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INTELLECTUAL PROPERTY RIGHTS, TRIPS AND TECHNOLOGY TRANSFER

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FOREWORD

The current paper, as the acknowledgement note indicates, arises out of a joint CSSSC and Roskilde University Project on 'Institutional framework for industrial development'. Dr. Tarun Kabiraj, a young economist who has done interesting work on the theoretical treatment of technology transfer, was requested by the Centre to prepare a paper on 'Intellectual Property Rights and TRIPs' in the light of accepted economic theory. The current paper is a result of that. Dr. Kabiraj has taken into account much of the theoretical literature while preparing the paper. However, the implementation of laws such as those related to intellectual property rights requires an investigation in detail of the institutions through which the implementation takes place. It is well known that China, Japan and other east Asian countries have been quite skilful in adopting international laws and yet interpreting them according to their own perceived interest and have defeated strategies of penetration into their economies by western multinationals. In judging the applicability of various theoretical expctatiòns in the Indian context, we have to remember that the Indian economy and society are far more transparent to the gaze of the foreigners than typical east Asian countries. Dr. Kabiraj's conclusions must be evaluated in the light of such institutional peculiarities that distinguish India from China, Japan, South Korea, etc. A paper on the working of the Indian Patents' Act which is a follow-up of the earlier work done at the Centre is in preparation and will also be published in the near future.

29 June 1994

(Amiya Kumar Bagchi)

INTELLECTUAL PROPERTY RIGHTS, TRIPS AND TECHNOLOGY TRANSFER *

1. Introduction

North-south polarisation has never been so prominent on any other issue than the one at present on intellectual property rights (IPRs). The inclusion of IPRs in the Uruguay Round of Multilateral Trade Negotiations (MTN) under the General Agreement on Tariffs and Trade (GATT) has created a stir among the developing countries, because it is feared that it would violate all international norms and codes of conduct and would provide absolute power to the developed countries to rule over the developing countries in the future on trade and technology matters. This will have far-reaching implications for the selfsufficiency and long-term growth performance of the developing countries. The purpose of this paper is to throw some light on this issue.

One of the major issues of the Uruguay Round talks under GATT is to provide protection to intellectual property (IP) worldwide. Traditionally, GATT limited its discussion on issues related specifically to tariffs and trade in goods, with an overall objective of free and fair trade among its member nations. The setting of norms and standards of IPRs was the subject of the

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World Intellectual Property Organisation (WIPO). However, the developed countries, and in particular the US, had been pressing to introduce the whole range of IP issues, including patents, trademarks, copy rights etc., within the ambit of the GATT. They argue that IPRs are trade related, and so there should be a GATT based agreement on IPRs so that trade distortions can be reduced, if not eliminated. Accordingly, they argue, inadequate and ineffective protection provided to intellectual properties in several countries has given rise to production and trade in counterfeit goods; so 'fair' conduct of trade has been violated. Hence they demand that GATT should call for international enforcement of the trade related intellectual property rights (TRIPs) by setting norms and standards applicable to all GATT members.

There was much dissension and difference of opinion on different aspects of the issue of intellectual property protection, and patent protection in particular, not only among the developed and developing countries but also within developed and developing nations. So to conclude the Uruguay Round talks, Mr. Arthur Dunkel, the then Director General of GATT offered a draft proposal (known as the Dunkel Draft) in 1991 on a 'take it or leave it' basis. Finally in December 1993, the member countries have signed the draft. Now it is very important to understand implications of the new changes. We provide theoretical underpinnings of the problem of IPRs in the context of international technology transfer (IT) and research and development (R & D).

In this context the relevant question that is often being asked is why GATT has been chosen for this purpose. The industrialised countries had for long been dominant in the international scene. In the post Second World War period the developing countries organised themselves as the Group of 77 (G- 77) and initiated in the United Nations and in UNCTAD a wide series of negotiations with the west and aimed at establishing a New International

Economic Order (NIEO). However, the developing countries had a very bad decade during the 1980s, with growing budgetary deficit, external debt and balance of payments crisis. To overcome the crisis they were forced to borrow from the IMF and the World Bank and surrender to their structural adjustment programme. Given the difficulties and disadvantages of the south, the west launched the Uruguay Round of Negotiations in the GATT. The United Nations and the UNCTAD—the universal fora for the north-south negotiations are left behind, and the GATT, an obscure and sleepy organization, so far limiting its role in tariff negotiations only, has been resurrected for making most far reaching negotiations which were mostly out of its scope and competence. The GATT, a club of the rich like the IMF and the World Bank, was chosen because the developing countries did not have the advantage of being organised there, as in UN or in G-77 (Patel, 1992).

To the extent IP issues are not directly trade issues, the Uruguay Round, it is stated, has included, not all IP issues generally, but only trade-related ones, i.e., TRIPs. In practice, however, in an interdependent world economy, with all countries being exposed to foreign trade, it is hard to isolate the one which is not trade related (Deardorff, 1990). So far the GATT's objective has been to promote free international flow of goods in trade, with this perspective one might be prone to extend a similar analysis to the cases of IPs and argue for free international flow of ideas. In this sense TRIPs as an agenda in the Uruguay Round is contradictory to the spirit of the GATT. However, the proponents of the TRIPs negotiations argue that protection of IP is needed to permit the owners of that property to export the products that embody their innovations, and hence IP protection is pro-trade.

2. Role of Technology in International Trade and Technology Transfer

It is unnecessary to elaborate on the importance of technology in the growth and dynamism of a country. The role of the technology factor in international trade has also been long recognized in the literature (Jones, 1970, Markusen and Svensson, 1985, UNCTAD, 1989). In this section we just pinpoint the role of technology in international competitiveness.

The world economy has undergone a major change. A growing volume of world trade in the last few decades cannot be explained by the traditional resource based comparative advantage trade theory. Also the intra-firm trade across nations is inconsistent in the Heckscher-Ohlin framework. The traditional theory is based on a number of simplifying assumptions like diminishing returns or increasing costs, perfect competition or impersonal market force, absence of externalities and identical technological knowledge across countries. But once we bring the technology factor, scale economies due to high fixed costs or sunk costs in the form of R & D expenditure associated with technology generation, play an important role, leading to falling unit costs. Market size, transport costs, location of plants etc. become important factors. Also strategic factors like entry barriers or sales promotion measures, and respective governments' (strategic) interventionist policies feature in international trade. It is no longer a situation of perfect competition. A firm by differentiating its product sufficiently (or just by using its brand name) can earn economic rents for a substantial period in a market without inducing the entry of rivals. Externalities may exist because of positive feed-back or spillover effects on productive efficiency of the upstreams and downstreams firms. And most importantly, significant interfirm technological differences exist in the same industry among different countries which create different cost advantages. Competitive advantage can also be created through the accumulation of experience

(learning by doing), initiating a successful R & D programme, technology transfer from firms in the same or other industries, and through imitative research. Thus much of the volume and growth of trade is explained by international technology gaps resulting in important intercountry variation in techniques used and product characteristics. The size of these gaps is determined by international differences in innovative capabilities, access to innovation, corporate strategies and institutional conditions, including government policies (UNCTAD, 1989).

The developing countries are at a disadvantage in respect of resource endowment, population growth and international competition. In such a situation the development and use of modern technologies is thought to be the simplest way by which the less developed countries (LDCs) can overcome the impasse of development. However, given the resource constraint, both human and physical, technologically backward economies are hardly in a position to acquire modern production knowledge and meet the developmental needs by their own efforts. Given that most of the advanced knowledge and technologies are developed and located in the north, it is thought that the LDCs can benefit from this advanced knowledge and experience and reduce the developmental gap vis-a-vis the advanced nations. Technology transfer is a way by which the backward economies can acquire the scientific knowledge and technology from the north and initiate a process of economic development of their own. Multinational or transnational companies are considered most important agents in transferring such resources and knowledge from the developed to the less developed nations (Caves, 1982). One variant of the north-south models of technology transfer that has drawn much attention in the theoretical and empirical literature is the 'product cycle hypothesis'. This explains a trade pattern between the north and the south, where new goods are innovated in the north and the north exports new goods and the south

exports old goods, keeping this trade pattern unchanged, although product-mix is always undergoing a change. In course of time, this affects world income distribution as well. This work is initiated by Vernon (1966) and then it has been extended, among others, by Krugman (1979) and Dollar (1986).

Technological change affects the competitiveness of a country's industry through innovation and diffusion (i. e., imitation and technology transfer). The more rapid the change, the greater is the level of technological capacity required to stay competitive. Some developing countries through the operation of such mechanism have already achieved success in various lines of production. Japan is an outstanding example (Ozawa, 1985). Once dependent upon foreign technologies through a sequence of well-defined government policies, Japan has emerged as one of the most industrially advanced nations in the world. In the group of Third World countries, the experience of South Korea, Singapore, Taiwan and Hong Kong with foreign capital investment and technology have much to justify this point (World Development Report, 1991). However, most of the developing countries have not been so successful. Success generally depends on the combination of the educational level, technical skill, manufacturing expertise, organizational and marketing capabilities, degree of institutional reforms and dynamic attitudes toward new changes. These in turn determine their ability to adopt, imitate and further develop the imported technologies. Most of the developing countries are often lacking in this kind of environment. This also limits their ability to make domestic savings available for investment and acquire more modern technologies needed for gaining a competitive edge in export markets.

3. IPRs and Technology Transfer

It is easy to understand the economics underlying IPRs in the context of a closed economy. On the one hand, patent protection

hinders dissemination of available knowhow and therefore, depresses social efficiency; on the other hand, the absence of some form of protection leaves little incentive to private investors for innovation and further development. It calls for a balance between protection of IPRs and social efficiency (Nordhaus, 1969, Scherer, 1980). Intellectual property protection is a compromise between shortrun deadweight loss and longrun gain of welfare.

But in the context of the world economy the above compromise is much more complex. It is easier to enforce property rights nationally, but enforcing it internationally is very costly because of the ineffective enforcement mechanism, and often impossible in the absence of the cooperation of the host governments due to the lack of dispute settlement mechanisms (Benko, 1987, Levin, 1986). It also involves appropriability problem (Magee, 1981, Teece,1981). Let us assume that all innovations take place in the north. If foreign IPs are protected by the governments of the south, the northern firms will gain a comparative advantage over the southern rivals. Otherwise, the firms in thesouth will pirate the innovation and become equal competitors in the international market place (see Mansfield, 1985, Mansfield and Romeo, 1980). This would increase welfare in the south at the cost of the north. Mansfield (1988) noted,

> In many cases, the United States has been responsible for the basic research and the original inventions underlying a major innovation, but much of the profits has gone to firms in other countries, such as Japan, that have imitated, adopted and improved the innovation (p. 16).

The U. S. International Trade Commission (1988) and the International Anti-Counterfeiting coalition estimated billions of dollars losses of US sales and export due to inadequate protection of intellectual property rights (see Benko, 1987). On the other hand, if intellectual property protection all over the world is granted, even if we forget other costs, there is a redistributional cost to the developing

economies. For example, suppose from the world's perspective the benefits and costs together balance out, there will still be a transfer of welfare from consumers in protected markets to the monopoly inventors or producers.

The above paragraph explains the source of conflicts and the complexities of the problem with IPRs. Developing countries are of the view that intellectual property rights over new innovations give inventors and innovators an undesirable monopoly that hinders the development efforts of the former and tends to prolong their poverty and low per capita income. Hence they demand that knowledge should be made available at the least possible cost to every one. But industrialised nations do not agree with this view. Accordingly, they argue, IPRs should be respected so that the private investors who take substantial risks in developing and commercialising new technologies can get fair returns from the innovations. In the absence of this, there will be little incentive for inventive and innovative activity, and it will ultimately impair the interests of all nations. Diwan and Rodrik (1991) have described the controversy on IPRs between the north and the south. Chin and Grossman (1990) have studied incentives that a government in the south has to protect the IPRs of a northern firm and have constructed models to compare welfare in each country with or without southern protection of northern IPRs. There are also situations where southern protection leads to a fall in global welfare (see Chin and Grossman, 1990, and Maskus 1990). If we now include equity and distributional considerations, the welfare implication of this situation is more likely to go against the poorest countries.

Intellectual properties are products of human intellect; so they are inherently intangible and abstract in nature. IPRs are the legal expression of the privileges granted by the state to the inventors or innovators for the use of their creations. It relates to items of knowledge and to information which can eventually be incorporated or embodied in an unlimited number of copies of tangible things,

machines, artifacts or goods, at the same time and in different geographical places all over the world (Bifani, 1990).

IPRs include both industrial property rights and copyrights. Industrial property rights are the rights granted to any new inventive solutions, including the design and appearance of products and processes. And copyrights refer to the privilege granted to make a copy of literary or artistic creations. Thus copyright protects works from being copied.

While industrial property rights can be in the form of patents, trademarks, brand names, industrial design etc., economists often deal with patents only. Patents give exclusive rights to move, use or sell a particular application of an innovation; at the same time it carries an obligation to disclose the invention to the public (after some finite time period). It is, therefore, a mechanism for the diffusion of technology. Copyrights favour and encourage dissemination of information. We have already noted the important role of technology in international trade and in shaping the pattern of trade. The relative technological capabilities of firms and countries define their ability to create dynamic comparative advantage and international competitiveness. It determines to what extent a country will participate in the global economic system. It also determines the rate of growth (see Bifani, 1990).

It may be noted that protection of property rights is given only for a limited time span. This is a departure from the traditional legal concept that gives protection for unlimited time. Society chooses a time limit to harmonise private and social interests. If the patent life is too long, the burden (deadweight loss) would be too great. In economic theory the optimal patent life is determined on the basis of a trade-off between the social loss caused by the temporary monopoly and the social benefits of the application of the new knowledge (see Reinganum, 1989, for this literature).

The traditional intellectual property system retains its "national" character in the sense that countries have the freedom to legislate in accordance with their own social, cultural and economic characteristics and development objectives. This is discouraging to the creators of new knowledge because the intellectual property has the distinctive feature that it transcends geographical and national boundaries much more easily than tangible properties.

In the traditional intellectual property system there is a provision to avoid the abuse of monopoly powers and guarantee effective dissemination of knowledge. The legal instruments are sublicensing and compulsory licensing. This is a sanction imposed upon the owner of the IPR should he fail to fulfil the obligation to work the protected invention.

However, the increasing internationalization of the world economy brings a threat to this traditional IPR system. Nowadays, R & D decisions are largely defined by global, rather than national, considerations and expectations, given the fact that R & D involves huge amounts of expense. Consequently there has been a growing demand in the industrial countries for a conclusion on agreement to upgrade and harmonize international protection standards and enforcement. The WIPO has no enforcement power or dispute-settlement mechanisms. It is in this background that IPRs have been kept as subject of GATT. The new GATT rules on intellectual property protection are known as trade related intellectual property rights. In the next section we seek to understand the implication of TRIPs in relation to IPRs in general. To be more precise, our question is: Does TRIPs mark a reversal from the earlier negotiations where the issue was how to make technology transfer between the north and the south more equitable ?

4. TRIPs Vs. Traditional IPRs

The last section has discussed the context of the GATT based approach to IPRs in the context of international technology transfer. In this section we discuss the features of TRIPs and to what extent it is a departure from the traditional IPRs. As we see, it calls for fundamental changes in the international patent system.

The Paris Convention, revised time to time, had provided an international framework for the protection of industrial property. While it was not obligatory for all the countries to join the Paris Convention, the developed countries, in particular the USA, the EEC and Japan, have always initiated moves to compel the developing countries to join the Convention. However, the acceptance of TRIPs under new GATT rules does not only imply automatic joining of the Paris Convention, it also calls for stronger terms and conditions for the developing countries. It is to be noted that there were twenty countries including India, who were members of the GATT but not of the Paris Convention. India not only took the lead but after a very careful consideration set up rules and enacted the Indian Patents Act 1970. This law became the model for many developing countries. The important feature of this model is that it gave priority to national interests over those of foreign firms. Hence it is necessary to study to what extent TRIPs under GATT is contradictory to the traditional IPRs (i. e. Paris Convention) and a departure from the Indian Patents Act1970. The studies by Keayla, Dhar and Rao (1993), and Rao (1989) are partly helpful in understanding the problem.

The mandate of the Negotiating Group regarding TRIPs reads:

> In order to reduce the distortions and impediments to international trade, and taking into account the need to promote effective and adequate protection of intellectual property rights, and to ensure that measures and procedures to enforce intellectual property rights do not themselves

become barriers to legitimate trade, the negotiations shall aim to clarify GATT provisions and elaborate as appropriate new rules and disciplines.

With this purpose in mind, GATT has framed a distinct set of rules and procedures for intellectual property protection (i.e. TRIPs), to be mandatorily adopted as a standard by all the GATT members. Obviously, under the new GATT rules, the flexibilities enjoyed by countries within existing rules of the Paris convention will cease to exist.

Trade relatedness underlying TRIPs implies that it has an impact on international trade flows. It is argued by the developed countries that trade distortions arise due to 'inadequate protection' of patent rights. The patent laws of the developing countries are compared with those of the developed countries. Then inadequacy means not having a high level of patent protection as prescribed by the developed countries (Rao, 1989). An important departure of new GATT rules from the traditional IPRs is seen particularly in respect of national treatment, working of a patent, its coverage and duration of patent life. All these have implications which we discuss briefly below.

National Treatment

Both the Paris Convention and the new GATT provide for national treatment, but there is a fundamental difference in interpretation. While the Paris Convention relates national treatment to persons, the GATT relates to goods. That is, in the Paris Convention, whatever rights and obligations are provided in the patent laws for the nationals are also applicable to foreigners, but under GATT, in respect of sales, purchase, transportation, distribution or use, no discrimination will be made between foreign and domestically produced goods. Thus under GATT there will be no discrimination against imports. Any provision of the patent system that restricts free

imports is regarded as trade distorting. The patent holder in such a situation will have an inherent right and propensity to import. It is to be noted that most of the patents in force in the world are held by nationals of the developed countries, and only a very insignificant proportion is owned by nationals of the developing countries (Dunning, 1994). This has important implications. There will not be much scope of learning by doing. Given the effect of strong brand names, consumers will prefer foreign products and local adopters will have restricted entry in the market. As firms will not get much scope of doing research on the imported product, imitative and adaptive activities will be suspended to a large extent. In such a situation the importing country will get no opportunity to adopt modern technologies even after the expiry of a patent. This leads to perpetual dependence on foreign products. Local resources would remain unutilised, unemployment would mount. Aggregate income would fall. Related to this national treatment is the working of the patent.

Working of the Patent

Under the Revision of the Paris Convention, the patentee is obliged to work the patent, that is, to use the patent for commercial exploitation in the patent granting country, but importation of the patented product was never considered as working of the patent. Also to stop the abuse of the patent right from the non-working of the patent, the patent granting authority was given the power to license the patent to anyone who was willing to work it. This provision ensured a balance between rights and obligations of the patentee (UNCTAD, 1988a). However, the spirit of the new GATT provision is to rule out compulsory licensing, and it has introduced 'importation as working of the patent'. It states,

> ....patents shall be available and patent rights enjoyable without discrimination as to the place of the innovation, the field of

technology and whether products are imported or locally produced.

Technological development and technology transfer are possible only if the patent is worked in the patent granting country. Using patent as an import monopoly will certainly have an adverse impact on industrialisation and innovation in these countries and we should, therefore, fight tooth and nail to delete this clause. A foreign patentee will not generally be interested in working all the patents in the developing countries. This will increase the number of 'sleeping patents'. The countries will be deprived of the benefits of these patents. Grant of patent monopoly will work against flows of foreign investment and technology, and also restrict their technological advance through imitation and adaptation. Note the contradictory views - while the developed countries consider compulsory licensing as trade distorting, the developing countries use this as a guard to avoid abuse of patenting and monopoly. In fact, trade based approach means that all the countries regard imports as working. This is a major and fundamental departure from the existing patent system. It is important to keep in mind that the overwhelming majority of patents in the world are taken out in the G7 countries and most of the effective patents are held by the transnational firms of those countries.

Coverage

The Paris Convention did not restrict the member states to choose the coverage of patentability. As a result various countries have excluded certain fields of technology from patenting. These are agricultural machinery, fertilisers, chemical products, nuclear inventions and pharmaceutical products. Particularly, pharmaceutical and food products were excluded from patenting on considerations of public health. But the lack of coverage of patents to certain fields of technology is considered by the developed countries as trade distortion. Dunkel Draft on TRIPs reads, ".... patents shall be available

for inventions, whether products or processes, in all fields of technology". With this provision it also covers selected forms of life which were hitherto not considered patentable by most countries. As regards plant varieties, the Dunkel Draft provides that protection has to be provided "either by patents or by an effective sui-generis system or by any combination thereof". So now farms will have to pay royalties to the original plant breeders.

Farmers will have to pay higher prices for the seeds. However, given the possibility of recycling of crops, possibly these will be one time payments. Keeping aside a part from the production and use or resale of seeds within themselves from this stock may not possibly be inconsistent with new GATT rules. Also at this stage it is not clear to what extent enforcing patent rules in case of plants, trees or cattle will be possible. However, the provision of product patenting will certainly affect the reproduction of hybrid seeds, given the threat of patent infringement. Patenting biotechnological inventions or micro-organism might have lot of implications in respect of domestic research, price and cost in the developing countries (Buchanan, 1993). The giant multinationals and other firms of G-7 countries already hold hundreds of patents in genetically engineered micro-organisms and plant and animal varieties, whereas patenting of these has so far not been allowed under the Indian Patents Act of 1970. So Indian firms do not hold such patents in India. This means that under the new provision anybody who wants to use any method or micro-organism that has already been patented will have to seek a licence from the patentee and pay royalties (Bagchi, 1994).

Process vs. Product Patenting

Product innovation implies creation of new goods and services, and process innovation reduces the cost of producing existing products. So product protection implies protection of the new active compound or the good itself, irrespective of the method by which they are

produced or the form or manner in which they are used or sold. But process protection implies that only chemical methods by which an active substance is produced can be protected (Laudien, 1986).

Two areas where patents play a very important role are chemicals and pharmaceuticals. In many countries, however,the products are not patented, although most of the countries protect process innovations. For example, for the chemical industry including drugs and pharmaceuticals India has so far allowed process patenting. This has helped Indian firms to find out more efficient and cheaper methods of production. It is to be noted that process patenting never targets to inhibit international trade, however it aims not to inhibit research in the development of alternative processes. But the developed countries consider process patent as inefficient and amounting to trade distortion. Perhaps they regard patent right as an 'individual right' and so criticise limited coverage of patents as a limitation of individual freedom and also as being trade distorting (Rao, 1989). Patenting products would block the development of the product by another process, and therefore, stop reverse engineering and catching up efforts by technological followers. It will influence power of the products and affect the research that is going on in these fields of technology.

As a plea to repair the weakness of IPR protection through process patenting the new GATT rules on TRIPs have prescribed 'product-by-process protection' and the 'reversal of the burden of proof', and to ensure the change from process to product patenting a ten year transitional period is made available to those countries seeking this change. Product-by-process protection means that the process protection is extended to the product when it comes from the patented process. In countries with product-by-process protection, the importation of a product made abroad by a process patented in the importing country constitutes an act of infringement (Laudien, 1986). In the traditional patent infringement legislation, the patentee

or plaintiff was to prove that the alleged infringer was using the patented invention. But under the 'reversal of the burden of proof' now it is the alleged infringer who has to prove that he or his agent is not using the patented process.

Therefore, the new provision of IPRs has relieved the patentee from producing any proof of infringement of his process patent. He can just sue the user and ask the defendant to prove that the latter is innocent. It will discourage investment in R & D for alternative processes because there is a potential threat that the investor may be sued for infringement of the patented process. Innovating alternative processes to produce the home product is prohibited by the clause of product patent. Even innovation of different products involves threats of infringement of patented inputs or processes. In countries like India, this means that producers using novel processes in the patented chemicals and drugs, will have to prove that they are not infringing any patent rights.In such a situation, given the provision of a transitional period of 10 years, it is an open question to what extent the firms in the developing countries can reap the benefit. Keayla and Dhar (1993) argue that the process patent regime practically becomes infructuous and non-operative. The countries will have to largely depend on imports. It is feared that the lead of Indian pharmaceutical industry will soon be exhausted and in the future this industry will have to be confined to old off-patent products.

There might be some counter-arguments as well. First of all, product innovation is far more costly compared to process innovation. Product patenting is an effective means to protect the interests of the product innovators. Secondly, when process patenting is available the inventor makes all-out efforts for every conceivable operable synthesis, often based on insignificant change of the compound. In some ways it is a waste of resources. This type of 'detour-research' does not contribute to the development of the local industry. Under

a process patent system the patent office is overloaded with all these useless patent applications for alternative processes which neither represent technical progress nor be ever used.

The product patent holder enjoys absolute monopoly to make and sell the product. However a meaningful process innovation may be accommodated within product-patent-structure by the use of cross licensing. For example, if someone invents an improved process — which is a real improvement, and not merely a 'detour' process based on insignificant changes of parameters— he should get a patent for the process but he is not entitled to produce the product without authorization by the patentee. Similarly, the owner of the product patent is not entitled to use the improved process without proper consent of the holder of the process patent. In such a situation both the product and process holders can benefit through collaboration by cross-licensing each other's patents. This should be optimal (a second best) for the society as a whole.

Patent Life

Patent life is an important issue. It is a trade-off between the provision of incentives and social costs of monopoly. A longer patent term will give the patentee a longer monopoly advantage, and a very short time may not provide the needed incentive. There is a lot of literature on the question of the optimum patent life. Historically, there has been no consensus as to what the duration of a patent should be. Paris Convention leaves individual members free to decide on the period of protection they wish to provide under their respective national laws. India, not being a member of the Paris Convention, stipulated a fourteen year patent period in general, and a seven year patent period for the pharmaceutical industry.

Theoretically, there are many factors to be considered while determining the optimal life of a patent. These are the cost of research and development, the importance of the innovation, the market size,

availability of alternatives, the threat of imitation, the rate of obsolescence, and the speed at which the patented product will ensure adequate returns to the patentee. Of course, these vary from country to country and product to product. So the differentiated patent term seems rational. In most of the countries only a few factors are considered, and a standard patent term for all patents is decided. This means, that both trivial inventions and important inventions are treated equally.

In such a situation in the context of the international economy, given that countries differ in respect of social and cultural habits and customs, educational levels and factor endowments, a uniform duration of 20 years patent term under TRIPs for all technologies and for all countries seem grossly irrational, and there is no explanation how that magic figure of 20 years patent term comes up. The problems with this provision are as follows. First, it does not consider the country-specific conditions at all. In the interests of the developing countries, patent term should be smaller so that patents can be exploited after their expiry. Secondly, in a world of rapid technological change, technologies are becoming rapidly obsolete. No patented technology is expected to last this long. Third, a longer patent term gives the patentee smaller incentives to start production as soon as possible. The economy might even be deprived of use of some important innovations. This would create the problem of sleeping patents.

Our evaluation of TRIPs in the above paragraphs clearly reveals the dimension of the problem with IPRs. The developed countries are of the view that trade distortions arise because of disparities present in the patent protection under different legislations. In the Paris Convention, patents are territorial rights, they are enforceable only in the country of grant. Different countries have different laws, depending on their perceptions about the role of patents in their overall economic development. These are also based on the conditions prevailing in the

respective countries. So in some sense the proposal-set made under TRIPs is an attempt to unify all patent laws at a very high level of protection. However, given that the economic and technological development of countries vary widely, the harmonisation of patent laws amounts to asking the developing countries to adopt the system that is being adopted by the technologically advanced countries. obviously, countries at different stages of technological development will not benefit equally from the same system of patent protection. It is feared that the LDC enterprises will not be able to take significant advantage of the incentive provided by intellectual property protection, because it is very unlikely that they will be able to acquire and adopt foreign technology without reference to its creator, or to import new products or processes from alternative and cheaper sources (UNCTAD, 1988b). In view of increasing costs (and risks) of R & D, the innovators ask for integrating the world market. As most of the R & D takes place in the developed countries, the new provision of the patent system would mean that the world market would support R & D of the developed countries. This would lead to further concentration of R & D in the developed countries.

5. Price Implications of TRIPs

We discuss the problem with reference to Indian pharmaceutical products. Prices of the pharmaceutical products in India are amongst the lowest in the world. This is thought to be an outcome of the Indian Patents Act 1970. In a paper Mehrotra (1989) has studied the impact of the Indian Patents Act 1970 on the development and performance of the pharmaceutical industry. It is argued that the Act has made a balance between the rights of the patentee (the inventor) and the welfare of the people (public interest). The provision of licensing and compulsory licensing has prevented the patentee (with patented product) from gaining absolute monopoly in the Indian market. Neither is importation considered as working of the patent, nor is

product patenting allowed for the pharmaceutical industry. This has prevented the patentee from charging an exorbitant price for the product. This has helped in providing drug security in the country and the industry has succeeded in getting access to foreign markets (Keayla and Dhar, 1993). In fact, the availability of process patenting has helped Indian firms to develop alternative innovative processes in a competitive environment and has resulted in lowering cost of production and in lowering prices for the product. This has given the Indian firms a competitive edge over foreign rivals.

But the provision of TRIPs seems to erode the competitive advantage of the Indian firms. Absolute monopoly of the foreign patent holder would prevail, because under the new rules imitation and improvement of the production method will be totally restricted. The provision of the reversal of burden of proof would discourage further research and development. The main impact would be on the prices of pharmaceutical drug products. It is feared that prices will jump up at high levels at par with other countries. In the following table (drawn from Keayla and Dhar, 1993) price differences across countries are highlighted. The two drugs are marketed by the same MNCs in four countries, and except India where there is process patent, in other countries, viz., Pakistan, the UK, and the USA there is product patent regime for medicines.

Price differences for selected drugs between India and selected countries

Drug	Brand	Company	India	Pak.	UK	USA
Ranitidine	Zantac 300 mg	Glaxo	29.03	260.40	481.31	744.65
Diclafenac	Voveran 50 mg	Ciba	5.67	55.80	95.84	239.47

Price difference seems to reflect high trade margins. There are plenty of examples of over-charging. To take a case at random, for the product Baralgan Ketone, the declared price of the product produced by an MNC was put at over Rs. 24,000 per Kg., whereas it was estimated that the fair price with return inclusive of all costs and selling and distribution expenses should be Rs. 1810.20 per Kg.. (Keayla and Dhar, 1993).

The foregoing analysis is not conclusive. It is, however, quite generally believed that prices of drugs will go up, because that is the way the innovators or owners of patents desire to recoup their expenses or increase their profits. But this never leads to the conclusion that prices must rise to the levels comparable to other nations. Aggregate demand and elasticity factors, and income distribution are important factors in making any comparison. Again, converting foreign drug prices into rupees will give a misleading picture of comparison. In fact, it may not be very difficult to explain the high prices (and profits) in the pharmaceutical industry in the developed countries (in particular, in the USA). [See Scherer (1993) for details.]

First of all, pharmaceutical drugs have the distinctive feature that the consumer and the consumption decision maker are different persons—while the drug products are consumed by the consumers, the decision to consume a particular drug comes from the physician. Again, the implications and consequences of different ingredients contained in a drug are not easily understood; only few physicians can acquire the full information (which involves costs). Given the high risks of information failure, third party reimbursement plan (insurance) are often operated. The combination of physician decision making, imperfect information and third party payment makes drug demand stronger and less price-elastic than it might otherwise be. This confers considerable monopoly on the seller.

Secondly, in order for a patient to benefit from a newly-

developed drug, it is necessary that the physician will understand its therapeutic value. Creating an awareness of the benefits of such a product requires a substantial investment of both time and capital. This involves preparation and distribution of literature, conducting seminars and symposiums etc. All these costs including sales and distribution are often substantial (Laudien, 1986).

Third, information failures lead to rigorous and careful clinical testing before the drug is finally approved and marketed. There is huge cost difference between pre-clinical research costs (including unsuccessful development projects) and costs of successful drugs (which includes research, development and testing outlays, including the cost of failure) (Scherer, 1993). More importantly, the average time required to bring a drug from the start of clinical trials (i.e. the date when patent is available) to the approval of the relevant authority is often lengthy. This reduces the effective period for patent protection. This makes it more difficult for the innovating companies to recoup the rising R&D costs (including costs of clinical test, distribution and marketing). In fact, even when the patent period expires and the original firms are to compete with the most generic imitators, the original firms have to continue expenses on testing to keep up their reputation. Thus new drug development is becoming a high-stake, high-risk game. This might discourage new drug development adversely. It calls for extending patent period so as to maintain the effective period. It is also suggested that there should be some provision to test the standard and quality of the generic substitutes. In the past foreign pharmaceutical companies were willing to invest in and supply new drugs although adequate patents did not exist. Usually they were able to recover all costs and reap profits since it would take several years for a generic product to appear in the market. Naturally these generic products are much cheaper because the imitator does not need to recover the costs of R&D (including the failure). In price sensitive countries, generic products, once introduced,

quickly capture the market from the original innovator's brand. Nowadays the drug manufacturers in the developing countries are quite competent to copy innovative products within few months. So the companies developing the new products are no longer able to recover all costs and make sufficient profits that otherwise could give incentives for further invention. This would affect technology transfer and distribution of products in the developing countries adversely. These countries, instead of patent protection, are unlikely to get access to the information of newly developed drugs.

With regard to the question of price implication of the branded products after the expiry of patent right one may expect that when the generic drugs will be available in the market along with the branded product, the price competition between branded and generic suppliers should lead to lower prices. This, however, may not always be the case; branded drug prices might even go up. This is because the individual physicians tend to be risk-averse, cost insensitive and creatures of habit, prescribing drugs by brand name, even when less expensive generic substitutes are available. Also consumers purchasing drugs at retail pharmacy normally lack knowledge sufficient to evaluate the alternatives and risks of substituting away from a prescribed brandname drug, even when the state law permits or encourages generic substitutes. (See Scherer, 1993, for further details). In the context of the world economy the buyers can be grouped into different income classes. When there is only one branded product, the pricing problem is straightforward. Once generic substitutes are available at lower prices, the whole market is bifurcated. The incumbent branded seller might find it more profitable to supply at higher price in the price-insensitive market than serving to all customers (Frank and Salkener, 1992, and Marjit and Kabiraj, 1993). The price of any product in a market depends on what the consumer can afford. So a low price in a low-income country and a high price in a high-income country are mutually consistent.

We are now in a position to explain why drug prices in India are relatively low. Given that our ability to imitate has increased tremendously, we are in a position to develop generic substitutes within a very short time. we have no consumers' Act so far. So without proper clinical test the products are being marketed, and the physicians face little risk in prescribing these generic products (so third party payment system is not developed). Also in our country, distribution and sales costs are by far the lowest. Low per capita income in general leads to the demand for generic products, and competition among generic substitutes tends to lower prices as well. Moreover, the Indian Government has followed drug price control measures for a long time under the Essential Commodities Act.

One may, however, reasonably question as to what extent price control measures have promoted cost effective healthcare for the ultimate consumers. It is said that price control policies have been counter-productive for the industry without any substantial gain to the consumers (see the Cover Story in *Capital Market*, December 5, 1993, pp. 11-14). It may be argued that Indian drug prices are low because the Indian drug industry is under an extremely irrational price control system (Thomas, 1993). Compared to high cost of capital and inflation, the return on capital investment is too low (2% approx.) to make innovative research worth-taking. If controls are withdrawn, the prices will go up to more rational levels, which is likely to promote basic research.

One contentious issue in this context relates to the question of turnover of the patented drugs in the the country. It has been widely held that only 5 to 10% of the commonly used drugs are under patent at any point of time. This means, 90 to 95% are outside the patents. For example, out of two hundred seventy drugs in the WHO list of essential drugs, only 10% are under patent (Thomas, 1993). In such situation it is not clear that monopoly exploitation will be too

severe.There are lots of substitute products available at a point of time, and only few of them are patented. Consumers might have many choices. So it is not that a company, because it has got a patent, can charge any price it wishes. There are a lot of other powers of the government to intervene and curb the behaviour of the firm.

It is, however, argued on the other side that when it is claimed that only 10% are patented drugs in the country, the list includes all non-essential medicines like balms and vitamins (Keayla and Dhar, 1993), however, if one considers important therapeutic groups, the share of patented drugs in the country might be substantial. So it calls for further study before making any conclusion in this matter.

While the politicians and economists are sharply divided on the question of possible effects of TRIPs, many of the Indian industrialists are not perturbed (*Capital Market*, 1993). Given the transitional period, product patenting will be implemented after 10 years. Also all the drug manufacturers will not be covered by patent. They are, in fact, chalking out plans to manufacture as many new products as possible. Patent protection should not prevent them from materialising a decent growth rate at least for this decade. However, as restrictions and controls will be withdrawn, they will be exposed to foreign competition. So the question remains: to what extent can Indian firms maintain their competitive advantage?

6. Conclusion

One unique feature of the Uruguay Round talks under GATT is the inclusion of trade-related aspects of intellectual property rights, or TRIPs. The objective, stated in the Dunkel Draft Text, reads as follows:

> The protection and enforcement of IPRs should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of

producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations. It is also stated that parties may, in formulating or amending their national laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provision of this agreement.

So far this goes, this is all good. However, this proviso restriction raises eyebrows on the question, to what extent the technologically poor countries will benefit in the new international set-up. Even within the third world group, countries differ widely in respect of resource endowment, education, technical ability, and research and development. Then it is quite natural that the dividend will not be equally divided, and the economically powerful nations will get the larger share of the world trade pie. Costa (1988) remarks that in an unequal world, any attempt to make intellectual property norms uniform would lead, in practice, to perpetuating the world's uneven division of knowledge and information resources.

There are few attempts to estimate gains and losses of different countries in this set-up. For example, following OECD figures it is estimated that full implementation of the Uruguay Round would lift growth in the E.C. and Japan by 1.7 per cent by 2002, against only 0.4 per cent for the U.S.A. The newly industrialised economies of Asia, including the rapidly expanding China, stand to be the biggest beneficiaries. Some developing countries, such as Indonesia, are expected to suffer economic loss because of the expected shift in terms of agricultural trade (*Statesman*, December 15, 1993, Calcutta). Our analysis, however, seeks to provide only directions of the consequences. Countries particularly lagging in R & D are anxious

because of the fact that international intellectual property protection in pharmaceuticals, food and agricultural products is likely to affect the poor. The other issues in the Dunkel Draft such as greater market access, liberalising trade in services, trade-related investment measures etc. have also led to numerous discussions in India and elsewhere. All these have implications in domestic R & D, technology transfer and attaining self-sufficiency in technology and trade matters.To the extent that the new GATT rules legalise the power of the multinationals internationally, the local LDC government will not be able to discriminate between a domestic firm over which it has some control and a transnational corporation over which it has little control. This will affect public strategies in respect of local resource use and choice of technology. Bagchi (1994) provides a historical evaluation of the new GATT treaty.

We understand the rationale behind protection of intellectual properties. But the question that can be raised is whether a country has the liberty to keep up its national interests. And if the interests of the developing countries do not tally with that of the developed countries, whose interests are to be looked for by multilateral organizations like the GATT ? While the GATT negotiations were on, we observed some powerful countries forming trade blocs such as NAFTA. The GATT proposals called for 'trade creation', but this is an act of 'trade diversion', and it violates the basic principle of GATT. If this trend goes on unchecked, the future of the international order will belong to selective groupings of nation states in rigid trade blocs rather than to the grand concept of multilateralism based on the ideas of the United Nations system.We are, however, yet to be convinced to what extent the setting up of the World Trade Organisation within the new GATT rules will mitigate the threat of unilateral retaliatory trade sanction as under the U.S. Law of Super 301.

We have argued in the paper that TRIPs under GATT calls for far- reaching changes in the institutional setup and patent legislation system of many countries. The economic reforms China has introduced in the 1980s are largely in the direction of TRIPs. In a sense China has already accepted the Dunkel proposals. It is to be mentioned here that China, though not a GATT member till date, joined the Paris Convention for the protection of industrial property, and at present she is desperately seeking entry into the GATT. Now, noting Chinese economic performance in the recent years and looking at her interest in TRIPs, one might be prone to suggest that developing countries should follow the Chinese model on patent laws and enactment. But the study by Paulwitz(1993) shows that so far the Chinese patent system has not performed well enough to encourage domestic inventive and innovative activities and to intensify foreign collaboration in the technology sector. The introduction of a national patent system can contribute towards technological development in the country only if it is part of a package of economic policy measures aimed at creating necessary operative conditions. In China, perhaps such a link is not well documented.

In India, already considerable discussion has taken place on the general issue of patent laws and TRIPs under the new GATT treaty. One set of arguments directed against the agreement on TRIPs relates to the implied change that is needed in the Indian patent legislation. And the other set of arguments seeks to dissect implications of TRIPs rules. It is argued that new GATT rules involve infringement of national sovereignty in important areas such as agriculture, services, pharmaceuticals and food grains. Granting product patent in all fields will affect indigenous R & D adversely. Extending the scope of patentability to life forms will disrupt technological development in the field of biotechnology. Also patent protection to plant and seed varieties will lead to dominance in agriculture by multinational corporations. However, India is likely to gain from the amendment

of multi-fibre agreement. Since 1974 imports by industrialised countries including the USA have been subject to quota restrictions. Also high tariffs are imposed so far, putting the developing countries at a disadvantage. Under GATT an enlargement of quotas and the phasing out of the multi-fibre agreement over time should lower import prices of textiles and clothing, and improve labour intensive exports for the developing countries like India. While there is a lot of exaggeration about the supposed increase in drug prices, there is no doubt that prices of at least the patented drugs will rise. But there is no reason why prices of other drugs will rise in the short run. To the extent patent protection stimulates more R & D, prices of many drugs should fall in the long run.

It should be mentioned that the Uruguay Round talks on IPRs cover seven different forms of property rights, including patent, copyrights, trademarks, industrial design, etc.; excepting rules on patent protection, India had accepted international norms and standards of intellectual property rights. Of course, dissension of opinion did appear on the question of enforcement mechanism. As mentioned earlier, many developing countries, including China, have already accepted the Dunkel proposals as a basis for formulating TRIPs legislation, even on patents for drugs and chemicals. Consequently, India finds little international support in her favour. One can hardly dare suggest India to be out of the GATT because the cost of being isolated in the international context may be too high. In such a situation, accepting Dunkel rules might be the self- immiserization choice for India. One might even argue that India should perhaps find greater safety in multilateralism - there would be a greater loss of sovereignty if India had to negotiate alone with the USA or other trade blocs.

Whether India should accept the Sutherland treaty(and its TRIPs provisions in particular), is no doubt, the most debated issue of the recent times. In deciding this question the experience with the Indian

patent system prevalent at present should be critically reviewed. It is true that the Indian Patents Act 1970 gave advantage to Indian firms and innovators in the 'national interests'. Then why did so far most of the Indian firms and innovators perform so badly? Why have we, after 40 years of planning, only less than 0.5 per cent share of global trade? Why have we failed to boost our R & D efforts in a meaningful direction? Why did not the 1970 Act increase domestic-to-foreign patent grant ratio significantly, and why was only an insignificant portion of domestic patent grants ultimately used commercially? The number of patent applications filed in India by Indian organizations remained more or less static at 1120 in 1969, 1124 in 1979 and 1077 in 1989, and not even 10% of these applications lead to commercially worthwhile new products (see the article on 'Dunkel Draft' by Abhijit Sen, *Statesman*, December 27,1993). India could otherwise reap this benefit from the new GATT rules had her R & D expenditure of Rs 4,000 crores per annum in various government laboratories been productively used. Moreover, depending on copying of foreign technologies for ever cannot be a suggestive policy for an economy like India. India should not depend on international piracy of intellectual properties. Once GATT has been signed, can we not accept the challenge of international norms on the subject while at the same time taking steps to make the national R& D more productive? Given her large potential domestic market and cheaper resource endowment and manpower, India might successfully negotiate the setting up production and R & D plants in the home country. In a world of unequal political and economic power structure, given that GATT is entrusted to the task of ensuring free non- discriminatory and equitable trade, we can strive and find out ways and means for making the maximum gain from the GATT outcomes. Today's signing of GATT is not the end but should be regarded as the beginning of future negotiations.

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