INTRODUCTION

Indian pharmaceutical industry has attracted the world attention from the time of the Uruguay Round of the General Agreement on Tariffs and Trade negotiations in 1986. A large-scale attack was mounted on the Indian drug industry from various sections belonging to the United States of America. The organizations and associations representing various corporate interests in America led by the drug companies, and supported by the United States Trade Representatives in different points in time, were in belligerent mood. The main attack was that the Indian drug firms were indulging in the violation of intellectual property rights, amounting to piracy of drug manufacture. This in fact, became one of the important issues of the agenda for discussion at the Uruguay Round negotiations.

The present offensive stance of American pharmaceutical companies and their associations such as Pharmaceutical Research Manufacturers Association (PhRMA), Pharmaceutical Manufacturers Association (PMA) and a host of other affiliated organizations is quite surprising. The past record of these organizations, to say the least, is without blemish. On the contrary they had to face the criticism from not only from general public from the world over, but also from the statutory bodies within the US. In fact, not long ago the Kefauver Committee had passed a strong indictment on the American drug firms, holding them responsible for a variety of unacceptable practices in the USA.¹

The pharmaceutical multinationals, not only in the US but also all over the world had earned for themselves a not so respectable image ever

since the occurrence of the multi-country Thalidomide disaster. The Monopolies Commission in the United Kingdom, for example, passed strictures on the Swiss drug multinational Hoffman-la Roche for transfer pricing practices for its sedative drugs Librium and Valium and directed the firm to reduce the prices, which the Committee felt, were unreasonably exorbitant. In fact, the UK government had set up a committee to review the functioning of the British pharmaceutical firms soon after the Thalidomide tragedy, and the report of the committee appeared much before the Report of the Kefauver Committee in the US.

The setting up of the committee to look into various problems of the Indian drug industry by the government of India in 1974, was in fact, the continuation of the government efforts to oversee and protect the interests of the public at large, were essentially initiated in the US, the UK, and other Western countries. However, the committee in India, which became well known by the name Hathi Committee, had submitted a voluminous report covering various aspects of the Indian drug industry, which in fact had become instrumental in the pursuit for self-reliance in that industry.

2 Thalidomide is a chemical intermediate, which was administered on pregnant women till the 1960s. It was then discovered that the substance had, apart from its high toxicity, given rise to structural deformities in the embryos and even the destruction of foetus, and had resulted in number of deaths of prospective mothers in various countries. The tragic details regarding this disaster are well documented. See, for instance, H. Sjostrom and R. Nilson, Thalidomide and the Power of the Drug Companies, Penguin, London, 1972.


5 Government of India had set up a committee under the chairmanship of Jaisukhlal Hathi, which consisted of 11 expert members drawn from various fields. The committee's report became popular by the name Hathi Committee Report. See, Report of the Committee on the Drugs and Pharmaceutical Industry, Government of India, New Delhi, 1975.
The Hathi Committee in its Report while pointing out a number of unacceptable practices resorted to by the foreign drug MNCs in India had devoted its attention to the most important aspect, namely, the measures to enhance indigenous capabilities of the domestic drug firms. It had also envisaged a greater role to the public sector in augmenting research and development efforts by continuous and sustained coordination with the public funded research institutions and laboratories.

It becomes quite important to examine the indigenous technological efforts initiated in the Indian drug industry way back in the 1970s, and the associated and complementary developments resulting in the building up of the research institutions, which had become instrumental in the pursuit of path of self-reliance. The study of these aspects gains further significance in the light of the emergence of the World Trade Organization, and the criticism advanced by the American drug companies, which precedes the establishment of the WTO.

The WTO regime envisages a greater role for the intellectual property rights, and stipulates that every country must follow a uniform IPR regime under its supervision. India being a member of the WTO should fulfill it obligations before 2005. It has become now certain that India has to permit product patents, which was absent until so far, and should gear up her drug firms for 'international competition' under strong IPR protection regime.

There has been a sudden spurt of economic literature showing the importance of IPR protection and innovation activity, foreign direct investment (FDI) and IPR protection, and spillover effects of the FDI,
which would dilute in case of weak intellectual property protection.\textsuperscript{6} There have also been some studies, which argue that wide price variations would lead to more efficient use of the product and more efficient level of R\&D than a policy that would result in uniform prices to all consumers.\textsuperscript{7} Advancing arguments that greater profits to private firms will lead to greater investments in R\&D and larger number of new innovations, without any empirical support, appear naïve in the face of it.

One of the striking features of the post-WTO economic theorization and empirical research has been a blatant and stubborn refusal to recognize the stupendous contribution made by public funded R\&D and public sector research institutions and scientists working in those institutions and universities. Further, most of current economic theorizing ends up in normative prescriptions without paying attention to the level of development of the economy, the particular characteristics represented by locational and historical background, level of industrialization and so on. For example, when it is suggested that spillover effects of FDI could be maximized with stronger IPR regime, the arguments relating to the nature of international technology markets, the oligopolistic structures, the nature of technology and its suitability to the specific conditions and so on are completely ignored. The domestic technological capabilities of individual economies, namely the capacity to adopt, absorb and assimilate new technologies, which are developed in a completely different environment and historical conditions are totally set aside. On the whole it appears that there is a strong current to advance


\textsuperscript{7} Patricia Danzon, "Testimony of the US Senate Committee on Health, Education, Labour and Pensions", June 13, 2000\texttt{[http://www.senate.gov/-labor/hearings].}
vociferously arguments in favour of unrestricted flow of technology, stronger IPR protection under the WTO order.

We have undertaken to examine in detail the questions raised above and the specific implications of the WTO for the technology acquisition process in the Indian drugs and pharmaceutical industry. The thesis is divided into four sections, Part I and Part II, preceded by the current introductory section. Part I consists of the first three Chapters, followed by Part II with fourth and fifth Chapters. The final section presents summary and conclusions. The first chapter brings out various facets of the Indian pharmaceutical industry in the post Independence period, including its systematic attempts at building indigenous strengths under the philosophy self-reliance. The second chapter discusses the specific policies of the government from 1950 to 2002 that have been instrumental in the development of the drug industry. The way the drug policy has evolved over a period of time including the pricing policy, and the changes it has undergone in the context of the WTO is also discussed in the second chapter. There is an exhaustive discussion on the process of globalization, intellectual property rights and the WTO in Chapter III. A vast amount of literature dealing with various aspects of intellectual property protection and pros and cons of public funded research in general and the empirical findings specifically related to the US is discussed in this chapter. Chapter IV in Part II discusses the temporal progress of the drug industry in India and how it has progressed through the path of self-reliance until WTO. A detailed empirical analysis has been presented regarding indigenous production capabilities in various therapeutic categories in terms of quantities of drug production and also in terms of sales turnover. In each segment relative strength of the MNC firms located in India as well as the Indian firms is given. It also deals with the questions relating pricing and consumer welfare in the aftermath of the WTO. Indian experience with technology acquisition and generation has been
presented in the fifth chapter. The fifth chapter presents a detailed empirical evidence of the indigenous efforts of the Indian drug industry and discusses the implications in the context of the WTO.

Data have been obtained and analyzed for 255 foreign collaboration agreements for the period between 1951 and 1986 and separately for 37 more collaborations from 1987 to 1991.

Some earlier studies, have examined foreign collaboration agreements in the pharmaceutical industry for the period 1956-65, involving 76, and again for the period 1962-72 covering 28 agreements. Our study extends the earlier study of K.K. Subramanian, in the context of pharmaceutical industry. In the earlier study it was found that the technology supplier stipulated stringent conditions involving a definite period of exclusion from seeking technology from other sources, when the supplier's agreement was in force. This forced firms seeking technology from multiple sources to some kind of a 'tie-up'.

However, it should be noted that during the 1970s, Indian firms were not quite experienced in negotiating contracts, and the choices were also restrictive. The position in the pharmaceutical industry was somewhat better than in other industries, for two reasons. Most of the contracts executed during the period 1950 and 1970 were technical and the duration of contract was restricted to 2 to 3 years. It is widely established fact in economic theory of technical change that the stringency of contracts is measured by (a) the price of contract, (b) the

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8 Data pool is constructed from data obtained from various sources; The main sources for pre-WTO data are: Government of India, Ministry of Chemicals and fertilizers, Dept. of Chemicals and Petro Chemicals; NICDAP, Drugs and Pharmaceuticals: Industry Highlights, National Information Centre on Drugs and Pharmaceuticals, CDRI, Lucknow; Government of India, Lok Sabha Secretariat (Loksabha Proceedings); Indian Drug Manufactures Association IDMA Bulletin, Annual report (various); OPPI, Annual Report (various) Indian Drugs and Pharmaceutical Industry (Various), Eastern Pharmacist (various), Indian Drugs (various), Pharma News (various), SCRIP (various), Pharma Times (various), Chemical Week (various), Chemical Business (various) and several other sources which helped build the data pool.

duration of contract, and (c) option to switchover from the contract without penal clause. As we will show in this chapter that in the context of Indian pharmaceutical industry and in the data set that we have furnished it was clear that by all the three criteria Indian drug firms were in an advantageous position. In fact the evidence for the post-WTO period, fragile though, shows that at least technologies imported were not on the basis of local relevance and need. We provide further evidence in case of technology generation and acquisition that the major technologies that were developed were basically in the public funded research institutions and government laboratories. In addition the magnitude and intensity of the technologies transferred from these laboratories and institutions to the private sector (which of course, does not include MNCs) was much below the potential of those institutions and laboratories. In the last section entitled 'Summary and Conclusions' which follows Part II we sum up the major arguments and results.

**DATA AND SOURCES OF THE STUDY**

Data have been collected from a variety of sources over a long period of time. The main sources of pre-WTO data are: Ministry of Chemicals and Petro-Chemicals, Government of India, New Delhi; Department of Science and Technology, New Delhi; Council for Scientific and Industrial Research, New Delhi; Lok Sabha Secretariat, Parliament House, New Delhi; National Medical Library, All India Institute of Medical Sciences, New Delhi; National Informatics Centre for Drugs and Pharmaceuticals, Central Drug Research Institute, Lucknow; various drug manufacturer associations in Mumbai and New Delhi and their publications; Federation of Medical Representatives Associations of India and its affiliated organizations in Hyderabad and Vijayawada and their publications; Operations Research Group, New Delhi, Vadodara and Ahmedabad; The main sources of post-WTO data are from these internet
portals: Indiainfoline.com, Probity Equity Research, Process Database of Centre for Monitoring Indian Economy. Licensed/paid services of the digital databases EBSCO Host and Sciencedirect.com, were made use of courtesy, Indira Gandhi Memorial Library, University of Hyderabad.

METHOD AND LIMITATION OF THE STUDY

The logical exploratory analysis has been adopted along with descriptive statistical methods throughout the study. The main limitation could be the absence of any econometric exercise in the study.
PART I