THE ECONOMIC EFFECTS ON THE INTERNATIONAL PHARMACEUTICAL INDUSTRY OF THE TRADE-RELATED ASPECTS ON INTELLECTUAL PROPERTY RIGHTS (TRIPS) AGREEMENT ON PATENT PROTECTION IN INDONESIA

Guido Oelkers and Barry Elsey

1. INTRODUCTION AND FOCUS OF THE PAPER

Political controversy on the prices of patented medicine, particularly in relation to the HIV/AIDS pandemic in many parts of the African continent, has raised debate on the impact of intellectual property rights (IPR) in developing countries. It is argued that IPR legislation, by maintaining high price levels, renders drug treatment beyond the means of the masses, of the poor and most needy. Therefore IPR is seen as a form of political and socio-economic discrimination (Denny, 2001).

In response to political and public outcry, many international pharmaceutical corporations have felt morally obliged to lower the cost of expensive drug treatments. This is unlikely to become a permanent strategy as revenue and profits expectations often come from new drugs, which have undergone a costly and prolonged process of R&D before reaching

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the marketplace. As a long-term strategy, however, international corporations and market globalization demands that an enforceable legal framework protecting intellectual property becomes a normal part of business activity.

One of the most prominent IPR legal frameworks is the TRIPS (Trade Related Aspects on Intellectual Property Rights) Agreement, a pre-condition for membership of the World Trade Organization (WTO). TRIPS is a far-reaching international agreement on minimum standards for IPR to protect patents, trade secrets, copyrights and trademarks (Jorda, 1999). Countries that have signed the agreement are committed to comply with legally defined standards within a fixed time. Under the agreement, developing countries needed to have complied by the year 2000 (including Indonesia). The least developing nations still have time to comply until the year 2005 (Sherwood, 1990).

Whatever the merits of the political and moral debate, from a business standpoint attention is primarily focused on the economic consequences of IPR in developing countries. There are two camps of thought. One argues that the stimulus effect on their economies is limited, mainly because of under-developed conditions, such as low levels of advanced work-related knowledge and skills and an inadequate technology infrastructure. In this argument, IPR legislation makes little economic difference (Sayeed, 1995). The opposite camp argues that IPR legislation has positive, mostly longer-term, impact on overall economic prosperity, notably through increased capital investment, technology innovation and knowledge transfer (Bale, 1999; Rappe/Rozek, 1990; PhRMA, 1996).

This paper aims to provide further conceptual understanding of the role of IPR, notably in terms of economic effects. It examines the perceived relationship between patent protection (as a key element of IPR) and economic effects from the perspective of leaders and decision-makers (CEOs and other senior managers) in the international pharmaceutical industry located in Indonesia. In reality, it would be virtually impossible for industry leaders to ignore the importance of the TRIPS-agreement and the long-term consequences of having an established legal and regulatory framework protecting intellectual property, for it lies at the heart of the global pharmaceutical industry. In that sense the impact of the TRIPS agreement may be regarded as a catalyst for strategic thinking within the industry and change in Indonesia. The underlying assumption is that industry leaders would naturally regard TRIPS and IPR legislation as an opportunity to increase revenue and profit expectations. In this paper the idea of economic effects widens to include future capital investment, knowledge and technology transfer, along with other economic

effects that provide the sustainability for an industry that operates on a long-term basis.

The Indonesian context is valuable because other developing countries seeking membership of the WTO would have to undertake the same process of compliance with the TRIPS agreement and the consequent changes this usually brings to traditional cultural and business practices, where IPR has largely been ignored.

An overview of the economic effects of patent protection

A meta-analysis of the commercial value of internationally patented products was performed using market statistics (IMS-ITMA, 2/1998), to scope the economic dimension of the topic, that is, the sales volume of internationally patented drugs in Indonesia. Even though the TRIPS Agreement does not cover an immediate acknowledgement of international patents (only additional pipeline protection would), this analysis seemed likely to provide ideas regarding the economic dimension of TRIPS after implementation.

In view of a global R&D cycle time of 10–12 years (DG Bank, 1999) and an average global patent protection of 20 years after the first application and an average regulatory cycle time of at least one year, the theoretical average span for exploiting a patent would be fewer than 10 years in Indonesia. Therefore, products were divided into two groups: those that had been on the market more than 10 years and those for fewer. As depicted in figure 1, in 1998 approximately 70% of the Indonesian market was captured by products on the market longer than 10 years. The IMS-ITMA data on launch dates were used for this analysis. Products on the market for 10 years or fewer contributed approximately 30% of the total market (RP 1,403 Bio.).

A further iteration was introduced, to value the overall significance of patentable products based on the international patent status. This analysis was important to evaluate the *potential* impact on the local pharmaceutical industry which was of particular concern to the Indonesian government. The market segment of products launched by international companies over the previous ten years was analyzed, to see if these items would still be internationally patentable, that is to say, patentable using their international patent term. The key selection criterion for this additional step was sales of these products launched over the previous 10 years by two leading generic companies (Cox and Ratiopharm) in Europe. It can be assumed that these generic firms launch generics soon after the patent expiry of the original product, so this was considered a pragmatic approach to reach approximate findings. Moreover, due to the internationalization of patent systems and the harmonization of

patent duration between the US and Europe, this seemed to provide sufficient grounds for approximation. The overall error margin was considered acceptable, due to the overall efficiency of generic manufacturers, thanks to the BOLAR provision (Correa, 1999).

It was found that no more than 14% of the total market would be in the category 'internationally patentable' — 6.7% of market commercialized by local companies (PMDN) plus 7.3% of the market commercialized by international companies (PMA). These findings were broadly in line with a study in India (Redwood, 1995).

Indonesia before its official compliance with TRIPS in 2000 provided an ideal opportunity to examine in some depth the economic consequences of new legislation protecting intellectual property, in an industry characterized by the added-value placed on knowledge and technology as the basis of product innovation. A knowledge gap and the necessity for further research in developing countries has been identified by previous research (Sherwood, 1997). The aim of this paper is to add to information and to interpretation.

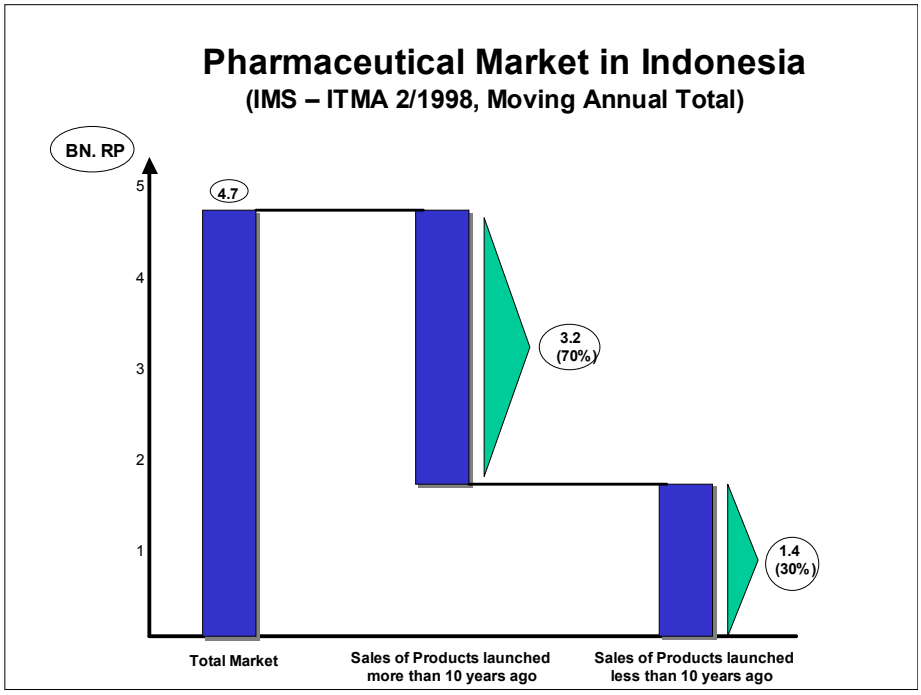

Figure 1

Adopting a business position, the paper focuses on qualifying and evaluating the expected (or at least potential) economic effects of new IPR legislation on the pharmaceutical industry in Indonesia arising from the TRIPS agreement. As explained, the research-based evidence is drawn from the perceptions and interpretations of decision-makers of the international pharmaceutical corporations in Indonesia. They were asked to think about the impending IPR legal framework in related ways. First, they had to generally consider to what extent they regarded IPR (confined to patent protection) as a change catalyst and driver in the industry in Indonesia. Second, they were asked to think about the interplay between patent protection and other well-recognised change drivers in the industry and assess the relative importance of IPR. Although the main emphasis of this paper is on economic and business aspects, it is necessary to take account of perceptions of IPR as a catalyst for change and its interaction with other industry drivers.

2 RESEARCH DESIGN AND METHODS

The fieldwork research was conducted in 1999, one year before the process of establishing a legal framework for IPR was to officially begin. The research design was based on a consultative process with industry leaders. Their perceptions and intentions were considered as the measurable outcomes, reported in the data-set findings later in this article. Thought was given to the nature and admissibility of evidence in this interpretive as well as empirical study. It was believed that as the industry leaders were experienced and knowledgeable senior executives, their perceptions and interpretations about the future implications of IPR would be acceptable evidence. All had major managerial responsibilities and were used to considering environmental developments. Pragmatically, the industry leaders were driven to exploit commercial opportunities emerging from environmental changes. Anticipating the future was crucial for them. It was further assumed that if TRIPS was not perceived as important, it was unlikely to have economic consequences. This thinking is in line with a well-established tradition of scholarship in this field of research (Mansfield,1994). With a few exceptions, members of the peak body in Indonesia, the International Pharmaceutical Manufacturers Group (IPMG), agreed that TRIPS was at least a potential catalyst for change and development in the country and therefore worthy of study. Therefore IPMG's support was given for the research that comprises this paper.

The primary knowledge rests on the subjective perceptions, intents, experiences and reflections of a number of people intimately involved in the pharmaceutical industry in Indonesia,

as CEOs, managers, legal experts, physicians and others with considerable inside knowledge.

The research had some obvious and unavoidable limitations. First, it was confined to the international pharmaceutical industry, due to an inherent conflict of interest for local pharmaceutical companies. Local pharmaceutical companies had the most to lose from the changes, as for many years they had freely copied the products of the international corporations. Second, the research could only be a single opportunity. A longitudinal study would have been desirable, to determine to what extent the predictions of industry leaders were realized, but this was not possible given the necessary time span and the many factors — particularly political and social unrest — driving decisions. These uncertainties need to be considered when evaluating the research results.

In order to strengthen the reliability of results, a number of research devices were used. The data collection was primarily based on a membership survey and focus group discussions with the IPMG executive committee. Further evidence was obtained from an intensive case study of a major pharmaceutical corporation, a market research survey of medical practitioners and interviews with key government officials.

3 RESEARCH SAMPLE

The IPMG group represented around 50% of the Indonesian pharmaceutical market (IMS, 1999) and their global organizations of IPMG companies contributed 54% of total world market sales as well as around 78% of worldwide spending in pharmaceutical R&D in 1999 (*see* figure 2). Among the IPMG companies were 24 of the leading 30 pharmaceutical manufacturers in the world (IPMG Open Sales Exchange Report, July 1999; Script, 1999).

Furthermore, on the basis of background research, this sample population represented one of the largest collections of informed opinion in the pharmaceutical industry to reflect on the strategic and change-management implications of IPR legislation, at least in Indonesia. The nearest comparable study (Lee, 1994), while addressing the issue of IPR, had a larger sample but had only nine firms from the chemical industry/pharmaceutical firms. The cited Mansfield study represented a smaller sample of chemical and pharmaceutical companies (Mansfield, 1994).

4 DATASET FINDINGS

In the first set of findings the nature of evidence is based on perceptions of what CEOs and senior managers think is emerging in the industry as a consequence of

anticipated changes to patent protection laws in the country. Their ideas about strategic options are based on these perceptions, regarded as admissible evidence in the article. The findings suggest that IPR (in particular, patent protection) in accord with TRIPS will be a catalyst for more foreign direct investment, technology transfer, knowledge spillovers, strategic alliances, innovative activities and economic benefits, for the research-based pharmaceutical industry of Indonesia and the country generally. An important finding relates to the time factor. It was agreed that the expected effects would take some years to make a significant difference, as in the long-time horizon of the pharmaceutical industry generally.

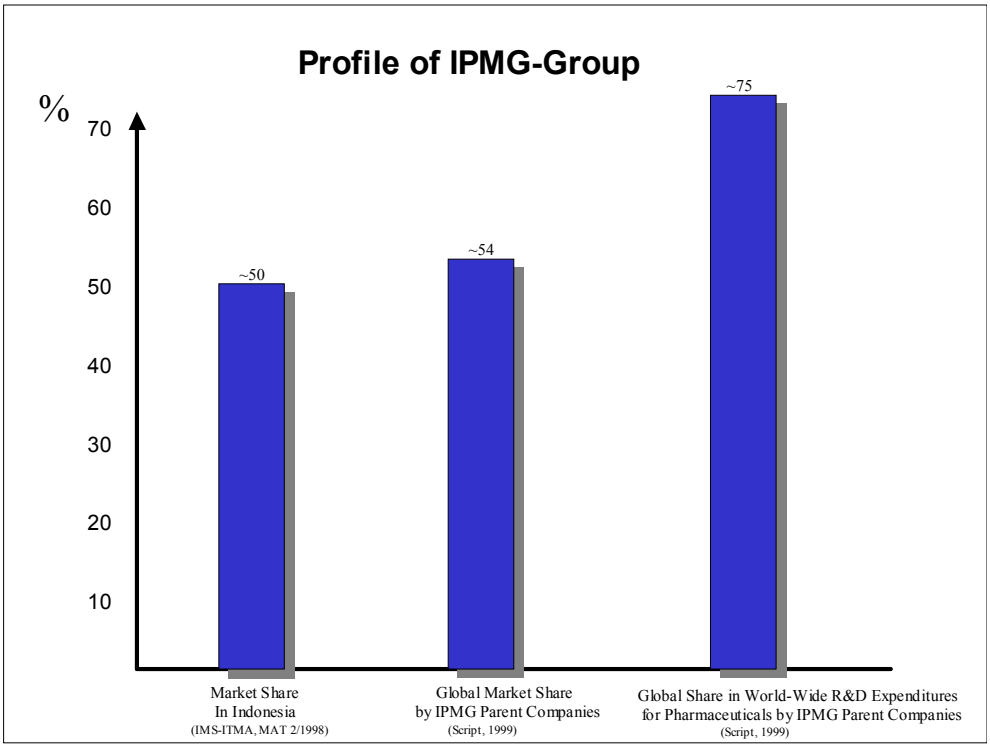

Figure 2 : Sources: IMS/ITMA 98; IPMG Open Sales Exchange, Script 1999

5 IMPORTANCE OF IPR AS A CHANGE DRIVER

To understand the importance of IPR as a change driver, a survey was done on the CEOs of the IPMG companies. Twenty-five of 35 pharmaceutical companies responded to a number of questions. The findings were triangulated with two additional focus group interviews involving senior executives of the industry. IPR or the TRIPS Agreement has been confirmed as an important change driver for the pharmaceutical industry in Indonesia across all research items. IPR scored highly in terms of importance compared with industry-related change drivers and macro-level key factors. The key factors that came to the minds of country managers are in table 1.

Change Drivers for the International Pharmaceutical Industry in Indonesia

Industry Related Factors	***Macro Drivers***
Innovation	Free Trade Zone (ASEAN)
Scientific Know How	GDP Development
Profit and Revenue Expectations	Exchange Rate
Investment	Inflation
Industry's competitiveness	Emerging Middle Class
Alliances	National Reimbursement
Regulatory Process	Managed Care
Mergers and Acquisition	Law Enforcement
Down Sizing	Factor Conditions
Generics	Exportations
Positive List	IPR
Counterfeit Products	
Code of Conduct	

Table 1

IPR was consistently mentioned as one of the most important change drivers during the various focus group interviews which complemented the survey. These focus group interviews involved CEOs of a number of international pharmaceutical manufacturers in Indonesia as well as senior managers of a case study company (a leading international pharmaceutical company in Indonesia. In a survey with international pharmaceutical companies supported by their association (IPMG), CEOs considered that a major portion of their future business (average of 54%) would be affected by IPR in the long-term — confirming the importance of IPR as a change driver. During the matrix evaluations by the CEOs and the case-

study company, IPR ranked third and second as an active driver for change. The high consistency of results shows that IPR is an important change driver for the research-based pharmaceutical industry and indicates reasonably reliable research results.

IPR appeared to be a longitudinal change driver, having a long time horizon, until it could unfold its complete effect on other change drivers, in a context such as the Indonesian pharmaceutical industry.

The results — figure 4 — clearly demonstrate the long-term effect of IPR in various key aspects. It becomes evident that the number of skeptical opinions towards the effects of IPR diminishes over time, while the expectations towards profit and revenues increase. Moreover, some (11%) can envisage investment in R&D activities in the long-term.

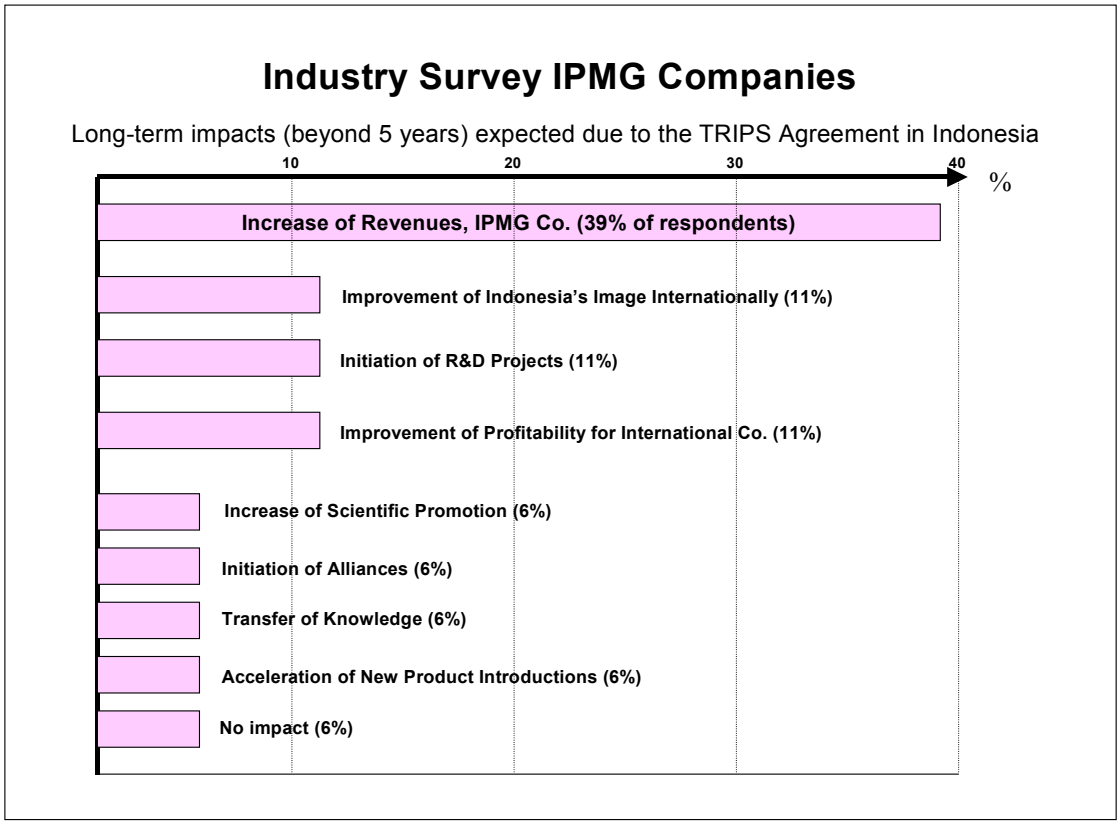

Figure 3

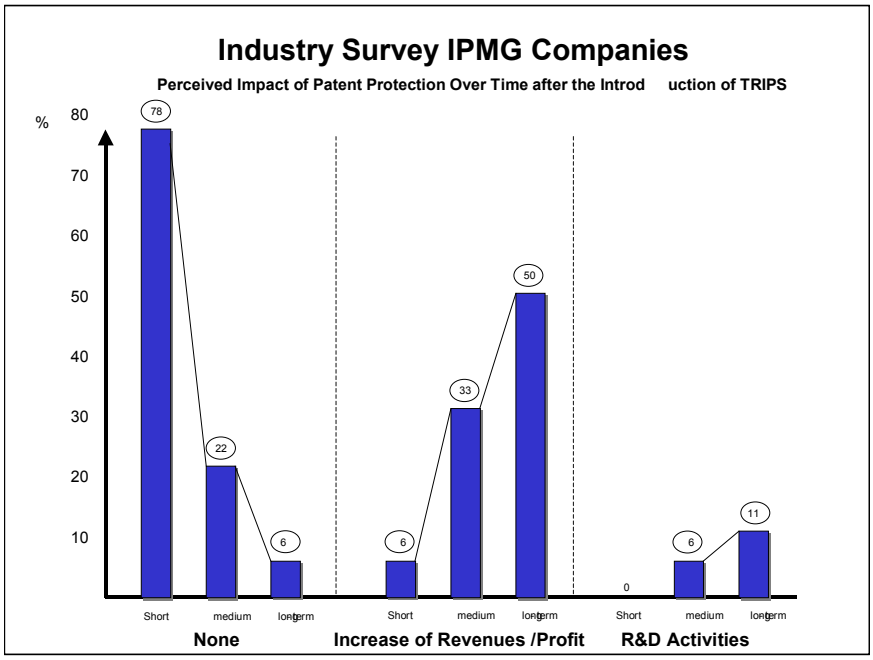

Figure 4

6 INTERACTIONS OF IPR WITH OTHER CHANGE DRIVER

To understand IPR's potential areas of influence from a high-level perspective, influence matrices were developed based on the results of two focus group discussions with senior executives of international pharmaceutical companies in Indonesia. The factors analyzed are depicted below:

Innovation	*Investment*	*Profit/Revenue Expectation*
Scientific Know How	*Phase III Trial*	*Alliances*
Industry's Competitiveness	*Set up new functions*	

Table 2

During the focus group interviews, interdependencies of key industry drivers were discussed and evaluated with CEOs of leading pharmaceutical companies of the IPMG. IPR had one of the most active parameters (score = 151) next to innovation (156), scientific know-how (152), and profit and revenue expectations (151). A total score of 120 would have been considered a neutral one. All other factors scored significantly fewer.

Ranking of Parameters according to their total active score	
1. Innovation	156
2. Scientific Know How	152
3. Profit and Revenue Expectations	151
4. IPR	151
Average Score of Parameters	140

Table 3

This pattern is supported by the second workshop findings with senior managers of a case-study company. IPR had a particularly strongly perceived influence on investment and innovation. Also strongly perceived were the influences on profit and revenue expectations, set-up of new functions, set-up of Phase III trials, scientific know-how and alliances. IPR was evaluated with a passive score of 141 — in line with the average of all factors evaluated (140). As participants of the focus group interviews considered the factors "companies' international competitiveness" and "set-up of new functions" as less relevant, they were not considered in the following mappings. During the focus group interviews the discussion centered on IPR as an active driver and the time horizon of its influences. Participants concluded that only one influence would have a noticeable impact with a time horizon of less than two years. This was the initial impact on revenue expectations, investment and Phase III trials. Revenue expectations had already had a perceived impact on investment. Thus the initial one on investment was only indirect. The evaluation on time horizons by the participants has been largely confirmed by the evaluation of additional survey results (*see* figure 5).

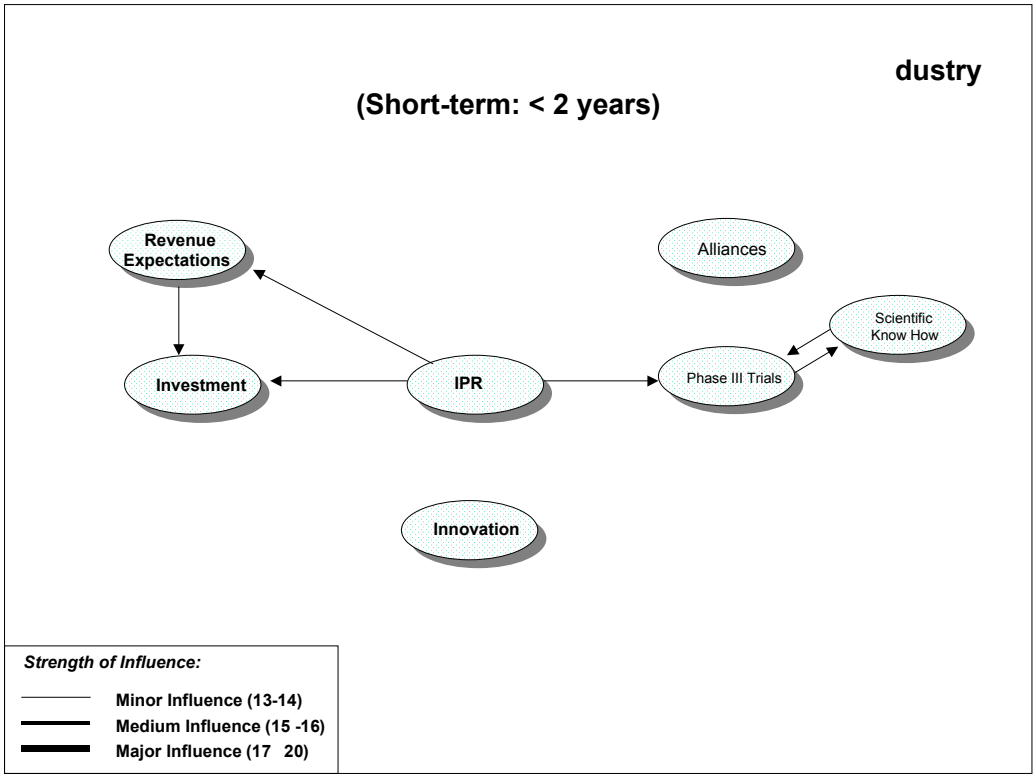

Figure 5

Participants were asked also to consider how the network would change with a medium-term time horizon (2–5 years). As depicted in figure 6 the direct influence on revenue expectations and alliances and Phase III trials was valued more strongly compared to the short-term perspective. The interplay between investment and revenue expectation was perceived very strongly. Furthermore, alliances seem to have a strong impact on investment decisions. This medium-term evaluation is supported by the survey results (questions: 3, 4, 6).

Taking a longer-term perspective (longer than 5 years) participants considered the matrix finding applicable. This evaluation of the main drivers is depicted in figure 6. The main influences are on investment and innovation. The impacts perceived on profit and revenue expectations, set-up of new functions, set-up of Phase III trials, scientific know-how and alliances were noticeable.

Due to the strong interconnection of the key drivers, the overall system appeared to reinforce itself and to

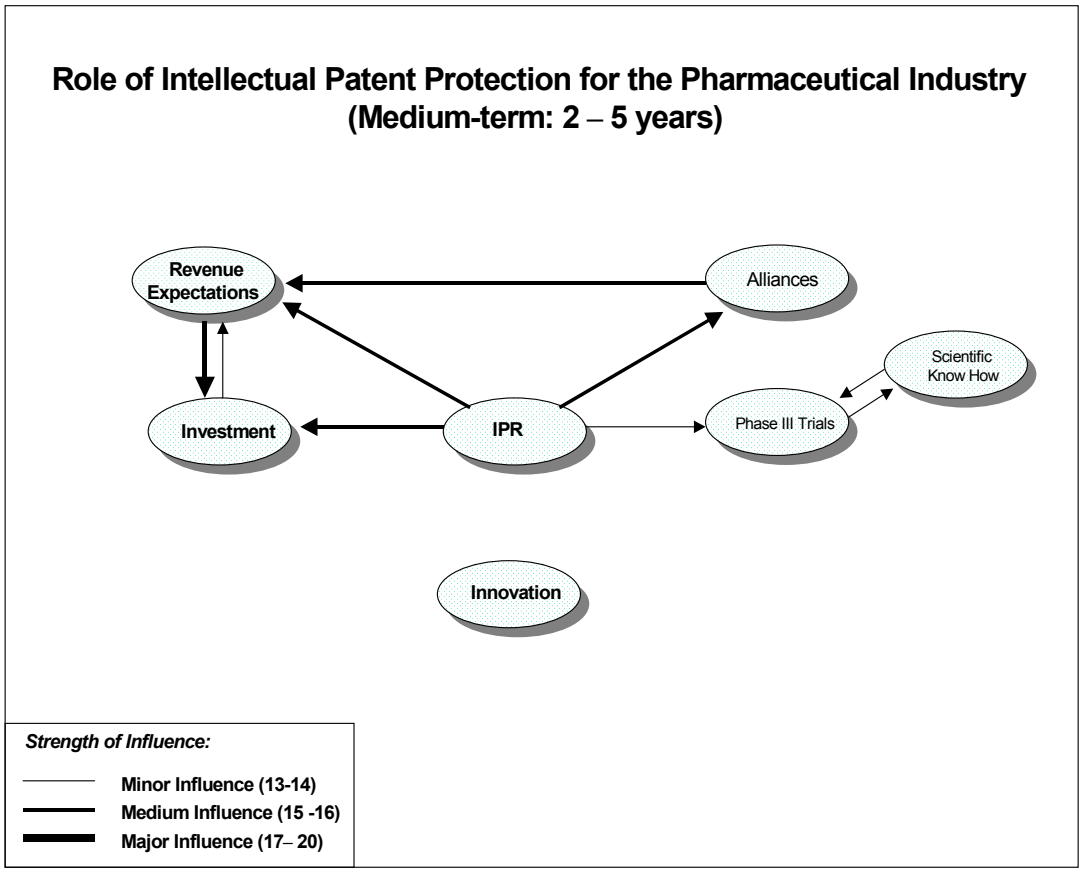

Figure 6

strengthen the impacts of a factor such as IPR on other key drivers. This might be a snowball effect. However, it became clear that it needed some time to display its full significance.

The mappings depicted above reflect the perceptions of a small number of country managers (n=5) of international pharmaceutical companies and are therefore more indicative than factual evidence. However, the results are supported by a survey conducted with the member companies of the International Pharmaceutical Manufacturer Group (IPMG) in Indonesia (n=35).

7 IMPLICATIONS OF IPR ON INVESTMENTS

The economic dimensions of the internationally patented products in Indonesia need to be kept in mind before turning to more precise perceptions and intents of country CEOs regarding investment decisions driven by IPR. In the case of TRIPS implementation, the additional economic potential refers only to the patented products under Indonesian jurisdiction. As mentioned, the economic potential of these products represents less than 2% of the entire market. CEOs mentioned that

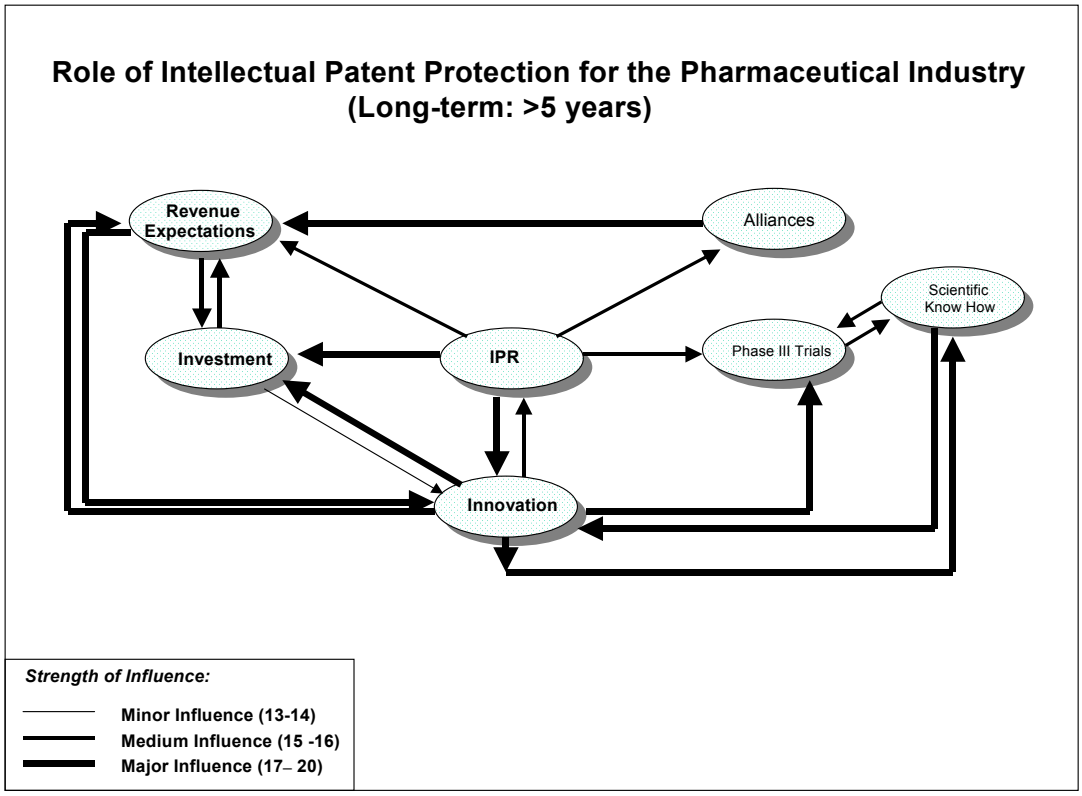

Figure 7

international pharmaceutical companies could not fully capitalize on this potential, as with their sales operation and their pricing structure they could not reach low-income groups. They believed that they could access around 20% of the sales of local companies with these items. Thus the expected immediate accessible potential due to TRIPS could be less than 1% of the entire market.

These relatively small additional market potentials might explain why CEOs and other senior executives foresaw that it would take several years for major impacts driven by the implementation and enforcement of IPR. The current dimensions at stake (in US$) did not suggest an immediate rethinking of the role of Indonesia by multinational pharmaceutical companies in their global strategies. The analysis helped to understand why companies foreshadowed investment primarily in marketing and sales during the first phase.

As outlined, TRIPS supported an increase in revenue expectations for the original brand, due to the temporary period of exclusivity, but would be, according to the discussions with CEOs, limited to an additional potential of around 20% of the status quo, due to purchasing-power limitations and the current desire of higher-income groups to purchase international, original drugs in any event. Thus, strategic alliances with local companies appeared to provide an interesting commercial opportunity to allow the international company to reach additional customer groups by different pricing and a complementary sales organization. The main areas for strategic alliances identified ranged from co-marketing agreements until the acquisition of a local company. Cooperation in product development and distribution appeared less likely.

In order to quantify IPR's potential impact on investment in the research context, IPMG members were asked to consider what specific advice they might give the head offices of their respective companies regarding investment, prompted by the establishment of patent protection in the country. Of course, the estimates were no more than that, and were intended to reflect a degree of confidence in the Indonesian context. CEOs were asked – "*Assuming that patent protection will be implemented and enforced, what recommendation might you make to your head office regarding* ***future additional investment*** *activities within a period of 5 years?"*

(1)	(2)
No	Below US$0.5 million
(3)	(4)
< US$1 million	> US$ 1 Mio.

A total of 63% of the IPMG companies (n = 22) responded to this question. The frequencies tables are

split into the respective categories RD = Research and Development; CT = Clinical Trials; PROD = Production; MANUF = Manufacturing; MARK = Marketing and LOGIST = Logistics.

The following results were found:

With regard to the field of **R&D**, 64% of all respondents thought that there would be no additional investment due to the emergence of implementation and enforcement of patent protection over a period of five years. A total of 91% of all respondents were of the opinion that the additional investment would be below US$0.5 million within five years.

In the area of **Clinical Development**, 23% of the respondents believed that there would be no additional investment due to the emergence of implementation and enforcement of patent protection in R&D over a period of five years. A total of 64% of all respondents were of the opinion that the additional investment would be below US$0.5 million within five years while 36% of all respondents could imagine additional investment of more than that.

Research and development

	Frequency	Percent	Valid percent	Cumulative percent
.00	2	9.1	9.1	9.1
1.00	12	54.5	54.5	63.6
2.00	6	27.3	27.3	90.0
3.00	2	9.1	9.1	100.0
Total	22	100.0	100.0	

Table 4

Clinical development

	Frequency	Percent	Valid percent	Cumulative percent
.00	1	4.5	4.5	4.5
1.00	4	18.2	18.2	22.7
2.00	9	40.9	40.9	63.6
3.00	7	31.8	31.8	95.5
4.00	1	4.5	4.5	100.0
Total	22	100.0	100.0	

Table 5

With regard to **Production**, 46% believed that there would be no additional investment due to the emergence of implementation and enforcement of patent protection in the area of R&D over a period of five years; 64% thought that the additional investment would be below US$0.5 million within five years while 36% could imagine additional investment of more than that.

Production

	Frequency	Per cent	Valid per cent	Cumulative per cent
.00	2	9.1	9.1	9.1
1.0	8	36.4	36.4	45.5
2.0	4	18.2	18.2	63.6
3.0	6	27.3	27.3	90.9
4.0	2	9.1	9.1	100
Tot	22	100.0	100.0	

Table 6

In the area of **Manufacturing**, 36% of all respondents believed that there would be no additional investment due to the emergence of implementation and enforcement of patent protection in R&D over a period of five years. A total of 50% of all respondents were of the opinion that the additional investment would be below US$0.5 million within five years while 50% of all respondents could imagine additional investment of more than that.

Manufacturing

	Frequency	Per cent	Valid per cent	Cumulative per cent
1.00	8	36.4	36.4	36.4
2.00	3	13.6	13.6	50.0
3.00	7	31.8	31.8	81.8
4.00	4	18.2	18.2	100.0
Total	22	100.0	100.0	

Table 7

With regard to **Marketing,** 32% of the respondents believed that there would be no additional investment induced due to the emergence of implementation and enforcement of patent protection in R&D over a period of five years. However, 68% of all respondents were of the opinion that the additional investment would be above US$0.5 million within five years.

Marketing

	Frequency	Percent	Valid per cent	Cumulative per cent
.00	1	4.5	4.5	4.5
1.0	1	4.5	4.5	9.1
2.0	5	22.7	22.7	31.8
3.0	7	31.8	31.8	63.6
4.0	8	36.4	36.4	100.0
Tot	22	100.0	100.0	

Table 8

In **logistics,** 32% believed that there would be no additional investment due to the emergence of implementation and enforcement of patent protection in R&D over a period of five years. A total of 77% of all respondents were of the opinion that the additional investment would be below US$0.5 million within five years while 23% of all respondents could imagine additional investment of more than that.

Logistics

	Frequency	Percent	Valid percent	Cumulative percent
.00	1	4.5	4.5	4.5
1.00	6	27.3	27.3	31.8
2.00	10	45.5	45.5	77.3
3.00	3	13.6	13.6	90.9
4.00	2	9.1	9.1	100.0
Total	22	100.0	100.0	

Table 9

In table 10 the mean values and standard deviation underpin the results from the findings of the frequencies.

	Mean	Standard deviation	Sum
RD	1.36	.79	30.00
CT	2.14	.94	47.00
PROD	1.91	1.19	51.00
MANUF	2.32	1.17	51.00
MARK	2.91	1.11	64.00
LOGIST	1.95	1.00	43.00

Table 10

The highest score was reached in the area of Marketing and Sales (2.91) — an average additional investment between US$0.5 million and $1.0 million due to the introduction of patent protection over five years. This appeared to be influenced by the companies' global strategies that usually emphasized the optimization of commercialization process for Indonesian subsidiaries. The second highest score was reached by manufacturing. As demonstrated, most international pharmaceutical companies performed manufacturing operations in Indonesia. The score of Manufacturing of 2.32 meant an average additional investment of above US$0.5 million.

In clinical trials, the third highest score (2.14) was reached — an average additional investment of less than US$0.5 million over five years. The substantial standard deviations per value reflected a considerable spread of evaluations which could be related to different perspectives on the role of the respective Indonesian subsidiaries in the global strategies of pharmaceutical corporations, as well as the different levels of confidence in the available factor conditions and prospects. Overall, the trends confirmed the qualitative results of the workshops with CEOs and senior management of the case-study company.

Five key parameters primarily drove investment decisions according to the perceptions of CEOs participating in workshop 2: Net Present Value, Factor Conditions, Global Strategy, Innovation and IPR. Global strategy relates to the fact that every company had a distinct perspective regarding the role of Indonesia in their country portfolio.

According to capital-market theory, investments are pursued when the net present value (NPV) of an investment is positive. Therefore, it is

important to understand the factors driving net present value at this stage. A recollection of the definition provides deeper insights. NPV is defined as the risk-adjusted discounted future cash flows of an investment (Brealey & Myers, 1991). This means that the future income stream, and the cost of capital and risk, determine the net worth of an investment project and the subsequent level of investment. The inappropriate protection of intellectual property and unethical business practices represent additional risk that reduces the anticipated value of a project. Consequently, willingness to invest is impaired. Therefore, IPR is considered to have an important role in this context.

The participants saw Indonesia's role more as an interesting market for the future, due to the large population and the expected economic growth.

Net present value is driven by two dimensions: risk and future revenue expectations. Both were positively influenced by IPR. The opportunity for additional revenues and improved legal security (meaning the reduction of risk) appears to explain the prominent pivotal role of IPR in the research-based pharmaceutical industry. In industries with long time horizons, such as the pharmaceutical industry, risk is an important component when appropriating resources. IPR does not abolish risk but seems to reduce risk for future investment decisions for international pharmaceutical companies in Indonesia, based on the findings of this research.

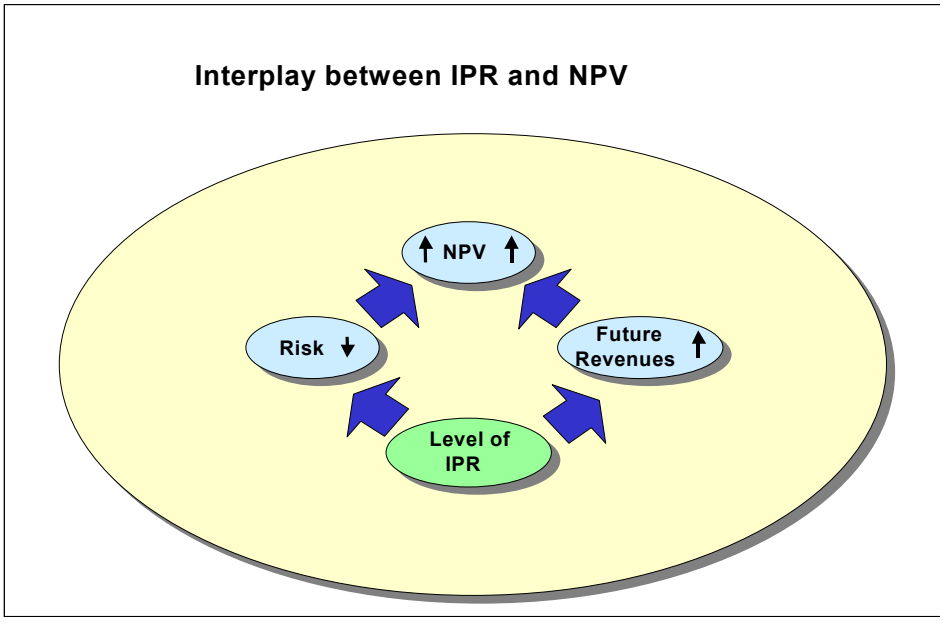

Figure 8

9 OTHER LIKELY IMPLICATIONS OF IPR

IPR's impact on alliances and technology transfer are considered as additional benefits of compliance with international IPR-standards for developing countries.

In discussions with senior executives, the concept of technology transfer and the formation of alliances were considered as likely outcomes of compliance with the TRIPS agreement in Indonesia. To generate a better understanding and a broader basis of informed opinions about this topic, questions were designed within the frame of the survey with IPMG companies. Another stimulus effect of patent protection is its possible role in encouraging alliances, not directly, but rather as one factor indirectly influencing the process. The question hints at strategic alliances between the international and local pharmaceutical companies. This follows the implicit idea that the inception of IPR laws and regulations arising from the TRIPS Agreement would, sooner or later, weaken the market position of local companies. To improve their prospects, they would need to consider forming strategic alliances between themselves or with the much stronger international companies. Moreover, these would also open opportunities for international companies. The question that follows addresses this, as perceived by members of the IPMG. A clear majority (74% of respondents) thought that patent protection stimulated strategic alliances, although a timeframe was not provided for members to formulate more refined answers.

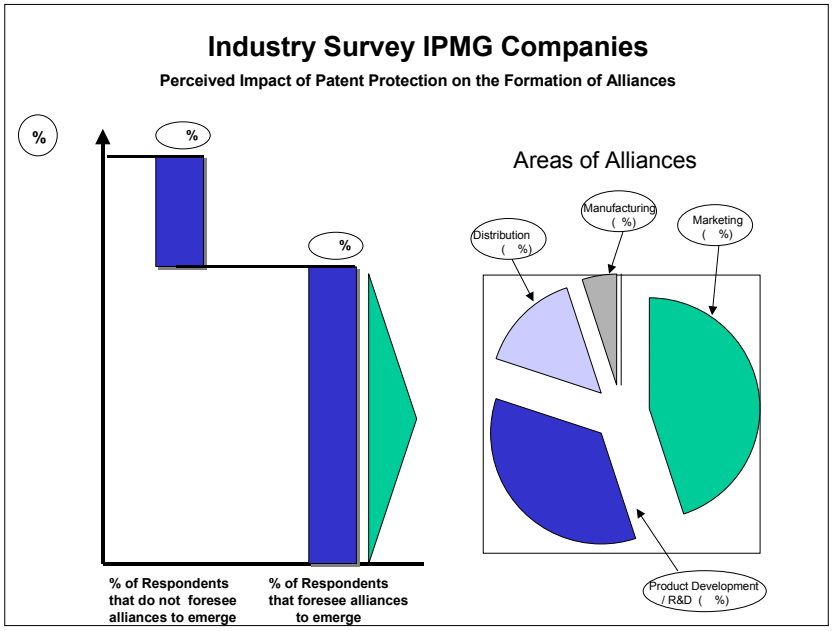

Figure 9

It seems that the highest potential benefits for international companies can be reaped from alliances with local companies in the marketing and sales area. The most far-reaching alliance would be the acquisition of a local company. But they were invited to consider in what areas of industry activity such strategic alliances were likely to occur (*see* below). The findings suggested that alliances and collaboration were more likely in the marketing (45% of responses) and distribution (15% of responses) areas, where local knowledge and 'inside' connection was an advantage, than in technology areas such as R&D, where international standards might not be reached by local companies. The reasons for these answers are likely to relate to the prevalent skepticism towards a sound implementation of the TRIPS Agreement as well as towards the TRIPS Agreement itself. As previously mentioned, TRIPS does mean the highest IPR standards and is likely to encourage economic activities to a level of manufacturing but not necessarily to R&D (Sherwood, 1997).

These findings are supported by the fact that after the period of exclusivity for patented products, large customer groups might not be reached for new compounds, as they cannot be reached by multinational companies (either due to limited organization size or to the inability of lower-income groups to pay for products). Cooperation with local companies would allow international companies to achieve a wider reach and/or to differentiate prices.

Once more, a minority of IPMG members (a total of 5 replies) was of the view that strategic alliances were unlikely to emerge after the year 2000. Four out of the five replies suggested that the interests of international companies were insufficiently served.

Another question in the industry survey dealt with IPR's potential impact on technology transfer. A key aspect of many innovation-driven industries such as the pharmaceutical industry is its reliance on advanced technology (directly related to knowledge and innovation formation) to develop new products. The question arises, whether patent protection, once established in Indonesia after the year 2000, would transfer technology and encourage technology development in locally based companies and institutions, in effect adding value to their overall contribution. The overall factor conditions of Indonesia are likely to be enhanced through this kind of economic activity. These transfers might support productivity gains.

A clear majority of 81% of respondents (17 out of 21) were of the opinion that technology transfer was more likely as a consequence of patent protection. The views of the four with reservations follow shortly, after the presentation of the next question, which identifies those areas of industry

activity most likely to reap the benefits of technology transfer.

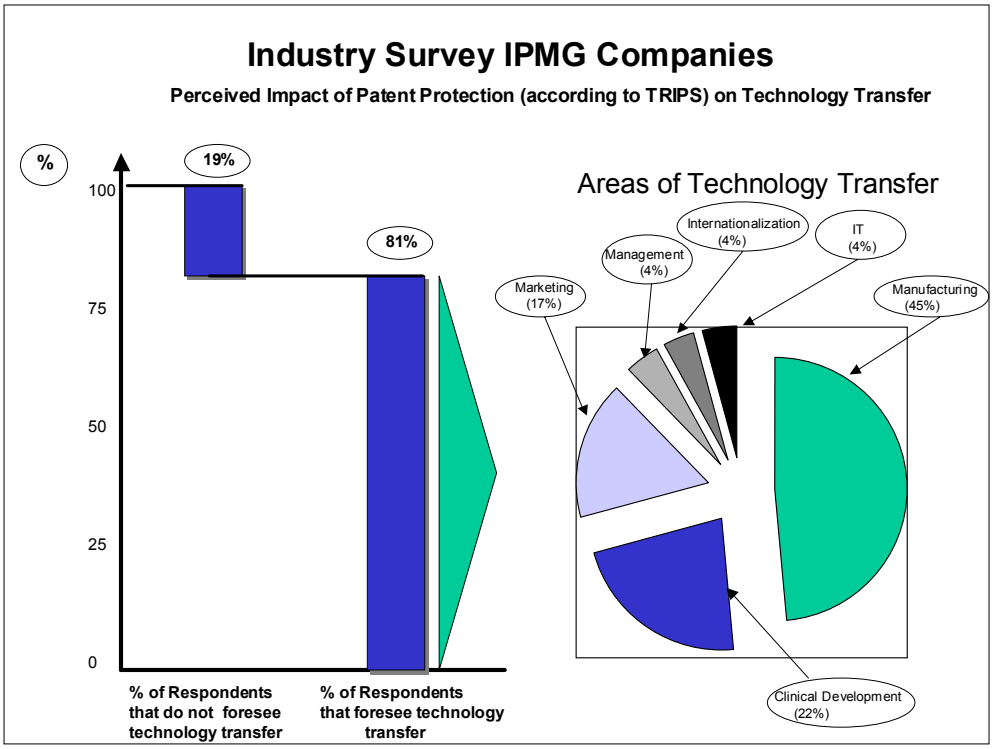

Figure 10

Technology transfer was most likely in manufacturing (48%) and clinical development (22%). No impact was detected in terms of basic research. These responses reflected the fact that technology transfer was directly related to these areas of activity. Out of the four negative replies, two respondents referred to a lack of competence and missing trade-secret regulations.

9 Discussion of the key findings

The research findings were intended to shed light on IPR's role as a change driver, the importance of the time factor for its effects, its potential implications on investment, and its potential implications on other economic areas such as technology transfer and alliances.

Primary emphasis has been placed on IPR's critical impact on investment decisions. According to Sherwood, robust intellectual-property protection can be expected to produce maximum benefits in markets where private capital and open trade are encouraged (Sherwood, 1997, p. 492). Even though the comparisons below are tentative, they provide a rough picture of how to evaluate TRIPS in comparison with other IPR systems distinguished by robustness (Sherwood, 1997a, p. 496).

Comparison of Intellectual Property Systems

Non-Robust Systems	Trade-Enhancing Systems (TRIPS)	Investment-Stimulating Systems
innovation is random/sporatic	innovation in some areas achieved	innovation is planned and constant
low prices of some priated products	higher prices for those products	prices lower than trade model
little proprietary technology acqu.	some proprietary technology acqu.	more proprietary knowledge acqu.
limited human skill development	some human skill development	higher skills developed
little private investment in technology	private investment in low technology	private investment in high technology
agricultural base - old science	agricultural base - some new science	agricultural base - best new science
industrial base - sales/distribution assembly	industrial base - some pirates displaced by imports	industrial base - new high tech industries sprin up
little risk capital	some risk capital	optimum risk capital
university technology, theoretical unused	some university technology transfer	more university technology transfer

Sherwood, 1997b

Table 11

In a different analysis, Sherwood studied the IPR system of mostly Latin American countries and rated them on a scale from 0 to 100 from an investor's perspective (Sherwood, 1997b). Sherwood invoked Mansfield's correlation between investment and IP protection from his World Bank report (Mansfield, 1995), indicating that the TRIPS level of protection was good enough to support private investment only in sales, distribution, assembly, and parts of manufacture. Only higher levels of protection encouraged complete manufacture or research and development. Even though the analysis provided only broad indications, it gave important trends in the discussion on IPR.

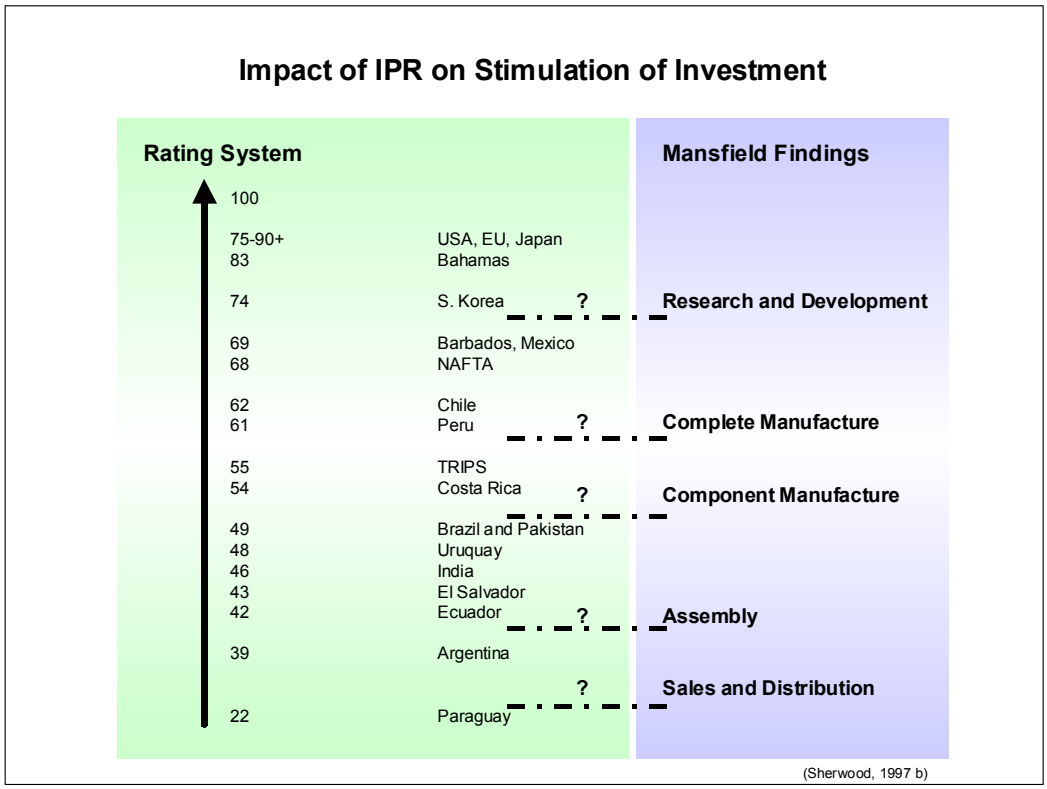

Figure 11

TRIPS is likely to provide sufficient protection to encourage the willing transfer of certain technology. A minimum threshold in protection must be achieved to encourage local companies to invest sufficiently in training and internal research and development of products and processes. Even though levels of investment and technology transfer are very sensitive to levels of IPR protection (Mansfield, 1994; Mansfield, 1995), the stimulus of intellectual property to investment is not perfect nor is it linear. The level of TRIPS protection needed to reach that threshold still needs to be explored. According to Sherwood, the impact of the TRIPS Agreement on most developing countries is likely to be slightly negative in the short run (one to two years) and increasingly favorable as the mindsets of local firms and individuals change and they realize the potential benefits (Sherwood, 1997).

Indonesia would be likely to score 40–50 before compliance to the TRIPS regulations at the time of research. Compliance with TRIPS would improve the outlook for more

technologically intensive activities. In fact, the research findings support this concept. Most investment was anticipated in the area of sales and marketing activities, manufacturing and, to a certain degree, in clinical trials. During the workshops it became evident that clinical trials were envisaged to provide an improved commercialization potential rather than to serve primarily scientific purposes. The relatively low factor conditions, particularly in scientific disciplines, have to be considered as underlying reasons based on the focus group interviews. The strong commercialization focus becomes evident when considering the results on alliances.

However, clinical trials are likely to spark the transfer of scientific skills and the development of scientific conditions. Positive impacts on local researchers and institutions can be expected. It needs to be reiterated that IPR fulfils important functions by reducing future risk and increasing revenue expectations, thus increasing the NPV of investment projects. IPR in interaction with other change driver is expected to enhance a country's factor condition development. The investment in technological areas is expected to gradually induce to technology transfer. It was demonstrated that the time factor plays an important role for the implications of IPR. The implications appear to be more long-term related (meaning beyond 5 years). The long-term research and development cycles in this industry appear to be relevant explanations in this context.

10 Conclusion

The findings demonstrate that it will take some time until substantial investment can be stimulated by TRIPS within the context of the international pharmaceutical industry. However, the erosion of the market share of copy products will take some time as well, due to the necessary availability of Indonesian patents. In a way, this will be a rather balanced scenario until the benefits derived from innovation and investment clearly outweigh the economic downsides from limiting imitations for a developing country.

Pipeline protection would be expected to accelerate the stimulation of investment and innovation.

Moreover, the research findings support the rationalization of the argumentation on the economic dimension of patented drugs in Indonesia.

These economic dimensions clearly indicate that significant economic benefits of IPR are mostly related to the long-term future. In a way these findings suggest that TRIPS allows significant time of adjusting an economy from imitation to innovation and to buffer negative implications on local industry.

REFERENCES

Bale, H. "Globalization: pharmaceuticals and vaccines", pp. 87–91 In WHO, *Perspectives on the WTO-TRIPS Agreement*, Geneva, January 1999.

Brealey, A.R., Myers, S.C., *Corporate Finance,* McGraw Hill, 4th edition, New York, 1991.

Correa, Carlos, "Implications for Public Health Policy Perspectives", pp. 81–82 In WHO, *Perspectives on the WTO-TRIPS Agreement*, Geneva, January 1999.

Denny, C., *Guardian Weekly*, April 12-19, 2001, p. 21

IMS: *IMS ITMA Report Indonesia* Q2/1998, Jakarta, 1999.

IPMG, *Open Sales Exchange*, Jakarta, July,,1999

Jorda, K., *Intellectual Property: Reflections on its Nature and Importance*, IPR–IPMG Seminar, Jakarta, March, 1999.

Lee, J.Y., *Knowledge Spillovers: Intellectual property rights, direct investment, and industry-university research relationships*, Pennsylvania, 1994.

Mansfield, E., "Intellectual Property Protection, Foreign Direct Investment, and Technology Transfer", International Finance Corporation of the World Bank Group, Discussion Paper 19, Washington, 1994.

Mansfield, E., "Intellectual Property Protection, Direct Investment, Technology Transfer: Germany, Japan and the United States", International Finance Corporation of the World Bank Group, Discussion Paper 27, Washington, 1995.

PhRMA: Facts & Figures, www.phrma.org, Chapter 8: Intellectual Property Protection and Trade, 1996.

Rapp, R.T., Rozek, R.P., "Benefits and Costs of Intellectual Property Protection in Developing Countries", Working Paper (3 National Economic Research Associates), White Plaines, New York, 1990.

Redwood, H., *New Horizons in India, The Consequence of Pharmaceutical Patent Protection*, Old Press, Suffolk, 1995.

Sayeed, Azra Talat, "The Impact of General Agreement on Tariffs and Trade on the Pharmaceutical Sector in the Third World", Ph.D.

Thesis, University of Minnesota, August 1995.

Scrip Reports: Scrip's 1999 Yearbook, Vol. 1 & 2, PJB Publications Ltd., Richmond – Surrey, January 1999.

Sherwood, Robert M., *Intellectual Property and Economic Development*, Westview Press, Inc., Colorado, 1990.

Sherwood, Robert, M., "The TRIPS Agreement: Implications for Developing Countries", *IDEA*, Vol. 37, No. 3, 1997a.

Sherwood, Robert, M., "Intellectual Property Systems and Investment Stimulation: The Rating of Systems in Eighteen Developing Countries", *IDEA,* Volume, 37, No. 2, 1997b.

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