outlays, there are few local manufacturers. Once a decision is taken to procure locally, the assembler's choice is limited to perhaps two or three firms, and it will be reluctant to antagonize them by not continuing orders. Thirdly, there are often considerable costs in changing suppliers, particularly as some purchasing departments are not well developed. The issue of search costs has already been referred to. In addition, there are numerous 'establishment costs' in developing new suppliers: engineers from the assembler have to inspect the supplier's plant and equipment and test the product; purchasing personnel have to reach agreement on procurement procedures; and reject rates in the initial batches can be high, owing to the supplier's lack of familiarity with new product specifications. For all these reasons, a continuous supply relationship says little about the strength of the relationship; in the Philippines it more likely implies reluctant acceptance.

5.1.4 Duration of the Contract

The duration of the individual supply contract is another possible indicator of the strength of the subcontracting relationship. It has been argued that one of the benefits of subcontracting may be that it obviates the need for the supplier to be actively involved on the marketing side, enabling him to concentrate on production. Here also there is little to suggest the presence of strong ties. Most contracts are on a batch basis, which specifies a time schedule over which the item is to be supplied. Some assemblers do go further and adopt a 'systems contract' which specifies likely requirements over the coming 12 to 18 months, and the share which the supplier may reasonably expect. Contracts generally run for

three to 12 months, six months being the most common. However, several assemblers, in an effort to reduce their investment in inventories, have been reducing contracts to as little as two months. Perhaps unexpectedly, many suppliers also prefer shortened contracts. This is because longer contracts specify fixed prices which, owing to frequent increases in the price of raw materials, may entail losses on the latter portion of the production contract. Assembler firms are generally prepared to negotiate a price increase, but this can be a lengthy process, and often suppliers cannot recoup the full effect of the cost increase.

Thus most current subcontracting relationships provide little long-term certainty for suppliers. It is true that continuing orders can be expected in most cases, but there is no guarantee about the volume of the order. Subcontracting in no way removes the marketing function of the supplier.

5.2 Inter-firm Linkages

The previous section argued that close, strong relationships are relatively rare. A second aspect of the relationship is the nature of inter-firm linkages, that is, do the assemblers play a positive role in assisting the supplier firms? This is an important issue because there is a general assumption in much of the discussion about subcontracting in developing countries that small-scale industry can be developed through its relationship with larger firms. Four main types of potential linkages may be identified.

5.2.1 Raw Materials

Provision of raw materials by the assembler can be of great assistance to supplier firms. Raw materials constitute a high percentage of the total cost of many parts and components (generally more than one-half). Their supply can be erratic in the Philippines because many have to be imported; moreover, import procedures are such that small firms are usually unable to import directly. Thus component manufacturers would benefit because less working capital would be required, there would be fewer interruptions owing to periodic shortages of raw materials, and less time would be taken in locating and ordering supplies. Much of the sub-contracting literature has argued that assemblers, also, would benefit. Assemblers ordering in bulk could obtain the raw materials cheaper than small firms owing to pecuniary economies of scale, and this would result in lower production costs.

In the face of these arguments, the results from our survey in Table 7 may appear surprising. Only two firms - 10 per cent of our sample - supplied raw materials on a substantial scale (defined as more than 20 per cent of purchase orders). Almost half the assemblers provided raw materials only in a very small proportion of orders. But assemblers do occasionally assist in locating raw materials. (See Table 10.) Most firms were reluctant to supply raw materials with purchase orders for several reasons: it would involve added administrative problems, when the purpose of subcontracting is to streamline operations and to concentrate on the core assembly process; problems of quality control may arise, since instances were cited of suppliers blaming rejects on defective raw

materials received through the assembler;[25] some firms mentioned the extra working capital which would be required.

Apart from the two firms actively providing raw materials, most assemblers were prepared to assist only in special circumstances. One case is when it is anticipated that supply problems or substantial price increases are likely to occur. Another is when reliable suppliers experience temporary financial difficulties or supply disruptions, and the assembler is anxious to continue ordering from the firm. Finally, several assemblers were importing some parts and components on a CKD basis, usually from the parent company or licensor, and having them assembled by a local firm (sometimes to give the impression of higher local content ratios).

Is the belief that assemblers should purchase the raw materials - to the benefit of both parties - mistaken? In some cases this is clearly true. Where assemblers use only small quantities of certain raw materials in their final product, and where they procure from specialist suppliers serving several firms (or even industries), the volume of their orders - and hence the scope for cost savings - will be less than that of the suppliers. More generally, however, the argument that cost savings are obtainable if the assembler is the buyer implicitly assumes the presence of market imperfections in the supply of raw materials. In perfectly competitive markets the returns to middlemen (raw materials traders) would not be expected to exceed the extra costs of the assemblers performing this additional distributive function. Market imperfections may well be present: in the case of certain imported raw materials there are only a small number of direct importers; and small supplier firms

may lack the information to obtain the cheapest raw materials. But there is no compelling theoretical reason for believing that the assemblers purchasing the raw materials directly will result in lower costs of production, even though this would of course assist supplier firms.

5.2.2 Finance

Small supplier firms invariably have difficulty obtaining loans at 'reasonable' rates of interest, especially for working capital. Subcontracting is seen by many as a solution to this problem because large assembler firms presumably have greater access to the formal credit market. These firms, it is argued, can ameliorate liquidity problems of small firms through the provision of raw materials and downpayments, or at least prompt payments for orders, and facilitate greater direct access to the formal credit market by acting as loan guarantors and referees, perhaps persuading banks to extend credit to a supplier on the basis of a purchase order (similar to the government plan mentioned earlier).

In practice, these forms of assistance are rarely provided. On the contrary, suppliers argue with some justification that they are financing the working capital requirements of the assemblers - the reverse of the argument above! Consider, first, provision of downpayments by assemblers (Table 8). These are very rare. Three-quarters of the firms provided then in very small or negligible quantities. And quite frequently the downpayment was for the supplier to buy only the mold or die to make the assembler's component, and hence did not constitute more general assistance. The two other main cases were if a long-established supplier, upon which the assembler was heavily dependent, was experiencing liquidity

problems, or if an assembler located a new, small supplier able to undercut the existing supplier but who lacked initial working capital. Even the two firms with aggressive procurement policies did not provide downpayments extensively.

But more important than the absence of downpayments is the actual payment record of assemblers. While cases of outright default were not discovered, contracts which provided for 30 day payment were never honored. The more frequent period was 90 to 120 days, in the case of some government firms up to one year[26] (and this is from the time the order has been processed and checked, which generally takes 15 to 30 days). If suppliers request payment on delivery or in 30 days, the assembler will usually discount the amount by between 1.8 and 2.5 per cent per month.[27] Frequent requests for immediate or downpayment are likely to result in the supplier firm being dropped. Assemblers also seem curiously reluctant to endorse or otherwise assist suppliers' application for credit from the banks. The problem here also may be attributed to the lack of exclusivity among suppliers.

Elastic payment schedules clearly benefit the assemblers, so much so that suppliers are often retained simply because they offer a 'good credit line'. And this is seen by some assemblers as the major benefit of subcontracting. While it adversely affects suppliers - none of the 12 subcontractor firms mentioned assemblers as a major source of finance - the impact may not be as harmful as appears at first sight. Quality, price and payment conditions are all interdependent. A slack relationship with regard to one of these variables has implications for the others. Assemblers are likely to adopt less strict quality control standards for suppliers who do not press for prompt payment. Similarly, all suppliers include an

assumption about delayed payment in their cost calculations, which partly compensates for the longer payment period. Nevertheless, it must be concluded that assemblers rarely give financial assistance, either direct or indirect, to suppliers, and that the reverse is more likely to be true. Thus another of the alleged benefits of subcontracting in developing countries is not operative in the Philippines.

5.2.3 Movement of Skilled Workers

The movement of skilled workers from the modern organized sector to small and medium firms can play a very positive role in the development of efficient, reliable subcontractors. Writing on an earlier period, Rosenberg (1976, P. 154) observed "the extent to which the transfer of technological skills ... was dependent upon the transfer of skilled personnel". A recent study of the scope for international subcontracting in several Asian countries also emphasized the significant impact of employees leaving foreign subsidiaries to establish, or manage, small supplier firms (APO, 1978). In Japan, also, senior trusted employees were encouraged to leave and establish (with assistance from the assembler) exclusive supplier firms (see the case studies by Ono and Odaka (1979), and Watanabe (1978)).

The benefits of such a practice to both parties are immediately apparent. The former employer has developed the necessary technical and, frequently, managerial expertise to operate a supplier firm. He will have developed a broad range of commercial and government contacts necessary for managing a small firm. He will also have a good understanding of the needs of assemblers, especially with regard to the need to maintain prompt

delivery schedules and acceptable quality standards. The assembler also stands to benefit through having a reliable former employee, with a good understanding of its operations, as its supplier.

It is very difficult to assess the magnitude of inter-firm transfers of personnel unless very detailed records of employees' employment histories are maintained. Even among the largest of firms, this is rarely the case, except for senior management positions. There are, in addition, many aspects to these labor transfers. It may be a case of a senior manager leaving to establish his own business in direct competition, or as a supplier, or simply moving to another firm. Similarly, middle-level management and below may transfer to a supplier company or another assembler, or become a suppliers themselves.

In our survey, it was not possible to obtain information on all these flows. We concentrate instead on just two aspects. First, how many cases are there of former employees becoming subcontractors of the assembler firm (exclusive or otherwise)? Table 9 indicates that it is not a common occurrence. In eight of the firms, there were no previous employees among their suppliers during the last two years - although five of these did report cases of unsuccessful attempts to establish supplier firms. In only one-quarter of the assembler firms, were four or more ex-employees among their suppliers, hardly a significant number when firms often have more than 50 suppliers. Moreover, the former employees generally established firms involving simple processes and technologies (eg, simple wood products, packaging and related operations, rewinding operations). Thus the cases of former employers supplying the assemblers

are relatively few, and they generally do not involve the diffusion of sophisticated technologies to small-scale industry.

The second aspect relates to the background of the owners and/or general manager of the 12 subcontracting firms interviewed, and here a more favorable picture emerges. Four of the owners had previously worked in automotive or appliance assembly firms (in positions of head of division or above), and two currently supplied the firms for which they had worked. But our sample of firms is too small to permit any generalization; moreover in three of the four cases the owners had worked in the automotive industry - though they now also supplied the appliance industry - and perhaps the movement of personnel has been more important in this industry.[28]

Why is it that movement of personnel, between assemblers and suppliers has apparently been rather limited? The first and obvious explanation is that the assembly sector and the process of backward integration are still in their infancy. The average age of the assembler firms is 15 years, but their manufacturing experience averages only 11 years.[29] Because there is nothing approximating the 'life-time system of employment' in Philippine firms, movement of personnel between firms is quite common. Indeed, the number of senior personnel with long experience in the industries is limited, they are often in short supply, and so they are likely to move to a more lucrative position with another supplier, rather than risk the uncertainly of establishing a new business. Middle-level management, especially technicians in the assemblers, are more likely to leave for well-paid positions in the Middle-East, than to set up their own business.

In any case most assemblers are ambivalent about the desirability of former employees becoming suppliers. First, there is the fear that they may eventually become rival assemblers. Secondly, because many firms have extensive in-house manufacturing capacity, they fear they may become rivals here also. Thirdly, there is the belief that they may know the company 'too well'. Most firms have confidential formulae for calculating 'acceptable' supplier prices and certain unwritten rules of conduct, regarding the extent to which they will tolerate erring suppliers (on quality and delivery schedules). Former employees, they feel, may be able to exploit their knowledge of the firm. Here again, the general absence of exclusivity is a problem, inasmuch as the employee could divulge information to a rival supplier. Nevertheless, not all assemblers adopt these negative attitudes. There are cases of employees being encouraged to establish supplier firms. And at the broader level, as the industries mature, the movement of skilled workers between firms is likely to become an increasingly important means of disseminating technology.

5.2.4 Technology

We adopt here a general definition of technology such as that of Strassmann (1968, P. 2), who argues that it "refers not only to tools, a stockpile of utensils, but to a kind of tool-using behaviour, a set of methods for making specific goods". In examining the process of technological diffusion, we are interested not only in the dissemination of machinery and products, but more importantly in the capacity to assimilate, operate and, where necessary, adopt the technology so as to be able to efficiently produce a given product, and to be able to innovate on the basis of the received techniques. In analysing the nature of technical

linkages between firms, a useful classification is that developed by Lall (1980, Pp. 217-218). He identifies 'low' linkages as being confined to communication of product specifications and to quality control assistance; 'medium' linkages refer to the joint development of product designs and assistance with production techniques, etc.; and 'high' linkages where the buyer modifies the design to suit the capabilities of suppliers. The latter category is not applicable to our analysis, because no instances were found of such linkages.[30] This may be compared with Lall's (1980, P. 218) finding that "technical linkages are extremely widespread ... and extremely strong for suppliers of all sizes with similar technologies".

There are a variety of ways in which assemblers may upgrade the technological capability of supplier firms. The movement of skilled labor between firms has already been referred to. A second possibility is to encourage the establishment of a supplier, or at least to provide machinery. Lall (1980, P. 214) reported that almost half the supplier firms interviewed in his survey (16 out of 36) owed their existence to an assembler. The Philippine experience is quite different. In the early years of the ELCP, some firms either established or assisted in the establishment of suppliers, if they were dissatisfied with existing suppliers but were not permitted to in-house the item. There are also the sister companies, although their record of performance is generally very poor. These and a few other isolated examples are very small in aggregate. Provision of or assistance in obtaining machinery is only slightly more common, apart from the case of dies and molds. Here also, this occurred in the early years of the ELCP, but much less so now. Elsewhere it occurs occasionally, generally in the case of an important but fairly small supplier who is not also

supplying the assembler's competitors.

Thirdly, all assemblers provide blueprints and, if necessary, samples. This is a necessity and could hardly be termed assistance, especially because the design of the item may be firm-specific. There may, however, be some initial technological spin-off if instructions or demonstrations accompany the blueprint, such that new processes or materials are discovered.

The fourth means of assistance, through improved quality control, is probably the most important for suppliers. Assemblers generally supervise and monitor suppliers only during the initial stages of the relationship, or if there is a sudden deterioration in quality. Upon initial acceptance of suppliers, engineers from the assembler inspect the plant, pinpointing any obvious areas of deficiency in plant design and layout of the production process. It is then usual to make follow-up visits in the next few months. Consequently assemblers reported quite frequent cases of substantial reductions in rejection rates, often through the introduction of relatively simple quality control procedures. Similarly, owing to the costs of switching between suppliers, assemblers are usually prepared to assist in resolving quality and production problems encountered by established suppliers, unless they are considered to be inherent in the firm's operations.[31] Suppliers clearly benefit from quality control supervision because in the process wide-ranging technical (and even managerial) advice may be given. Moreover, if they are supplying firms whose quality control standards are very strict and who closely monitor suppliers, their reputation is enhanced and other assemblers seek them out. On the other hand, firms supplying less strict assemblers and

experiencing no major quality problems may receive a plant visit from the assembler once a year or even less.

A final form of assistance is training of management and workers in supplier firms. This is almost entirely absent, apart from that which arises informally and coincidentally during plant visits. Assemblers usually arrange for annual or biannual meetings with suppliers, involving factory tours, discussion of production plans, introduction of new products, etc. But more substantial training courses on technical or managerial aspects are never conducted for owners of supplier firms, much less their senior employees.

The conclusion that emerges from the assemblers' side is that technical linkages are weak and sporadic. How do suppliers view the relationship? Our small survey of subcontractors and the more substantial investigations by Tolentino and Ybañez (1980) and Watanabe (1979) strongly reinforce this conclusion. Suppliers generally adopted a negative attitude regarding assistance from assemblers: in the words of one, "the only assistance I receive is the order". There were complaints that factory inspections by the assembler designed to assist them were in reality a means by which the assembler ascertained the necessary know-how for in-house manufacture. There were also complaints of 'grease money' being necessary to secure orders from the large assemblers, although this practice is probably not widespread. Finally, some suppliers argued that assemblers were willing to place orders, production of which involved the acquisition of expensive machinery, but that no guarantee of reorder beyond the first three or six months would be given.

The significance of assistance from assemblers can be seen in better perspective by examining Table 10 and the Appendix table.[32] Several important findings emerge from these tables. The resources of the owner of the supplier firm constitute the single most important source of technical know-how. This is very apparent from our survey, and would be so in the Appendix table if this source had been included in Watanabe's survey. The success of these firms, more than anything else, depends essentially on the experience and skill of the owner. The assembler appears to play a significant role, judging by the totals, but in both tables more than half the assistance is rendered in the form of product design or new product development, which is a necessity for the assembler. The only other area where significant assistance is rendered is that of quality control, confirming our discussion above. In all other areas, especially training of workers, managerial guidance, and layout and installation of equipment, the role of the assembler is minimal.

Before leaving our analysis of technical linkages, it should be noted that their strength varies between firms and appears to be depend on at least three variables. First the number of suppliers in the industry. Where there are relatively few, and alternatives cannot easily be developed, assemblers are forced to develop a closer relationship with the supplier.[33] Secondly, linkages are generally weaker in the case of suppliers producing goods of dissimilar technology (for example, tires and batteries for motor cycles), mainly because specialist knowledge is required which the assembler does not possess. Thirdly, linkages are usually stronger for smaller suppliers. This is because these firms generally require greater assistance initially, and because the assembler

is more willing to assist owing to the fact that they are less likely to be also supplying rival assemblers.

6. Conclusions and Some Policy Considerations

6.1 Conclusions

The distinction between local content, local procurement and subcontracting relationships is important. Notwithstanding marked variations among industries, our study has shown that local content and local procurement are increasing, but that subcontracting relationships are generally shallow and linkages between assemblers and suppliers very weak. In section 4 the main factors impinging on the choice between make, buy (locally) and import were analysed. It is clear that increased localization, more particularly increased local procurement, has not led to any commensurate strengthening of inter-firm linkages. Why is it that strong relationships have not developed in the Philippines as they have in Japan and, to a lesser extent, India?

The main reasons are implicit in our analysis of the previous sections, so our explanation will be brief. First, and most important, has been the absence of a concerted, consistent government push towards localization and local procurement. Government policies have been frequently revised, implementation has not always been consistent, and different arms of the government often pursue conflicting policy objectives. Moreover, initial attempts at localization provided a strong incentive for in-house manufacture.[34] Secondly, small market size and excessive market fragmentation have been important factors. These two factors make local

manufacture of many parts and components uneconomic. In particular, they reduce the scope for developing exclusive relationships. As we argued above, lack of exclusivity is an important constraint on assemblers developing their supplier firms because they cannot internalize the full benefits of their investment. A third factor is the alleged individualistic behaviour of Filipino businessmen, and their belief that the Japanese system is 'feudalistic'. Watanabe (1978), for example, questions the extent to which the Japanese system of closely-knit, enduring relationships is transferable to developing Asian countries, particularly to those whose business communities have serious ethnic devisions (but the latter is less marked in the Philippines than Indonesia or Malaysia). In her study of the Taiwanese metalworking industry, Amsden (1977) also alludes to this behavior as an impediment to close relationships.[35] It is very difficult to assess the impact of this factor. However, the fact that close relationships do exist in other areas of Philippine business activity suggests that its importance may have been overstated. Finally, the manufacturing experience of the Philippines is still very limited. The process of backward integration began in earnest only in the early 1970s. To cite Stigler (1951) once again, vertical disintegration and the development of a reliable network of suppliers are lengthy processes, especially when supplier industries are underdeveloped.

6.2 Some Policy Considerations

Should governments promote localization and subcontracting programs? Why not 'leave it up to the market' and let subcontracting networks develop as firms require them? The propensity for governments to distort the allocation of resources is well documented, and administrative

feasibility must be a major consideration in policy formulation. Nevertheless, the experience of countries which have developed strong and efficient supplier industries - Japan, Taiwan, South Korea and India - suggests that some initial government stimulus is required. For example, from her study of the Taiwanese machine tool industry, Amsden (1977, P. 230) concludes that

> "in the absence of exceedingly rapid capital accumulation, opportunities for sales to other developing countries, and fortuitous breaks, the production of general-purpose machine tools, if left to the free market, may proceed as slowly and erratically as it did in Taiwan prior to the late 1960s".

Similarly, in Japan, widely regarded as the most successful exponent of subcontracting, government encouragement was important in the early stages of industrialization. Odaka (1980, Pp. 19-20) reports that during the inter-war years the Toyota Motor Company dropped its original idea to subcontract wherever possible because of the poor performance of its suppliers. Indeed, Watanabe (1971, P. 66) observes that many of the problems initially encountered by Japanese assemblers in the 1930s - slow delivery, high costs and poor quality - are precisely the problems currently besetting assemblers in developing countries. The evidence from these and other studies suggests a positive government role in developing supplier industries is required, especially as most governments have tended to develop the final (that is, assembly) industries first. The issue then becomes, what is the appropriate nature of public intervention?

Based on his examination of the first two decades of import-substituting industrialization in the Philippines, Baldwin (1975, P. 152) states the issue succinctly:

> "The easy days of import substitution are over ... Trying to force the domestic production of manufactured intermediates and capital goods in the manner used to achieve local production of simply processed consumer goods is likely to prove self-defeating ... What is needed is a more realistic policy of development that does not aim at the establishment of a completely integrated industrial structure in the not-too-distant future ...".

Nearly a decade after the period examined by Baldwin, there is a very real danger that the government may push for an across-the-board policy of backward integration in all the automotive and appliance industries, regardless of the cost. What is required is much greater selectivity in the localization drive. In what industries and products does Philippine comparative advantage lie? Or, alternatively, in what activities are the 'Baranson curves',[36] which depict the relationship between the relative cost of production and the level of local content, likely to be flatter? The answers to these questions are beyond the scope of the present study, because they can be ascertained only by a series of disaggregated industry and product studies of the type undertaken by the recent Industrial Promotion Policies Project in the Philippines (Bautista, Power and Associates, 1979).

Some broad guidelines do emerge from our study, however. Currently the Philippine automotive and appliance industries comprise high cost, low volume producers who are generally not internationally competitive. Even though rising incomes and the spread of rural electrification will contribute to a rapidly expanding domestic market for some products, the economies of scale in the production of several key parts and components dictate that their local production will be economically feasible only if a significant proportion of the output is exported. For the domestic

market, industry rationalization and the choice of products will be crucial in promoting greater localization. The implications of the small market, characterized by a huge proliferation of firms and models and a lack of standardization, have already been referred to. In the case of products selected for localization, the process will be greatly facilitated by choosing those whose design is not undergoing rapid change, and which do not require highly sophisticated technology in the manufacture of their parts and components (these points are developed by Pack, 1980). The foregoing considerations suggest that, for the products included in our survey, refrigerators, stoves, fans and perhaps motor cycles and sewing machines might be sensible industries in which to focus a further push towards greater backward integration, but that audio-visual products and air conditioners may not be. But this is purely an hypothesis, which requires case-to-case empirical investigation.

In the implementation of localization programs, another important policy consideration arises: should governments simply require greater local content, or should they go further and specify that it be achieved through local procurement (as distinct from in-house manufacture)? As we have seen, the Philippines broadly has adopted the former course whereas India and Japan (in an earlier period) the latter. A related issue concerns the means by which it is achieved, whether by imposing a minimum local content ratio, or by listing the parts and components to be produced locally. The former permits greater flexibility for the assemblers, but it is open to abuse through price manipulations. Moreover, the latter method has the advantage that it is more systematic, and that local suppliers can develop, secure in the knowledge that all

assemblers will be sourcing locally.

Whether governments should aim specifically to foster subcontracting networks is a complex issue. Governments such as in India, which give a high priority to developing small-scale industry, naturally find this an attractive policy. Conversely, there is a danger, perhaps based on a misunderstanding of the remarkable Japanese successes, in the indiscriminate adoption of forced subcontracting policies.[37] There appear to have been special factors underlying the Japanese model, such that it may not be easily duplicated in developing countries (see, for example, Watanabe, 1979, Pp. 63-66). Policies which enforce subcontracting, but do little else to upgrade suppliers, in effect both over and under-protect these firms: over-protect in the sense that assemblers are forced to buy from one or a small number of suppliers; under-protect in that direct steps are not taken to improve their technical and managerial competence. Rather than simply promote subcontracting, localization programs should be undertaken in conjunction with (or preferably subsequent to) programs which develop supplier industries for both the local and overseas markets. Subcontracting may be a component of the overall policies, but it should not be the central one; a concerted drive to upgrade suppliers is far more important. The ability and willingness of assemblers to upgrade supplier firms - especially in the context of small domestic markets - is rather limited. Often they themselves lack extensive technological know-how.

There are, in addition, a number of more specific issues which need to be addressed. The first of these is standardization, a critical

issue in the context of a small, fragmented market. In the words of one respondent (an assembler), "it is extremely difficult to achieve, but absolutely essential". Failure to achieve greater standardization will result in continuing high costs of production and will frustrate attempts at increased localization. Historical studies have alluded to its key role, but also emphasized that it is a lengthy process (for example, see Rosenberg, 1976 P. 157 ff). In the Philippines, where virtually every product design is imported, from countries with large markets for which standardization is not such an important issue, the process is likely to be still more complicated. Most assemblers have an ambivalent attitude, conceding the longer-run benefits, but pointing to the problem of obtaining overseas approval for design modification and to the implementation difficulties. Two points need to be stressed: there is generally no technical impediment to achieving greater standardization; and it is essential that the government moves cautiously in the area, making a thorough examination of the options available. Apart from the difficulty of obtaining approval from the foriegn partner or licensor, the main issues are does the government have the resources to implement such a program, and what (or whose) standards will be adopted? Each assembler will be required to make some modification, and those which have to make the greatest will oppose the scheme. Ultimately a package will have to be developed, perhaps involving incentives during a transition period. Here, also, there will be differences among industries. It would be easier to implement for motor cycles (at least the three 2-stroke manufacturers), where some progress has already been made, than audio-visual products and air conditioners, which have more proprietory parts and greater design differences.

A second issue is what role export-processing zones (EPZs) may play as future suppliers of the domestic industry. EPZs have become an important part of Philippine manufacturing in the 1970s. Two firms in our survey, establishing factories to manufacture parts and components in EPZs, were permitted to use a proportion of their output in their local assembly operations. But this practice is not widespread. There are frequently differences in specifications, and EPZ factories operate on such a volume that they are generally not interested in servicing small orders for the local market. Moreover, it is difficult and time-consuming to obtain permission to source from EPZ manufactures. Clearly, if the government were to permit it more frequently, it would be tantamount to scrapping its protectionist policies towards assemblers and suppliers.

A third issue which requires investigation is the precise reasons for the Philippines inability to compete internationally in these products. As already indicated, the industry has largely performed an import-substituting role, but the small domestic market hampers efforts towards greater localization. The general reasons for lack of competitiveness are well known - the high cost of certain raw materials, uneconomic production volumes, variable quality, poor infrastructure and excessive government regulation, and low labor productivity. But it is not known which of the factors are the more important, and whether they vary between industries. A series of in-depth case studies, comparing the cost structures of Philippine and (for example) Taiwanese firms making similar products, would be very illuminating.

Finally, this paper has focused solely on domestic subcontracting problems and prospects. International subcontracting is at least as

significant, for low wage countries like the Philippines which have developed EPZs. Both types of subcontracting raise some common policy issues, particularly in attempts to maximize the technological and other 'spin-offs' for domestic suppliers. But international subcontracting also raises a number of issues regarding the terms and conditions under which foreign firms are established, and these have not been discussed in this paper.[38]

Table 1: Production of Selected Products, 1973-1980[a]

Product	Year							
	1973	1974	1975	1976	1977	1978	1979	1980
Sewing Machines								90,000
Air Conditioners			30,000	30,000	36,000	43,000	53,000	45,000
Television Sets[b]	85,000	100,000	107,314	130,191	162,006	180,105	205,074	232,000
Audio Units	38,000	44,000	35,134	39,231	50,142	53,620	40,026	33,000
Electric Fans								500,000
Refrigerators			67,000	77,000	110,000	136,000	162,000	180,000
Gas Stoves								65,000
Motor Cycles		29,075	29,220	31,028	42,188	51,741	49,071	45,054

Source: Ministry of Industry, Trade and Investment, and Manufacturers' Associations.

Notes: a Figures refer to domestic sales of all manufacturers.
Blanks indicate production data not available.
Data rounded to '000 are approximate.

b Includes color and black and white. Color sets comprise about 5 per cent of output.

Table 2: Prescribed and Actual Local Content in the Motorcycle Industry, 1973-1981

Year	Local Content[a] (%)	
	Prescribed	Actual
1973	10	12
1974	20	25
1975	30	33
1976	40	45
1977	50	46
1978	50	52
1979	50	54
1980	50	55
1981	50	-

Source: Ministry of Industry, Trade and Investment.

Note: a Using the Ministry's deletion method. Actual figures represent a weighted average for the four manufacturers.

Table 3: List of Components for Local Production, ELCP Program Years 1 and 2

1. Printed circuit board;
2. Coils and transformers;
3. Cabinets and loudspeaker enclosures;
4. Chassis and other sheet metal ware attached to the chassis and forming part thereof;
5. Cabinet and chasses accessories; decorative trims, speaker grilles, nameplates, emblems, dials, knobs, backcovers, CRT cups, masks, grille cloth, escutcheons frames, fronts, control panel assemblies, bezels, sliding door railings, guides, lug-type terminal strips;
6. Monochrome TV picture tubes;
7. Loudspeakers;
8. Antenna;
9. Single conductor hook-up wires (pre-cut and/or pre-trimmed) and power cords;
10. Solder;
11. Plastic brackets and supports;
12. Packaging materials;
13. Mechanical TV tuners, AM, FM and FM/AM tuners.

Table 4: Effective Rates of Protection in the Mechanical Engineering Sector, Selected Products, 1974

	EPR
1. Consumer Products	
Household radio, TV sets, phones and supplies	204
Refrigeration and air conditioning equipment	195
Other household electrical appliances and wares	103
Motor cycle, bicycles and parts	52
Unweighted average	(139)
2. Intermediate Inputs	
Basic ferrous metal products	27
Basic nonferrous metal industries	0
Stamped coated and engraved metal products	38
Fabricated wire products	14
Electrical wires and wiring devices	51
Unweighted average	(42)

Source: Tan, 1979, Pp. 139-143.

Table 5: Sourcing of Parts and Components by Value (%)[a]

roduct	Number of Firms in Survey (1)	Survey Firms' Share of Total Domestic Output in 1980 (2)	Sourcing: Imports (3)	Sourcing: In-house Manufacture (4)	Sourcing: Local Procurement (5)	Sourcing: Local Content (6)	Coefficients of Varia: Imports (7)	Coefficients of Varia: Local Procureme (8)
ng Machine	2	70	36	49	15	64	14.6	7.2
Conditioners	5	77	56	24	20	44	11.6	44.4
vision - Color	4	84	87	7	6	13	6.2	72.7
vision - Black and White	10		36	26	38	64	30.6	50.8
o[b]	5	75	62	14	24	38	12.5	40.1
tric Fans	3	85	13	55	32	87	43.6	39.7
rigerators[c]	4	90	24	46	30	76	67.2	47.1
Stoves	4	85	21	47	32	79	90.8	85.6
r Cycles	3	60	53	12	35	47	8.3	7.6

urce: Firm Survey

tes: a The sourcing percentages are unweighted averages.

b Radios, stereo sets and casette decks.

c Includes small quantities of commercial drink coolers and freezers.

Table 6: Number of Parts and Components for Which Assembler Firms Regularly Have Only One Supplier

Number of Parts of Components for which only 1 supplier	< 2	2 - 4	5 - 8	> 8
Number of Assembler Firms	7	6	5	2

Source: Firm Survey.

Table 7: Provision of Raw Materials by Contractor Firms

Percentage of Purchase Orders for which Contractor Firm provided Raw Materials in 1980	Negligible (< 1%)	Very Small (1-5%)	Small (6-10%)	Significant (11-20%)	Substantial (> 20%)
Number of Firms	4	5	6	3	2

Source: Firm Survey.

Table 8: Provision of Down-Payment by Contractor Firms

Percentage of Purchase Orders for which Contractor Firm provided Down-Payment in 1980	Negligible < 1%	Very Small 1-5%	Small 6-10%	Significant 11-20%	Substantial > 20%
Number of Firms	9	6	3	2	-

Source: Firm Survey.

Table 9: Former Employees Supplying Contractor Firm[a]

Number of Former Employees who have supplied the contractor firm in the last 2 years	0	1	2	3	4	5
Number of Firms	8	5	1	1	4	1

Source: Firm Survey.

Note: a Average number of employees (excluding sales and distribution staff) in the 20 contractor firms was 345 in January 1981.
Average age of the firms was 15 years, but as assemblers and manufacturers only 11 years.

Table 10: Main Sources of Technical Assistance for Subcontracting Firms

Source of Assistance	Type of Assistance[a]								
	1.Product Design	2.Quality Control	3.Choice of Equipment	4.Worker Training	5.Layout and use of Machinery	6.Maintenance	7.Management	8.Locating Raw Materials	Total
Assembler Firm	12	5[b]	1					5[b]	23
Research Institute or Government Agency[c]	1[b]	2		3				1[b]	7
Books, Manuals, Newspapers, etc.	2	2	7		4	5		1[b]	21
Machinery Suppliers			8		2	2		1[b]	13
Know how of Owner	1	8	6	12	11	10	12	10	70

Source: Firm Survey (12 Subcontractors).

Notes: a In some cases firms listed more than one source of assistance.

b Not on a regular basis in most cases.

c In all cases, the MIRDC.

Appendix: Sources of Information, Advice and Assistance for Firms Supplying the Automotive Industry

Major Source	Type of Information, etc.							
	Design of Product	New Product Development	Quality Control	Processing Technology	Choice and Aquisition of Equip-ment[a]	Layout and Installation of Equip-ment	Managerial Guidance	Training of Workers
1. Parent firm/Assembler[b]	152	62	63	54	27	16	20	19
2. Equipment supplier	5	5	1	14	31	19	-	5
3. Raw materials supplier	6	9	4	13	7	1	-	-
4. Private Consultant or Consulting firm	7	2	3	6	4	8	8	7
5. Government Agency/ Research Institute	2	9	14	7	-	1	3	9
6. Industry and Trade Associations	5	3	1	4	4	3	4	6
7. Books, technical journals etc.	26	20	3	35	22	7	6	2
8. Own experience[c]	25	31	44	43	43	44	47	48
9. Other[d]	3	2	-	9	4	1	3	2

Source: Tolentino and Ybañez (1980, Table 5.20) and Watanabe (1979, Table 17).

Notes: a Tolentino and Ybañez (T-Y) further divide this into Choice of Equipment and Acquisition of Equipment. The T-Y totals for this column are averages of these two.

b Watanabe (w) includes here (i) car assemblers, (ii) other 'parent firms', (iii) other customers, and (iv) foreign 'mother firms' or licensors.

c W refers only to external assistance, so data in this row are just from T-Y.

d Includes friends, relatives and associates for T-Y, and trade fairs for W.

Footnotes

1. This is a preliminary report on fieldwork conducted by the author in Metro Manila from March to July 1981. A second paper, incorporating a more detailed analysis of the survey data in the context of the literature on vertical integration, is in preparation. Grateful acknowledgement is made here to the managers of firms who kindly completed a questionnaire and with whom the author conducted detailed discussions. For assistance in this research, the author also wishes to thank Mr. Quintin G. Tan, Director, Bureau of Small and Medium Industries, and Mr. Ramon S. Yazon, Officer-in-Charge, Manufacturers Subcontracting Development Office.

2. For comprehensive analyses of Philippine industrialization see Bautista, Power and Associates (1979), Baldwin (1975), and Power and Sicat (1971).

3. There is no single satisfactory term for each group of firms. For firms which produce final products, we use the terms 'assembler' or 'contractor' because their primary function is to assemble the many parts and components in the final product, some of which are obtained from (contracted out to) supplier firms. For firms which produce the parts and components, we use the terms 'manufacturer' or 'subcontractor', because they are engaged mainly in the manufacture of intermediate goods ordered by the assemblers. In practice, the distinction between the two groups is not always clear, because the assemblers manufacture some of their required parts and components. Ishikawa and Odaka (1979) and Odaka (1980) adopt the terms 'parent' and 'ancillary' firms,

perhaps suggesting a stronger relationship than that implicit in our terms.

4. Excellent discussions of the Japanese experience include Ono and Odaka (1979), and Watanabe (1978, 1970).

5. Watanabe (1970) argues that these first two factors were prime considerations in the case of Japan.

6. The television industry is a good case in point. The Philippines was the first Asian country to introduce television, in 1953. There were some moves to encourage local manufacture in the 1960s, but the first major steps were taken in 1975 with the introduction of the Electronic Local Content Program (Lee, 1979, Pp. 45-53). The ELCP will be examined shortly.

7. This has also affected color television sets. Industry sources estimate that approximately 55,000 of the 70,000 new sets purchased annually are either smuggled or brought in by Filipinos returning from abroad.

8. For example, compare the figures in Table 1 with production statistics for Indonesia in 1980-81 (in thousands):

sewing machines	525.4
motor cycles	409.9
radios	1,100
television sets	730

9. Three categories were delineated, as follows:

Category	Definition	Sales Tax
Integrated	≥80% of total quantity of P&C, made locally	7%
Non-Integrated	≥50% of total quantity of P&C, made locally	15%
Other		30%

10. A third program has been introduced for trucks, the PTMP.

11. One additional, highly controversial exemption should also be noted. Recently, the BOI permitted the establishment, under LOI 640, of a television assembly plant which is exempt from all tariffs and taxes. Its influential owners have been charged with the provision of cheap 12 inch television sets for the dissemination of news and information "for in-school and out-of-school youths in rural and depressed areas". Accounting for about 10 per cent of domestic sales and with price well below the other manufacturers, the firm has aroused considerable controversy because its sets are readily for sale in Metro Manila (see supplements on the Appliance Industry in Business Day, 13 November 1980 and Evening Post, 28 October 1980).

12. Some of the items in Table 4 are not sufficiently disaggregated for our purposes. For example, 'motor cycles' apparently also includes motor cycle parts and components.

13. The significance of this price disadvantage becomes apparent when it is realized that raw materials typically constitute 60-65 per cent of the costs of production of metalwork shops.

14. The list includes Medium and Small Industries Coordination Program (MASICAP), Small Business Advisory Centers (SBAC), both essentially

extension services; Metals Industry Research and Development Center (MIRDC), Design Center of the Philippines (DCP), Technology Resources Center (TRC), Technology Development Center (TDC), all having a technology, training and dissemination function; Development Academy of the Philippines (DAP), University of the Philippines Institute of Small-Scale Industries (UP ISSI), which run training programs. Doubtless there are other bodies. In addition, there are numerous industry-specific units, such as the Philippine Textile Research Institute (PTRI).

15. Amsden (1977, P. 222) found this to be the case in Taiwan in the early 1970s.

16. Notable exceptions, some already referred to, include Culliton (1942), Ishikawa and Odaka (1979), Lall (1980), Stigler (1951) and Watanabe (1978).

17. In the case of air conditioners and refrigerators the import figure for the industry may be lower than that in Table 5. For air conditioners this is because one firm not included in our survey has a higher local content figure than the industry as a whole. The case of refrigerators is explained by the fact that the sourcing percentages are unweighted and the largest producer has achieved a higher local content.

18. Economic efficiency may be measured by calculating, for example, the Domestic Resource Cost (DRC) of local manufacture. A recent study of a related industry in which a localization program has been introduced (automobiles) concluded that "the industry, broadly

speaking, is an economically inefficient saver of foreign exchange" (Sta. Romana, 1979, P. 332).

19. In addition, of course, there are the practical problems of administering localization programs, ensuring compliance with regulations, and the adoption of appropriate formulae to determine local content ratios. (These were discussed in Section 3.)

20. Although Stigler was discussing industries, elements of his analysis (familiarity with suppliers, etc) may also be applicable to firms.

21. There is an analogy here with the growing literature which argues that one reason firms adopt inappropriate technologies is ignorance of alternative techniques and the search costs in obtaining the necessary information. (See, for example, Lecraw, 1979.)

22. A useful recent survey of the Philippine metalworking industry, appraising it in particular with regard to the scope for international subcontracting, is FGU Kronberg (1981).

23. Even in the latter case, however, some firms resort to the drastic action of deliberately switching suppliers every six months or so, regardless of the supplier's performance, and transferring the mold or die to another firm.

24. Another exclusive supplier was an independent firm in name only and in reality was part of the assembler. The formal separation had occurred to keep the firm's workforce below 500. Firms in the Philippines employing more than 500 workers are required to invest in rice production.

25. Other malpractices were also alleged, including the supplier substituting inferior quality raw materials for those supplied.

26. The tight financial conditions through 1980-81 may have exacerbated this problem, but not significantly. Earlier surveys by Tolentino and Ybañez (1980) and Watanabe (1979) both report similar payment periods.

27. The terms of payment of assemblers are such that several firms, when asked what financial assistance they had given to suppliers, mentioned the payment of post-dated checks, the benefit being that suppliers could cash the checks at a slightly lower discount rate than current interest rates outside the formal sector!

28. The studies by Tolentino and Ybañez (1980) and Watanabe (1979) on subcontracting in the Philippine automotive industry provide information on the background of the supplier firms, but not unfortunately on the firms' owners.

29. These would be lower still if the two oldest firms in our sample were removed, one establishing in 1935, the other in 1953.

30. However, the nature of the local market is such that technologically less complex products are required (for example, the demand for automatic 'zigzag' sewing machines - common in developed countries - is very limited in the Philippines). In a related industry, automobiles, Baranson (1969, P. 24) observed that little modification is made to product design because of the expense involved. Nevertheless, at least one automobile producer in the Philippines introduced a scaled-down production technique, although primarily because of the

economics of small-scale production, rather than for the benefit of suppliers (APO, 1978, P. 57).

31. Several assemblers even placed an employee in a key supplier firm, to supervise quality control.

32. The data from the two surveys in the Appendix table are not strictly additive because Watanabe's sample was larger and apparently included a greater incidence of multiple response by suppliers. Thus it tends to 'swamp' the findings of Tolentino and Ybañez. Moreover the importance of 'own experience' is understated because Watanabe considered only external sources. Tolentino and Ybañez found this to be the most important source in all cases except the design of the product. A similar finding would probably have applied if Watanabe had adopted the same questionnaire.

33. Indeed from our small survey of subcontractors, the successful firms seemed to be those whose owners carefully examined parts and components currently being imported, and chose to develop those which could be economically manufactured locally, but which few other suppliers would be prepared to attempt.

34. There is also the more general point we raised and which is argued strongly by Pack (1980), Watanabe (1970) and others, that excessively favorable treatment of the modern sector at the expense of small-scale firms imparts a strong bias against local procurement.

35. A broader related issue is the alleged short time horizon of businessmen who, it is argued, seize the opportunity for making quick short-term profits, rather than establishing a longer-term stable

relationship. One manifestation of this may be the reported preference of suppliers for the spare parts market, where quality standards are lower (on this, see APO (1978) and Tolentino and Ybañez (1980)).

36. Based on Baranson's (1969) study of the automotive industry, and subsequently extended by Ishikawa and Odaka (1979).

37. For example, in recent years the Indonesian government has been promoting the so-called Bapak Angat policy, whereby state enterprises and other firms would render financial and technical assistance to local small firms. No evaluation of the scheme is available but at least in the case of state enterprises there is little in their past record to suggest that they would be capable of rendering substantial assistance.

38. For a discussion of these, see APO (1978) and Sharpston (1975).

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