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Research Paper N°2

THE TRANSFER OF TECHNOLOGY FROM EUROPEAN TO ASEAN ENTERPRISES: STRATEGIES AND PRACTICES IN THE CHEMICAL AND PHARMACEUTICAL SECTORS

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February 1980

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INTRODUCTION

In his opening address at the second ASEAN-EEC Industrial Cooperation Conference in Jakarta on February 26 1979, President Suharto called for a reinforcement of the industrial cooperation between ASEAN and EEC, stressing that : "If such cooperation will be successful, it will not only be beneficial for both parties, but it will also contribute a great deal in preparing the conditions aiming at the establishment of a world economic order which is more balanced and more just". The Ministry of Industry, Mr. Soehoed, added that : "Private foreign direct investment is a major channel for transfer of technology among countries and regions, as well as a means for the conversion and transfer of natural resources for the mutual benefit -equitably shared- of the cooperating nations".

Transfer of technology is at the heart of a stream of increasingly crucial relationships between Europe and the five South-East Asian countries. This is the reason why the European Economic Community asked the Euro-Asia Centre of the European Institute of Business Administration (INSEAD) to conduct a series of seminars on the "Management of Transfer of Technology". This seminar was designed by Professor H.C. de Bettignies, Director of the Euro-Asia Centre, according to guidelines defined by the Ambassador of the ASEAN countries in Brussells. The participants to those seminars which have been held until now in Singapore (1977), Kuala Lumpur (1978), and Pattaya (1979), were Civil Servants or Senior Executives from public and private ASEAN corporations. The seminars' aims have been to improve participants' capacities to deal effectively with problems stemming from the transfer of technology process in their own countries' environments. In the course of the seminars, participants have openly discussed major issues they are facing in their day-to-day life with regard to the technology transfer. It emerged clearly from those discussions that technology transfer problems were quite well documented at the macro economic level, but that very few insights could be found in the available literature at the business level.

What motivations lead the companies to transfer and to receive technology ? What is transferred and how ? What problems are encountered ? Those questions have often been raised, but the amount of first-hand experience and systematic research available was limited, so participants were left with answers

which were too general.

This research was then conceived to limit this shortening. Indeed, if such questions are relevant, and if Europe and ASEAN need to reinforce their links, why not undertake a survey of actual cases of technology transfer between European and ASEAN countries. As a new contribution to the EEC-ASEAN dialogue, it was decided by the Commission of the EEC that an INSEAD team of the Euro-Asia Centre would undertake such a study to provide results which could serve as a tool for deepening our understanding of the process of technology transfer of European companies in ASEAN countries.

This study has been greatly helped by Mr. John Hansen, now head of the EEC delegation in Bangkok, who realized the importance of providing new knowledge in this critical area of the EEC-ASEAN dialogue; Mr. Robert Hull, Mr. Ricardo Ravenna, from the Commission's Direction of External Relations, should receive our thanks for the impetus they gave to the research.

Particular thanks should also be addressed to the various individuals in the five ASEAN countries who helped the researchers to choose and to approach the companies. In Thailand, our gratitude should go to Mr. Chamroon Malaigrong from the Ministry of Industry, Mr. Pairote Gesmankit and Mr. Thamrong Mahajchariyawong from the Board of Investment. In Malaysia, the help came from Mrs. Wong Hiong Chin and Mr. Ahmad Shahrom from the Ministry of Trade and Industry. In Singapore, Miss Daisy Goh from the Singapore Economic Development Board, has been very effective in helping us. Mr. Afiat Wirjoasmoro from the Ministry of Industry and Miss Sridati from the BKPM, should be thanked for the effort they put into the organization of the study in Indonesia. In the Philippines, Miss Lylia Bautista and Miss Eva Payumo devoted precious time to our study. We should not forget in our thanks all the executives in Europe and in Asia who kindly agreed to find approximately half a day and sometimes more, to answer our questions.

We wish also to express our thanks to Henri Claude de Bettignies whose support and commitment to the project was a definite asset. Finally we would like to include the various members of the staff at the Euro-Asia Centre and at INSEAD who devoted hours to the typing, editing and data processing for the study.

The report is divided into five parts. The first chapter provides a summary of the findings and a discussion of the implications they suggest. The reason for placing this chapter at the beginning is to give the hurried reader an opportunity to make up his mind about the contribution of the study.
In chapter II, the framework which served as a foundation for the study and the methodology used are described. Chapter III examines the strategies of the European and ASEAN companies when they undertook the transfer. Chapter IV investigates various aspects of the technologies involved in the transfers, and chapter V assesses the results of the transfer operations from the point of view of the European companies, and from the point of view of the ASEAN partners.

In conducting the study, we have been struck by the variety of problems and circumstances that faced foreign investors, and in many cases their local partners, in our sample. Our field experiences have brought home to us the inappropriateness of many armchair generalizations -whether ideologically motivated or not- concerning the transfer of technology.

Another point that emerged was the extent to which the transfer of technology was peripheral to the concerns of both transferor and transferee in our sample. In many instances, we were observing a process that took place sporadically, unconsciously and in a low key fashion. Our hunch is that, often, technology transfer is a slow humdrum process rather than the glamorous "event" depicted in many case studies, a "secretion" by firms rather than a "transaction" between them. The sample selection method used may be responsible for this view. Very few of the cases studied had ever hit the headlines.

Finally, we feel that despite their imperfections, our data help to bring out the role of strategy in the behaviour of transferors and of some transferees in technology deals. Our hope is that it will contribute in a modest but efficient way to enhance the communications between Europe and ASEAN.

Fontainebleau, February 1980

CHAPTER I

SUMMARY AND IMPLICATIONS

1. SUMMARY OF FINDINGS

The starting point of this report has been the increasing interest on the part of ASEAN countries to attract foreign technology and on the part of the Europeans to reinforce their position in South East Asia.

On the basis of a study of 33 cases concerning 28 European corporations and 15 ASEAN companies in the chemical pharmaceutical and allied sectors, involving 1 turnkey project, 6 licensing agreements, 20 joint-ventures and 6 wholly owned subsidiaries, three main areas of investigation have been explored:

a) the strategy followed by the transferors and the transferees,

b) the nature of the characteristics of the technology transferred and the way it has been transferred,

c) the results of the transfer as perceived by transferors and transferees.

This sample cannot pretend to have a statistical representativity, therefore the inference drawn in this study cannot call for strong generalizations; it can only suggest a certain number of relationships (*).

1.1. Strategies

1. The strategy of transferring technology from Europe to ASEAN through foreign investment or licensing agreements is a relatively recent phenomenon. Official statistics (**) show that Japanese and U.S. foreign investments outweigh the European ones. In this study, practically all the operations involving technology transfer have been started during the past 15 years. This fact shows that we are observing an evolving and still young form of international business cooperation.

(*) In order to be statistically significant a sample should be drawn at random on a known population. In the present case even the population is not known.

(**)A consolidation of statistics on foreign investment in ASEAN countries can be found in Thomas W. Allen "The ASEAN Report", The Asian Wall Street Journal - Dow Jones Publishing Co., Hong Kong, 1979.

2. The strategies adopted by European companies to set up their technology transfer agreements in ASEAN countries are predominantly market-based: they go for technology transfer to protect or develop a market. Technology is only one minor element in the whole set of parameters which counted when they decided to go for a joint-venture, a license, or a subsidiary.

3. Strategies of European companies can be classified into three categories:

a) defensive strategies, which have been developed primarily as a reaction to a particular set of threats (e.g. increasing competitive pressure in the ASEAN countries, tariff barriers and ban of imports by host governments, loss of traditional markets...)

b) development strategies, which have been formulated with a long term perspective to build upon a corporate strength (e.g. exploiting a product technology competitive advantage). A particular form of this type of strategy is the long term establishment strategy epitomized by large German corporations. In long term establishment strategy, market dominance and presence prime short or medium term profitability, products are diffused in an international network as soon as markets can take them, and products are adapted to local conditions.

c) opportunistic strategies are those which have been implemented as a result of an unplanned event or initiative.

4. There are two profiles for companies which have undertaken technology transfer operations in the region. The first one encompasses medium sized companies with major specializations, non-dominant competitive positions and little experience in direct distribution or manufacturing in the ASEAN countries; those companies have reacted to a changing environment and they adopted defensive or opportunistic strategies. The second profile concerns large, diversified companies which stand among the world leaders in their fields and have already gained a direct experience of the ASEAN countries. For those, transfer of technology is part of a strategy of development.

5. Strategies of ASEAN partners can also be classified into three categories: defensive, opportunistic and development. There is a relatively large proportion of ASEAN companies who undertook their operations with European partners for opportunistic reasons (as a financial investment). When they adopt a development policy, they exploit a competitive advantage based on marketing expertise. Some pursue a backward integration strategy.

6. When a strategy is formulated, either defensive or development, by an ASEAN partner, the acquisition of technology does not play a big role: in a number of cases, market considerations are more important than the specific development of technical skills.

7. There is a strong similarity of profile between European companies which adopt a defensive (or opportunistic) strategy and ASEAN companies which adopt a development strategy. Both are more likely medium sized and specialized in one sector, and the European is looking for one type of experience that the local partner can provide. In such cases the preferred mode of agreement is licensing. Licensing is also a preferred way for European companies which have development strategies but do not enjoy extensive experience of the region.

8. Large diversified companies adopting development strategies based on long term establishment are more likely to develop a wholly owned subsidiary or a joint-venture with a dormant partner.

9. Joint-venture is a versatile form of technology transfer agreement. It can fit any combination of strategies for European and ASEAN companies.

10. The initiative for technology transfer is generally taken by the European partner, except in the cases of licensing agreements. There is a lack of rigour in the selection of partners which is a source of potential future problems.

11. In the negotiation process the most difficult cases have been those in which the European companies had defensive strategies and the ASEAN partners had development strategies.

12. During the negotiation process, financial, marketing and legal factors are given more weight than technological factors. European companies protect their technology through an embodied form (machine, raw materials) or through intangible advantages (know-how).

13. ASEAN government interventions in the technology transfer negotiation are based on two types of constraints:

a) direct intervention into the substance of the business (import requirements, distribution and price regulations); or

b) indirect intervention through people (ownership policy, regulation on the number of expatriates).

Indonesia applies controls through both types of regulations, the Philippines prefer to adopt a type of regulation based upon direct intervention, and Thailand prefers indirect regulation. Malaysia is a moderate regulator and Singapore, a low regulator in both dimensions.

1.2. Technologies

1. There is very little involvement of local partners in the setting up of operations. European companies make limited use of local resources except for the construction work but show willingness to train the local personnel either locally or in Europe.

2. One can classify the technologies transferred into two basic types:

a) Type 1 technology, also called upstream technology, concerns more particularly intermediate products, involves continuous production processes and the production of active substances.

b) Type 2 technology, also called downstream technology, concerns more particularly consumer products, involves more batch operations consisting of mixing, filling and packing operations.

3. Upstream technology is characterized in ASEAN by a large asset base but a small market base due to the national regulations. Therefore, those operations involve financial risks. In this technology there is a lot of skill and knowledge transferred to customers through intervention and technical assistance in order to help them in their application and use of the products. The operations using this type of technology receive technical assistance and visits from technicians coming from European based research and development centres and factories.

4. Downstream technology is characterized by a small asset base serving national consumer markets. Service to customers is done through demonstrations and product promotion. Those operations are heavily dependant on Europe for their raw materials (active substances).

5. In both upstream and downstream technologies, a large training effort is made. Training is more technically oriented in upstream operations, and marketing oriented in downstream operations.

Wholly owned subsidiaries and licensing agreements are more frequently associated with downstream technology than are joint-ventures. The explanation may be derived from the fact that upstream operations involve more financial risks than downstream ones.

6. One finds proportionally more downstream operations in the chemical and pharmaceutical sectors in Indonesia, the Philippines and Thailand, than in Malaysia and Singapore. This may be due to the combination of two factors : a) the size of national consumer markets which constitutes a positive factor to invest downstream and, b) the degree of government and regulatory constraints put on foreign investment which may reduce the likelihood to take risks by investing upstream. A third explanation, which was not specifically tested, could be drawn from European companies' perceptions of the political risks in each country.

7. The cases involving German partners demonstrate unique features. The majority of investments are made in downstream (or mixed) technologies, but the operations present characteristics normally associated with upstream technologies: technical assistance to customers, technical expertise available from European headquarters, sophistication of products.

1.3. Perceived Results

1. More than half of the European companies are satisfied with the results of their operations of technology transfer in ASEAN countries.

2. The European companies which are satisfied tend to be large, diversified, multidimensional-structured companies which have dominant positions on world markets and which have gained previous direct experience in ASEAN countries.

3. The European companies which are not satisfied are more likely to be medium sized, with no direct previous experience of the ASEAN region. Licensing agreements in consumer goods are particularly problematic. European companies having entered the market with defensive or opportunistic strategies are more likely to be in the unsatisfied category.

4. The major source of problems from the point of view of European companies is poor communication with their local partners. Ranking second in importance are problems generated by government policies and general economic conditions.

5. European companies gave a positive evaluation to the fact that their technology transfer operations enabled them to succeed in maintaining their presence in the region. Satisfaction resulting from technical achievement and also from better knowledge of the region is also often expressed by European companies.

6. Half of the ASEAN partners are satisfied with the results of the transfer and half are not. There are no very clear internal characteristics which differentiate those who are satisfied and those who are not. This fact indicates that the source of dissatisfaction or satisfaction has to be found in the behaviour of the European partner.

7. Among the major sources of problems mentioned by dissatisfied ASEAN companies are:

a) the lack of trust on the part of the European partner,

b) the lack of experience with the region on the part of expatriate managers,

c) unrealistically high expectations from European headquarters,

d) difficult communications.

8. ASEAN companies' dissatisfaction is proportionally higher when they deal with companies from large European countries (UK, France, Germany) than with companies from smaller countries.

9. ASEAN companies' dissatisfaction is more frequent in Indonesia and in the Philippines.

10. The most frequently quoted positive result of the transfer operations, from the point of view of ASEAN partner, is the upgrading of skills obtained through training, frequent contacts with their European partners' technicians and managers, and exposure to European managerial practices.

11. When one combines the assessment of European and ASEAN partners, one finds very few cases in which both are satisfied.

12. Cases involving non-dormant ASEAN partners show a degree of overall dissatisfaction which is higher than when the local partner is dormant or when there is no local partner.

13. The conflicts arise primarily over issues relating to the control of marketing and distribution, particularly when one or both partners lack experiences in the country and/or in the technology.

14. When European companies have a defensive strategy and local partners have either a defensive or development strategy, the results are less satisfactory than when both partners have development strategies.

15. Technological aspects are not very often the explicit source of problems but are an implicit stake. For the European companies, technology is an element of competitive advantage. They want to use it in order to consolidate or expand their position in world market. For the local companies, technology is also an element of competitive advantage which can be acquired along with brand name, reputation, etc. in order to gain or protect a market.

2. IMPLICATIONS

The various findings which have just been summarized and which are developed further in chapters III, IV and V, are based on observations made on a sample which is not large or representative enough to lead to strong generalizations. However, various practical suggestions can be drawn from this study. Those suggestions have been grouped into three main categories : 1) Suggestions for European companies; 2) for ASEAN companies; 3) for ASEAN governments.

2.1. For the European companies, the practical implications can be grouped around four major themes :

a) the need to develop global international strategies in which technology transfer policies are explicitly incorporated;

b) the need to approach and negotiate partnerships and transfer agreements with rigour and long term perspective;

c) the need to promote and diffuse a real international culture inside their own organizational structure;

d) the need to contribute to the effort of technological development in the host countries.

2.1.1. The need to develop international strategies incorporating transfer of technology policies

The empirical evidence collected in this study shows the overwhelming importance of marketing considerations in the strategies developed by European companies in their ventures in ASEAN countries, and the modest weight given to technologic factors. This is as if companies practiced the famous guidelines provided by Général de Gaulle to the French provisional government after World War II : "L'intendance suivra !" (*) and translated it into : "Technology will do !". As a matter of fact, data show that technology does not "do" unless it has been specifically included in global strategic reasoning. In most of the problematic cases analysed in this study, too many of the assumptions which were underlying the strategic choices revealed to have been wrong, either because they were not sufficiently analysed, or because they were taken for granted.

2.1.2. The need to approach partnerships and negotiations of transfer agreements with rigour and long term perspective

In a large number of cases, European companies have mentioned that they were dissatisfied with their local partners. Most companies, when asked, answered that they did not select their partners. This means that they engaged in a long term relationship with a partner whose motivations, capabilities and intentions were largely unknown to them. This approach is a corollary of the first point : lack of strategic thinking brings lack of thoroughness in strategic implementation. A local partner in a host country is an asset for the European; he is someone who will develop technically and commercially thanks to the relationships built around the technology transfer and who, in the future, when the country has reached a more autonomous stage of technological developments, will help the European firm to adapt to changing conditions and to maintain a fruitful presence in the region. Those companies which are looking for straw-men as partners are likely, as the present study shows, to be more satisfied than others. The question remains, "for how long ?".

(*) "Logistics will follow"

2.1.3. The need to promote and diffuse a real international culture inside their own organizational structure

With few real exceptions, none of the European companies interviewed in this study exhibit the features of what H. Perlmutter calls the "geocentric" international enterprise, in which there is a melting pot of culture, and key men operating inside the global organization. Too many stereotypes and a priori judgments are still expressed on the capabilities and motives of the host countries' human resources. A large proportion of conflicts analysed in this study revealed a failure in communication due to a lack of understanding of the other's point of view : his norms, constraints, the political system in which he is living, his social environment, his culture... Those topics are not often taught in business schools and are not taught in engineering schools in Europe or elsewhere, and yet these are the realities that the expatriate manager, the regional marketing manager, the technical assistance expert are going to meet in their day-to-day contacts with the host country. On the other hand, the training given to local managers is very often limited to the technicalities of the transferred operations. The overall training effort of the international European companies still lacks the long term and cultural perspectives which allow transfer of technology to become a solid continuous bridge between organizations in an international network.

2.1.4. The need to contribute to the effort of technological development of the host countries

All the ASEAN countries want to promote technology transfer in order to enhance their internal capabilities and to become in the future, mature and autonomous economies. The various policies implemented by the governments often lack the consistency needed to successfully achieve the objectives (see § 2.3.). The European companies, however, could contribute significantly to the achievements of those objectives by making greater use of the research and development infrastructural capabilities in the various countries, as in, for instance, the utilization of universities or research centres laboratories for quality testing, the organization of training periods for students, the arrangement of research contracts with local centers or the financing of such centres. The European companies should also contribute to the establishment of regional markets so that large scale, advanced, upstream technologies could economically survive. In these respects the pooling of industrial resources at the industrial level among European companies should be seriously considered.

2.2.1. The need to develop their capabilities in strategic analysis and formulation.

This study shows the high proportion of cases involving local partners having undertaken technology transfer agreements for purely opportunistic reasons, and among the remaining cases, the strong tendency to undertake technology transfer after very little analysis of the degree of fit between the technology adopted and the internal capabilities of the firm. Strategic analysis for technology transfer requires a diagnosis at two levels :

1) a clear identification of the market and industry evolution in the country and/or the region so that the right type of products and technology can be identified;

2) a clear identification of the present and potential internal capabilities of the firm in terms of financial, human and other resources, so that the required resources can be adequately negotiated with the "right" partner in order to complement the internal resources of the firm. A third element should complement the two first ones : a clear identification of the objectives that the firm wants to pursue. A very frequent tendency in ASEAN countries is for firms to seize opportunities on the basis of short term perspectives : the attraction of the "good bargain" is very natural in an entrepreneurial society based mainly on trade. It becomes far more dangerous with industrial structures. The more one moves towards high level industrial technology, the higher the risk, the less flexible become the systems, and the less easy it is to retreat from a "dead weight operation". The price of a mistake is very high, hence the need for careful prior strategic thinking. Another lesson which can be drawn from the observations made in the present study is the need for ASEAN companies to adopt a global perspective in the portfolio of their activities . For the reasons mentioned above, it is not possible for an industrial corporation to become a successful tentacular diversified concern without a clear framework and a coherent administrative system to manage this diversity; our observations in the present study show that this is not the case. It seems that a more appropriate strategy for ASEAN companies would be to concentrate first on a certain domain of activity in which they can develop, with the help of their foreign partners,a set of strong competences upon which they can build for the future, instead of attempting diversified growth in sectors where they may achieve, at best, a mediocre distinctive competence.

2.2.2. The need to enhance their managerial capabilities

In complement to the effort needed to improve their strategic thinking, ASEAN companies need to enhance their managerial capabilities. A large number of unsatisfactory cases in this study are associated with ASEAN companies in which lack of financial management, marketing management or production management created a conflictual situation with the European partner. In turn, these mismanagement practices justified, in the eyes of the European, the need to be more cautious in relationships with the local partner, increasing therefore the communication gap, and then increasing the conflict. Such a vicious circle could be avoided if ASEAN entrepreneurs placed more emphasis on management training and education. However, such an effort should not consist of a gimmick or a placebo of the "Two-day XYZ Management Seminar for Company Presidents" type, but should be a rigorous training plan, linked to the strategy of the company, its structure and its career system.

2.2.3. The need to invest thoroughly in technological capabilities

A striking result of the study is the modest weight given by ASEAN partners to technological aspects in their major preoccupations with regard to their licenses or joint-ventures with European partners. They put themselves into the position of the "buyer" of a package, in which technology is an element. They wrongly make the assumption that their partner is going to "sell" something, and that they will be able to receive the transfer without paying the organizational costs needed for absorbing the technology. Trading mentalities are still very strong in ASEAN companies and the advantages attached to long term investment in peoples' technical capabilities are still not recognized. Governments in the various countries certainly have a big role to play in this respect but nothing can be achieved if companies do not recognize the prime importance of technical jobs at all levels in their hierarchies, and make practical changes in their wage structures, career developments, rewards systems, and training efforts to reflect this recognition.

2.2.4. The need to contribute to their countries' efforts in technological development and to push for an ASEAN economic reality

The examination of the various interviews conducted with ASEAN companies indicate that very few of them have explicitly mentioned national development

objectives in their motives for selecting a partner, a technology, or a particular mode of transfer. Without concluding that ASEAN companies do not take national interests into consideration when they organize a technology transfer, it does appear, however, that this is a domain in which more consideration could be invested and put into action. It is very difficult to make any specific suggestion in this respect, since it is not the sole responsibility of the companies to develop such a government business relationship for technology transfer, but the situation implies, at least, that the various ASEAN Chambers of Commerce should take initiatives to encourage more symbiotic functioning between government bodies and private and public enterprises to elaborate, implement and control policies and programs for the technological development of the ASEAN countries. Another issue, already recognized by the ASEAN International Chamber of Commerce, is the need to promote the concept of an ASEAN market and an ASEAN cooperation in the field of production calling for upstream technology. As the study shows, this is a necessary condition for ASEAN market development. This requires that private entrepreneurs accept the loss of the safety of national barriers' protection and disinvest in some areas in order to gain market share and competence in others.

2.3. For the ASEAN Governments, this study provides four elements for reflection :

a) The need to review their policies toward technology transfer,

b) The need to coordinate foreign investments and technology transfer policies within the ASEAN countries,

c) The need to invest heavily in infrastructural technological capabilities,

d) The need to invest in human resources' development.

2.3.1 The need to review the policies towards technology transfer

This survey suggests, (despite its methodological limitations) that the types of technologies transferred in the ASEAN countries which exert the most governmental constraints are very likely to be downstream technologies*. As will be discussed later, the government constraint factor is not the

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* Several cases of upstream technology in the Philippines are analysed in this study, but all of them are in sectors which are peripheral to the chemical sector.

sole explanatory factor. The relatively large size of the Indonesian, Thai, and Filipino markets, and the effect of political risks on the businessmen perception of investment climates, may well explain why Singapore and Malaysia are the countries in which one finds most upstream investments *. However, the ASEAN countries should review their policies and regulations concerning technology transfer with regard to the direct and indirect effects those regulations have on foreign investors on the one hand, and local entrepreneurs on the other hand. A regulation which, for instance, tends to set a deadline for the establishment in the country of upstream production processes and which at the same time does not liberalize the import of other raw materials, is a regulation which does not recognize or allow for the economic constraints of an investor: i.e, import regulations reduce the market to national boundaries while upstream investments require large markets. Among the criteria which are interesting to mention for the evaluation of technology transfer agreements and their contribution to the welfare of the country, is the amount of customer assistance which is associated with the transferred technology. If one considers for instance, industrial paints operations, they may not be sophisticated in terms of the technical processes involved in their production, but they are potentially associated with a lot of sophisticated technology which is to be transferred through the various applications' techniques and which needs to be learnt by the various small industrial users. Similar instances can be found in industrial gases, synthetic fibres and intermediate goods.

2.3.2 The need to coordinate the foreign investment policies and the technology transfer policies and regulations within the ASEAN countries

For its modest part, it is hoped that this study will be a contribution to the present debate concerning the cooperation among ASEAN countries with respect to foreign investment and technology transfer. It has been stressed several times, and the data support the conclusion, that there is a need

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* If one looks at the published indices of political risks either in the ASEAN Report, Asian Wall Street Journal, Hong Kong, 1979; or in the special report on Asia published by the Business Environment Risk Index (BERI), the ranking of the ASEAN countries with regard to political risk is, (from the riskiest to the least risky): Indonesia, Thailand, Philippines, Malaysia, Singapore.

for a common market for intermediary products. At the same time, the various European companies interviewed confirmed the fact that the incentive packages proposed by the countries did not play an important role in their decisions to invest: market prospect and general climate played the major role. Instead of concentrating their efforts on differentiating themselves from each other in their investment packages, the ASEAN countries should harmonize their regulations in order to present a common set of requirements and benefits. They could also exchange information relating to their various experiences in technology transfer agreements (cost of raw materials, prices etc..). The constitution of ASEAN joint-ventures with foreign partners could enlarge the financial and human resource bases of the ASEAN partners. Finally, ASEAN research centres specialized in certain field could contribute to the enhancement of the technological capabilities of the ASEAN countries.

2.3.3 The need to invest heavily in infrastructural technological capabilities

For a country, the ultimate objective of technology transfer is to provide itself with the capability to control the core technology of a domain in order to assure economic autonomy or to gain bargaining power. For a transferor of technology, the ultimate objective is to keep for as long as possible, a competitive advantage which secures for his long term viability. For him, technology transfer is a succession of deals through which he is progressively selling this competitive advantage while the technology itself becomes mature. This is a recapitulation of the international product life cycle model for technology transfer. In order to be able to control such a process, one needs to have access to the core technology of a sector, that is to say, to fundamental and applied research. Thus, one constructive role for ASEAN governments would be to promote the creation of various research centres in which fundamental and applied research could be carried out in association with local and foreign firms. Another great contribution which the governments of ASEAN countries could potentially make, would be the creation (if possible, in association with each other) of a data bank on technology transfer operations and on technological experiences in other countries.

2.3.4 The need to invest in human resources' development

It seems to always be a "lieu commun" for a study on transfer of technology to conclude that there is a need to upgrade the human capabilities. In the course of the interviews, a large number of respondents underlined the crucial importance of the skills of the personnel involved in technical operations and the lack of competence in those field in the ASEAN countries. Even in the countries where the level of education is very high, the european expatriates complained about the lack of technical training. As mentioned earlier in the sections on the ASEAN companies, there is a need for dual skills at all levels in the industrial population: managerial and technical skills should receive a particular attention.

2.4. For the EEC countries, finally, this study confirms the growing interest of the European companies, at least in the chemical and pharmaceutical sector, in the ASEAN region. As already mentioned, a large number of the cases described and analyzed in this report concern recent operations involving medium sized firms which have had little experience in the region and which came to the region to gain experience and to expand their operations in the future. They are all learning, sometimes with some problems, the new game of international business and industrial cooperation. More European presence is needed, and the ASEAN countries are in favour of it. It is hoped that this study will have contributed to this purpose.

From our observations, from our data analysis, one realizes how companies which have strategically thought through their transfer of technology as a "complex process", give themselves a better chance of long term success. It is also clear that beyond the "will" to transfer, the "skills" are needed just as much. Those skills can be acquired, developed and "transferred" as it is demonstrated by some examples in our sample.

The chemical and pharmaceutical industries in this research have been two of the most fertile grounds for such study, to learn how EEC and ASEAN firms could cooperate more fruitfully.

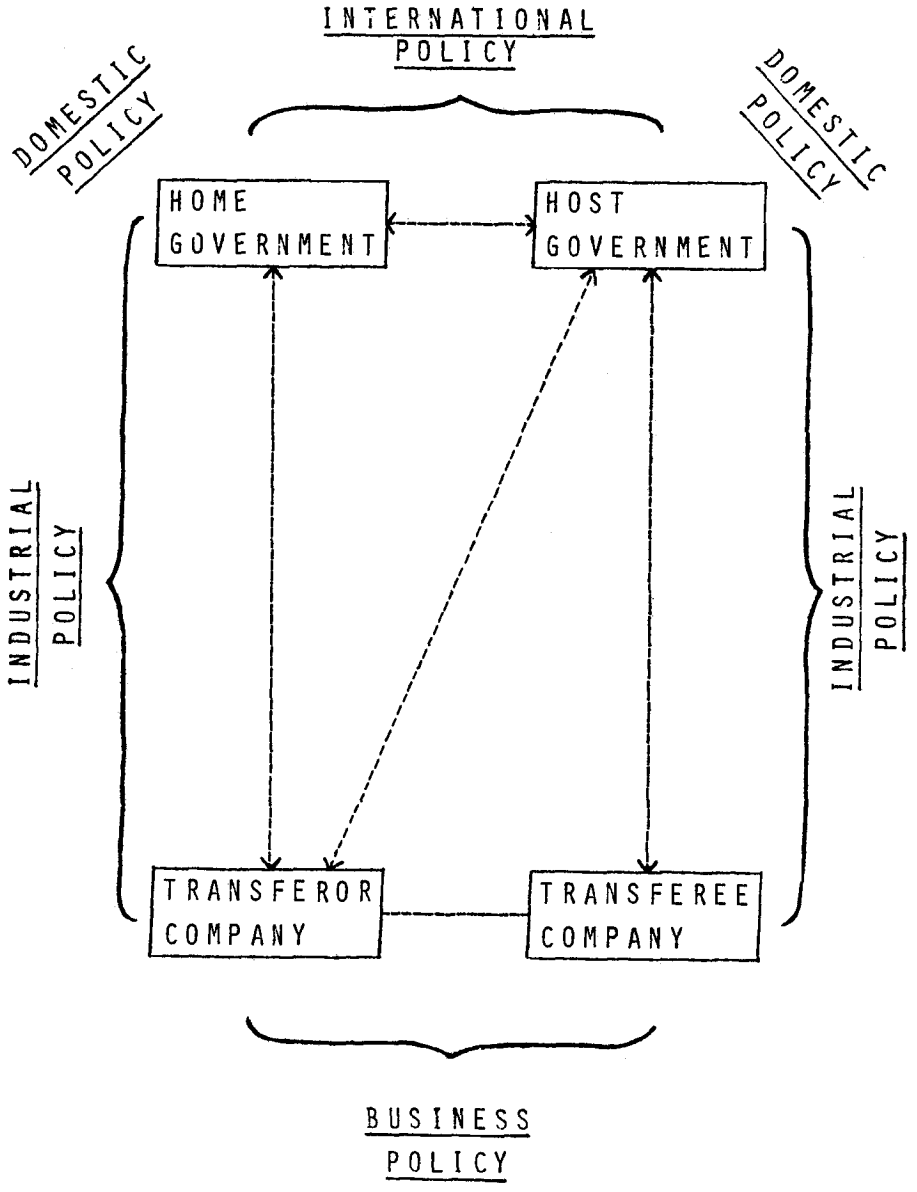
Successful cases of "effective" transfer -as assessed by both the European and the ASEAN partners- do exist, though too often one observes a "sub-optimization" process (for the many -often interdependent- reasons identified and discerned in the study).

We hope that such analysis will foster more exchange and discussion on EEC-ASEAN experience and processes of transfer of technology, to make it more often a reality of today, rather than an objective for tomorrow. It is now easier to see how this could be possible.

CHAPTER II

ORGANIZATION OF THE STUDY AND METHODOLOGY

This research is approached in the same way as a case study, in which four actors interface: home country government, host country government, transferor company and transferee company. (Figure 1)



ACTORS IN INTERNATIONAL TECHNOLOGY TRANSFER

Figure 1

The focus is on the relationship between transferor and transferee companies, with transferor companies coming from Europe, and the transferee from one of the ASEAN countries.
This study differenciates itself from previous ones which looked primarily at US companies and which confined their attention exclusively on the transferor and his point of view. (*)

1. OBJECTIVES OF THE STUDY - DEFINITION OF A FRAMEWORK

The research is not designed to test an elaborate set of hypotheses, but to explore at a general level the proposition that technology transfer is the outcome of an interaction between two strategies: that of the transferor and that of the transferee. The framework for the investigation is the following: At a point in time a European firm with a given strategic posture and a given history has developed a strategy which led to an agreement with another entity located in an ASEAN country. This entity has also its own strategic posture, history and strategy. Technology transfer has been developed within a structural arrangement derived from this agreement. One can relate hypothetically a configuration of successful/unsuccessful technology transfers to certain types of strategic and structural arrangements (see Figure 2).

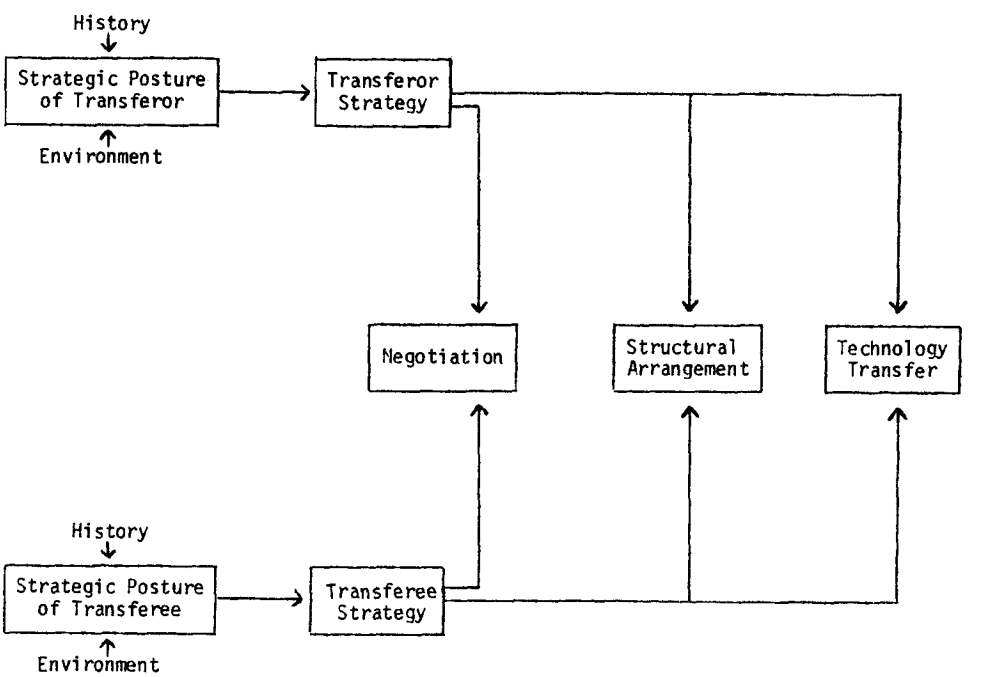


Figure 2

Overall framework for the study of Technology Transfer

(*) with the exception of C.A. Michalet (1977)

Research questions that guided the study can then be classified into 5 categories:

1- What were the strategies of actors when they undertook the technology transfer ? How did they negotiate it ?

2- What is their strategic posture as defined by size, competitive position, history, experience, government incentives and pressures; how did these affect negotiations ?

3- What specifically has been transferred ? Is it possible to establish a typology of technologies and of transfer patterns ?

4- What relationships -structural and other- developed between the actors ?

5- What assessment can be made of the transfer operation ? What results were obtained ? How are they perceived by the actors ? How can the above factors help to explain them ?

These questions address a view of technology transfer as one of a number of outcomes that results from interactions between a transferor and a transferee. In some situations, the transfer is central to the relationship between the parties, in others it is quite peripheral. At some stage in the evolution of the interaction between transferor and transferee, their relationship becomes formalised, whether by means of a purchasing agreement -in the case of trade- or a turn key operation, a licensing agreement, or joint venture arrangements. We take this formalised arrangement as a part-manifestation of the strategic intentions of the two parties: what were they looking for in coming together ? What were they offering ? What options did they consider ? How did the relationship fit their overall operations ? How successfully did the relationship evolve subsequently ? The expression 'part-manifestation of strategic intentions' is carefully chosen. How far such intentions are deducible from the deal finally struck depends on how far either party was led to make concessions to the other whether at the negotiating table or in the earlier context of their evolving relationship. The concept of strategic posture refers here to the various characteristics of a firm which are the results of its history and of the evolution of its environment and which define this firm both in an absolute sense: its size, its products and markets, its know-how, its resources, and in a relation sense: its competitive position, its previous experience in international operations, the influence of external actors such as a government.

The concept of strategy refers to the way a firm deploys its resources to cope with its environment, constrained by norms and the value system emerging from its social structure (Andrew). Broadly speaking, a strategy is defined by four attributes: a set of objectives which define expected results; a competitive profile which defines the products, the markets and the manoeuvres that this firm is willing to use in order to fight competition; a set of policies which indicate the resource allocation pattern among divisions, departments and functions, and set the rules for games such as pricing, financing, recruiting, ect; finally a programme of actions over time.

The concept of negotiation refers to the way actors have sought each other out and the bargaining they carried out in striking a deal.

The concept of structural arrangement refers to the formal aspect of the deal -joint venture agreement, licensing, ect- the formal structure of the transfer to the organization of the local operation, and to the way relationships develop both formally and informally (i.e. reporting system and coordination devices).

Finally the concept of technology transfer refers to the set of physical (equipment, operational manuals, formulas, raw materials) and informational (know-how, knowledge, information) elements which contribute to the definition, the manufacture and the marketing of products and services as transmitted from one organization to another.

The results of a technology transfer operation are obtained mainly through a process of subjective evaluations of the relative success of the operation. The focus is on the satisfaction of the actors, their areas of concern and on the identification of problem sources. The evaluation is carried out either by the actors themselves or by the researchers.

2. METHODOLOGY

In view of the exploratory nature of the study, it was felt that whatever the data collection methods chosen, it should give access to qualitative as well as quantitative data, and to primary rather than secondary sources. Desk research might give an initial orientation to the data gathering process but field data would be required. The aim was to collect information from two sources and in two geographical regions:

Source 1 : A technology transferor - both in his home base and his field operations where he had set up locally. A licensor would probably only need to be seen in his home base. A joint venture partner would have to be seen both in his home base and in the field.

Source 2 : A technology transferee - he would be contacted in the field, his home base.

Region 1 : Western Europe - the home base of the technology transferors under study.

Region 2 : The ASEAN countries - the home base of the technology transferees under study.

The distinction is only made for analytical convenience. Some cases do not fit confortably into this scheme. What for example is one to make of a direct foreign investment through a wholly owned local subsidiary - a case of source 1 and source 2 being the same firm ? Or again how does one deal with a joint venture between a European and, say, a Japanese firm operating through a local subsidiary in one of the ASEAN countries ?

It was decided to proceed with semi-structured confidential interviews, within a case study framework. A case (figure 3) would consist of an interview with the relevant executives of a European firm at home, and, where appropriate, in the field, and another interview with the relevant executive of a local ASEAN firm (in those cases where joint venture arrangements were made with individuals rather than organizations, these would be interviewed). Twenty-five cases would be sought on the basis of approximately five per ASEAN country. This number of cases would not allow any sophisticated quantitative treatment of the data, but would offer a good spread of qualitative information and some comparison between cases

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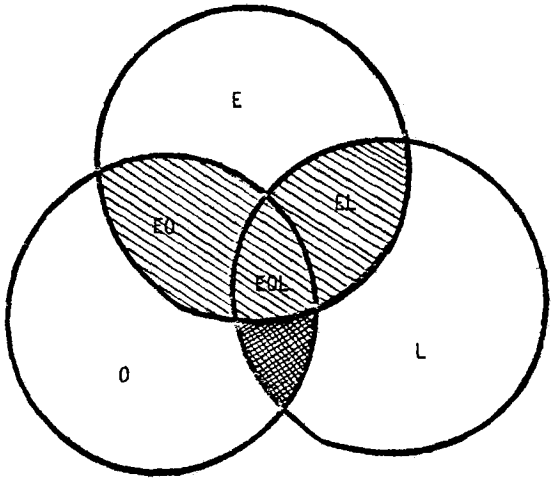


A CASE is defined as an OPERATION of transfer involving at least 2 ACTORS

The ACTORS can be :

- 1 or several European transferors (E)
- 1 or several local partners (L)
- 1 operating company (O)

An OPERATION can be :

EL = EL1 Licensing
EL2 T.K.P. (Turn Key Project)

EOL = Joint Venture

EO = Direct Investment

Figure 3

Definition of a case in the study on Technology Transfer

might be possible at this sample size. Also, twenty-five cases seemed feasible within the allocated time budget for the field work: two five week field trips with a six week interval between them. Splitting the field work into two phases presented a number of distinct advantages: the decision to do so was taken after some initial contacts with a number of European firms had shown that collecting our sample of twenty-five firms from the European end would be an impossibly slow and predictably bureaucratic business. Contact with prospective firms would therefore have to be made directly in the field, and since the executives that we sought to interview travelled extensively and would not always be available at short notice, a second trip would greatly increase our chances of completing each case. Moreover, there was a fair chance that in many cases the interview could not be completed in a single session; to reschedule a second session two months hence in order to complete an interview was somewhat easier than asking if we could come back the following morning.

Three approaches were used in securing the participation of firms in our study:

The first consisted of contacting the parent prior to our field trip by letter, describing the study and asking for their collaboration. This yielded no results. A number of firms replied and some were visited in Europe but in only a few cases did they have an involvement in the ASEAN countries, and where they did, it took the form of trading operations, a form of transfer that we had decided not to investigate.

The second approach consisted of writing to the government department in each ASEAN country responsible for foreign investment; in most cases this was the Board of Investment. The nature of the project was described and the department's assistance was asked for in identifying possible "technology deals" (i.e. licensing agreements, joint ventures) that they would have on register, and in contacting the parties involved. This turned out to be a most fruitful strategy; in each of the five ASEAN countries the local Board took considerable trouble in helping us identify eligible cases and in contacting the people to be interviewed. The larger part of our sample of cases was secured with their help.

The third approach complemented the second; it amounted to following up leads suggested by firms already interviewed. In some cases, the European parent of such firms had operations in the other ASEAN countries which fitted our requirements; having interviewed senior executives in one of the firm's subsidiaries made it somewhat easier to get their colleagues in neighbouring countries to participate. In the event thirty-three cases were completed as compared with the twenty-five initially planned. That this was possible is largely due to the help received from the government departments concerned. Of course, there is nothing random about the sample given the way that contact with firms was established. This was not a great handicap as the investigation was not designed to produce statistically unimpeachable experimental results.

In order to limit the variability of the data and allow for some comparison between cases, it was decided to focus the investigation on cases within one industry The Chemical and Allied industries, with a special reference to the Pharmaceutical section, were chosen. A number of reasons guided the choice:

1. The industry has been established in Europe for well over a century and typifies the process oriented industries identified by Franko as the home of European multinationals.

2. It is research intensive and therefore a generator of new technology and innovations.

3. The industry -with the exception of the pharmaceutical sector- is capital intensive.

4. It operates a wide and varied range of technologies at different levels of sophistication.

5. The development of this industry is a priority in each of the five ASEAN countries.

A word must be said about the interview as a data collection device; it presents limitations in an investigation of this kind which must be identified and acknowledged. Perhaps the most severe is the language barrier: both the Europeans and the South-East Asians interviewed had a varying command of English -the language used in the interview- and while in none of the cases did this emerge as an explicit obstacle, questions or answers may not always have been interpreted as intended.
If the information to be collected had been highly standardised, a questionnaire could have been used and pre-tested in Europe before the field work began. As it was, the interview was semi-structured, that is to say, the interviewer had a list of questions drawn up on an interview guide which he could ask in any sequence and indeed in any form. The reason for this was the need to be opportunistic; each case had its idiosyncrasies and its own "personality"; it needed a flexible approach in which some points could be developed and other committed as circumstances dictated. Questions were mostly open-ended and not all were applicable in a given case. Often the context of the interview itself would help to explain a question or rob it of meaning for an interviewee. The interview guide attempted to mitigate the semantic problem by addressing some issues through two or more questions where one could act as a consistency check on the other.

A second limitation of the semi-structured interview approach is the danger of observer bias creeping into the process unnoticed. Questions are framed in such a way as to favour particular answers; replies given in less than

perfect English are corrected for grammar but suffer semantic distortions. All this may be quite unconscious and well outside the interviewer's control given the nature of his data collection methods. A third problem is the one of reliability: would someone asking the same question at a different time and/or to a different person in the firm studied get the same answer ? Also would the answer given adequately measure the phenomenon we were trying to capture ? In short, was the information valid as well as reliable ?

In order to overcome some of the limitations of our data gathering tool, it was decided to develop a transcript of each interview which would be sent to each person interviewed for checking. In the transcript, each question was put in a standardized form thus reducing the effects of observer bias, and the answer was written out as simply and as clearly as possible. The interviewee thus had the opportunity of checking the facts recorded in his name as well as how some of his more subjective responses were interpreted.

The letter that accompanied the transcript informed him that if we did not hear from him within six weeks, we would take it to mean that our transcript was substantially correct and that, at least in his view, it adequately represented his position in the interview. This was certainly no foolproof formula: our respondent's thirst for truth may well be tempered by the extra-time and effort he was being asked to invest and this, particularly in those cases where language difficulties were greatest. A non-reply could indicate incomprehension rather than approval. As they turned out corrected, transcripts were returned for approximately one third of the interview given. None called for major modifications to the data, and in many, additional information was volunteered which had not been available at the time of the original interview. We must remain agnostic about the transcripts that were not returned, comforted by the thought that any flagrant mispresentation on our part would have elicited some kind of response.

The interview guide that was developed grouped 147 questions under fourteen sections. Since not all questions would be relevant to all interviewees, three subguides were developed: one for the parent company in Europe; one for the local indigenous firm or person in the field; one for the operating company whether wholly owned by the European firm or jointly owned by the European firm and a local firm or person. Each subguide would contain approximately one hundred questions at varying levels of detail. A brief description of what was sought under the fourteen section is given below:

1. Market structure

What are the firm's product/markets, its competitive posture and key success factors ?

2. Technological development

What is the technology used by the firm; how is it evolving; and what was transferred ?

3. Linkages with suppliers

How far has the firm come to depend on the local markets ? How extensive are its supply links outside the country ?

4. Linkages with the market

How extensive are the interactions between the firm and the local market ? How much technology is diffused to customers ?

5. Institutional framework

What is the role of host government or ASEAN institutions in the firm's operations ? What has been their effect ?

6. Historical background

What have been the main steps in the firm's development ? How did it get into its current business ?

7. Organizational structure

How has the firm structured its local operations, and what links does it have with its parent or subsidiaries (European or local) ?

8. Objectives

What is the firm's strategy, how is this translated into objectives and by whom ?

9. Resources

What resources are available to the firm in terms of finance, manpower, experience, technology, know-how, ect.? How self-contained is it in his operations. What are the points of inter-dependency with other organizations (parents, subsidiaries, joint venture partners, etc.) ?

10. The background to the technology transfer agreement

How did the firm come to be involved in an operation involving technology transfer ? How was the process initiated and by whom ?

11. Negotiations

What was the process by which the "technology deal" was agreed ? What problems, if any, occurred ?

12. The form of agreement

What were the main features of the agreement and what did it call for in terms of provisions for technology transfer ?

13. The transfer process

Where the transfer took place in a "project mode" -i.e. within a definable and self-contained time budget- What was the outcome ? Who was involved and to what extend ?

14. Results

What were the successful and problematic features of the operation ? What was learnt ? What is the feeling of the parties towards the experience ? How does it differ from their experiences elsewhere ?

Many more questions were listed than one expected answers to. In some cases, the information was simply not available; the person interviewed had not been present at negotiations; the whole thing happened ten or more years ago; etc. In other cases, the respondent was unwilling to divulge information -this was mostly the case for financial data where a privately held company was concerned. In one research intensive firm even the organization chart would not be disclosed: it was considered to be competitively sensitive information. A positive response to a question should not be taken to mean an adequate response; in certain cases the interview was substantially completed, but with a parsimonious flow of data; in others only one third of the questions listed were answered but each one brought forth a cascade of data. Each interview, whether given in one or two sessions, lasted between two and five hours. This was partly a function of the case itself and of the time that the respondent could spare. Documents were used if available and their contents, where relevant, were woven into the transcripts for subsequent checking by respondents. Interviews were only sought at senior management level; the information asked for would only be in the hands of senior

executives; in the one or two cases where our respondents had middle management responsibilities, it was made clear to us that they had been closely involved in the technology transfer operation and could probably answer our questions better than the senior managers. At times, at the firm's suggestion, the interview took place with a group of managers representing different functions, or with several managers in succession. In such cases, the transcript was sent to one person who then distributed it to his colleagues for checking. The most surprising feature of our investigation was that where operating firms were contacted in the field rather than through the European parent company, they were generally quite willing to participate. In many instances extensive interviews were obtained as the result of "cold calling" -i.e. with no prior contact- through the Board of investments or any other government department. More interviews were in fact obtained than could make up cases; in some instances it was only in the course of the discussion that one discovered that a firm's operations did not meet the requirements of our investigation; and although the data collected was kept for reference, it could not be used systematically. Nevertheless, with a total 89 interviews actually conducted in the field, we only encountered two outright refusals by local operating companies to participate and one by a local indigenous firm.

3. CODING THE FIELD DATA

The completed transcripts were coded and put in a form that would allow a measure of systematic analysis. The coding was not a mechanical process; most of the data was qualitative in nature and could not be reduced to a common measure without exercising judgement as to what information would be sacrified in the process. The cruder the classification, the greater will be the gap between the observed behaviour of the individual members of a class and the modal behaviour of the class as a whole, but conversely, the greater the chance of getting statistically significant relationships between classes. As it was, the coding classification was suggested by the interview data itself. There was no way of anticipating the range and variability of responses to specific questions. The coding efforts were guided by two considerations: the first was the need to restrict the number of classes developed for any response if significant relationships were not to be sacrified to a needless refinement in the data; the second was to confine the coding to those parts of the data that would not strain our subjective judgements to the point that they became mere caprice. This is a problem inherent in any process of data reduction and although too much should not be made of it, the pitfalls it presents must be pointed out.

4. PROFILE OF THE SAMPLE

The 33 cases of technology transfer analysed in the present study concern:

- 20 joint-venture arrangements
- 6 pure licensing agreements
- 6 wholly-owned subsidiaries
- 1 turn-key project

A diagramatic scheme showing the relationship between companies actually interviewed is given in Appendix IV Table 1 below shows the distribution of cases by country of transferor and by country of transfer.

TABLE 1

Distribution of cases by transferor's origin and country of transfer

EUROPEAN ORIGIN	COUNTRY OF TRANSFER: INDONESIA	THAILAND	SINGAPORE	MALAYSIA	PHILIPPINES	TOTAL
U K	0	2	1	1	1	5
GERMANY	3	2	1	1	2	9
FRANCE	1	1	0	0	4	6
HOLLAND	0	2	0	0	0	2
SWITZERLAND	1	0	0	0	1	2
NORWAY	0	1	1	0	0	2
DENMARK	2	0	0	1	0	3
DUAL*	0	0	D	2	0	2
JOINT**	0	0	1	1	0	2
	7	8	4	6	8	33

NOTE: (*) DUAL refer to a case where the European company has two or more nationalities

(**) JOINT refer to a case in which two European partners of different nationality are involved

Table 2 gives the distribution by country and by types of operations.

TABLE 2

Oistribution of cases by countries and type of operations

	TYPE OF OPERATION				
	TURN KEY	LICENSING	JOINT VENTURE	WHOLLY OWNEO	TOTAL
EUOPEAN ORIGIN					
U K	0	1	4	0	5
GERMANY	0	0	6	3	9
FRANCE	1	3	2	0	6
HOLLANO	0	0	2	0	2
SWITZERLANO	0	1	0	1	2
NORWAY	0	0	2	0	2
OENMARK	0	1	1	1	3
OUAL	0	0	1	1	2
JOINT	0	0	2	0	2
TOTAL	1	6	20	6	33
COUNTRY OF TRANSFER					
INOONESIA	0	3	3	1	7
THAILANO	0	0	8	0	8
SINGAPORE	0	0	3	1	4
MALAYSIA	0	0	4	2	6
PHILIPPINES	1	3	2	2	8
TOTAL	1	6	20	6	33

The 3 tables that follow show the nature of technology deals by country of transferor and by country of transfer.

TABLE 3

Distribution of arm's length operations (Turn key projects and licensing) according to European origin and country of transfer

EUROPEAN ORIGIN	COUNTRY OF TRANSFER INDONESIA	PHILIPPINES	TOTAL
U K	0	1	1
FRANCE	1	3	4
SWITZERLAND	1	0	1
DENMARK	1	0	1
TOTAL	3	4	7

Table 3 shows the distribution of licensing agreements and turn key projects which represent arm's length agreements; and Table 4 gives the distribution of joint-venture; the definition of a joint-venture is a broad one : is taken as such any firm that is partly owned by two parties to the deal, even if one of them owns 10 % of the shares and is wholly passive in the operation. This is done deliberately to explore the constraining influence of joint-venture arrangements on the respective strategies of either party. Where a joint-venture was itself the object of a licensing agreement with either of its shareholders, the agreement was treated as an integral part of the joint-venture deal and was not further sub-classified.

TABLE 4

Distribution of joint venture

by European origin and country of transfer

EUROPEAN ORIGIN	COUNTRY OF TRANSFER INDONESIA	THAILAND	SINGAPORE	MALAYSIA	PHILIPPINES	TOTAL
U K	0	2	1	1	0	4
GERMANY	3	2	0	0	1	6
FRANCE	0	1	0	D	1	2
HOLLAND	D	2	0	0	0	2
NORWAY	0	1	1	0	0	2
DENMARK	0	0	0	1	0	1
DUAL	0	0	0	1	0	1
JOINT	0	0	1	1	0	2
TOTAL	3	B	3	4	2	20

Finally, Table 5 shows the distribution of wholly owned subsidiaries.

TABLE 5

Distribution of wholly owned subsidiaries

according to the European origin

and the country of transfer

EUROPEAN ORIGIN	COUNTRY OF TRANSFER INDONESIA	SINGAPORE	MALAYSIA	PHILIPPINES	TOTAL
GERMANY	0	1	1	1	3
SWITZERLAND	0	0	0	1	1
DENMARK	1	0	0	0	1
DUAL	0	0	1	0	1
TOTAL	1	1	2	2	6

Stricto sensu these cases should not have been incorporated in the study since there is no real "local partner" to the deal. It was however felt that for comparative purposes their integration was useful.

Table 6 lists the products groups of the cases. The major areas are pharmaceutical products, paints, plastics and fine chemicals (primarily pesticides and insecticides).

TABLE 6

LIST OF PRODUCTS GROUPS
(Standard International Trade Classification)
(3 Digits)

. Organic Chemicals (512)	3	
. Inorganic Chemicals & Gases (513)	5	
. Dyestuffs (531)	4	
. Dyeing & Tanning (532)	4	
. Paints (533)	9	●
. Pharmaceutical (541)	16	●
. Essential Oil (551)	1	
. Perfumery Preparation (553)	4	
. Soaps (554)	1	
. Fertilizers (561)	4	
. Plastics (581)	8	●
. Fine Chemicals (599)	8	●
. Synthetic Rubber (231)	1	
. Artificial Fibres (266)	2	
. Paper Pulp	1	
. Foods	2	
. Metallurgical Process	2	
	75	

(one case may include several sectors)

CHAPTER III

THE STRATEGIC FRAMEWORK FOR TECHNOLOGY TRANSFER

The purpose of this chapter is to answer the two first research questions concerning the strategic postures and the strategies of the transferors and of the transferees when they undertook their operation of technology transfer. In the first part the European companies' strategies will be analysed; followed in the second part, by analysis of the local partners' strategies. In a third part the negotiation process will be discussed.

1. THE EUROPEAN COMPANIES STRATEGIES

The cases which are analyzed in this study are quite recent, since 28 out of 33 have been set up during the past 15 years.

Out of the 5 cases which are related to operations started as wholly owned subsidiaries before 1965, four changed their structure to become joint-ventures. This indicates that the strategy of transferring technology through foreign investment or licensing agreement is a relatively recent phenomenon as far as Europe and ASEAN are concerned (*). Why was it so ? What created this move towards technology transfer on the part of European companies ?

During the interviews with European executives and expatriate managers, the respondents were asked to indicate why this particular operation was undertaken and what were the ventures declared strategies.

(*) Obviously this statement does not relate to the investments made during the colonial period. Some of them are included in the sample, but they have evolved into new types of operations, so that it is possible to consider them as recent. However as it will be seen, the experience of the region is a factor of success in the technology transfer.

TABLE 7

MAJOR STRATEGIES OF EUROPEAN COMPANIES

FOR TECHNOLOGY TRANSFER

	Number of times Mentionned
A) DEFENSIVE STRATEGIES (14 cases)	
. Increasing competitive pressure	6
. Overcome tariff barriers	3
. Ban of foreign imports	3
. Loss of traditional market	1
. Search for low cost labour	1
B) OPPORTUNISTIC STRATEGIES (3 cases)	
. Transformation of a license project into a joint-venture.	1
. Transformation of one turn-key project into another one	1
. Appointment of a new Chief Executive Officer, joint-venture suggested by distributor	1
C) DEVELOPMENT STRATEGIES (16 cases)	
. Long term establishment strategy	8
. Market prime profit . On-going renewal of products . Global approach	
. Capture of growing markets	4
. Consolidation of well established position	2
. Build upon a specific technological strength	2

Table 7 indicates a classification of the answers into three major categories:

- Defensive strategies (14 cases)
- Opportunistic strategies (3 cases)
- Development strategies (16 cases)

1.1. Defensive strategies are those which have been developed primarily as a reaction to a particular set of threats.

The most often quoted reason was the increasing competitive pressure: the competition comes from the increasing size of the market which makes it appealing for new comers. The following comment illustrates this motive:

> "The firm had a plant in Europe which had a good world export market including S.E. Asia. At a certain market size it became economic to produce locally otherwise others would have taken the market"
> (A British Producer)

The Japanese competition in particular was sensitive :

> "20 years ago Singapore was a wide open market. Then the Japanese came in and gobbled up the market. The choice was between leaving the market or setting up local production. The firm chose the latter and sought a partner that it had known as a customer."

Another source of threat which is not exclusive of the first is related to protectionist measures taken by local governments through tariff barriers, which increased the cost of imports and threatened the holding of brand image or market share. As one pharmaceutical company puts it :

> "The firm did business in the Philippines before the war using local distributions for the employment of medical representatives. When sales became significant the firm decided on contract manufacturing to save on duties taxes and packaging costs. The firm needed to be price competitive in a competitive market".

A small UK paint and resin manufacturer decided on a joint-venture agreement to imitate competitors :

> "The firm's European competitors moved in to counteract the country's protectionism policies. There was one indigenous manufacturer established behind a tariff wall".

Another source of protectionism was the legal barrier established by the Indonesian government to ban import of pharmaceutical products in order to have local production:

> "The firm had left a good market behind in the early 1970's when the Indonesian government started nationalizing international factories. Meanwhile industry developed and "toll manufacturing" was a way of going back while meeting the requirement of the law on local manufacturing at a minimum level of investment -the firm would have exported if it had been allowed." (A German pharmaceutical firm)

In one case the reason involved for a French company was the loss of its traditional Indochinese market which led to a search for a substitution market in South East Asia.

In only one case the reason was the search for low labour costs (*) because the European plant was operating at a loss:

> In France between 1964 and 1970 the cost of production rose by 70 % while the prices were controlled by the French government. The French factory accumulated a 17 million $ loss. Then it was decided to move it abroad.

1.2. Opportunistic Strategies are those which have been implemented as a result of an unplanned event or initiative.

In one case the company had no particular policy to set up joint-venture but the pressure came from various sources:

> The initial request for the venture came from a supplier of equipment who had been contacted by a local manufacturer who wanted to create competition against the Japanese. The initial project was to establish a licensing agreement but the project was transformed into a joint-venture proposal under the pressure of the local representative of a European banker. (A French group)

In another case a turn-key project for a paperpulp plant was the result of a transformation of another project which had been planned initially but which could not be developed. Since the French contractor was in charge of the first project, he was asked to complete the second one.

(*) It is characteristic of the chemical industry, which is not very labour intensive, that low cost strategies are not very often found.

In the third case the establishment of a joint-venture came at a time of a reorganization in the mother company. A new Chief Executive Officer wanted to pull the company from a dormant market and was looking for any "good" opportunity; this one came from a Thai distributor who suggested the creation of a manufacturing joint-venture.

1.3. Development strategies are those which have been formulated with a long term perspective to build upon a corporate strength. The most frequent strategy is the one which can be qualified as a long term establishment strategy in which market dominance and presence motivation come before short or medium term profitability. As one German expatriate explained:

> "The aim is to produce first class products and services; the firm does not aim at market share for its own sake.
>
> Profit in this respect is a secondary matter. This is a highly competitive market in which local producers are dominated by the Chinese who are after a "quick buck".
>
> The firm aims to market a product locally as soon as it comes out of the main office."

Another manager was more explicit :

> "Our company aims to keep a foot in the market no matter what the difficulties imposed by governments. The firm will stay in even if it means giving up its identity."

Another feature of this long term establishment strategy is the on-going transfer of new products. Inside the multinational corporation new products are diffused abroad as soon as the markets seem attractive:

> "The firm's long term investment policy is:
>
> a) translating the results of research into profitable products,
> b) concentrating on highly sophisticated product lines,
> c) strengthening its position abroad by means of local production."

This approach has synergistic effects on home based production:

> "Germany is no longer a country where one can afford to make caustic soda. What is needed is high value-added manufacturing. Our company takes the view that by moving the low value-added parts of their operations overseas, they are stimulating, through those operations, a demand for high value-added complementary products back home. This is happening now."

TABLE 8

ORIGIN, DESTINATION AND NATURE OF AGREEMENT ACCORDING TO STRATEGY FOR TRANSFER OF EUROPEAN COMPANIES

	Defensive and Opportunistic Strategies	Development Strategies	Total
A. COUNTRY OF ORIGIN			
. UK	5	4	9
. GERMANY	2	7	9
. FRANCE	4	4	8
. HOLLAND	1	1	2
. SWITZERLAND	1	1	2
. NORWAY	1	1	2
. DENMARK	3	-	3
. DUAL	1	1	2
	18	19	37
(*) Joint partners are counted individually			
B. COUNTRY OF TRANSFER			
. INDONESIA	5	2	7
. PHILIPPINES	4	4	8
. THAILAND	4	4	8
. SINGAPORE	2	2	4
. MALAYSIA	2	4	6
	17	16	33
C. NATURE OF AGREEMENT			
. TURN KEY PROJECT & LICENSE	5	2	7
. JOINT-VENTURE	10	10	20
. WHOLLY OWNED	2	4	6
	17	16	33
D. YEAR OF THE AGREEMENT			
. LESS OR EQUAL TO 5 YEARS (1974-1979)	7 } 14	7	14
. 5 TO 10 YEARS (1969-1973)	7	-	7
. MORE THAN 10 YEARS (before 1969)	3	9	12
	17	16	33

The final striking characteristic of such a strategy is its global aspect in which centralized product development does not preclude geographical adaptation:

> "The local strategy reflects our global market-based strategy; invest as soon as possible where the market can take it. The firm aims to tailor its product strategy to national rather than regional markets. Tariffs, taxes, consumers, are unique in each market."

Another type of development strategy is similar to the one described above but with a more modest base. It relies on the capturing of growing markets in which the firm can apply a competitive advantage. The following answer from a paint manufacturer illustrates well this approach:

> "Our company is specialised in automotive paints. The aim has been to break into the sophisticated paint markets -the automotive and the industrial.
> The market is very cost conscious, especially in household paints, and it can become essential to go for sophisticated buyers in specialist products. In automotive products the firm supplies mostly foreign car makers."

In two cases the strategy was a mixture of long term establishment strategy and defensive strategy. In those cases two European companies had been established for a long time in the region, building upon their respective competitive advantages in order to develop their operations. To counteract mounting competitive pressure from local manufacturers, they decided to merge their local operations and consolidate their positions.

Finally, in two cases, the development strategy was due to two relatively small European companies. One, a Norwegian with a specialised know-how in paint, developed an international strategy to overcome limitation due to the small size of the home market. The second was a French pharmaceutical company which sublicensed proprietary products because it could not control its foreign licenses directly. This company had adquired particular skills in synthetical metabolic regulators, thanks to a strong R & D effort.

1.4. European strategies and strategic postures

In table 8 the basic strategies for technology transfer have been crosstabulated according to the nationality of transfer, type of agreement, country of transfer, and year of agreement. An examination of this table shows that, except for Germany and Denmark, the other European countries are not

particularly associated with one type of strategy or another. German cases show a clear inclination toward long term presence strategies, while in the Danish cases the transferors undertook their operation in ASEAN countries for defensive reasons. The major German chemical companies were not ambiguous in their answers regarding their policy towards foreign investment and technology transfer. They represent the archetype of the long term presence strategies. They consider that their foreign ventures must stay in the host country and must adapt to local requirements, even if the income statement does not present good results:
"We are there to stay" seems to be the motto of those large concerns which were already in Asia before the war through IG-Farben, and which patiently reconstructed their international networks after 1945.

Another interesting feature revealed in Table 9 is the relationship between the strategies and the nature of the agreement on the one hand and with the year of the agreement on the other hand. Licensing agreements are the preferred vehicles for defensive strategies, while wholly owned subsidiaries reflect more long term presence strategies. Defensive strategies have been developed during the past 10 years while development strategies are either very recent (less than 5 years) or very old (more than 10 years). Indonesia is clearly the country in which defensive strategies have been implemented, while in Malaysia, the European companies have come, in the majority, with development strategies in mind. This does not come as a surprise since the opening of Indonesia to foreign investment was set up in 1967 after a period of turmoil. The Indonesian legislation especially in the pharmaceutical sector was very much oriented toward import substitution and regulation concerning local manufacturing and distribution forced the late comer to react (then the higher proportion of defensive strategies in Indonesia). The strong association between licensing agreements and defensive or opportunistic strategies may well be due to the fact that licenses are a flexible mean, requiring no capital, to maintain or to buy a presence in a market which is not very familiar or developed. At least, in our case, the European Company indicated that it had started with a license in Indonesia, in order to get acquainted with the market but was considering for future expansions going for joint ventures.

On the other hand, Malaysia and Singapore have a longer tradition of foreign investment. In those countries, traditional colonial subsidiaries have been established for a long time, and the governments show more tolerance to wholly owned subsidiaries than in the other ASEAN countries.

In Table 9, the two types of strategies have been cross-tabulated with various characteristics of the transferor companies. This table illustrates that defensive strategies are more likely to be associated with companies which are smaller, relatively little diversified, in non-dominant competitive positions, lacking in previous experience in the ASEAN countries. Conversely, development strategies tend to be carried out by large diversified companies, which are among the five world leaders, and which have gained experience in the country through distribution or manufacturing subsidiaries.

Two interesting relationships are those linking strategies and Research and Development budgets on the one hand and strategies and the origin of the pressure to transfer on the other hand. The companies having adopted a development strategy are not those which have the highest R & D budget relative to sales, while among the companies which have the highest percentage of sales spent on R & D, one finds the highest proportion of defensive strategies. Similarly, when asked the question : "Did you feel pressurized to transfer your technology, and why ?", the companies having a development strategy answered that they did not feel pressurized or if they did, it was to exploit a technological advantage. Those having adopted defensive strategies felt in majority pressurized to transfer for an external reason (someone pushed them) or a market reason (to defend a market).

Those two relationships suggest that a large R & D effort is not a sufficient ingredient of a long term strategy for technology transfer. It should be complemented by an analysis of the competitive advantages of the firm and of the domains and countries in which it could apply. This first look at the strategies pursued by European companies in their transfer of technology agreements in the Asean countries reveals two basic features:

1) Technology, from the point of view of the European chemical and pharmaceutical companies, is only one minor element in the whole set of parameters which counted when they decided to go for a joint-venture, a license or a subsidiary. Their major preoccupation concerns the market; they go for technology transfer to protect or develop a market. During the course of the interviews a large number of European executives and expatriate managers stressed that in their case they did not really see what technology was transferred and that their basic purpose was to compete in a market.

TABLE 9

STRATEGY OF TRANSFER AND STRATEGIC POSTURE OF TRANSFERORS

	Defensive and Opportunistic Strategies	Development Strategies	Total
A. SALES OF EUROPEAN			
. LESS THAN 1 000 M $	10	2	12
. MORE THAN 1 000 M $	7	13	20
	17	15 (one missing)	32 xxx
B. NUMBER OF EMPLOYEES			
. LESS THAN 10 000	9	2	11
. BETWEEN 10 000 AND 50 000	5	2	7
. MORE THAN 50 000	3	12	15
	17	16	33 xxx
C. DEGREE OF DIVERSIFICATION			
. SINGLE SECTOR	3	1	4
. DOMINANT	5	-	5
. RELATED DIVERSIFIED	5	12	17
. DIVERSIFIED	3	3	6
	16 (one missing)	16	32
D. RESEARCH & DEVELOPMENT BUDGET AS % OF SALES			
. LESS THAN 2 %	2	-	2
. 2 TO 5 %	6	12	18
. MORE THAN 5 %	7	3	10
	15 (two missing)	15 (one missing)	30 xx
E. SALES IN OTHER COUNTRIES THAN HOME COUNTRY (% OF TOTAL)			
. LESS THAN 60 %	4	7	11
. MORE THAN 60 %	8	8	16
	12 (five missing)	15 (one missing)	27

.../

TABLE 9 (ctd)

	Defensive and Opportunistic Strategies	Development Strategies	Total
F. COMPETITIVE POSITION			
. AMONG 5 WORLD LEADERS	-	12	12
. NATIONAL LEADERS	12	2	14
. MEDIUM AND SMALL	5	2	7
	17	16	33
G. PREVIOUS RELATIONSHIP IN THE COUNTRY			
. NONE	4	1	5
. IMPORTED THROUGH AGENT	9	4	13
. HAD DISTRIBUTION OR PRODUCTION SUBSIDIARY	5	10	15
	18	15	33
H. PRESSURE TO TRANSFER			
. NONE OR BASED ON TECHNOLOGY	6	12	18
. MARKET BASED OR EXTERNAL	11	3	14
	17 (one missing)	15	32
I. POLICY TOWARD TECHNOLOGY TRANSFER			
. NONE	5	1	6 6
. GUIDELINES	3	8	11
. ARTICULATED	7	7	14
	15 (two missing)	16	31

TABLE 10

MAJOR STRATEGIES OF ASEAN PARTNERS

FOR TECHNOLOGY TRANSFER

	Number of times Mentioned
A) DEFENSIVE STRATEGIES (2 cases)	
. Importer wants to protect his market	1
. Local company is not doing well seeks a partner to turn around its operations	1
B) OPPORTUNISTIC STRATEGIES (7 cases)	
. Portfolio investment	3
. Diversify in order to gain an export base	1
. Shift of project	1
. Opportunity to start own business	1
. To gain European experience	1
C) DEVELOPMENT STRATEGIES (9 cases)	
. Benefit from present position to enlarge product range	5
. Backward integration	3
. Diversify source of supply	1

2) There are two profiles for companies which have undertaken technology transfer operations in the region. A first one concerns medium sized companies with major specialisations, non-dominant competitive positions and little experience in direct distribution or manufacturing in the ASEAN countries those companies have reacted to a changing environment and they were pushed toward technology transfer. The second profile concerns large, diversified companies which stand among the world leaders in their fields and had already gained a direct experience of the ASEAN countries. For those transfer of technology is part of a strategy of development. They pushed the transfer.

2. THE ASEAN COMPANIES STRATEGIES

As for their European counterparts, the ASEAN partners have developed strategies for their operations involving technology transfer. For the 18 local partners interviewed those strategies can also be classified into three main categories (see Table 10):

- Defensive strategies (2 cases)
- Opportunistic strategies (7 cases)
- Development strategies (9 cases)

2.1 Defensive Strategies

One of the two cases falling into this category concerns the sole distributor of a European paint manufacturer, a highly diversified entrepreneurial family group managed by a Thai of Chinese origin. Anticipating the need for putting manufacturing in Thailand he proposed a joint-venture to the European firm.

The other case is also found in the paint industry, in which a Chinese entrepreneur had several manufacturing facilities in three countries. Those companies were not operating well and he looked for a foreign partner. He was introduced by a friend to a large European manufacturing firm which at this time was looking for a joint-venture in the region.

2.2. Opportunistic Strategies

In three cases the reason given by the local partner of the joint-venture agreement was a pure investment reason. Two of them were large banks which saw an opportunity to maintain good business relationships with an industrial company:

> "For the bank, participating in the joint-venture offered a profitable lending opportunity with a good client. The bank however considers equity participation on its own merit. The criteria are viability and profitability. In lending the additional criterion is security. The Bank's policy is never to take a majority position - usually it aims at 30%."

The third case concerns a Hong Kong based service company which entered into a joint-venture agreement in Thailand in the paint industry. To the question: "What steps led to the decision to transfer ?" the managing director of this company answered: "A beer in a bar" !

In another case the decision to go for joint-venture with a European partner was motivated by the desire of a large Filipino group to diversify into an export business in which it could compensate for the larger foreign exchange deficit incurred in its main business line, because of imports of raw materials.

Another example of opportunistic strategy on the part of a local company is a Filipino group which was granted the right to exploit a large forest concession containing hardwood and pines. Originally it planned to build a dissolving pu plant; this proved to be unfeasible and the project was transformed into a pap pulp plant.

In another case, an ex government official in Indonesia was approached by a large chemical group to become a local shareholder. This then led him to start his own distribution company in the chemical sector.

Finally, in another case, an opportunistic strategy was followed by a private investor in the Philippines who wanted to have a joint-venture agreement with European just to gain some insight into the European way to manage:

> "For me, the motivation was predominantly financial; I was seeking a measure of diversification in the context of extensive personal investments with US and Japanese firms, but at the same time, I felt that the joint-venture would offer some useful insights into the workings of an established European firm. Thus, I would not have been interested in investing in a simple trading operation. It has been my continuing hope that the joint-venture would broaden its local production base and move upstream into higher-value-added activities."

2.3 Development Strategies

In 5 cases the local company was already established in its own country and waited to enlarge its own product range by adding new products. They have a marketing structure which is appealing to those European partners who are looki for a network to distribute their products. In one Indonesian pharmaceutical

company which has negotiated and signed 11 licensing agreements with Japanese, US and European companies, the marketing director explained:

> "Our licensing agreements have been decided on the basis of careful screening of growth potential of certain products. In those segments we are looking for partners who are among the 5 to 10 largest in their own country, who have R & D capabilities of their own and enjoy an international reputation."

In 3 other cases, the reason for looking for a technology transfer agreement was to integrate backward in order to gain a production expertise for a product the company used to market. As the general manager of a Filipino company told the interviewer:

> "The firm must expand in order to compete and to this end has been ploughing back all its profits.
> In the next few years the firm wants to acquire some facilities and move into the fabrication of upstream materials. From there it can move downstream into higher value-added fabrication operations."

In another Filipino pharmaceutical company, the president mentioned :

> "Backward integration into production is necessary to stabilise supplies and keep abreast of developments. To achieve the latter, the firm has a strategy of seeking out specific products and companies, via a broker, that the firm could represent. They are for licensors who are in no position to manufacture or distribute in the Philippines on their own."

In a final case the development strategy adopted by a large textile manufacturer was to go for a joint-venture with a European synthetic fibres producer in order to diversify his sources of supply away from Japanese groups.

2.4 Other cases in which partners could not be inteviewed

In 6 other cases the local partners could not be interviewed, and hence it was not possible to question them about their strategy. As a matter of fact in five of those cases they were fully sleeping partners who hold shares only to satisfy the regulations of the country. In the fifth case the partner was a state development bank in Malaysia which was also a sleeping partner.

2.5 Strategies of ASEAN partners and strategic posture

As Table 11 indicates, ASEAN partners who have developed defensive or development strategies do not indicate a clear preference toward a particular European country.

TABLE 11

ORIGIN, DESTINATION AND NATURE OF AGREEMENT

ACCORDING TO STRATEGY OF ASEAN PARTNERS

	STRATEGY OF ASEAN PARTNER		
	DEFENSIVE OR OPPORTUNISTIC	DEVELOPMENT	
A. ORIGIN OF EUROPEAN			
. UK	2	2	
. GERMANY	3	1	
. FRANCE	2	4	*
. HOLLAND	1	-	
. SWITZERLAND	-	1	
. NORWAY	1	-	
. DENMARK	-	1	
	9	9	
B. NATURE OF AGREEMENT			
. TURN KEY PROJECT OR LICENSE	1	6	*
. JOINT-VENTURE	8	3	
	9	9	
C. COUNTRY OF TRANSFER			
. INDONESIA	1	4	
. PHILIPPINES	3	3	
. THAILAND	4	1	*
. SINGAPORE	1	1	
	9	9	

Except in the case of France there is a larger proportion of partners having a development strategy than in other European countries. This can be explained by the fact that French companies came into the region late and thus could easily be approached by local companies who wanted to develop particular strengths.

Licensing agreements are the major vehicles for local companies who adopt development strategies. This is to be contrasted to the fact that licensing agreements are more likely to be found with European companies which have adopted a defensive strategy. In Indonesia one finds a majority of development strategies, and in Thailand, a majority of defensive ones. Indonesia established legislation which required that the distribution be in the hands of a local company, and in the case of pharmaceutical products, manufacturing in the country was mandatory. This regulation gave an opportunity to local companies to develop their own strategies.

Table 12 reveals the salient characteristics of local partners having adopted one strategy or another. The local companies having adopted development strategies are more likely to be relatively small in size, with a good competitive but not leadership position, concentrated in one sector (chemical) and developing a research and development effort. On the other hand, the features of the defensive or opportunistic are not so clear. This could be expected given the variety of motives behind their strategy and the fact that the basis for their collaboration with Europeans is not particularly related to operational capabilities within the chemical industry but very often is a response to external (legal...) reasons.

This analysis of the strategies of the ASEAN partners reveals three major points:

1) A large number of reasons have pushed local partners to establish a link with a European company and among those reasons quite a large proportion are not basically attached to a particular strategic thinking.

2) When a strategy is formulated, the acquisition of technology does not play a big role: market considerations are more important than the specific development of technical skills in a large number of cases

TABLE 12

STRATEGY OF TRANSFER AND

STRATEGIC POSTURE OF ASEAN PARTNERS

	DEFENSIVE OR OPPORTUNISTIC	DEVELOPMENT
A. SALES		
. LESS THAN 10 M $	1	6
. MORE THAN 10 M $	6	1
	7	7
B. NUMBER OF EMPLOYEES		
. LESS THAN 500	2	2
. 501 - 5 000	4	6
. MORE THAN 5 000	3	1
	9	9
C. DEGREE OF DIVERSIFICATION		
. SINGLE SECTOR	3	2
. DOMINANT	4	7
. DIVERSIED	2	-
	9	9
D. SECTOR OF ACTIVITY		
. CHEMICAL	3	9
. OTHER THAN CHEMICAL	6	-
	9	9
E. COMPETITIVE POSITION		
. LEADER	2	1
. STRONG BUT NOT LEADER	2	8
. WEAK	3	-
	7	9
F. RESEARCH AND DEVELOPMENT		
. NONE	7	-
. SOME EFFORT	2	9
	9	9

3) The strategic profile of the sample is constituted on the one hand by medium sized, specialized companies, having marketing advantages and competitive positions to consolidate and who engage in a technology transfer in order to develop their markets and their products range. On the other hand opportunistic and defensive strategies are adopted by a wide range of individuals and companies which do not present a salient characteristic.

3. THE FIT BETWEEN EUROPEAN AND ASEAN COMPANIES STRATEGIES: THE TRANSFER AGREEMENT

In the two first sections the separate strategies of each partner were described and analysed. In this section the purpose is to combine the transferor and the transferee strategies and to analyze the way they negotiated the transfer agreement.

In Table 13 the 33 cases of the sample have been crosstabulated according to the respective strategies of the European companies and of the local partners. It is puzzling to observe that in only 2 cases have both European and local followed a development strategy. This suggests that there is a certain unbalance between partners, at least at the strategic level when they go for technology transfer.

The second striking factor of Table 13 comes from the observation that, contrary to what a vast amount of literature describes, the Europeans are not always in a dominant strategic position: the combination local-development/European-defensive represents 7 cases (the largest of all in the table). In those cases the local partner possesses a definite strategic advantage vis à vis his European partner which is generally, as mentionned earlier, a medium sized unexperimented company. The transfer type of the second largest frequency is one involving European companies with development strategies and no local partners (6 cases) which indicates that the wholly owned subsidiary is the preferred medium for long term strategic development. As mentionned earlier, licensing agreements play a particular role in the development strategies of local partners and in the adaptations of Europeans to local markets.

TABLE 13

CROSS-TABULATION OF STRATEGIES FOR TECHNOLOGY TRANSFER

	EUROPEAN STRATEGY	
	DEFENSIVE OR OPPORTUNISTIC	DEVELOPMENT
LOCAL STRATEGY		
DEFENSIVE OR OPPORTUNISTIC	4 CASES . 3 JOINT-VENTURES . 1 TURN KEY PROJECT	5 CASES . 5 JOINT-VENTURES
DEVELOPMENT	7 CASES . 3 JOINT-VENTURES . 4 LICENSES	2 CASES . 2 LICENSES
DORMANT LOCAL	3 CASES . 3 JOINT-VENTURES	3 CASES . 3 JOINT-VENTURES
NO PARTNER OR EUROPEAN JOINT-VENTURE	3 CASES . 1 JOINT-VENTURE . 2 WHOLLY OWNED SUBSIDIARIES	6 CASES . 2 JOINT-VENTURES . 4 WHOLLY OWNED SUBSIDIARIES

This table and the analysis done in the previous sections have been summarised in figure 4 which describes the various strategic combinations which have been observed in the study and which can serve as a basis for a more general explanation of strategic behaviour in technology transfer. When the respective strategies of both European companies and ASEAN companies are analysed jointly, three major characteristics appear:

1) There is a strong similarity of strategic posture between European companies which adopt a defensive (or opportunistic) strategy and ASEAN companies which adopt a development strategy. Both are more likely medium sized and specialized in one sector, and the European is looking for one experience that the local partner can provide. The preferred mode of agreement is licensing. Licensing is also a preferred way for a European company having a development strategy but not enjoying a large experience of the region.

2) Large diversified companies adopting a development strategy based on long term establishment are more likely to develop wholly owned subsidiaries or joint-venture with a dormant partner.

3) A joint-venture is a versatile form of technology transfer agreement. It can be adopted by a European company following a defensive strategy and joining a partner having either a defensive, opportunistic or development strategy. It also can fit situations when the European adopts development strategy and the partner has a defensive or opportunistic one.

4. NEGOTIATIONS

4.1 Who took the initiative ?

In the sample as a whole, the party who took generally the initiative in the agreement is the European company. This proportion is reversed in the cases of licensing agreements, where proportionally more local partners have been the initiators (see Table 14) proportion is also preserved in the cases of French, and to a lesser extent, U.K. companies. In the case of the German companies the strategy of partner selection was very specific; it is typical of the long term establishment strategy described earlier. Otherwise no particular generalisation can be drawn from the sample to identify who is

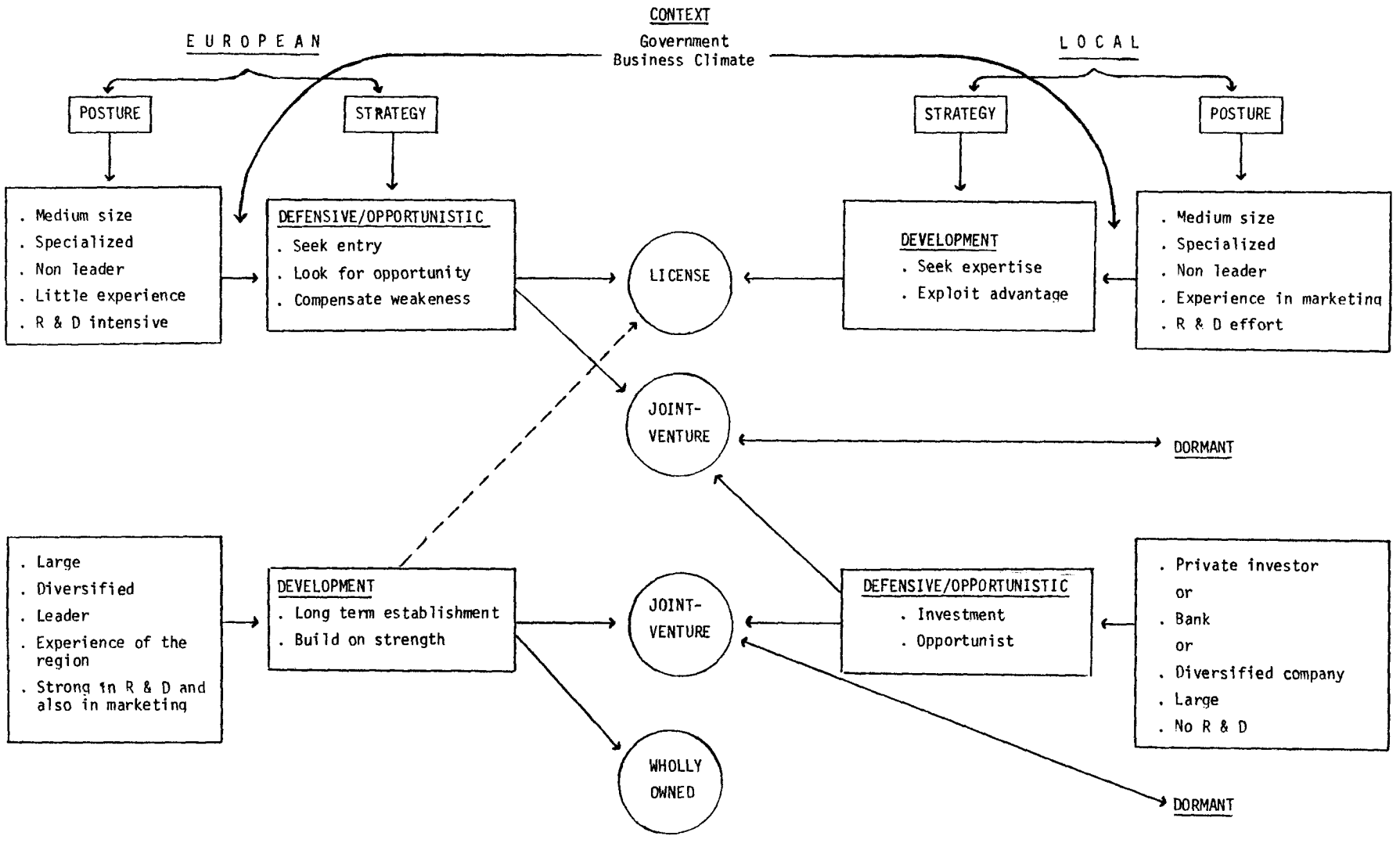


FIGURE 4

STRATEGIC FRAMEWORK FOR TECHNOLOGY TRANSFER

TABLE 14

DIFFERENCE OF INITIATIVE ACCORDING TO

TYPE OF AGREEMENT AND ORIGIN OF EUROPEAN

	INITIATIVE TAKEN BY EUROPEAN PARTNER	INITIATIVE TAKEN BY LOCAL PARTNER OR EXTERNAL SOURCES
NATURE OF THE AGREEMENT		
TURN KEY PROJECT / LICENSE	2	5
JOINT-VENTURE / WHOLLY OWNED SUBSIDIARY	19	5
	21	10 *
COUNTRY OF ORIGIN		
GERMANY / NORWAY	10	0 **
FRANCE / UK	4	7
OTHERS	7	4
	21	11
STRATEGIES OF EUROPEAN		
DEFENSIVE	11	6
DEVELOPMENT	10	5
	21	11
STRATEGIES OF LOCAL		
DORMANT OR NONE	10	3
DEFENSIVE	6	3
DEVELOPMENT	4	5
	20	11

likely to take the first step in the transfer agreement. In practice, once a strategy, either defensive on development, is put into action, the practical implementation is frequently a matter of routine. For example, one continues to go along with the agent who was already working for the company and one transforms a distributionship into a joint-venture. When one thinks of entering a country for the first time, the initiative nearly always comes from an outside source, either from an equipment supplier, as in the case of a French joint-venture, or else the name of potential partners may be given by bankers or business colleagues. In no case was the intervention of a commercial attaché mentioned. As will be analyzed in the last chapter, this apparent lack of rigour in partner selection is the source of many problems. This domain deserves more attention and a more methodic approach on the part of potential investors.

4.2 Feasibility studies

In approximatively two third of the cases a feasibility study of some sort has been done mainly on the basis of a market study and an evaluation of general considerations : business climate, weighing of advantages, etc. Financial techniques such as discounted cash flow or net present value are mentioned in passing but, as usual (*), more as a window dressing device than an actual decision-making tool.

No real pattern emerges from the analysis of the cases to explain in which case a feasibility study is done, and as it will be seen later, there is no clear relationship between the degree of satisfaction and the fact of having done a feasibility study or not.

The interviews also reflect that feasibility studies are not really an issue in technology transfer operations of this type. A feasibility study gives some structured information on the future operations and on the country but it constitutes only one part of a more subtle process of strategic analysis.

(*) A large number of studies such as the one done by J. Bower & R. Aharoni have pointed to the minor role of capital budgeting techniques in the actual investment decisions.

TABLE 15

NEGOTIATION : ISSUES AND MAJOR DIFFICULTIES

	FREQUENCY OF ANSWERS	
	EUROPEAN AND LOCAL SUBSIDIARIES	LOCAL PARTNERS
A. ELEMENTS OF IMPORTANCE DURING THE NEGOTIATION ?		
. Financial terms of the agreement	17 (60 %)	9 (50 %)
. Marketing aspects : Distributionship, Brand, Protection of share, Quota	5 (20 %)	3 (17 %)
. Technical elements	3 (10 %)	2 (11 %)
. Legal characteristics : Ownership, Control, Duration of contract	3 (10 %)	4 (22 %)
	28	18
	NUMBER OF TIME MENTIONED	
B. ELEMENTS OF DIFFICULTIES		
. Share valuation	5	-
. Government interventions and constraints	3	4
. Duration of contract	2	-
. Royalties	2	-
. Change of person	2	-
. Financial transactions	1	-
. Defining responsabilities - ownership	1	1
. Commission on equipments	1	-
. Quota - Evaluation of market	1	-
. Language	-	2
. Price of equipment	-	1
. Credit terms	-	1
. Transfer pricing	-	1
. Brand names	-	1
. Speed of setting up equipments	-	1
. Exclusivity of joint-venture	-	1

TABLE 16

HOW TECHNOLOGICAL ADVANTAGE IS PROTECTED

ACCORDING TO NATURE OF AGREEMENT

COUNTRY OF TRANSFER AND ORIGIN OF TRANSFEROR

	SOURCE OF PROTECTION			IS TECHNOLOGY PATENTED	
	None	Know How	Active Ingredients and formulation	No	Yes
A. NATURE					
. TURN KEY	1	-	-	1	-
. LICENSE	1	1	4	-	6
. JOINT-VENTURE	3	8	9	9	10
. WHOLLY OWNED SUBSIDIARY	1	1	4	2	4
B. ORIGIN OF TRANSFER					
. UK	3	0	2	2	3
. GERMANY	1	1	7	4	5
. FRANCE	1	3	2	2	4
. HOLLAND	-	-	2	2	-
. NORWAY	1	1	-	2	-
. SWITZERLAND	-	-	2	-	2
. DENMARK	-	1	2	-	3
C. COUNTRY OF TRANSFER					
. INDONESIA	-	-	7	1	6
. PHILIPPINES	2	2	4	2	6
. THAILAND	-	3	5	5	3
. MALAYSIA	1	4	1	2	3
. SINGAPORE	3	1	-	2	2

4.3 Negotiating the agreement

Table 15 gives a description of the major sources of concern of both European and local partners when they negotiated. The major concerns of both partners are related to the financial aspects of the agreement: share valuation, intangible asset valuation when part of the shares of the European is constituted of patents or trademark, asset valuation when it is constituted by equipment. Dividends, royalties, management fees and also part of the major items to be discussed. The marketing elements rank second in the preoccupations of the Europeans. The issues in this area are related to the level of minimum sales required in a licensing agreement in order for the European to be sure to collect enough yield from the transfer of active ingredients. Another issue in negotiation is the definition of markets in which an exclusivity is granted or conversely where a distribution is not allowed on the part of the licensees or joint-venture. Duration of contract for licenses is a very important issue; as mentioned earlier, licensing agreements are preferred when a European wants to enter a market he does not know. The shorter the agreement, the better it fits the needs of the European: it gives him a "free hand" if the local partner does not sell enough or if another partner proposes a better deal.

Curiously, the technological elements of the deal do not rank very high. Only in one case was the issue seriously mentioned; it concerned a joint-venture agreement between two European companies who joined their efforts in this particular country but were competitors in other parts of the world: it was important for them to protect their respective know-how. In another case, the technological aspect was mentioned vaguely as a source of real difficulties.

4.4 Protection of technology

The Europeans have organised the protection of their technological advantage through formulation (coding of raw materials, secrecy clauses). Active ingredients (obligation to use a particular proprietary) through know-how or simply through trademarks and patents (*). As indicated in 16, the protection through active ingredient or formulation is used more often in cases of licenses or wholly owned subsidaries, by German, Dutch or Swiss companies, and more likely in Indonesia.

(*) Only in 2 cases was no protective device specifically mentioned. One is the turn key project in which the technological know-how is embodied in the machinery and the manufacturing design.In the other case the respondent did not want to answer.

4.5 Climate of negotiation

After having analyzed the substance, one can look at the climate of the negotiations. Table 17 gives the distribution of cases according to the amount of difficulties and the duration of negotiations. First it appears that there is no clear correlation between the speed of the negotiation and the difficulties. The length of the negotiation depends very often on the legal requirements and the complexity of the project, and not necessarily on the negotiation climate. Negotiation appears to have been more difficult with licensing agreements with French companies, and in Indonesia and Singapore. Those relationship are rather weak for any

TABLE 17

CLIMATE OF NEGOTIATIONS

BY TYPE OF AGREEMENT AND COUNTRIES

	DIFFICULTIES		DURATION	
	NO	YES	LESS THAN ONE YEAR	MORE THAN ONE YEAR
A. NATURE OF AGREEMENT				
. TURN KEY PROJECT	-	1	1	-
. LICENSE	1	5	3	3
. JOINT-VENTURE	12	8	9	10
. WHOLLY OWNED (*)	3	I	-	3
B. COUNTRY OF TRANSFER				
. INDONESIA	2	5	3	4
. PHILIPPINES	4	4	3	4
. THAILAND	7	1	5	2
. MALAYSIA	3	2	-	5
. SINGAPORE	-	3	2	1
C. ORIGIN OF TRANSFEROR				
. UK	3	2	0	4
. GERMANY	5	3	4	4
. FRANCE	1	5	4	2
. HOLLAND	2	-	1	1
. SWITZERLAND	1	1	2	-
. NORWAY	1	1	2	-
. DENMARK	1	2	-	3

(*) concern the negotiation with the government in 2 cases and with a local manufacturer for manufacturing contracts in 2

generalizations. A more interesting analysis is to assess the negotiation climate according to the strategic types. This is done in Table 18, which suggests two interesting trends: on the one hand the more dynamic local partner is in his strategy, the more difficult is the negotiation. On the other hand, the more defensive the European is, the more difficult is the negotiation (except in the cases in which there are no ASEAN partners).

4.6 Government policies

As a source of problems and difficulties, the policies and practices of government officials have been mentioned several times. In the cases taking place in the Philippines, several references have been made to the bureaucratic practices of the Board of Investment, which delayed the signature of transfer agreements.

TABLE 18

NEGOTIATION CLIMATE

ACCORDING TO STRATEGIES OF PARTNERS

LOCAL PARTNER STRATEGY	EUROPEAN STRATEGY: DEFENSIVE-OPPORTUNISTIC		EUROPEAN STRATEGY: DEVELOPMENT	
DORMANT	Difficulties	33 %	Difficulties	0 %
	Duration	66 %	Duration	33 %
	European initiative	100 %	European initiative	66 %
DEFENSIVE OR OPPORTUNISTIC	Difficulties	75 %	Difficulties	20 %
	Duration	50 %	Duration	40 %
	European initiative	50 %	European initiative	80 %
DEVELOPMENT	Difficulties	100 %	Difficulties	50 %
	Duration	70 %	Duration	0 %
	European initiative	40 %	European initiative	50 %
NO PARTNER (*)	Difficulties	0 %	Difficulties	33 %
	Duration	66 %	Duration	33 %

(*) Agreement between Europeans and negotiations with local authorities

This table presents the percentage of cases per categories :

. in which some difficulties were mentioned
. in which the duration was more than one year
. in which the European took the initiative of the venture

In order to analyze the government interventions in technology transfer agreements, several questions concerning government constraints have been asked during the interviews. Several types of constraints have been reported in the interviews: constraint on choice of technology, on imports, on exports, on marketing and distribution, on ownership requirement, and on expatriate employment.

An interesting result derived from a quantitative analysis showed that those various constraints could be grouped in two independant clusters or types of government interventions (see table 19). Those two types of constraints are two independent devices to regulate the transfer of technology in a country : one is direct intervention into the substance of the business (regulations on operations). The other is more indirect; it is done through people.

When one compares the five ASEAN countries according to their respective scoring on a composite index of direct operational intervention and indirect social intervention, one can see the strategies of the various ASEAN countries (table 20).

Indonesia pressures through both type of regulations, the Philippines prefer to adopt a type of regulation based upon direct intervention, Thailand prefers to regulate indirectly, Malaysia is more inclined toward direct

TABLE 19

GROUPS OF CONSTRAINTS (*)

CONSTRAINTS RELATED TO THE REGULATION OF OPERATIONS	CONSTRAINTS RELATED TO THE REGULATION OF OWNERSHIP & PERSONNEL
. REGULATION OF IMPORTS . REGULATION ON CHOICE OF TECHNOLOGY	. REGULATION ON OWNERSHIP . REGULATION ON EMPLOYMENT OF EXPATRIATES . REGULATION ON NATIONALITY OF DISTRIBUTOR

(*) Obtained after factor analysis / Principal components - Varimax rotation

intervention, while Singapore is low in both dimensions. The fact that the negotiation climate was assessed as more difficult in Indonesia and in the Philippines may be also explained by a more stringent context generated by government policy. In the next chapter the effect of those policies upon the type of technology transfer will be analyzed.

The analysis of the negotiation process confirms one trend which was already emerging from the analysis of the strategies: the minor role of the technology as an explicit issue of bargaining. Technology is protected by the European either through an embodied form (machine, substance) or through a most intangible factor (know-how). While the strategy was based on market considerations, the negotiation is going to concentrate on financial, legal, or marketing aspects.

Another interesting point which emerges involves the respective strategies of the government for controlling foreign operations. They can adopt various combinations of two independant elements: substantive control which necessitates interventions in the operations, or social controls which act upon people. The five ASEAN countries are different with respect to those forms of regulation.

TABLE 20

SCORING OF THE FIVE ASEAN COUNTRIES
ON TWO TYPES OF REGULATORY POLICIES (*)

	DIRECT OPERATIONAL REGULATION	INDIRECT SOCIAL REGULATION
	(Index from 1 to 6) Mean score	(Index from 1 to 8) Mean score
INDONESIA	5.60	4.00
PHILIPPINES	3.60	3.12
THAILAND	2.75	4.00
MALAYSIA	3.16	3.16
SINGAPORE	2.75	2.75

(*) The score has been obtained by summing up the score on individual items :

- Operational regulation : Score on constraints put on choice of technology, and score on constraints put on marketing and distribution.
- Social regulation : Score on constraints put on ownership, and score on constraints put on expatriate employment.

CHAPITRE IV

THE TECHNOLOGY TRANSFER PROCESS

The purpose of this chapter is to analyze the differences in technologies transferred and therefore to answer the third and fourth research questions. What has been exactly transferred and how ?

1 SETTING-UP OF OPERATIONS

The setting-up of operations involved, in 21 of the cases, the construction of a new plant or production system (16 joint ventures, 3 wholly-owned subsidiaries, 1 turnkey project, and 1 licensing agreement). In the five other licensing agreements, there was no need to build new production facilities; the products were manufactured in the plant of the licensee. In the wholly-owned subsidiaries in the Philippines the products were manufactured by a local manufacturer of pharmaceutical products under manufacturing contract. In the five remaining cases the facilities were already existing for a long time and the respondents could not give meaningful information about the setting-up of the plant.

In the start-up phase of an operation, one generally expects the transferor of technology to be more active than the transferee. However, a participation of the transferee in the design phase of the plant contributes to the acceleration of the technology transfer by :

a) providing the project with some local perspectives which take local constraints into consideration and therefore increase its appropriateness;

b) educating the local partner to deal with the erection of an industrial facility.

1.1. The degree of participation of local Partners has been very weak in the sample observed. Only in 13 cases has it been possible to identify a participation of the local partners in the setting-up.

Table 21

Degree of Participation of Local Partners in the setting-up of the plant	
. Participation limited to the feasibility study only	4 cases
. Participation limited to the construction phase only	2 cases
. Participation limited to the operations of starting-up	1 case
. Participation to feasibility design, construction and starting-up	6 cases

Very few local partners complained about this situation. In one particular case, a conflict developed between the European company responsible for the erection of the equipment and the local partner responsible for the constructio work. The construction was delayed and each partner was blaming the other. In this particular case, the local partner used to come on site at 6 o'clock in the morning to give instructions which were not in line with the European's ones. In another case, the local partner had the feeling that he had been recruited as a partner only to smooth things with the government, while he expected more involvement in the project.

1.2. The use of external consultants to supervise the work has been identified in only three cases; in all the others the European company sent to the region at least one of its engineers. In the most extreme case, a French company had sent more than 40 expatriate engineers to get the plant started. As expected, the construction work was done by local contractors (17 cases) or by local firms managed by European or US managers (4 cases).

1.3. The design of the plant was done in Europe without adaptation in 10 cases, while in 7 cases local adaptations were suggested by the subsidiary or the project team established locally. In only four cases was the design done locally. In two large groups' subsidiaries, managers complained about the fact that European designs were much too sophisticated for the country:

> "In our mother country, there is a Technical Assistance Service which designed the plant; they are expensive and they are 'perfectionist'. The subsidiary tries to use them as little as possible. However, plant layouts are standard".
> (Managing Director of an Indonesian Subsidiary)

In the same vein another one mentioned:

> "The engineers in Germany 'overdesign'. They must have 100% certainty in performance. They do nos always understand local conditions".

However, except for two cases which will be analyzed in the last chapter, the sophistication of the technology was not a main source of dissatisfaction. In most cases, necessary appropriate training was done locally and in Europe in order to initiate the local managers, engineers and work forces to the technology (see Table 22). The more the production technology concerns intermediate products located upstream in the technological flow, and the more the process involves the manufacturing of raw materials with a mix of batch and continuous processes, the more start-up training is done, and the more it needs to be organized overseas.

1.4. The conclusions which can be drawn from those various observations are that at the early stage of the technology transfer the European companies have shown a strong desire to control the setting-up of the plant, in order to fulfill their contractual obligations, and the involvement of the local partners have been limited. European have shown willingness to train the local personnel, either locally, by sending a training team especially for downstream technology in consumer goods, or in Europe, when the technology moves upstream. The limited use of local resources except for construction work is surely understandable due to the scarcity of local engineering and consulting companies in the ASEAN countries. This lack of local involvment at the setting-up phase was not identified in this study as a source of problems except in two cases.

2. THE NATURE OF THE TECHNOLOGICAL PROCESS

2.1 Dimensioning of technological process

Several characteristics of the technological process have been assessed:

2.1.1. The nature of the product involved in the technology transferred has been roughly categorized into two main classes :

1) Consumer products sold to the final consumers : pharmaceuticals detergents, toilet preparations, paints, insecticides and

TABLE 22

DISTRIBUTION OF CASES IN WHICH

A START-UP TRAINING HAS BEEN ORGANIZED BY THE TRANSFEROR

	NUMBER OF CASES	NONE	LOCAL	EUROPE & LOCAL
NATURE OF PRODUCT				
. CONSUMER GOODS	19	6	9	4
. INTERMEDIATE	10	2	2	6
	29			**
TECHNICAL OPERATION				
. RAW MATERIAL	6	1	0	5
. FORMULATION, MIXING PACKING	17	5	9	3
. PACKING, MIXING ONLY	4	1	2	1
	27			**
PRODUCTION PROCESS				
. BATCH	21	7	10	4
. BATCH & CONTINUOUS	7	-	1	6
	28			**
TECHNOLOGICAL STAGE				
. MORE UPSTREAM	10	2	2	6
. MORE DOWNSTREAM	19	6	9	4
	29			**

2) intermediate products sold to other industries : organic and synthetic chemicals, dyestuffs, gases, synthetic fibres plastics, synthetic rubber. When one company included both types of product, it was categorized according to the sector which dominated.

2.1.2. The position in the technological flow : The local operations have been put into two categories :

1) those using upstream technology, and
2) those using downstream technology.

In the chemical industry, the technology can be represented as a fan (See Figure 5).
The closer to the core technology, the more upstream is the process.

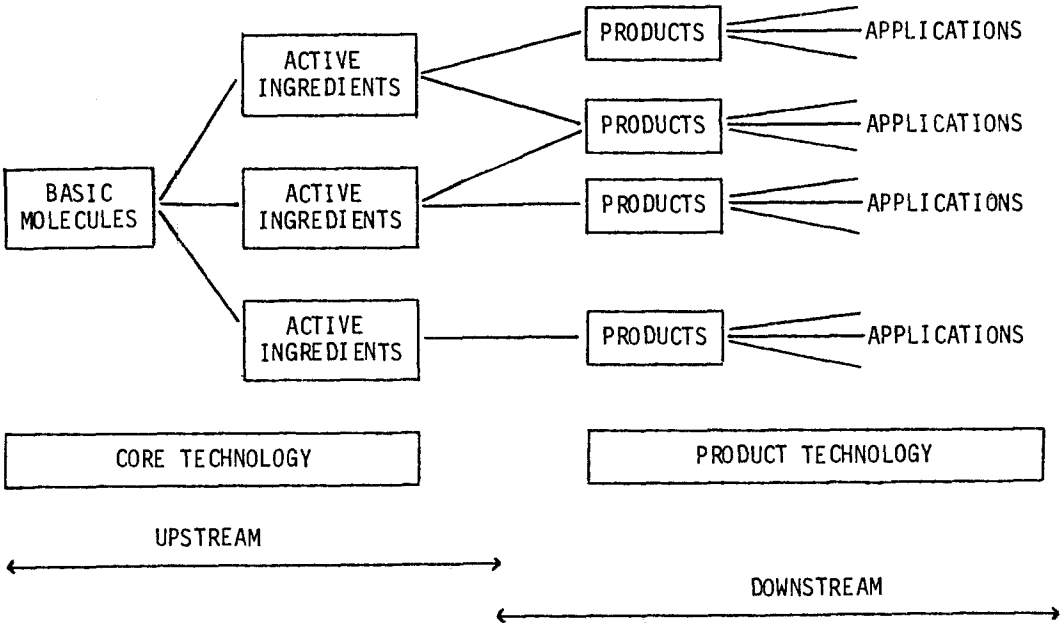


FIGURE 5

TECHNOLOGICAL STREAM IN THE CHEMICAL INDUSTRY

2.1.3. Technical operations : this classification, very similar to the previous one, tries to identify in each case what particular operation is performed by the company investigated. In the chemical and pharmaceutical sector, four basic operations have been identified :

- manufacturing of active ingredients from raw material,
- formulating : manufacturing of a product on the basis of the right mix of basic active ingredients
- mixing, giving a final shape to the product, i.e. tablets, powder, liquid, etc.
- packing is the final stage before commercialization. Sometimes mixing and packing are done together.

In no case was there packing only. Therefore only three categories have been adopted.

2.1.4. The production technology : two main categories have been used to describe the production methods :

- a) batch production and
- b) continuous production.

In all but two cases, batch production techniques were used; therefore the sample is divided in two categories : those using batch only and those also using continuous.

TABLE 23

SIMILARITIES OF TECHNOLOGICAL MEASURES

	NATURE OF PRODUCT		TECHNOLOGICAL FLOW		PRODUCTION METHOD	
	INTERMEDIATE	CONSUMER	UPSTREAM	DOWNSTREAM	CONTINUOUS & OTHERS	BATCH ONLY
TECHNOLOGICAL OPERATION						
. ACTIVE INGREDIENT	7	1	7	1	6	-
. FORMULATION, MIXING, PACKING	2	16	3	15	2	16
. PACKING AND MIXING	2	3	-	5	-	5
	11	20	10	21	8	21
PRODUCTION TECHNOLOGY						
. CONTINUOUS & OTHERS	8	2	8	2		
. BATCH ONLY	4	18	3	19		
	12	20	11	21		
TECHNOLOGICAL FLOW						
. UPSTREAM	8	4				
. DOWNSTREAM	4	17				
	12	21				

TABLE 24

SALIENT CHARACTERISTICS OF TECHNOLOGICAL TYPES

	NATURE OF PRODUCT		TECHNOLOGICAL FLOW			PRODUCTION METHOD		TECHNOLOGICAL OPERATION		
	INTERMEDIATES	CONSUMERS	UPSTREAM	UP AND DOWN	DOWNSTREAM	CONTINUOUS AND BATCH	BATCH ONLY	ACTIVE INGREDIENTS	FORMULATION MIXING PACKING	MIXING PACKING
A. MARKET CHARACTERISTICS										
. SIZE		⊕			⊕		⊕		⊕	⊕
. DISTRIBUTION CHANNELS		⊕			⊕		⊕			
. PROMOTION EFFORT		⊕					⊕		⊕	
B. SERVICES TO CUSTOMERS										
. VISITS		+		⊕	⊕		⊕			
. DEMONSTRATION		+		⊕	⊕					
. TRAINING		+						+	+	
. ASSISTANCE	+							⊕		
. MAINTENANCE	⊕									
C. INCREASE IN PERCENTAGE OF LOCAL SUPPLIERS							⊕		+	+
D. TRAINING EFFORT TO START OPERATIONS	⊕		⊕			⊕				
E. DEPENDENCY FROM EUROPE										
. TECHNICAL DATA			+			⊕				
. TRAINING			+	+		+				
. ASSISTANCE			+			⊕				
. RAW MATERIALS				+	⊕		⊕		⊕	⊕
. PROCUREMENT				+			+		⊕	⊕
. IMPORT				+			⊕		⊕	⊕
F. SIZE OF INVESTMENT	⊕		⊕			⊕		⊕		
G. TYPE OF AGREEMENT										
. LICENSE		+			⊕				⊕	
. JOINT-VENTURE								+		
. WHOLLY OWNED		⊕		+	+		+		+	+
. TUN KEY	+					+		+		
H. COUNTRY OF TRANSFER										
. INDONESIA		⊕			⊕		⊕		+	
. THAILAND		+			⊕		⊕		+	
. MALAYSIA										
. PHILIPPINES										
. SINGAPORE	+		+			⊕		⊕		
I. COUNTRY OF ORIGIN										
. UK										
. GERMANY		⊕		+	+		⊕		+	
. FRANCE										
. HOLLAND		+		+			+		+	
. SWITZERLAND		+		+			+		+	
. NORWAY	+									
. DENMARK		+		+					+	

⊕ indicates that there is a larger proportion of cases (significant at 0,10)

\+ indicates that there is a larger proportion of cases (not statistically significant)

2.2. Two types of process contrasted

Those four measures are highly correlated (See Table 23) and taken together, they describe two basic types of technology:

1) TYPE 1 which can be called UPSTREAM TECHNOLOGY concerns mainly intermediate products, involving continuous operations and the production of active ingredients;

2) TYPE 2 called DOWNSTREAM TECHNOLOGY which concerns mainly consumer products, involving batch operations and consisting of formulating, packing and mixing.

In the automobile, the mechanical or the electronic industry, Type 1 would be component technology, and Type 2 would be assembling technology.

In Table 24 several cross tabulations between the various measures of technological processes have been reported, and a summary of those characteristics is presented in Table 25 in order to differentiate Type 1 and Type 2 technologies. The major differences are now discussed:

TABLE 25

MAJOR DIFFERENCES BETWEEN
UPSTREAM AND DOWNSTREAM TECHNOLOGY

	TYPE 1 : UPSTREAM TECHNOLOGY	TYPE 2 : DOWNSTREAM TECHNOLOGY
TYPE OF SERVICES GIVEN TO THE CUSTOMER	. Based more on interventions, technical assistance maintenance.	. Use more services based on visits and demonstration
	Applications	Demonstration
TRAINING EFFORT	. More important to start operation - need more travel to Europe.	. Done more locally
TYPE OF MARKET	. Small in size . Small number of distribution channels . Direct promotion only	. Large consumer market . Large number of distribution channels . Large promotion efforts
DEPENDENCY FROM EUROPE	. Based more on the transfer of services (assistance, training, informations).	. Based more on the transfer of goods (active ingredients)
ASSET BASE	. Large (more employees)	. Small
LOCAL SUPPLIES	. Have not increased significantly over time	. Have increased over time

2.2.1 Size and scope of investment

Upstream technology call for a large investment : In the sample the original investment averaged 37 million dollars, while the present assets average 40 million dollars for the operations using this type of technology; the average goes down to 1,5 million dollars for original investment and 4,5 millions dollars for present assets in cases using type 2 technology. This contrast is not so marked in sales (Type 1 average sale = 20 M$, Type 2 = 1M$) nor in number of employees, (Type 2 average = 350, Type 2 average = 200), although type 1 technology tends to procure more employment and to generate more sales.

On the other hand, the size of the markets expressed in dollars is larger in type 2 technology (average = 120 M$) than in type 1 (average 50 M$). No significant difference was observed between the scope of the market (regional versus national) and the type of technology.

This reversed proportion between the size of the investment and the size of the market served is one of the factor which explain why there may not be more investment in upstream technology : the investment is large for the expected result. The following comparison between the average turnover per per $ of assets and per $ of market size works to the advantage of type 2 technology from a private investor's point of view (*)

Ratios	Type 1 Upstream technology	Type 2 Downstream technology
Average SALES / ASSETS Ratio	0,5	2,5
Average MARKET SIZE / ASSETS ratio	1,25	26,-

In order to make an investment in upstream technology more attractive, one needs to improve the sales factor since the assets factor is technologically bounded, and in order to act upon the sales factor, one needs to enlarge scope of the market. This is exactly what is lacking at the present time: the ASEAN region is not yet a market and it is therefore not economical to produce active ingredients for separate national markets, while it is attract-

(*) Unfortunately not enough data have been obtained about the rate of protif. The limited information collected does not indicate a clear difference in profit rate between the two types of technology.

ive to produce with downstream (low capital intensive) technology for national consumer markets. As Table 24 shows, Indonesia and Thailand are the countries in which downstream investments are proportionally more frequent than upstream investments.

The only exception is the Philippines, where a special effort to attract upstream technology. The policy developed by Indonesia to oblige pharmaceutical firms to produce active ingredients in the country confronted this issue. Several companies insisted upon the fact that only large scale operations could justify upstream investments, it was far from clear whether the ASEAN market could be considered as one single market.

2.2.2. Communications with the market

Another main set of differences between upstream and downstream technology comes from the way communication with the market is organized. Communication with the market is done through the promotion and the distribution effort ; it takes place before the selling of the product. Sales visits and advertising communicate convictions or purchasing behaviour to the market, but transfer little know-how; this is a communication by demonstration. Another way of communicating with the market is to assist the consumer in the utilisation of the product ; the know-how which is transmitted is an application know-how. The consumer learns how to use a particular type of resin or fibre; the nurse learns how to use a particular type of medicine. The communication of application know-how is done through assistance. Both type 1 and type 2 technological processes use demonstration and assistance communication, but upstream technology uses more assistance while downstream technology uses more demonstrations. An example of the assistance communication developed by a type 1 operation is provided by a Thai joint-venture in artificial fibres whose customers are small Chinese textile manufacturers with little technical expertise. Each time an order is delivered, a technical adviser has to come to the customer's plant in order to help him to set up the machines. A monthly visit is done to assist the customers in their operations. In the paint companies both types of communication are found, but assistance is of prime importance for industrial and automotive paints. Finally the pharmaceutical firms insist on demonstration type of communication through their network of detailmen but they also provide assistance to hospitals by organizing special training sessions for nurses. As a whole, however, the more the firm tends toward type 1 technology, the more it develops a communication with the market which goes beyond simple demonstration.

Assistance to customers seems to be an original and typical constribution of the chemical and pharmaceutical industry to technology transfer in the ASEAN countries. In contrast to the traditional view of technology transfer in which it is depicted as the import of sophisticated equipment, this study reveals that a large part of transfer occurs on a day-to-day basis through the links established between customers and technicians concerning the technology of applications.

One example would be the intangible knowledge of consumer preferences acquired by participating in a given culture; it was this kind of knowledge that in 1912 suggested to Henry Ford the possibilities of standardized high volume car production. The potential mass market to which he was turning had as yet no way of registering its choices, and its aspirations had to be intuited from many transient and ambiguous signals.

Another example would be the awareness of available opportunities that one develops as one masters the complexities of a given field of inquiry. An improvement in instrumentation or analysis may open the road to major advances in an area that has proved refractory to all investigation : an inability to decipher the insulin molecule has until recently held up progress in the treatment of diabetes and it is only with development of X-ray crystallography that the problem was overcome and new opportunities for progress became possible (Rosenberg, 1976, p.270).

2.2.3. Links with the European operations

Another difference between upstream and downstream technology comes from the type of dependence established with the mother companies.

Companies using downstream type of technology are more dependent for their supply of raw materials, while upstream technology firms rely on European headquarters for technical assistance and training.

In the downstream types of operations, transferor companies have embodied the technology in the active ingredient which is shipped to the local operation to be mixed and packed, while in the upstream operations, the local plant has to solve on site problems related to the core technology and therefore needs technical assistance on the part of the mother companies.

2.2.4. Training effort

With one exception involving a larger training effort done by the upstream type of technology at the starting-up of operations, no significant differences appear between the two types of technology with regard to the training of the workforce. The two types of operations made equal efforts in manager and lower level personnel training on the job which was organized inside or outside the firms. Only in the case of firms manufacturing active ingredients was the proportion of manager training done in Europe larger than for the other process. This reflects the dependency which was discussed earlier. This lack of significant difference in training effort according to the type of technology comes as a surprise. One would have expected the training to be more intense when the firms use the more complex technologies of type 2. This lack of difference can be explained by the way the data have been scored. In 31 cases for managers and in 28 cases for lower level personnel, some sort of training was organized regularly after the start up training. This encompasses the quasi totality of the sample therefore no quantitative difference can really be grasped. When one turns to a more qualitative analysis of the training effort organized in each case, one observes a more rigorous and intense effort of training done by companies having an a upstream technology orientation. Some examples of this effort can be suggested as follows:

Example 1 In the Malaysian and Singaporian subsidiaries of a joint-venture between a French and a UK company a systematic scheme of senior and middle management training is organized in Europe and locally. For lower echelon a pyramid training is instituted in which everyone in the firm is trained to do the tasks at the next level up the hierarchy.

Example 2 In a textile fibres joint-venture, local top managers are systematically sent to Europe for a period of 6 months to one year while technical courses are provided regularly to middle managers and foremen.

Example 3 In a joint-venture subsidiary of a large group, which is manufacturing a whole range of products ranging from active ingredients to consumer products, the firm is developing a joint training program with the local drug association. The government has asked the firm for assistance in training government employees in quality control. These were sent to Germany at the firm's own cost after they had received language training.

In the downstream type operations the training effort is oriented toward the marketing personnel, and the typical training programs, in those types of operations, involve one to two day sessions organized for detailmen in order to brief them about the characteristics of the products.

2.2.5. Form of the transfer agreement

Observation of Table 24 indicates that licensing agreement and wholly owned subsidiaries are less frequently in type 2 technologies while joint-venture fits with both types. There are not enough cases of turn key projects in the sample to draw a conclusion that this one case is associated with type 1 technology. If one exempts this turn-key project case, the following relationship seems to hold between the type of technology and the form of transfer (figure 6):

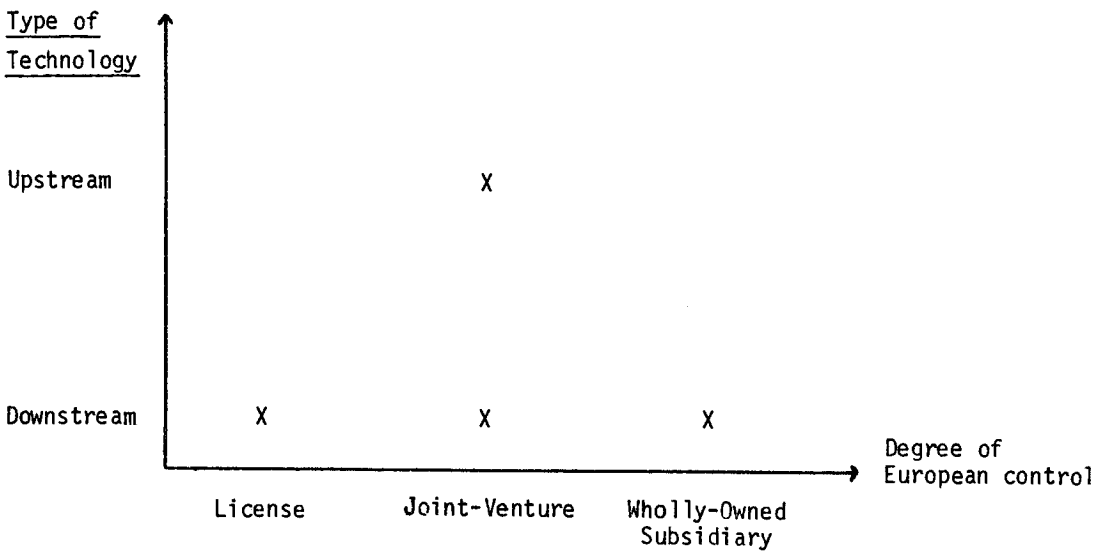


FIGURE 6

SCHEMATIC RELATIONSHIPS BETWEEN

TYPE OF TECHNOLOGY AND NATURE OF AGREEMENT

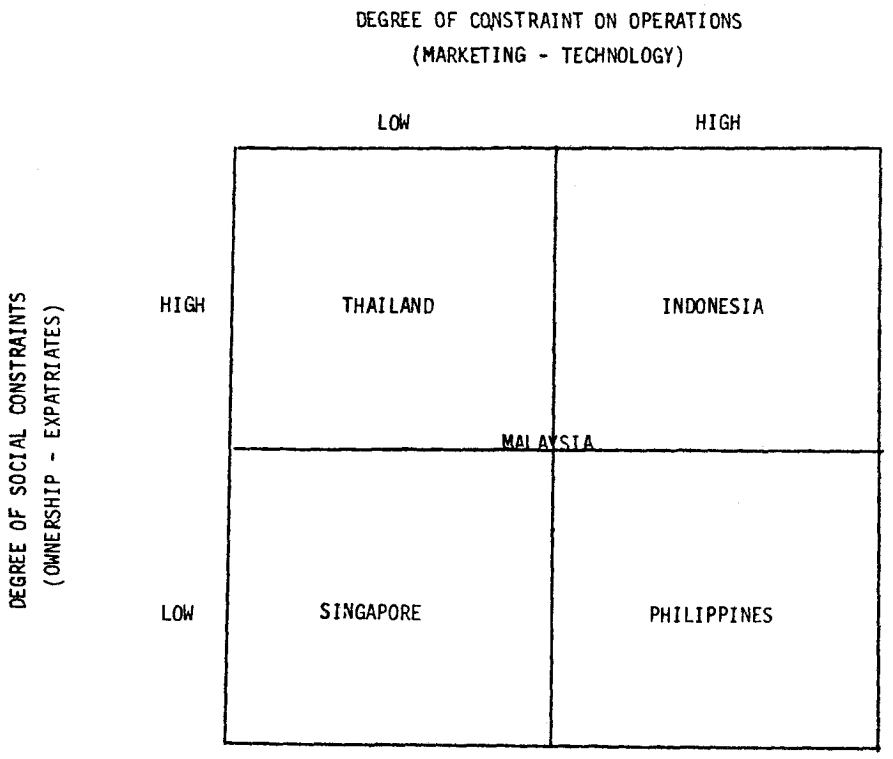
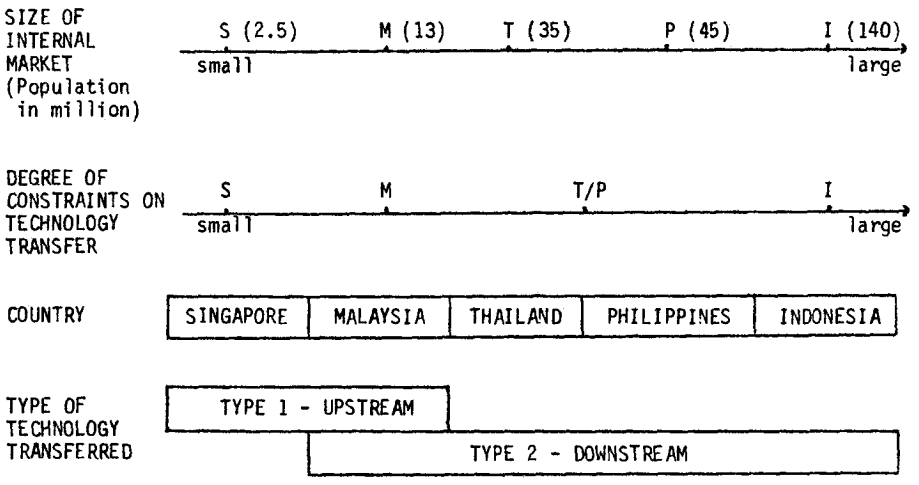


FIGURE 7

CLASSIFICATION OF ASEAN COUNTRIES ACCORDING TO THE TYPE OF CONSTRAINTS THEY PUT ON TECHNOLOGY TRANSFER



(I = Indonesia, P = Philippines, T = Thailand, M = Malaysia, S = Singapore)

FIGURE 8

RELATIONSHIP BETWEEN GOVERNMENT POLICY
SIZE OF INTERNAL MARKET AND TYPE OF
TECHNOLOGY TRANSFERRED IN THE FIVE ASEAN COUNTRIES

The explanation may be found in the degree of risk. As observed earlier, upstream technology is financially risky. The European company therefore is likely to lower its risk exposure when it bears the risk alone as in the case of the wholly owned subsidiary, while the local company may prefer to lower its risk exposure in the case of a licensing agreement. Thus it is only when risk is shared, as in a joint-venture, that they can flourish by the fact that two of the joint-ventures included in the category of upstream technology come from two European companies who joined their effort in order to share the risk associated with their operations.

2.2.6. Country of transfer

Indonesia and Thailand have a higher proportion of type 2 technology while Singapore has a higher proportion of type 1. The Philippines have an equal share of both while Malaysia has more type 2, but not significantly. The case of Singapore does not come as a surprise given its small national market, the minimum range of constraints on foreign investment, and the availability of local financing and skilled personnel. Indonesia and Thailand, on the other hand, are not surprising either, given the expansion of this consumer market. The most surprising comes from the Philippines, where, out of 8 cases, 3 clearly present the characteristics of type 1 technology, while the other ones are of type 2 technology, with one case having some characteristics of both types. As a matter of fact among the 3 cases of type 1 technology, all present a "special" characteristic with regard to the whole sample : one is a turn-key project of a paper pulp factory; another one is a joint-venture in a type of industry which is different from the main stream of the chemical industry; the third case concerns a licensing agreement in a metal based firm. Therefore all 3 cases are "exceptions" and one can consider that the Philippines also fit with the hypothesis that in large consumer markets with constraints put on technology transfer there is a tendency for technology transfer to be done in downstream technology. This seems to confirm a relationship between the degree of constraint applied by the government and the type of technology.

In figure 7 the five ASEAN countries have been categorized according to two dimensions related to the constraints put by the governments on technology transfer (see previous chapter).

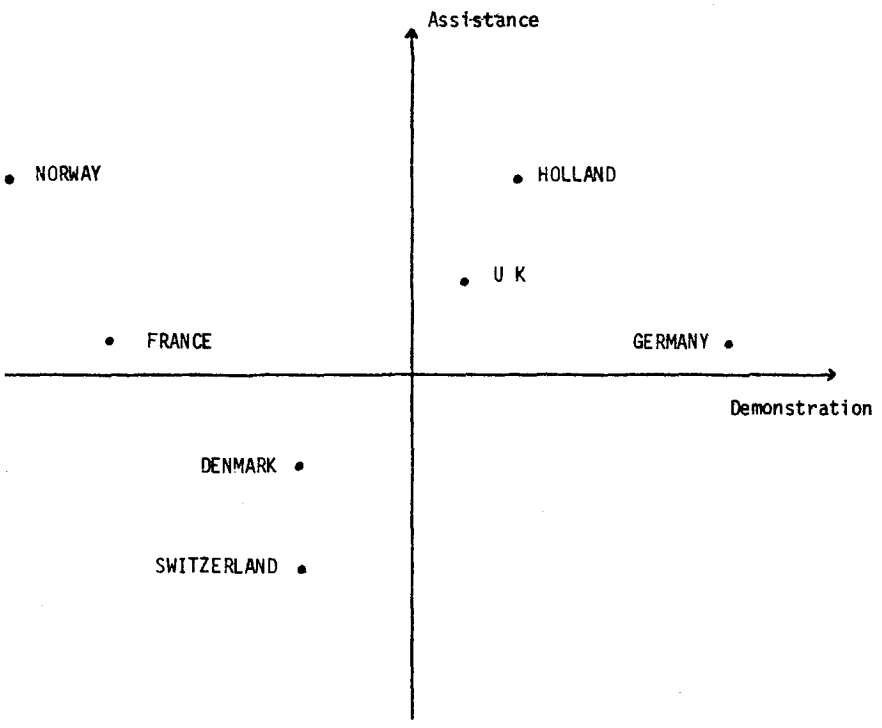


FIGURE 9

CLASSIFICATION OF COUNTRY OF ORIGIN ACCORDING TO THE SERVICE TO CUSTOMERS

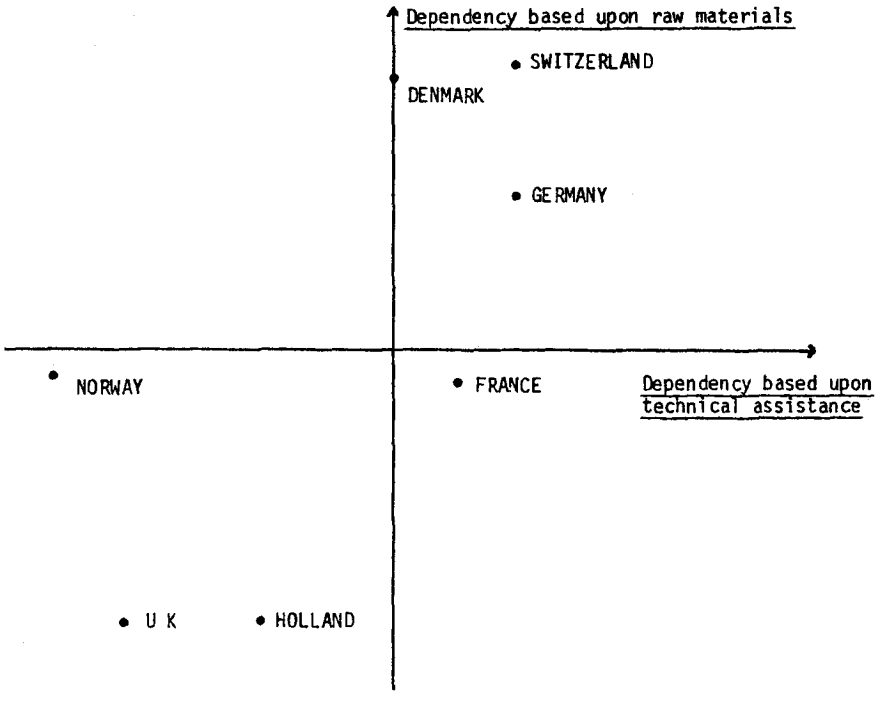


FIGURE 10

CLASSIFICATION OF COUNTRY OF ORIGIN ACCORDING TO THE DEPENDENCY OF SUBSIDIARY

a) Operational constraints indicate the degree of constraints put on marketing (for instance the obligation to go through a local distributor or price control) or on technology (for instance the obligation to have an import permit, the obligation to have only new machine, the requirement to manufacture active ingredients)

b) Social constraints indicate the degree of constraints put on ownership (need to have a local shareholder) or on the employment of expatriates.

The diagram of figure 7 is based on the computation of an index built according to the answers given during the interviews. It appears that Indonesia is the country with the most constraints in both dimensions; the Philippines scores more on operational constraints; and Thailand, on social constraints. Malaysia is in-between and Singapore low in both dimensions.

Taking together those two parameters: degree of constraint and size of internal potential consumer market (as measured according to the population), one can construct a diagram (figure 8) which illustrates the correlation between those dimensions and the type of technology.

2.2.7. Country of origin

The only really significant relationship between the origin of the transferor and the type of technology concerns German cases which are proportionally more engaged in type 2 technology along with Dutch, Swiss and Danish firms (although for those latter 3 countries the number of cases is too small to draw a general inference) while British and French are engaged in both technologies and Norwegian, in type 1 technology.

The result concerning German corporations was not expected. As indicated earlier, large German groups have developed a long-term establishment strategy in the region with a global perspective.

The active ingredients are produced economically in a central place and the product formulation, mixing and packing are done in the subsidiaries for commercialization in their countries. In order to show the originality of German subsidiaries in the technology transfer process, figures 9 and 10 have been drawn. They present the position of the case according to the nationality of the transferor and the degree to which the local operations are servicing

their local customers (the relative degree of demonstration and of assistance) and the types of dependent links which are established with the operations (based on raw materials and based on technical assistance). As described earlier, transfers of type 2 technologies exhibit more demonstration communication and more dependency based upon raw materials.

Germany subsidiaries rank high in both dimensions (demonstration and dependency on raw materials) but also they rank relatively higher than average on the other dimensions (service based upon assistance and dependency based upon technical assistance). It is the only country which presents this dual characteristic. In other words, German subsidiaries are primarily developing type 2 technology but they also develop features which are typical of type 1. A further explanation is provided by the fact that operations of German origin are those which are proportionally more diversified and offer products which have the highest degree of sophistication in consumers' eyes.

3. CONCLUSIONS

The various analysis presented in this chapter have revealed four major characteristics of the process of technology transfer in the chemical and pharmaceutical industry between European and ASEAN companies.

1) A large proportion of the technology transferred in this industry is an application technology. The main recipient of the technology is not the industrialist who has made the agreement but his customers; the main devices for transfer are technical assistance, technical services and demonstration.

2) Two basic types of technology can be transferred. A first type concern upstream manufacturing, capital intensive, strongly limited with the european companies through technical services. A second type is a downstream technology more concerned with consumer products and with low capital intensive production processes consisting mainly of mixing, filling and packing.

3) Type 1 technology represents the highest commercial and financial risk; it implies a larger transfer of technology internal to a firm. In order to develop, it needs a large market. In many cases, the market of an individual ASEAN country is too small to make profitable investments in type 1 technology. A further complication comes from the regulation policies of the various governments.

4) A substantial training effort is made by the european companies in their operations of technology transfer, the effectiveness and efficiency of this training is still difficult to assess.

CHAPTER V

ASSESSMENT OF THE RESULTS OF THE TECHNOLOGY TRANSFER

Since the main objective of the study was to assess the success or the lack of success of each technology transfer and to identify the underlying reasons and possible explanations, a large part of each interview was devoted to asking executives how they perceived the results of their operations. The first part of this section will analyze their answers from the point of view of the European headquarters. In a second part, the point of view of the ASEAN companies will be analyzed and in a third part a global assessment will be made.

1. SUCCESS AND LACK OF SUCCESS: THE EUROPEAN POINT OF VIEW

The majority of the European headquarters (55%) are satisfied with the results of their operations in the 33 cases investigated, while 45% indicate unsatisfactory, problematic or moderately satisfactory results. The problems which were most frequently mentioned by the 15 European respondents who expressed dissatisfaction, concern marketing functions (6 cases), production or technological functions (5 cases), or profitability (4 cases).

When marketing and profitability problems are mentioned as the main source of concern their manifestations are somewhat subtle; in some cases it refers to the fact that the quality of output is not up to standard; in some other cases the target volumes of output have not been achieved; while in some cases the European headquarters show dissatisfaction with the behaviour of the local partner of local attitudes.

1.1. Source of Problems Mentioned by European Headquarters

A further extension of the analysis of the reasons attributed to the problems has shown that the answers may be classified into three categories.

1.1.1. Reasons attributed to general conditions

Those reasons concerning the economic conditions of the country or the industry: inflation, devaluation, overcapacity, severe or unfair competition, over-extension of credit terms, were mentioned 8 times by Europeans*. In one case, the investment in a plant which led to a joint-venture agreement has been planned when the economic conditions were very promising and the sales forecast very ambitious. Since then, the oil crisis has considerably reduced the scope of the market. The Indonesian devaluation of November 15, 1978 was mentioned several times as a source of real problems since imported active ingredients are purchased with foreign currency. The cost of raw materials went up by 50% for the licensee or the joint-venture partners, creating, at least at the time of the study, severe constraints on the market development of the product. Some European executives mentioned the particular problems involved with the competitive climates of industries in which the main elements of technological advantage are grounded in application technologies. It is often the case, that as soon as the venture or subsidiary of a European firm has launched new applications, a local entrepreneur invests in the same domain and competes on the basis of price. Since the whole development and marketing effort oriented towards applications has been already made, the new-comer can capture a sizeable part of market share. This explains why, in some highly sophisticated markets, competition can still be based on price and create problems for the European firm.

Frequent reference is made to the competitive practices of the Overseas Chinese business community. One company executive observed:

> "It is difficult to come to grips with the Chinese hold on distribution; it is quite intangibe and this makes it difficult to carry out one's own distribution without making a very large investment at the outset in order to leave any impact at all. The Chinese impact on local trade practices has been a dominant influence. They keep the region together and make it more difficult to break into the region."

---

* Even the respondents who were satisfied as a whole could mention a source of problems. A single respondent could indicate several sources.

Some others attribute the difficulties of doing business in the region to the overwhelming Japanese presence:

> "A potential customer who is Japanese will not buy from a European firm if there is a Japanese supplier available. As long as European remains a minor investor in South East Asia, the place will get more Japanese by the day."

1.1.2. Reasons attributed to government policy

Government policies were mentioned by European headquarters as a source of concern in 9 cases.

The major problems mentioned are the regulations implemented by some countries in order to force local production of active ingredients:

> "Indonesia is forcing the firm to carry out a chemical reaction locally. Scale problems and quality problems make this unprofitable. Also this raises the problem of acceptability in third markets."

The registration procedure is perceived in some cases, especially in Thailand and Indonesia, to be biased in favor of local competitors.

One company specifically stated that the regulation on remittances in Indonesia forced the firm to play the transfer pricing game.

In Malaysia the government's policy to encourage the development of indigenous entrepreneurs (bumiputras) is not really perceived as a source of problems by the European headquarters, while this obstacle was often mentioned by the managers of the local subsidiaries. The European headquarters, in contrast to their local subsidiaries, did not mention corruption of government officials as a source of problems. One area manager stressed that dealing with "corruption was left to the local partner."

1.1.3. Reasons attributed to partnerships and skills

The major sources of problems from the point of view of European headquarters are related to the social environment and to the attitudes and behaviour of local partners. In five cases the respondents complained about the lack of skills of the local labour force and poor managerial capabilities of middle managers. If one excepts Singapore, where no remark of this sort was made, four other Asian countries were subjected to this criticism. Specific problems with the local partners were mentioned in 7 cases in three countries: Thailand, Indonesia and the Philippines. In one case the respondent talked about

TABLE 26

EUROPEAN ASSESSMENT & NATURE OF AGREEMENT

COUNTRIES OF TRANSFER & TYPE OF PRODUCTS

	TOTAL	UNSATISFACTORY CASES	MODERATE SATISFACTION	SATISFACTION
a) NATURE OF THE AGREEMENT				
Licensing	6	5	-	1
Joint Venture	20	4	5	11
Wholly owned	6	1	-	5
	32 **	10	5	17
b) COUNTRY OF TRANSFER				
Indonesia	7	4	1	2
Phillipines	7	5	-	2
Thailand	8	1	3	4
Malaysia	6	-	1	5
Singapore	4	-	-	4
	32 *	10	5	17
c) TYPE OF PRODUCT				
Raw Material and Intermediary	3	-	1	2
Intermediary	8	2	-	6
Intermediary and Consumer	10	2	4	4
Consumer	11	6	-	5
	32 *	10	5	17

Statistical Significance: *** 0.01
** 0.05
* 0.10
NS between 10% and 15%

"political and conspirational games" which prevented the venture from growing as fast as it could. In another case the local partner was suspected of engaging in systematic uncooperative and disruptive behaviour in order to buy back the venture at a cheap price. In a third case the local partner who was supposed to manage the factory of a joint-venture company was very often present at his office and did not delegate any responsibility to middle managers. As a result, productivity of the factory was very poor. In three cases of licensing agreements (2 in Indonesia; one in the Philippines) the licensee was suspected of neglecting to develop the sales of the licensed product.

1.2. Salient characteristics of successful and unsuccessful cases

As mentioned earlier, out of the 33 cases, 15 were perceived unsatisfactory, problematic or moderately successful, while 17 were reported to be satisfactory by the European headquarters. In one case the opinions of the European headquarters could not be obtained. This section attempts to identify the salient characteristics of the successful and unsuccessful cases as perceived by the European headquarters.

1.2.1. Nature of the operation, country of transfer and sector

As Table 26 indicates, the European headquarters express more dissatisfaction with licensing agreements and more satisfaction with wholly owned subsidiaries, while joint-ventures give mixed results.

The countries where the more problematic cases are encountered are Indonesia and the Philippines, while Singapore and Malaysia are more satisfactory. Thailand presents mixed cases.

Activities which involve consumer goods are more problematic than those which deal with raw materials and intermediary goods.

1.2.2. Characteristics of the Transferors (see Table 27)

Among the European companies, the French ones are the most unfortunate, since four out of five operations involving French companies are qualified as unsuccessful. A less extreme result would be obtained if one added to those five cases the two which are the result of joint-ventures with French companies, and which are qualified as successful or moderately successful. Nevertheless, this result confirms the lack of experience of French companies in South East Asia.

TABLE 27

EUROPEAN PERCEPTION & CHARACTERISTICS OF TRANSFERORS

	TOTAL	UNSUCCESSFUL OR PROBLEMATIC	MODERATE	SUCCESSFUL	
a) Country of Origin					
. France	5	4	-	1	*
. Germany	9	3	2	4	
. U.K.	5	1	1	3	
. Denmark	3	1	-	2	
. Holland	2	-	1	1	
. Norway	2	-	-	2	
. Switherland	2	1	-	1	
. DUAL ORIGIN and	4		1	3	
. Joint companies					
	32	10	5	17	
b) Size (Number of employees)					
. Less than 1000	3	3	-	-	*
. 1000 to 9999	8	3	1	4	
. 10000 to 50000	6	1	-	5	
. More than 50000	15	3	4	8	
	32	10	5	17	
c) Degree of Diversification					
. Single	4	4	-	-	*
. Dominant	5	1	1	3	
. Related diversification	17	4	4	9	
. Unrelated diversification	6	1	-	5	
	32	10	5	17	
d) Competitive Position					
. Leader	12	1	3	8	
. Major	13	4	2	6	
. Medium or small	7	5	1	1	*
	32	10	5	17	

.../...

TABLE 27 (ctd)

	TOTAL	UNSUCCESSFUL OR PROBLEMATIC	MODERATE	SUCCESSFUL
Motivation to Transfer				
. Defensive	14	7	-	7
. Opportunistic	2	2	-	- *
. Development	16	2	4	10 *
	32			
Policy Toward Asean				
. None or trial	6	3	2	1
. Country by country	20	5	3	12
. Regional	4	1	-	4
	30			
Structure				
. Functional	6	5	-	1
. Divisional	9	3	1	5
. Mixed	16	2	4	10
International Structure				
. Export	3	3	-	-
. Mother daughter or product division	13	4	2	7
. Matrix	14	2	3	9
	30	9	5	16
Previous Relationships in the country				
. None	4	3	-	1
. Export	13	4	4	5
. Subsidiary	15	3	1	11
	32			

TABLE 28

EUROPEAN ASSESSMENT
AND CHARACTERISTICS OF LOCAL PARTNERS

	TOTAL	UNSATISFACTORY	MODERATE	SATISFACTORY
a) PARTNERSHIP WITH LOCAL				
- No partner at all	6	1	0	5
- One partner	15	7	2	6
- Several partners	11	2	3	6
	32			
b) ROLE OF LOCAL PARTNER				
- Passive	11	2	2	7
- Active	15	7	3	5
	26			
c) LOCAL PARTNER OF CHINESE ORIGIN				
- No	8	4	-	4
- Yes	9	5	2	2
	17			

The data do not reveal a strong relationship between the perceived success of the transfer and the size of the European partner, although the 3 smallest companies see the results as unsatisfactory (b) (c).

The European companies which are in strong competitive positions are also those which are likely to be satisfied with their area operators (d).

The relationship between the strategy of the European partners and the way they assess the success of their ventures reveals that those who had had an approach based on a long term development are also those who are the most satisfied. Those who indicated that their motive was essentially defensive tall into two categories: satisfactory or unsatisfactory. The opportunistic are clearly penalized.

The European companies which have adopted complex organizational structures are also those which are the most satisfied. A similar relationship holds in the cases where the European has had previous experience of the country through a local subsidiary.

1.2.3. Characteristics of the local partners

The main salient relationships between the degree of satisfaction of the European companies and the characteristics of the local partners are presented in Table 28. Although the relationships are not statistically significant they are interesting to examine.

Europeans who have no partner or have several partners show greater satisfaction than those who have only one, while among those who have one or several local partners, they are more satisfied when the partners take a passive role.

One interesting question was to verify if the ethnic origin of the partner made a difference with regards to the degree of satisfaction of the European company, considering the role played by the businessmen of Chinese origin in the Asian countries. In 9 cases the partner was identified as Chinese, and among those cases, 5 were viewed as unsatisfactory, which is a higher proportion than observed among cases without Chinese partners. However, the difference is not statistically significant.

1.2.5. Characteristics of the technological deal

Table 29 shows that among the various means of protecting a technological advantage the method based on the sale of active ingredients is associated

TABLE 29

EUROPEAN ASSESSMENT

	TOTAL	UNSATISFACTORY	MODERATE	SATISFACTORY
a) TYPE OF EUROPEAN PROTECTION				
- None	5	1	-	4
- Based on formulation and know-how	15	3	2	10
- Based on sales of active ingredients	12	6	3	3 *
	33			
b) STABILITY OF THE MARKET				
- Stable	16	2	3	11
- Unstable	13	6	2	5 *
	29			
c) GROWTH OF THE MARKET				
- High growth (10 %)	15	7	2	6
- Low growth	16	2	3	11 *
	31			
d) TRAINING IN PROPRIETARY TECHNOLOGY				
- None	17	2	3	12
- Training	15	6	2	5 * *
	32			
e) REPORTING FOR EUROPE				
- Unsystematically	12	7	2	3
- Systematic	20	3	3	14 *
	32			
f) NEGOTIATION CLIMATE				
- Good or neutral	23	6	5	12
- Difficult	7	4	-	3
	30			
g) LENGTH OF NEGOTIATION				
- Less than one year	12	3	2	7
- More than one year	16	7	3	6
	28			

with less satisfactory results than the one based exclusively on the exercise of a technological competence. On the other hand, complex technologies requiring more training seem to be more problematic than technologies not requiring sophisticated training. Operations which function in stable and low growth markets (less than 10%) are likely to be more satisfactory in the eyes of the European companies. When one looks at the way the European partner has established communications with the operations, it appears that a systematic and continuous reporting gives better results than unsystematic reporting.

Finally, it appears difficult to predict the degree of satisfaction of the European partners through observing the climate and length of the negotiation, although the data suggest (without being strongly significant) that difficult negotiations and lengthy negotiations are likely to produce less satisfactory results.

1.3. The Positive Aspects

When the European executives were interviewed they were systematically asked the two following questions:

1 - What was the most successful feature of the transfer operation ?

2 - What lessons were learned through this operation ?

To the first question the most frequent answer was that the company was capable of maintaining its presence in the region or developing its market share (10 times). The second most frequent answer was related to a feeling of satisfaction with regard to the technical performance of the plant or the process installed in the country (5 times). Another source of satisfaction was the fact that the company had been capable of gaining knowledge of the region or had developed good working relationships with its partner (4 times). One person answered "I discovered that I could work with Thais". In three European companies, executives specifically mentioned that this experience was very positive for developing their internal capabilities for dealing with foreign countries. A respondent who assessed the transfer as unsatisfactory did say, however, "thanks to this experience, we have developed international managers."

The most frequent answer to the second question is related to the company's need to develop its own intelligence and not to rely too much on secondary sources in selection of a partner or execution of a feasibility study (5 times)

MAJORITY SATISFIED

WHO IS NOT ?

- More likely French
- More likely small
- Licensor
- More likely in Indonesia or Philippines
- More in consumer goods
- Opportunistic
- Base their protection on the selling of active ingredients
- Has unsystematic reporting
- Has complex technology

THE EUROPEAN POINT OF VIEW

WHO IS ?

- Large
- Diversified
- Complex structure
- Leader on his market
- Has had direct experience
- Has a long term strategy
- Has no partner or several partners
- Has dormant partner

SOURCES OF PROBLEMS

General conditions

- Change in economic conditions
- Devaluation
- Low price - imitation competition
- Overseas Chinese business practices
- Japanese implantation

Government policies

- Local production of active ingredients
- Registration procedures
- Regulation on remittance

Social skills and partnership

- Lack of managerial skills
- Absenteeism
- Poor motivation
- Partner does not care
- Partner not dynamic enough
- Partner wants to take over

WHAT WAS POSITIVE

- Maintained presence and name in the region
- Developed market share
- Achieved good technical performance
- Gained knowledge of the region
- Developed internal capabilities

WHAT WAS LEARNT

- Do things by oneself
- Take long term perspective
- How to deal with a foreign partner

FIGURE 11

SUMMARY OF EUROPEAN COMPANIES ASSESSMENTS

A typical answer comes from a French executive who stressed "One should analyze by oneself the conditions in a country to select a partner and don't trust others". Another lesson which was learned was the importance of taking a long-term perspective when one approaches international operations. The president of a small U.K. company mentioned, "The firm hastily rushed in to protect a market when it should have taken a long term point of view. Had it done so, it would have invested in other South East Asian countries as well."

Finally, some European companies have learned how to communicate better with their partners, and with the environment. A typical answer came from a French group which had had a very painful experience: "We have learned how to solve problems which seemed impossible to solve".

1.4. Summary

The European point of view has been summarized in the following figure 11.

2. SUCCESS AND LACK OF SUCCESS: THE LOCAL PARTNERS' POINT OF VIEW

In the 18 cases for which the local partners were interviewed, 9 of them have assessed the technology transfer as satisfactory while 8 consider their experience as unsatisfactory; one exhibits a moderate and reserved satisfaction.

2.1. Sources of Concern and Problems

9 respondents indicated that production and technology were sources of concern to them, 4 among those were satisfied and 5 among those were unsatisfied; the typical concern was related to the time lost in transferring the equipment or failure to the documentation at the right time. Start-up problems were emphasized in one case in which the local partner still thinks that the quality of the production set up by the European partner does not meet the standard. In another case the local company was concerned with the time lost and as a result the sales lost because the European licensor did not send a manufacturing procedure adapted to local conditions. Finally, one respondent mentioned that he was very much concerned by the failure of the joint-venture to efficiently use local talents.

The second largest source of concern is related to distribution and marketing, which is mentioned 5 times (4 times for cases in which the local partner is not satisfied). In all 5 cases the sales targets were not met. The only

respondent who is still satisfied attributes this lack of performance to external conditions and not to a lack of soundness in the joint-venture.

The sources of problems or of dissatisfaction identified by the local partners can be classified into two categories:

(a) General economic conditions

(b) Behaviour of the European partners or expatriate managers and problems of communication .

These two categories are not exclusive.

(a) General Economic Conditions

Two major sources of problems have been mentioned:

- The nature of the competition. This applies mainly to highly fragmented markets in the paint business in the Philippines and Thailand. Overcapacity in the synthetic fibres industry, due to the effect of the oil crisis on the world market, was identified as the origin of troubles which developed between partners in a large operation in Thailand.

Finally, in one case the difficulty of collecting bad debts was emphasized as a source of problems.

- Government regulation. In one case customs duties created large delays in the construction of a new factory, while in another case the extended period required by the Food and Drug administration to register the product was criticized by the local manufacturer. Those two cases were in the Philippines. In Indonesia no partner mentioned or complained about government behaviour as a source of problems. This is surprising, given the fact that the interviews were done 6 months after a 50% devaluation of the Rupial, and, as it was analyzed earlier, Indonesia has a strong interventionist policy.

(b) Behaviour of the European Partner or Expatriate Managers and Problems of Communication

Local partners, even among those who are generally satisfied, have often something to say about European partners. The main issues are:

- Lack of trust on the part of the European partner, causing the local partner to be excluded

In one case the major local partner who was also the Managing Director and the Commercial Director was dismissed as Commercial Director and was given the role of a passive General Manager. He very much resents this situation.

In another case in Indonesia, the local partner felt that he was essentially treated as a strawman, recruited only because of his government contracts. In response to the unwillingness on the part of the European compnay to let him have a strong managerial role in the joint-venture, he created his own organization to sell chemical products. In a third case, also located in Indonesia, the local joint-venture partner of a European pharmaceutical compnay, who is also the distributor for the joint-venture, resents very much the fact that the European is trying to find another distributor for the products.

In all three cases the European partner gave good reasons for its behaviour. In two of them (the first and the third) the reasons were related to the personal behaviour of the local partner. In the other one, it was a company policy to keep joint-venture partners away from day-to-day operations.

- Lack of experience in the region and poor managerial capabilities

One local partner stated very specifically that he did not appreciate the fact that the European company sent expatriate managers and engineers with no previous experience of the region. This created some communication lapses with the labour force during the plant erection and the start-up phase.

In five cases the local partners specifically mentioned that there were too many expatriates involved in running the joint-venture.

- Unrealistically high expectations

The expectations held by the Europeans can be of three types: high technological standards, high sales volume, or high revenues coming from high transfer pricing. In all three cases the study revealed that when those European expectations were too high on any of those three measures they were perceived as sources of problems by the local partner.

Here are some examples:

- In 1972 a medium-sized European company asked its local partner (who was acting as distributor for the venture) to increase his quota; the local distributor and partner failed to achieve the higher quota and was withdrawn from the distributorship of the venture. He remains as a shareholder only.
- The newly established plant of a French manufacturer was built with a very recent technology for the production of a basic raw material this process was considered the most advanced process in the field. The startup operations were difficult and required the presence of a large number of French expatriates. The local partner is dissatisfied and says that a more appropriate production process would have been better. This is not the opinion of the European partner who on the contrary is satisfied with the technological achievement of the plant.

TABLE 30 MAIN CHARACTERISTICS BETWEEN SATISFIED AND UNSATISFIED LOCAL PARTNERS

	UNSATISFIED	SATISFIED	TOTAL
COUNTRY			
. INDONESIA	3	2	5
. PHILIPPINES	4	2	6
. THAILAND	2	3	5
. SINGAPORE	0	2	2
. MALAYSIA	0	1	1
	9	10	19
EUROPEAN PARTNER			
. GERMANY	3	1	4
. U K	2	1	3
. FRANCE	4	2	6
. OTHERS	0	6	6
	9	10	19
NATURE OF AGREEMENT			
. TURNKEY PROJECT AND LICENSING	4	3	7
. JOINT VENTURE	5	7	12
	9	10	19
PARTNERSHIP IN JOINT VENTURE			
. LOCAL HAS MINORITY	4	3	7
. LOCAL HAS MAJORITY	1	4	5
	5	7	12
ROLE OF PARTNER			
. PASSIVE	4	5	9
. ACTIVE	5	5	10
	9	10	19
TYPE OF PRODUCTS			
. CONSUMER GOODS PREDOMINANTLY	6	3	9
. INTERMEDIARY GOODS AND RAW MATERIALS	3	7	10
	9	10	19
TECHNOLOGICAL CHARACTERISTICS			
. EUROPEAN PROTECT THEIR TECHNOLOGY :			
- Through active ingredients	5	2	7
- Through know-how	2	5	7
. EUROPEAN TRAIN PEOPLE IN PROPRIETARY TECHNOLOGY			
- Yes	9	5	14
- No	-	5	5
. MANAGERS ARE TRAINED :			
- Locally	3	6	9
- Locally and in Europe	6	4	10
LOCAL'S MOTIVATION FOR TRANSFER			
. REACTIVE	1	1	2
. OPPORTUNISTIC	2	2	4
. DEVELOPMENT	6	7	13
	9	10	19
SALES OF LOCAL PARTNER			
. UP TO 10 M $	3	4	7
. FROM 10 TO 100 M $	3	1	4
. MORE THAN 100 M $	1	3	4
	7	8	15

- In two cases, in Indonesia, the European licensors in the pharmaceutical sector asked for an excessively high transfer pricing; the product do not sell well; the Europeans are not satisfied and neither are the licensees.

- Communications

In four specific cases, among which 3 have French partners, the local companies mentioned that the technical documentation was not properly transmitted either because it was not translated into English or it was not adapted to local understanding. In one of these, this problem was created because the French licensor, a small firm, did not deal directly with the licensee but went through an intermediary Swiss firm which acted as a sub-licensor.

2.2. Characteristics of Local Partners According to Their Degree of Satisfaction

Contrary to their European counterparts the characteristics of the dissatisfied local partners as opposed to the satisfied ones are not clear.

For the 19 cases in which local partners have provided data, a distribution according to degree of satisfaction and a number of other characteristics is provided in Table 30. Practically none of those characteristics reached a satisfactory level of statistical significance. But the figures indicate certain interesting points.

Indonesian and the Philippines again score higher with regard to dissatisfaction as far as local partners are concerned. This is consistent with the European point of view. Thailand still stays in an ambivalent position, whilst all the local partners in Singapore and Malaysia are satisfied.

If we consider the nationality of the transferors, the three large European countries, Germany, UK and Frence, all have more dissatisfied than satisfied local partners. Satisfied and dissatisfied local partners can be found in either joint-venture or licensing agreements, but when the local partner has a majority shareholding in a joint-venture he tends to be more The local partners' satisfaction cannot be predicted by either their active- or passiveness, or the fact that they have entered the transfer agreement for reactive, opportunistic or for more developmental reasons.

The size of their operation does not make a big difference, although the largest seem also to be the most satisfied. The nature of the technology seems to play some role in the way they assess the result of the transfer. When a European partner effects its transfer policy and procures its revenues through sales of active ingredients which embody the technology, local partners

seem less satisfied than when the European bases its deal upon its know-how. On the other hand, in technologies which are complex and which imply some proprietary training and training done in Europe, the satisfaction of the local is lower. There is no direct relationship between these factors, but the interviews have provided evidence that technologies which are highly complex require a lot of interventions on the part of the European: high numbers of expatriates, technical assistance, adjustment etc. Under these conditions the transferor often tries to set up the technology in such a fashion as to maintain its sophisticated technical reputation, uses his own resources, and does not take the time and the effort to involve the local partner. The latter perceives this as unsatisfactory. On the other hand, when the European protects his technology through active ingredients, he is selling a black box, and the local has to treat it as a black box without any involvement whatsoever in the definition or understanding of its arrival. Converserly when the European partner bases his technological transfer on know-how and when this know-how is not too sophisticated, he is likely to share experience with the local partner. The latter participates in the process of technology transfer and feels more satisfied.

In other words, the fact that no real salient characteristics emerge to identify the satisfied local partner from the dissatisfied one reveals that his degree of satisfaction has to be found in reference to the behaviour of the European partner.

2.3. Positive results

The above comments should not prohibit appreciation of the positive aspects of the technology transfer. First, one cannot forget that half of local partners are satisfied with the results of these operations with European companies, and that among the others, various positive elements have been mentioned.

The most frequently mentioned positive result, and at the same time the most vaguely defined, is the upgrading of skills. The training efforts undertaken in the various forms of technology transfer agreements have been considered as a positive contribution to the development of technical and managerial competences. In an earlier part of this report it was mentioned that in 31 out of 33 cases managers' training has been provided; in 28 cases, training programs have been implemented for lower level personnel; and in 16 cases, has have been done specifically in the proprietary technology.

Some of the characteristics of the training activities in the companies interviewed in the ASEAN countries are reported in Table 31. It shows that there are wide-spread training efforts with some variations according to the type of agreement (licensing agreements tend to focus on training in the proprietary technology, on training for the starting of operations and on-the-job training); to the country of origin (Germans give more formal management and lower echelon training but not in the proprietary technology); or to the recipient country (Indonesia benefits more from start-up training and proprietary training).

This effort is generally recognized by local partners as a factor which contributes to the upgrading of skills but it is not the only one. Managerial practices and the use of systems and procedures in operational management (manufacturing, marketing) are "brought in" from Europe, and are adopted by local firms. For instance, in a bank, it was mentioned that since the bank has been a joint-venture partner of a Norvegian firm, it has adopted a more sophisticated technique of investment evaluations.

A second feature of technology transfer which generates local satisfaction concerns production technology. In the majority of cases, whether it concerned type 1 (upstream) or type 2 (downstream) technology, there has been a flow of communications between local technicians and technicians coming from Europe in order to set up production processes, or to intervene when needed on a technical problem. Quality control procedures, maintenance programs, inventory checking have been carefully implemented and the production personnel has been trained to the necessary disciplined effort of controlling the production process on a day-to-day basis.

This satisfaction with production technology is not matched by a similar feeling in the marketing field.

A third source of satisfaction among local partners concern their increased opportunities to diversify their activities provided through their contacts with European companies. Some of them could, thanks to their license or their joint-venture, acquire a competence in a domain which was important for further expansion. This is the case for instance, in a Philippines' company which could step into a growing segment of a market through its license with a French group; this license has given this company an expertise which it will use in the future for further expansion in related areas.

TABLE 31

ANALYSIS OF THE TRAINING EFFORT

	MANAGER TRAINING		LOWER TRAINING		PROPRIETARY TRAINING		START UP TRAINING	
	On the job	Formal	On the job	Formal	None	Yes	None	Yes
A. NATURE OF THE AGREEMENT								
. TURN KEY	-	1	1	-	-	1	-	1
. LICENSE	5	1	6	-	-	6	1	5
. JOINT-VENTURE	3	15	11	5	11	9	5	12
. WHOLLY OWNED	-	6	4	1	6	-	2	3
B. COUNTRY OF ORIGIN								
. UK	1	4	4	-	3	2	2	3
. GERMANY	1	7	4	4	6	3	3	6
. FRANCE	3	3	6	-	1	5	1	5
. HOLLANO	-	1	1	-	0	2	1	1
. SWITZERLANO	1	1	2	-	1	1	-	1
. NORWAY	1	1	2	-	1	1	-	1
. DENMARK	1	2	2	-	2	1	-	3
C. COUNTRY OF TRANSFER								
. INDONESIA	4	2	4	1	2	5	-	7
. PHILIPPINES	2	6	7	1	3	5	2	6
. THAILAND	1	6	5	2	4	4	4	4
. MALAYSIA	1	5	3	1	6	-	1	2
. SINGAPORE	1	3	3	1	2	2	1	2
O. TYPE OF TECHNOLOGY								
. TYPE 1 - UPSTREAM	3	10	10	3	6	7	1	9
. TYPE 2 - DOWNSTREAM	5	13	12	3	11	9	7	12

In other cases, the diversity is not reflected in products, but rather, in origin of partners. In many ASEAN countries, investments by Japanese or U.S. companies have been more numerous and significant than investments by European companies.

If one excludes a considerable British presence in Singapore and Malaysia, the Europeans have a low profile in the region. Local companies appreciated the problems that would be confronted with another type of partner. The purpose of the study was not to make a comparative analysis between behaviour of U.S., Japanese, and European companies (*), and local respondents were reluctant to make clear comments on this subject, but it was the feeling of the interviewers that the comparison was not unfavourable to European companies.

When asked the question: "What was learnt from this operation ?", two kinds of answers were obtained. On the one hand, respondents which were not satisfied indicated that they had learnt how to avoid the sources of their current problems: in one company for instance, it was mentioned that in the future, no sales quota on a yearly basis would be accepted; in another one, the chief executive declared that "next time he would be tough in negotiating with a European". A large number of ASEAN companies declared that they had learnt how to deal more efficiently with foreign partners. In these cases, as for the Europeans, the ventures or the licensing agreements provided opportunities to increase communication capabilities.

2.4. Summary

The ASEAN company point of view is summarized in Figure 12.

3. SUCCESS AND UNSUCCESS: A GENERAL SYNTHESIS

So far, the points of view of the Europeans and the points of view of the local partners have been considered separately. In this final section the purpose is to look at the overall pattern of success and lack of success, combining both assessments, and to compare them with regard to the strategies analysed in Chapter III.

3.1. European and local assessments combined (see Table 32)

Of the 18 cases in which there is a local partner in only one case was the local partner unsatisfied while the European was satisfied. In this particular

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* One can find interesting comparison in A.B. SIM: "Management Practices and Performance: American, British and Japanese Multinationals in Malaysia", Singapore Management Review, vol. 1, n° 2, July 1979.

SPLIT

HALF ARE NOT SATISFIED

- More likely Indonesian or Philippinos
- More likely with German, French or British partners
- More likely in too complex technology
- More likely when active ingredients are protected

THE ASEAN POINT OF VIEW

HALF ARE SATISFIED

- Singaporian or Malay
- They have majority in a joint venture
- More than 100 M $ sales

SOURCES OF PROBLEMS

General conditions

- Hard competition
- Government regulations
- Bad debts

Behaviour of European

- Lack of trust
- Lack of experience
- Too many expatriates
- Too high technical expectation
- Too high sales quotas
- Too high transfer pricing
- Communications

WHAT WAS POSITIVE

- Upgrading of skills
- Improvement in production technology
- Basis for diversification in related areas
- Managerial practices

WHAT WAS LEARNT

- Do not accept sales quota on a one year basis
- Give insight in its own way to management
- To be tougher in negociation next time
- To communicate
- How to deal with Europeans
- Production technology

FIGURE 12

SUMMARY OF ASEAN PARTNERS ASSESSMENTS OF THE RESULTS OF TECHNOLOGY TRANSFER

case, the local partner was seeking a deeper involvement in the management of the joint-venture and was disappointed to find his role reduced to a purely inactive one. In this situation, where he was forced to react, he created his own company, trading products for an American group in the same industry.

In 4 cases, the locals are satisfied while the Europeans are not. In three out of four cases, the European company puts into question the managerial capabilities of its ASEAN partner. This leads to a disappointment on their part. Two cases concern licensors who are unhappy about the way the licensees market the products, and in one case the European is unhappy about the lack of rigor demonstrated by the ASEAN firm which is in charge of managing a new production facility.

TABLE 32

EUROPEAN & LOCAL COMBINEO SATISFACTION

LOCAL / EUROPEAN	NO PARTNER OR EUROPEAN	DORMANT	LOCAL UNSATISFIEO OR MODERATELY	LOCAL SATISFIEO	TOTAL
EUROPEAN SATISFIEO	7 CASES	5 CASES	1 CASE	5 CASES	18
EUROPEAN UNSATISFIEO	2 CASES	1 CASE	8 CASES	4 CASES	15
TOTAL	9	6	9	9	33

TABLE 33

INDICES OF EUROPEAN AND LOCAL SATISFACTION

ACCORDING TO STRATEGIES

EUROPEAN STRATEGY

LOCAL PARTNER STRATEGY	DEFENSIVE - OPPORTUNISTIC		DEVELOPMENT	
	EUROPEAN SATISFACTION	LOCAL SATISFACTION	EUROPEAN SATISFACTION	LOCAL SATISFACTION
DORMANT	3 YES		2 YES, 1 NO	
Index of Satisfaction	100 %		66 %	
DEFENSIVE/ OPPORTUNISTIC	1 YES, 3 NO	2 YES, 2 NO	3 YES, 2 NO	3 YES, 2 NO
Index of Satisfaction	25 %	50 %	60 %	60 %
Combined Index	37 %		60 %	
DEVELOPMENT	1 YES, 6 NO	2 YES, 4 NO	1 YES, 1 NO	1 YES, 1 NO
Index of Satisfaction	14 %	42 %	50 %	50 %
Combined Index	2B %		50 %	
NO PARTNER OR EUROPEAN PARTNERS	2 YES, 1 NO		5 YES, 1 NO	
Index of Satisfaction	66 %		84 %	

In 8 cases, both are unsatisfied, and in 5 cases both are satisfied. Finally, Table 32 shows that in 18 European/ASEAN real partnership situations, less than one third are globally satisfactory. This result should be compared with the 15 cases in which there is no partner (wholly owned subsidiaries), dormant partners or European partners, and in which 80% (12 cases) are evaluated as satisfactory.

This correlation between the presence of a partner and the level of dissatisfaction is really striking. It suggests that the development of international business relationships is not an easy process. In order to reveal the reasons which could explain this situation, a comparison has been carried out between the strategic types and the level of satisfaction in Table 33 and between strategic types and technology in Table 34 . The most unsatisfactory cases are those in which the European partner has a defensive strategy and the local has a defensive or development strategy (with a slight but not really significant greater dissatisfaction when the local has a development strategy). These cases are also those in which there is a tendency to have a more upstream technology, while in the cases in which Europeans have either the total control or are more development oriented, the technology tends to be more downstream (*).

3.2. Strategy and Technology Transfer

As mentioned in Chapter III the main motivations for European or ASEAN companies in setting up a technology transfer agreement are primarily guided by the capture or the defense of market positions, and sometimes for ASEAN companies by pure opportunistic reasons. In this context technology becomes an implicit stake. For the European company, technology is an element of its competitive advantage and it wants to benefit from it in order to consolidate or expand its position in world markets. For the local company, technology is also a competitive advantage which can be bought along side with brand name, reputation, etc. in order to gain or to protect a market. The key issue in this debate is the control of marketing and distribution. When the European controls marketing and distribution, as in the case of a wholly owned subsidiary or in a joint-venture with a dormant local partner, the perceived results may be seen as more satisfactory than when both European and local have a word to say in the marketing field.

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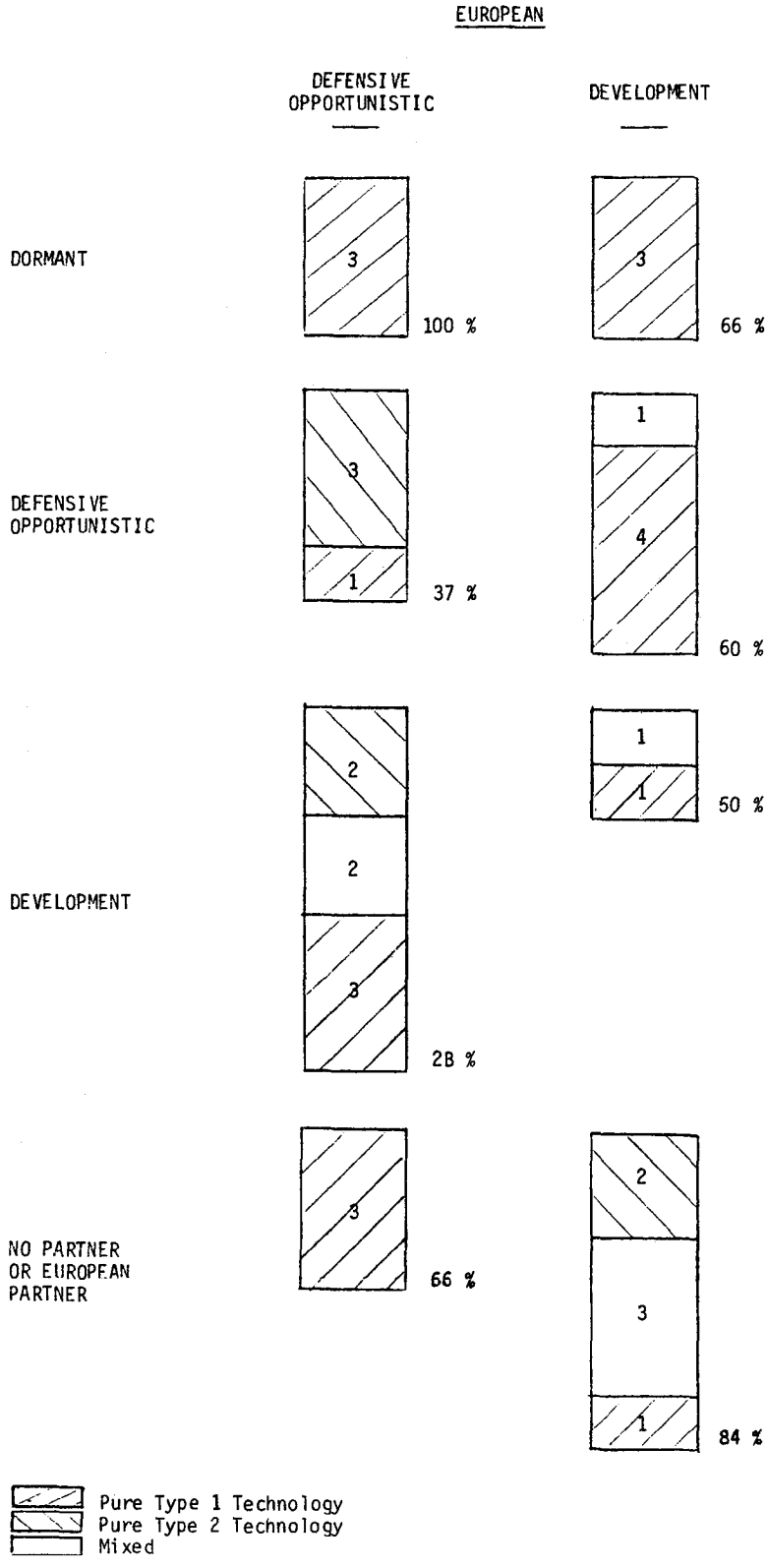
* The only exception to this tendency (to employ downstream strategy when the European is dominant), is the combination European development/no partner as can be found in Malaysia and Singapore , where two joint-ventures with European partners clearly use upstream technology. As explained earlier, this is a function of the investment climate of those countries.

TABLE 34

RELATIONSHIP BETWEEN STRATEGIES AND TECHNOLOGY



When the local partner controls part or the whole of the distribution, as it is typically the case with local partners who have adopted a development strategy, the European is inclined to demand superb marketing performance of his partner and, in order to try to keep a certain power over him, he is going to hold on to his technology. As a result the climate deteriorates very rapidly, especially if the European is not very experienced and familiar with the country. This explains why the combination of defensive European and development local partners is so conflictual.

If we look at the second area of conflictual situations when local partners have adopted defensive or opportunistic strategies, the reasons for the conflict are less clear. In some cases the basic reasons are due to the inexperience of both partners (a case which is likely to happen when both partners are opportunistic) or only of one of them. This lack of experience, which creates poor managerial technical or commercial practices, is a source of dissatisfaction for one or two parties. It is in those particular cases that some pure technology transfer problems in the traditional sense of the term (start-up problems, difficulties to get the plant started...) have been found in the sample.

A P P E N D I X E S

APPENDIX I : EUROPE/ASEAN TECHNOLOGY TRANSFER

DESCRIPTIVE STATISTICS (N=33)

A- GENERAL DATA

1- NATURE OF AGREEMENT	TURN KEY PROJECT	1	3 %
	LICENSE	6	18 %
	JOINT VENTURE	20	61 %
	WHOLLY OWNED SUBSIDIARY	6	18 %
		33	
2- COUNTRY OF ORIGIN FOR TRANSFEROR EEC Companies represent 90 %	GERMANY	9	
	FRANCE	6	
	U K	5	
	DENMARK	3	
	SWITZERLAND	2	
	HOLLAND	1	
	NORWAY	1	
	DUAL NATIONALITY	2	
	TWO OR THREE NATIONALITIES INVOLVED	4	
		33	
3- COUNTRY OF TRANSFER	THAILAND	8	24 %
	PHILIPPINES	8	24 %
	INDONESIA	7	21 %
	MALAYSIA	6	18 %
	SINGAPORE	4	12 %
		33	
4- SHARE HOLDING OF EUROPEAN	NO SHARE HOLDING	7	21 %
	MINORITY	7	21 %
	EQUAL OR MAJORITY	13	40 %
	100 %	6	18 %
		33	
5- NUMBER OF LOCAL PARTNER	ONE ONLY	16	
	MORE THAN ONE	11	
	NO PARTNER	6	
		33	
6- ROLE OF LOCAL PARTNER	ACTIVE	16	
	PASSIVE	11	
	NO PARTNER	6	
		33	
7- STATUS OF LOCAL PARTNER	CORPORATE	20	
	INDIVIDUAL	4	
	INDIVIDUAL & CORPORATE	3	
	NO PARTNER	6	
		33	

B- DATA CONCERNING THE OPERATIONS

1- NUMBER OF YEARS SINCE THE OPERATION STARTED (*)	. LESS OR EQUAL TO 5 YEARS . BETWEEN 5 & 10 YEARS . MORE THAN 10 YEARS * - Creation of subsidiary for wholly owned subsidiary - creation of company for joint venture - date of signature of license or turn key project	7 14 12	64 % 36 %
2- SALES OF OPERATIONS	. LESS OR EQUAL TO 5 M $ US . BETWEEN 5 AND 11 M $. BETWEEN 11 AND 31 M $. MORE THAN 31 M $. NOT YET AVAILABLE (sales of licensed products only for licensing agreement)	9 9 7 5 3 33	
3- NUMBER OF EMPLOYEES	. UP TO 100 . BETWEEN 100 AND 300 . MORE THAN 300	11 11 11 33	
4- RELATIVE MAKET SHARE POSITION (BCG definition)	. LEADER . FOLLOWER (from 1/3 to 1) . SMALL (less than 1/3)	5 16 6 27 (6 missing)	
5- DEGREE OF SECTORS DIVERSITY (number of 3 digits sectors)	. ONE SECTOR . TWO TO FIVE SECTORS . MORE THAN FIVE SECTORS	20 9 4 33	60 %
6- DEGREE OF SEGMENTS DIVERSITY (number of 5 digits segments)	. ONE OR TWO SEGMENTS . 3 TO 5 SEGMENTS . MORE THAN 5 SEGMENTS	9 14 9 32	42 %
7- DEGREE OF DIVERSIFICATION	. ONLY IN ONE SECTOR (2 digits) . ONLY IN CHEMICALS . CHEMICALS & RELATED . CHEMICALS & UNRELATED	18 8 4 3 33	60 %

B- DATA CONCERNING THE OPERATIONS (ctd)

8- PRODUCTION TECHNOLOGY	. BATCH	22	67 %
	. BATCH & CONTINUOUS	8	
	. CONTINUOUS	2	
		32	
9- TECHNICAL PROCESS	. MIXING/PACKING	5	
	. FORMULATING/MIXING/PACKING	18	54 %
	. RAW MATERIAL/FORMULATING/ MIXING/PACKING	8	
		31	

C- DATA CONCERNING THE MARKETS

1- TYPE OF SECTORS (Standard international trade classification 3 digits)	. ORGANIC CHEMICALS (512)	3	
	. INORGANIC CHEMICALS & GASES (513)	5	
	. DYESTUFFS (531)	4	
	. DYEING AND TANNING (532)	4	
	. PAINTS (533)	9	●
	. PHARMACEUTICAL (541)	16	●
	. ESSENTIAL OIL (551)	1	
	. PERFUMERY PREPARATION (553)	4	
	. SOAPS (554)	1	
	. FERTILIZERS (561)	4	
	. PLASTICS (581)	8	●
	. FINE CHEMICALS (599)	8	●
	. SYNTHETIC RUBBER (231)	1	
	. ARTIFICIAL FIBRES (266)	2	
	. PAPER PULP	1	
	. FOODS	2	
	. METALLURGICAL PROCESS	2	
		75	
	(one case may include several sectors)		
2- MARKET SIZE	. LESS OR EQUAL TO 45 M US $	10	30 %
	. GREATER THAN 45 M $ LESS OR EQUAL TO 95 M $	8	25 %
	. GREATER THAN 95 M $	15	45 %
		33	
3- COMPETITIVE STRUCTURE	. HIGHLY CONCENTRATED(ONE TWO OR THREE COMPETITORS)	8	24 %
	. MEDIUM CONCENTRATION (UP TO 10 COMPETITORS)	10	30 %
	. FRAGMENTED (MORE THAN 10)	12	36 %
		30	
	(There are 3 missing data)		
4- CLASSIFICATION OF PRODUCTS ACCORDING TO USERS	. RAW MATERIALS ONLY	9	27 %
	. INTERMEDIATE GOODS ONLY	11	33 %
	. CONSUMER GOODS AND INTERMEDIATE GOODS	10	30 %
	. CONSUMER GOODS ONLY	3	10 %
		33	
5- TREND OF MARKET (Growth rate)	. STATIC (less than 2 % /year)	2	6 %
	. MEDIUM (up to 10 %)	14	42 %
	. HIGH (Greater than 10 %)	15	45 %
		31 (2 missing	

C- DATA CONCERNING THE MARKET (ctd)

6- SCOPE OF MARKET	. LOCAL	22	67 %
	. LOCAL AND REGIONAL	9	27 %
	. LOCAL AND WORLD	1	
	. WORLD ONLY	1	
		33	
7- STABILITY OF MARKET	. UNSTABLE	6	
	. MIXED	7	
	. STABLE	16	48 %
	(4 missing)	29	
8- SENSITIVITY TO PRICE	. HIGHLY SENSITIVE	16	48 %
	. HIGHLY TO MEDIUM	7	
	. MEDIUM TO LOW	2	
	. LOW	4	
	(4 missing)	29	
9- SENSITIVITY TO BRAND IMAGE	. HIGH	11	33 %
	. HIGH TO MEDIUM	4	
	. MEDIUM	5	
	. LOW	9	28 %
	(4 missing)	29	
10- SENSITIVITY TO SERVICE	. HIGH	13	39 % } 60 %
	. HIGH TO MEDIUM	7	21 % }
	. MEDIUM	6	
	. MEDIUM TO LOW / LOW	3	
	(4 missing)	29	
11- PERCEIVED SOPHISTICATION OF PRODUCTS	. HIGH	8	24 %
	. MEDIUM OR MIXED	14	42 %
	. LOW	8	24 %
	(3 missing)	30	
12- NUMBER OF DISTRIBUTION CHANNELS	. ONE	13	
	. TWO	14	
	. THREE	4	
	. MORE THAN THREE	2	
		33	

C- DATA CONCERNING THE MARKET (ctd)

Services offered to Customers

	Technical Assistance	Training	Demon-stration	Visits & Information	Mainte-nance	Testing
No	17	18	9	4	28	26
Yes	16	15	24	29	5	7
Sample Size	33	33	33	33	33	33

D- FINANCIAL DATA

1- SIZE OF ORIGINAL INVESTMENT	1 M $ US OR LESS	9
	BETWEEN 1 & 5 M $ INCL.	6
	BETWEEN 5 & 10 M $ INCL.	2
	BETWEEN 10 & 150 M $ INCL.	3
	NO REPLY	13
		33
2- DEBT	5 M $ US OR LESS	6
	BETWEEN 5 & 10 M $ INCL.	2
	BETWEEN 10 & 30 M $ INCL.	2
	BETWEEN 30 & 120 M $ INCL.	2
	NO REPLY	21
		33
3- EQUITY	1 M $ US OR LESS	7
	BETWEEN 1 & 5 M $ INCL.	2
	BETWEEN 5 & 30 M $ INCL.	5
	NO REPLY	18
		32
4- FIXED ASSETS	1 M $ US OR LESS	8
	BETWEEN 1 & 5 M $ INCL.	3
	BETWEEN 5 & 60 M $ INCL.	5
	BETWEEN 60 & 120 M $ INCL.	1
	NO REPLY	16
		33
5- TOTAL ASSETS	5 M $ US OR LESS	11
	BETWEEN 5 & 10 M $ INCL.	5
	BETWEEN 10 & 30 M $ INCL.	5
	BETWEEN 30 & 130 M $ INCL.	2
	NO REPLY	10
		33

E- ORGANIZATIONAL DATA

1- FORMAL ORGANIZATIONAL STRUCTURE	FUNCTIONAL ONLY	17
	BY-FUNCTIONAL & PRODUCT LINE	12
	BY-PRODUCT LINE	4
		33
2- PERCENTAGE OF LOCAL MANAGEMENT	50 % OR LESS	1
	BETWEEN 50 % & 75 %	5
	ABOVE 75 %	27
	NO REPLY	1
		34
3- NUMBER OF EXPATRIATES	NONE	13
	ONE OR TWO	4
	FROM THREE TO FIVE	6
	MORE THAN FIVE	3
	NO REPLY	7
		33
4- THE OPERATING FIRM'S PRICE FREEDOM	NONE	3
	YES IN CONSULTATION WITH PARENT	5
	YES	25
		33
5- THE OPERATING FIRM'S INVESTMENT FREEDOM	NONE	15
	YES IN CONSULTATION WITH PARENT	9
	YES	9
		33
6- EUROPEAN CONTACT	BOARD REPRESENTATIVE	5
	AREA MANAGER	4
	FUNCTIONAL & DIVISIONAL MANAGERS	9
	BOARD REPRESENTATIVE & FUNCTIONAL MANAGER	5
	AREA & FUNCTIONAL MANAGERS	5
	BOARD, AREA & FUNCTIONAL MANAGERS	4
	NO REPLY	1
		33
7- FREQUENCY OF REPORTING TO EUROPE	ON AN AD HOC BASIS	12
	ONCE A YEAR	6
	ONCE A MONTH	13
	MORE THAN ONCE A MONTH	1
	NO REPLY	1
		33

E- ORGANIZATIONAL DATA (ctd)

The Operation depends on the Company in Europe for:

	No.	To some Extent	Almost Totally	Sample Size
Proprietary Equipment	28	4	1	33
Equipment	24	8	1	33
Exclusive Raw Materials	15	9	9	33
Non-Exclusive Raw Materials	11	6	16	33
General Imports	6	9	18	33
Procurement	8	13	12	33
Technical Assistance	4	14	15	33
New Technical Information	1	11	21	33
Training	8	14	11	33
Money	33	-	-	33

The Operation depends on the Host Country for:

	No.	To some Extent	Almost Totally	Sample Size
Raw Materials	9	20	4	33
Labour	-	-	33	33
Money	2	22	9	33

Government Constraints on Operations

	Virtually None	Some Constraints	Heavy Constraints	Sample Size
Choice of Technology	22	11	-	33
Imports	27	6	-	33
Exports	29	3	1	33
Marketing & Distribution	19	6	8	33
Ownership	14	17	2	33
Expatriate Employment	24	8	1	33

F- DATA ON EDUCATION AND TRAINING

1- SECONDARY SCHOOL ATTENDANCE	25 % OR LESS OF WORKFORCE	3
	BETWEEN 25-50 % INCL. OF WORKFORCE	11
	BETWEEN 50-75 % INCL. OF WORKFORCE	4
	BETWEEN 75-100 % OF WORKFORCE	10
	NO REPLY	5
		33
2- UNIVERSITY ATTENDANCE	5 % OR LESS OF WORKFORCE	6
	BETWEEN 5-10 % INCL. OF WORKFORCE	10
	BETWEEN 10-20 % INCL. OF WORKFORCE	5
	GREATER THAN 20 % OF WORKFORCE	7
	NO REPLY	5
		33
3- START-UP TRAINING	NONE GIVEN	8
	SOME GIVEN LOCALLY	11
	SOME GIVEN IN EUROPE	4
	SOME GIVEN BOTH LOCALLY AND IN EUROPE	6
	NO REPLY	4
		33
4- BLUE COLLAR TRAINING	NONE GIVEN	5
	ON THE JOB TRAINING GIVEN	22
	FORMAL TRAINING GIVEN (BOTH INTERNALLY & EXTERNALLY)	6
		33
5- MANAGEMENT TRAINING GIVEN	NONE	2
	ON THE JOB ONLY	8
	FORMAL GIVEN LOCALLY	4
	FORMAL GIVEN LOCALLY AND IN EUROPE	19
		33
6- TRAINING GIVEN IN A PROPRIETARY TECHNOLOGY	NONE	17
	SOME	10
	A CONSIDERABLE AMOUNT	6
		33

APPENDIX II : DESCRIPTIVE DATA OF EUROPEAN COMPANIES

1- COMPETITIVE POSITION OF EUROPEAN FIRMS	AMONG THE TOP 5 IN THE INTERNATIONAL MARKET	7
	AMONG THE TOP 5 IN THE HOME MARKET	14
	MEDIUM-SIZED IN THE HOME MARKET	4
	SMALL IN THE HOME MARKET	3
		28
2- APPROACH TOWARDS ASEAN	NONE IN PARTICULAR	3
	ON A TRIAL BASIS	1
	COUNTRY BY COUNTRY APPROACH	17
	REGIONAL APPROACH	4
	NO REPLY	3
		28
3- REGIONAL INVOLVEMENT	IN THE OTHER ASEAN COUNTRIES	21
	IN OTHER ASIAN COUNTRIES	23
4- SALES OF EUROPEAN FIRMS	LESS THAN 100 M $ US	3
	BETWEEN 100-1000 M $ US	7
	1000 M $ OR MORE	15
	NO REPLY	3
		38
5- PERCENTAGE OF SALES ABROAD	LESS THAN 25 %	2
	BETWEEN 25 % & 50 %	3
	50 % OR MORE	16
	NO REPLY	7
		28
6- TOTAL ASSETS	LESS THAN 100 M $ US	2
	BETWEEN 100-1000 M $ US	8
	1000 M $ US OR MORE	12
	NO REPLY	6
		28
7- NUMBER OF EMPLOYEES	LESS THAN 1000	3
	BETWEEN 1000 & 10 000	8
	BETWEEN 10 000 & 50 000	8
	GREATER THAN 50 000	8
	NO REPLY	1
		28

DESCRIPTIVE DATA OF EUROPEAN COMPANIES (ctd)

8- ORGANIZATIONAL STRUCTURE	FUNCTIONAL	6
	DIVISIONAL	9
	MIXED	11
	NO REPLY	2
		28
9- INTERNATIONAL STRUCTURE	EXPORT DEPARTMENT	3
	"MOTHER-DAUGHTER"	10
	PRODUCT DIVISIONS	3
	PRODUCT & COUNTRY DIVISIONS	9
	NO REPLY	3
		28
10- R & D AS A PERCENTAGE OF SALES	LESS THAN 2 %	7
	BETWEEN 2-5 %	7
	BETWEEN 5-10 %	6
	10 % OR MORE	5
	NO REPLY	3
		28
11- COMPETITIVENESS OF TECHNOLOGY TRANSFERRED	BEHIND THE STATE OF THE ART	6
	AT THE STATE OF THE ART	15
	AHEAD OF THE STATE OF THE ART	2
	NO REPLY	5
		28
12- PRESSURE TO TRANSFER TECHNOLOGY	NONE	8
	PRESSURE FROM TECHNICAL DEVELOPMENT	6
	PRESSURE FROM MARKET DEVELOPMENT	5
	PRESSURE FROM OTHER SOURCES	8
	NO REPLY	1
		28
13- PRIOR CONTACT WITH HOST COUNTRY	NONE	5
	THROUGH AGENT	11
	THROUGH SALES SUBSIDIARY	7
	THROUGH LICENSEE	1
	THROUGH JOINT-VENTURE OR MANUFACTURING SUBSIDIARY	3
	NO REPLY	1
		28

DESCRIPTIVE DATA OF EUROPEAN COMPANIES (ctd)

Other Technology Deals of European Firms

	Joint Ventures	Licencing Agreements
None:	6	1
Less than 10:	10	12
More than 10:	5	10
No reply:	7	5
	28	28

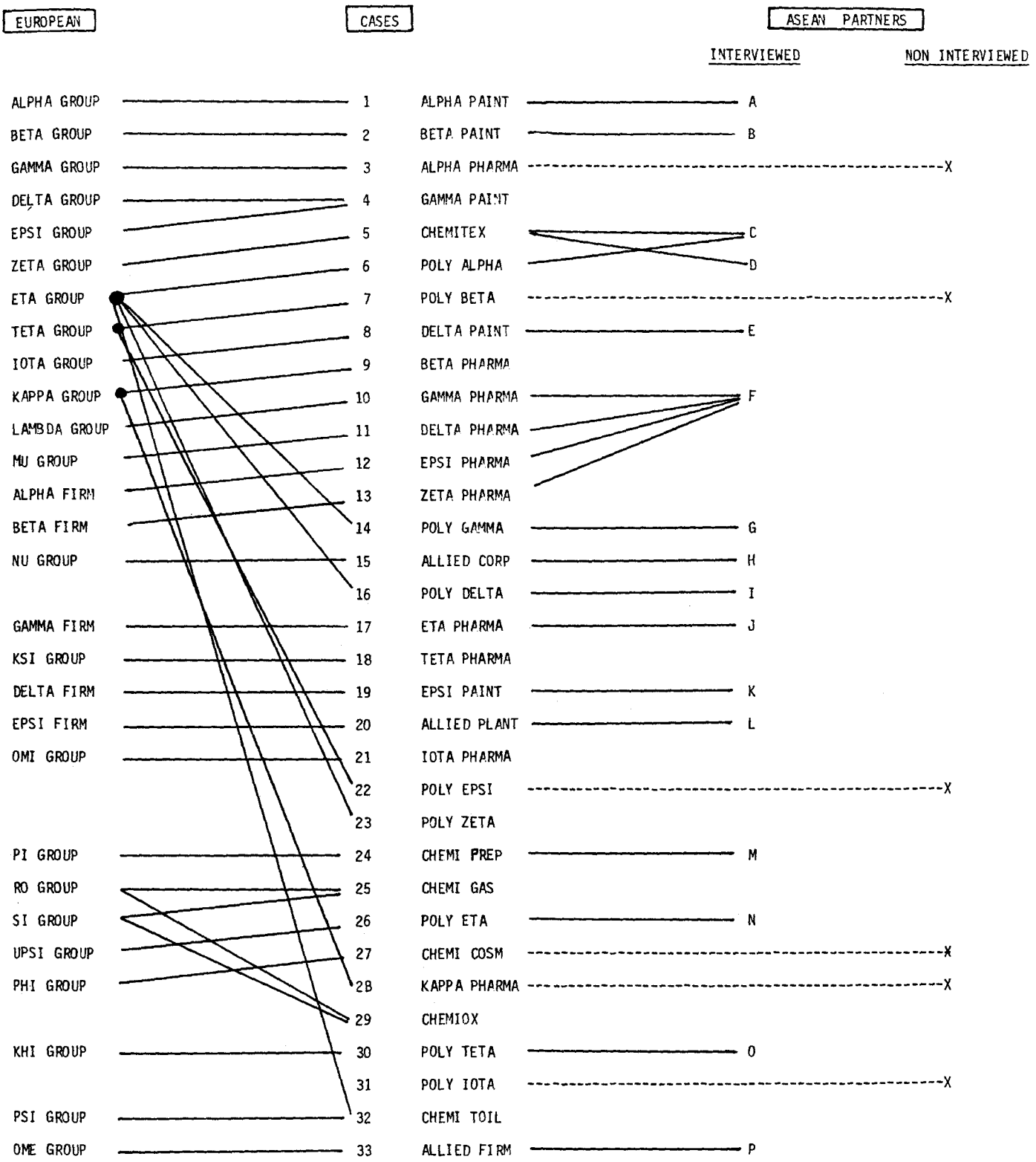
APPENDIX III : DESCRIPTIVE DATA OF ASEAN PARTNERS

1- LEVEL OF DIVERSIFICATION OF ASEAN PARTNER	SINGLE ACTIVITY DOMINANT ACTIVITY (*) DIVERSIFIED ACTIVITY (*) More than 70 % of sales in a single sector	6 7 2 15
2- SECTOR OF ACTIVITY OF ASEAN PARTNER	NON-PRIVATE INVESTOR BANKING TRADING & SERVICES CHEMICALS OR PHARMACEUTICALS ALLIED INDUSTRIES CONGLOMERATE	1 2 2 5 3 2 28
3- COMPETITIVE POSITION OF ASEAN PARTNER	HOME MARKET LEADER AMONG THE TOP 5 IN HOME MARKET MEDIUM SIZE IN MARKET NO REPLY	3 7 3 2 15
4- GEOGRAPHICAL COVERAGE OF ASEAN PARTNER	NATIONAL MARKET ASIA THE WORLD	7 5 3 15
5- SALES OF ASEAN PARTNER	10 M $ US OR LESS BETWEEN 10-100 M $ US GREATER THAN 100 M $ US NO REPLY	4 4 4 3 15
6- NUMBER OF EMPLOYEES	LESS THAN 500 BETWEEN 500-5000 MORE THAN 5000	6 6 3 15
7- AGE OF ENTERPRISE	10 YEARS OR LESS BETWEEN 11-35 YEARS MORE THAN 35 YEARS	4 7 4 15

DESCRIPTIVE DATA OF ASEAN PARTNERS (ctd)

8- TOTAL ASSETS	10 M $ US OR LESS BETWEEN 10-100 M $ US MORE THAN 100 M $ US	7 2 6 15
9- ORGANIZATION STRUCTURES	"ENTREPRENEURIAL" FUNCTIONAL DIVISIONAL	4 9 2 15
10- MOTIVE FOR INVOLVEMENT	EXTERNAL FACTOR REACTION TO THREAT OPPORTUNISTIC DEVELOPMENT OF MARKET OR TECHNOLOGY	2 2 5 6 15
11- RELATIONSHIP TO OPERATION OF ASEAN PARTNER	INVESTOR ONLY CUSTOMER OR SUPPLIER BANKER LICENSEE	4 7 2 2 15
12- OTHER JOINT-VENTURES OR LICENSING AGREEMENTS OF ASEAN PARTNER	WITH US FIRMS WITH JAPANESE FIRMS WITH OTHER NATIONALITY	13 11 10

APPENDIX IV



DIAGRAMATIC REPRESENTATION

OF THE CASES

INCLUDED IN THE SAMPLE

: On the left are the disguised names of the European companies
On the right are the disguised names of ASEAN partners
On the middle are the names of the cases

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