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Briefing Paper No. 1

STRATEGIES AND PRACTICES

OF TRANSFER OF TECHNOLOGY

FROM EUROPEAN TO ASEAN ENTERPRISES

Some Major Findings & their Implications

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This report is a condensed version of a study done at the Euro-Asia Centre of INSEAD, for the European Economic Community, entitled "The Transfer of Technology from European to ASEAN enterprises : Strategies & Practices in the Chemical & Pharmaceutical Sectors"- February 1980 -

FOREWORD

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.

STRATEGIES AND PRACTICES OF TRANSFER OF TECHNOLOGY FROM EUROPEAN TO ASEAN ENTERPRISES

Some Major Findings & their Implications

INTRODUCTION

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 (*). Table 1 gives the distribution of cases by countries of origin and of destination, and Table 2 the type of sectors.

(*) 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.

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	0	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

LIST OF PRODUCTS GROUPS

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)		

1. STRATEGIES FOLLOWED BY THE TRANSFERORS AND THE TRANSFEREES

1.1. 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.

1.2. 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.

1.3. Strategies of European companies can be classified into three categories: (See Table 3)

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.

(**)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.

1.4. 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.

TABLE 3

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

1.5. 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. (See Table 4)

1.6. 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.

TABLE 4

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

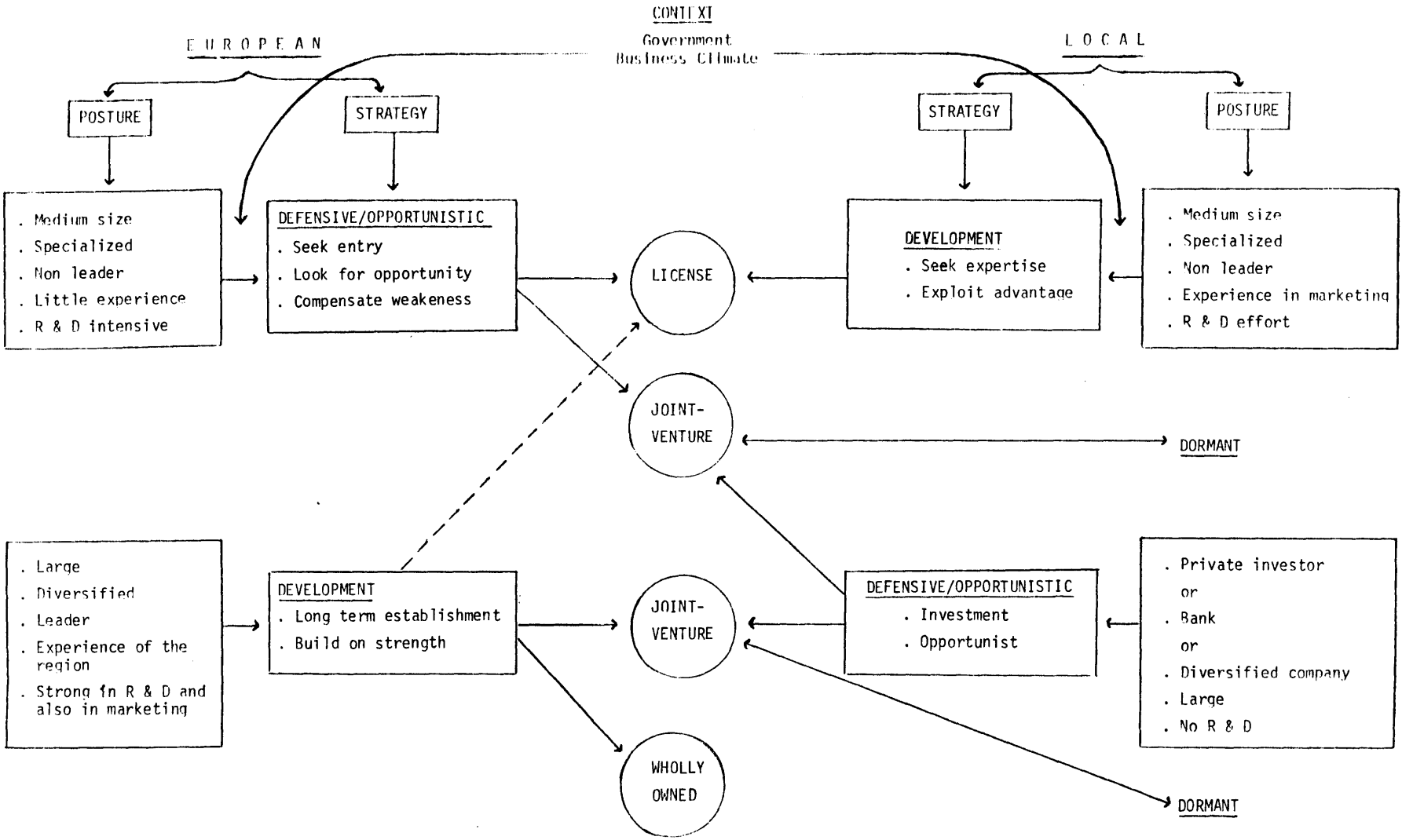


FIGURE 1

STRATEGIC FRAMEWORK FOR TECHNOLOGY TRANSFER

1.7. 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.

1.8. 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.

1.9. Joint-venture is a versatile form of technology transfer agreement. It can fit any combination of strategies for European and ASEAN companies. The salient strategic relationships between transferors, transferees, and forms of transfers are summarized in Table 5 and Figure 1.

TABLE 5

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

1.10. 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.

1.11. 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. (Table 6)

TABLE 6

NEGOTIATION CLIMATE

ACCORDING TO STRATEGIES OF PARTNERS

EUROPEAN STRATEGY

LOCAL PARTNER STRATEGY	DEFENSIVE-OPPORTUNISTIC		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

1.12. 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). (Table 7)

1.13. 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. (Figure 2)

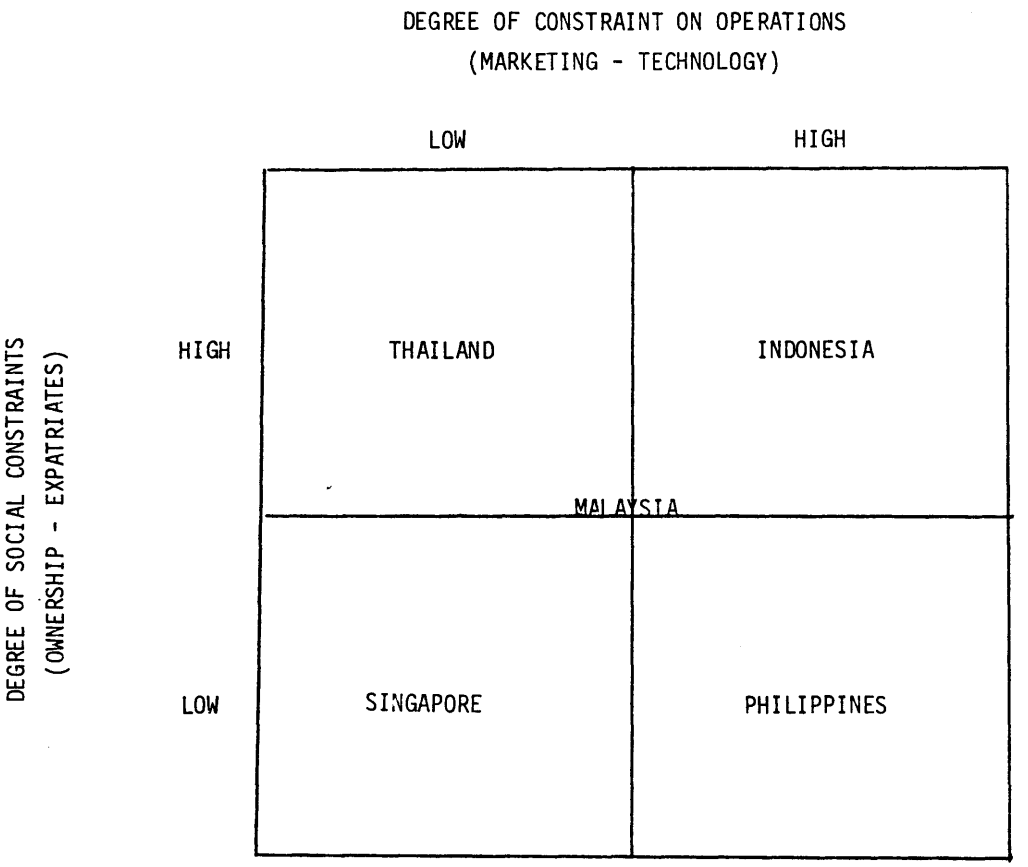


FIGURE 2

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

TABLE 7

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

2. CHARACTERISTICS OF THE TECHNOLOGIES TRANSFERRED

2.1. 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.

2.2. One can classify the technologies transferred into two basic types: (Figure 3)

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.

2.3. 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.

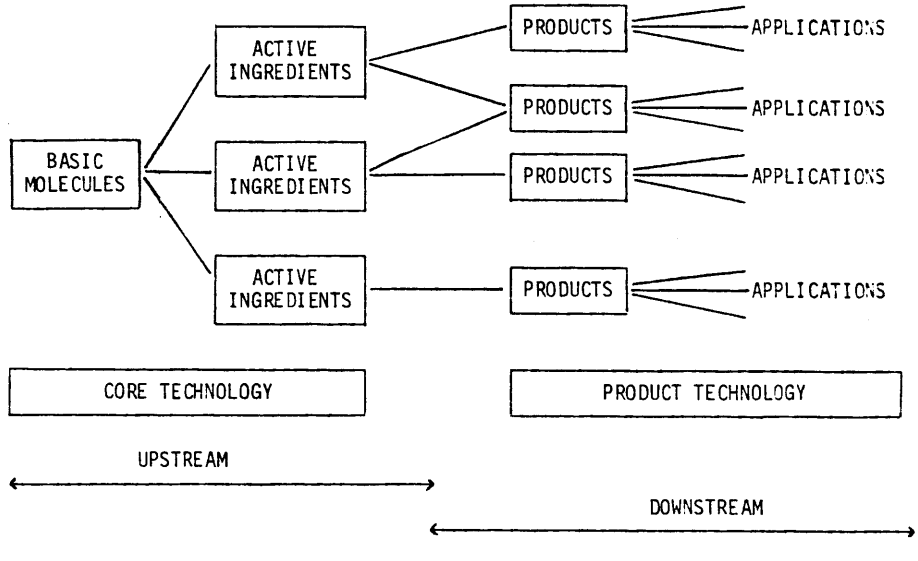


FIGURE 3

TECHNOLOGICAL STREAM IN THE CHEMICAL INDUSTRY

2.4. 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). (Table 8)

2.5. 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.

TABLE 8

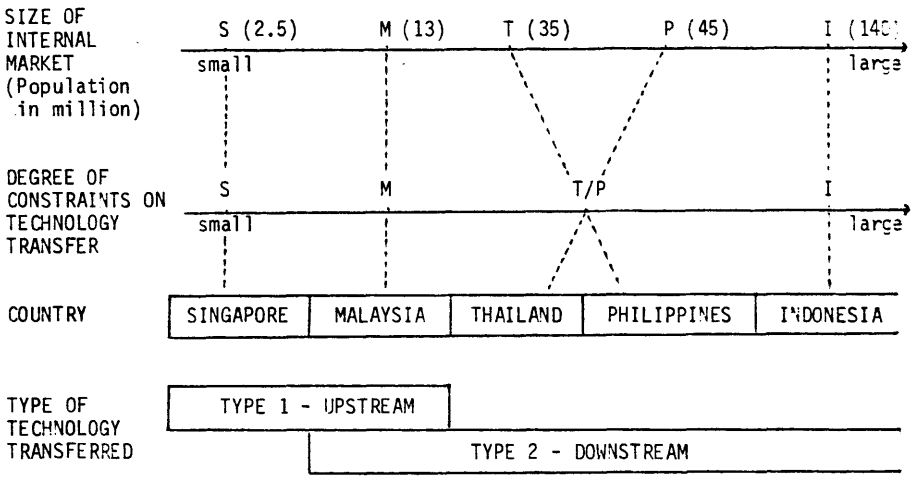
MAJOR DIFFERENCES BETWEEN
UPSTREAM AND DOWNSTREAM TECHNOLOGY

	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 basec 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
RATIOS	. Average Sales/ Assets = 0,5 . Average Market Size/ Assets = 1,25	. Average Sales/ Assets = 2,5 . Average Market Size/ Assets = 26,-

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.

2.6. 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. (Figure 4)

2.7. 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.



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

FIGURE 4

RELATIONSHIP BETWEEN GOVERNMENT POLICY

SIZE OF INTERNAL MARKET AND TYPE OF

TECHNOLOGY TRANSFERRED IN THE FIVE ASEAN COUNTRIES

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

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

THE EUROPEAN POINT OF VIEW

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 5

SUMMARY OF EUROPEAN COMPANIES ASSESSMENTS OF THE RESULTS OF TECHNOLOGY TRANSFER

3. PERCEIVED RESULTS OF THE TRANSFER

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

3.2. 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.

3.3. 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.

3.4. 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.

3.5. 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. (Figure 5)

3.6. 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.

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

HALF ARE SATISFIED

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

THE ASEAN POINT OF VIEW

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 6

SUMMARY OF ASEAN PARTNERS ASSESSMENTS

OF THE RESULTS OF TECHNOLOGY TRANSFER

3.7. 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.

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

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

3.10. 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. (Figure 6)

3.11. When one combines the assessment of European and ASEAN partners, one finds very few cases in which both are satisfied. (Table 9)

3,12. 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.

TABLE 9

EUROPEAN & LOCAL COMBINED SATISFACTION

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

TABLE 10

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 28 %		50 %	
NO PARTNER OR EUROPEAN PARTNERS	2 YES / 1 NO		5 YES / 1 NO	
	Index of Satisfaction 66 %		84 %	

3.13. 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.

3.14. 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. (Table 10)

3.15. 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.

4. IMPLICATIONS

The various findings which have just been summarized, 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.

4.1. 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.

4.1.1. 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 technological 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.

(*) "Logistics will follow"

4.1.2. 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 ?".

4.1.3. 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.

4.1.4. 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.

4.2.1. 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.

4.2.2. 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.

4.2.3. 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.

4.2.4. 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.

4.3. 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.

4.3.1 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 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

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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.

* 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.

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.

4.3.2 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 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.

4.3.3 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.

4.3.4 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.

4.4. 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.

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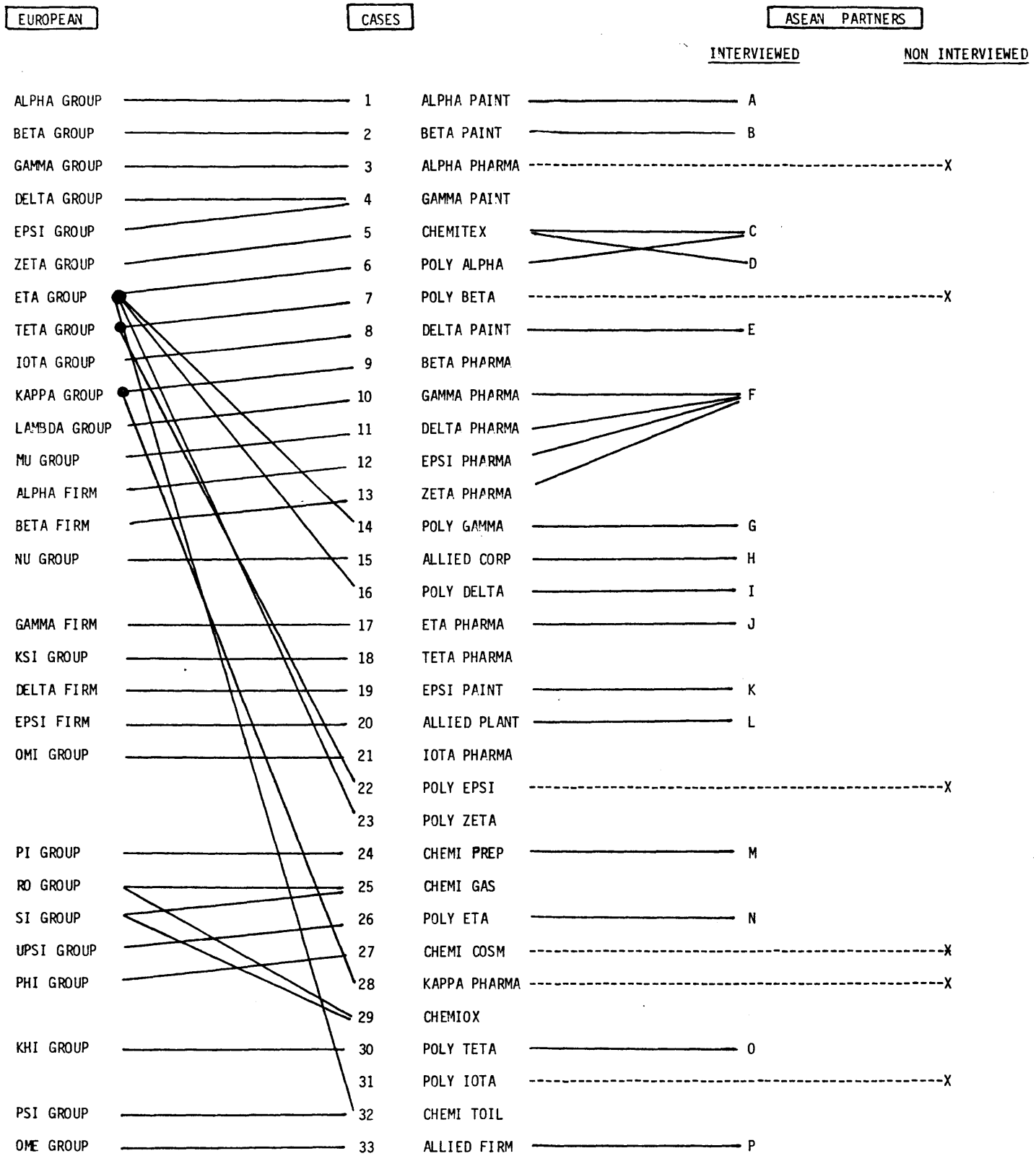
APPENDIX



DIAGRAMATIC REPRESENTATION

OF THE CASES

INCLUDED IN THE SAMPLE

Nota : 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