

Transfer of Technology for Successful Integration into the Global Economy

A Case Study of the Pharmaceutical Industry in India

Biswajit Dhar and C. Niranjan Rao,

with inputs by Veena Gupta



United Nations

New York and Geneva 2002

Note

This paper is part of the series of case studies on Transfer of Technology for Successful Integration into the Global Economy carried out by the Investment Policy and Capacity Building Branch, DITE, under the UNCTAD/UNDP Global Programme on Globalization, Liberalization and Sustainable Human Development: Best Practices in Transfer of Technology. The work has been carried out under the direction of Assad Omer, assisted by Maria Susana Arano. Overall guidance was provided by Khalil Hamdani.

The views expressed by the authors do not necessarily represent those of UNCTAD or UNDP.

UNCTAD/ITE/IPC/MISC. 22

TABLE OF CONTENTS

Preface	vii
Introduction.....	ix
Chapter I: Historical overview of the Indian pharmaceutical industry	1
1. The policy regime since the 1970s.....	2
2. The new drug policy of 1978	2
A. Expansion of capabilities and the role of foreign firms.....	2
B. Emphasis on technology and R&D.....	3
C. Price control regime.....	4
3. Modifications to the drug policy.....	5
4. The Indian patent system.....	6
Chapter II: Impact of the policy regime on the development of the pharmaceutical industry.....	9
1. The effects of active policy intervention.....	9
2. Performance of the pharmaceutical industry during the 1990s.....	14
A. Production.....	15
B. Exports.....	16
C. Imports.....	19
D. Research and development.....	20
E. Knowledge partnerships	22
F. Technology transfer.....	27
G. Foreign direct investment.....	28
Chapter III: The success of Ranbaxy Laboratories.....	29
1. The performance of the firm in the 1990s.....	30
A. Growth in size.....	30
B. Growth in size of operations.....	31
C. Foreign exchange transactions.....	33
2. The technology factor in the performance of Ranbaxy Laboratories.....	36
A. Growth of in-house R&D activities in the 1990s.....	36
B. Areas of R&D spending of Ranbaxy Laboratories.....	38
(i) Abbreviated new drug applications.....	38
(ii) Development of new processes.....	39
(iii) Novel drug delivery systems.....	39
(iv) New drug discovery.....	39
Concluding remarks	41
References.....	45

TABLES

1.1 The Indian pharmaceutical industry in the 1970s: Production (US\$ million).....	1
1.2 Bulk drugs under price control (1970 to 1995).....	6
1.3 Time lag between introduction of a new drug in the world market and its introduction in India.....	8
2.1 Production performance of the Indian pharmaceutical industry during the 1980s (US\$ million).....	9
2.2 Profitability ratios of drug and pharmaceutical industries (percentage)....	11
2.3 Profitability of industries in India (1989-2000).....	13
2.4 Production performance of the Indian pharmaceutical industry in the 1990s (US\$ million).....	15
2.5 Indian pharmaceutical industry: Exports (US\$ million).....	17
2.6 Shares of exports in total production of the pharmaceutical industry (1990/91–1999/00).....	17
2.7 Shares of bulk drugs and formulations in total exports (percentage).....	18
2.8 Indian pharmaceutical industry: Imports (US\$ million).....	20
2.9 Reported R&D expenditure by Indian pharmaceutical firms (1990/91 to 1999/00).....	22
2.10 Industry/Institutional Alliance.....	25
2.11 Drug and pharmaceutical projects financed by the TDB.....	26
2.12 R&D drug and pharmaceutical projects under PATSER.....	27
3.1 Ranking of the leading pharmaceutical firms among the best performing firms in India.....	29
3.2 Size of Ranbaxy Laboratories (1989/90 to 1999) (US\$ million).....	31
3.3 Compound rates of growth in the size of Ranbaxy Laboratories during the 1990s (Percentage).....	31
3.4 Size of operations of Ranbaxy Laboratories (1989/90 to 1999) (US\$ million).....	32
3.5 Compound rates of growth in the operations of Ranbaxy Laboratories in the 1990s (Percentage).....	32
3.6 Ranbaxy's foreign exchange transactions (US\$ million).....	34
3.7 Composition of foreign exchange earnings (US\$ million).....	34
3.8 Ranbaxy Laboratories: Market distribution of products of different therapeutic groups in 1999 (US\$ million).....	35
3.9 R&D expenditure of Ranbaxy Laboratories (1992/93 to 1999) (US\$ million).....	37
3.10 Growth rates of the three components of R&D expenditure by RL.....	37
3.11 R&D intensity of Ranbaxy Laboratories.....	38

FIGURES

1. Profitability of pharma and non-pharma industries in India: Profits after tax to net worth.....	12
2. Comparative profitability of Indian industries.....	14

ANNEX TABLES 47

I. Approvals for ANDA obtained by Ranbaxy Laboratories in the United States.....	47
II. Patent applications made in India by Ranbaxy Laboratories.....	48
III. Patents granted to Ranbaxy Laboratories in the United States.....	50
IV. Applications made under EPC by Ranbaxy Laboratories.....	51
V. Applications made under PCT by Ranbaxy Laboratories.....	52

Preface

The main objective of the studies carried out under the UNCTAD/UNDP Global Programme on Globalization, Liberalization and Sustainable Human Development: Best Practices in Transfer of Technology is to identify factors that could enable firms in developing countries to upgrade technologies or develop new technologies with a view to enhancing their productivity. The case studies focus on successful cases of technology transfer and integration into the world economy. They are thus expected to provide lessons, in terms of *best practices*, to other developing countries in the context of *technological capacity building*.

The project consists of three case studies¹ of sectors where the selected developing countries have demonstrated their ability to create new productive capacities and successfully participate in the world market. Each of the sectors represents an example of created comparative advantage; that is, where a country's factor endowments were modified through investment in physical capital, human resources and the building up of capacities to develop and use new technologies. Central to an understanding of the catch-up process and the building of technological capacity across countries is the identification of firm-level factors as well as government policies and institutions that enable firms to thrive, grow and compete in the world market. Therefore the case studies aim to identify conditions under which sectoral development, integration into the global economy, and sustainable human developments are all linked together.

¹ The three case studies are: *A Case Study of the Pharmaceutical Industry in India*; *A Case Study of the South African Automotive Industry*; and *A Case Study of Embraer in Brazil*. These three studies will also be part of a forthcoming publication under the UNCTAD/UNDP GLOBAL PROGRAMME ON GLOBALIZATION, LIBERALIZATION AND SUSTAINABLE HUMAN DEVELOPMENT, which will include an overview on the studies and on the international dimension of the national policies adopted in these cases.

INTRODUCTION

The decade of the 1990s has been significant for India in terms of the changes in policy orientation directed at its economy. From the relatively inward looking policies in place till the end of the 1980s, the policy regime adopted in 1991 sought to break down the walls of protection behind which Indian industry had developed in the past. The biggest challenge for Indian industry posed by the new regime arose from the need to adopt measures that would improve its competitive strength.

This study focuses on the performance of the pharmaceutical industry, a sector that has been able to meet the challenges posed by the new policy regime with a degree of success. The success that this industry experienced in the 1990s was, however, built on a foundation that was laid in the 1970s. During this phase, the Government provided a policy environment to the industry, which was defined through a mix of instruments. The prime objective of the policy framework was to develop a viable domestic industry with adequate participation of Indian entrepreneurs. A key instrument for the realization of this objective was the policy aimed at building up the technological sinews of the industry.

The impact of the policies adopted through the three decades covering the 1970s to the 1990s is analysed in this paper in three chapters. While the first two chapters present a broad overview of the performance of the industry, the third chapter provides a case study of the leading Indian enterprise in this industry, namely Ranbaxy Laboratories. The case of Ranbaxy Laboratories shows how the Indian pharmaceutical industry performed through the changing policy regime.

CHAPTER I

HISTORICAL OVERVIEW OF THE INDIAN PHARMACEUTICAL INDUSTRY

The pharmaceutical industry in India has evolved through three phases over the past 50 years. The first was the period prior to 1970, when the industry was relatively small in terms of production capacities. The second phase spanned the late 1970s to the early 1990s, a period during which the industry experienced policy-induced growth. In its third phase, during the 1990s, much of the regulatory structure that the Government had imposed during the previous two decades was dismantled.

Even as late as the mid-1970s, India had a relatively small pharmaceutical industry, with a total production of just over US\$ 600 million. During the subsequent four years, the total output of the industry more than doubled, the major contribution being made by formulations, which accounted for 85 per cent of total production. Table 1.1 shows the production figures for the two broad segments of the industry: bulk drugs and formulations.

Table 1.1

Indian pharmaceutical industry in the 1970s: Production (US\$ million)			
Years	Bulk drugs	Formulations	Total
1974/75	111.1	493.7	604.8
1975/76	155.2	668.6	823.8
1976/77	167.4	781.3	948.7
1977/78	187.7	1 029.9	1 217.6

Source: Based on GOI, Ministry of Chemicals and Fertilizers, *Annual Report* (various years).

An overwhelmingly large share of installed capacity in the Indian industry was in the

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_10776

