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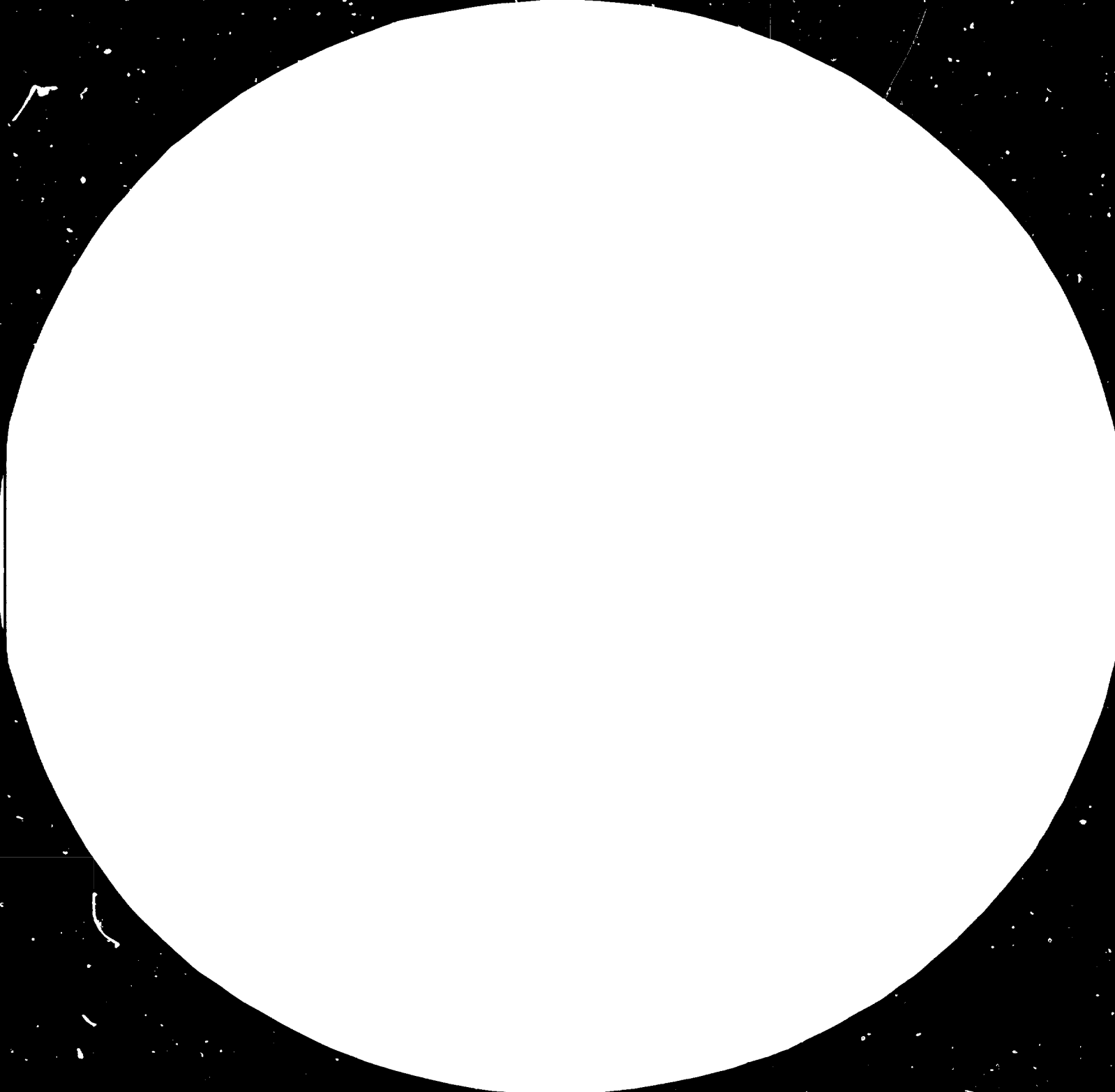

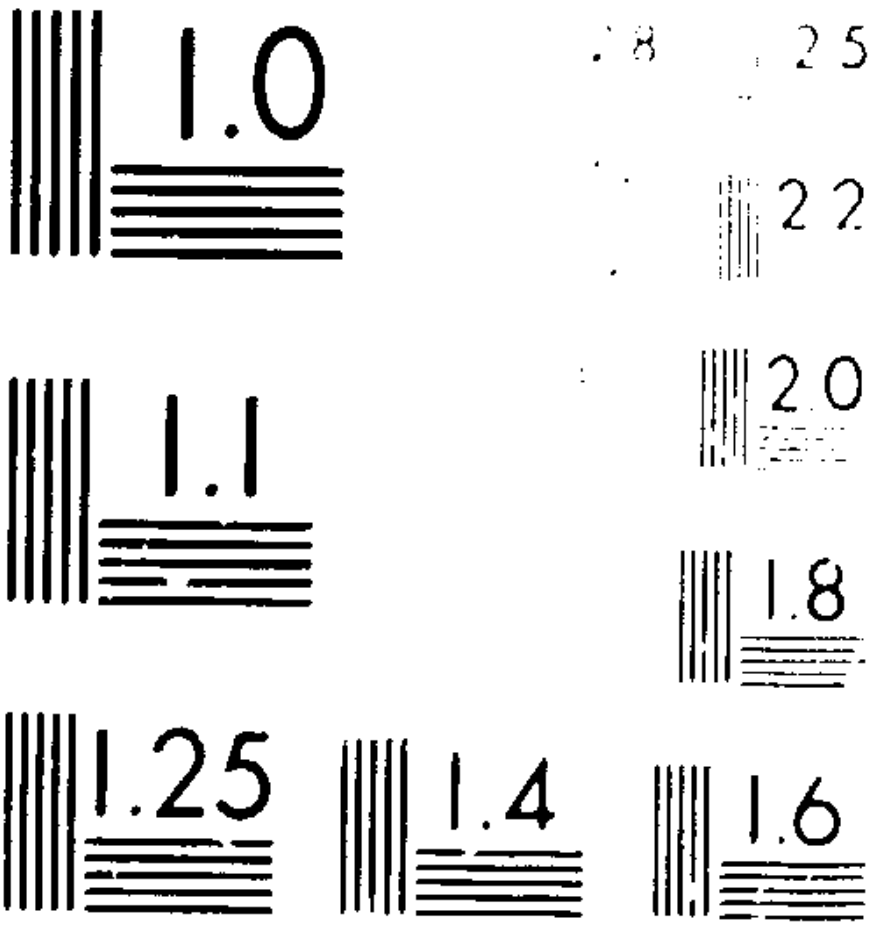
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STRENGTHENING OF THE TECHNOLOGY
TRANSFER BOARD OF THE MINISTRY OF INDUSTRY
DP/PHI/78/008
PHILIPPINES

Technical report: The establishment of an over-all information system designed to gather and analyse data on technology transfer contracts

Prepared for the Government of the Philippines
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of V. Corado-Simões,
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United Nations Industrial Development Organization
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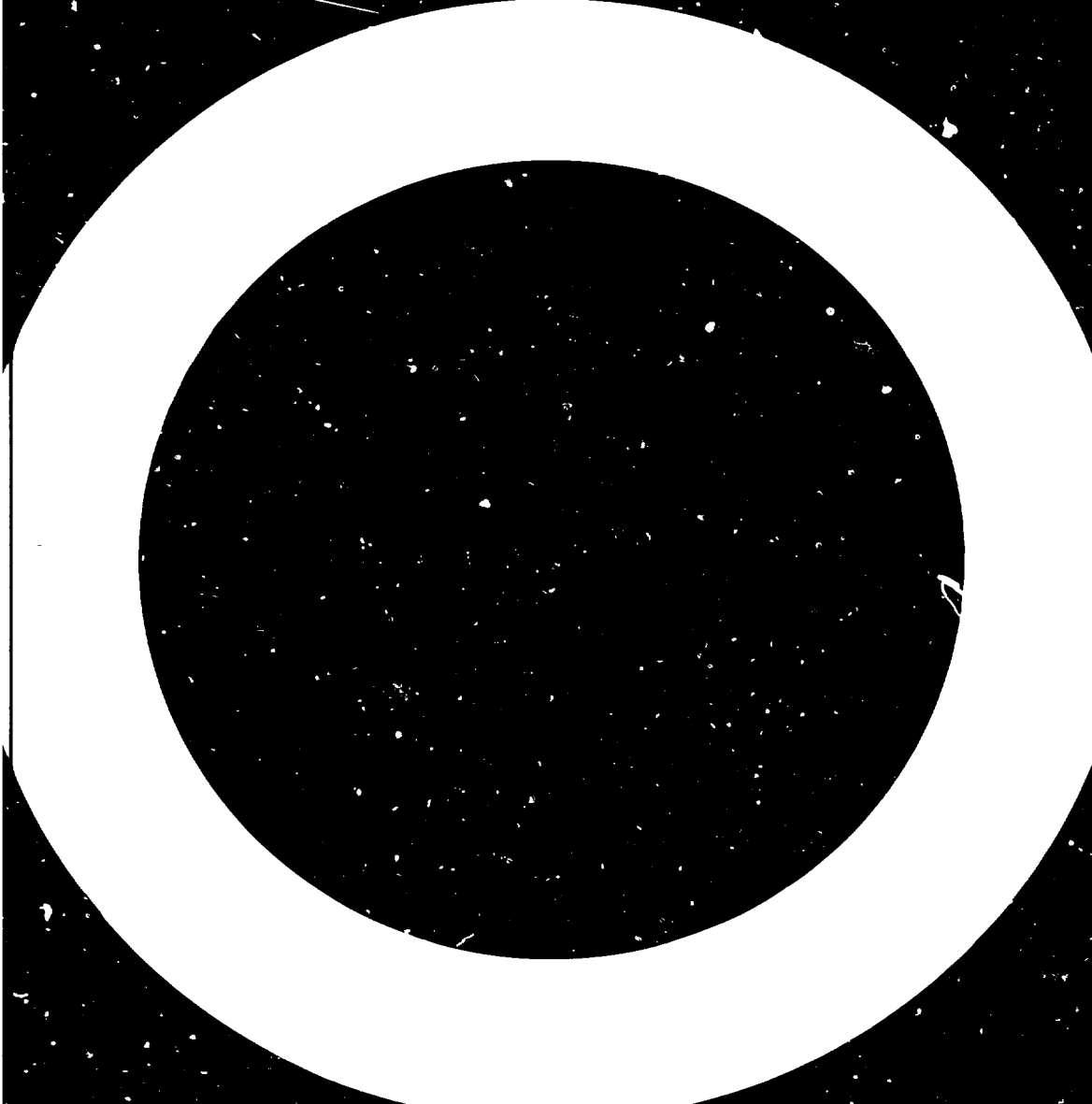
Explanatory notes

BOI	Board of Investments
ICC	International Chamber of Commerce
IPR	industrial property rights
ISIC	International Standard Industrial Classification
LEE	licensee
LOR	licensor
LVA	local value added
MNC	multinational corporation
NEDA	National Economic Development Authority
N	not restrictive (on an *a priori* analysis)
NSDB	National Science Development Board
PPO	Philippines Patent Office
SITC	Standard International Trade Classification
SMI	small and medium-sized industries
S + T	science and technology
TA	technical assistance
TIES	Technological Information Exchange System
TRC	Technology Resource Center
T/T	technology transfer
TTB	Technology Transfer Board of the Ministry of Industry

ABSTRACT

The mission was carried out with the aim of "Strengthening of the Technology Transfer Board of the Ministry of Industry" (DP/PHI/78/008). The establishment of an over-all information system, designed to gather and analyse data on technology transfer contracts acted upon by the Technology Transfer Board, was the main objective of the three-month mission. After an evaluation of the existing system, where some important shortcomings were found, a more encompassing information system was suggested. This enabled an easier and more accurate collection and analysis of relevant data on contracts. The last phase of the mission concentrated on the implementation of the system and on the drawing up of guidelines for practical use. The performance of the system largely relies on the work of people charged with data collection and storage and on the uniformity of the criteria followed. An information system must not be seen as a mere end, but as an important means of fostering the accomplishment of the over-all goals of the Board; information and evaluation work may therefore be seen as complementing one another. The present manual system will enable the operators to obtain the necessary experience to allow for a steady transition to computerization. Computerization is recommended as a way of improving the capability of the Technology Transfer Board in performing its tasks, either in the statistical or in the evaluatory field.



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INTRODUCTION

Background

The complexities involved in the process of technology transfer, which encompassed regulatory, co-ordinating and promotional efforts, led the Government of the Philippines to request assistance in strengthening of the Technology Transfer Board of the Ministry of Industry (TTB). The United Nations Industrial Development Organization (UNIDO) became executing agency for the resulting United Nations Development Programme (UNDP) project (DP/PHI/78/008). This is the report of a mission carried out from June to August 1981 as part of that project.

Before the three-month mission began, the activities already performed under the project had been limited to a study tour by two teams of TTB and technical staff to observe the systems developed by similar bodies in six other countries: Argentina, Brazil, Colombia, Mexico, the Republic of Korea and Spain.

Objectives

The objectives of the mission were closely involved with the over-all goals of the project itself: to overcome the shortcomings of the TTB. More specifically, the mission aimed at the establishment of an efficient information system of data gathering, processing and analysis of the terms and conditions of technology transfer contracts to service the requirements of the TTB for information of this type.

The objectives have been accomplished insofar as a global information system has been designed and its implementation has begun. Further follow-up assistance is needed to observe the working of the system, to assist in a more detailed analysis of data collected and to help in case of a need for modification of the handling system.

RECOMMENDATIONS

On the basis of the experience gathered and with the aim of providing a steady development of the system the following recommendations are made:

(a) The usefulness of the system largely depends on updating and in accuracy of information. People charged with filling out the basic cards must bear this fact in mind;

(b) Uniformity of criteria is an essential factor. Existing guidelines, however extensive, cannot encompass all the situations. Typification of unforeseen situations must be added, after an exchange of views among staff members;

(c) A clear distinction between evaluation and statistical staff is neither feasible nor advisable, so that a continuous interflow and interaction can take place, without prejudice to some degree of specialization. Someone should be carrying out statistical analysis, but performing at the same time, evaluation tasks;

(d) It must be borne in mind that the information system must be in accordance with, and subordinated to, the over-all goals of the Board. Information is not an end in itself. It is of crucial importance, however, to an accurate achievement of the perceived goals. More specifically, statistical analysis has to be fully integrated with evaluation objectives; statistical data must be the background which can lead to a more correct evaluation and to the definition of policy measures;

(e) Computerization has several advantages over manual handling, chiefly in reduced costs for additional analysis, time saving, added accuracy of data, increased possibilities for more sophisticated analysis, utilization of inquiry facilities, increased effectiveness of monitoring and eventual linkages with other information networks.

Experience obtained from the working of a manual system will be helpful for the steady implementation of a computerized system. To overcome eventual confidentiality issues and to achieve effective independence, acquisition of a microcomputer for exclusive use of TTB will perhaps be the most appropriate action, avoiding as far as possible proliferation of facilities inside the Ministry.

An extension of the project in 1982 could be utilized to review and monitor the system, and to assist in contacts with the systems analyst charged with designing and programming, so that computerization could start later in the year;

(f) Linkages with the Central Bank concerning the exchange of information must be further developed. The availability of data concerning foreign exchange outflows due to technology transfer contracts (either registered by TTB or previous to its implementation) must be seriously considered;

(g) Information linkages with other bodies outside the Ministry of Trade and Industry must also be improved. Knowledge of the functions and targets of the TTB could be given to the business community at meetings where technology transfer issues could be discussed and TTB goals could be publicized. The seminar to be held in November 1982, sponsored by UNIDO, could pave the way for this kind of action.

I. MAIN ACTIVITIES

Within the framework provided by the job description (see annex I) and in close co-operation with TTB technical staff, activities have been directed towards the establishment of an adequate system of collection and analysis of information on technology transfer, designed to suit the specific needs of Philippine economic and technological development and, more specifically, of the TTB.

Accordingly, the work was mainly concentrated in three fields:

(a) Appraisal of the existing information system;

(b) Designing and discussion of a more appropriate and encompassing system;

(c) Implementation of the proposed system.

Appraisal of the existing information system

Basic sources of information are well developed and are suited to the needs of the TTB. A comprehensive application form has to be completed by companies so that official acceptance of a contract for evaluation can take place. For monitoring purposes, a form for reporting annual progress is used; this provides extensive data on the operations performed under the technology transfer agreement.

Evaluation work is done conscientiously and appeals, in some cases, for information outside the TTB, mainly concerning background sectoral data and engineering or technical data.

Modifications of either the application or the monitoring forms were not needed. The need for improvements lay in what could be designated as secondary sources of information, i.e., appropriate forms for storage, analysis and later utilization of relevant data on the contracts, either for evaluation or for statistical purposes.

Work was, therefore, concentrated on the improvement of information gathering and analysis.

Design of an over-all information system

Two distinct, although closely interlinked questions were asked:

(a) What kind of data must be selected and what kind of outputs must be produced?

(b) Which handling system (manual versus computerized) should be chosen?

With regard to the latter, it is thought that the most realistic procedure has been followed. Computer facilities are not yet available and the utilization of other organizations's facilities could raise problems of confidentiality; moreover, design and programming of a computerized information system are closely interconnected with type and characteristics of the computer to be used.

In order to profit from the technical assistance and to avoid an excessive accumulation of contracts, it was decided to begin work with a manual system. Furthermore, this option had the advantage of allowing the operators to gather experience and, eventually, to introduce some improvements into the system.

In the medium term, however, a computerized system must be introduced. In spite of the relatively small number of agreements acted upon, computerization has the edge on a manual system. The availability of a microcomputer exclusively for the ITB's use would be the most adequate solution to comply with confidentiality requirements. The establishment of linkages with existing or foreseen facilities inside the Ministry of Industry could also be considered.

The first set of questions was extensively analysed and, in the expert's opinion, an over-all system was designed to fit the specific needs of the ITB. The system encompassed two main vectors:

Collection and storage of information
Statistical analyses and reports

Collection and storage of information

One of the chief shortcomings of the previous system was the great reliance on contract folders; another was the lack of crosslinkages among data storage forms.

To overcome those deficiencies and after taking into account the option for a manual handling system, a set of cards containing all the relevant information concerning technology transfer contracts was established. The system is based on the following principles:

(a) The progress of each contract must be easily followed from its initial entry to its registration and later monitoring;

(b) For statistical purposes the relevant information contained in the text of contracts and in application forms must be systematized on storage cards; the reading of agreements for statistical (and often for evaluation) purposes will no longer be needed;

(c) All information storage cards must be connected, but unnecessary duplication must be avoided (a more in-depth approach is provided as annex II).

Accordingly, a set of six cards was proposed: contract flow card, contract card, product card, recipient card, supplies card and monitoring card. The contract card is the cornerstone of the system, providing a brief but complete insight into the framework and the text of the agreement and, at the same time, an appraisal of the modifications introduced as a result of TTB intervention (a copy of a contract card is shown in annex III). The product card is relevant for evaluation activities; it provides detailed information on the fields where contractual technology is imported.

Statistical analysis and reports

The main objectives of statistical analysis system were identified as follows:

(a) Assessment of the trends and characteristics of contractual technology inflow in the Philippines;

(b) Assessment of the efficiency and the results (either qualitative or quantitative) of TTB intervention;

(c) Assessment of the impact of imported technology on the national economic and scientific or technological system.

Besides these objectives, others must also be considered such as the improvement of the relationships between the TTB and national business and scientific and technological communities, as well as the strengthening of linkages with information systems of international organizations, especially the UNIDO TIES system.

Stemming from the above objectives, three kinds of statistical analysis reports were suggested:

(a) Surveys of registered contracts, including an appraisal of the main features of the contracts as well as an estimation of the effects (especially financial effects) of TTB regulation. These detailed reports will be provided to the Board each quarter. The contents of periodic reports were extensively discussed and some guidelines were established;

(b) Surveys of technology transfer payments will be provided to the Board on either a bi-annual or an annual basis. However, as data on effective payments was not available to the TTB, basic data must be provided by the Central Bank;

(c) In-depth sectoral studies, aimed at presenting a close insight into the process of technology transfer in specific sectors. It must be recognized, however, that this type of study is hardly feasible, due to the limited number of TTB technical staff, and that it implies, moreover, the setting up of linkages with other bodies with broader functions, such as BOI or NEDA (see annex IV for further details on the main suggestions made concerning statistical analysis).

Implementation

The limited time-period of the mission meant that an option had to be taken concerning implementation. The mission began with the over-all system collection and storage of information, as far as it was essential for the performance of the other steps.

A thorough discussion on the contents of the cards took place. Written guidelines were prepared in order to ease and stabilize completion procedures. These are now being performed.

II. ACHIEVEMENT OF OBJECTIVES

The objectives of the mission were attained to a great extent. Only task (f) of the job description in annex I was not performed; indeed the fulfillment of this task will imply a close relationship with the technology transfer organization expert.

An over-all system for collection of information was designed and its implementation has already begun. On-the-job training was provided through discussions and exchanges of views with technical staff as well as through supervision of implementation procedures.

In addition, advice was given concerning the purchase of a microfiche reader. As funds have already been allocated for this purpose, purchase should not be delayed. Microfiche reproduction is a good method of preventing loss or damage of existing data.

Finally, talks were held with representatives of some computer companies as a first step to eventually purchasing a microcomputer.

The work performed will lead to the strengthening of the capacities of the TTB, inter alia on the following grounds:

(a) Knowledge of the flow of the contracts inside the TTB;

(b) Knowledge of the terms and conditions of the import of contractual technology;

(c) Information on a product basis;

(d) Assessment of the effects (either qualitative or quantitative) of TTB intervention;

(e) Improvement of evaluation procedures, by providing up-to-date background information.

III. FINDINGS

The TTB is a recent body. Its operations began in October 1978, and current evaluation tasks have absorbed most of its time and were of the utmost concern to the Board and the technical staff.

The time has now come to get a closer insight into information issues, based on data and experience accumulated during its three years of operation. The working of a comprehensive information system will provide an evaluation background that is likely to improve substantially decision-making and screening of technology imports.

Computerization will be the next step in the process, and will be geared to ensure more efficient data collection and retrieval. Utilization of inquiry facilities, allowing immediate access to data stored, would be helpful for evaluation purposes.

Monitoring activities will then have to be considered. The staff are aware of the importance of monitoring; the text of contracts only provide a framework for their implementation, they do not say how they are carried out. Monitoring is not an immediate issue. However, while the five-year term of the first registered agreements will soon be to hand, and renewals will be requested, the need for establishing monitoring procedures will increase.

The approach followed by the TTB has been a pragmatic one: steady and step-by-step. In spite of the various improvements suggested, the balance of TTB regulation has been largely positive and is likely to increase further.

Annex I

JOB DESCRIPTION

The main tasks assigned to the technology transfer information expert were the following:

(a) To study and evaluate the information collection and dissemination system applied by the TTB;

(b) To fully investigate present and future needs of the TTB in terms of collection, storage and dissemination of information related to all its duties;

(c) To specify and oversee implementation of a more efficient information system for internal use;

(d) To assist the TTB in its efforts to supply information into the UNIDO Ties system;

(e) To provide on-the-job training in information collection and processing for the TTB staff;

(f) To establish guidelines for an information and advisory service at the TTB which would encompass access to sources of information on available technologies, including those made known through the UNIDO INTIB and local technologies.

Annex II

INFORMATION COLLECTION AND ANALYSIS

A. Comments on the existing system

Before assessing the TTB system of collection and analysis of information, the question must be asked: what are the purposes of such a system?

There are chiefly two: the support of evaluation tasks and statistical aggregate data, namely, accomplishment reports sent to the Board and bi-annual TIES I reports.

The main sources of basic data are collected from: the application forms and the contracts themselves.

Some of this information is translated onto:

(a) Contract cards, following TIES coding forms (some data are added; namely those concerning foreign exchange outflows, inflows and savings (derived from TTB intervention), tax earnings and employment);

(b) Sectoral contract data, containing information about products involved, recipient, supplier, type of agreement (new or renewal), royalty rate.

These data are extensively used in evaluation procedures in order to gather information about similar agreements or technologies; however, for a more in-depth analysis an appeal to the contracts themselves is needed. Furthermore, identification of agreements is made only under the name of the recipient or supplier, and registered agreements are filed by registration number. The addition of new contracts to the existing sheets could also entail some problems, especially when the total number of agreements increases;

(c) Royalty rate cards, filed according to royalty rates. The usefulness of those cards seems limited.

Other noteworthy elements relate to monitoring of tech[illegible]ansfer (T/T) agreements such as the forms for annual progress report[illegible] and [illegible]oring reports.

A large number of annual progress report have already been received and are filed under contract registration numbers. However, monitoring reports have not yet been issued. In fact the TTB is less than three years old and daily pressure on evaluating agreements and in complying with the 60-day term as laid down by law have been until now the overwhelming requirement. Furthermore, as agreements are generally allowed for five years, only a few cases of contracts registered by the TTB have so far been renewed.

The forms for the annual progress reports and the monitoring reports must be integrated into an overall system of T/T information. To establish its exact role, the goals pursued with monitoring must be identified; they include the following:

(a) General compliance with the objectives of T/T policy;

(b) Checking, for each agreement, its compliance with the expectations and with the terms and conditions set by the Board;

(c) Support in the evaluation of renewal demands;

(d) General statistics about the inflow of technology in the Philippines.

A problem arises as to which are the most important ones. Will there be a need for an annual check of each agreement? Will it be preferable to concentrate on the bigger contracts with some assessment (by random sampling) of the minor ones? Which will be the linkage between monitoring and renewal evaluation? What about the effective transfer of technology, that is, the absorption of the know-how by the recipient and its ability to carry out the affair alone? This cannot be appraised by a mere progress report; it implies a more in-depth analysis and a thorough observation of the plant.

These matters must be extensively discussed in order to integrate monitoring then into the general information system. It is necessary to plan this integration before the beginning of monitoring activities.

Application forms are complete and supply evaluation staff with most of the relevant data concerning the agreement and the parties. At present, and taking into account that they have been modified recently, it is thought that they must remain unchanged regarding the information gathered.

Two improvements could, however, be introduced: first, data about total investment of the project in relation to T/T agreements are useful. Secondly, an overview of the recipient company could also help in the evaluation. Application forms must give more information about the recipient company in order to see what the agreement 'T/T project' means for it. Is it a basic activity or just a marginal one?

Evaluation memoranda are clear and deal with all the more relevant items. Evaluation work is conscientious and appeals for information outside the TTB, mainly concerning the background sectoral data or engineering and technical data.

However, from an information viewpoint memoranda are not well-suited. Another link between evaluation and information collection is needed. The contract card currently used is not enough to collect all the relevant data on the contract (as well be seen later), and in most cases information, even statistical data, only can be got from the agreements themselves. This is a major short-coming that must be overcome in the designing of a global information system.

In brief, the evaluation stage must provide adequate data in a suitable form for statistical and retrieval purposes. Further reading of the contracts for statistical purposes should not be necessary. A short but complete contract card, gathering all the relevant information, must be filled out at the evaluation stage, in two steps (initial and final; that is, when the contract comes in and when it is registered).

Current contract cards closely follow the TIES coding forms. They are midway between an exhaustive contract card and a short aperçu of basic contract elements. They do not avoid, unfortunately, an analysis of the text of the agreements themselves in order to get information on restrictive business clauses, for instance.

Furthermore, the connection between the cards and the sectoral contract data is difficult because the former are filed by registration numbers and the latter are organized by products and do not refer to registration numbers (in some cases they do not have even registration numbers because the companies do not comply with the terms and conditions set by the Board).

These cards will not be needed in the foreseen information system.

With regard to information on a sector (or product) basis, the expert believes that the idea underlying the existing system is correct. Evaluation staff need up-to-date information on a product basis, about existing (registered or not) agreements.

However, some pre-requisites must be accomplished as follows, in order to provide greater usefulness:

(a) Linkages between one set of information and others (namely contract cards) must exist;

(b) Updating must be easy and must not entail later subdivision of items (that is, a system must be selected for the identification of products);

(c) The goal is to identify which agreements have been acted upon in the relevant sector and not to have extensive information about them; the latter can be obtained, if necessary, from the contract card.

Some modifications must be introduced within the actual system such as the utilization of product cards and the identification of products according to the SITC. The problems raised by service agreements can be easily solved; in fact, most of them fall into six categories: restaurant operation, rent-a-car systems, hotel management, general management, telecommunications systems and computer software and data processing.

Royalty rate cards are rarely used. Indeed, when the staff evaluate an agreement the point is not how many agreements have that royalty rate, but rather, how many agreements deal with products (and what are their terms and conditions).

Even for statistical purposes those cards are not suitable. One must be aware not only of the royalty rates but also of the royalty basis. Useful information on T/T payments can be easily collected from other sources.

B. Outline of an information system

The design of an information system must comply with the following conditions:

(a) Each agreement must be capable of being followed from its entry to registration and later to monitoring; the stage reached by each contract must be known;

(b) For statistical purposes, secondary sources of data, not primary ones must be relied upon. The relevant information contained in the text of contracts and in application forms must be transferred to manual cards (or to computerized supports); reading of agreements for statistical purposes will not be necessary if an adequate contract card is designed;

(c) All information storage cards must be linked and connected but unnecessary duplication must be avoided; in a manual system, however, some degree of duplication of main items could save time.

Relevant information on T/T agreements, either for statistical or for evaluation purposes, can be stored on six cards: contract flow card, contract card, product card, recipient card, supplier card, and monitoring card.

All these cards are connected, but information stored and its purposes are different.

From a contract's entry in the TTB to its registration it passes through a number of stages: entry, official acceptance, evaluation, approval (or denial), and registration. Some stop at a given stage and do not reach the next one; companies may no longer be interested in such a contract or may not be interested in going along with it in view of the terms and conditions set by the Board. Identification of the stage reached by every agreement is necessary; at the same time, it is a means of controlling the work of the TTB staff and the compliance of companies with TTB requirements (namely concerning information requirements and registration terms and conditions).

To allow for up-to-date information on the flow of each agreement a contract flow card was proposed. These can be identified in three ways: entry number, registration number (only for registered agreements), and recipient name (only for agreements not officially accepted).

These cards must be filed in line with the identification methods already mentioned:

(a) A contract must receive an entry number, but only after official acceptance; up to that time the contract is not yet worthy of consideration by the TTB. Contracts which do not comply with the requirements for application must be recorded on the contract flow card, but should not be mixed with those which are ready for evaluation. The flow card of those contracts must be filed in alphabetical order of recipient company (a periodic review of those cards must be undertaken to see if there are some contracts which can be considered as abandoned);

(b) Flow cards of contracts not yet registered must be filed according to entry number. Entry number is the most adequate way of identifying agreements not registered;

(c) Finally, contracts already registered must be filed according to registration numbers. Registered contracts must be seen as being cancelled; after the issuance of the Certificate of Registration and the endorsement by the Central Bank, the contract does not entail any more work for the TTB a/ - its flow has ended.

The completion of this card does not require any particular knowledge; the task can be performed by clerk personnel.

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a/ Not considering monitoring operations and possible minor amendments or additions.

Contract cards are the basic corner stones of the system. They must be designed to permit the collection of all relevant information including the application form. At the same time, the card must show the modifications introduced by the Board on the former agreement; that is, a comparison between requested and approved terms and conditions.

Contract cards must be completed by evaluation staff in two steps: when the evaluation begins, and when the agreement is submitted for registration or when it takes place.

At first, this task seems to involve a lot of additional work. However, this is not the case, because the completion of contract cards helps the evaluation work; a contract card can be seen as a check-list of all the relevant provisions generally found in technology transfer agreements, and it provides a useful support to a careful examination of the text of the agreement; furthermore, it helps to systematize the elaboration of evaluation memorandum. Portuguese experience in this field showed that, at the start, evaluation staff were reluctant to perform the task; later, they recognized the usefulness of contract cards and even proposed some amendments to them.

Another advantage of a contract card is that it avoids the necessity of reading the text of the agreements and is complementary, in some respects, to evaluation memorandum. It can also be utilized by the members of the Board as another information input for decision-taking.

Finally, the expert underlines its statistical usefulness; it provides an easier method of collecting data, either in a manual or in a computerized system.

Statistical data on foreign exchange outflows and inflows, foreign exchange earnings deriving from TTB intervention, tax earnings, employment generation, net sales, local value added and production capacity can all be recorded on this card. As can Board decisions.

A draft of the proposed card can be seen in annex III. Its contents deserve, however, more in-depth discussion and analysis.

In assuming that a manual system will be selected, three xerox copies of the card will be needed:

(a) The first will be included in the contract folder;

(b) The second will be utilized for statistical purposes;

(c) The third will be utilized for evaluation purposes (analysis of similar agreements relating to the same product).

Copies can only be obtained after registration of the agreement. U 'l then, there will be only one card in the contract folder.

The following cards centre around the contract card. They include partial information only, designed for easy evaluation and statistical procedures.

The product card is a main input for correct evaluation work. Product (or sector) summary sheets are now being utilized. However, as the number of agreements grow, they will be increasingly difficult to consult and update; furthermore, product classification must be established in order to prevent confusion or misclassification.

Product cards will be identified by SITC, complemented with a description of the product. Relevant items to be retained in the card include:

(a) Entry number;

(b) Registration number;

(c) Recipient company;

(d) Supplier company;

(e) Object of the contract (know-how, trademarks, patents, technical assistance, training);

(f) Type of agreement (new/renewal);

(g) Approved royalty rate.

In order to shorten the card and to avoid unnecessary duplication, data on supplier company, type of agreement and approved royalty rate can be deleted. Further discussion of this topic will be useful.

SITC classification must be attributed by technical staff in the first phase of the evaluation procedure. The completion of the card must be performed by trained personnel in two steps:

(a) Product identification (when applicable), entry number, recipient, supplier, object and type of agreement - immediately after the completion of contract cards by staff;

(b) Registration number, after registration has been carried out.

Cards must be filed according to their SITC number.

The aim of recipient cards is to collect information on all the agreements of each Filipino firm; some data about the firm itself will be also useful (BOI registration, foreign holdings and products manufactured). If a computerized system were selected, more information could be analysed and recorded (for instance, sales, employment, assets);[b/] a closer connection between BOI and the TTB could also be accomplished.

Recipient cards provide information either for evaluation or for statistical purposes. The knowledge of previous contracts of recipient firms is background information that must be taken into account, especially in cases where a bunch of agreements exists with the same supplier (or affiliated suppliers). The card also supplies information about applications filed and not registered. A closer scrutiny of companies which in a systematic way do not comply with Board registration requirements could be necessary.

The completion of the cards does not require any particular ability and can be easily performed by clerks, on the basis of contract cards.

Most data can be obtained from the contract cards immediately after the first stage of the evaluation procedures; only the registration number has to be filled in at a later stage.

Like product cards, some shortening of recipient cards is envisaged, mainly in what concerns products, suppliers' foreign holdings and the objects of the contract.

Supplier cards are similar to recipient cards. Their purpose and completion procedures are broadly the same.

Specific comments on supplier card has been avoided, although additional discussions and exchanges of views on this subject are welcome.

A monitoring card has also been designed and has been commented on earlier.

In theory a computerized system will allow for the collection of more information than provided for in the monitoring card.

An annual comparison between projected and actual performance is an essential element of monitoring activity. Detecting the reasons which lead

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b/ It must be pointed out, however, that application forms do not provide this information; it can, nevertheless, be collected from financial statements (excluding employment).

to over or under performance is another task which cannot be recorded in a summary monitoring card (as proposed) but rather on a monitoring report, encompassing quantitative and qualitative appraisal, as the one already designed but not yet in use.

Monitoring cards must be identified by registration number (only registered agreements are in force and can therefore be monitored) and, should contain data on:

(a) Total sales;
(b) Domestic sales;
(c) Exports;
(d) Royalty payments;
(e) Total foreign exchange disbursements;
(f) Local value added;
(g) Employment;
(h) Tax payments;
(i) R and D expenses.

Data on these items can be collected from application forms and contract cards (concerning projected values) and from former forms for annual progress reports provided by recipient firms (for actual values).

To understand the relationships to be established between evaluation procedures and information collection, a summary flow-chart of the most relevant evaluation steps and the corresponding information work follows:

Receipt of application	- Application control book[c/]	Clerk
	- Contract flow card (recipient/supplier/object/receipt of application/assignment to staff)	Clerk
Preliminary review Additional requirements	- Contract card (issuance of additional requirements)	Clerk
Official acceptance	- Contract flow card (entry date/entry number/date decision due/official acceptance date/assignment to staff)	Clerk
	- Application entry book[c/]	
Evaluation	- Evaluation memorandum [c/]	Technical staff
	- Contract card (as requested)	Technical staff

c/ Elements outside the information system.

	- Recipient card (all items except registration number	Clerk
	- Supplier card (all items except registration number)	Clerk
	- Product card (all items except registration number and royalty rate)	Clerk
Submission to Acting Executive Director		
Submission to Board (Board decision)	- Contract flow card (Board decision date)	Clerk
	- Contract card (terms and conditions of registration)	Clerk/Technical staff
Issuance of notice	- Contract flow card (date of issuance of notice)	Clerk
Acceptance of terms and conditions for registration		
Registration	- Contract date (as registered)	Technical staff
	- Certificate of registration number c/	Clerk
	- Certificate of registration c/	Clerk
	- Contract flow card (compliance with conditions/issuance of certificate of registration/ endorsement to Central Bank)	Clerk
	- Product card (registration number)	Clerk
	- Recipient card (registration number)	Clerk
	- Supplier card (registration number)	Clerk
	- Monitoring card (projected item)	Clerk/Technical staff

The proposed scheme of information collection implies a lot of additional clerical work and also some more work for the technical staff. The latter can be considered as negligible as far as the completion of contract cards will help and improve evaluation procedures.

The workload increase will be substantial for clerical staff, and will require the recognition of a new element in their employment situation. TTB clerks are in need of some further administrative support and also of typing assistance.

However, further discussions will be needed on this subject. In some instances, appraisal of work performances and needs can be misleading. In addition, the employment of new personnel has to be linked with the option of a manual or a computerized system of information. In the latter case, the TTB will use a global facility (in the sense that it is one among many uses), and co-ordination with the general management of the computer facilities, at the ministerial level, will be required. Furthermore, acceptance needs differ according to the system chosen.[d/]

A further point that requires examination is the collection of information on agreements already acted upon by the TTB after October 1978.[e/] Agreements acted upon, as of 8 July, have reached a total of 335, of which 265 have been registered.

The completion of cards on those contracts (other than contract flow cards) will take 280 to 330 man/hours: i.e. up to 8.5 weeks. About 60% of the time will be spent with contract cards; the remaining 40% will be used to fill out supplier, recipient, product and monitoring cards.

Beyond the time allocated to the completion of the relevant cards, a training period has to be provided to the personnel carrying out this task. Training would last for one week.

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d/ Expectations on applications must also be taken into account: Will the downtrend on the first half of 1981 remain? Will the law be modified to have a larger scope?

e/ The question has not been raised yet of information about old agreements, that is, those agreements which TTB analysed at the request of the Central Bank (there were about 430 contracts between 1973 and 1978).

The question then arises as to whether the old agreements (previous to the start of the TTB) are worthy of statistical treatment also. Are they relevant for evaluation purposes, namely as background information? Would recipient cards and product cards on those agreements be useful?

The expert feels that this is another issue for discussion. Nevertheless, whatever information was collected from those agreements, it will be less complex than that of TTB agreements.

This paper is only a preliminary attempt to deal with the procedures of information collection; its purpose is to allow a discussion of the various issues. The fact that a set of cards is proposed does not entail any option for a manual over a computerized system. The expert is simply trying to establish the relevant information to be collected and to take into account the requirements either of evaluation or statistical work.

Annex

CONTRACT CARDS

CONTRACT CARD (1)

Entry no. _____
Registration no. _____

RECIPIENT COMPANY _____
State owned [ ] Privately owned [ ] Mixed [ ] Foreign holdings _____%
Origin of foreign equity _____

SUPPLIER COMPANY _____
Country _____ Holdings in the recipient _____%
Indirect relationships _____
Type of agreement : New [ ] Renewal [ ] Amendment [ ] ISIC _____
SITC _____

OBJECT (SPECIFY) _____

TECHNOLOGICAL ITEMS INVOLVED

Licence agreement [ ] Service agreement [ ] Franchise agreement [ ]

Knowhow [ ]	Feasibility studies [ ]	Process engineering [ ]	T.A. Erection/Start-up [ ]
Trademarks [ ]	Market studies [ ]	Basic engineering [ ]	T.A. Production [ ]
Patents [ ]	Management studies [ ]	Detailed engineering [ ]	T.A. Management [ ]
Models [ ]	Other studies [ ]	Training [ ]	T.A. Marketing [ ]
Other (specify) _____			General T.A. [ ]

TYPE OF LICENCE : Exclusive [ ] Non-exclusive [ ] Silent [ ]

TYPE OF PAYMENTS

Lump sum	[ ]	[ ]
Fixed royalty	[ ]	[ ]
Variable royalty	[ ]	[ ]
Technician's fees	[ ]	[ ]
No payments	[ ]	[ ]
_____	[ ]	[ ]

ROYALTY PAYMENT BASIS

Net sales	[ ]
Net profit	[ ]
Local value-added	[ ]
Exports	[ ]
Gross sales	[ ]
Fixed amount per unit	[ ]
Project & equipment	[ ]
_____	[ ]

VARIATION FORMULA

Products	[ ]	[ ]
Sales (value)	[ ]	[ ]
Sales (volume)	[ ]	[ ]
Production	[ ]	[ ]
C/A	[ ]	[ ]
Exports	[ ]	[ ]
Time	[ ]	[ ]
Location	[ ]	[ ]
_____	[ ]	[ ]

TAX LIABILITY

Recipient	[ ]	[ ]
Supplier	[ ]	[ ]
Silent	[ ]	[ ]

MINIMUM ROYALTY

Yes [ ] [ ] No [ ] [ ]
Reduction [ ]

RESTRICTIVE CLAUSES

Post-expiry restrictions	[ ]	[ ]
Confidentiality restrictions		
Undue payments	[ ]	[ ]
Restrictions on improvements	[ ]	[ ]
Grant-back clauses	[ ]	[ ]
No-contest clauses	[ ]	[ ]
Restrictions on competing technology	[ ]	[ ]
Restrictions on technology management	[ ]	[ ]
Tie-in clauses	[ ]	[ ]
Export restrictions	[ ]	[ ]
Restrictions on volume/scope of production	[ ]	[ ]
Price-fixing restrictions	[ ]	[ ]
Restrictions on distribution channels	[ ]	[ ]
Other restrictions in TPAs	[ ]	[ ]
Restriction on finance, investment & employment	[ ]	[ ]
Restriction on applicable law	[ ]	[ ]

DURATION

Required _____
Accepted _____
Effective date _____

RENEWAL

Automatic [ ] [ ]
Subject to TTB [ ] [ ]
Technical fee reduction [ ] [ ]
Reduction [ ] [ ]
Yes [ ] No [ ]

Entry No. _____
Registration No. _____

POST-EXPIRY PROVISIONS

	. Post-expiry secrecy	
	. > 5 years	[ ][ ]
	. 2 to 5 years	[ ][ ]
N	. < 2 years	[ ][ ]
	. Production/sales forbidden	[ ][ ]
	. Other restrictions	[ ][ ]
N	. Cease use trademark	[ ][ ]
N	. Return documentation	[ ][ ]
	. Silent	[ ][ ]

UNDUE PAYMENTS PROVISIONS

. Payments for expired IPRs	[ ][ ]
. Post-expiry payments	[ ][ ]
. Other	[ ][ ]
. Silent	[ ][ ]

ACCESS TO IMPROVEMENTS

. LEE's access not allowed	[ ][ ]
. Allowed under additional payments	[ ][ ]
. Other restrictions	[ ][ ]
N . Reciprocity	[ ][ ]
. Silent	[ ][ ]

GRANT-BACK CLAUSES

. Improvement to be patented in the name of LCR	[ ][ ]
. Improvement patented name of licensor in countries where LEE decides not to patent	[ ][ ]
. Improvement exclusively assigned to LCR	[ ][ ]
. Patentable improvement disclosed to LCR free of charge	[ ][ ]
. Non-patentable improvements disclosed to LCR free of charge	[ ][ ]
. Other grant-back restrictions	[ ][ ]
. Silent	[ ][ ]

NO CONTEST CLAUSES

. No-contest clauses	[ ][ ]
. Defence of patent obligation	[ ][ ]
. Silent	[ ][ ]

RESTRICTIONS ON THE ACQUISITION OF COMPETING TECHNOLOGY [ ][ ]

TECHNOLOGY MANAGEMENT

. Field of use restrictions	[ ][ ]
. Restriction on technical product adaptation	[ ][ ]
. Restriction on R & D activities	[ ][ ]
. Other	[ ][ ]
. Silent	[ ][ ]

PROCUREMENT OF INPUTS

. Tie-in relating to	
. Raw materials	[ ][ ]
. Intermediate goods	[ ][ ]
. Equipment goods	[ ][ ]
. Acquisition from	
. Licensor	[ ][ ]
. Firm designated by LCR	[ ][ ]
. Terms and conditions	
. International prices	[ ][ ]
. Most-favoured buyer	[ ][ ]
. LCR's current prices	[ ][ ]
. Others	[ ][ ]
. Silent	[ ][ ]
. Margin of preference to LCR	[ ][ ]
. Silent	[ ][ ]

PROVISIONS ON VOLUME/SCOPE OF PRODUCTION/SALES

. Production/sale of competing goods not allowed (in non-exclusive licences)	[ ][ ]
. Restriction on diversification or location of production	[ ][ ]
. Obligation to produce/sell minimum or maximum volume	[ ][ ]
. Other	[ ][ ]
. Silent	[ ][ ]

PRICING CLAUSES

. Prices fixed by LCR	[ ][ ]
. Prices fixed upon agreement between LEE and LCR	[ ][ ]
. A posteriori information to LCR	[ ][ ]
. Silent	[ ][ ]

Entry no. _____
Registration no. _____

EXPORT PROVISIONS

. Exports not allowed [ ][ ]
. Previous authorization of LOR [ ][ ]
. Authorization for some countries [ ][ ]
. Authorization except for countries with exclusive licensees or for the country of LOR [ ][ ]
N. Authorization except for countries with legal impediments [ ][ ]
N. Authorization after consultation [ ][ ]
N. Overall authorization [ ][ ]
. Limitation volume/ share production [ ][ ]
. Territory assigned [ ][ ]
. Other [ ][ ]
. Silent [ ][ ]

DISTRIBUTION CHANNELS

. Obligation to use LOR channels for sales [ ][ ]
. Obligation to use LOR channels for exports [ ][ ]
. Obligation to sell to LOR a share of total production [ ][ ]
. Agreement of LOR concerning sales agents and retailers [ ][ ]
. Other [ ][ ]
. Silent [ ][ ]

OTHER CLAUSES CONCERNING IPRs

. Sole liability by LEE for infringement [ ][ ]
. No representation that the licensed patents aren't infringing third party rights [ ][ ]
. No modification of contract in case of refusal or invalidation of patents [ ][ ]
. Other [ ][ ]
. Silent [ ][ ]

PROVISIONS ON FINANCE, INVESTMENT AND EMPLOYMENT

. Restriction on LEE's financial policy [ ][ ]
. Restriction on LEE's investment policy [ ][ ]
. Restriction on LEE's employment policy [ ][ ]
. Silent [ ][ ]

APPLICABLE LAW

N. Philippines [ ][ ]
. Neutral country [ ][ ]
. Supplier's country [ ][ ]
. Silent [ ][ ]

VENUE

N. Philippines [ ][ ]
N. Neutral country [ ][ ]
Supplier's country [ ][ ]
. Silent [ ][ ]

ARBITRATION

N. Arbitration law of the Philippines [ ][ ]
. Arbitration law of neutral country [ ][ ]
. Arbitration law of supplier's country [ ][ ]
. UNCITRAL arbitration rules [ ][ ]
N. Rules of conciliation & arbitration of ICC [ ][ ]
. Other [ ][ ]
. Silent [ ][ ]

TERMINATION CLAUSES

. Restriction on LEE to use rights and licences in the case of early termination due to LOR [ ][ ]
. LEE's inability to comply with minimum sales/ production [ ][ ]
. Other [ ][ ]
. Silent [ ][ ]

GUARANTEES & WARRANTIES

. Suitability for use [ ][ ]
. Quality levels [ ][ ]
. Training [ ][ ]
. Liability [ ][ ]
. Performance guarantee (volume/ yield of production) [ ][ ]
. Guarantees concerning engineering/ equipment [ ][ ]
. Other [ ][ ]
. Silent [ ][ ]

Entry No. _____ Registration No. _____

	U	____YEAR	ANNUAL AVERAGE
1. NET SALES			
2. CONTRACT PAYMENTS (Requested)			
3. CONTRACT PAYMENTS (Approved)			
4. FOREIGN EXCHANGE SAVINGS - (a) Reduction of royalties			
5. FOREIGN EXCHANGE SAVINGS - (b) Import substitutions			
6. TAX PAYMENTS			
7. EXPORTS			
8. IMPORTED INPUTS			
9. NET FOREIGN EXCHANGE EARNINGS*			
10. EMPLOYMENT/INCREMENTAL EMPLOYMENT			
11. NET PROFITS			
12. LOCAL VALUE-ADDED			
13. PRODUCTION VOLUME			
14. PRODUCTION CAPACITY			

*Net foreign exchange earning = Exports - Imported Inputs - Royalty payments.

BOARD DECISION:

Annex IV

OUTLINE OF A STATISTICAL ANALYSIS SYSTEM

A. Objectives and general features

In general, the purpose of statistical analysis is to gather and organize information in order to provide better knowledge, thus allowing the definition and design of the best policy policies to correct the identified shortcomings. The ultimate purpose of statistical work is to supply the relevant knowledge needed for the most appropriate action.

The objectives of the TTB statistical system must therefore be closely related (and subordinated) to the TTB's overall objectives. Statistical data will be a relevant input to allow a better accomplishment of the TTB's functions.

The main objectives of the statistical analysis system are as follows:

(a) Assessment of the trends and characteristics of contractual technology inflow in the Philippines;

(b) Assessment of the efficiency and the results (either qualitative or quantitative) of TTB intervention;

(c) Assessment of the impact of imported technology in the national economic and scientific or technological system.

In addition to the above objectives, there are three secondary objectives, two of them concerning national horizontal relationships and the third relating to international linkages:

(a) Improvement of the relationship between the TTB and the national business community;

(b) Improvement of the relationship between the TTB and the national scientific and technological system;

(c) Regular supply of data to international organizations, namely the continuous participation in the UNIDO Technological Information Exchange System (TIES).

The importance of the linkages between TTB and the utilizers and developers of technology must be emphasized. A continuous flow of information (of which statistical information is only one part) must be established, thus allowing a better reciprocal knowledge and a more successful import, absorption, adaptation and development of suited technologies. In particular, TTB could provide a useful service to the business community, supplying it with information on imported technologies and on potential suppliers.

At the international level, the adherence of the Philippines to TIES I-A must be taken into due account in the design of the statistical system. However, given the limited TIES I-A requirements, this will not entail any significant extra work. They are in line with the statistical information system to be implemented and can be envisaged as a by-product of statistics for internal use.

Three areas of statistical outputs can be identified which arise from the main objectives:

(a) Main features of the agreements;

(b) Outcome of TTB intervention in T/T contracts;

(c) Impact of technology inflow (sectoral and historical assessment).

Those areas of work are closely linked, particularly the first two which entail, in some instances, some duplication. As TTB generally introduces some changes in the main features of contracts (royalty rates, royalty basis, restrictive clauses) statistical analysis cannot disregard TTB work. An initial and final approach was suggested; that is, comparing the characteristics of the contract as presented to TTB and as registered by this body.

Statistical analysis of the main features of the contracts and of the outcome of TTB intervention will continue to be presented in periodical survey reports to the Board, the Ministry of Industry and Malacañang. The periodicity and wider distribution of those reports will be discussed later.

As envisaged, statistical analysis reports will be different from the quarterly or bi-annual reports. They will, nevertheless, include all the relevant financial information. The expert plans to make them more encompassing, allowing for full knowledge of the main features of registered contracts and of TTB intervention.

The studies on the impact of contractual technology inflow must be quite different from statistical surveys. These are indepth studies which try to identify the consequences of technology import in selected sectors. They must be linked with monitoring actions.

Issues to be analysed include the effect of imported technology on development of recipient enterprises and local technological adaptation, development and diffusion of imported technologies.

Statistical analysis reports and surveys and in-depth studies are, in some way, complementary. They provide relevant information for defining policy measures

concerning the improvement of overall technological policies, the definition of technological priorities and the improvement of TTB evaluation and decision criteria.

The accomplishment of secondary objectives involves the collection of two types of information: surveys of imported technology on a product basis and TIES reports.

The aim of the surveys is to provide regular information on the characteristics and destinations of imported technology. It is suitable for enterprises and research centres for upgrading their knowledge of existing technologies and on the ways, terms and conditions in which they can have access to it. These surveys could be a supplement to statistical analysis reports; their contents deserve, however, careful examination due to confidentiality requirements.

Besides TIES reports, other kinds of co-operation on statistical matters is envisaged with United Nations bodies, such as UNCTAD and UNCTC.

The expert stresses that the suggested statistical system is consistent with existing international information exchange requirements and can easily provide additional statistical information.

The table contains a summary of the objectives and their translation into action.

B. Statistical analysis reports

Two types of statistical analysis reports are envisaged: surveys of registered contracts and surveys of technology transfer payments.

The first deals with current work of the TTB and tries to give a comprehensive approach to the characteristics of registered agreements and of the outcome of TTB action.

The second shows the annual foreign exchange outflows due to technology transfer contracts, either registered by the Board or prior to its implementation.

Surveys of registered contracts

Before analysing in detail the contents of those surveys, the question should be asked why reliance is placed on registered contracts, and not on those approved and registered.

Objectives of statistical analysis	Reports
Trends and characteristics of technology inflow	Periodic surveys
Efficiency and results of TTB evaluation work	Periodic surveys
Impact of imported technology in national economic and S and T systems	In-depth studies
Improvement of linkages between Government and business community	Periodic surveys
Improvement of relationships between TTB and national S and T system	Periodic surveys
Supply of data to international organizations	TIES reports and studies

y of objectives

Designation	Action
Board	Improvement of criteria of evaluation and decision
Ministry of Industry	Definition of technological priorities
Malacañang	Improvement of overall technological policies
Firms Business organizations	Better selection of technologies and suppliers, and negotiation of terms and conditions of contracts
NSDB TIC Others	Reorientation of research programmes
UNIDO UNCTAD UNCTC	Technical support Information on other countries policies Information on other countries general and specific features of T/T agreements

Registration is essential for a contract to be used to authorize payments. It is the final act of the TTB and it is necessary to permit the contract come into force. Approval of a contract does not mean that the approved version will be the final one; parties can make a request for reconsideration, according to TRule VII of Section 5 of P.D.1520. It is not uncommon for the Board to accept some claims in this respect.

To take the registered agreements as the basis of statistical analysis is more logical and correct. At the same time, statistical records would be more reliable - which would not be the case if approved contracts were used. Requests for reconsideration will, in some instances, be accepted by the Board with the result that modifications on previous statistical tables and outputs will be needed.

Surveys of registered contracts should cover three sets of data:

(a) The main features of the contracts;
(b) A financial estimate on the effects of TTB intervention;
(c) Detailed data on agreements on a product basis.

The main features of contracts rely on what is called non-financial data, that is, data designed to reflect the text of the agreement and to characterize the enterprises involved. The statistical analysis already provides some information on the outcome of TTB regulation (for instance, deletion of restrictive clauses and reduction of royalty rates).

Financial estimates are based chiefly on data provided on the application form and on calculations made by the technical staff. Their aim is to provide a quantified approach to the main financial benefits accruing to the national economy due to TTB intervention.

The third set of data (which is not the result of statistical operations) is mostly directed towards the business and scientific communities. This information is an appendix to statistical analysis. Its inclusion in the report is not essential, but is deemed useful in order to comply with two of the secondary objectives.

Main features of contracts

The most relevant items to be analysed are as follows:

(a) Technology supplier country;

(b) Industrial sector (according to ISIC);

(c) Product (according to SITC);

(d) Foreign holdings in recipient company;

(e) Equity relationship between recipient and supplier companies (direct or indirect);

(f) Technological items involved;

(g) Type of agreement (new/renewal);

(h) Duration;

(i) Type of payments;

(j) Royalty basis;

(k) Royalty rates (on net sales, on net profit and on local value added ;

(l) Restrictive clauses.

Other items (exclusivity provision, tax liability, minimum royalties, recipient type) could also be considered. They were not included in the set of basic data in order to avoid an excessive number of current reports. Nevertheless, especially if a computerized system were to be chosen, relevant statistical tables concerning those items can be elaborated, although not necessarily published.

With a view to obtaining a more detailed appraisal of the terms of the contracts, it is possible to go further than restrictive clauses. Contract cards provide a complete set of contractual clauses, although some of them have no restrictive nature. As contract cards will be stored in the computer (assuming that a computerized system is selected), statistical tables and analyses of these items in detail will not involve too much additional work. The same is not true, however, if a manual system were implemented; in this instance, a detailed statistical analysis of more specific terms and conditions (although provided in the contract card) will mean a lot of effort.

With respect to the relevant relationships to be established between the selected items, it is obvious that the amount and the level of relationships to be considered will depend on the desired depth of the analysis and on the means of calculation. All basic data on technology transfer contracts will be collected and stored in contract cards (either manual or computerized).

Nevertheless, for statistical purposes, a set of relationships can be defined which does not leave too much room for controversy. This has been checked against existing statistical data on T/T in the Philippines.[a/]

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a/ Checks were made with Lilia R. Bautista, "La réglementation du transfert de technologie aux Philippines" (UNCTAD/TT/32); Edgardo L. Tordesillas, "Philippines: Country paper on information needs of host countries in respect to TNC's 1980"; and TIES reports.

In the expert's view, a sectoral approach is most suited for a statistical analysis of this kind. It does not follow, however, that non-sectoral relationships will be omitted; some of them will also be taken into account.

Industries are largely the most influential elements in the varieties of conditions shown in T/T agreements. At the same time, when designing their specific technological policies, national authorities often adopt sectoral approaches. Furthermore, the utilization of an internationally accepted sectoral classification allows useful inter-country comparisons.

The accompanying matrix states the proposed relationships, and to help in reading it the following comments are applicable:

All the recorded relationships are established between two variables (items). Some three-item relationships have also been envisaged, as follows:

(i) Selected sectors/technological items/royalty rates;

(ii) Selected sectors/technological items/restrictive clauses;

(iii) Selected sectors/type of agreement/royalty rates;

(iv) Selected sectors/technological items/equity relationships between recipient and supplier companies;

(v) Selected sectors/countries/foreign holdings in the recipient company.

However, given the meagre number of contract registered yearly, it is thought that those three-item analyses will not be needed in current statistics, at least as a standard. They can, however, be useful, in providing a better understanding of contract terms in a selected sector with a great number of contracts. The recourse to this kind of detailed analysis will depend on the findings observed when the surveys are carried out.

In addition, the usefulness of those relationships increases as the number of surveyed agreements grow. For instance, they would be helpful in a statistical study on all TTB registered agreements.

Tables involving items (8) through (14) will have an initial and a final . The first is aimed at reflecting the characteristics of the contracts s they were presented to TTB for evaluation; the latter reflects the terms and tions of registered agreements. A clear appraisal of the modifications introduced by the TTB in the text of the agreements is therefore allowed. A "qualitative"[b/] approach to the outcome of TTB work in improving terms and conditions of agreements is thus presented.

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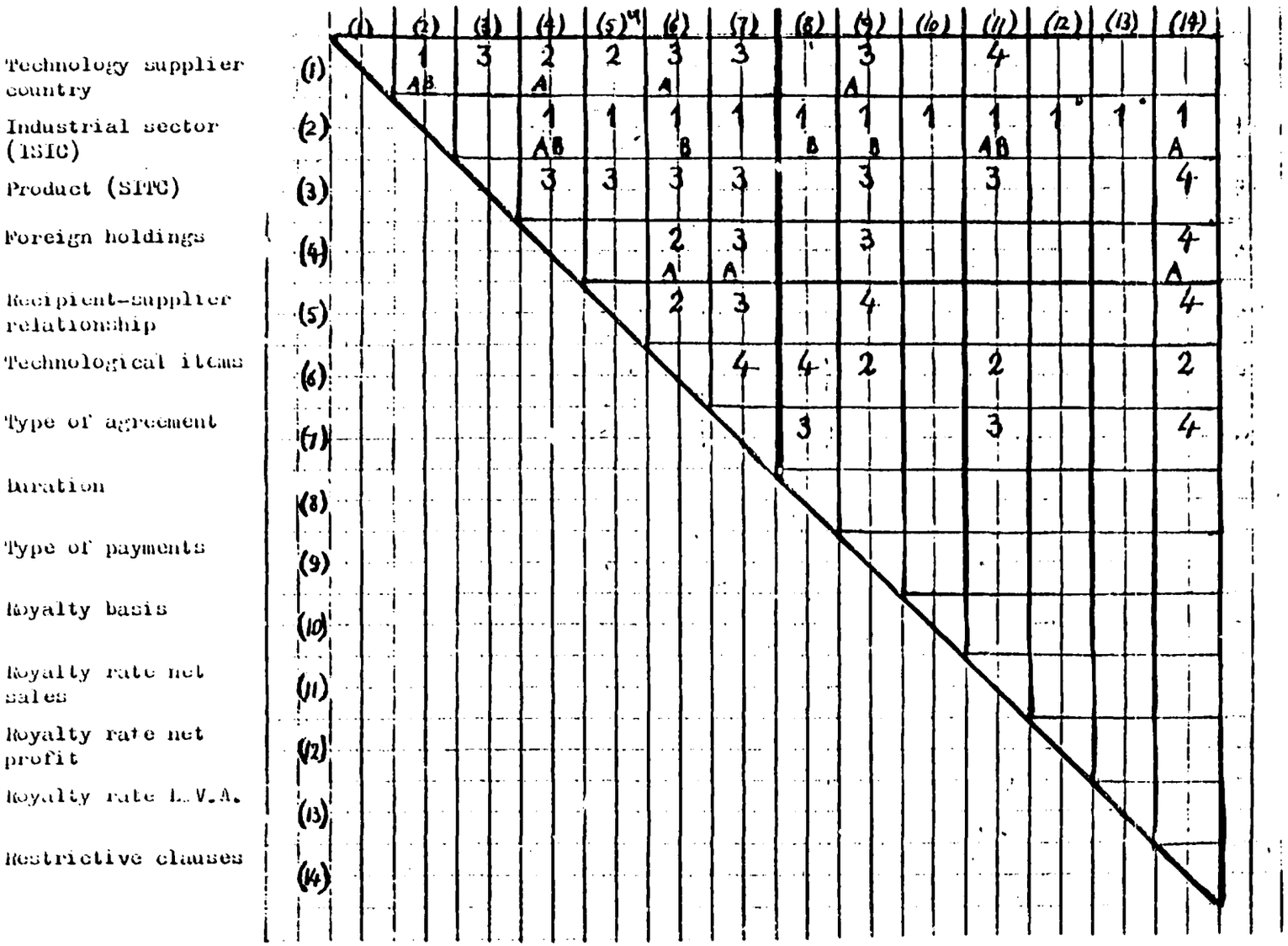
b/ As opposed to the "quantitative" approach, provided in financial estimations on the effects of TTB intervention.


Country
Industry
Product
Foreign holding
Recipient-supplier relationship
Technological items
M/A type of agreement
Duration
Type of payments
Royalty basis
Royalty net sales
Royalty net profit
Royalty L.V.A.
Restrictive clauses
(1) Technology supplier country
(2) Industrial sector (ISIC)
(3) Product (SITC)
(4) Foreign holdings
(5) Recipient-supplier relationship
(6) Technological items
(7) Type of agreement
(8) Duration
(9) Type of payments
(10) Royalty basis
(11) Royalty rate net sales
(12) Royalty rate net profit
(13) Royalty rate L.V.A.
(14) Restrictive clauses
1 – first priority
2 – second priority
3 – third priority
4 – fourth priority
A – relationship recorded in the TTB report
B – relationship recorded in TIES reports

The addition of "qualitative" and "quantitative" records provides an overall insight into the effectiveness of TTB regulation.

An hierarchization of the importance attached to each recorded relationship is given. This hierarchization can be useful not only for the purpose of an incidental selection of statistical tables, but also in connection with the definition of the periodicity and contents of statistical reports. As quarterly reports to the Board are recommended,[c/] they should not be too large; a detailed approach is permitted only for annual reports.

Some tables involving the SITC product classification are proposed in the matrix. However, these can be considered as an unnecessary duplication of information, because first, the ISIC already provides a reliable specification of activities, and secondly, detailed contract-by-contract data organized on a product basis will be provided in the proposed third part of the report.

Furthermore, [illegible] the short number of registered agreements and the statistical usefulness of the detail of ISIC, the significance of the tables will suffer.

On the other hand, presentation of data on a product basis would be helpful for evaluation purposes and for specific policy decisions.

The recorded relationships will originate 65 statistical tables.
65 statistical tables.

	Single tables	Double tables	Total	Accumulated total
Priority 1	5	14	19	19
Priority 2	4	6	10	29
Priority 3	9	12	21	50
Priority 4	1	14	15	65
Total	19	46	65	

However, if product-based tables are considered, the number of tables will be reduced to 54.

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c/ An exchange of views on the usefulness of short monthly reports (if a computerized system is chosen) would be helpful.

	Single tables	Double tables	Total	Accumulated total
Priority 1	5	14	19	19
Priority 2	4	6	10	29
Priority 3	4	8	12	41
Priority 4	1	12	13	54
Total	14	40	54	

The above figures deserve some comments. First, the number of relationships to be taken into account will differ according to the system adopted. In a computerized system the cost of additional tables is irrelevant, so all the tables could be elaborated. It is suggested that, in a manual system only priority levels 1 and 2 are retained, at least for current statistical reports.

Secondly, published reports contain only some of the proposed tables. Priority levels 1 and 2 are again suggested.[d/] The other tables, whenever elaborated, would be considered as internal working data.

Thirdly, as already stressed, regularity of reports must be considered. Annual activity reports can be comprehensive and should aim at providing a full picture of the trends and characteristics of technology transfer. Quarterly current surveys should give a brief appraisal of the inflow of technology, being statistical analysis mainly limited to industry-based insights.

As well as the suggested tables, annual reports must also provide other information, either of a qualitative or a quantitative nature, in order to allow for a better understanding of contractual technology transfer inflow.

An appraisal of the degree of firm-concentration of T/T agreements (and also of the characteristics of firms) is deemed useful. As the annual number of registered agreements is relatively low, the occurrence of numerous contracts for just one firm must be checked in order not to bias statistical outputs and conclusions.

An analysis of the main features of agreements could be usefully supplemented with some data of a financial nature, aimed at giving a picture of the overall

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d/ If more comprehensive reports were deemed useful, some level 3 tables could be included, the choice depending on the purposes of the report.

importance of registered agreements. A more detailed analysis of financial information would be provided in what can be designated as part II of the report,[e/] but a general view of the financial amounts involved (expected sales and expected royalty payments) could be included along with the survey of the most relevant characteristics of contracts.

Financial estimates of effects of TTB intervention

Modifications introduced by national authorities into the texts of T/T contracts (royalty rates, royalty basis and tax liability) also have a financial translation. Foreign exchange outflows can be substantially reduced and tax earnings increased. At the same time, critical goals of national economic policy can be fostered (e.g., export premium rates).

Some concern has been expressed about the undertaking (especially by MNCs) of practices that circumvent regulatory activity. Evidence on transfer pricing is undeniable.[f/]

Nevertheless, even if reaction practices are taken by some companies, the overall balance of national regulation on T/T agreements is highly positive and statistics must record it as clearly as possible.[g/]

Data on the financial effects of TTB intervention can be collected from application forms and from evaluation memoranda, they should be recorded on the contract card. Financial data to be taken into account include:

(a) Net sales;

(b) Foreign exchange outflows (with requested royalty rate and with approved royalty rate);

(c) Foreign exchange savings;

(d) Foreign exchange earnings (exports);

(e) Net foreign exchange earnings;

(f) Tax payments.

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e/ See following section.

f/ See E. Bautista and W. Clemente, "Technology policies in the pharmaceutical sector in the Philippines" (UNCTAD/TT/36).

g/ The expert shares the view expressed in Bautista, op. cit.

Quarterly statistics on the effects of TTB regulation until now have been supplied to the Board. Their contents include:

(a) Estimated foreign exchange savings (five years);

(b) Estimated annual foreign exchange savings per each contract;

(c) Estimated annual foreign exchange savings per each contract with reduced payments;

(d) Estimated foreign exchange earnings from exports (five years);

(e) Estimated annual foreign exchange earnings from exports;

(f) Average annual foreign exchange earnings per each exporting firm;

(g) Estimated tax revenues accruing to the Government (five years);

(h) Annual estimated tax revenue accruing to the Government.[h/]

The above data provide a suitable picture of the absolute amounts of savings and earnings generated by TTB intervention.

Some agreements have no financial projections (namely, savings projections), due to statistical allocation difficulties. Those agreements must not be included in the average computation. There are instances where royalty rates have been reduced and financial projections (including savings projections) do not exist. The estimated savings for each contract would be understated if all registered contracts were considered.

Similarly, contracts which do not involve payments (some pure trademark agreements), have no savings. In this instance, savings are impossible. Inclusion of those agreements for averaging purposes also causes an understatement of estimated savings for each contract.

Clear statements of the number of agreements with reduced royalties are needed, with financial estimates and an indication of those which have no payments.

As far as savings in foreign exchange outflows are concerned, account must also be taken of modifications in tax liabilities. If tax liability were assigned to the supplier instead of to the recipient, a corresponding reduction in foreign exchange outflow will be obtained.

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h/ Employment level has been omitted because it is not a financial item.

The settlement of some ratios between the relevant financial variables would be helpful for the appraisal of the effects of TTB regulation. It would complement the absolute values that have currently been used.

On the basis of the selected financial data and taking into account the above comments, the contents of the report on financial estimates on the effects of TTB intervention can be stated as follows:

Absolute amounts

Foreign exchange outflows (approved)	(5 years/1 year)
Foreign exchange savings	(5 years/1 year)
Foreign exchange earnings (export)	(5 years/1 year)
Net foreign exchange earnings	(5 years)
Tax revenues	(5 years/1 year)

A clear statement of the number of agreements considered in each item must be provided.

Contract average data

Foreign exchange outflows (approved)[i/]	(1 year)
Foreign exchange savings[j/]	(1 year)
Foreign exchange earnings (exports)[k/]	(1 year)

Firm average data

Foreign exchange earnings

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i/ Only contracts with financial estimates and foreign exchange outflows.

j/ Two contract bases can be considered: (i) contracts with savings estimates and foreign exchange outflows (payments); (ii) contracts with foreign exchange outflows. Due account of agreements with reduced royalty rate but no financial estimates must be taken.

k/ Two contract bases can be considered: (i) all agreements with financial estimates; (ii) only contracts with foreseen exports. In either case twin contracts (e.g. licence plus trademark contracts) must be counted as one, in order to prevent duplication.

Ratios

Savings/requested outflows

Savings/requested outflows (only contracts with reduced payments)

Savings/exports

Exports/approved outflows (total number of comparable agreements)

Exports/approved outflows (only contracts with expected exports)

Other ratios could be established in order to given a more indepth appraisal of TTB work such as:

Exports/requested outflows (total number of comparable agreements)

Exports/requested outflows (amended contracts)

Exports/approved outflows (amended contracts)

Exports/approved outflows (non-amended contracts)

A sectoral analysis of these financial data has been envisaged, and it was noted that the level of sectoral breakdown and the variables chosen were conditioned by the number of agreements registered each year. As this will probably remain low, a too-detailed and deep analysis offers a risk of not producing significant results.

Sectoral breakdown and financial performance indexes must be chosen accordingly. By and large, a two-digit ISIC breakdown of absolute financial amounts[1/] can easily be done each semester. The utilization of averages and ratios must be done carefully; it requires a minimum number of contracts or financial amounts.

The chief aim of providing this information is to help the Board to take more accurate decisions in line with the overall technological and economic policies of the Government.

The selection of items and their relationships must therefore be subordinated to policy goals - data must reflect the level of fulfilment of those goals by the TTB in its daily work and must also constitute an input for future decision-making.

1/ Foreign exchange outflows, foreign exchange savings and exports are the most relevant.

Further elaboration and debate on statistical recording of financial issues is needed. The above set of proposals must be thoroughly analysed and discussed in order to meet the user's needs.

Detailed data on agreements

The data on agreements is aimed at supplying not only the Board but also Philippine business and scientific technological communities with knowledge about imported technologies, their suppliers and the general terms and conditions of contracts.

TTB work must not only be confined to the control and screening of contracts, it must also use the available information and experience in a "prophylactic" manner, supplying the business community with the relevant information needed to obtain better contractual terms and conditions. The price of technology broadly depends on the relative bargaining power of recipient and supplier; the collection of "enveloping information" (on available alternative technologies, potential suppliers, current contractual terms and conditions, licensing agreements already set up by supplier) will increase the bargaining power of the recipient company and allow it to obtain a better price. A good relationship between the TTB and the local business community, through the interchange of information, will be decisive in improving the standards of technology inflow.

Technical staff presently provides the Board with a quarterly report containing relevant information on each agreement, organized in accordance with a mixed product and industry classification.

The information includes the product, the type of agreement (new or renewal), the names of the recipient and the supplier, and the royalty rate.

Almost all the relevant information is available. A reliable basis for a systematic delivery of detailed data on agreements is already to hand. All that is required are some relatively minor modifications which consist of the following:

Scope of distribution

Distribution of data must not be confined to the Board, as at present. A wider divulgence to the business and scientific and technological communities is needed.

Questions of secrecy will arise concerning data on payments. Rule XI of Section 5 of P.D. 1520 allows the assignment of a confidential nature of certain data: "Upon written request therefor, information and documents received by the Board for registration of agreements shall be treated as confidential and shall not be divulged to any private party without the consent of the parties concerned." In some countries, confidentiality is a sensitive issue and divulgence of terms of contracts is not allowed. A more in-depth exchange of views on this issue is needed.

Most data on agreements (excluding payments) can be freely divulged and will be helpful for companies wanting to import technology. As the requirements of the scientific and the business communities are different, the data could be obtained as required (for instance, royalty rates are of lesser importance to researchers); this will mean additional work which has to be evaluated in the light of the benefits derived from more customer-tailored information.

Ordering of contracts

Contracts must be ranked according to the SITC product classification.

Information on contracts

Slight changes only are proposed concerning contract data. These apply to product identification, technological items and supplier country.

Product identification must be detailed and clear in order to be useful. Where feasible, information on the technological processes involved would also be welcomed.

Technological items in the contract must be divulged in order to provide a better insight into what is actually transferred. As a summary, information includes:

Clear and detailed product identification and, if feasible, technological processes or methods of manufacturing

Technology items involved

Types of agreement (new or renewal)

Recipient

Supplier

Supplier country

Royalty rate

Finally, discussion centres on contracts in which data are to be divulged. Information until now has been provided on approved or registered agreements.

Detailed disclosure of information is neither an appraisal of the characteristics of contracts which comply with all administrative and legal requirements and which are in force, nor a statement of the financial repercussions of technology transfer. It provides:

(a) A picture to the Board of the relevant features of the agreements acted upon;

(b) An insight to the business and scientific communities of the characteristics of contracts and also of Board guidelines on terms and conditions.

If they were confined to registered agreements, the aims of detailed disclosures of information would not be completely fulfilled. The range of information to be provided must be as broad as possible to allow companies and research institutions to acquire and develop the most appropriate technologies under better terms and conditions.

Surveys of technology transfer payments

In spite of the existence of annual progress reports sent by recipient firms, a flow of information on foreign exchange outflows due to technology transfer agreements must be established between the Central Bank and the TTB.

Annual progress reports do not guarantee a fully reliable basis for statistical analysis of payments because:

(a) Many agreements that result in payments were achieved before the TTB came into existence, and these are not screened along with annual progress reports;

(b) Annual progress reports are generally filed some months after the end of each year; thus, a time-lag is inherently implied. A good flow of information from the Central Bank will avoid this time-lag and will allow more up-to-data statistical reports;

(c) Experience shows that some companies do not comply with the requirements of annual progress reports; the rate of compliance was about 60 per cent and 47 per cent in 1979 and 1980, respectively. A large proportion of contracts has, therefore, no reports on payments;

(d) Problems of computation can arise. Foreign exchange disbursements by local firms are not equal to foreign exchange outflows because of the incidence of withholding tax. Foreign exchange outflows are really what matter for statistical purposes;

(e) Finally, even filed under oath, annual progress reports do not necessarily provide an accurate and unbiassed account of real foreign exchange remittances.

Based upon the good relationships which exist between the Central Bank and the TTB, the expert feels that the establishment of the suggested flow of data will not mean too many problems. As the Central Bank already has a representative on the Board and as close ties have been long established between the two bodies, co-operation can be envisaged as being highly probable and highly suitable.

The means of technology transfer payments as recorded by Central Bank are ignored. However, the information required by the TTB is straightforward and easy to provide.

Data should be supplied regularly (monthly or quarterly) and should include contract identification, recipient and supplier (if a clear contract identification is not feasible), amount of foreign exchange outflows, country of destination of payments, reference period.

Data received from the Central Bank must be stored on contract payments cards along with other relevant data on contracts, collected from contract cards.[m/]

Items to be taken into account in payments statistics and analysis must include:

(a) Contract identification (a distinction is useful between payments derived from old contracts - that is, contracts registered under BOI/Central Bank regulations - and TTB registered contracts);

(b) Recipient company;

(c) Supplier company;

(d) Country of destination of payments;

(e) ISIC classification of agreements;

(f) SITC classification (however, utilization of SITC could mean problems of allocation of payments in contracts which involve more than one product classification. In the absence of a breakdown of estimated sales per product, allocation of payments can be biased by subjective assessments);

(g) Foreign holdings in recipient company;

(h) Relationships between recipient and supplier companies;

(i) Recipient type (state-owned enterprise, private, mixed) (the selection of this information depends, however, on its relevance in terms of policy objectives);

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m/ If a computerized system is to be chosen the linkage between payments data and contract card data can be get through an appropriate program and all the processing of data will be thereby easier.

(j) Amount of foreign exchange outflows;

(k) Reference period for payments;

(l) Possible technological items transferred, or relevant combination of them (this information requires further discussion and depends on policy objectives concerning the kinds of technological items acquired under T/T contracts).

Besides the data identified above, other information on recipient enterprises would be useful in order to appraise the relevance of technology payments (and thereby technology imports) for the firm. However, as the forms used do not provide those data, a high priority to the following items should not be allocated:

Company size (number of employees)

Company sales

Company profits

Company exports

The statistical reports, which are the surveys on technology transfer payments, should be elaborated each year; a six monthly report on payments would also be useful.

Relationships to be considered in these surveys include:

(a) ISIC versus countries of destination of payments;

(b) ISIC versus levels of foreign holdings in recipient companies (this supplies information about absolute and relative amounts of payments derived from local and foreign-owned enterprises, disaggregated by industrial sector; empirical evidence suggests that most payments are generated by foreign-owned companies. For example, in Portugal, companies with 25 per cent or more of foreign holdings in 1980 were responsible for 57 per cent of outflows due to technology transfer contracts);

(c) ISIC versus relationships between recipient and supplier companies (authorities must be aware of the importance of payment flows which remain inside the boundaries of some transnational groups; the definition and implementation of T/T policies must take into account those internal flows which, more than remunerating technological assets, constitute a means of international transfer of funds. Portuguese figures for 1980 show that 52% of technology transfer payments were due to agreements where some kind of relationship existed between recipient and supplier);

(d) Countries of destination of payments versus relationships between recipient and supplier.

The value of payments must be expressed in United States dollars, since this is the currency used worldwide for international accounts and for most technology transfer payments by Philippine firms. For the purpose of a national comparison (for items expressed in the national currency), the conversion into pesos must be done (rates could be either quarterly averages or annual average, assuming that fluctuations are not too great).

The above tables are the most relevant. Nevertheless, they are not the only ones envisaged. Other helpful relationships can be considered such as:

(a) Those using SITC product classifications instead of ISIC industry classifications (the expert prefers ISIC utilization for two reasons: (i) ISIC implies less allocation problems, (ii) it is more adequate for statistical purposes. It has to be recognized, however, that if a comparison between T/T payments and exports were to be made, SITC is more suitable);

(b) ISIC versus technological items;

(c) Foreign holdings in recipient company versus technological items (these relationships imply the existence of a contracts classification according to technological items; one could be a distinction between licence, franchise and management agreements; another, between agreements involving the supply of productive and manufacturing know-how, and those mostly concerned with commercialization, i.e. pure trademark agreements. Utilization of this type of classification must be in accordance with policy purposes; therefore, the contents of classification must be defined accordingly);

(d) ISIC versus "age" of contracts this table is aimed at giving insight into the importance of old (i.e., contracts registered before the TTB) came into existence) and new contracts (i.e., contracts registered before the TTB in accordance with industrial sectors. This table must be interpreted carefully, since TTB registration does not imply that the contract is really a new one - it could just be the renewal of an existing agreement. Accordingly, a break-down of TTB registered agreements into new and renewal would be useful;

(e) Concentration of payments according to ISIC;

(f) ISIC versus employment.

Data on payments could be compared with overall data provided by national statistics, i.e. those appearing in the annual survey of establishments - manufacturing, and external trade statistics.

Payments due to T/T contracts could be compared with sales, gross output and value added on a three-digit ISIC basis.

Similarly, payments could be related to exports, at least for the more important products.

Nevertheless, however useful those comparisons are, they cannot be utilized in annual surveys on T/T payments because national statistics are normally published with a two-year time-lag, while annual surveys must provide up-to-date information, with a time-lag of less than three months.

In-depth studies, where time constraints are not so crucial, the above relationships with national statistics can be retained.

A further use for data on T/T payments is for the support of monitoring activities, i.e. the selection of firms and agreements.

Not all contracts are of the same importance and successful monitoring must bear this in mind because monitoring all agreements thoroughly is to some extent wasteful. Only contracts deemed relevant (because of either the level of payments, the importance of the technology or their economic impact) should be extensively monitored. Minor contracts should be monitored only on the basis of random sampling. Furthermore, contracts should also be scrutinized from a firm's viewpoint: in some cases a multiplicity of contracts is used to elude an analysis by the authorities.

The computation of annual T/T payments by each firm will permit the 25 or so more important firms to be identified. Those companies will be responsible for a large share of the total payments and will provide the basis for beginning monitoring activities.

In-depth sectoral studies

Surveys of registered contracts were chiefly designed to provide information on terms and conditions of T/T contracts and on the outcome of TTB evaluation work. It is recognized, however, that the text of the contracts (amended in accordance with national authorities requirements) is insufficient to convey the way the agreement will be implemented and developed. The text of agreement is only the starting point; it is not the complete picture.

Alongside payments and restrictive practices, concern should be expressed about the real impact of imported technologies in recipient enterprises, in industrial sectors and in overall scientific and technological capacities.

These concerns led to the establishment of annual progress reports and monitoring reports. These are the instruments to determine the "effectiveness of technology transfer".

In-depth sectoral studies are therefore closely linked with monitoring reports, in the sense that both try to be more in-depth than the text of the contracts and try to analyse its management and implementation. Nevertheless, their scope and aims are diverse: monitoring reports are concerned with the contracts themselves; in-depth sectoral studies are broader, and designed to encompass an overall sectoral view of the impact of the inflow of technology. On one hand, monitoring actions will provide some of the needed inputs for the elaboration of in-depth sectoral studies; on the other, the studies give a useful background for the evaluation and monitoring of individual agreements.

There are three main objectives of in-depth sectoral studies:

(a) To provide a general picture of the import of technology in the industry sector concerned;

(b) To further assess the impact of TTB regulation on the terms and conditions of agreements and on the promotion of local technological capacity;

(c) To assess the technological impact of the inflow of technology in the development of the selected sector. n/

The last objective is envisaged as the most relevant. It transcends the limited insight of control of technology inflow to emphasize the interaction between technology import and national technological development.

The conclusions of these studies would be of the greatest importance for the design of sectoral technological policies; more specifically, for the issuance of sectoral orientations for TTB regulatory work.

The elaboration of the studies must be carried out by the TTB technical staff, preferably by teams of economists and engineers. Support from other government agencies could be welcomed, for example, NEDA for more in-depth statistical data; NSDB and TRC concerning research priorities and programmes and available technologies; BOI, on matters related to foreign investment and incentives awarded; and PPO for data concerning patents requested and granted to national and foreign firms or individuals.

It must be stressed that the studies must be feasible and practical; the temptation to be all-encompassing and perfect must be avoided. Studies are not an end in themselves; they are only an instrument. The work of the TTB technical staff must be a means of providing better insight and a background for evaluation and monitoring work.

Two methodological issues are discussed here before dealing with the contents of the studies.

First, the scope of technological imports. Three channels of technology import are generally identified: acquisition of equipment and machinery, foreign investment and contractual transfer of technology, especially, licensing. Unlike similar agencies in other countries, the TTB deals only with one of those channels - licensing agreements - which makes global appraisal more difficult. In an open economy such as Philippines, foreign investment achieves real significance (foreign capital inflow, according to the Ministry of

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n/ Some of the ideas expressed in this paper draw on "Proposed guidelines for analysis of specific industrial sectors", prepared by the UNIDO Secretariat with the assistance of V. Simões (ID/WG.325/10).

Industry,[o/] amounted to $236.75 million in 1980); furthermore, the import of equipment and machinery is the usual way of acquiring technology for small and medium-sized enterprises.

Although these facts are recognized, it is essential, nevertheless, to rely on T/T contracts. This is the work that matters most for TTB purposes, and time and effort should not be wasted in trying to encompass everything. As well as institutional difficulties, appraisal of the content of technological inflows through direct foreign investment and equipment raises complex methodological problems.

An inquiry into the technical development of selected firms with T/T contracts has been proposed, and, the other channels of technology inflow will then somehow be assessed in an indirect way. Furthermore, foreign equity in recipient enterprises will receive special attention.

Secondly, in assuming that T/T contracts will form the basis of the work, the question arises as to which kind of data should be taken into account for the elaboration of sectoral studies?

Four main sources of data can be identified:

(a) Data existing in the TTB information system. They include:

(i) Data on terms and conditions of T/T agreements;

(ii) Data collected from application forms;

(iii) Data collected from annual progress reports;

(iv) Data on technology transfer payments (assuming that the Central Bank will provide the above data on payments);

(v) Other relevant data stemming from evaluation procedures;

(b) Data collected from general statistical series currently published by NEDA. Particularly useful for our purposes will be:

(i) Annual survey of establishments (mining and quarrying, and manufacturing;

(ii) Foreign trade statistics;

(c) Data provided by other government agencies;

(d) Additional data obtained from the enterprises or from plant visits by the TTB staff (as part of monitoring work).

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o/ Ministry of Industry, "Philippine industry in the 1980s".

Studies will focus on enterprises which have obtained T/T contracts - either under TTB regulation or before.

As one of the major objectives of the studies is to assess the impact of technology inflow (via licensing agreements), some time must have elapsed between the beginning of the contract and the date of analysis. This implies that recent agreements must not be considered. However, a separate analysis of agreements approved under the TTB and previous contracts must be carried out in order to allow a better assessment of the outcome of TTB regulation. In this connection, due account has to be given to the renewal of previous contracts.

Contents of in-depth sectoral studies

The contents of sectoral studies must be in accordance with the above objectives. In addition it must not be forgotten that they are designed to promote the effectiveness of regulatory action and to allow the definition of more adequate policy measures.

Sectoral studies should generally contain the following four chapters:

(a) General features of the sector;

(b) Contractual technology transfer: main characteristics and effects of TTB regulation (in some instances the assessment of the effects of TTB intervention must be closely related with the assessment of the impact of imported technology. This is particularly so in cases where modifications imposed by the TTB were conducive to a free or wider disposal of technology and to a better absorption of it. The suggested chapters are not independent of each other; they are closely linked and often inter-related);

(c) Assessment of the impact of technology import;

(d) Conclusions and policy recommendations.

General features of the sector

It is necessary to note that sector does not necessarily refer to a 4, 5 or 6-digit ISIC industry. Sector is an homogeneous production or group of productions where contractual technology transfer assumes importance enoug' to be the subject of study. In most cases, however, sectors could be easily identified with ISIC subdivisions.

Information to be gathered and analysed must refer to:

(a) The importance of the sector in an industrial structure within an historical perspective (the past 6 to 10 years). Items to be taken into account include:

Gross output

Value added

Employment

Value of shipments

Total book value of fixed assets

Exports

(Philippine manufacturing statistics provide all these data, except exports, by four-digit industry groups for establishments employing 20 or more workers and by three-digits for establishments employing five or more workers. Export data must be collected from foreign trade statistics);

(b) Structure of production.

The identification of the main manufactured products, their level of importance and technological content. Manufacturing stages deserve careful attention, as far as ISIC classification does not reflect them adequately (in electric and electronic industries, for instance, it fails to distinguish between the manufacturing of basic devices and their later assembly; in pharmaceuticals only a four-digit classification provides the distinction between the mere dosage formulation and the manufacturing of basic drugs);

(c) Structure of productive units.

The issues to be dealt with are as follows:

Relationships between firms: vertical integration; subcontracting

Role of small and medium-sized enterprises: importance of SMIs in the sector, in terms of output and employment (eventually, also value added) p/

Level of market concentration: it can be measured by the share of the sales of the four main firms for the most important products (data of this kind may not be available; nevertheless, a rough evaluation of market concentration would be acceptable);

(d) Ownership patterns.

Statistics on manufacturing provide information on the form of ownership of establishments in five classification groups: individual proprietorship, partnership, corporation, association and Government;

(e) Importance of foreign enterprises.

Some data on the level of foreign ownership in the concerned sector must be provided; items such as sales, employment, gross output or book value of fixed assets could be utilized.

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p/ Manufacturing statistics on employment levels for each establishment already provide a useful proxy for the relative importance of firms.

The importance of foreign firms according to their relative export performance could also be retained.

However, data on performance of foreign companies established in the Philippines are not available; as is the case with data on the stock of foreign investment. Only data on the flow of approved foreign investment is available and currently supplied by BOI;

(f) Foreign trade.

Increasing export performance is one of the main concerns of Philippine economic policy. It is reflected in the TTB method of evaluating agreements and establishing royalty rates. In most cases a royalty premium is granted on exports; available data on effects of TTB regulation seems to show a more flexible approach to contracts linked with exports.

Appraisal of most relevant features of foreign trade in the sector must be provided, i.e. the following ratios:

Exports/gross output
Imports/gross output
Exports/Imports
Exports of foreign companies/total exports
Share of the exports of main products in total sector exports, identifying the main exporting products;

(g) Besides the above items, an overall view of the sector must be given, in qualitative terms. References to development expectations, policy guidelines, technological level reached, and dynamics of entrepreneurship would be helpful in providing a background for a more detailed analysis of contractual technology transfer.

Contractual technology transfer: main characteristics and effects of TTB regulation

This chapter leans heavily on data collected and analysed by the TTB in its current statistical work. The statistical system described previously supplies all the information needed.

There are three main headings in this chapter:

(a) General features of contracts;

(b) Outflows derived from contracts;

(c) Assessment of TTB regulation.

General features of contracts

(a) Characterization of recipient enterprises:

Ownership patterns
Relationship with the supplier
Size
Relevance of the agreement for the company (diversification, vertical integration or maintenance of previous productions via renewal);

(b) Characterization of supplier companies:

Countries of domicile
Size
Other agreements already registered in the Philippines;

(c) Technological items transferred and type of agreement (new or renewal);

(d) Products involved:

Technological content
Previous production in the Philippines
Market destination (internal market or exports)
Effects on other industries;

(e) Contractual terms and conditions:

Duration
Royalty rates
Restrictive clauses.

The study of the general features of contracts should also extend to old contracts (i.e. approved prior to TTB regulation). However, an effort must be made to include only contracts actually in force; agreements already expired should not be considered. Furthermore, distinction between contracts approved under Central Bank/BOI and under TTB regulation would be helpful. It could provide some insight into the extent of modifications arising from the latter.

Outflows derived from contracts

This data will be based on information supplied by the Central Bank. If feasible, time series could include payments in the last five years; this would provide information on the historical evolution of T/T payments either in absolute or in relative terms (by comparison with relevant data collected from statistics on manufacturing industries).

Data on payments to be included in sectoral studies must highlight the following aspects:

(a) Absolute level of paymerts each year, disaggregated according to:

Countries of destination of foreign exchange outflow
Levels of foreign holdings in recipient companies
Relationships between recipient and supplier companies
Products classified by SITC standards
"Age" of contracts g/;

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g/ These disaggregations have already been suggested, although the last two were considered less important. Current statistics on payments would provide the required data on absolute level of payments.

(b) Relative level of payments. Ratios aimed at providing information on the relative magnitude of T/T payments would be helpful; a better appraisal of the relevance of contractual technology transfer in the sector under study would be available.

The following ratios could be retained:

T/T payments/gross output
T/T payments/sales
T/T payments/value added
T/T payments/exports
T/T payments/profits
T/T payments/R and D expenses

However, data on profits and Research and Development expenses are not currently published. The above relationships are stated more on a "desirable" than a "realistic" basis.

Appraisal of the importance of contractual T/T vis-à-vis direct foreign investment would also be useful. However, on the question of methodology, the ratio T/T payments/inflow of foreign investment can be obtained more easily with the available data on foreign investment.

It would be preferable to have a breakdown of the above ratios according to the ownership (national versus foreign) and the size (measured by employment) of companies, but this would cause some problems.

Assessment of TTB regulation

The appraisal of the effects of TTB intervention on T/T contracts can be developed in three ways:

(a) Contractual terms and conditions:

Royalty rates and lump-sum payments
Royalty base
Duration and renewal conditions
Restrictive clauses

Data on modifications introduced on the above issues can be obtained from the proposed statistical tables by comparison between the initial and final versions r/;

(b) Financial effects. On one hand, the financial estimates broken down as suggested earlier, using the five years figures would be satisfactory.

On the other, it could be asked if it would be worthwhile checking those estimates against the real data available from the annual progress reports and from the Central Bank on payments. It could be useful to get information on the effective financial outcome of TTB regulation. Although this check is

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r/ See matrix reproduced earlier.

difficult, its implementation in connection with monitoring reports could be envisaged. This issue deserves further analysis;

(c) Effects on technological performance. The TTB conditions for the registration of agreements chiefly concern economic, financial and legal matters (royalty rates, export restrictions, termination rights, grantback conditions, applicable law and the settlement of disputes etc.). Conditions of a technological nature, such as training programmes and settlement of linkages with national engineering firms, are less frequent. Nevertheless, a technological evaluation is made by technological staff, more with respect to appraising the complexity and sophistication of technologies in order to determine adequate royalty rates, than with a view to introducing modifications in the conditions of transfer of technological knowledge. In pure licensing agreements the scope for introducing changes of a technological nature is rather limited when compared with that provided in "process package" contracts. 3/

TTB regulation has direct and indirect effects on technological performances of recipient firms and on the improvement of scientific and technical capacity that must be appraised. The following issues could be considered:

Training programmes
Local manufacturing programmes
Full transfer of technological know how
Disaggregation of technological packages
Adaptations of technologies to local conditions and requirements
Establishment and development of R and D facilities
Spill-over effects
Linkages with national engineering and consulting firms
Reduction or elimination of post-termination dependence on technology supplier

Assessment of the impact of technology import

The purpose of this chapter is to see how T/T contracts have been managed, and how they contributed to the development of Philippine manufacturing industry.

Inputs for analysis must be collected from:

(a) Annual progress reports;

(b) Inquiries conducted from a selected sample of companies. These inquiries will not only be an input for the study but could also be considered as monitoring actions, in the sense that they would provide insights into the effective implementation of T/T agreements

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3/ "Process package" is quoted from "Handbook on the acquisition of technology by developing countries" (UNCTAD/TT/AS/5).

This chapter of the study comprises an elaboration of the following issues:

(a) Effect of imported technology on the development of recipient companies;

(b) Local technological adaptation and development;

(c) Recipient-based diffusion of technology;

(d) Practical constraints on the mastering of imported technology.

Effect of imported technology on the development of recipient companies

A review of the growth of the company would be made in order to evaluate the role played by foreign technology. At the same time, an analysis must be undertaken of the importance of imported technology in the firm's production, in an attempt to understand the extent firms depend on the supply of foreign know-how and brand names for their growth.

Local technological adaptation and development

Technology import and technology mastering are not synonymous: to be successful in national terms, the import of technology must be followed by its assimilation, adaptation and further development. If this is not done, then a strong dependency link will become established and will increase as the technology grows old-fashioned, outdated and new developments take place in foreign countries.

The assessment of the impact of technology inflow must take into account the level of local assimilation, adaptation and development of imported technologies. Monitoring report forms should show awareness of these factors, with regard to recording the level of skill of the workers and relevant data on indigenous and foreign technology.

Information must be obtained concerning the following issues:

(a) Specific actions with regard to adaptation and development of imported technologies (on-the-spot changes, planned adaptations to local conditions, outcome of research and development efforts; underlying reasons, if any; skills of personnel that carried out these actions);

(b) Level of skill of personnel (data can be collected from annual progress reports);

(c) Research and development facilities and expenses (progress reports also provide some data);

(d) Linkages with, and promotion of, local technological services (engineering and consulting firms and government research institutions);

(e) Role of foreign supplier on adaptative actions.

Recipient-based diffusion of technology

The purpose in this respect is to determine to what extent imported technology has been spread beyond the boundaries of recipient firm in order to improve the overall level of sectoral manufacturing knowledge.

Possible ways of diffusion of knowledge include inter alia:

(a) Demonstration effects (which lead competitors to look for similar technologies);

(b) Copying;

(c) Outflow of skilled personnel;

(d) Subcontracting;

(e) Co-operation with R and D centres and technological services;

(f) Sublicensing (or licensing).

An evaluation of the importance of technology exports - not only through licensing agreements but also in other ways such as the supply of equipment, engineering services or skilled personnel - would be useful.

Practical constraints on the mastering of imported technology

Identification of the various factors which limit the internal adoption and adaptation of foreign technology is a critical issue for an adequate definition of policy measures concerning technology transfer and development.

Due account must be given to the following items:

(a) Limitations arising from the text of the agreement (such as those stemming from restrictive clauses);

(b) Poor collaboration of supplying partners in the implementation of the contract (insufficient training and defective supply of know-how);

(c) Shortcomings inherent among recipients themselves (insufficient skills, small size, short-term management approach and foreign control);

(d) Shortcomings arising from the overall technological development level of the country.

Conclusions and policy recommendations

The outstanding aim of these in-depth sectoral studies is to contribute to the formulation of more suitable policies on technology transfer and development, either in general terms or, more specifically in the concerned sectors. Policy recommendations are therefore the culmination of the work.