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A Line of Inquiry into Cotton Ginning in Uganda

by

E. B. Riordan

Cotton ginning, once the biggest industry in Uganda is still a major concern. The production of lint and cotton seed by ginning the fuzzy seed cotton brought from the field, is an important stage in cotton marketing. Lint is one of Uganda's two major exports and a valued source of Government revenue. The resources employed in ginning and the turnover of this industry are also relatively large. The margin paid for buying and ginning the cotton crop in 1964/65 was four million pounds or eighteen percent of the lint Marketing Board's receipts from the sale of lint and cotton seed. The nation's rapidly growing co-operative movement is now ginning over sixty percent of the crop, and the movement has got to repay £1.4 of the loans it received to purchase ginneries.

TABLE 1

THE COTTON GINNING INDUSTRY IN UGANDA
Season 1963 to 1964

The Crop		Lint Marketing Board	
		Payments	Receipts
Lint 400 lb Bales	379,413 bales		£15,929,000
of which home consumption	29,000 bales		
Seed	117,342 tons		£ 2,239,000
Paid to Growers		£11,751,000	
Paid to Ginners		£ 3,572,000	

Ginners		
Number	Working	Silent
Private	103	33?
Co-operative	30	9?
Total	133	42?
Employment at 31st Dec., 1963	1300	
Ginning Costs - major items		
Wages	£700,000aprox.	
Packing and other materials	£554,000	
Fuel	£192,000	
Consumable tools and spare parts	£100,000 aprox.	

Sources
a. Lint Marketing Board, Annual Report 1964
b. Uganda Government, Survey of Industrial Production 1963 and 1964.

The aim of this paper is to lay the foundations for a study of the cotton ginning industry that will attempt to:-

(a) Provide data that will quickly indicate both the general scope for reducing costs and the causes of high costs at individual ginneries.

(b) Show ways of reducing costs and increasing the effieiency of, for instance, manual workers, accounting and management.

(c) Provide the basis for estimating the effects of changes in the industry involving such things as the size and location of ginneries, the adoption saw ginning or the use of snap ball picking.

The scope for reducing costs is indicated by data for co-operative ginneries in Table 13 of the recent Report of the Committee of Inquiry intothe Cotton Industry, 1966. (1) The twenty three co-operative ginneries in the Kengo, Busoga and Mbale ginning zones may usefully be examined as a sample receiving similar allowances for the lint they gin. In this sample two ginneries had operating costs just below 28 cents per pound of lint ginned in the 1964/65 season. On the other hand the operating costs at one ginnery in the same season were 47 cents and all-together four ginneries had costs of over 40 cents per pound of lint produced. The average operating costs of ginneries in these zones was 35.8 cents per pound of lint. Some of this variation in costs is probalby due to differences between ginneries in levels of output relative to capacity and to difference in productive assets. Even so, in most of these ginneries there is likely to be scope for reducing operating costs with virtually no investment and even more scope for cost reduction by altering ginneries.

It is likely that there are similar possibilities for reducing costs in the other working ginneries in the country. Considerable savings in costs could be made for the benefit both of those in the ginning industry achieving the cost savings and for growers of cotton. For each reduction in the average buying&ginning cost of 3 cents per pound of lint, the price of cotton seed could be raised by about 1 cent per pound. Put another way, a 3 cents per pound reduction in average costs amounts to an annual saving of about £250,000 on an annual output of 500,000 bales of cotton. It if worth noting that the production target for the end of the current plan is 575,000 bales, meeting this target could be easier with a more efficient ginning industry.

Cotton ginning has been a central topic of six official commissions of inquiry and many official memoranda. This volume of work is in odd contrast with research interest in the industry. The only dissertations on the industry are those by Eherlich and Kuiper while Brett has recently worked in this field.[2] In none of the above publications is the ginnery business examined at first hand. Further these businesses were rarely studied within an explicit theoretical framework nor was there an attempt to provide information to assist individual businesses. The burden of past inquiries has been to examine and advise on public policy for this highly regulated industry.

A constant interest of these inquiries was to minimise the amount of resources used in ginnery cotton. Schemes have also been devised to raise the value of Ugand's lint. These

at raising marketing efficiency have dealt with the proper interest of Government in pricing efficiency.

Now it may be argued that with an efficient pricing system for both inputs and outputs, each competing profit seeking enterprise is likely to move towards the configuration required for overall efficiency in its p t of economy.

Collusion and control have broken this sequence in the cotton ginning industry. Here the size of a ginnery's profits are unlikely to provide an index of economic efficiency and may indeed be earned more by g.od luck than good guidance.(4) Other measures of economic efficiency are thus required both to guide individual ginnery enterprises and to inform discussion of the industry. For increasing the economic efficiency of an enterprise will both tend to increase its profits and its contribution to the economy. The concept of economic efficiency will thus be and then used as a framework for details of the proposed enquiry.

ENTERPRISES EFFICIENCY

The efficiency of an enterprise refers to its performance, relative to some standard, in arranging the transformation of one set of scarce goods and services, inputs, into another set which is saleable output. An authoritative definition in this vein is 'The net outcome in a given period from a given inp t of factors of production' (5). Satisfactory and comprehensive single indices of enterprise efficiency have not yet been developed. There are, however, a number of simple partial efficiency indices and an example of this class are productivity indices referring to 'The output of a unit of a factor of production in a stated period' (6), when the provision of co-operating factors is the same in all the situations being compared. The term 'efficiency' is also applied to the ratio between, say, the output of energy per unit of energy applied. This typical technical efficiency ratio is not only a single measure of performance but also has a theoretical maximum to serve as a standard for comparison. Unfortunately maximising the productivity of a factor&maximising technical efficiency eventually tends to reduce enterprise efficiency. For in maximising one of these partial efficiency indices, the use of inputs not under consideration is likely to be increased and the additional inputs will eventually contribute less to output than their cost. Hence the need for measures of overall enterprise efficiency.

Before examining measures of enterprise efficiency it might be well to note a general difficulty. It is sometimes held that while productivity refers to the <u>results</u> of material, almost <u>mechanical</u>, activity, efficiency involves conscious <u>choice</u> in the direction of the activity. Thus it might be said that enterprise efficiency refers to the success of choices made within the enterprise. But if the choices or <u>decisions</u> are judged by <u>results</u> it is quite likely that various freak events, beyond the control of the enterprise, will distort the comparison between one enterprise and another. How are we to allow for the chance achievement of high or low performance? Is one sample of an enterprise's performance adequate for judging efficiency in matters so impregnated with the calculus of probability?

Average Total Costs as n Efficiency Correlate:

This is a single ratio produced by aggregating inputs through their prices and deviding this sum by the resulting output. Figures like this have no efficiency implications unless compared with others. The average total cost of an enterprise this year might be compared with the figure for last year, figures for similar enterprises or even figures derived from an ideal enterprise. If the only difference between the enterprises compared are operating decisions and general management behaviour, and how can we avoid this? we might use Average Total Costs as an index of enterprise efficiency. Unhappily, previous investment decisions, and even the day to day decision of the past, live on in the balance sheet, capital equipment and morale of the enterprise to affect current costs. This problem might be partially overcome by neglecting the unavoidable costs such as depreciation and all other charges against revenue due to the capital invested in the business. This would reduce the uncontrollable cost element.

Average Variable Cost as an Efficiency Correlate:

We might imagine that Average Variable Costs (AVC) are proportionate to operational efficiency in an enterprise. Again differences in capital equipment can affect the levels of other inputs needed to produce a given level of output. Even when comparing plants of the same capacity and throughput, peculiarities of equipment and layout might seriously affect the plants' performance. Rather than further confuse comparisons by adjusting costs for differences in working conditions, Average Variable Costs might be qualified by partial efficiency indicators. One such indicator would be the ratio of labour input to labour requirements derived from work measurement.

Differences in the intensity of capital equipment useage also tends to affect the level of variable costs, according to the 'law' of deminishing marginal returns. Intensity of output in a cotton ginnery may be measured by the plant's hourly rate of output from a standard ginning machine. If it is found that this rate of output can be increased by raising the level of variable factor input, irdependent of ginning technique, then the relationship would have to be determined to compare the AVC of enterprises working at different intensities. The length of the ginning season might also affect AVC as there are some costs such as those due to the annual employment of an engineer that do not change in proportion to ginnery output. These are still variable costs however, as they could be avoided by deciding not to gin any cotton.

What problems are raised by the assumption that all conditions other than the state of capital assets and decision making, together with their costs, are the same for all the enterprises being compared? First comes the problem of differences in ratios between prices paid for inputs or outputs. The greater the opportunities for substitution between inputs and outputs the greater the problem of comparing the AVC of enterprises facing different price ratios. In cotton ginning the seed cotton largely dictates the ratio between outputs of lint and cotton seed and in any one year the output price ratios are fixed. Similarly in one year input price ratios are not likely to vary a lot throughout the country, but it might be necessary to limit comparisons to firms paying approximately the same wages for ordinary workers. If the above statements are true then Average Variable Costs could be compared by applying the same input prices to the quantities of inputs used per unit of lint output. In doing this allowance would have to be made for observable differences in the productivity of inputs.

Causes of variation in the standarised average variable costs can now be studied. An item by item examination of average variable costs might show two types of variation one due to the enviornment the enterprise has to accept in the short run, such as quality of seed cotton or the characteristics of its equipment. The other type of variation originating in decisions made in the enterprise. The enterprise with the lowest A.V.C. might be viewed as most operationally efficient, provided this result was not largely due to chance, and how can this be shown? Enterprises with higher A.V.C. not due to uncontrolable conditions would appear to be operationally inefficient as a different set of the operational decisions would have reduced their A.V.C. The degree of relative inefficiency being in proportion to the excess of their A.V.C. over the A.V.C. of the most efficient enterprise, assumed here to be the lowest A.V.C. The standard of this scale of operational efficiency might be established by examining the scope for improving the performance of the most operationally efficient enterprise, possibly by comparison with estimates of costs in a ginnery under ideal management.

Thus we arrive at a position where we can gauge both the size and causes of inefficiency in the enterprises studied. Ideas for improvement in subsequent production periods might be gained from the study of the most efficient enterprise.

Investment Efficiency:-

Investment affects production and for all decisions mainly on selling, renewing, improving and increasing the enterprise's stock of lasting factors of production. The level of accounting costs associated with these 'fixed' factors of production show, in a capricious way, the effects of past investment decisions and are thus not related to current investment efficiency. We then require a comparison of current investment decision between enterprises to indicate their efficiency in investment.

Attaining approximate comparability of current operating conditions between enterprises is much easier than giving all enterprises the same prospects. The difficulties are increased in industries located at the source of raw material and subject to detailed government

control, such as the ginning industry. Under these conditions it might be useful to assume

(a) Particular price trends for the main inputs other than seed cotton.

(b) That a set of projections gives the volume and characteristics of the seed cotton available to the enterprise for ginning.

(c) That enterprises with comprable net assets can obtain loans at the same rate of interest.

(d) That all enterprises have the same alternatives to investment in cotton ginning.

Further, a rate of discounting would also be required. Different rates of discounting might be used for projects lasting (a) 3 years or less (b) 4 to 10 years and (c) over 10 years. Some idea of the relevant rate might be obtained by examining the rate implicit in recent carefully considered investments made by ginneries and the rates they pay for improvement loans.

With these assumptions and after discovering a rate of discounting it would be possible to compile the present values of various investments and rank them in order of profitability. Then one might enquire why apparently profitable investments had not been made in some enterprises and why elsewhere investments yielding a poor return had been made rather than the more profitable alternatives available.

Variations in investments might be expected due to considerable differences between enterprises in the conditions of their plants, supplied of funds for investment and expectation of future conditions. Chance events affecting investment activity might also be the cause of some variations. Variations in investment not accounted for under the above trends would tend to indicate that the firm involved was perhaps slow to grasp opportunities or had failed to appreciate the return available from the various relevant investments, or had not let their assessment guide their action. The lack of investment efficiency in these enterprises would be gauged by the opportunity cost of their investments. Advice might be given on what investments an enterprise might consider, can you also advise on avoiding rush judgements?

We have thus arrived at fairly objective measures of the current short run and long run economic efficiency of an enterprise. The value of these measures is that they relate to decision making in the enterprise and tend to show where this might be going wrong. The main difficulty is to attach confidence statements to these measures, as taking the measures of performance of the same enterprises in excessive periods is both laborious and may introduce new disturbances. A measure of absolute efficiency based on ideal management would be hard to construct and always open to the challenge 'try it'. The measure of operational efficiency proposed appears to be more objective and reliable than the measure of investment efficiency. This is inevitable for the future is still a matter of speculation. and expectation - a state of mind.