ENTREPRENEURIAL PATTERNS IN THE NIGERIAN SAWMILLING INDUSTRY

by

J. R. HARRIS AND M. P. ROWE

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ENTREPRENEURIAL PATTERNS IN THE NIGERIAN SAWMILLING INDUSTRY

WE have been engaged during the last year in a study of indigenous industrial entrepreneurship. To date, over 200 firms with more than 10 employees have been interviewed.

The sawmilling, furniture, printing, rubber processing, singlet making, tailoring, and baking industries were selected as having substantial indigenous participation, being found in all regions of Nigeria, and having a wide range of firm sizes.

This paper reports our findings for one such industry—sawmilling. It has been selected for presentation because it is one of the largest and most important industries, has a large number and percentage of indigenously owned firms, and presents an opportunity for a study of the development of and obstacles to expansion of entrepreneurial capacity in modern industry.

The paper is divided into five principal parts: (*i*) The structure of the industry; (*ii*) The structure of the individual firms; (*iii*) The entrepreneurs; (*iv*) Growth of the firms; and (*v*) Conclusions.

I. THE STRUCTURE OF THE INDUSTRY

Timber, one of Nigeria's most important natural resources, is extracted from the forests as logs which are used in a number of ways. Table I (1) shows the various uses in 1962.

Thus we see that over 61% of Nigerian timber is converted to sawn lumber. A large portion of this conversion is undertaken by the rather primitive technique of pit sawing using only hand tools. Much of the pit-sawn timber is later re-sawn by power-driven circular saws in the plank

TABLE I (1)

Uses of Nigerian Timber in 1962

Use	*Quantity of Input (million cu.ft.)*	*% of Total*
Pit Sawn Timber[1]	10.9	23.6
Mill Sawn Timber[2]	17.5	37.6
Plywood[3]	1.9	4.0
Round Logs Exported[4]	16.2	34.8

Sources:
1. Lawrence Okigbo: *Sawmill Industry in Nigeria*, Federal Department of Forest Research, Ibadan, 1964 (Table 4). This estimate is considered by some authorities to be very low.
2. Okigbo, op. cit., Table 11.
3. *Annual Abstract of Statistics, 1964*, Federal Office of Statistics, Lagos. Table 8.16 using Okigbo's Conversion Factor of .14 (p.15).
4. *Annual Abstract of Statistics, 1964*. Table 8.16

markets. The portion included as "mill-sawn timber" is primary conversion of logs to lumber by modern power-driven saws.

Of the sawn timber, some 2.46 million cubic feet was exported in 1962 (2.7 m. cw.ft in 1963). This amounted to 28% of the mill-sawn timber—none of the pit-sawn is exported. One firm, The African Timber and Plywood Company accounts for 72% of the exported sawn timber (Okigbo, p. 24). The balance of the sawn timber, some 9.56 million cubic feet, is sold in the local markets.

Of the exported lumber, about one-third is of utility grade soft woods; about two-thirds furniture-type hard woods. It is a constant struggle for the smaller firms to maintain export quality even for the soft woods. The export market for seasoned, graded lumber is as yet largely untapped. Mill improvements and expansion in output could easily double present export earnings on lumber while retaining the employment benefits and profits from milling in Nigeria.

Turning to lumber for the domestic market it may be said that the bulk of what is sold is imperfectly cut; the slicing lines are rarely level and drying is haphazard at best. Pitsawing produces an even less regular product.

No organized system of stacking or timing in-and-out of lumber was found by us in any mill producing exclusively for the local market. Yard arrangement, the scarcity of land and lack of knowledge militate against even rain protection. Consequently, the lumber available for local joinery and building is costly to plane and finish and if not stored for additional seasoning is subject to warping.

Okigbo estimates that the principal consuming sectors are: "Housing, eighty per cent; Furniture, ten per cent; Bridges, two per cent; Boat yards, 0.5 per cent; Coffins, two per cent; others, 5.5 per cent" (p. 26). Inquiries among furniture makers and builders demonstrate a substantial market for dried, properly cut and reliably graded lumber of all sizes, including non-exportable short cuts.

Supplies of Timber

Okigbo has pointed out very clearly that Nigeria's merchantable timber reserves are limited. At present about 50% of the total cut is thought to come from free areas, so that as the free areas are progressively turned into farm land over the next 20-25 years the total cut from Reserves will have to double, to maintain log supplies at their present rate. This is a matter of great concern.

This paper can only serve to summarize some of the possibilities for ensuring log supplies for local millers. These are:

1. Diversion of some logs from export to local milling as wastage and quality controls improve local milling profitability.
2. Diversion of some logs from pitsawing to bandsawing; as logging control and increasing sophistication of lumber purchasers mean a drop both in supply and demand for pitsawyers.

3. Changes in cutting cycle from 100 years to 50 years for some species.
4. Changes in markets here and abroad to accommodate the commercial sale of perhaps 10-30 species now "unknown" to the markets.
5. Improve Reserve and non-Reserve practices to reduce illegal logging and preserve and thereby some wasteful practices.
6. Exert greater control or suasion over non-Reserve area logging, so that ultimate conversion of these areas into farm land will at least occur intentionally, with as littlewaste as possible.
7. Further research on plantations of swift-growing tropical hard woods, and especially valuable woods like teak, to enlarge the future supplies of valuable timbers.

Real progress along all of these lines might be expected to *increase* the supply of timber available in the next ten years to local sawmillers. Combined with an effective decrease in wastage from all improved practices of 5-10[1], and an increase in production quality, this industry should be expected to become definitely more profitable to Nigeria.

The Federal Office of Statistics presents data for 45 sawmills with over ten employees which were included in the *1962 Industrial Survey*. Sawmilling ranked fourth out of the 37 industries covered in number of firms (Motors Vehicle Repairs, Printing and Publishing, and Furniture each had more). In terms of employment sawmilling, with 8,786 workers, ranked first and had a value added of £4,733,000 which was second only to miscellaneous Food Products. Table I(2) shows a regional breakdown of the information from the Industrial Survey.

TABLE I (2)

Regional Distribution of Sawmills (in 1962)

Region	*No. of Sawmills*	*Employment*	*Value Added*
Lagos	14	936	£ 16,914
West	17	2,002	402,297
Mid-West	8	4,963	4,079,870
East	3	763	63,805
North	3	122	16,914
	45	8,786	£4,733,000

Source: Industrial Survey of Nigeria, 1962, Federal Office of Statistics, Lagos. Tables 1, 6, 11, 16, 21 & 26.

This clearly shows the concentration of sawmills in the West, Lagos, and the Mid-West. Both employment and value figures for the Mid-West are dominated by the largest firm in the industry—African Timber and Plywood Company, Sapele.

It is clear that this survey represents a considerable underestimate of the number of sawmills. In July 1963 Okigbo compiled a comprehensive list of all sawmills using power-driven saws (re-sawing operations were eliminated while mills with less than ten employees were included). Table I (3) presents his findings.

[1] Wastage will decrease as pitsawing declines and product quality should improve sharply.

TABLE I (3)

Regional Distribution of Sawmills (1963)

Region	*No. of Sawmills*	*Employment*	*Log Input (cu.ft. per year)*
Lagos	30	502	4,291,940
West	28	1,168	4,852,048
Mid-West	10	1,245	6,267,973
East	8	442	1,727,150
North	4	68	365,140
	80	3,425	17,504,251

Source: Okigbo, op. cit., Tables 7 and 11.

At first sight it is difficult to reconcile Tables 2 and 3. Although Okigbo finds almost twice as many mills, he reports less than half as much employment. At least part of the explanation for the larger number of mills in Table I(3) is that some mills are included which have less than 10 employees. These were excluded from the Industrial Survey. One reason for the fewer number of reported employees in the Okigbo study is that he eliminated any employees engaged in logging operations or plywood manufacture while these are included in the total employment of the firms in the *Industrial Survey* (this would eliminate approximately 2000 employees from African Timber and Plywood Co. alone). Furthermore, Okigbo reports only permanent staff although daily paid workers form the most important part of the work force in the indigenous part of this industry. Finally, the years 1961-62 were very much "better" years than 1963. A fairly clear picture emerges of sawmilling as a major Nigerian industry concentrated in the Mid-West, West and Lagos employing a relatively large number of Nigerians.

Okigbo also classified sawmills according to size, as measured by production. This table is reproduced below as Table I(4)

TABLE I (4)

Classification of Sawmills by Size

Firm Size	*Production Range (cu.ft. per year)*	*Number of Mill Units*	*% of Total Mills*
Very Large	100,000 and over	16	20
Large	20—100,000	48	60
Medium	10—20,000	7	9
Small	5—10,000	4	5
Very Small	under 5,000	5	6
Total		80	100

Source: Okigbo, op. cit., Table 12.

The majority of the sawmills he surveyed fell into the "large" category which represent employment of approximately 25 to 100 people in each.

One of the factors that makes the sawmilling industry interesting for the purposes of this study is the high degree of Nigerian participation. Unfortunately, Okigbo does not indicate the ownership of the mills, but our analysis reveals the following breakdown.

TABLE I(5)

Ownership of Sawmills (1963)

Region	*Expatriate*	*Indigenous*	*Total*
Lagos	4	24	30
West	1	29	28
Mid-West	4	6	10
East	4	3	7
North	4	–	4
Total	17	62	79

With the exception of the mills in the North and Lagos, all of the expatriate-owned mills fall into the largest size category. Of the twelve mills exporting sawn timber listed by Okigbo (Appendix 4), six are indigenously owned but account for only 8.5% of the exported sawn timber.

There are three main patterns of sawmilling activity in Nigeria. The first, is an adjunct to the export of logs. Firms in the timber trade find themselves with stocks of logs on hand that fail to meet export requirements. Hence, the conversion of these logs into lumber for the local market represents the best possible use for these otherwise unsalable logs. Recent improvements in forestry management practices have forced loggers to remove a greater number of species from their concession areas. Many of these species find no ready export market and so are converted to lumber for local use. Also, ownership of a sawmill has become virtually a requirement for the granting of additional timber concessions in the Mid-West. Clearly, with these firms, sawmilling is of secondary interest to the primary business of extracting and exporting logs but it can prove to be a profitable part of an integrated business. These firms are located principally in the Mid-West and in Ondo Province of the Western Region—the principal sources of logs.

The second category of mill is solely engaged in sawing for local markets. Most often owners of logs hire these mills to do sawing on contract at a fixed charge per cubic foot of timber to be sawn. These mills are concentrated in the Lagos, Ijebu, Abeokuta, Ibadan, Ife, Onitsha, and Port Harcourt areas—the principal markets for lumber.

The third category of mill is engaged in sawing for export. In order to compete in export markets lumber must be sawn to grade, properly dried and in some cases, treated against stain and insects. Sawing to grade requires considerably more skill and precision than is common in sawing for the local markets and drying requires either kilns or carrying a stock of lumber for an extended period while air drying is taking place. This export trade, however, is potentially more lucrative than sawing exclusively for local markets. These mills also supply the local market with non-exportable species and subgrade lumber as well as with short lengths and narrow widths which cannot be exported.

The technology of sawmilling in Nigeria is relatively simple. A bandsaw is used to slice the log into pieces of the appropriate thickness, then a small circular saw is used to trim the plank to the appropriate width and length. In larger mills more elaborate equipment may be utilized—the band mill may

during the rainy season when construction activity virtually ceases. Mills producing for the local market cut back to a skeleton crew on one shift, or may even close down entirely for a couple of months, although mills producing for export try to stockpile a large number of logs at the end of the dry season and continue normal production throughout the year. During the dry season, most mills which have electric lights work one and a half or two shifts.

The key requirements of management are the securing of an adequate supply of logs, finding markets for the lumber, supervising production to maintain quality of cut and a steady flow of work through the mill, insuring that proper machine maintenance and saw sharpening is performed, and preventing pilfering.

We should now have a fair picture of the nature and requirements of the sawmilling industry in Nigeria. The balance of this paper will present the findings of our detailed interviews with 59 Nigerian-owned sawmills. Table I(7) shows the regional distribution of these mills and Table I(8) shows the distribution by size of firm.

TABLE I (7)

Regional Distribution of Sawmills Interviewed

Region	*No. of Mills*	*% of Total*
Lagos	22	37
West	25	42
Mid-West	8	14
East	4	7
North	0	0
Total	59	100

TABLE I (8)

Distribution of Sawmills by Number of Employees

Size of Mill	*No. of Mills*	*% of Total*
Less than 10	2	3
10—24	27	46
25—49	15	25
50—99	15	26
Total	59	100

This list includes all but two of the known Nigerian-owned sawmills in 1965 with over ten employees in Lagos and the Mid-West, all in the East and all but four in the Western Region. Those mill owners which were omitted were inaccessible and attempts are being made to get data from these mills by mail and 1966 interview. There are no Nigerian-owned sawmills with over ten employees in the Northern Region. It is not believed that the ommissions seriously bias the findings.

Turnover among indigenous firms has been very high. Okigbo reports 21 firms extant in 1946, no one of which appeared in our survey, although some few may have reorganized under new management. In the Lagos area, some five firms have disappeared and six new ones appeared in the last 18-24 months. This high turnover may be explained by the instability of indigenous

partnerships, ordinary business failure and the slow spread of understanding about the values of incorporation. Turnover and/or attrition in coming years is likely to be extremely high, as modern business and technological practices among a few firms force the majority out of business.

Whereas heretofore the 3-shift modern AT and P complex has co-existed happily with a large number of small firms (many serving heretofore far away markets), the least able firms are now already suffering severely from competition for logs and customers.

II. THE FIRMS IN 1965

The geographical distribution of firms classified by size is given in Table II(1)

TABLE II (1)

Location of Firms According to Number of Employees

	Number of Employees			
Province	*Less than 25*	*25–49*	*50–100*	*Total*
Lagos	15	4	3	22
W.R. Ijebu	6		1	7
W.R. Abeokuta	3	1	1	5
W.R. Ibadan	1	2	1	4
W.R. Oyo (E)	2	2		4
W.R. Ondo	1	1	3	5
M.W. Benin	1	2	2	5
M.W. Delta		2	1	3
East*		1	3	4
Total	29	15	15	59

* The four firms in the East were distributed one each in Onitsha, Enugu, Owerri, and Port Harcourt Provinces.

One sees from this table that the proportion of smaller mills is greater in Lagos, Ijebu, Abeokuta and Oyo (East) Provinces while larger mills predominate in Ibadan and Ondo Provinces, the Mid-West and East. The former group are almost exclusively sawing logs on contract for dealers, while the latter are mostly cutting their own logs. The table understates the difference in sizes of *firms* as the employees in sawmilling represent only about one-third to one-half of the employees in firms that are also extracting logs. Every attempt was made to separate out the number of employees actually employed in the sawmill; workers in extraction were treated as being employed in another business of the same owner.

Four expatriate mills were also visited, but are not reported in this study. Their employees in sawmilling were 90,120,165, and 900 respectively. In addition, one of the sawmills reported above is a 50-50 joint venture between Nigerian and expatriate interests. The Nigerians started the firm and then invited the expatriate to contribute capital and management when they encountered difficulty. The point to be made is that the Nigerian firms tend to be smaller than the expatriate firms.

Table II (2) shows the distribution of firms in the study by organizational form.

This table shows clearly the preponderance of proprietorships and partnerships in the Nigerian sawmilling industry. The majority of the Private Limited Companies are also in effect proprietorships as they are closely held as family businesses. About half of the firms have more than 25 employees, more than

TABLE II (2)

Form of Business Organization

Form	*Frequency*	%
Proprietorship	37	62.7
Partnership	11	18.6
Private Limited Company	10	17.0
Public Limited Company	1	1.7
Total	59	100.0

Other measures of size of firm are value of assets and annual turnover which are presented in Tables II (3) and II (4).

TABLE II (3)

Distribution of Firms by Value of Assets

	Less than £5,000	*£5,100–£10,000*	*£10,100–£20,000*	*£20,100–£50,000*	*Over £50,000*
Number of Firms	14	18	11	10	6

TABLE II (4)

Distribution of Firms by Annual Turnover

	No Response	*Less than £1000*	*£1,000–£5,000*	*£5,100–£10,000*	*£10,100–£20,000*	*£20,100–£50,000*	*Over £50,000*
Number of Firms	4	2	26	11	8	5	3

£10,000 in assets and over £5,000 in annual turnover (the turnover data are the weakest).

Of the 59 sawmills, only six were engaged in the export of sawn lumber although many others were exporting logs. As mentioned earlier, sawing for export is demanding in control of quality and requires an ability to fill rather large orders in a reasonable time. Because of this, and relatively high costs, Nigerian timber men prefer to sell logs overseas and make sure profits rather than undertake sawing.

Table II (5) shows the responses to the question: What were the principal obstacles encountered in building up the businesses?

TABLE II (5)

Principal Obstacles Encountered (multiple response)

Response	*Number*
Supply of Logs	35
Marketing	20
Trouble with machinery	16
Lack of funds	13
Lack of management	8
Lack of technical personnel	3
Others	2
Total	97

It is interesting to note that supply of logs and marketing were the two most mentioned problems. Actually, the two problems merge in the case of mills sawing on contract. It is entirely consistent with our observation that demand is the most serious problem facing the industry today.

Our investigation indicates that the average miller catering to the local market spends half of each working day in finding customers and/or finding contracts for his customers.

Among his possible ultimate consumers are:

(1) Government and quasi-Government agencies. Some contracts go out on tender and some tenders are awarded on merit. Many contracts (particularly in Lagos) go out through "middle women". The economic service to the community performed by middle-women is difficult to assess. The millers as a whole resent the system; whether they could co-operate openly to destroy that system by arranging to fill large contracts reliably is moot. The present system perpetuates the "award" of contracts on a personal rather than merit basis.

(2) Large builders and contractors. The economics of private business militates for award of contracts on merit and the trend is in this direction. Personal contacts and "Long legs" still go far to facilitate marketing. Most lumber goes into construction (page 3) although it is not clear whether more lumber is sold to contractors or Government. Most large contractors pay higher prices to expatriate mills for lumber in order to ensure uniform quality. Others own their own mills.

(3) Plank traders who sell to the North and Dahomey. Little is known about this rather important marketing channel.

(4) Furniture makers, small builders and joiners. Many of these contracts are very small. Women timber contractors supply many of these users; many buy directly from millers.

Marketing, for the Nigerian sawmillers, is in many ways characteristic of traditional Nigerian distribution. It seems likely that improved grading, a better tender system, better transport and communications will increase the present competitive pressure. The industry seems "ripe" for modern lumber

marketing and it is probable that a few modern mills will seize the major share of the market in the future.

The only promotional efforts in the local market indicated by our millers was personal contact. They were asked for the reasons for customers, preference. A summary of the responses is given in Table II(6).

TABLE II (6)

Why do Customers Come to You? (multiple response)

Response	*Frequency*
Good Quality	31
They know me	30
Can finish work quickly	15
Can take large orders	8
Gives Credit	6
Can store work	6
They trust me	5
Advertising (courtesy cards)	5
Gives delivery	3
Keeps promises (delivery date, etc.)	2
Low price	1
Total responses	112

It is interesting that quality was the most frequently mentioned reason for attracting customers. We could find little difference in quality between mills although each owner maintained that his cuts were more level etc. The rest of the answers stressed personal contact or service. Only one mill indicated that it offered lower prices. Certainly, competition on a price-cutting basis is almost unheard-of at this time. Any town with more than two sawmills seems to have an association or agreement to charge uniform prices. There is some indication, however, in Lagos that there have been some offers of lower quality lumber at a lower price which seems to have been somewhat successful. Where grading practices and quality control are little known Gresham's Law applies also to timber quality. This, of course, is a feature of the Nigerian market for many goods.

The sawmillers seemed to have relatively little awareness of competitor's activity. When asked if their competitors had any advantages over them, some 57% of those responding indicated there were none, while the next most frequent response was by 14% who thought some competitors had more political influence.

This competitive attitude of "Live and let live" despite limited markets and log supply has encouraged the spread of many more mills than are economically justified. Okigbo estimates that the installed capacity of sawmills was about twice that of the annual supply of non-exported timber (Table 11, p. 28). He concluded: "But were the mills to perform at their maximum capacities more than 15,000,000 cu. ft. of logs will be required. This means that the forests must be able to produce over twice their present rate. It is doubtful that they can" (pp. 28-29). A brief discussion of measures that could be taken to increase the supply of timber was contained in the previous section (p. 4).

All sawmillers were anxious to have a reliable source of supply of logs. Each wants allocation of timber reserve areas. Two problems arise in this respect. First, there are insufficient reserve areas to satisfy all of the claims. Secondly, the allocation of reserves is tied up in politics.

Many of the concessions are obtained by individuals who have no means of working them, but lease them in turn to expatriate or indigenous timber contractors. This raises the cost of timber concessions to those operating them and gives an advantage to those favoured firms which obtain concessions directly. The presence of such a margin of profit accruing to individuals who are providing no economic service means that the government could derive more revenue from the concessions or that Nigerian timber could be more competitive in world markets. The whole system of forest allocation cries out for rationalization.

We made a rough estimate of capacity utilization in the industry. Our measure of capacity was 24-hour use of the bandmill. Most of the firms work a single shift plus some overtime or, in a few cases, two shifts during the dry season, and reduce to a single shift or shutdown in the rainy season. We tried to estimate the utilization at the busy time of the year only. Table II(7) shows the results of this estimate.

Although there seems to be a weak relationship between size and utilization (a higher proportion of firms in the 50-99 category operate above 25% utilization than of the firms with less than 25 employees) it does not reach any acceptable level of significance when a Chi-Square test for association is applied.

TABLE II (7)

Capacity Utilization of Sawmills Classified by No. of Employees

	No. of Employees			
% of Capacity Utilized	*Less than 25*	*25—49*	*50—99*	*Total*
Less than 10%	2	1	1	4
11—25%	16	5	4	25
26—50%	10	8	9	27
51—75%	1	1	1	3
Total	29	15	15	59

Only three of the 59 sawmills were rated as operating above 50% of capacity. These were regularly running two shifts at reasonable efficiency. Almost half of the mills were below 25% utilization. Actually, our estimates overstate the degree of utilization because we measured it primarily by the number of hours per day it was in operation. Okigbo did a measure of efficiency on sawmills (efficiency being the proportion of time that the saw was actually cutting) and found a range of between 5.5% and 90%; 52% of the mills were below 50% and only 6% above 70%. Hence, it is probably safe to assume that most Nigerian sawmills are producing only about 10-20% of the lumber that the installed machines are capable of producing.

When asked their reasons for not working more shifts the millers gave the reasons indicated in Table II(8).

TABLE II(8)

Reasons for not working additional Shifts (multiple response)

Reason	*Frequency*
Material supply inadequate	47
Lack of demand	39
Trouble with machines	22
Managerial problems	6
Others	10
Planning to add another shift immediately	2
Total	126

These responses again reinforced the conclusion reached previously that there are a larger number of sawmills than can be justified in terms of supply of logs and demand for lumber. The response concerning trouble with machines and managerial problems are again part of a single problem—management. A lack of capable and trustworthy managers makes the owner fear that there will be a widespread pilferage and neglect of maintenance when he is not present. This is largely the fault, however, of the entrepreneurs themselves. They do not, for the most part, understand how to delegate authority and yet keep control (which is the essence of management) and they have made little effort to train supervisors and managers. Out of the 59 mills only 13 had any training at all for foremen or managers while nine had no training schemes for any workers (the majority have apprentice saw doctors and machine operators). Owners are furthermore not willing to pay a sufficient salary to attract competent Nigerian managers. The salary of Nigerian managers in these mills ranged mainly between £12 and £40 per month. An exception was one of the most successful and large mills which paid a manager £70 per month. Yet, mills hire expatriate managers (three of them had expatriate managers) with salaries above £200 per month plus benefits such as houses and cars. We are convinced that good Nigerian managers can be found in the expatriate firms and government but a sufficiently attractive salary must be paid.

Within the firms, the owner, partners, or managing director reserved the decision-making authority for investment and financial decisions, while decisions with respect to sales, production, and hiring employees were in a few cases delegated to managers or foremen. The vast majority of the sawmills are truly one-man businesses.

The general standard of financial management is low. Ten of the firms kept no books at all; another 30, only rudimentary cash in-and-out books. No annual summaries of any kind were prepared by 23 of the firms, and of the 19 who had balance sheets and operating statements prepared, only a few used them as a management tool. This is reinforced by noting that only 10 of the firms had any kind of cost accounting—even the most rudimentary.

The larger firms had annual statements prepared by outside auditors for the purposes of establishing tax liability—thus avoiding arbitrary assessment, but for the most part these were documents lying on the shelf gathering dust and the owners showed little familiarity with them. The combination of lack

of records, their unreliability, and difficulty of interpretation made the collection of financial data very difficult. We were surprised to see that very few millers had any idea of their previous year's gross sales or output (of all our data this is the weakest part). Too much stress can be laid on mere keeping of accounts, however. One of the most effective systems of control we found was a simple cash-in book with allocation made to each category of expense such as wages, rental, provision for new machines and owner's salary, etc. This miller made no annual statements but the accounts were a management tool which he used every day.

This widespread lack of financial control was reflected in that only 21 of the millers had an adequate understanding of depreciation and of the 25 millers who were asked about the minimum production per day needed to break even, only seven (27%) could give a reasonable estimate. Fifty-eight of the millers answered the question of how much salary they took. The results are shown in Table II(9.) Only about five of the millers paid themselves a salary on a regular basis. The rest withdrew funds as needed but 35 of these drew an amount that could be estimated on a monthly basis. The separation of personal and business finance is rare.

Some of those withdrawing no salary from the business are deliberately leaving the money in for additional accumulation, while other mills are profitable insufficiently to provide any surplus.

TABLE II(9)

Salary of Owners of Sawmills

Amount (monthly)	*Frequency*
None	9
Too irregular to estimate	9
Less than £50	12
£50—£100	12
£101—£150	10
£151—£200	4
Over £200	2

Although the data are very weak, we have tried to make some estimates on profits in the industry. They range from sizeable annual losses to profits in the range of 8-14% return on invested capital. There are obvious difficulties in allocating surplus between capital and wages of management. We think, however, that this range is realistic. Okigbo has some estimates of potential profitability which reduce to about 15% return on investment after paying £2,000 per year for management (pp. 33, 34). The point to be made is that sawmilling can be a profitable business, even on a low capacity utilization basis. The lack of proper understanding of financial management and production control is a serious hinderance to the healthy development of the industry.

Although technical assistance for marketing and machine operation and maintenance is eagerly sought, only a handful of the owners felt any need for assistance in financial management. There is no doubt, however, that misunderstanding of depreciation and break-even points contribute heavily to business failure. Withdrawal of more funds than the business can stand

is not uncommon. Depreciation on a small mill amounts to an average of £1,000 per year. The millers whose mills were bought on loans have a built-in reminder of the cost of capital and some realize thereby that they are losing money. Others may in effect eat their capital over the life of the machine and not realize that they are actually incurring losses until too late. This latter pattern probably explains some of the high attrition rate of sawmillers.

Another source of unprofitability is unwise employment practices. Okigbo found: "In the smaller mills, there is a tendency to engage too many hands. There does not appear to be any relationship between the number of workers in a mill and the mill production . . . " One frequently given reason for this state is the necessity of employing relatives. We asked whether relatives were hired and 50% (25) of those responding indicated that they either never had or do not now hire relatives. Only 35% (17) of those responding were favourable to employing relatives while the rest were either unfavourable or insisted that relatives would be treated the same as any other employee. It is our impression that this problem is not as serious as indicated by Okigbo.

A more serious problem, however, is the poor organization and layout of the yard for moving logs to the saw. It is not uncommon for a band mill to be shut down for three hours out of each eight-hour shift while logs are being put into place by manpower. Only a few of the larger mills have gantry cranes to handle the logs. Okigbo found that some 46% of the inefficiency of mills was attributable to delays in log handling, another 25% from bad layout of the yard and mill, and 11% from deficiencies in the site. Together these accounted for 82% of the inefficiency of the mills (pp. 18, 19).

Immediate savings in costs could be brought about without considerable capital expense by:

(1) reorganization of work yards to regularize firewood, customer wood, drying-wood, log and path areas.

(2) reduction in wastage through better marketing of shorts, narrows, and firewood.

(3) "feeding hillocks" upon which logs can be stockpiled for swift feeding to the machine.

(4) pilferage control.

(5) introduction of costing to demonstrate machine and crew profitability; hard- and soft-wood profitability; the profitability of delivery service, manager's selling time, and advertising. This information is necessary for rational management decisions.

(6) strict grading practices to encourage competition through excellence.

(7) in-and-out records for drying lumber.

(8) improved log storage, including insect and stain treatment.

(9) improved tendering practices by Government and quasi-Government agencies so that lumber is bought only by grade and through acceptance of tender.

Additional changes which are needed but would require additional capital include:

(1) gantry cranes or other methods of improved log handling;

(2) kilns and drying houses;

(3) resetting most of the band saws;

(4) additional training of workers.

Although most mill owners attribute most of their deficiencies to lack of sufficient capital, it is our strong belief that lack of sound managerial practices presents a far greater handicap. The above lists of possible improvements tend to substantiate this claim. Furthermore, good management by increasing profitability can in effect "create" additional capital—additional capital resources will merely be wasted without the necessary management and technical skills.

III. THE ENTREPRENEURS

The Nigerian sawmilling entrepreneurs do not look as much alike as their sawmills do. We shall first give a general description of the "typical" or modal sawmiller and will then present more analytical treatment of the various factors affecting his development and performance.

The modal sawmiller[1] was born in Ijebu. He was the eldest child in the family and was expected to help the family educate younger brothers. He considered higher education but rejected it; there was no money and in his generation it was harder to know how to get on in the academic sphere.

In adolescence he came to Lagos to complete his schooling up to Standard VI. His father paid for the schooling, despite the fact that (or because) neither of his parents went to school.

In the course of the next twenty years he began as a craftsman. His father and grandfather had been farmers; his mother a trader. Neither of the parents had been very wealthy in relation to their own communities. When he left school he wanted to be eminent—preferably through wealth. He dabbled in trade and travelled through other Regions (without, however, learning any other language than English which he speaks fairly well). As he traded he found lumber trading was the most lucrative line. He left the crafts work and went full-time into trading. During this period he built himself a house in his own village; he was building his Lagos house about the time he began in sawmilling, in his early forties.

He also financed the education of several siblings who entered occupations such as professional, craftsman, or trader. This financial burden—and responsibility—was to play a great part in guiding his career. His entrance into

[1] Because of the preponderance of Lagos Mills in our group this description of the "typical" sawmiller is drawn almost entirely from Lagos. The latter part of the section will give a better idea of differences in other areas.

industry was dictated by need for money and security. He did not view the mill as a risky business. He watched others and talked with other sawmillers persuading himself of the safety of the investment.

Part of his caution comes from having had a bad time with an early partner; he is now the sole owner of his business and would not consider now taking on a Nigerian partner.

Like his parents, the modal sawmiller is a Christian (with African personality). He has more than one wife, and tends to use traditional decision-making practices in a minor way (e.g. his business decisions are made only on certain days).

At least one of his wives has had as much or more schooling than he. She trades, sometimes helps him with selling, and gives much towards the support of the children. It must be said however that he has done a great deal to help his children and relatives. He has fourteen dependants at this time and spends around £500 a year on school fees alone.

He is now in his early fifties. He has three children in school—one at University level. He hopes that the children will be professionals or engineers and expects one or more to take over the business when he retires.

His ties to the village, however, are weakening. He visits "home" several times a year but actually expects to remain at work until near death, and many social ,cultural and church activities keep him oriented to Lagos. On the other hand he is definitely influential at home and his village is his political base. Perhaps he will be in the village for his final years.

He feels that hard work, close supervision, and integrity will lead to success. To the outside observer, however, a general lack of management techniques and experience hamper him greatly. New ideas are uncommon in the industry.

Even though he lacks managerial acumen he does keep careful track of his overall income and profits. This sensible attitude has led him to try out other investments as well. About 40% of his assets are in real estate although his principal source of income is from milling. His income is over £200 per month; his total assets exceed £10,000. As he talks about his financial life it is evident that caution, responsibility to family, and pride in accomplishment describe him best.

Now let us turn to a more detailed examination of the distribution of responses to our questions on personal background and development.

Table III(1) shows the distribution of provinces of birth compared with provinces in which the business is located. Distribution by ethnic group was the following: Yoruba—44; Ibo—7; Bini (Edo)—6; Urhobo—1; and Itsekiri—1.

Perhaps the most striking thing about Table III(1) is the evident lack of geographical mobility. With the exception of Lagos, the majority of entrepreneurs were natives of the province in which their business was located. Only those born in Ijebu and Abeokuta provinces tended to found businesses outside their province of birth and these were mostly in Lagos which is nearby. Two Easterners with sawmills in Lagos were the only instances of interregional mobility. In an industry in which personal contact is the principal

TABLE III (1)

Entrepreneur's Province of Birth Classified by Province in Which Business is Located

	Location of Business									
Province of birth	*Lagos*	*W.R. Ijebu*	*W.R. Abeo-kuta*	*W.R. Ibadan*	*W.R Oyo*	*W.R. Ondo*	*M.-W. Benin*	*M.-W. Delta*	*E.R.*	*Total*
Lagos	3									3
W.R. Ijebu	9	6		1	2					18
W.R. Abeokuta	5		5	1		1				12
W.R. Ibadan				2						2
W.R. Oyo (East)					2					2
W.R. Ondo	2					4				6
M.-W. Benin		1					5	1		7
M.-W. Delta								2		2
E.R.*	2								4	6
N.R.**	1									1
Total	21	7	5	4	4	5	5	3	4	59

*Three Easterners were from Onitsha Province; two from Owerri Province; one did not specify province.

**The one Northerner was from Ilorin Province.

method of securing both customers and supplies of logs, it is probably not surprising that people start their businesses in an area in which they are well known and have important "contacts".

Table III(2) presents the data for education of entrepreneurs classified according to their total employees.

TABLE III(2)

Education of Entrepreneurs Classified According to Total Employees

	Number of Employees						
Own Education	*Less than 25*	*25-49*	*50-99*	*100-199*	*200-499*	*More than 500*	*Total*
None	5	2	3				10
Some	4	1		2			7
Std. VI	11	4	1	1	1	2	20
Some Secondary	4	1	3				8
G.C.E.	1	4	1	1	3		10
Post-Secondary			2			1	3
Total	25	12	10	4	4	3	58*

*One entrepreneur did not indicate his total number of employees.

Although the greatest number of our sawmillers had attended school up to the Standard VI level, it is interesting to note that ten had no formal schooling at all. One of those with no schooling, however, had become literate through his own efforts as an adult and was one of the most sophisticated record keepers in the group. Nevertheless, the apparent lack of relationship between education and number of employees is striking.[1] Total employees

1 We consolidated the data in Table III(2) to satisfy the assumptions for Chi-Square test for association and found the Chi-Square value to be 7.04 with 6 degrees of freedom—significant only at the .4 level. Furthermore, the greatest contribution to Chi-Square was from the cells with greater than expected frequencies of: (1) men with little education and large businesses and (2) relatively more education and small businesses.

in all of the individual's enterprises was used as an indicator of total entrepreneurial achievement. Kilby, in his study of the Nigerian baking industry, explained the lack of correlation between size of firm and owner's education to the greater diversion of efforts of more educated individuals.[1] He postulated that as entrepreneurs they were more successful than their performance as bakers would indicate. If this were the case, we would expect a positive relationship between education and total number of employees in Table III(2).

We have no general explanation for this phenomenon. It may be that individuals with less education feel greater pressure to succeed than their brothers who hold certificates. Several of the sawmillers made a point of their relative success through hard work despite limited education. Whether or not this is the case cannot be demonstrated satisfactorily by the data available. The subject, however, is worthy of further psychological research.

Our sawmillers were, however, considerably more educated than their parents. Only 15 (27%) of the fathers had ever attended school; three of them attained the level of Standard VI or above. Four of the mothers attended school at some time and none reached the Standard VI level.

Table III(3) shows the occupational backgrounds of the entrepreneurs, their fathers and grandfathers.

TABLE III(3)

Occupational Backgrounds of Entrepreneurs

Occupation	*Own first Occupation*	%	*Own last Occupation*	%	*Father's Occupation*	%	*Grandfather's Occupation*	%
Subsistence Farmer	4	6.9	0		15	25.9	26	55.3
Farmer Cash-crop	0		0		10	17.3	3	6.4
Small-scale Trader	2	3.4	4	6.8	4	6.9	2	4.3
Large-scale Trader	0		6	10.2	5	8.6	2	4.3
Craftsman (employed)	18	31.0	2	3.4	4	6.9	1	2.1
Clerical	13	22.4	1	1.7	1	1.7	0	
Managerial	1	1.7	2	3.4	1	1.7	0	
Teacher	10	17.3	1	1.7	0		0	
Professional	0		1	1.7	1	1.7	1	2.1
Self-employed Craftsman	0		4	6.8	6	10.4	2	4.3
Building Contractor	0		4	6.8	1	1.7	0	
Timber Contractor	1	1.7	15	25.3	5	8.6	0	
Transporter	1	1.7	9	15.3	1	1.7	0	
Government Service	7	12.2	8	13.5	2	3.4	0	
Engineer	1	1.7	1	1.7	0		0	
Traditional High Rank	0		1	1.7	2	3.4	10	21.2
Total	58*	100.0	59	100.0	58*	100.0	47*	100.0

*Totals less than 59 are accounted for by non-responses.

[1] Peter Kilby: *A Study in African Enterprise: The Nigerian Baking Industry*. Palo Alto. Cal.; Hoover Institution, 1965.

The occupational mobility of these entrepreneurs is noteworthy. Coming from a group of grandfathers who were preponderantly farmers or chiefs, and fathers who were farmers, craftsmen, or traders; these men started their economic life as craftsmen, clerks, teachers or government servants, and were mostly self employed as traders, craftsmen, or contractors prior to starting their own sawmill. It is important to note that timber contracting was the principal occupation of almost 26% of the sawmillers immediately prior to their entry into industry. A look at the occupational experience of these men may also help to explain the lack of relation between formal education and success; these men got much education in the "school of experience".

Unfortunately, no reliable census data exist for the occupational structure of Nigeria in the 1940's or 50's. Nevertheless, the proportion of fathers in farming is considerably lower than the usually quoted figure of some 70% of the population engaged in agriculture; the proportion in crafts and contracting is higher than believed to be the case for the population as a whole.

Little relationship exists between particular occupational experience and either initial or present assets or employment. There is a slight tendency for the men who started out on a larger scale to have come from contracting, transport or government service. The relationship, however, reaches no acceptable level of statistical significance. This weak relationship does not even persist between previous occupation and present size of business. We just cannot say from these data that certain occupations were "better" training grounds for sawmillers.

Status mobility has been difficult to judge. One-sixth reported a chief in the family two generations back; most fathers were clearly influential men. However, the millers report themselves nearly uniformly "now, or son-to-be more important" than their fathers. Forty-five per cent are presently chiefs of some kind and/or hold many organizational offices.

Nearly all felt that their present-day importance depends on personality—and money. Their economic mobility has been great. About half the millers reported their fathers, or both parents, as "low" or "medium" in income. Only seven reported both parents to be of "high" income. About 60% of the millers have total personal assets in excess of £10,000 and some 17% are worth more than £50,000. Nearly half earn, *in toto*, over £200 per month. Only half reported most of their income as coming from sawmilling; nearly 30% (predominantly in Lagos) named real estate as their principal source of income. Sawmilling certainly has been an important, but not sole, contributor to this economic mobility.

Returning to vital statistics, just under a quarter of the group opened their mill before turning 35. More than a quarter were over 50, and three people were over 60. No significant relationship between age at founding and success was found, however.

Three-fourths of the millers claimed to be Christian—the balance were Moslems (many are Alhajis). In contrast, half of the parents were Christian; 30% Moslem; and 20% pagan. Religion, however, does not seem to be a dividing factor within the families. The higher proportion of Christians

among the millers is more a reflection that the majority have attended mission schools. It would be dangerous to try to read too much significance into the religious affiliation of this group.

In addition to the nearly 30% who live in their home towns, another 20% visit "home" more than once a month. Their sights are on a modern future. Indeed, one of the most significant investment patterns among these men is the amount spent for education. Forty per cent spend more than £500 a year on school fees; 28% spend more than £1,000. These sums amounted to 25-50% of total income of the millers.

One-third of the millers "support regularly" more than eighteen other people. Many of the dependants are aged, but more than half are the "new generation". It is difficult to evaluate the influence of the extended family on the development of enterprise. We can say nothing about the incentive or disincentive effects of the arrangements, but can point out that the family has not been a significant source of capital; the obligations require a heavy financial outlay. Whether or not these funds would otherwise have been invested in industry is moot.

About 25% of the millers have travelled to Europe or England. It is not clear whether or not such travel has been an important influence in their entering industry. Most of the travel has been taken after the business was well established, but may well contribute to the adoption of new ideas in the future.

It is impossible to determine the individual's motivation for entering industry, but we asked them what they thought their reasons had been. Table III (4) presents the answers.

TABLE III(4)

Why did you go into Business? (multiple response)

Answer	*Frequency*
Could make more money	40
Previous experience in the line offered security	18
To provide jobs for people	6
Desire for independence	6
Was my father's work	5
Born to do it (destiny)	4
Enjoyment	4
Gives importance among own people	3
Accidental	2
Helps Nigeria	2
To get away from family's business	1
Total	101

Straightforward economic reasons came first, then security and several other responses. This fits well with our impression of the saw-millers (and other Nigerian entrepreneurs also) as men who have responded to opportunities for economic gain. A straightforward economic interpretation of entrepreneurship (conditioned by the knowledge of and ability to exploit an opportunity) seems to be more useful in a study of Nigerian industrial

entrepreneurs than some of the more sociological or psychological interpretations that have been propounded.

In sum, the Nigerian sawmillers are, within their own context, an ambitious, successful group; active in many economic and social pursuits; generally looked up to with respect by their communities.

IV. FOUNDING AND GROWTH

As shown in Table IV (1), more than half of the sawmills have been established since 1961. This partly represents the surge of interest in sawmilling since that time and also reflects the high attrition rate of the firms.

TABLE IV(1)

Year of Establishment of Sawmills by Province

Province	*Pre-1950*	*1951-55*	*1956-60*	*1961-63*	*1964-65*	*Total*
Lagos	1	5	4	8	4	22
W.R. Ijebu		1	2		3	6
W.R. Abeokuta		1	1	3		5
W.R. Ibadan	1		1	1	1	4
W.R. Oyo (E)			1	3		4
W.R. Ondo		2	1	1	1	5
M.-W. Benin	1		1	2	1	5
M.-W. Delta	1	2				3
East		2	1	1		4
Total	4	13	12	19	10	58*

*Date of founding was unascertainable for one firm in Ijebu Province.

Although the earliest surviving sawmills are from Lagos, Ibadan, and the Mid-West, no particular pattern of the spread of sawmilling is apparent from this table. The data were also examined to see if there was relationship betwen date of founding and size of mill (table not reproduced here). There was a slight tendency for the older firms to be larger in terms of assets, but the relationship did not reach any acceptable level of significance on a Chi-Square test for association.

The initial capital requirements for setting up a sawmill are moderate. Table IV (2) shows the distribution of initial assets for the firms in our study.

TABLE IV (2)

Initial Assets of Sawmills

Value of Assets	*Frequency*	%
Less than £1,000	11	19.3
£1,100—£5,000	22	38.6
£5,100—£10,000	14	24.6
£10,100—£20,000	6	10.5
More than £20,000	4	7.0
Total	57*	100.0

*Information on initial assets was not obtained from two firms.

Some 57.9% of the firms were able to start with less than £5,000 in assets and only 7% started with more than £20,000. While this is not an inconsiderable amount by Nigerian standards, the availability of hire purchase and loans has further eased the capital requirements and encouraged a larger number of entrants into the field. Table IV (3) shows the sources of capital for starting the businesses.

TABLE IV (3)

Sources of Initial Capital (multiple response)

Source	*Frequency*	%
Savings in previous occupation	56	47.5
Loans from government	14	11.9
Hire purchase	12	10.2
Loans or gifts from family	11	9.3
Loans from bank	11	9.3
Loans or gifts from friends	6	5.1
Other Nigerian investors	4	3.4
Money lenders	3	2.5
Expatriate investors	1	.8
Total responses	118	100.0

No source was mentioned which did not contribute more than 25% of the initial assets for the business. It is significant that some 35% of the responses indicated loans from outside of the family or close circle of friends. Although Nigerians all feel that lending institutions are unduly strict, it is evident that credit is available to a sizeable number of these firms. Although the above figures refer only to frequency of the sources being mentioned and not the actual amount of capital contributed, it is clear that the loans from lending organizations represent a higher proportion of assets than their frequency indicates. Loans or gifts from friends or family tended to be quite small in relation to frequency, while hire purchase arrangements were underreported—respondents did not consider it in the same light as other loans and frequently failed to mention it unless asked specifically.

Similarly, we asked about sources of capital for expansion of the mill. Table IV (4) summarizes the responses to this question.

TABLE IV (4)

Sources of Capital for Expansion (multiple response)

Source	*Frequency*	%
Reinvested profits	40	62.5
Loans (from all sources)	14	21.8
Hire purchase	8	12.5
Additional personal investment	1	1.6
Bringing in additional partners	1	1.6
Total	64*	100.0

* There was a total of 64 sources mentioned by 43 of the firms. The other 16 firms had either experienced no expansion or did not answer the question.

Reinvested profits were by far the most important source of capital for expansion although loans and hire purchase represent about the same proportion as for starting the business.

Even though it appears that credit is available to a greater extent than generally believed to be the case, the capital market works in rather strange ways. The receipt of government loans is frequently conditioned by political involvement of the applicant (although this clearly was not true in all cases). It is particularly difficult, however, to determine what the criteria used by the commercial (largely expatriate) banks might be. In some areas businesses in a rather shaky condition seem to be able to get overdrafts or loans with ease while in other areas potential borrowers with adequate security and healthy businesses are unable to borrow anything at all.

Getting control over capital resources to start a sawmill is only the first of many hurdles that must be crossed. Perhaps the most important factor is technical information that will enable the entrepreneur to select the appropriate equipment and supervise its operation. The sources of technical information utilized by the sawmillers in this study are shown in Table IV(5).

TABLE IV (5)

Sources of Technical Information

Source	*Frequency*	*%*
Watching other sawmillers	38	28.8
Own training and experience	33	25.0
Suppliers and repairmen	25	18.9
Journals and books	9	6.8
Hired Nigerians	9	6.8
Government	6	4.6
Hired Expatriates	3	2.3
Trade association	3	2.3
Foreign aid agencies	2	1.5
Expatriates (not hired)	2	1.5
Trips abroad	2	1.5
Total	132	100.0

It is apparent that almost 50% of the responses indicate informal means of acquiring the necessary technical knowledge. Watching other sawmillers being most important, followed by own training and experience which frequently was not particularly relevant (most often it was either acquaintance with the timber trade or mechanical experience—frequently this has little connection with the operation of a sawmill, and explains a good bit of the low-quality sawing and poor maintenance of equipment).

One of the factors that has been frequently claimed to be an impediment to development of successful Nigerian entrepreneurs is the frequent dispersal of effort over several businesses at once. Schatz and Kilby[1] have both discussed this problem and feel that it is serious. We asked the sawmillers if they were engaged in any other businesses which take a substantial part of their time. The responses are shown in Table IV (6).

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[1] Sayre P. Schatz emphasized this point in a seminar on 27 February 1965 at the University of Ibadan; and Peter Kilby: *A Study in African Enterprise: The Nigerian Baking Industry*, Palo Alto., Cal.; Hoover Institution 1965 deals with it at length.

TABLE IV (6)

Are You Engaged in Any Other Business?

Response	*Frequency*	%
None	23	39.0
Plantations or modern Agriculture	9	15.2
Trading	7	11.9
Contracting (timber or building)	6	10.2
Real Estate	6	10.2
Other manufacturing	4	6.8
Transport	3	5.1
Other services	1	1.6
Total	59	100.0

This represents less dispersal of effort than we expected. The plantations were mostly rubber, and rubber and timber are closely associated industries in the Mid-West. Frequently the same brokers are used for export of both items and it is not a serious diversion. The traders were most often engaged in lumber trading which again is closely related and the relation with timber contracting is intimate and natural. Building contractors (three cases) went into sawmilling primarily to satisfy their own needs, while the transporters are largely engaged in hauling logs and lumber.

In order to better understand the diversion of time from sawmilling the entrepreneurs were asked what proportion of their working time is spent in connection with the sawmill. The responses appear in Table IV (7).

TABLE IV (7)

Proportion of Time Spent on This Business (as % of 8-hour working day)

Proportion	*Frequency*	%
0–25%	6	10.4
26–50%	10	17.2
51–75%	14	24.1
76–100%	24	41.4
Over 100%	4	6.9
Total	58*	100.0

*One respondent did not answer the question.

Almost half of the respondents spend more than six hours per day in connection with the sawmill, and nine of those spending less than that amount had no alternative business. Those entrepreneurs with other businesses who spent less than half their time on the sawmill had hired managers to run the affairs of the mill. We conclude that while dispersion of effort is not common, it is not a major problem in the sawmill industry. For many, it is a full-time operation, and for the majority of others it is a part of a rationally integrated business.

We attempted to rate the firms according to their degree of success. Our criteria of success was a combination of growth and profitability. In order to be rated as "very successful" a firm must have both shown considerable growth and relatively high profits. "Successful" firms also had to show growth or above average profitability (several firms which started on a rela-

tively large scale and were profitable but had not been expanded fell into this category). "Average", "marginal", and "unsuccessful" categories are largely self-explanatory, and a further category of "cannot evaluate" was used for firms that were less than one year old or had recently undergone major reorganization. Table IV (8) shows the distribution of firms (classified according to number of employees) on our rating of success.

TABLE IV (8)

Success of Firms Classified According to Number of Employees

Degree of Success	*Number of Employees*			
	Less than 25	*25–49*	*50–99*	*Total*
Very Successful			2	2
Successful	5	6	9	20
Average	13	4	2	19
Marginal	5	4	1	10
Unsuccessful		1		1
Cannot Evaluate	6		1	7
Total	29	15	15	59

The above table indicates that there is a bias in our rating such that the larger firms are more likely to be rated successful than the smaller ones[1] which would be expected from the weight of growth in our measure of success. It is interesting to note, however, that no such relationship exists between success and initial assets as shown in Table IV (9).[2]

TABLE IV (9)

Success of Firms Classified According to Initial Assets

Degree of Success	*Less than £1,000*	*£1,000–£5,000*	*£5,100–£10,000*	*£10,100–£20,000*	*More than £20,000*	*Total*
Very Successful	1		1			2
Successful	5	8	2	2	3	20
Average	4	7	6	2		19
Marginal	1	5	1		1	8
Unsuccessful			1			1
Cannot Evaluate		2	3	2		7
Total	11	22	14	6	4	57*

*Two of the firms in the "marginal" category did not report initial assets.

Some light is shed here on our previous assertion that capital is not a particularly serious obstacle to development of the sawmilling industry. Capital shortage would be expected to have two main effects. First, given economies of scale, some firms might well be of less than optimal size. This would be reflected in smaller firms being less profitable than larger ones; with profits serving as the major source of capital for expansion, the smaller firms would then tend to have lower rates of growth as well. Secondly, if there are no

[1] After re-grouping and eliminating the "cannot evaluate" category, a Chi-Square test for association was applied which proved to be significant at the .01 level.

[2] After re-grouping and eliminating the "cannot evaluate" category, the Chi-Square test for association failed to reach any acceptable level of significance.

significant economies of scale, or if all firms are of optimal size, capital shortage would be reflected by a high degree of utilization and high profitability of the existing capital equipment. Additional investment in the industry would be warranted but precluded.

Our finding no positive relationship between initial size of firm and "success" brings into doubt the existence of the first manifestation of capital shortage. The firms which started with less capital did at least as well in terms of profit and growth as those firms which started out with more. Our previous findings of considerable excess capacity combined with the possibility of increasing output with non-capital using improvements denies the second possible indication of capital shortage.

These two findings (lack of relation between initial assets and success and the existence of considerable over-capacity), give some further substance, although certainly not conclusive "proof", to our argument.

Of our 59 firms, eighteen (31%) had plans for expansion that will be realized within the next eighteen months. A strong association between "successful" firms and planned expansion exists. Twelve out of the 20 "very successful" or "successful" firms had such plans; only two of the 30 "average" "marginal", or "unsuccessful" firms did.

Real estate forms the most important single alternative investment for our sawmillers. Table IV (10) shows the distribution proportion of personal assets held in real estate not connected with sawmilling by entrepreneurs classified by degree of success.

TABLE IV (10)

Proportion of personal assets held in real estate	*Degree of Success*						
	Very Successful	*Successful*	*Average*	*Marginal*	*Unsuccessful*	*Could not be Evaluated*	*Total*
Less than 10%	1	4	4	2			11
10–30%		7	3	2		1	13
30–40%		1	5	2		2	10
40–50%	1	5	3	1	1	2	13
50–60%		1	2			1	4
Over 60%		1	1	2			4
Total	2	19	18	9	1	6	55

Note: Four entrepreneurs did not indicate the proportion of their personal assets held in real estate.

Although real estate did account for a considerable amount of investment by these entrepreneurs, it was less important than we had expected. Further analysis of the pattern of real estate holding (table not reproduced) indicates that real estate holding is relatively more important among Lagos entrepreneurs which is not surprising considering that the return to real estate is somewhat higher in Lagos than elsewhere (we found the average rate of return ranging between 8 and 14% outside of Lagos and between 10 and 35% in Lagos). Nevertheless, more than half of the sawmillers held *less* than 40% of their assets in this form. The entrepreneurs frequently stated that real estate represented their "retirement plan" and also provided security against

which loans for the business could be raised. In summary, real estate represents an important use of investible resources for the sawmillers but is not as serious a diversion of funds and energy as is frequently believed.

There has been very little innovation within the sawmilling industry. The technology has been well known and expatriate firms were already set up. Of the 59 mills in our study, two had made some innovation in business method (one was the first public limited company in the East), one was the earliest to use an improved bandmill, and two pioneered new market areas. These five firms were not innovational in a Schumpeterian sense; nevertheless they did represent pioneering efforts in the adaptation of existing technology and business practices to a new situation.

The fact that there has been little innovation has not meant that the firms have been stagnant. Since the time of founding, two-thirds of the firms had made some kind of important change. Twenty-two had expanded their mill by addition of equipment, thirteen had installed improved types of machines and/or revamped the layout of the mill, three had opened new branches, and one had introduced a new product (switched into exporting).

Growth and change are well accepted by the sawmillers. Almost without exception they wanted to expand their mills but claimed to be hampered by lack of funds. Loans from the government are looked to by many as the solution for all their problems. It was not unusual to find a man with a badly underutilized mill complaining about lack of logs and customers who nevertheless wanted a loan for more machines. When asked how the supply and marketing problems would be solved, he would usually answer that having more machines would somehow take care of the problem. This pattern is quite consistent with the observed over-expansion of the industry.

V. CONCLUSIONS

The following conclusions come in part from the foregoing study of the sawmilling industry and in part from our impressions gained from the larger study of which this forms a part.

1. Theories of entrepreneurship as a manifestation of social deviance, or theories of underdevelopment related to a lack of entrepreneurial spirit are inapplicable to Nigeria. Nigerians appear to be actively seeking material rewards and entrepreneurship as such is socially honoured. The sawmilling industry is a case in point demonstrating that an industry with *relatively simple* technology and *moderate* initial capital requirements will elicit a rapid entrepreneurial response. Nigerians are alert to profit opportunities and can find the necessary capital for industrial projects which seem to be within their capability to exploit.

2. In the sawmilling industry, capital has not been a limiting factor. Actually, more capital resources are now devoted to the industry than can be economically justified. There are serious defects in technical and managerial

competence, however. These are potentially remediable through additional experience, competitive pressure, and technical assistance. It must be pointed out that competent management can "create" capital by increasing the profits of existing units which are then available for reinvestment.

3. The Nigerian entrepreneurs are an economically and socially mobile group which has emerged only in the recent past. Further expansion of the group is quite probable. In particular, many of the sawmillers are now training sons overseas who will soon join the businesses and may well modernize the management practices of the firms.

4. Additional loans programmes to aid indigenous industry will most likely fail as they have in the past. This is tied up in the managerial deficiencies existing at this time. A possible means of assisting such businesses is now being tried out in the Industrial Development Centre, Owerri (E.R.). A programme of technical assistance, training, and advice is combined with a loans programme. It is still too early to evaluate the benefits of such a programme in relationship to its costs.

Nigerian Institute of Social and Economic Research,
University of Ibadan,
Ibadan

JOHN R. HARRIS

Economic Development Institute,
University of Nigeria,
Enugu Campus,
Enugu

MARY P. ROWE