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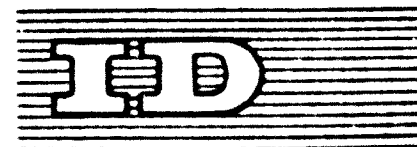
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INTRODUCTION

Israel's experience with the practice of subcontracting may be viewed as an example of the extensive development process which necessarily underlies the growth of that institution. Although this process will necessarily be different in important ways in different developing countries, the major conclusions reached in this paper, when properly qualified, may be of value to other countries currently undergoing development.

In order to convey some sense of the dynamics of the process, a chronological framework will be adopted for the description and the analysis, using four economically meaningful periods.

ECONOMIC SCARCITY AND RAPID POPULATION GROWTH (1947 to 1952)

At the beginning of this period, with the achievement of independence, Israel possessed a number of economic characteristics typical of most developing countries. The economy was largely agricultural, being based upon citrus cultivation, which accounted for most of the employment and most of the foreign exchange earnings. In addition to agriculture, significant numbers of persons were employed in public services and in commerce. Industrial employment, which followed behind the other branches, was mainly found in workshops and very small plants, doing repairs or producing clothing, furniture, and household utensils of a simple nature. The few larger industrial establishments were of the type found in developing countries at an early stage in the process, namely, primary industries such as cement, food processing, spinning and weaving, iron founding, and elementary metal fabrication, such as fencing. Such subcontracting as existed consisted of sewing for the garment industry, supplying packaging and the like for the food processing industry, and providing simple metal products for truck bodies which were themselves locally fabricated. Even by 1952, only about 15 per cent of the labor force was engaged in industry, compared to some 20 per cent in agriculture and over 50 per cent in commerce and services.

The period, 1948 to 1952, was characterized by a giant leap in population, scarcity of goods, rationing, price and wage control, and government initiative in economic development. The growth in population, from 650,000 in 1948 to 1,500,000 in 1952, made the provision of employment a major objective of government policy. Despite the rapid growth in population, the total reached was still small, and this coupled with the inability to trade with neighboring countries made for a small local market. As a result of this, and because of the presence of artisans and owners of small workshops in the immigration of this period, the number of small establishments grew rapidly. During this period there were essentially no qualitative changes in the structure of industry. Accordingly, subcontracting practice changed little from the beginning of the period, as previously described.

ACCELERATED ECONOMIC GROWTH (1952 to 1962)

In this period the provision of employment for large numbers of immigrants continued to be a major objective of government policy. To achieve this objective industrial development was accelerated, emphasis being placed upon labor intensive industries. Great efforts were also made to fit the new immigrants, many of them with no previous industrial experience, for industrial work, by providing basic education and vocational training on a wide scale.

At the same time, pressure on the balance of trade because of the rapid increase in consumer demand and the lack of natural resources led to the encouragement of industries which could effect import substitution and thus foreign currency savings. Assembly plants for automobiles, refrigerators, and the like, were established in this period.

To provide a larger role for market forces to stimulate and direct economic activity, the government pursued a policy of gradually freeing the economy. The system of price control based upon cost plus was

abandoned and a greater measure of competition was introduced through some deliberate lowering of customs barriers. However, the infant industries which were being nurtured for import substitution and foreign currency savings were protected by the usual administrative measures and tariffs. In addition to the export of citrus and diamonds, the beginnings of industrial exports occurred in this period, mainly in clothing, tires, plywood, and processed food products.

As a result of the activities described above, the number of industrial establishments and the number of workers employed in industry grew rapidly. From 1952 to 1962 total employment in industry grew tenfold. At the same time the proportion of workers in industry increased from about 15 per cent to 26 per cent of the labor force while the proportion in agriculture declined from about 20 per cent to 11 per cent. As the relative importance of industry to the economy grew, attention began to be given to modern industrial techniques, such as cost accounting and work study.

As industrial development progressed new and more advanced types of subcontracting were attempted, principally by the industries which were involved in import substitution, such as assembly plants. This practice was stimulated by the government which would only give the right to assemble to a factory which would guarantee that a stipulated percentage of the total value of the product would be added locally. The economies of scale and of specialization would then in most cases cause the additional work to be given to subcontractors.

A different kind of subcontracting was evolved by entrepreneurs who saw market opportunities for a non-sophisticated type of product and became knowledgeable in product design and production techniques. These entrepreneurs preferred not to be burdened with their own production facilities and subcontracted production to small shops, providing raw materials, design, and supervision, and then exporting the finished product. This type of subcontracting occurred principally in the clothing industry and in some types of houseware manufacturing.

The efforts to use subcontracting for other than relatively primitive products ran into difficulties. There was a basic problem in communications, partly because the major contractor often did not know how to draw up specifications and tolerances, partly because the subcontractor sometimes could not read drawings. Another difficulty in communication stemmed from the poor understanding both parties had to metrology. The importance of calibrating measuring instruments against a higher order standard and maintaining that calibration by periodic checking was not really understood at this time. A classic example of the problems arising from poor or non-existent metrology occurred in the subcontracting of a simple hub pin for a bicycle. Although both parties were exceptionally well qualified industrialists in all other regards, their measuring instruments used on this pin were not calibrated to the same standards and the subcontractor's work was thought to be faulty.

In addition to problems of communication, the attempts to use subcontracting during this period ran into the basic problem of the technical and managerial competence of both the contractor and the subcontractor. The contractors did not know how to order, did not provide specifications, did not provide enough lead time, did not know how to control quality, and did not know how to test the subcontractors' output. Subcontractors in turn had difficulty in manufacturing to the tighter tolerance required and in controlling the level of quality generally. The inability of the subcontractor to manage his enterprise manifested itself in an inability to meet delivery dates. Most of the subcontractors had either been artisans or merchants before turning to industry and their backgrounds did not equip them for managing even a small industrial enterprise. Consequently their scheduling and control of production was faulty, leading to intolerable delays in delivery. A survey carried out by the Small Industry Advisory Center showed that only 12 per cent of metal working plant employing fewer than 50 workers were operating at a high level of quality and management, using equipment, measuring instruments, and operational systems which enabled them to manufacture sophisticated, precise products. Twenty-three

per cent of the plants could manufacture only less demanding products because of a lack of technical or managerial skills or equipment. The remaining 65 per cent of the shops surveyed were limited in their manufacturing capability to simple, non-demanding product types, using a limited range of material.

As a result of these difficulties, the larger producers attempted to remain independent of subcontractors, to the extent that this was possible technically and economically. A survey made in the second half of the 1950's showed that unsatisfactory quality and unreliable deliveries were the two principal reasons for attempting to avoid subcontracting. So strong was this feeling at that time that the large plants were even willing to carry out operations which they knew were not basically economical simply to control quality and to assure deliveries.

This attitude on the part of large plants led to the establishment of departments which were in essence workshops or small plants, duplicating facilities already in existence outside the plant. Although not desirable in itself on purely economic grounds, there was a certain amount of long term benefit in that the large plants were exposed to the full range of problems involved in the control and coordination of "subcontracting" in their own shops.

THE DRIVE TO EXPORT (1962 to 1966)

The growth in production capacity which took place in the 1950's and the limited size of the local market resulted in an intensification of the drive to export. The same industrial development absorbed the available labor supply so that additional industrial development required a switch to capital intensive industry. The government started a gradual relaxation of administrative controls and a lowering of tariffs protecting local production. The net effect of the exposure to imports and the need to export was to bring about a change in basic attitudes toward competition on the basis of quality and price. With these changes in attitude local

plants began to exhibit a concern for efficiency in a broad sense, in the rationalization of production, and in product policy and marketing.

The same concern for efficiency and rationalization led the government to believe that the production resources scattered among thousands of small enterprises could be more fully utilized both for local consumption and export through the use of subcontracting. To stimulate subcontracting government organized formal arrangements for putting potential subcontractors in touch with producers. In one of these schemes a special company was established which attempted to collect orders in foreign countries and to transmit them to local producers. Another scheme attempted by government in this period involved the organization of temporary syndicates of small plants in order to secure orders which would then be subcontracted among the members of the syndicate.

These attempts to stimulate subcontracting by superimposing administrative organizations on what was basically the small industry sector did not bring the desired results. In part this was due to the artificial approach taken and to the staffing of the organization by administrators without experience in industrial production or marketing. But in part the results were also due to the fact that the technical and managerial limitations of the small plants had not yet been overcome on a wide scale.

Although this paper is not supposed to deal with agriculture it may be of some value to cite an example of agricultural subcontracting in Israel which has been highly successful. Here individual small growers of specialty produce, such as strawberries and flowers, receive marketing instructions which ultimately derive from European cities, harvest, and deliver to the air terminal, often within a matter of hours. In attempting to derive some benefit for industrial subcontracting from this example, it should be noted first of all that for a long period of time government provided growers with an extensive network of research, training, and field services to draw upon. Secondly, as a result of this network of governmental activity, agricultural producers had by far and large solved their production problems and were looking for new markets. Thirdly, the

interest in agricultural subcontracting emanated from the agricultural producers themselves, following a lengthy process of evolution, so they were fully prepared to play the demanding role required of them. In contrast, the attempts to organize industrial subcontracting centrally did not emanate from the industrialists but were laid down from above, resulting in a formal organization lacking experience in manufacturing, marketing, and logistics. Given in addition that the technical and managerial foundation of small industry was not yet entirely in place and it is no wonder that the hoped for results were not achieved.

CONTRIBUTIONS OF INSTITUTIONS AND SERVICES TO SUBCONTRACTING

The problems and difficulties described in the preceding pages which limited the successful development of subcontracting are now gradually being overcome. The accumulation of experience within the industrial complex has contributed to a certain degree to the solution of these problems. However, the major contributions toward the successful growth of subcontracting have come from a wide variety of institutions, services, and activities which were not necessarily concerned directly with the subject. It is worthwhile at this point to mention some of these things and their major lines of contribution.

The Standards Institute which has primary responsibility for the establishment and acceptability of product standards and specification, has played a major role in the development of quality standards. The Institute provides testing services for materials and products.

A network of technical research and service institutes contributed to applied knowledge concerning materials and processes. Examples of the areas in which such institutes operate are fibres, metals, ceramics, and paints.

The establishment of industrial estates for small industry provided plant facilities for a concentration of small enterprises, together with

technical advice, exhibition rooms, and auxiliary services. In addition to the obvious benefits of well-designed facilities and services, the physical proximity of small industry in a housing estate itself contributes to the promotion of subcontracting ventures.

Organizations like the Export Institute and the Institute for Packaging and Product Design provided information on export markets and products. Among other activities, these institutes have established fashion centers and a center for the export of jewelry and handicrafts which have contributed towards the marketability of products of small enterprises.

The Bank for Artisans and Small Industry has made it possible for subcontractors to obtain financing on favorable terms. Government agencies dealing with small industry have also provided special financing for contractors and subcontractors engaged in export.

The Institute of Productivity provided consulting service and training courses for industry, among others, carried out surveys for individual establishments and economic branches, and did research in areas related to management and productivity. Recognition of the fact that the problems of small industry could not be dealt with efficiently within the same framework which contained the larger plants led to the establishment of the Small Industry Advisory Center. In addition to carrying out for small industry functions which parallel those of the Productivity Institute, the Center has an important role in developing technical understanding in areas such as metrology and in certifying the competency of suppliers. An activity of the Center which has contributed directly to subcontracting is the arranging of special meetings for managements of both large and small plants in order to clarify general problems and to air complaints concerning subcontracting.

A particular activity which was very significant was the establishment of a training program for procurement and purchasing agents of large industrial and marketing enterprises. By means of this training procurement people obtained a better concept of what is required by a

contractor to facilitate manufacturing by small subcontractors. A further development of the training activities was the emergence of the Association of Purchasing Agents which continues to seek ways and means of improving sources of supply and which furthers the establishment of product specifications.

THE BEGINNINGS OF SOPHISTICATION (1966 to the present)

The current period, which began with the close of the economic slowdown of 1965 - 1966, may be called "the opening to sophistication." By this time earlier attempts to compete in the export market had led to a change in outlook regarding product policy. Emphasis now shifted from simple, cheap product to products which demanded sophistication and precision, in design and in production. Examples of such product lines are fashion wear, custom electronics, and sophisticated metal products.

The use of subcontracting in this period has mushroomed. Part of this rapid growth is attributable to defense-related production, part to the growth of exports, and another part to the growth of a new kind of entrepreneurship. The "new entrepreneurs" have recognized market opportunities and have acquired production know-how regarding sophisticated products and have the organizational capacity to farm out subcontracts for parts and components. These entrepreneurs maintain supervision and control of manufacturing by the subcontractor, assemble the finished product themselves, and finally perform the marketing.

Subcontracting in Israel today is in a position to profit from the cumulative effect of a number of factors. First, as a result of their previous experiences in taking over the subcontracting function, large plants are now better able to communicate their requirements to subcontractors. Second, subcontractors have had their own experience to learn from and are now much more aware of the demands which they will have to satisfy in executing the subcontract. Third, the subcontractor today knows that in the event he is unable to cope with a problem there

are available to him a wide range of services from government sources.

These new conditions of subcontracting have been given formal expression in an arrangement by which large purchasers, such as the Defense Department, may require potential contractors and subcontractors to acquire certification by a professional institution, such as the Standards Institute or the Small Industry Advisory Center, that they are able to meet technical and managerial standards. The process of certification itself provides the opportunity to recommend corrective courses of action, both with regard to technical problems and managerial difficulties. Government agencies and banks also encourage the use of advisory services by industrial establishments as a condition for receiving financial assistance on favorable terms.

A current development of significance for the future is the growing use, on an informal basis, of the Small Industry Advisory Center as an information exchange. This has evolved naturally from the involvement of the Center with small plants and its consequent knowledge of the competencies and capacities for subcontracting. Plans are now being laid to establish an information exchange, formally, in the Small Industry Advisory Center.

CONCLUSIONS

In summarizing briefly Israel's experience with subcontracting, the following points stand out:

1. Industrial subcontracting in a developing country is not a simple matter. On the contrary, it is an extremely complex problem in logistics, management, and coordination. The successful practice of subcontracting demands sophisticated knowledge, professionalism in organization, production, and specification, and the ability to control a variety of diverse organizations, both technically and administratively.
2. The imposition of formal organizations, which have not grown out of the industrial environment they are attempting to direct, and which do not have the professional background required to understand

basic problems, will not contribute significantly to the growth of subcontracting.

3. The process of developing sound subcontracting, in addition to providing structural arrangements and economic incentives for both parties, must be based upon training and consultation. Government and public associations have an important role here in fostering the required services.

4. Large plants and marketing organizations, which constitute the large concentration of industrial purchasing power, also have an important role in the process. The motivation of the subcontractor and his training can best be stimulated by the prime contractor. It is therefore essential for government and for professional bodies to bring large plants to an understanding of their role in the process and to train their functionaries in the concepts and techniques required for the successful development of subcontracting capability.

5. The establishment of an "infra-structure" of institutions and services which contribute directly or indirectly to subcontracting is vital. Minimally, there should be institutions which would cover the areas of standards, of training, and of small industry advisory service.

6. Administrative arrangements to promote subcontracting should be introduced only after the infra-structure described in (5) already exists, and then provision should be made for their integration with these functional institutions.

7. Subcontracting exchanges should be established, again only after provision has been made for the infra-structure required and with tight integration into the network of technical and managerial services.

8. The government should stimulate subcontracting by activities which favorably affect the government, only some of which activities can be illustrated here. In providing economic incentive for the development of industry and the encouragement of investment, government can require a reasonable proportion of local production in the assembly,

manufacture, or processing of semi-finished foreign products. Government should encourage and reward by special economic conditions the initiative of individual entrepreneurs who create subcontracting opportunities in export. Government must take primary responsibility for establishing the network of institutions and services which contribute so greatly to the development of subcontracting.





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