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INTERNATIONAL SUB-CONTRACTING AND TRANSFER OF TECHNOLOGY TO LDC'S

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INTERNATIONAL SUB-CONTRACTING AND TRANSFER OF TECHNOLOGY TO LDC's*

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Introduction

Despite the drawbacks they may present for entrepreneurs and sub-contracting, international sub-contracting (ISC) arrangements are generally considered - according to a traditional approach - as an effective means of accelerating industrial development, since they foster a certain complementarity of production lines on the basis of a specialisation which reflects comparative advantages, since they increase the rate of utilisation of productive capacities, since they have positive effects on the balance of payments of the LDCs, and especially since they allow a mobilisation and better utilisation of the LDCs'manpower resources.

The development of international sub-contracting should contribute to the dissemination of scientific and technical knowledge to the less developed countries. Work done by sub-contractors has to conform to strict technical specification and if goods, regardless of their origin, are to be of uniform quality, technological standardisation is necessary.

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* This paper constitutesa summary of the problematic and framework of a research undertaken by the OECD Development Centre on "International Sub-Contracting and Reinforcing of LDC's Technological Absorption Capacity". The contents of the paper are thus largely inspired by the various preparatory documents of this research and particularly by the research project itself as well as the state-of-the-arts report prepared by Prof.Michalet Consultant of the Centre.

As for the preliminary results of the Tunisian case study presented in annex of this paper, they constitute part of the report prepared by Prof. Falise, Consultant of the Centre.

1/ OECD Principal Administrator; The opinions expressed in this paper are the responsibility of the author, and do not necessarily represent those of the OECD.

Sub-contracting agreements could also help to enhance the local technological potential and, through the combination of the sub-contractor's and the main contractor's technology, can foster the development of appropriate or intermediate labour-intensive technologies.

This said, to the degree to which one might want to proceed with a systematic and theoretical study of the phenomenon, one must place the analysis of ISC in the more general framework of the discussion taking place on the emergence of a new international order which, if it is to take shape, will require a number of changes in the distribution of economic sectors between developed and developing countries. The traditional breakdown into the industrial versus the primary sectors will have to be replaced by a less clearcut line of separation which will preclude the economies of the developing countries from being wholly dependent on the production of primary commodities. If this is to be accomplished, a number of industrial activities will have to be relocated from the developed countries. The redeployment of world production should generate an increase in the developing countries' share in world trade and this increase should be increasingly based on exports of manufactured or semi-manufactured goods. Increased international sub-contracting could prove an effective instrument in achieving that objective. A substantial increase in the number of sub-contractors located in the developing countries should be accompanied by intensified trade in manufactured or semi-manufactured goods between countries at differing levels of development.

The analysis of international sub-contracting can finally be linked to the manner in which the master concepts in development strategy have evolved. Models based on the "import substitution" process are less well-regarded than they were fifteen years ago. The results produced by the introduction of such models are inhibited by the limited size of domestic markets.

If the momentum is not to be lost, there will have to be a change in income distribution. Reform along those lines may not be easy to carry through in some of the developing countries. This accounts for the success of another industrialisation concept, in which emphasis is placed on export promotion and foreign demand is made a substitute for domestic demand. Here again, international sub-contracting appears to be an acceptable approach. On the one hand, in fact, the new development strategy is in line with attempts to bring about a new international division of labour and we have just seen that international sub-contracting is geared precisely to that new image of the future. On the other hand, international sub-contracting should be instrumental in strengthening industrial structures in the developing countries. If its scope were broadened, a large number of local firms could be mobilised for sub-contracting work. Furthermore, international sub-contracting lends itself to the use of medium-and small-sized production units.

For all these reasons, it is not surprising that the development of ISC - which has had an extremely high rate of acceleration since 1960 - has followed somewhat belatedly the tendency of firms toward multinationalisation. In any event, these latter are participating actively in ISC either as prime contractors or sub-contractors.

I - Typology - Forms of International Sub-contracting

According to UNIDO 1/, "a sub-contracting relationship exists when a firm (the principal) place an order with another firm (the sub-contractor) for the manufacture of parts, components, sub-assemblies or assemblies to be incorporated into a product which the principal will sell. Such orders may include the treatment, processing or finishing of materials or parts by the sub-contractor at the principal's request" 2/.

1/ ONUDI, "La sous-traitance et la modernisation de l'économie" (Nations-Unies, New York, 1975, 147 p.).

2/ Other international organisations such as the IBRD, UNCTAD, IDB etc. have also proposed definitions for sub-contracting. However, we consider UNIDO's definition as being closest to our concept of the phenomenon.

If to this we add, on the one hand, the possibility of sub-contracting finished products destined to be sold as such by the prime contractor, and on the other hand an international dimension [1] we can distinguish four types of ISC relations:

Type A: Two independant units in countries at different levels of development - the "pure" or "classic" form of international sub-contracting.

Type B: The subsidiary of a multinational enterprise and a local firm.

Type C: Between two subsidiaries of different multinationals in the same country. In both cases B and C there may be some supply to the local market.

Type D: Between two subsidiaries of the same multinational enterprise, in different countries.

Types A and D are forms of "direct" international sub-contracting, in which the production of the sub-contractor is completely exported to the principal. Types B and C represent forms of "indirect" international sub-contracting, in which the sub-contracting relationships occur through a subsidiary of the multinational enterprise which sub-contracts work to a local firm or other multinational enterprise affiliate.

On the basis of this typology we can raise the question of the evolution of sub-contracting: whether it is a stage in the decentralisation of production by large firms towards wider geographical dispersion of affiliates, or whether it is a forerunner of LDC industrialisation leading to the production of finished goods for local or export markets.

1/ The localisation of firms in relation to their sub-contracting: situated in different countries, or destination of products manufactured by the sub-contractor (export or re-export).

A priori this evolution will largely depend on which strategy plays the predominant role: if local sub-contracting firms are used more intensively, the type "A" direct internationa sub-contracting will become dominant. If the trend is more towards internationalisation of production through multinational enterprise affiliates, type "D" direct sub-contracting will dominate.

Sub-contracting arrangements can also take many forms and are motivated by a number of different factors. Thus, by referring to the criteria of comparative advantage sought by the main contractor as well as to the regularity of the orders, one can distinguish:

(i) speciality sub-contracting: The contractor entrusts the sub-contractor on a permanent basis, in general, with the execution of certain manufacturing operations. The sub-contractor has specialised machinery and equipment, or has developed specialised technologies, with or without the assistance of the main contractor;

(ii) economic or cost-saving sub-contracting. The contractor' main motivation for such an arrangement is that the sub-contractor's costs for certain operations (production or transformation) are considerably lower;

(iii) complementary sub-contracting or intermittent sub-contracting. This form of sub-contracting is used when the main contractor's production capacity is at times insufficient, owing to sudden surges in his order books.

Moreover, all sub-contracting agreements can be considered firstly as essentially "commercial" and "external" operations when the order is received direct from abroad for the manufacture of a finished product or a component part which is re-exported, and, secondly, as essentially "industrial" and "internal" when the sub-contractor manufactures elements and parts which are assembled locally by the enterprise which placed the order, which is, generally, a subsidiary of a MNC.

II - Impact of International Sub-contracting: a particular reference to the transfer of technology problem

There is no denying that international sub-contracting has an impact on local production, employment and external equilibrium in the sub-contracting countries. The force of that impact depends on a number of variables and it will differ with the sectors involved, the relative level of development of the host country, the policies followed by the host countries with respect to international sub-contracting and the types of international sub-contracting itself (direct and indirect type).

These aspects having been more or less analysed in most studies on ISC, we shall bring out here in particular the impact of ISC on technology transfer.

In fact, sub-contracting can lead to a transfer of "second-hand" technologies (second hand equipment), which are, consequently, low-cost and, in general, labour intensive.

Moreover, sub-contracting agreements can - notably with "speciality" sub-contracting - be based on the use of local techniques, which could in time be improved by the sophisticated know-how (or at least some elements of it), of the principal firm which would lead to the creation of intermediate technologies. This development depends evidently on the industrial branch and is observed, in general, to the extent that sub-contracting extends productive capacities.

After these general remarks, one should distinguish - for the analysis of the different types of ISC, and still on the basis of Michalet's report - three main cases: transfer of technology through direct sub-contracting between independent units, transfers through direct international sub-contracting between the subsidiaries of an international firm, and transfers through indirect sub-contracting.

A. The international transfer of technology and direct international sub-contracting between independent units

This situation corresponds to form A of international sub-contracting. The international transfer of technology - in instances where it exists - is confined to the technical assistance which principals provide for sub-contractors. This technical assistance is not automatic and is provided only in instances where sub-contractors do not have the industrial and technical capacity to comply with the specifications laid down by their partners. Technical assistance may take a variety of forms, ranging from the mere provision of detailed specifications to the secondment of technical experts from parent companies to sub-contractors, in addition to such intermediate stages as the organisation of training for some of the sub-contractor's personnel, advice on the selection of capital goods, sales of licences and patents and informal contacts through correspondence and telephone communications It is quite obviously in the principals' interests to insist that the sub-contractors' output comply with the standards of workmanship required of goods that will subsequently be incorporated into finished products. However, technical assistance must not involve a significant rise in the costs borne by principals and the latter will therefore endeavour to make a prior selection of firms that will make least call on their technical services. This line of reasoning militates in favour of sub-contracting firms that have already attained a high technological standard and have a skilled labour force. In other words, the degree of sophistication of the products sub-contracted will largely depend on the level of economic, scientific and technical development of the countries engaged in international sub-contracting. As a result, this form of international sub-contracting tends to consolidate the status quo rather than develop scientific and technical potentialities.

B. The international transfer of technology and direct international sub-contracting between subsidiaries of a multinational firm

In D-type international sub-contracting, the transfer of technology is confined to the internal circulation of scientific and technical know-how within the multinational firm. The workshop-subsidiary is not a creative centre nor even a place where technological knowledge is tailored to needs, since production is entirely geared to the export of components. Moreover, it is not an agency for the external dissemination of technology. As the independence of the sub-contracting subisidary is very limited, the choice of products, their technical specifications, the capital goods needed to manufacture them and the internal organisation of labour are all laid down by the specialist departments at the head office of the multinational firm. The only noteworthy contribution of this form of sub-contracting lies in the training of professional-level technical staff in instances where their skills are not considered of a high enough order.

The overriding feature of the two forms of international sub-contracting is that the goods supplied by the sub-contractors have to comply with strict specifications because of their subsequent incorporation into finished products that are chiefly marketed in the most developed countries. The main corollary of this product standardization requirement is the harmonization of production techniques. In the final analysis, the transfer of technology through direct international sub-contracting is dominated by the constraints imposed on principals on account of the fact that they belong to the group of countries with the highest technological standards. The need to maintain their international competitive position cannot be reconciled with a concern for adapting techniques to the local conditions encountered by sub-contractors. International sub-contracting clearly emerges as the removal - neither more nor less - of a production unit to a region where labour is cheap. The comparative usefulness of making a distinction between two forms of international sub-contracting lies in the fact that figure A offers sub-contractors the possibility of escaping the "technological

package" policy by systematically diversifying their input sources. However, here again their freedom of action is still largely theoretical. If it were to become a reality, sub-contractors would be compelled to attain a standard of specialisation that would enable them to impose their own views.

C. The international transfer of technology and indirect international sub-contracting

The foregoing comments on relations between subsidiaries and their family group largely apply to the case of indirect international sub-contracting. However, it is possible to single out two differences, although they differ in importance. Firstly, subsidiaries of multinational firms devote part of their production capacity to manufacturing finished products, the output being destined to supply the local market to varying degrees. Hence, they may adapt those products slightly to make allowance for local conditions of use and consumer tastes. The second original feature of indirect international sub-contracting is the recourse subsidiaries have to local firms. If the latter are to be used efficiently, the subsidiaries placing the sub-contracting orders often have to provide their support.

As in the case of direct international sub-contracting, this support takes the form of technical assistance, but it may also involve financial backing and occupational training. The links between the subsidiary and its sub-contractors are usually closer and may also be more wide-ranging if the manufacture of the finished product permits, as in the case of the motor industry, for example. Since subsidiaries are more dependent on sub-contractors in such cases, they have to provide a broader spectrum of technical assistance and hence undertake a much more substantial external transfer of technical know-how than in the previous case. These observations relate more specifically to cases where the sub-contractors are independent local firms. The situation is usually quite different when subsidiaries of other multinational firms are involved. In the second assumption, these subsidiaries are either the habitual sub-contractors of the group or are highly

specialised producers. In both cases, these sub-contractors do not usually need technical assistance from the principals, either because they are accustomed to working with the group and know its demands or else because they are in a position, owing to their technical specialisation, to impose their own models on the principals. Whatever the assumption, the position occupied by subsidiaries in indirect international sub-contracting is that of a middleman between the group and the sub-contractors. They accordingly only pass on the technical precepts of their parent company. It can be argued that the real principal is still the parent company itself, in that it has continuing responsibility for matters of R & D and technology. In instances where the sub-contractors are local firms, therefore, the transfer of technology is qualitatively no different from that in case A, but it takes on a quite different complexion when the sub-contractors are subsidiaries of other multinational firms.

International sub-contracting can provoke a flow of foreign capital and thus act as a catalyst in attracting other investments which would allow, both an increase in local value added and the diversification of the product range. Sub-contracting contracts should be a first step towards the creation of joint ventures, because the cooperation involved appears profitable for both partners. It is exactly in this case (where a sub-contracting agreement offers the prospect of developing into a joint venture) that technology transfer accelerates and the network of sub-contracting firms becomes viable.

Finally, the introduction of "regional" hypotheses opens up other sub-contracting possibilities, notably the industrial sub-contracting of specialities practised by MNC subsidiaries, which could very effectively contribute to regional integration, but without losing sight of the technical and political difficulties which this tendency could come up against.

Annex

SOME SUMMARY FINDINGS STEMMING FROM THE MONOGRAPH ON INTERNATIONAL SUB-CONTRACTING IN TUNISIA

This paper presents opinions given by public officials, heads of sub-contracting firms and principals or parent companies classified under two headings, firstly those relating to typological analysis and trends in international sub-contracting and secondly those relating to policy for promoting international sub-contracting. Lastly some thoughts on methodology are put forward that may possibly help to increase the utility of any later studies.

I. SUMMARY OF OPINIONS ON DEVELOPMENTS IN INTERNATIONAL SUB-CONTRACTING IN TUNISIA

From all the comments made it emerges that international sub-contracting in Tunisia has developed in two forms:

1. Economy sub-contracting mainly via the subsidiaries of multinational firms, with a few cases of joint ventures. The products made are articles of clothing (trousers, shirts and working clothes) whose share in the imports of the EEC Member-countries (1) has grown rapidly in recent years, increasing from 1 to over 5 per cent (and even 10 per cent in Germany) in their respective categories. Other, more recent activities are the assembly of electrical appliances and electronic equipment, thus introducing more variety in sub-contracting although continuing to fall within the same type of industrial organisation. There are two reasons for the growth in sub-contracting: the general transfer of labour-intensive production to countries with low wage levels and efforts to diversify sources of supply. The wish to replace products made in the Far East or East European countries by goods from the Maghreb and other African countries in order to maintain ultimate control of production has led parent companies to set up subsidiaries and negotiate joint venture agreements in which the assymetry favourable to the principal

(1) But some other European countries as well, e.g. Switzerland and Austria.

or parent company is preserved. In both cases, the European principal's control is complete, covering the organisation and equipment of the production plant, staff training and supplies, any alternatives based on local inputs that may be cheaper but are considered to offer greater risk being rejected in favour of the reliability of European sources. As a result these firms function well, operating at very attractive cost levels for European industry and competitive at international level. Effects on employment and earnings, which the country finds very welcome, are far from negligible because of the large number of people put to work. The technology transfer effect, on the other hand, is less because it depends solely on the goodwill of the European principal who always keeps to himself the design of the product, its production processes and particularly, at the end of the chain, his marketing know-how to which neither type D subsidiaries nor type A subsidiaries have access. Even so, technological progress is not wholly precluded, its main manifestation being in the general heightening of the level of technical ability in employees that are frequently of rural origin. Work in plants organised in accordance with time standards and other industrial constraints such as quality control form an introduction to industrial attitudes. In the clothing field, however, opportunities for increasing the pace of technology transfer and reducing the assymetry between Europe and Tunisia are to be found in the existence of an upstream textile sector which is now integrated from the spinning stage onwards and increasingly capable of replacing imports.

2. Secondly, alongside economy sub-contracting (accounting for over nine-tenths of firms), compensation sub-contracting which the principal has to accept in exchange for access to the Tunisian market because of Tunisia's need to balance its foreign payments and to expand markets for Tunisian firms with larger production capacity than needed for local requirements. The absence of any industrial infrastructure makes this form of international sub-contracting highly fragile at the supply level, to the extent that the differential in manpower costs is largely offset by the higher prices caused by the dependence on other countries and the inadequate national environment.

The following table summarises, in broad outline, the characteristics of these two types of sub-contracting and their management systems with an indication of specific and common features (see the following pages).

Overall, it can be seen, that, whilst the benefits of international sub-contracting to the Tunisian economy are far from negligible in terms of jobs, earnings and foreign trade, their effects in terms of technology transfer is slow and fragmentary. The situation in this regard is slightly better and more promising in compensation sub-contracting but its development comes up against the difficulties of all kinds stemming from an industrial structure that is in its infancy and therefore suffering from grave deficiencies.

This raises the question of the fundamental difference, both at theoretical level and in terms of its concrete consequences, between sub-contracting relationships within industrialised countries and those prevailing between a principal in a technologically advanced country and a sub-contractor in a developing country. In the latter case there is practically no place for specialisation sub-contracting based on specific skills and know-how - the only possibility is economy sub-contracting based on lower wage costs and for technologically simple operations under strict supervision. If the authorities manage to enforce a certain amount of compensation sub-contracting in addition, this encounters the same difficulties as regards the wide technology gap and inadequate local industrial structure and results in terms of the assymetry of relationships between principal and sub-contractor are the same.

The Tunisian case, therefore, suggests that results in terms of technology transfer are relatively meagre for these first years of experience of international sub-contracting. First impressions are that it is not general, being limited to certain firms and certain operations, but that the conditions applying to international sub-conctracting offer little scope for technology transfer in the short term.

Management characteristics / ecific features	Commercial	Technical	Financial	Workforce	Advantages	Disadvantages
conomy sub-contracting clothing, etc. + metal engineering and electrical industries, type D)	Long runs with very little variety	Non-specialised products Minimal local supplies New and second-hand equipment Limited technology transfer (general training) Supervisory staff trained on the job	100% owned subsidiaries of multinational firms, or joint ventures Tunisian banking system used only for day-to-day business	Mainly female Recruitment by selection On-the-job training Share in supervisory function	Hourly rates 3 times lower than in Europe More control over production than in South-East Asia	Lack of full and precise information at the outset Initial underestimation of certain costs because of this lack of information
ompensation sub-contracting (Metal, ngineering and electrical industries, ype A)	Assistance from the authorities in finding sub-contracting work Preference for non-standard series	More complex products Use of local inputs New equipment at start but sometimes old More technology transfer (opportunities for intermediate technologies) Supervisory staff recruited among school leavers	Solely Tunisian capital Tunisian banking system used for financing	Training received in technical education system Recruitment on basis of educational certificates Almost exclusively male (unless there is a shift towards economy sub-contracting) More hierarchical staff structure	Making-up costs half those in Europe but... Suitability for small runs	...sometimes as high as in Europe and with greater risk (of supplies being interrupted) Lack of continuity in sub-contractor's policy Unsuitable and inadequate equipment

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Management characteristics / cific atures of	Commercial	Technical	Financial	Workforce	Advantages	Disadvantages
th economy and compensation sub-contracting	No marketing department Principal has dominant position on the market (multinational firms) Order book equivalent to 6 months - 1 year's production Assymetry very favourable to principal	Strict specifications laid down by principal Dependence on foreign inputs Substantial technical aid from the principal Quality control No innovation		Recruitment by local main labour exchange No job mobility Better social climate than in Europe	Proximity to Europe High level of general education and culture open to European influence Flexibility in production	Telephone Telex Relationships with customs authorities Lack of recognition of industry on the part of the government

This negative assessment, however, needs to be qualified by two other considerations of a positive nature. Firstly, though not leading to large-scale technological progress as such, international sub-contracting is accompanied, from the outset, by a process whereby operatives, and supervisory and even management staff becomes trained - the condition and opportunity for technological progress in the medium-term. The advent and dissemination of processes of industrial behaviour may thus be put to the credit of international sub-contracting because, provided they are correctly integrated, guided and used in the development of the country, they should gradually lead to more substantial improvements. Secondly, the technology gap and the difficulties stemming from an inadequate industrial structure are not the same for all sectors. In cases where industrial policy has gradually built up a coherent network of input-output activities, the country's ability to absorb know-how and make technological progress is far greater and international sub-contracting is on ground that is more favourable for both principal and sub-contractor. This is to be found in the textile and clothing sector, for example, as compared with the metal, engineering and electrical industries.

The conclusion is that international sub-contracting as such can contribute to technology transfer only if it is part of a coherent and well-defined industrial policy defining lines of development and areas of complementarity in sufficient detail. Even if there is no such policy, international sub-contracting may, in the long term, promote desirable changes in behaviour from the industrialisation viewpoint. At all events it has positive effects as regards employment, earnings, and foreign trade, though in a context of assymetry and technological dependence which certainly fall short of the country's ambitions and even its potential.

II. POLICIES FOR THE DEVELOPMENT OF INTERNATIONAL SUB-CONTRACTING

The first suggestions that may be made stem from the complaints of the firms as regards their own environment and their purpose is simply to improve the way international sub-contracting works in its present form. More general proposals, which follow, are aimed at promoting international sub-contracting as a whole in terms of complementarity with the fabric of European industry and of technology transfer.

II.1 Improvements to the current operation of international sub-contracting

Firms would like some simplification of formalities and greater flexibility in the application of regulations on the part of the government and more particularly the Customs. They feel that the absence of a spirit of co-operation on the part of certain government servants may be the result of a lack of information about what the firm really is or a negative picture formed in the mind of the official concerned, the firm being suspected from the start of not complying with the rules. The country would be far better off if the head of the firm were looked upon by the official as a partner in national development. Among other things, this would prevent delays in the arrival of supplies or equipment, held up due to administrative formalities, and would help to do away with stoppages which may cause lay-offs for technical reasons and therefore production losses.

Greater efforts are needed to install the infrastructure firms needs, particularly as regards telephone and telex services.

General training in Tunisian education should include preparation for industrial life: responsibility, allowing for the "time" factor, knowledge of the firm. The notion of time-saving as a type of development and as a condition for competitiveness at the international level should be brought out clearly particularly now that the level of earnings is inducing a certain passivity.

Firms covered by law 72-38 should have the right to discount their bills of exchange in Tunisia.

Lastly, at the internal level, heads of firms should fit two conditions:

- they should be imaginative so as to be able to find the necessary alternatives when the resources available are precarious, and
- they must pay special attention to training and in particular that of medium-level supervisory staff

II.2 General suggestions as regards the organisation of international sub-contracting

The keystone for the organisation of international sub-contracting is the definition of an industrial policy based on genuine scope for the transfer of industrial activities from Europe to the Maghreb. This can be achieved only through consultation in order to establish which sectors should be involved, analyse the economic and social costs and benefits in each case and ensure that aid is not granted for maintaining jobs in Europe and at the same time transferring them to the LDC.

Rejecting prestige-building projects and costly and ambitious schemes, such an industrial policy should endeavour to identify gaps where Tunisia's complementarity with the Western countries and the Maghreb would stand a good chance of developing, and should include the provision of the industrial infrastructure needed to give these firms logistic support as has already been done for the clothing industry which now has an upstream textile sector (blue jeans cloth for sports trousers). Liaison officials - engineers with economic knowledge of the present and future possibilities of industrial processes - should be placed with the public bodies responsible for promoting such firms. In order that the entrepreneurial mentality may become more general and more medium and small-sized firms formed, it is recommended that young business graduates be urged to take up assistant managerships in type D sub-contractors and that the best repair firms be converted into manufacturing companies, the necessary assurances and guarantees being given them at the outset.

Lastly, both potential principals and possible sub-contracting firms need to be better informed about the steps that have to be taken since relations seem difficult to establish only initially, most firms capable of international sub-contracting failing to do so because they overestimate the difficulties involved.

III. COMMENTS ON METHODOLOGY

The above report being the first experimental attempt in a series of monographs to be produced as part of the OECD programme, it was felt that it might be useful to set out a number of comments that may help towards greater effectiveness in subsequent stages of this research.

Firstly, the questionnaires used for interviewing firms seemed to be too extensive and too dense for the interviews to be carried out, the forms filled in and the information analysed in a relatively short space of time. There would therefore need to be some selection in relation to the types of international sub-contracting found in a given country whose weighting and main characteristics could be estimated following a first set of interviews with public officials and industrial executives. In making these choices, special attention should be paid to the technical aspects providing a better insight into technology transfer, and in particular the way in which specifications are decided and transmitted in practice, with full details of how technical standards are implemented and monitored. The pre-selection of a few firms applying a more complex and advanced technology would mean that technological questioning could go to greater depths in their case, thus yielding a greater wealth of qualitative information than standardized interviews can.

A further point is that the very recent nature of practically all Tunisian experience in international sub-contracting ruled out any identification of historical trends towards forms of more complex sub-contracting, technological and commercial progress and co-related developments in financial structures. If possible, it would be desirable in other monographs to select firms with longer experience in this field and to study them in greater detail. Similarly it would be interesting to give closer consideration to cases of sub-contracting activities grafted onto an existing industrial unit and therefore closer, perhaps, to the forms of sub-contracting relationships within the industrialised countries. Lastly, it should not be forgotten that, in the typology initially proposed to the investigators, only types A and D were found in Tunisia and that information on categories B and C would therefore need to be sought elsewhere.

A final point is the considerable interest shown in the interviews by principals who firstly have a broad and comparative knowledge of international sub-contracting potential in a given country and secondly are able to position each production line more accurately in the choice of industrial projects and innovations. It would almost certainly add to the value of each monograph if more attention were devoted to the principal. Similarly it might be worth considering a study confined exclusively to a sample of international principals to counterbalance the monographs on various developing countries.