Small Enterprises in African Development:
A Survey

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SMALL ENTERPRISES IN AFRICAN DEVELOPMENT: A SURVEY

This essay reviews evidence concerning the structure and performance of small scale enterprises in Africa. Small and artisanal firms, employing between 1 and 50 workers, are uniformly the largest employers in the manufacturing sector of African economies, and there is striking similarity across countries in the types of industries dominated by small enterprises. Data from several microeconomic surveys are used to examine the relationship between firm size, choice of technique and technical efficiency. Studies of factor markets indicate that substantial variations exist in relative factor prices faced by different size classes of firms within individual economies and that smaller firms apparently experience substantially higher opportunity costs of capital. The role of small firms in providing entrepreneurial training and development is also examined. The survey concludes with a review of the policy environment confronted by small enterprises in several African countries.

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INTRODUCTION

Recent concern for the problems of employment creation and income distribution in less developed countries has revived interest in the role of small scale enterprises in the process of economic development. High and rising rates of urban unemployment pose major hardships for many developing countries, but despite substantial growth of output in modern, formal sector industrial activities the rate of employment creation has failed to keep pace with the rate of increase of the urban population. The industrial sectors of many LDC's--particularly in Africa--are largely dependent upon public policies which provide substantial subsidies to import competing firms and which make capital funds available at low or negative real rates of interest. Such policies have contributed to biases in the choice of technique and product which have encouraged the proliferation of capital intensive manufacturing processes. Capital-labor ratios for industrial investments in LDC's frequently exceed $15,000 per worker (Morawetz, 1974). Although the potential for employment creation in the formal sector can be increased by higher rates of capital formation and by restructuring incentives to encourage more labor intensive techniques of production, the scope for generating major increases in industrial employment in large scale manufacturing remains limited.

Within the urban economies of many LDC's, however, another sector has developed without the active encouragement of public authorities, and frequently with their disapproval. This sector--identified as "informal" or intermediate--is characterized by very small scale manufacturing and service activities, whose products and methods of production differ greatly from those encountered in the modern sector. These small enterprises, vehicle repair, metal and woodworking, clothing and shoe manufacture, construction, and retail trades, frequently provide products which substitute for the output of the industrial sector and which, because of their inferior quality and lower cost, are more suited to the needs of the less affluent segments of the population. Moreover, it is widely believed that small firms are more labor intensive than large scale enterprises, and hence that their promotion is an important aspect of an employment oriented strategy of economic development. If small scale firms are more labor intensive, more geographically dispersed, or more accessible to indigenous entrepreneurs their promotion may contribute to meeting the policy goals of employment creation and improved regional and vertical distribution of income. If, on the other hand, their low levels of labor productivity reflect technical inefficiency, small enterprises may be both capital and labor using and their promotion will involve employment creation at the cost of a sacrifice in the growth of output. Also, the composition of small enterprise output may limit the scope for promotion of these firms. If, as some analysts have contended, the output of the intermediate sector is confined to inferior consumer goods (Hymer and Resnick, 1969), the demand for these products will decline as income increases, and promotional policies aimed at small producers will have little lasting impact.
This paper reviews some of the evidence relating to the structure and performance of small scale enterprises in Africa. The first section presents some available data on the approximate magnitude of the small scale sector in several African countries, and focuses on the employment composition of small scale activities. Section Two reviews evidence regarding the structure of demand for the output of small enterprises.

Section Three reviews evidence on the choice of technique and technical efficiency from several empirical studies. It is widely accepted that there exists a positive relationship between firm size and capital intensity. The greater labor intensity of small enterprises is often ascribed to adaptation of the choice of technique to relative factor prices characterized by a low wage rental ratio. Such a response may represent efficient factor substitution in labor abundant economies. If, however, small firms use not only more labor but also more capital per unit of output than do larger firms, they are technically inefficient and thus do not represent an efficient means of output expansion. Engineering and survey evidence on the choice of technique and technical efficiency are used to illuminate these issues.

Section Four turns to the questions of sources of finance for small enterprises, the market for capital and labor, and relative factor prices. Substantial evidence exists that small firms confront capital costs which exceed those available to larger enterprises, and that they have extremely limited access to commercial credit. Less agreement exists, however, on the extent to which the expansion of small enterprises is constrained by lack of credit, or on the degree to which credit programs directed toward the small scale sector in Africa may substitute for personal savings.

Section Five examines the role of small scale industry in entrepreneurial development. Numerous writers on Africa have identified the absence of indigenous entrepreneurial and managerial talent as a severe constraint on economic development, (Kilby, 1969; Harris, 1971; Schatz, 1977). Small enterprises appear to provide managerial training and an outlet for entrepreneurial talent which is not available in the modern formal sector. Survey findings on determinants of entrepreneurial success yield some surprises, however, notably the lack of correlation between education and good economic performance and a lack of consistency of findings across countries.

The final section of the paper considers the policy environments affecting small enterprises in several African countries. Without exception, until very recently official policy has tended to discourage the creation and expansion of intermediate sector activities. Licensing arrangements, restrictive zoning, health and production regulations, and a variety of discriminatory tax and subsidy policies have limited the growth of small enterprises. Only the indigenization schemes popular throughout Africa have favored the development of the intermediate sector. Recent policy initiatives in several countries include credit schemes, provision of industrial infrastructure and technical training. An evaluation of the desirability of these policies in light of the evidence from the survey concludes the paper.
I. The Magnitude and Structure of the Small Enterprise Sector

The concept of scale is ambiguous, particularly in a survey which attempts to summarize evidence from a number of countries at varying stages of economic development. An enterprise which is small in the context of one economy may be relatively large in the context of another. Stratification by size of firm should ideally reflect the differences in economic incentives and performance which are the focus of the survey. Among the papers reviewed the number of workers is most commonly used as the size criterion, and this is sometimes supplemented by data on the distribution of assets or output. The cut-off points employed by various authors are not consistent, and therefore any classification scheme must be somewhat arbitrary. In general firms will be classified as very small scale or "artisanal" if they employ less than ten full time employees, and as small scale if they employ between ten and fifty employees.

In addition a distinction should be made between enterprises which have some fixed capital investment and in which additional workers have a positive marginal product, and those activities in which additional workers add little or nothing to the value of output. The former activities, which may vary from traditional crafts to modern small scale enterprises, have been defined as "intermediate" sector activities (Steel, 1977) and are the focus of the empirical research surveyed. The latter category of economic activity constitutes the so called "informal" sector largely composed of service and distributive activities. Evidence on these activities will not be reviewed.

Estimates of the relative magnitude in terms of employment or output of small scale enterprises in Africa are made difficult by the failure to enumerate unregistered establishments in industrial and employment surveys and by general underdevelopment of economic statistics in most African countries. Small and artisanal firms are largely unregistered; hence estimates of the extent of small scale employment are generally based on the comparison of census and labor survey data on employment in manufacturing. The residual computed from this comparison is presumably composed of craft and household production that does not take place in registered industrial establishments.

Table 1 presents estimates of the structure of manufacturing employment for several African countries. Large and medium firms, those employing more than 50 full time workers, are registered establishments covered in the various employment and industrial surveys. Small scale enterprises are defined as those firms employing 10-50 workers covered by the official industrial statistics. Coverage, particularly at the lower end of the range, is undoubtedly incomplete and the relative size of employment in this class of industrial establishments is therefore understated. Where surveys of the artisanal sector have been undertaken, employment in these enterprises, ranging in size from 1-10 workers, has been entered separately from the residual.
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<tr>
<td><strong>Total Manufacturing Sector Labor Force</strong></td>
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<td></td>
<td>92.3</td>
<td>766.0</td>
<td>204.1</td>
<td>380.1</td>
<td>281.7</td>
<td>1100.0</td>
<td>92.7</td>
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<tr>
<td><strong>Large and Medium Firms</strong></td>
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<td></td>
<td>34.5</td>
<td>490.0</td>
<td>83.9</td>
<td>56.9</td>
<td>48.7</td>
<td>160.0</td>
<td>4.1</td>
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<td><strong>Small Scale Firms a/</strong></td>
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<td></td>
<td>6.2</td>
<td>76.8</td>
<td>20.2</td>
<td>1.2</td>
<td>..</td>
<td>290.0</td>
<td>88.6</td>
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<td><strong>Artisanal Firms b/</strong></td>
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<tr>
<td></td>
<td>1.3</td>
<td>199.6</td>
<td>..</td>
<td>25.1</td>
<td>233.1</td>
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<tr>
<td><strong>Unregistered Employment c/</strong></td>
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<tr>
<td></td>
<td>52.2</td>
<td>..</td>
<td>100.2</td>
<td>296.2</td>
<td>..</td>
<td>650.0</td>
<td>..</td>
</tr>
</tbody>
</table>

Note:  
- **a/** Employing 10-49 workers  
- **b/** Employing 1-9 workers  
- **c/** Residual estimate  
- .. not available
Sources:

        Republic of Tanzania, Survey of Employment
        and Earnings, 1967.


Nigeria: G. Shepherd, "The Structure of Small Scale Industry:
        Nigeria" Washington, D.C.: World Bank, West
        African Projects Department, 1978, Mimeographed.

The picture which emerges, although the evidence must be interpreted with some caution, is that small and artisanal firms, employing 1-50 workers are uniformly the largest employers in the manufacturing sector, accounting for as much as 95 percent of total manufacturing employment. Within the intermediate sector unregistered and artisanal enterprises predominate. Small factories account for between 10 and 30 percent of intermediate sector employment.

The data suggest a certain bimodalism of industrial structure, which may be characteristic of predominantly agrarian economies at early stages of industrial development. The prominence of the non-factory sector in small scale employment and the relatively low share of small factories in overall registered manufacturing employment appears to indicate a stage of industrialization in which a large number small craft-based enterprises coexist with a limited number of large scale, foreign or state-owned firms. The mass of traditional small scale firms have not transformed themselves into more modern small factories.

The employment structure of the intermediate sector is remarkably uniform across countries in Africa. Table 2 summarizes available evidence from several studies on the structure of employment in small scale manufacturing in urban areas.

The largest share of small scale manufacturing employment is consistently found in the clothing industry which accounts for between thirty and fifty percent of total small scale employment. Moreover, in those countries for which comparative data exist, clothing manufacture is substantially more important as an employer in the intermediate sector than in the formal sector (Steel, 1977; Joshi, Lubel and Mouly, 1976; Schadler, 1968). Small and large firms compete directly in the clothing industry, and the concentration of employment in the intermediate sector may indicate that small firms possess a comparative advantage in the economic environment of most African countries (Steel, 1977).

The predominant position of tailoring activities is consistent with evidence from other developing countries in which clothing manufacturing appears as the largest small scale urban industry. (Shetty, 1963; Berry 1972). Tailoring is characterized by substantial ease of entry. Initial capital requirements are among the lowest for all small manufacturing enterprises, consisting principally of the purchase of a manual sewing machine (Aluko, Oguntoye, and Afonsa, 1972; Schadler, 1968; Calloway, 1973; Steel 1977; Liedholm and Chutta 1976; van Dijk, 1976) and in some urban areas initial capital outlays have been further reduced by the development of rental schemes for tailoring equipment. (van Dijk, 1976; Badgley, 1978). Perhaps for this reason a majority of tailoring enterprises in those countries for which evidence exists consist of one person firms in which the owner undertakes all productive activity. Apprentice labor is also an important input, however little hired labor is employed by clothing manufacturing firms (Steel, 1977; Liedholm and Chuta, 1976; Schadler, 1968; Calloway, 1973). Steel (1977) finds that more than sixty percent of the labor force engaged in tailoring in his sample consists of women, but his findings appear unique to Ghana. Evidence from Sierra Leone, Kenya and Nigeria indicates that few women are employed in small scale manufacturing of any type (Liedholm and Chuta 1976; Child, 1977; Calloway, 1973).
## TABLE 2

**Distribution of Employment in Small and Artisanal Industries**

*for Selected African Countries*

(Percentage of Total Sector Employment)

<table>
<thead>
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<tbody>
<tr>
<td><strong>Clothing</strong></td>
<td>51.7</td>
<td>33.0</td>
<td>31.3</td>
<td>26.2</td>
<td>45.3</td>
<td>41.3</td>
<td>33.2</td>
</tr>
<tr>
<td><strong>Shoes</strong></td>
<td>4.2</td>
<td>3.8</td>
<td>1.4</td>
<td>9.4</td>
<td>10.0</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td><strong>Carpentry/Furniture Mfg.</strong></td>
<td>10.7</td>
<td>8.2</td>
<td>16.4</td>
<td>19.2</td>
<td>10.8</td>
<td>13.5</td>
<td>14.7</td>
</tr>
<tr>
<td><strong>Vehicle Repair</strong></td>
<td>9.3</td>
<td>16.5</td>
<td>1.6</td>
<td>16.9</td>
<td>6.9</td>
<td>5.5</td>
<td>13.4</td>
</tr>
<tr>
<td><strong>Metal Products</strong></td>
<td>4.1</td>
<td>11.2</td>
<td>15.3</td>
<td>5.4</td>
<td>3.8</td>
<td>4.1</td>
<td>9.9</td>
</tr>
<tr>
<td><strong>Printing</strong></td>
<td>1.6</td>
<td>7.0</td>
<td><strong>..</strong></td>
<td><strong>..</strong></td>
<td><strong>..</strong></td>
<td><strong>..</strong></td>
<td>6.0</td>
</tr>
</tbody>
</table>

Notes: .. indicates data unavailable

- **Nigeria**: Firms employing less than 50 workers
- **Ghana**: Firms employing less than 30 workers
- **Sierra Leone**: Firms employing less than 50 workers
- **Tanzania**: Firms employing less than 50 workers
- **Senegal**: Registered Artisans in Production and Service employing less than 5 workers
- **Cameroon**: Firms employing less than 5 workers
- **Zaire**: Firms employing less than 50 workers
Sources:

Nigeria: Aluko et al. (1972).


Sierra Leone: Liedholm and Chuta (1976).

Tanzania: Schadler (1968).


Cameroon: Steel (1979 b)

Carpentry and furniture manufacturing represent the second largest small scale manufacturing activity, employing between 8 and 20 percent of the labor force in the intermediate sector. Its products include household items such as chairs, tables, cupboards, and beds, and industrial and school furnishings. Small and large firms compete vigorously in urban areas and in some locales the output of smaller enterprises has reached a quality equal to that of larger manufacturing firms (Page, 1974), although in general, small firms manufacture household items of simple design at low cost. (Child, 1977).

Furniture manufacturing has a substantially greater proportion of multiple employee firms in the intermediate sector than does tailoring (Steel, 1977; Liedholm and Chuta, 1976; Schadler 1968; Calloway, 1973). Apprentice labor, as in the tailoring industry, is the major form of non-owner labor input, but furniture manufacturing firms also hire a greater percentage of wage employees.

Barriers to entry in the form of human and physical capital requirements are somewhat higher in the furniture manufacturing industry than for clothing manufacturing. Carpenters have among the longest durations of apprenticeship and highest learning fees of all small scale activities (Liedholm and Chuta, 1976; Ayree, 1976), indicating a relatively lengthy process of skill formation. Starting capital requirements, although greater than for tailoring, remain quite modest.

Metal products manufacturers comprise the last major subsector of small scale manufacturing across the countries surveyed. These activities fall into several categories including traditional blacksmithing, welding, fitting, and manufacture of metal products for household consumption. Their heterogeneity makes generalizations regarding the subsector more tenuous. Small metal products firms have a more modern employment structure in the sense that they employ a relatively greater proportion of wage employees than other small manufacturing activities. (Steel, 1977; Liedholm and Chuta, 1976; Calloway, 1973; Schadler, 1968, Aluko et al., 1972). Initial investment requirements vary substantially with the type of output produced by the firm. Starting investments are very low for traditional blacksmithing and tinsmithing activities consisting primarily of hand tools (King, 1977; Calloway 1973; Schadler, 1968) but rise to form a significant barrier to entry in such modern activities as welding (Child, 1977; Steel, 1977).

Several other small manufacturing activities are important elements of the urban economy in many African nations. Food manufacturing, including bread baking, is a major small scale employer in West Africa, employing approximately five percent of the urban intermediate sector labor force (Liedholm and Chuta, 1976; Steel, 1977, Kilby, 1962; Aluko, Oguntoye, and Afonsa, 1972). Goldsmithing which is a traditional craft, particularly in West Africa, is a significant small manufacturing activity in both East and West Africa. (Schadler, 1968; Steel, 1977; Liedholm and Chuta, 1976). Other traditional craft activities include woodcarving, weaving, and mat and basket making. Traditional crafts are primarily sole proprietorship enterprises, supplemented by apprentice labor, and characterized by relatively low initial investment
requirements (Calloway, 1973; Steel, 1977; Liedholm and Chuta, 1976; Schadler, 1968). Among non-traditional activities manufacture of cement blocks, saw-milling, chemical manufacturing and printing are also important small scale industries (Child, 1977; Calloway, 1973; Schadler, 1968; Steel, 1977).

Vehicle repair is apparently the most important small scale non-manufacturing activity in Africa. Unlike small scale manufacturing, this subsector reflects substantial complementarity between the intermediate and formal sectors in the economy. Where comparative data exist it appears that vehicle repair and manufacture of specialized parts are predominantly small scale activities (Steel, 1977).

Both the employment structure and capital requirements of vehicle repair differ significantly from those encountered in small manufacturing processes. Hired labor forms a greater proportion of total employment, and single worker firms are rare. (Steel, 1977; Calloway, 1973). Initial capital requirements are among the highest for all small enterprises.

Data on the structure of rural small industry are severely limited. Steel (1977) and Liedholm and Chuta (1976) stratify their samples by size of locality and note significant differences in the composition of small industries between urban areas, defined as having populations exceeding 20,000, and rural localities. Not surprisingly, the more "traditional" crafts such as blacksmithing, weaving, and mat and pottery making are relatively more important in rural areas while more modern small industry, tailoring, furniture and carpentry, and vehicle repair tend to predominate in urban sites. Agricultural processing activities, particularly grain milling, are also concentrated in rural areas (Humphreys and Raeder, 1978; McIntyre, 1978; Monke, 1978).

The structure of employment within individual firms varies between urban and rural locations. Rural small industries are characterized by a higher proportion of single worker enterprises. Apprentice and wage labor become relatively more important components of total employment as size of locality increases.

Rural small enterprises appear to be less market oriented, both in sale of output and in purchase of inputs, than their urban counterparts. Liedholm and Chuta (1976) find that the volume of labor inputs into all types of small enterprises in Sierra Leone is significantly lower in villages than in any of the other locations surveyed. Analysis of combined farm and non-farm labor data indicates that 66 percent of the labor time of those engaged in small scale activities in rural areas was devoted to farming. The low percentage of time allocated to non-farm activities reflects the part-time, household nature of small enterprises in rural areas, and incomplete specialization of labor in small manufacturing. Steel (1977) finds a significant relationship between wage employment in small enterprises and city size, suggesting that the employment composition of small scale businesses changes significantly between rural and urban areas. Rural firms rely more heavily on family labor than do those in urban areas. As size of urban location increases the share of total employees in wage employment increases.
Steel ascribes this relationship to the importance of a growing cash market for the expansion of the small scale sector. Increased urbanization and expanding cash markets give rise to a shift from traditional household activities to complete specialization of the entrepreneur in small scale production and increased use of apprentice and hired labor.

Little is known about the development of the intermediate sector over time in Africa. Statistical data on changes in its structure are nonexistent, however evidence from surveys concerning the age of small firms, their growth, and respondents perceptions of changes in the demand for their output provide some insights into the growth of the intermediate sector. Small enterprises engaged in manufacturing and repairs are of relatively recent origin in Africa, although small firms, particularly those which are indigenously owned, developed earlier in West Africa than in other regions. Survey data from Nigeria (Calloway, 1973; Aluko, Oguntoye and Afonja, 1972) reveal that fewer than twenty percent of firms surveyed were operating prior to 1945, and these firms are almost exclusively concentrated in traditional activities such as blacksmithing, tailoring, and weaving. Both surveys indicate that more than 80 percent of the firms interviewed were established within 15 years of the survey period. The surveys reveal that rapid expansion occurred in tailoring, carpentry and furniture manufacturing, and motor vehicle repairs following independence.

Child's (1977) data on Kenya tell a similar story. Seventy-four percent of the firms in his sample of rural small enterprises were established after 1964. Firms in the sample founded prior to 1950 comprised less than 10 percent of the observations and most of these were established non-citizens Asians and subsequently purchased by Kenyan citizens (Child, 1977). Schadler's (1968) age of establishment data for Tanzania reflect a similar expansion of small enterprises showing relatively new firms in tailoring, furniture manufacturing, and vehicle repairs.

The skewness of the distribution of age of firm data may reflect a high rate of mortality for small scale activities rather than expansion of the intermediate sector. The impression of growth is reinforced to some extent, however, by responses to surveys eliciting proprietor's opinions concerning the growth of the number of enterprises and output in their industries. A majority of entrepreneurs in the areas surveyed believed that output and the number of enterprises in their industry had expanded (Liedholm and Chuta, 1976; van Dijk, 1978). There are substantial variations, however, in estimated growth by industrial category and by locale. The results provide some indication that such small scale activities as clothing manufacturing, baking, and furniture and carpentry have experienced substantial growth, while more traditional crafts, such as blacksmithing, goldsmithing and weaving may have exhibited more stable levels of employment and output. The data also indicate that small scale industries may be growing more rapidly in urban than in rural areas.
II. The Structure of Demand for Products of Small Scale Enterprises

Overwhelmingly the primary market for the products of small enterprises throughout Africa is consumer demand. Most of the major small scale industries represent simple consumer goods, clothing, furniture, shoes, baked goods, and metal products which cater to the needs of the low income rural and urban populations. Survey results indicate that more than three-fourths of all sales by small enterprises are directly to consumers (Badgley, 1978; Gerry, 1974; Aryee, 1976a; Liedholm and Chuta, 1976). Markets for the products of small firms are highly localized with very limited spatial distribution of output. 3/

Within the intermediate sector marketing arrangements vary to some degree depending on the type of firm. Tailors and cobblers while continuing to produce primarily directly for individual customers have also begun to manufacture some products for collecting wholesalers who organize a number of small producers to provide a standard product (Aryee, 1976a; Wynne-Roberts, 1978). Furniture manufacturers on the other hand produce almost exclusively for individual customers on a custom order basis.

Marketing of products depends primarily on personal contact between the small entrepreneur and the final customer. Few of the businesses surveyed actively engaged in marketing of products, preferring to wait for customers to contact them, although King (1977) presents anecdotal evidence of more aggressive marketing practices among metal products manufacturers in Kenya.

A crucial parameter required for analysis of the potential for expansion of the intermediate sector is the income elasticity of demand. Several studies have suggested that with the possible exception of repair and service activities, African small enterprises have concentrated on the production of inferior goods. If this is true, the demand for and production of these products will decline as rural and urban incomes increase. 4/ (Child, 1977; Gerry, 1974; van Dijk, 1978; ILO, 1972). In addition estimates of income or expenditure elasticities provide important insights into the indirect effects on small scale enterprises of policies designed to alter the distribution of income.

Systematic budget studies at a level of disaggregation sufficient to distinguish commodities by sector of origin are practically nonexistent. Liedholm and Chuta (1976) report the only known attempt to estimate expenditure elasticities by product group for the principal products of small enterprises. Their data, derived from rural household expenditure surveys in Sierra Leone, yield surprisingly high and positive expenditure elasticities. Coefficients for clothing, furniture, baking products and for an aggregate measure of all small scale industrial products exceed unity. Moreover, attempts to test the specification for variation by income classes failed to yield statistically significant results. For the range of incomes included in the survey, the expenditure elasticities do not decline with rising income.
levels. These data suggest that there is substantial scope for increasing the output of small enterprises as incomes increase. Without more broadly based expenditure studies particularly in urban areas, however, the question of the inferiority of consumer products from the intermediate sector remains unresolved.

In those economies in which small scale and craft enterprises have been historically important, they have primarily specialized in the production of intermediates and capital goods for the formal sector. Such forward linkages are not well developed in the African context. None of the enterprise surveys reveal significant sales or subcontracting relationships between the formal sector and small enterprise. In part the manufacture of intermediate and capital goods is constrained by lack of standardization and low levels of quality control. Most small firms in Africa lack the equipment and technical ability to produce standardized inputs for modern industrial firms. But the pattern of import substituting industrialization with its emphasis on assembly operations undoubtedly also constrains the development of specialized small input producers.

Small scale industries which have developed linkages with the formal sector tend to be among the more "modern" enterprises in terms of type of output and structure of employment. Furniture manufacturing and metal products firms (excluding blacksmithing and tinsmithing) have the greatest proportion of sales to the formal sector, including government, of major small scale activities (Aryee, 1976a). Firms which sell to the formal sector engage a greater share of wage workers in the labor force and have correspondingly lower shares of apprentice and family labor in total employment. Wage labor, which consists primarily of journeymen, may embody higher levels of skill than family or apprentice workers, and the greater skill level of the labor force in these forward linked enterprises is consistent with the reported need for higher standards of quality.

An issue which appears to have escaped the attention of existing surveys is the extent to which entrepreneurs providing goods to the formal sector received training either in modern large scale enterprises or in formal technical schools. The apparent requirement for greater levels of technical skill in producing inputs for industry would appear to favor entrepreneurs with more formal technical training. In addition skilled workers from formal enterprises may perceive profitable opportunities for subcontracting or production of specialized inputs which are not apparent to craftsmen trained under the apprentice system in the intermediate sector.

Linkages between agriculture and small industry have occupied an important place in the rural development of several countries. In Africa these linkages appear to be limited largely to the processing of several crops and to manufacture of implements for traditional agriculture. In West Africa small scale rice mills have expanded rapidly in response to significant increases in rice output. These small hullers often compete directly with large scale, public-sector mills, and their proliferation apparently indicates that they can compete efficiently with large scale processing facilities at
existing prices. Studies of the extent and efficiency of other agriculturally related processing activities have not been undertaken, although small firms are known to engage in other forms of grain milling and in the processing of oil seeds, (Steel, 1977; Child, 1977).

Backward linkages from agriculture to small industry are apparently limited to the production of agricultural implements such as machetes, hoes, knives, and axes and to the repair of farm tools and equipment. Liedholm and Chuta (1976) offer the only quantitative estimates of the magnitude of these links. Their rural farm surveys indicate that approximately one percent of gross output from the agricultural sector in Sierra Leone consists of inputs from rural blacksmithing. King (1977) provides some anecdotal evidence of indigenous adaptation and design of farm machinery in rural Kenya by small entrepreneurs, but the magnitude of this more sophisticated backward linkage to agriculture has not been examined.

Traditional and culture goods produced by small enterprises may have substantial potential as exportables. Ho and Huddle (1976) have estimated that the income elasticity of demand for culture goods in the OECD and United States exceeds unity. Development of tourism can similarly contribute to growth of the demand for traditional goods, although quantitative estimates of the composition of tourist expenditure are unavailable. Several francophone African economies have attempted to promote the development of "artistic" artisans producing cultural and traditional goods for the foreign market. These countries exercise some degree of quality control by requiring the registration of artisanal enterprises and by administering craft tests to applicants. In return applicants are certified as "artistic" artisans and receive some benefits in terms of the marketing of their products by state enterprises.
III. The Choice of Technique, Technical Efficiency and Capacity Utilization

One focal point of interest in small scale enterprises is the widely observed difference in labor intensity between small and large firms. If small firms have adopted greater labor intensity in response to factor prices which reflect a lower wage rental ratio than that prevailing in the formal, large scale sector, observed differences in the capital-labor ratio may reflect efficient adaptation of factor proportions to economic incentives. Moreover, if the relative factor prices faced by small firms more closely reflect the social opportunity costs of factors in the economy, expansion of the intermediate sector can engender an efficient labor using increase in output.

A problem arises, however, if production methods and technologies are so different between small and large firms that they do not confront the same production function. In such a case small firms may have lower capital intensity, but they may be inefficient in the sense that they employ more labor and more capital per unit of output than do large enterprises. Such small firms are "technically inefficient" in Farrell's (1957) terminology.

The Choice of Technique and Technical Efficiency

The relationship between technical efficiency, the choice of technique, and economic efficiency is illustrated in Figure One. If all firms in an industry employ two factors of production in a well-behaved linear homogenous production function, production decisions may be represented in input space by a point giving the combination of primary factors required to generate one unit of output. The input combinations of each firm give rise to a scatter of observations in the input plane. By joining the points that represent minimum output combinations a unit isoquant is drawn such that no observation lies between the envelope and the origin. The frontier, thus defined, represents the minimum quantities of inputs required per unit of output given existing technology. Plants A, B, and C all lie on the isoquant, FF. At their respective levels of output they use no more of the two inputs than required and are said to be technically efficient. Firm D exhibits an input combination to the right of the frontier and is classified as technically inefficient.

Farrell's method measures each firm's technical efficiency relative to the achieved frontier. Thus, in Figure One, the measure of firm D's technical inefficiency is given by the ratio OA/OD, since firm D, using techniques available to firm A, could reduce its inputs in that proportion and continue to produce at its existing level of output.

The appropriateness of the choice of technique may also be measured within the context of the Farrell diagram. If MM' represents the relative factor price ratio facing all firms in the industry, the optimum input combination lies on the ray OB, and only firm B is price efficient. Firms A
and C although technically efficient are using inappropriate techniques at market prices. The degree of price inefficiency for firm A is given by the ratio OR/OA.

The literature on small enterprises suggests, however, that all firms do not face equal wage-rental ratios. If the relative price of capital is substantially greater for small firms, as given by the relative price line AA', these enterprises will adopt the more labor intensive technique represented by point A while firms facing higher wage rental ratios will choose capital intensive techniques represented by point B. Movement from B to A represents efficient substitution along the production frontier, and if the social opportunity costs of factors correspond to the relative factor prices faced by small firms they will exhibit greater social efficiency. In such circumstances expansion of the intermediate sector represents an efficient, labor using means of increasing output.

It is possible, however, that small firms do not lie on the production frontier. If the input combination for small enterprises gives rise to an observation such as D, the firm is technically inefficient although it employs the technique which would be adopted if all firms confronted the relative factor prices given by AA'.

An observation such as D can arise from two possible sources of inefficiency. First, if all firms employ the same production technology, some firms may be technically inefficient simply as a result of failing to achieve maximum potential output with a given vector of inputs. Second, some firms may not employ the technology which defines the frontier. They may obtain maximum output given their production possibilities, but the technique which they use is dominated by the newer best practice technology.

Technical efficiency is a somewhat elusive concept, but it is most frequently associated with the role of management in the production process. Traditional, static microeconomic theory assumes that all firms adopt technically efficient production processes and that managers employ known techniques with maximum efficiency. Movement from the interior of the production possibilities frontier to the outer boundary is regarded as costless. Recent empirical and theoretical work has challenged these assumptions. Liebenstein (1966) has argued that firms may fail to produce on the outer boundary of their production surface due to the effort-leisure preferences of managers and workers, giving rise to variations in the level of "X-efficiency." Shapiro and Muller (1977) in a recent study of modernization and production in traditional agriculture find a significant correlation between technical efficiency and the entrepreneur's stock of information. Thus variations in technical efficiency may arise from differences in the stock of knowledge possessed by managers and from differences in the quantity and quality of managerial effort supplied to the firm.

The presence and extent of this form of technical inefficiency has important consequences for public policy toward small industry. As drawn,
both observation B, which is technically efficient but employs an inappropriate technique at accounting prices, and observation D, which is price efficient but technically inefficient, have equal unit social costs of production, and public authorities should be indifferent between allocating resources to either activity. Policies to improve technical efficiency and thus to move firms inward along the segment AD will increase the social profitability of small enterprises. Alternatively, if the government can act directly to reduce the divergence in factor costs faced by large and small firms, social costs will be reduced as a consequence of substitution along the segment AB. Policies designed to subsidize inputs to small enterprises may have perverse consequences, either by encouraging inappropriate factor substitution or by reducing the level of technical efficiency. 11/

If all firms do not have access to the same technology the distinctions drawn in Figure One are less meaningful. Substitution possibilities can no longer be represented by a single frontier isoquant since small and large firms confront two separate production functions. 12/ If the techniques available to small firms are dominated by those employed in the large scale, modern sector the possibility of an employment-output tradeoff emerges.

This is represented in Figure One by the isoquants showing limited substitution possibilities containing points B and E. As drawn, both processes employ the same amount of capital per unit of output but the small scale process employs substantially more labor. This labor makes no net contribution to total output in the economy, since it neither produces more output nor saves capital compared with the large scale sector at point B. If labor has a positive opportunity cost, expansion of the small scale sector will incur high social costs. The location of the unit isoquant for small firms along the interval AE is crucial in determining the relative social costs of expanding large or small enterprises.

Even if they are technically inefficient or employ a dominated technology small firms may remain in the economy, and the intermediate sector may expand. For example, wage costs to the intermediate sector may be substantially below those faced by large scale firms due to labor market imperfections. Alternatively, the output of small and large firms, although substitutable, may not be homogeneous, in which case efficiency comparisons between the sectors become difficult to interpret.

Evidence on Factor Intensities and Relative Efficiency

Unfortunately, valid comparisons of factor intensity and technical efficiency between large and small firms are difficult to construct, and the evidence from Africa is therefore limited. Ideally, enterprises must be producing the same final product and must be vertically integrated to the same extent. If for example larger firms undertake distribution of their products while small enterprises sell ex-factory, apparent differences in capital intensity may reflect differences in this ancilliary activity, rather
than substitution in the central production processes. Few of the studies surveyed attempt to make comparisons among size categories within the same product group and none have attempted to deal with the problem of differing levels of vertical integration. Thus the conclusions drawn from comparisons of factor intensities must be viewed with a degree of skepticism.

A number of studies have focused on comparison of aggregate capital-labor ratios across all industrial activities. Small enterprises in these studies are consistently identified as more labor intensive than large firms. (Mureithi, 1975; Aryee, 1976b; Gerry, 1967 Child, 1977). Capital stock to number of workers ratios differ between the large scale and intermediate sectors by factors ranging from four to ten to one. Such comparisons are of little policy relevance, however, since the product mix of the two sectors differs significantly in all of the economies studied. Small scale activities are concentrated in the most labor intensive product groups at all levels of output, while large scale enterprises cover a broader spectrum of products and factor intensities. Thus advocacy of small enterprise promotion based upon aggregate data implicitly reflects a call for alterations in the product composition of output toward more labor intensive goods.

Comparisons between production units of different scale within the same industry are more relevant for questions of industrial policy. Two types of evidence are available, engineering studies of the choice of technique and survey data comparing the factor proportions in existing production units.

Data on the relationship between size of firm and choice of technique based on engineering or process analyses exist for a limited number of industries in Africa. Engineering data possess some advantages over firm level observations in that a full range of technically feasible alternatives may be specified to produce a homogeneous output. The optimum technique at each level of output is identified using factor cost data for the economy in question.

Engineering studies exist for cement block manufacturing in Kenya (Stewart, 1975), sugar processing in Ghana and Ethiopia (Forsyth, 1977), footwear manufacturing in Ethiopia (Pickett, 1975), and timber extraction in Ghana (Page, 1978). Each of these investigations finds significant economies of scale in the industry and a positive relationship between size of plant and capital intensity of the optimum technique. Thus at high volumes of output there are efficient labor intensive processes, but the production function is non-nomothetic. At high output levels capital intensive processes dominate at the given wage rental ratio.

The cause of the relationship between capital intensity and economies of scale is not fully understood. Continuous flow processes such as sugar refining exhibit surface-volume relationships which give rise to scale economies. Set up costs appear to be relevant in timber extraction, but the relationship between capital intensity and scale is less clear for the other two processes investigated, and the extent of these relationships in other industries is not known.
The presence of significant economies of scale creates a dilemma for small enterprise promotion. At low volumes of demand small enterprises will be viable and will be more labor intensive than large scale firms, but promotion of the industry will give rise to increases in size of firm and capital intensity. Policy makers are therefore confronted with the choice of restricting firm size by policy interventions and incurring greater unit costs or accepting efficient but more capital intensive production processes.

Survey data on the factor intensities of existing small scale enterprises exist for a number of African countries. Valid comparisons across several size categories of firms within single product groups are limited, however, to Steel’s (1977) study of Ghana and evidence from Sierra Leone summarized by Byerlee et al., 1978. Both find that within industries the hypothesized positive correlation between firm size and capital intensity normally holds, especially in comparing the capital-labor ratio of firms employing more than one hundred workers with those employing from one to ten. There is substantial variation within individual industries, however, and, although dramatic differences are observed between very large and smaller firms in such activities as milling and baking, printing, Steel notes that some industries such as furniture manufacturing show little difference across size groups and substantial variability within size classes.

Steel suggests that the apparent variations in factor intensities reflect differences in production techniques. This is particularly true in clothing manufacturing and furniture where enterprises employing less than ten workers are based on hand crafting, and a single worker makes the product from start to finish. Larger scale firms in contrast employ continuous process operations producing a standardized product. This dichotomy in processes is not true of the printing industry, however, where specialized labor and automatic machinery are common in very small scale enterprises.

Liedholm and Chuta (1976) have attempted to analyse the scope for factor substitution in producing a single product within small enterprises. They identify a traditional and modern process for producing clothing, furniture, baking and metal products among others and note that in all cases the modern process is significantly more capital intensive than the traditional method. Both their process analysis and econometric evidence suggest that within the intermediate sector there is substantial scope for capital-labor substitution. 18/

Steel’s data provide some limited evidence on the possible inefficiency of small scale firms relative to large enterprises. In a two factor production function the capital-output ratio is critical in determining the relative efficiency of capital intensive and labor intensive processes. If labor intensive firms also exhibit higher capital output ratios they are inefficient relative to the capital intensive enterprise. Although capital-output ratios tend to increase across size categories when observed in aggregate, ratios by firm size within individual industries do not show a consistent pattern. In milling and baking and clothing manufacturing the average capital-output ratio for firms employing less than thirty workers exceeds that for medium and large scale firms, suggesting that in these industries small scale
enterprises employ a separate and inefficient technology and/or exhibit high levels of technical inefficiency. The results for other industries are consistent with the hypothesis that all firms face the same production function, although it is impossible from the data to draw any conclusions regarding the relative technical efficiency or small versus large firms. Byerlee et al. conclude that smaller scale firms in general have both lower capital labor ratios and higher output capital ratios than large firms in the same industry.

In sum little can be learned from existing comparisons between large and small firms. The latter are frequently more labor intensive, but it is impossible to conclude anything about their relative efficiency. 19/

**Capacity Utilization**

Underutilization of capacity raises both the capital-labor and capital-output ratios for firms which adjust their labor input to changes in output. Thus if small and large firms exhibit different rates of capacity utilization or react to decreases in demand in a different fashion, factor intensities and relative efficiency may appear to be different at actual and projected full capacity output.

Very little evidence exists on relative rates of utilization between large and small firms. Where supply side constraints are principally responsible for low levels of capacity utilization, for example when the foreign trade regime has engendered shortages of imported intermediate inputs, small firms may be at a disadvantage relative to larger enterprises in obtaining essential inputs and may therefore suffer lower levels of capacity utilization. 20/ When excess capacity is due primarily to insufficiency of demand, however, it is difficult to argue on a priori grounds that smaller firms will be impacted differentially. 21/

Rates of capacity utilization by small firms derived from survey data are generally quite low. Firms rarely operate on more than one shift and the percentage of projected full capacity output actually produced ranges from an average of 30-40 percent in Ghana to 74 percent in Sierra Leone. (Steel, 1977; Liedholm and Chuta, 1976). Utilization rates vary across industries and by location, with urban enterprises generally showing higher utilization rates than rural firms. Steel (1977) in particular has argued that increasing rates of capacity utilization in small-scale enterprises may be an efficient mechanism for increasing both output and employment at low social cost. His evidence from Ghana suggests that expansion to full capacity utilization by firms in the intermediate sector would double employment and triple output without requiring additional investment (Steel, 1977, pp. 110-111).

Such an analysis is appropriate if the sources of excess capacity are principally supply determined, but given the low barriers to entry characteristic of most small scale activities demand stimulation may not give rise to higher rates of utilization. Increases in the demand for the output of small enterprises may stimulate new entrants rather than fuller utilization of existing capacity. Undoubtedly, though, removal of supply constraints which favor large firms represents a mechanism for facilitating increased capacity utilization in the intermediate sector.
IV. **Factor Markets**

**Capital**

Evidence that small enterprises exist within a segmented capital market, and that they are largely excluded from access to commercial and public banks is ubiquitous in Africa. Table 3 summarizes data from a substantial number of studies in several countries regarding the sources of funds for initial capital investments by small and very small scale firms. Personal savings supplemented by loans or gifts from relatives dwarf all other sources of funds, consistently representing more than eighty percent of initial investment capital.

The paucity of funds obtained from commercial banks or public development agencies for initial or continuing finance is striking. Only in Ghana and Kenya do combined borrowings from public and private lending institutions approach ten percent of initial investment. In most of the surveys less than one percent of the respondents reported success in obtaining a public or private sector loan.

The causes of such capital market segmentation are difficult to pinpoint and vary to some extent with the institutional characteristics of individual countries. Public agencies, including development banks, have until quite recently ignored small enterprise lending. Lack of administrative capacity to screen loans as well as failure of initiative on the part of lending agencies have reduced the effectiveness of public agencies even where loan windows for small enterprise promotion have been created. Steel (1977) reports that Ghanaian experience with a small enterprise loan scheme was characterized by progressive increases in the size of disbursements and discrimination against small borrowers. Marris and Somerset (1972) and Child (1977) reporting on public lending agencies in Kenya provide similar anecdotal evidence of lack of initiative and bias toward large scale, more established applicants. Studies of financial institutions in Sierra Leone, (Dunlop, 1971), Cameroon (Wynne-Roberts, 1978; Steel, 1978), Zambia (Kochav, et. al., 1974; Young, 1971), Uganda (Bosa, 1969), and Nigeria (World Bank, 1978b) similarly indicate that government credit schemes have been ineffective in meeting the needs of small scale borrowers.

Private bank lending to small firms is limited by the high administrative costs of loans to smaller firms and by the greater perceived risk of default. 22/ A direct solution to this problem would be to allow lenders to charge differential rates by category of borrower. To do so, however, is frequently prohibited by government banking regulations (Steel, 1977). In addition to the higher real costs of small scale lending, some evidence exists that small enterprises are the victims of extra-legal charges on the part of bank officials (Child, 1977). Extra legal payments for loans would not be unusual and would increase the cost of obtaining commercial credit where available.
TABLE 3
Sources of Finance for Initial Investments
By Small Enterprises in Some African Countries
(Percentage of Initial Investment by Source)

<table>
<thead>
<tr>
<th>Source</th>
<th>Nigeria Western Region</th>
<th>Nigeria Ibadan</th>
<th>Ghana</th>
<th>Tanzania</th>
<th>Sierra Leone</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own Savings</td>
<td>97.7</td>
<td>59.0</td>
<td>78.0</td>
<td>60.2</td>
<td>77.5</td>
<td></td>
</tr>
<tr>
<td>Relatives</td>
<td>1.9</td>
<td>35.0</td>
<td>15.0</td>
<td>19.5</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Banks</td>
<td>.02</td>
<td>2.0</td>
<td>10.8</td>
<td>1.0</td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Government</td>
<td>-</td>
<td>2.0</td>
<td>-</td>
<td>1.0</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Money Lenders</td>
<td>.03</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>4.0</td>
<td>-</td>
<td>6.0</td>
<td>18.3</td>
<td>21.7</td>
</tr>
</tbody>
</table>

Sources:
- Nigeria: Aluko et al (1972)
- Ghana: Steel (1977)
- Tanzania: Schadler (1968)
- Sierra Leone: Liedholm and Chuta (1976)
- Uganda: Bosa (1969)
Somewhat surprisingly, despite the intermediate sector's isolation from the institutional market for credit, neither suppliers' credits for equipment nor the curb market appear to be significant sources of initial capital funds. Bosa (1969) and Child (1977) report that equipment for initial investment was rarely available through suppliers' credit. Small scale, informal credit markets are well established in Africa, and the surveys reveal that moneylenders provide a small portion of the initial capital for intermediate sector activities. They are not, however, a major source of investment funds to small manufacturing activities.

The predominance of self-finance for small scale firms suggests that a major contribution of the intermediate sector may be in generating new savings. Little evidence exists, however, concerning the savings behavior of small entrepreneurs. Savings out of wage income or profits from trading predominate as sources of investment capital. In addition, savings from agriculture represent approximately one third of initial small scale investments (Liedholm and Chuta, 1976; Steel, 1977; Child, 1977). The extent to which these funds represent new savings, a sacrifice of present consumption, is not reported, and further evidence concerning alternative outlets for savings and the extent of financial intermediation within the class of small entrepreneurs will be required before judgments can be made regarding the role of small enterprises in generating new savings.

A similar pattern of limited access to institutional credit emerges when data on the sources of funds for expansion and working capital are examined. Investments for the expansion of existing enterprises are overwhelmingly financed out of retained earnings. Commercial banks and public institutions provide a greater proportion of the funds for expansion than for new investment but in no survey did the proportion of firms receiving credit from public or private banks exceed twenty-five percent. (Child, 1977; Liedholm and Chuta, 1976; Callaway, 1973).

Lack of access to commercial credit is perhaps most acute as a problem for small firms in obtaining adequate working capital. Respondents in most of the enterprise surveys identified insufficient working capital as a major constraint limiting the ability to maintain adequate stocks of finished goods and raw materials (Steel, 1977, 1978; Child, 1977; Bosa, 1969; van Dijk, 1978; Badgeley, 1978; Wynne-Roberts, 1978). The credit squeeze is exacerbated by business practices which require that firms extend credit to purchasers, but that they pay cash for purchased inputs. Contracts with the government in particular have been identified as a major problem area for small scale suppliers due to excessive delays in payment for goods provided to the public sector (Child, 1977; Steel, 1977, 1978; Wynne-Roberts, 1978).

Inadequate working capital may be a major reason for the widely observed failure of small manufacturing firms in Africa to produce standardized products for inventory. Work done on a custom basis, particularly on materials provided by the purchaser, reduces the needs for inventories of both inputs and output. The transition of firms from craft based activities to small modern enterprises may, therefore, require substantially greater access to working capital than currently exists.
An estimate of the opportunity cost of capital to small enterprises is of crucial importance to an understanding of the question of relative factor intensities in the formal and intermediate sector. High rental costs of capital to small scale firms relative to those for modern industry would support the contention that their observed labor intensity represents an efficient labor using adaptation to relative factor prices.

Child (1977) reports official rates of interest on commercial and development bank loans to small enterprises in Kenya in the range of 8.5 to 9.5 percent. Computation of the implicit interest rate from repayment schedules provided by loan recipients indicated that the effective interest rates on such loans were in the range of 12 to 20 percent. Steel (1977) reports that the rate of interest on Ghanaian commercial bank loans to small enterprises was approximately 13 percent in 1973. Other studies report similar magnitudes for commercial and development bank loans to small borrowers.

Evidence on interest rates from non-institutional lenders is severely limited. Lending rates observed in the traditional credit market are very high, sometimes in excess of 100 percent per annum (Byerlee et al., 1979; Humphreys, 1978). In large measure these high rates of interest reflect real costs of providing credit in small amounts. Unit costs associated with gathering information and transacting loans, each of which is small in magnitude, are substantial. Moral hazard and the inability to insure against default also increase the risk premium associated with informal lending arrangements. The scattered data on lending rates in the curb market range from 42 percent per annum observed in a rural region of Upper Volta (Humphreys, 1978) to annual rates for seasonal credit in the Ivory Coast of 60 to 80 percent (Humphreys and Raeder, 1978). In a recent survey of evidence regarding costs of capital in the agricultural sector of six West African countries the authors conclude that real interest rates for funds obtained from traditional sources are in the region of 25 to 35 percent. (Stryker, Page and Humphreys, 1978).

The major unanswered question regarding the opportunity cost of capital to small enterprises is the magnitude of the alternative returns to funds provided out of personal and family savings. The extreme nature of capital market segmentation in these economies implies that there will be substantial differences between borrowing and lending rates in the informal market (Chandavarkar, 1971). Opportunity costs for self finance may, therefore, lie below those for borrowed-in funds by an amount equal to the real costs of providing credit. These costs have been asserted to imply an interest rate premium of approximately ten percent, suggesting that the opportunity cost of funds provided from retained earnings may lie in the range of 15 to 25 percent (Humphreys, 1978).
An estimate of the opportunity cost of funds provided from agricultural profits should be given by evidence on the marginal returns to investments in cash crop agriculture. Data on returns to capital in agriculture are quite limited, but the results of several West African studies suggest that real rates of return to marginal investments in tree crops and in such cash crops as rice, maize, and cocoa-yam may equal approximately 20 percent per annum (Humphreys, 1978; Rourke, 1973; Aw, et. al. 1977).

Data on the profitability of small enterprises themselves should provide some indication of the accuracy of these estimated opportunity costs. Profitability calculations from survey data have been attempted for Kenya (Child, 1977), Sierra Leone (Liedholm and Chuta, 1976), and Nigeria (Simmons, 1975). They reveal that rates of return to capital in small scale manufacturing are high but extremely variable. Simmons' estimates of rates of return in the food processing industry in Northern Nigeria range from 40.5 percent to -3.1 percent. Average returns appear to be of similar magnitude to those encountered in agriculture, which is the principal alternative in the region. Rates of return are higher and display even greater variance in the two more broadly based surveys from Kenya and Sierra Leone. Child reports estimates of the rate of return to fixed plus working capital ranging from more than 1000 percent to less than -300 percent. After adjusting his data for outliers, Child finds a median rate of return for firms in the sample of 61 percent. Liedholm and Chuta present similar magnitudes for five industries and also note the high variance in profit rates both within and among industries.

Overall, the pattern which emerges is one of an intermediate sector with limited access to institutional credit markets principally financed by the savings of individual entrepreneurs. These capital funds are generated in agriculture, in the intermediate and informal sectors, and in wage employment in modern industry or services. Rates of interest on borrowed funds and the opportunity cost of self-financed investments exceed 20 percent and may be as high as 35-50 percent. Rates of return to small scale enterprises are similarly high, although they exhibit great variability.

Rates of interest charged to large and medium scale firms by commercial banks and public development agencies appear to be substantially lower than the cost of capital in the intermediate sector. Summarizing data on the capital market in six West African countries, Stryker, Page and Humphreys (1978) find real rates of interest from institutional sources of credit from 5 to 15 percent. Steel's (1977) study of Ghana reports a nominal interest rate ceiling of ten percent applied to commercial banks and lower nominal rates for funds from public development agencies. The data from East Africa are less detailed but seem to confirm the hypothesis of a substantial gap in interest rates between large and small scale firms (Bosa, 1969; Child, 1977).

It is apparent that a significant difference exists between the rates of interest paid by modern large scale enterprises and the intermediate sector. Capital is relatively scarce for small firms and they, therefore, have greater incentives to conserve on its use. The observed labor intensity of small enterprises is undoubtedly in part a reflection of this fact.
Labor

Differences in the wage for skilled and unskilled labor between the modern formal sector and small scale enterprise are relevant both for the choice of technique and for the ability of small firms to compete with larger enterprises within the same market. If labor markets are imperfect, small firms may be able to match the unit costs of technically superior enterprises because their wage costs are substantially lower. Thus, inferences concerning the relative efficiency of small enterprises based upon their survival or profitability are irrelevant. 24/

There appears to be general agreement that wages in the formal sector of most African economies are relatively unresponsive to labor market conditions and are downwardly rigid at an institutionally or legally established minimum. 25/ Among the sources of this rigidity are the apparent propensity of foreign firms to pay wages in excess of the competitive wage, the predominance of public sector enterprises paying high wages to unskilled labor, union pressures which cause productivity gains to be translated into wage increases, and minimum wage legislation. Evidence from East Africa supports the hypothesis that urban wages have not declined in response to the pressures of an excess supply of labor. In fact wages in the urban formal sector increased in the period between 1960 and 1970, resulting in a substantial rural–urban income differential (Sabot, 1978).

In contrast, lack of barriers to entry in the unprotected sectors of the urban economy should make the urban wage outside the formal sector responsive to changes in the supply of labor. In those activities characterized by very low barriers to entry — personal services, and petty commerce for example — it has been argued that disguised unemployment may exist, since the marginal product of labor can be driven to zero if the supply of labor is sufficiently large. Additions to employment become a means of sharing income and the wage depends on the supply of workers to the sector. (Steel, 1979a; Berry and Sabot, 1977).

The intermediate sector, characterized by some form of barriers to entry due to the presence of physical or human capital requirements, lies about midway between these two extremes. Because they are largely unregistered small enterprises escape application of the minimum wage common to the formal sector of most African economies and normally avoid employer's contributions to social insurance schemes. Moreover, there is reason to believe that the wage in the intermediate sector is responsive to changes in the labor supply. Because apprentice labor is overwhelmingly the primary source of labor input to artisanal firms, increases in the numbers of individuals seeking apprentice training should reduce the net cost to employers of apprentices. Costs of hiring unskilled labor and the opportunity cost of family labor will similarly decline if the market wage in casual sector employment falls. Indeed, in equilibrium, in the absence of differential probabilities of obtaining a high wage job, the marginal unskilled worker should be indifferent between working in casual or intermediate sector employment. But because of the relatively small size of the intermediate
sector and due to its barriers to entry the equilibrium wage will be equal to the marginal product of labor in small scale enterprise but to the average product in casual activities. 26/

Unfortunately, evidence on the structure of wages in small scale industry provides little data to test this hypothesis. That a wage gap between small and large firms exists is clear. The magnitude of the gap, however, is variable and difficult to identify. Badgley (1978) and van Dijk (1978, 1976) report differentials for unskilled labor in Senegal and Upper Volta on the order of fifty percent. Evidence from Zaire and Egypt indicates that although intermediate sector wages equal or exceed the legal minimum wage in those economies they fall short of the actual wages paid to unskilled workers in the modern private or public sector. (World Bank, 1978, 1977a). Steel (1977) and Byerlee et al (1979) report the presence of a similar wage gap for Ghana, and Child (1977) infers that a gap exists between formal sector and rural small scale industries in Kenya, although he makes no correction for differences in the cost of living. All of the studies concur that wages for labor in small scale industry exceed annual incomes in the agricultural sector, but no comparisons exist between incomes in urban casual employment and small enterprises.

A simple comparison of wages in formal and intermediate sector employment, however, is insufficient to estimate the impact of labor market segmentation on the magnitude of the wage gap. Differences in non-pecuniary returns to employment and in real incomes complicate the comparison. More subtly, firms in the high wage sector may be able to select more proficient unskilled workers in which case a part of the differential will reflect differences in skill levels. Here again evidence is lacking, but Berry and Sabot (1977) in a recent survey of labor market performance in LDC’s summarize evidence from Africa which favors the hypothesis that differences in the wage rate between the formal and intermediate sector partly reflect divergences in skill levels and labor turnover. In sum a wage gap exists, but it is probably not as large as the nominal difference in wage rates for unskilled labor.

Evidence on the marginal productivity of labor in small enterprise is similarly limited. Liedholm and Chuta (1976) estimate production functions for five small scale industries in Sierra Leone, and test for allocative efficiency in the use of labor. The results are mixed. Marginal productivity estimates for proprietors are positive and significantly different from zero in four of the five industries, supporting the assertion that small enterprises in manufacturing do not represent a disguised form of unemployment. The authors have greater difficulty, however, in finding statistically significant output elasticities for apprentice and hired labor. Marginal productivity estimates are significantly different from zero in only two of the five industries. Tests for allocative efficiency in those two industries reveal that the value of the marginal product of labor is remarkably close to the average wage which suggests a reasonably high degree of allocative efficiency in these industries.
In summary, wage-rental ratios differ between the intermediate and formal sectors of most African economies. Major divergences are more likely to be found in the capital market than in the market for labor, but it is probable that differences in interest rates will be reinforced by higher wages in modern sector activities. The degree to which the observed wage-rental ratio in the intermediate sector approximates a shadow factor price ratio for the economy is not clear from existing data. It is therefore difficult to make inferences concerning the social efficiency of small firms from evidence on their profitability at market prices. 27/
V. Entrepreneurship and Management

A central theme in much of the literature on small enterprises is that the intermediate sector provides an outlet and training ground for entrepreneurs. The lack of an indigenous entrepreneurial class and a generally low level of managerial skills have been identified as a major constraint on the development of many African economies (Kilby, 1969; Harris, 1970). Thus, if small firms assist in identifying and training indigenous entrepreneur/managers, the intermediate sector may play an important role in the process of human capital formation, and to the extent that returns to the managerial factor are not wholly captured by the firm social and private returns to investments in small enterprises may diverge.

Entrepreneurship and managerial efficiency are difficult concepts to define and measure. A substantial literature has developed which seeks to determine the origins of entrepreneurs in the intermediate sector and to identify the determinants of entrepreneurial success, as measured by the rate of profit or by the rate of growth of the firm. Less is known, however, about the extent to which managerial skills learned in the intermediate sector are transferred to other sectors of the economy, and the extent to which returns to management are external to the enterprise.

In general the owners of small enterprises in Africa originate within the intermediate sector. Data from enterprise surveys indicate that between sixty and ninety percent of the entrepreneurs of small firms had received training as apprentices in other intermediate sector enterprises (Gerry, 1974; Aryee, 1976b; van Dijk, 1976, 1978; Liedholm and Chuta, 1976). The length of the transition from apprenticeship to ownership is a function of the skills required and the level of financial barriers to entry in the intermediate sector. More "modern" activities, furniture manufacturing, vehicle repairs, and modern metal products, require longer periods of apprenticeship and show greater proportions of entrepreneurs who engage in wage employment following completion of their training (Aryee, 1976b; Liedholm and Chuta, 1976). This finding reflects both the greater level of skills required in these industries and the relatively high initial investment requirements to establish an enterprise.

There is substantial regional variation in the structure of apprenticeship programs within Africa. Western African economies appear to have large and highly organized traditional apprenticeship programs within the craft and small enterprise sector (Gilpin and Grabe, 1972; Aryee, 1976; Callaway, 1973) while those in East Africa are more recent and less formalized (King, 1977). The method of instruction in all of the traditional apprentice systems consists of on the job training, and most of the programs reviewed include some form of trade test, the successful completion of which is a prerequisite for attainment of journeyman status.
A surprising finding of many of the enterprise surveys is the limited extent to which skills learned in the formal sector form the basis for subsequent investments in intermediate activities. In large measure owner/managers with experience and training in the modern sector are concentrated in modern small enterprises which are directly linked to the formal sector, either through subcontracting or by forward linkages. Where general surveys of the intermediate sector have been undertaken, less than ten percent of the respondents among small entrepreneurs indicated that their prior experience had been in modern, large scale industry (Gerry, 1974; Aryee, 1976b; van Dijk, 1978). Child's (1977) survey of small rural enterprises in Kenya reveals a substantially higher proportion of respondents originating in formal sector wage employment, but the structure of his sample is biased toward more modern small scale activities.

The levels of formal educational attainment among small business proprietors are quite modest, although as a group they reflect higher levels of formal education than the population in general. Estimates of the percentage of small scale entrepreneurs lacking formal education range from a low of 13 percent in Harris' (1971) sample of Nigerian enterprises to a high seventy-seven percent in Sierra Leone (Liedholm and Chuta, 1976). On average approximately one half of the proprietors surveyed had not achieved functional literacy (Child, 1977; Aryee, 1976b; Aluko, Oguntoye, and Afonsa, 1972; Marris and Somerset, 1972; van Dijh, 1976, 1978).

Utilization of technical training by small proprietors is similarly limited. Less than fifteen percent of the entrepreneurs surveyed in any of the studies had attended technical or vocational schools prior to establishing their enterprise (Aryee, 1976b; van Dijk, 1978; Gerry, 1976; Child, 1977). This limited access to technical training has caused several authors to question the applicability of existing programs of vocational education for small enterprises. In particular they note that high entrance requirements and the largely academic orientation of such programs preclude many potential entrepreneurs from entering vocational schools (Child, 1977; van Dijk, 1976; Gilpin and Grabe, 1972).

The picture which emerges from the data is of an intermediate sector characterized by quite low technical barriers to entry, where skill formation is largely concentrated in the apprenticeship programs of the individual trades. Owners of enterprises, particularly those which are the more traditional small scale activities, are craftsman-entrepreneurs, technically proficient in the manufacturing process but without extensive training in financial management or business organization.

Surveys of small firms universally find that the majority of entrepreneurs fail to keep even rudimentary financial records (Liedholm and Chuta, 1976; Kilby, 1962; Aryee, 1976b; van Dijk, 1978). The quality and extent of bookkeeping efforts appears to improve with size of firm (Marris and Somerset, 1971; Harris and Roe, 1966), but even for those firms maintaining some form of accounting system the records are frequently deficient and not regularly consulted as a management tool (Child, 1977; Kilby, 1962; Harris, 1970).
This phenomenon suggests a lack of experience with and training in compilation of numerical data. Anecdotal evidence indicates that managers of small firms were frequently surprised to learn that on the basis of data which they provided the cost of a specific activity exceeded the revenue generated (Child, 1977). The failure to apply financial management tools to the daily conduct of the business manifests itself in several observed characteristics of small firms. There is a tendency for more successful firms to be overcapitalized, particularly to maintain excessive stocks of raw materials (Child, 1977; Harper, 1975). In part these stocks are viewed as an outward manifestation of the firm's success, and recognition that inventories should be maintained at a level sufficient to insure an orderly flow of production does not appear to be widespread. Investment in equipment is similarly excessive or misdirected in a significant number of firms. Some of this investment is in equipment which is inappropriate to the firm's business, while other enterprises invest in machinery which they lack the skilled manpower to operate. 28/

More widespread than the tendency to hold excessive stocks or capital equipment is the failure of firms to separate business receipts and expenditures from household incomes. The incomplete isolation of enterprise from household accounts is particularly important in rural and artisanal enterprises where transfers between household and firm are commonplace and make financial accounting difficult (Badgley, 1978; van Dijk, 1978; Liedholm and Chuta, 1976).

Small firms frequently show very low standards of organization of the production process. Layout of machinery involves substantial duplication of effort in transporting materials between operations. Stocks are inadequately protected and subject to high rates of deterioration. Hand tools and machines are inadequately stored and maintained (Child, 1977; Badgley, 1978; Kilby, 1962; Liedholm and Chuta, 1976). The impact of these organizational deficiencies on the technical efficiency and profitability of the enterprise is apparently unrecognized by many small entrepreneurs.

Efforts to identify important entrepreneurial characteristics which are statistically associated with the growth or profitability of small enterprises have met with limited success. The studies do, however, provide some insights into the complex relationships between entrepreneurial attributes and the success of the enterprise.

The relationship between formal education and business success has been studied in the context of several African economies. Usually an index of profitability or a composite index of growth and profitability is regressed on the number of years of education of the proprietor or on a dummy variable indicating the presence of formal education. These studies consistently find weak and frequently negative relationships between formal education and entrepreneurial success (Child, 1977; van Dijk, 1978; Liedholm and Chuta, 1976; Harris, 1971; Nafziger, 1970; Kilby, 1969). When more precise definitions of educational attainment are employed, however, a more complex relationship between education and success of the enterprise begins to emerge. It appears
that functional literacy is positively correlated with the profitability of the small firm (Aryee, 1976b; Olakanpo, 1968). Those owners who are able to read and write to a middle school standard, a minimum level of functional literacy, show significantly better performance than illiterates. Education beyond the level of functional literacy, however, does not appear to contribute significantly to the profitability of the enterprise, and may in fact be correlated with poor entrepreneurial performance.

Such a relationship between education and performance is consistent with the role of the craftsman-entrepreneur in a small enterprise. Basic literacy and numeracy are essential to the efficient management of the firm but time spent in school beyond that level incurs an opportunity cost in terms of technical training foregone. Because the craftsman-entrepreneur supervises, and frequently engages in, production such technical training is essential to the success of the enterprise. Harris (1971) also suggests that formal education and basic ability may be inversely correlated in the intermediate sector. If the best students possessing high levels of formal education are absorbed into the public sector and large scale industry, only the least able are likely to turn to small scale businesses. Among the less well educated, brighter and more able individuals may be drawn to the intermediate sector as the best available alternative.

Because little is known about the growth of small enterprises, it is difficult to determine at what point lack of education on the part of the owner limits the size and growth of the firm. It is likely, however, that when the entrepreneur ceases to exercise direct supervision over the production process those managerial skills which can be acquired through formal training assume greater importance. Kilby (1969) notes that there is a positive correlation between formal education and the number of business activities undertaken by an entrepreneur. This suggests that diversification of enterprises requires different skills from those possessed by craftsman-entrepreneurs. Nafziger (1970) similarly asserts that lack of formal training, particularly in financial management, limits the size and complexity of small firms.

The relationship between profitability and experience is similarly complex. Liedholm and Chuta (1976) find a significant positive relationship between profitability and the age of the enterprise, while Child (1977) finds that those entrepreneurs in his sample who founded their firms without prior experience had significantly higher rates of return to capital than those with previous experience. Aryee (1976b) notes that entrepreneurs coming from families with similar enterprises are significantly more successful. In sum, the data are not sufficiently comparable or precise to allow a test of the significance of learning by doing in small enterprises.

Entrepreneurs who keep financial records are apparently more successful than those who do not. In those surveys which included questions regarding the presence of an accounting system, maintenance of financial records was positively and significantly correlated with the profitability of the enterprise (Liedholm and Chuta, 1976; van Dijk, 1978; Page, 1976).
Anecdotal evidence from several other surveys confirm the importance of financial data in determining the success of small firms, although the authors frequently stress the need for active use of records rather than simply presence of a bookkeeping system (Child, 1977; Badgley, 1978).

Several studies have noted a tendency on the part of small entrepreneurs to diversify their holdings of small scale activities rather than to reinvest profits in expanding a single enterprise (Kilby, 1962; Marris and Somerset, 1971; Harris, 1971; Child 1977). It has also been suggested that such growth by diversification is harmful in that it detracts from the owner/manager's attention to the efficiency of his initial investment. Where data exist on the patterns of diversification of investments the tendency appears to be for small investors to expand their holdings of real estate and to make new investments in commercial and trading activities. Such portfolio diversification appears to be a rational response on the part of small enterprise to a structure of incentives which penalizes firms for expanding to the point where they are noticed by public authorities and to the risk associated with investments in small scale manufacturing. In exchange control economies the covariance between profits in trading activities and small manufacturing may be negative. Thus diversification into trading is a mechanism for reducing the overall variability of returns.

The data on entrepreneurial characteristics and determinants of entrepreneurial success presented above unfortunately provide only indirect evidence on the role of the intermediate sector in augmenting the supply of managerial talent to the rest of the economy. To the extent that small enterprises are predominantly run by craftsman-entrepreneurs the types of skills acquired in the intermediate sector do not appear to be readily transferable to management of modern, large-scale enterprises. Lack of education and in particular the failure to acquire basic financial management and organizational skills may severely limit the size and complexity of firms. Other studies of entrepreneurship suggest that predominance of the craftsman-entrepreneur characterizes early stages of industrial development as small manufacturing firms grow out of the traditional crafts (Papanek, 1962, Wilson, 1955). These firms are eventually supplanted by enterprises owned by individuals with greater familiarity with market opportunities and with greater commercial and managerial experience. The African economies appear to be still in the early stage of entrepreneurial development, although there is scattered evidence that investments in small enterprises by entrepreneurs from commerce and the public sector are increasing.

A hitherto unexplored issue is the extent to which small enterprises may economize on the use of scarce managerial resources. Comparisons of the social efficiency of large and small firms have focused primarily on returns to capital and labor. Information bearing directly on the relationship between firm size and type of labor input is unavailable, but the anecdotal evidence suggests that the share of hired labor in technical, managerial and supervisory categories is higher for large, modern enterprises than for small firms. Moreover if managerial inputs could be specified in terms of efficiency-units reflecting the human capital content of various classes of
management large scale firms might be more management intensive than small enterprises. Thus the superior technical efficiency of large scale enterprises where observed may partly reflect more intensive use of scarce managerial and supervisory resources. In this three factor environment intermediate enterprises may define an efficient facet of the production surface.
VI. The Policy Environment

Small enterprises have, until quite recently, been largely neglected by policy makers in Africa. Industrialization efforts of the 1960's focused primarily on large scale, import substituting investment, and to the extent that small firms were an object of policy intervention, it was a consequence of indigenization efforts designed to increase the number of nationals engaged in retail trades, manufacturing, and services. Industrial and trade policies have, however, had important indirect impacts on the environment for small enterprises and have frequently discriminated against smaller firms. As a consequence of the revived interest in small scale producers during the 1970's a number of policy initiatives have been undertaken with the goal of promoting the development of the intermediate sector. These actions have been designed in part to mitigate the adverse effects of economy wide policies, for example in the market for capital, which have discriminated against small firms and in part to address directly specific problems of small scale production such as deficient organization and management.

Foreign Trade Regimes and Small Scale Production

A common problem of small scale enterprises in LDC's is inadequate access to intermediate inputs and spare parts which are imported. Foreign trade regimes which employ rationing systems for imports, coupled with overvaluation of the exchange rate, tend to favor large scale, modern enterprises which can exercise substantial political and economic power. Thus for example in Ghana where direct allocations of import licenses are made to large scale firms the structure of protection provides an implicit subsidy to direct importers. Small firms which are excluded from direct allocation of import licenses are subject to both higher prices of imported intermediates and greater uncertainty of supply (Steel, 1977). Even in circumstances where foreign exchange allocations are directly available to small firms, they remain at a disadvantage relative to larger scale enterprises due to their limited administrative resources and their consequent inability to undertake the protracted bureaucratic procedures required to obtain an import license. The direct solution to the problem is a shift from quantity to price rationing of importables. In the absence of such a change interventions should consist of encouraging associations of small manufacturers which could finance the staff required to deal with the exchange control regime. Bureaucratic support for such associations would be essential to insure their success. Without a sufficient allocation of input licenses such an organization could not mitigate the discriminatory effects of import rationing and would cease to function.

Even in those economies where direct controls are not employed, the structure of protection evolved in support of an import substitution strategy frequently discriminates against small firms. In Kenya, the Cameroon, and Sierra Leone, for example, small firms producing manufactured goods are not entitled to duty drawbacks on imported intermediates of the same scope and magnitude as large scale firms (Child, 1977; Wynne-Roberts, 1978; Liedholm
and Chuta, 1976). In countries where the legal entitlements are the same for all sizes of firm the problem of the inability of small firms to deal with the bureaucracy remains. It would not be surprising, therefore, to discover large scale enterprises receiving substantially higher rates of effective protection than small firms producing similar goods.

In the absence of rationalization of the structure of protection, perhaps the most appropriate course for governments seeking to promote small enterprises is to make incentive schemes uniformly applicable, and to streamline the procedures required for access to the incentive scheme. This would reduce the present degree of subsidy provided to large scale firms and the independence of smaller enterprises on their large scale competitors for imported inputs.

Credit Policies and the Capital Market

Government penchants for direct intervention and controls extend not only into the market for foreign exchange but also into the market for capital. Government policy in many African countries in the 1960's acted to suppress the real rate of interest for both deposits and loans from the banking system. Faced with competing demands from potential claimants in excess of the funds available, the banking system responded by rationing credit to traditional customers and by holding portfolios characterized by low risk of default. Venture capital for industrialization was provided to large scale firms via public sector loan windows, often at highly subsidized rates of interest, and small scale enterprises were excluded from the commercial credit market both by their higher level of risk and because of the greater unit costs of administering small loans.

Current policy initiatives in several countries appear intended to redress this bias against small enterprises by creating additional public lending institutions, by providing guarantees for a portion of commercial bank loans to small enterprises, and/or by reserving a portion of commercial bank funds for the exclusive use of the intermediate sector.

Where public lending institutions have been created to channel credit to the small enterprise sector, rates of interest have generally been similar to those charged to large scale enterprises. Credit rationing has led to the bulk of funds being allocated to the largest and most politically adept of the eligible recipients. Policies which reserve a portion of the loan portfolio of the commercial banks for the use of small enterprises appear to have resulted in a similar bias in favor of larger intermediate sector firms and in favor of commercial and trading firms rather than manufacturing enterprises (Steel, 1977, 1978; Child, 1977; World Bank, 1978; van Dijk, 1978).

To the extent that policies of providing credit to the intermediate sector result in rates of interest below the opportunity cost of capital, credit programs may bias the choice of technique by small firms toward greater capital intensity. This is particularly likely to occur where credit for the
purchase of capital equipment is available at subsidized rates, but where imported spare parts are either unavailable or carry substantial foreign exchange quota premia. Small firms have incentives in these circumstances to hold a relatively large capital stock as an inventory of spare parts and perhaps to depreciate their existing plant more rapidly. Both of these actions increase the ratio of capital services to labor, resulting in an upward bias in the capital intensity of small scale production.

Evidence on the scope for capital-labor substitution in small scale enterprises suggests that subsidizing credit will provide an incentive for small scale firms to move away from the labor intensive methods that constitute an important argument in favor of their promotion. Credit programs, therefore, are probably best focused on identifying those elements of lending to small firms which are characterized by private costs in excess of social costs, and intervention in those activities, rather than on providing credit at subsidized rates to the intermediate sector. Programs of general credit subsidies may give rise to the perverse phenomenon of capital intensive small enterprises.

**Africanization**

In many countries, particularly those with large expatriate populations, the promotion of small firms is viewed as an important vehicle for achieving greater Africanization of the economy. In this context programs of subsidized credit and other concessions to small enterprises are intended to facilitate transfer of ownership from foreign nationals to citizens. Discrimination against smaller non-African businesses has normally been accomplished by some form of licensing, reserving sectors or individual business activities for citizens. It is probably correct to argue that these policies were not intended for the promotion of the intermediate sector as a whole. Rather they were intended to improve the African business environment at the direct expense of alien enterprises. Indigenization programs involving the transfer of ownership of small enterprises have been important aspects of small enterprise promotion in Ghana, Kenya, Cameroon and Zaire and have affected both commercial and manufacturing enterprises. In economies at an earlier stage of development such as those of Malawi and Swaziland and the impact of Africanization on small enterprises has been confined largely to commerce and a limited number of crafts (Dinwiddy, 1974).

The goal of Africanization is, perhaps, principally a political one. The promotion of small businesses provides a mechanism for expanding participation in the industrial sector by citizens without at the same time restricting foreign investment or transferring ownership of existing large scale enterprises. Policies designed to promote African small business ownership, however, should be designed in conjunction with programs to promote the general growth and efficiency of the intermediate sector. Where ownership becomes the paramount goal there is an almost irresistible tendency for policymakers to select "targets of opportunity," sectors where direct alterations in the structure of ownership can be achieved with relative ease, and to employ policy instruments such as subsidized credit or creation of industrial estates, which may have detrimental impacts on the growth and efficiency of the intermediate sector as a whole.
Legal Constraints on Small Enterprise Development

A number of legal institutions, many of them apparently holdovers from colonial administrations, appear to discriminate against the development of intermediate sector enterprises. Among these are zoning regulations, registration and business licensing requirements, quality, health, and safety standards, and methods of taxation.

Zoning regulations tend to impact particularly severely on small enterprises because of the limited geographic nature of their markets. In Cairo, for example, efforts to relocate existing small enterprises away from the central city in industrial estates have met with limited success, and have tended to favor larger firms (World Bank, 1977a). In addition inconsistent and arbitrary application of zoning regulations discriminate against firms which are unable to make extra-legal payments to the enforcing authorities (Child, 1977; King, 1977). Exclusion of small firms from certain urban areas is essential where verifiable health and safety hazards exist, but the sense of most authors reviewing the evidence on zoning regulations in African cities is that existing restrictions reflect aesthetic rather than health or safety concerns. 31/

Registration requirements for small firms are similarly problematic in most African economies. Small enterprises in general fail to register with public authorities, partly due to an inability to deal with the bureaucratic requirements and partly out of a desire to avoid tax liability. In the Francophone countries of West Africa registration requirements appear to be uniform throughout the country for small and artisanal enterprises, and the consequences of failure to register impact primarily on delivery of assistance to small firms (Badgley, 1977; van Dijk, 1976, 1978). In the Anglophone areas greater local autonomy exists in terms of registration and licensing. The consequences of this practice are substantial variations in requirements and fees from region to region within each country and increased scope for haphazard and discriminatory enforcement of regulations (Child, 1977; Steel, 1977, 1978). The appropriate policy response is for authorities to simplify and make uniform registration procedures. Enforcement of health, safety, and taxation regulations might also be separated from registration (Child, 1978).

Child (1977, 1978) has argued that product quality standards enforced in many developing countries discriminate against small firms. Quality standards may be relevant to an economy which is attempting to penetrate export markets, but for the range of goods presently produced by the majority of small manufacturing enterprises in Africa, legal quality standards reflecting more than adequate health and safety requirements will discriminate against small enterprises development.
Tax avoidance and evasion are endemic to small firms in Africa. Although the complexity of profits and business tax schemes varies across countries, most smaller firms fail to pay some or all of their tax liability. Moreover, because most intermediate sector enterprises do not maintain accounts, application of the tax laws is difficult and subject to substantial discretion on the part of enforcing authorities. Since the possibilities for tax evasion decline as firms become larger and more visible, the present structure of taxation in most African countries may discriminate against artisanal firms developing into small and medium enterprises. Such firms would not be large or administratively sophisticated enough to qualify for the credits and tax holidays available to formal sector enterprises, but they would be too visible to avoid taxes. The structure of taxation may, therefore, partly explain the observed tendency for successful small entrepreneurs to diversify into several small enterprises, rather than to increase the scale of their initial investment.

Providing Infrastructure for Small Enterprises

Among the policies directed specifically at the intermediate sector one of the most popular has been the provision of infrastructure, principally in the form of industrial estates. Programs vary in scope and sophistication from the Kenya Industrial Estates, Rural Industrial Development Centers with their extension staffs and demonstration shops (Child, 1977; World Bank, 1977) to the simple designation of certain areas within Ghanaian cities for the exclusive use of specific crafts (Checci, 1977; Aryee, 1976a).

The appropriateness of industrial estates as a means of small enterprise promotion is open to question. Particularly where the estates involve major investments in buildings and machinery their impact has been to raise the capital intensity of small enterprise investments located in the estate significantly above the average for small firms producing similar products and close to the capital-labor ratio of large scale enterprises (Steel, 1978). The limited funds available for infrastructural investment in most African economies are perhaps better directed toward general infrastructure.

Managerial and Technical Training and Extension

An area with great promise for successful public intervention in the intermediate sector is the provision of managerial and technical training. Entrepreneurs and managers of small enterprises frequently lack experience or formal training in either the technical or financial management of their enterprise and often lack basic literacy.

Present programs of extension and managerial training, however, are limited in their ability to reach small firms both by lack of adequate personnel and by the relatively high standards of educational attainment required as prerequisites. Most management training programs presently operating in Africa exist in fixed locations to which students must travel for training. Small entrepreneurs are less able to take time off from their business for
off premises training and therefore frequently fail to utilize existing opportunities. In addition the techniques demonstrated by managerial training centers are too sophisticated for smaller enterprises or presuppose literacy and numeracy skills not found among small entrepreneurs (Child, 1977; Aryee, 1976b; Badgeley, 1978).

The alternative, extension training on the firm's premises, requires personnel and resources currently unavailable to most small enterprise promotion programs. But, for teaching basic skills in bookkeeping, inventory control, or layout, highly trained instructors may not be essential. Child (1978) reports on the success of an extension scheme in Kenya using high school graduates with limited training in business practices. Extension schemes linked to industrial estates, such as the Kenya Rural Industrial Development Centers, have had some measure of success also, but their scope is necessarily limited to the tenants of the estates.

Given the importance of functional literacy to entrepreneurial efficiency, national education policies may have important long run impacts on small enterprise development. Educational strategies which focus on providing universal basic literacy and numerical skills should raise the technical efficiency of small firms.
FOOTNOTES

1. See for example Pack (1978) or White (1978) for evidence on this issue.

2. Steel (1979c) attempts to provide a functional definition of firm size based on barriers to entry.

3. Within the small scale sector individual industries exhibit very different spatial patterns of marketing. Tailors, cobbiers, and furniture makers have much more localized markets for their products than do modern metal products manufacturers for example. For limited evidence on the structure of markets by type of enterprise see Liedholm and Chuta (1976), Calloway (1973) and Aryee (1976a).

4. Although the demand for such products will decline, it is possible that some firms will modify their output to adapt to the changing structure of demand. Staley and Morse (1965) also make the point that when particular lines of small manufacturing activity become superseded, new outlets for the highly mobile capital stock of these firms are often found in small scale service, repair and installation activities.

5. On the historical development of forward linked small enterprises in Japan see Shinohara (1968) and Kaneda (1978). Ho (1978) presents similar evidence on the evolution of small enterprises in Korea and Taiwan.

6. Page (1975) noted that the development of small specialty firms providing inputs into Ghana’s timber export industry was largely a consequence of skilled workers leaving large scale employment and establishing their own enterprises.

7. Johnston and Kilby (1975, Ch. 7, 8) summarize evidence on linkages between the agricultural sector and rural industry. Child and Kaneda (1975) discuss the importance of forward linkages to agriculture for the development of Pakistan’s small scale engineering industry. Anderson and Leiserson (1978) review the evidence on rural non farm employment and reach similar conclusions on the significance to agriculture-industry interactions.

8. Studies of rice production and processing in West Africa include Monke (1978), Tuluy (1978), and Humphreys (1978), all of which conclude that small scale hullers are increasing in number in response to major increases in rice output.

9. On these arrangements see Badgley (1978), van Dijk (1976). On a similar scheme in Ghana see Aryee (1976a).
10. In part, this ambiguity is due to a wide range of conflicting definitions. The terms technical, managerial, and X-efficiency have been used interchangeably in the literature. In a recent contribution, Liebenstein (1977) argues that what we call technical efficiency is in fact a manifestation of X-efficiency. Pack (1974) differentiates between "technical efficiency" which arises from firms' access to technology and "X-efficiency" which he associates with the quality of management. In fact, as we shall argue below, each of these definitions is one component of measured technical efficiency. The significance of each component is an empirical question which has not been adequately answered by the literature on small enterprises.

11. The potential for reduction in technical efficiency incident to subsidy programs rests on a similar argument to that linking X-inefficiency with monopoly and protection. For a review of that literature and an analysis of X-efficiency effects of protection see Martin (1978).

12. If the assumptions of linear homogeneity and homotheticity are relaxed it will also be impossible to represent the frontier production function by a single isoquant. The results of relaxing these assumptions are qualitatively similar to those discussed in the text for the case of differing production possibilities.

13. The problem of vertical integration is particularly relevant when marketing and distribution costs differ among size classes of enterprises. When markets are not well integrated spatially the optimum technique for production cum distribution may differ from the optimum production technique alone. Spencer et al. (1976) provide an empirical study of choice of technique including distribution costs for rice processing in Sierra Leone. High distribution and assembly costs were found to favor small scale local processing activities. Anderson and Lieserson (1978) make a similar point.

14. For evidence on the factor intensities of product groups see Morawetz (1974) and White (1978). Infrastructural investments and investments in utilities are concentrated wholly in the large scale sector. Including their assets in the definition of large scale industry biases the aggregate capital labor ratio upward.

15. Generally only the privately optimal technique, based on market prices is identified. It is possible, however, to use accounting prices to identify socially optimal techniques using the same method. See, for example, Forsyth (1977) and Page (1978).

16. That is at constant factor price ratios, factor intensities alter with scale. In terms of the isoquant map the income-expenditure ray in capital and labor space is not a straight line.

17. Indeed for some of the processes studied capital intensive techniques dominate at any wage rental ratio.
18. Liedholm and Chuta estimate CES production functions for industries in their sample and are unable to reject the hypothesis of unitary elasticity of substitution in any industry.

19. White (1978) reviewing a more extensive body of evidence on the relationship between small and large enterprises reaches a similar conclusion.

20. Steel (1977), Child (1977) and the World Bank (1978) have argued that this is precisely the situation in Ghana, Kenya and Zaire respectively.

21. Page (1974) reports on a situation in Ghana's furniture manufacturing industry in which smaller firms had captured an increasing share of a declining market and had higher utilization rates than their large scale competitors.


23. See for example World Bank (1977a, b) van Dijk (1976), Byerlee et al (1979), and Steel (1978).

24. It is also possible, however, that lower wage rates of unskilled labor may reflect differences in quality, in which case wage differentials are not evidence of labor market segmentation.

25. For a recent survey of labor market performance in LDC's see Berry and Sabot (1977).

26. Steel has elaborated a multisector model based upon these assumptions in Steel and Tagaki (1978).

27. Such inferences are subject to the same type of error as arbitrary adjustment of market prices in social cost benefit analysis. If for example the relationship between social welfare and the shadow wage rental ratio takes a strictly concave, single peaked form, arbitrary adjustment of the market factor price ratio in the "appropriate" direction may lead to approval of welfare reducing investments. Estimates of the magnitude of domestic distortions as well as a feeling for their direction are essential before making inferences concerning the social efficiency of investments.

28. Child (1977) presents a number of interesting anecdotes concerning the tendency for small firms in Kenya to engage in "non-economic" behavior.

29. Marris and Somerset (1971, pp. 122-126) and Kilby (1969, p. 338) both argue along these lines.

30. Page (1978) reports on a scheme of subsidized credit to small logging firms in Ghana which led to higher capital intensity among those enterprises than for the industry as a whole, despite a positive engineering relationship between firm size and capital intensity.

32. The World Bank (1977b) reporting on the capital intensity of small enterprises built as part of an industrial estate in Upper Volta cites a capital stock/labor ratio of US$9100 per worker. This can be contrasted Child's (1977) aggregate capital-labor ratio for firms in his small enterprise sample of $667 per worker.
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