-Withdrawal Period 1973-1977		Post-Withdrawal Period 1978-1980	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
IBM	31	73.8	106	73.0	6	3.1	0	0
ICL	2	4.7	17	11.7	19	9.9	20	2.0
ECIL	0	0	5	3.4	77	40.3	98	10.2
HCL	0	0	0	0	0	0	390	40.5
DCM	0	0	0	0	0	0	265	27.5
IDM	0	0	0	0	0	0	17	1.8
ORG	0	0	0	0	0	0	70	7.3

Source: Joseph M. Grieco, "Between Dependency and Autonomy: India's Experience with the International Computer Industry," in Theodore H. Moran, ed., Multinational Corporations (Lexington, Mass.: D. C. Heath, 1985), pp. 55-81.

Key: ICL - International Computers Limited
 ECIL - Electronics Corporation of India Limited
 HCL - Hindustan Computers Limited
 DCM - DCM Dataproducts, a subsidiary of Delhi Cloth Mills
 IDM - International Data Machines
 ORG - Operations Research Group

introduction in the United States and the same model's introduction in India is one such indicator.

Grieco, in his extensive study of the Indian computer industry, determined that India's technological lag increased during the 1967-1972 period when compared to the 1960-1967 pre-policy period. As indicated in Table 4, the average lag of the 33 systems introduced during the 1960-1966 pre-policy period was 4.4 years. This lag period increased to 8.3 years for the 126 systems introduced during the 1967-1972 pre-FERA period. However, as indicated in Table 4, this trend was reversed during the 1973-1977 period. The increase in the lag during the 1967-1972 period was a result of the manufacturing activities of IBM and ICL in India. They imported second-hand computer systems, reconditioned these units, and then leased or sold them to Indian users. Later, after the mid-1970s, the technological lag was reduced through direct imports of foreign computer systems.

A second measure of the technological sophistication of the computer systems manufactured in India, used by Grieco, is the cost-per-bit of main memory used by the central processing unit. A decreasing cost-per-bit of main memory is indicative of advanced technology. The IBM-1401 was the major system fabricated in India during the 1967-1972 period. The Systems 360/30 and 360/40 that IBM hoped would succeed the System 1401 during the early and late 1970s are used for comparison. The System 360/40 has the lowest cost-per-bit of main memory, as indicated in Table 5.

Based on the above factors, India appears to have made very little progress in achieving its policy objectives during the years 1967-1972.

Table 4

Technology Lag of Foreign Computers in India, 1960-1980

	Pre-Policy Period 1960-1966	Pre-FERA Period 1967-1972	Pre-Withdrawal Period 1973-1977	Post-Withdrawal Period 1978-1980
Number of Systems	33	126	95	87
Total Lag (years)	145	1049	351	231
Average Lag (years)	4.4	8.3	3.7	2.6

Source: Joseph M. Grieco, "Between Dependency and Autonomy: India's Experience with the International Computer Industry," in Theodore H. Moran, ed., Multinational Corporations (Lexington, Mass.: D. C. Heath, 1985), pp. 55-81.

Table 5

Cost-per-bit of Main Memory of Selected IBM and Indian Computers

<u>Company</u> <u>System</u>	IBM			ECIL		DCM
	<u>1401</u>	<u>360/30</u>	<u>360/40</u>	<u>TDC-312</u>	<u>TDC-316</u>	<u>Galaxy 11</u>
Year Introduced	1960	1965	1965	1974	1975	1978
Cost-per-bit (in dollars)	.93	.32	.21	.25	.14	.06

Source: Joseph M. Grieco, "Between Dependency and Autonomy: India's Experience with the International Computer Industry," in Theodore H. Moran, ed., Multinational Corporations (Lexington, Mass.: D. C. Heath, 1985), pp. 55-81.

Key: ECIL - Electronics Corporation of India Limited
DCM - DCM Dataproducts

First, little if any success was achieved in increasing Indian participation in the ownership and control of foreign computer subsidiaries operating in the country. Second, only a very small portion of needs of the domestic market was satisfied by Indian computer firms. Lastly, very little access to the latest computer technology had been secured by the Government of India.

As a result, India derived several benefits from IBM's operations. First, the foreign capital invested by IBM was an important supplement to Indian capital and was needed to foster the planned or desired rate of growth. Second, IBM's investment in India added to national income, encouraged development of ancillary industries, and created jobs in India. Third, the Indian operations of IBM generated tax revenues to help meet government expenditures. Fourth, there was the potential for export generation through diffusion of advanced technology. These exports help to reduce the foreign exchange deficit and augment India's foreign exchange reserves.

Offsetting these benefits were diverse costs arising from IBM's operations in India. First, there was the outflow of dividends, profits, management and royalty fees, interest on loans, and other remittances by IBM through the intra-company billing system. Second, IBM's dominant position stifled the growth of Indian enterprises in the computer industry and lead to a dependence on foreign firms in a strategic sector. Third, IBM successfully competed for and used scarce local capital, thereby slowing the growth of Indian firms in the computer industry. Indian computer firms, competing with IBM, did find it difficult to attract capital, skilled manpower, and raw

materials. Fourth, local research and development activities suffered as local entrepreneurs jumped on the bandwagon and used foreign technology to compete effectively with IBM. Fifth, the technology transferred by IBM was obsolete or of a type that could be developed in India.

Having examined the costs and benefits to both IBM and India during the pre-withdrawal period, IBM's performance during the post-withdrawal period is examined next. A comparison is then made of IBM's performance during the pre- and post-withdrawal periods.

Post-Withdrawal Performance of IBM. The decision to withdraw from the Indian market may appear, at first glance, to be the appropriate response to the policy directives of the Government of India. From the standpoint of IBM, the Indian subsidiary contributed only 0.07 percent to IBM's total net income. The sacrifice of this income was more than offset by the retention of control over its technology.

A major concern at the time was the setting of a precedent by giving in to the demands of the Government of India. With a strong emphasis on research and development, IBM insisted and secured 100 percent ownership in its overseas subsidiaries. However, in 1977, IBM's organizational and control practices were challenged by Nigeria, Indonesia, and India. Nigeria and India insisted on equity participation in the local IBM subsidiaries. Indonesia asked for control over the marketing operations of the local IBM subsidiary. IBM officials were concerned that complying with the policy directives of the Government of India would set a precedent. This could lead to similar demands by other developing and industrial countries in the future.

Taking a long-term perspective, however, IBM's withdrawal from India created an immediate void and opened the market to potential competitors. Many computer companies carved out a niche for themselves in the Indian computer market. Brand loyalty suffered as IBM users were induced to try alternative brands in the absence of IBM products and found that these new brands met their needs. The inroads made by domestic and overseas computer firms would pose a challenge to IBM in the future. These competitors have established manufacturing operations, distribution networks, and maintenance and service facilities. Besides, existing satisfied users of competitive brands are unlikely to opt for alternative brands in the future. Switching brands would involve new systems, new procedures, new parts, and difficulty in network integration. Given these problems, reentry into the Indian market would be a difficult challenge.

Moreover, IBM has relinquished a strategic base for serving the rapidly growing Indian as well as Asian computer markets. With the maturing of U.S. and Western computer markets, computer firms are scrambling to establish a beachhead in the new and rapidly growing computer markets. Market development and product development are both necessary to sustain their growth. Computer firms are scrambling to gain a strong foothold in attractive new markets for both offensive and defensive strategic purposes. Thus, from a long-term strategic perspective, the decision to withdraw from India may haunt them in future years.

Based on the above discussion, it appears that the costs incurred by IBM in withdrawing from the Indian market outweigh the benefits

realized. Thus, IBM appears to have fared worse during the post-withdrawal period. Recognizing the importance of participating in the rapid growth of the Indian computer market, IBM has actively sought new business and secured several orders for computer systems in India in recent months.

Having assessed the performance of IBM, an attempt is now made to analyze the costs and benefits to India during the post-withdrawal period.

Post-Withdrawal Performance of India. After the withdrawal of IBM from India, Burroughs and ICL consolidated their operations. However, the major development during this period was the emergence of several Indian systems-engineering firms that were not under the control of the Government of India.

In addition, three other Indian computer firms were designing and assembling systems. The first of these Indian computer firms, Hindustan Computers Limited, was a joint venture between a private Indian firm and the Uttar Pradesh state government. The second computer firm, DCM Dataproducts, was a subsidiary of Delhi Cloth Mills. Finally, the third computer firm, the Operations Research Group, was a subsidiary of Sarabhai Enterprises. A fourth Indian enterprise, International Data Machines, was founded by former IBM employees with the assistance of IBM. This computer firm marketed and serviced a microsystem designed and assembled by the National Radio and Electronics Company, a subsidiary of Tata Enterprises. (National Radio and Electronics Company and Tata-Burroughs were two separate enterprises.)

These Indian computer firms had carved out a niche for themselves by the end of the decade. Further, they provided considerable employment potential. In 1980, the computer division of the Electronics Corporation of India Limited had approximately 1000 employees. A total of approximately 600 people were employed by Tata-Burroughs and International Computers Limited. The new Indian computer enterprises, Hindustan Computers Limited, DCM Dataproducts, the Operations Research Group subsidiary of Sarabhai Enterprises, and International Data Machines, together had about 1900 employees.

Based on the above developments, the Government of India achieved effective Indian participation in the ownership and control of the local units of foreign computer firms. Furthermore, new Indian computer firms emerged to fill the void created by the departure of IBM from India.

During the late 1970s, Indian computer enterprises as a group continued to grow and become a major force in the Indian computer market. The four new Indian computer firms surged ahead and overtook the Government of India's Electronics Corporation of India Limited. Hence, during the post-withdrawal period, the Government of India succeeded in attaining its second policy objective of self-sufficiency in the Indian computer industry.

On the technology front, India's technology lag continued to narrow during the post-withdrawal period in the late 1970s. As depicted in Table 4, the average lag of the 87 computer systems introduced had decreased to 2.6 years during the 1978-1980 post-withdrawal period. This average lag of 2.6 years was lower than the average lag

periods of 4.4 years, 8.3 years and 3.7 years registered during earlier periods.

The cost-per-bit of main memory also declined during the post-withdrawal period, signifying an advance in technological sophistication of computer systems manufactured in India. The Government of India's Electronics Corporation of India Limited produced the System TDC-312 and the System TDC-316 during the post-FERA and subsequent periods (middle and late 1970s). DCM Dataproducts fabricated the Galaxy 11 System during the post-withdrawal period (late 1970s and thereafter).

As indicated in Table 5, the cost-per-bit of main memory of both the TDC-312 and TDC-316 was lower than that of the IBM 1401, the 360/30, and the 360/40, fabricated during the pre-withdrawal period. This indicates that the Indian computer systems, fabricated during the post-FERA pre-withdrawal period (1973-1977), were more advanced than those manufactured by IBM during the pre-FERA period (1967-1972). The Indian computer systems were even more advanced than the System 360 that IBM had proposed to succeed the System 1401.

The systems manufactured in India at the end of the 1970s continued to improve technologically. In 1978, the cost-per-bit of main memory of an ECIL TDC-316 was about \$.14, and that of the DCM Galaxy 11 was approximately \$.06. The most impressive gains were achieved by the new Indian computer firms rather than the government-owned computer enterprise Electronics Corporation of India Limited.

Based on the above factors, India appears to have made some progress in achieving its policy objectives during the years 1967-1972.

First, success was achieved in increasing Indian participation in the ownership and control of foreign computer subsidiaries operating in the country. Second, Indian computer firms satisfied the majority of the needs of the domestic market. Finally, Indian computer firms had decreased the technology lag period and reduced the cost-per-bit of main memory by achieving access to the latest computer technology.

Summary and Implications

The primary objective of foreign direct investment is to induce the transfer of technology and capital. Technology and capital transfer are considered prerequisites to achieve technological and industrial development and to attain self-sufficiency.

The Government of India opted in favor of achieving self-sufficiency in the computer industry through domestic development. Foreign direct investment was used as a catalyst in the process of industrial development. The recent withdrawal of IBM from India highlights this quest of attaining the twin objectives of technological development and self-sufficiency with respect to the computer industry.

This study examines the costs and benefits to both IBM and India arising from the Government of India's decision to deny IBM 100 percent foreign equity and IBM's subsequent decision to withdraw from India. The costs incurred and benefits realized by IBM and India are explored during both the pre- and post-withdrawal periods.

Data on all the costs and benefits to both parties arising out of IBM's withdrawal from India are difficult to obtain. However, based on an analysis of the major factors pertinent to the case, the results

are mixed. The Government of India appears to have succeeded in securing effective participation in the ownership and control of domestic operations of foreign computer firms. In addition, it appears to have succeeded in achieving self-sufficiency as well as advanced technology by Indian computer enterprises. IBM, on the other hand, is again actively seeking and securing new contracts in the Indian computer market. Only time will tell whether IBM will resume manufacturing operations and reestablish the strong foothold it once had in India.

FOOTNOTES

¹Joseph M. Grieco, "Between Dependency and Autonomy: India's Expertise with the International Computer Industry," in Theodore H. Moran, ed., Multinational Corporations (Lexington, Mass.: D. C. Heath, 1985), pp. 55-81.

²Department of Electronics, Government of India, Annual Report 1984-85 (New Delhi, India: DOE, 1985).

³"One Year of the Policy: Promises in Perspective," Dataquest, December 1985, pp. 40-61.

⁴Electronics Committee of India, Electronics in India (New Delhi, 1966).

⁵Maggie McLening, "Big Blue Tiptoes into India," Datamation, December 1985, pp. 55-58.

HECKMAN
BINDERY INC.



DEC 95

Bound-To-Please® N. MANCHESTER,
INDIANA 46962

UNIVERSITY OF ILLINOIS-URBANA



3 0112 060296057