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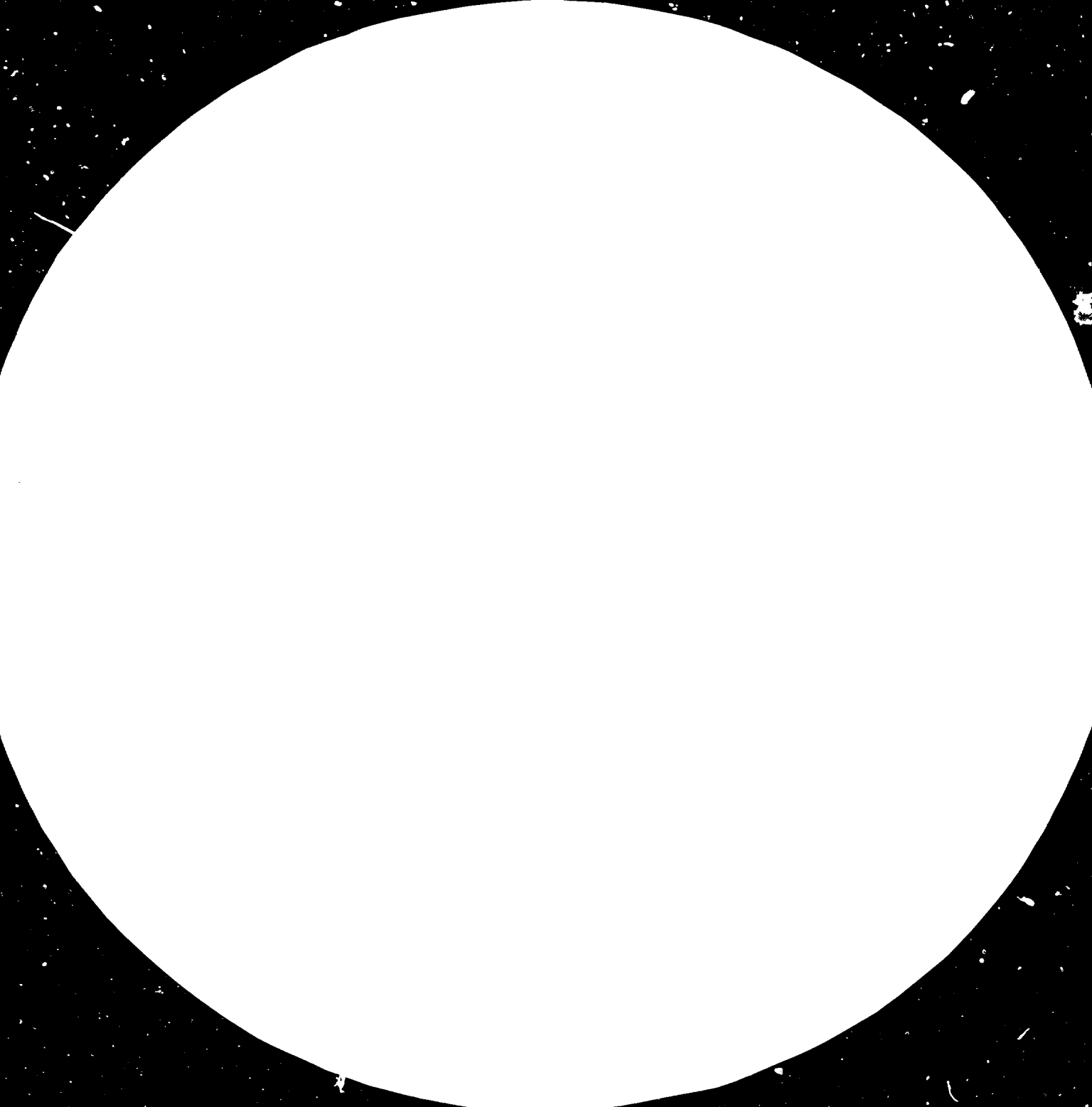
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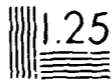
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TRANSFERENCE OF TECHNOLOGY IN MEXICO,  
THE CASE OF SMALL-MEDIUM INDUSTRIES \*

by

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1. AT the present state of development, Mexico is eminently a technology buyer country, and for that reason we search for it under the best conditions taking in consideration the comparative advantages of the country and the worldwide geopolitic balance of the triangle formed by energetics, food and technology.
2. Within this frame we define sectorial goals in accordance to the role that the national programs assign to technology.
  - i) Technology policy derives from political philosophy and from the national objectives.
  - ii) The main purpose is to constitute a technological and scientific basis that supports the priorities of production of goods, the development of strategic sectors and the Mexican Food System (SDM).
  - iii) To enforce basic research
  - iv) To orient applicable research and experimental development towards the solution of the priority problems,
  - v) To attend the formation and capacitation of human resources
  - vi) To enforce and promote the scientific and technical services that constitute the research and development infrastructure and the concrete basis in which technological innovation with stands.
  - vii) Support technology transfer policies in such a way that besides of being a national technology registry, it develops other services and policies.
  - viii) Promote within the population a more favorable atmosphere to scientific and technological development.
3. Domestic technological development is looked for in those activity fields where the country has real possibilities of development and in those areas in which lack of natural or human resources, or because of a secular behindness in relation to the worldwide tendency, are dependent from acknowledgement and technology from abroad. Common sense acknowledges that this practice will yield in a saving of resources and above all, will minimize the investment risk.
4. The general direction on foreign investment and technology transfer of the Ministry of National property and Industrial Development performed a study of the 12000 contracts registered up to December, 1980, which permitted to identify the

main characteristics of the economic and technological structure of each one of the priority activities, and particularly of the small-medium industry.

The analysis objective was of anticipating the effects that the purchase of foreign technology would have over the country's development, if the same tendencies remained. The existence of a high technological dependence from abroad was found in the manufacturing of capital, intermediate, and long-lasting goods, in these activities the expense is highly proportioned one to technology in the added value, and foreign capital participation.

The technology expense in relation to the manufacturing cost trends to be higher for the intermediate and capital goods than for the others.

The activity branches that participate with the highest payments on technology, are those that generate the larger exportations, except for agroindustry, which generally requires, traditional or low level modern technology, normally available in the country. Its payments on this matter are less significant, though not its exportations, as it is one of the industrial activities that contributes the most on this concept.

5. On the other hand, the global estimation for 1975-1980 gives a general view of the technology transfer payments' behaviour. Correspond to the manufacturing sector 94.8%, to services, 3.2%, and 2.0% to commerce.

The amount of payments for the use of foreign technology, in the industrial sector are made for the production of intermediate goods, which in average represent the greatest amount (45.9%).

Next come the capital goods and agroindustry, participating with 8.2%.

Following in importance, the services sector comprises 3.2%, in average, with the acquisition of technical and assessment services as well as with those which are payed by the national hotel industry, in order to become part of the large foreign enterprises and to their international reservation and commercial systems.

The commercial trend is to nulify the payments for technology. Due to the fact that these are only accepted as an exception.

6. As of December, 1972, when the law on the registry of technology transfer and patents and trade marks came into effect, the political scheme of it sets up the possibility of carrying out a project of autonomous assimilation and innovation, starting from the imported technology that fulfills the National priorities among which the most important is the small industry.

The National Industrial Development Plan, in which the country's and sectorial priorities are established, considers as small enterprise that in which the fixed assets investment is less than 200 times the annual minimum salary for the Federal District. At present, the amount is approximately of 15 million pesos. The high priority assigned to the growth and modernization of the small industry is based in its relative importance within the manufacturing sector, particularly in agroindustrial branches, basic consuming goods manufacturing, and in the metal-mechanic industry.

In second place, to the high volume of employment it generates, while using labor force in an intensive way, and contributing efficiently to its training and to the diffusion of its administrative abilities.

7. The small and medium size industries' technological characteristics variate in relation to the sector in which they are localized. Recent studies reveal, for example that the basic metal industries prefer acquiring machinery and equipment rather than employing labor force, resulting to a better productive structure.

The same happens with the food industry. Nevertheless, in activities such as textile and clothes industries, labor force is utilized in a very intensive way, but since it is low qualified, it generates high costs and low efficacy.

Due to the differences in each industrial branch and its own characteristics and conditions, we cannot pretend to make a sectorial analysis on the technological behavior of the small and medium industry. Instead, we can englobe Mexico's experience in the matter, by specifying the enterprises' characteristics in relation with the role they play within Mexico's industrial structure.

Small-medium size industry is localized at one level linked to the large enterprise, like a satellite, that benefits from the technology that is transferred from the large industry for the manufacture of parts and components or for the development of specific processes.

In this level, the tendency is to acquire incorporated technology in machinery and equipment that not always adjust to the Mexican market requirements of scale of production, and that are regularly operated below their normal capacity.

3. Relative to the origin of the machinery and equipment used by the enterprises, information about the small sized industries shows totally opposed signs as to the medium sized ones. While the first indicated to have 62% of domestic manufactured machinery and equipment, with 38% of imported components, the others imported 66%, and only utilized 34% of domestic manufactured equipment. This sounds logic considering that small enterprises use more simple processes.
9. For the rest of the small and medium size enterprises, particularly for the agroindustrial ones, technology is either eupinic or handcrafted. These enterprises and the implied technological gap, represent an enormous majority, in relation to the modern sector of the economy.

Within this context, it is required at first, to practice a policy that rather than giving specific support to individual enterprises, it provides a promotional frame for subcontracting processes in specific activities.

For this reason, technological selection will have fundamentally to search that which is adequate to small and medium size industries.

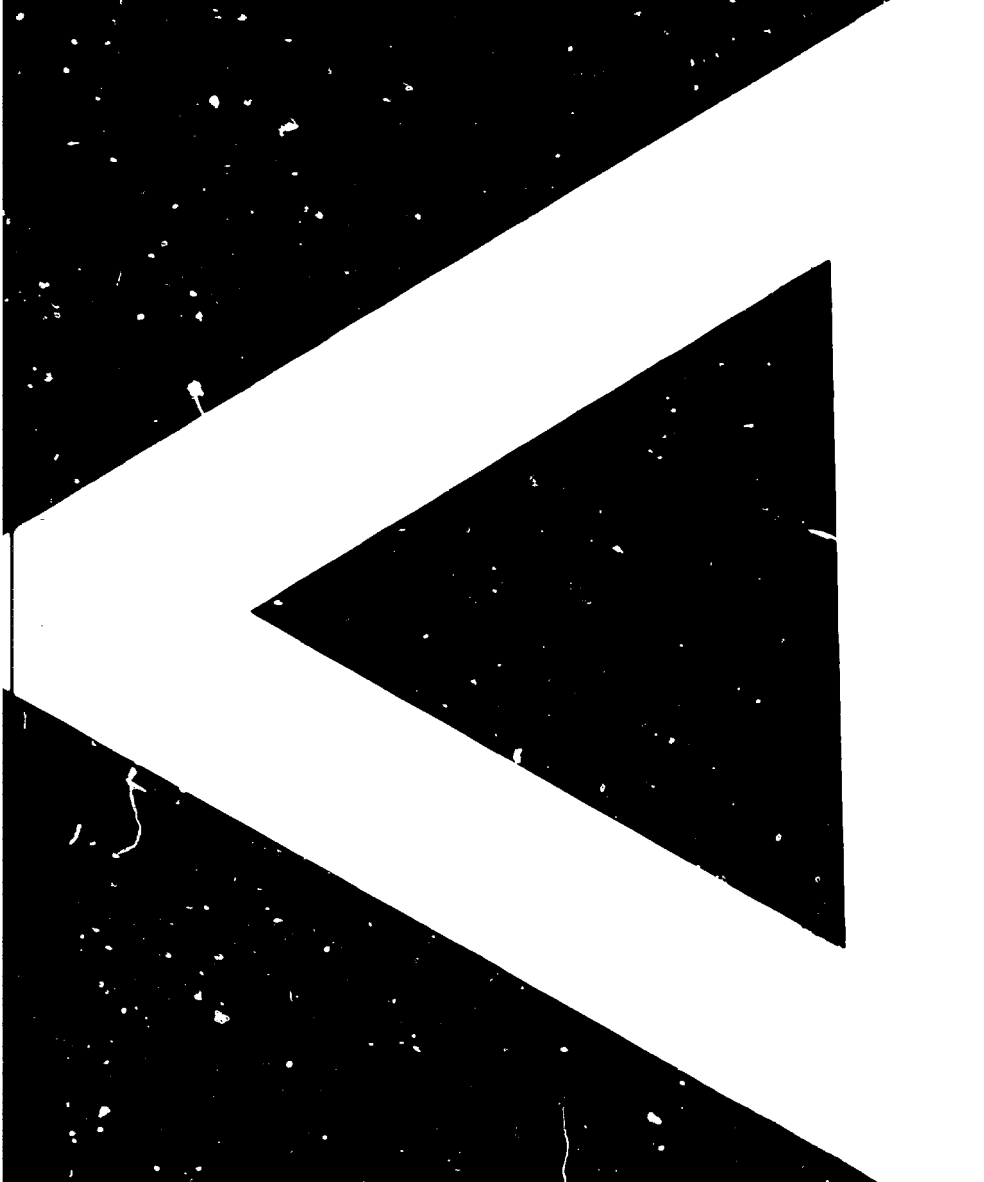
10. Regarding the selection of technology for processes to be developed by the large enterprise, subcontractation should be looked for as an alternative that allows the captation, assimilation and development of technology.
11. If in terms of large enterprises we count upon industries with medium-level technology, they must be oriented towards the low-level ones, so that they



reach medium-level technologies. Those with medium-level technology, towards technological leadership.

In order to guide adequately the technological transference from abroad to the country and within the country, it is necessary to undertake a technological-expenditure policy for those sectors in which their productivity results more profitable.





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