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REPLY

Malcolm Purvis (5) raises one policy and two empirical questions in relation to my study of the Nigerian palm oil industry. I shall endeavor to show that each of his three contentions is mistaken. I shall begin by replying to his second empirical criticism, which is based upon a quickly corrected factual oversight, and then proceed to deal with his first and third points.

Purvis contends that the lower prices received by the small-scale processors, as reported by W. L. Miller, are spurious insofar as differences in technology are concerned; he then offers a number of conjectural explanations for the observed differential, chief of which is that it represents ENDC's buying allowance of 7.4 shillings per cwt. This explanation must be disqualified (a) because one would now have to explain why Pioneer mill oil received 1.3 shillings less than native method and screw press oil (the quality differential was 6.1 shillings), and (b) because Stork press operators, few of whom were licensed buying agents, received the same differential as did the ENDC mills. Given that Miller collected all his data at the same time of year (2, p. 92) and that the Marketing Board pays transport differentials on the basis of the location of the buying agent, it would require very special and highly improbable circumstances to validate his other explanatory hypotheses.

Mr. Purvis' assertion to the contrary, I did explain the source of the differential (near the top of page 195): "The latter [lower total revenue] reflects the absence of a final stage of clarification and bulking in eight-hundredweight metal drums." This sentence was apparently overlooked by Purvis. (Admittedly a more exact descriptive term than "quality differential" would have been preferable.) The two small-scale processes do not carry out clarification (2, pp. 8, 35, 50), and the native processors, quantitatively the more important of the two, do not produce, on average, eight-hundredweight of oil over the course of an *entire year* [my table 8]. The very real economic services provided to the small-scale processors for the 6 shillings are described by Miller as follows:

> After palm fruit is processed by the hand method or the screw press, the small batches of oil and kernels produced by each firm are purchased by middlemen. The middlemen combine the small batches into larger containers and transport the oil and kernels to buying stations which have been established throughout the oil palm region by licensed buying agents.

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> At the buying stations the oil is heated and decanted to separate water and dirt from the oil, while the kernels are dried and separated from the broken shells and stones. The clean oil and kernels are placed in eight-hundredweight metal drums and two-hundredweight jute sacks respectively for shipment to the ports. Palm products processed by other technologies are not handled by the small middlemen or buying stations because they are cleaned and stored in large containers as part of the processing operation (*2*, p. 8).

Purvis' second empirical point is that the native method and screw press operators do not necessarily get better fruit, and hence this will not explain the apparent divergence of observed efficiencies from the normally tested 85–65 per cent ratio. My response is twofold: both deductive and empirical evidence do support the proposition that small-scale processors get better fruit on a continuous and regular basis; second, even if Purvis is right, an assumption of uniform quality raw material to all processors does not alter my basic argument or the policy recommendations derived therefrom.

In his excerpts from page 195 of my article Purvis omitted the sentence between the second and third sentences he quoted which contained the operational linkage explaining why *logically* small operators may be expected to obtain fruit of higher oil content. "Not only is the small-scale processor able to inspect the small quantity of fruit he buys much more carefully than his larger competitor,[1] but with no fixed costs he can stop production whenever the better quality fruit is not available." Now follows "This logical presupposition is supported by all investigators' reports that the small-scale processors do get the premium fruit, and by Miller's findings that these two small-scale technologies have more than double the unutilized capacity of the other two techniques." Clearly it *is* a logical proposition and differential unutilized capacity can be taken as supporting evidence until a better explanation for it is set forth—and Purvis offers no such explanation.

As to investigators' research findings on this point, Purvis asserts that a meaningful degree of selectivity is not reported. Regarding the degree of selectivity, I do not find it at all "hard to imagine" that palm fruit traders who are working on the margin of a few pennies will systematically sell their lowest quality fruit (or *from* that portion of their fruit which they consider to meet the lowest acceptable minimum) to those buyers who pay the least attention to inspecting fruit quality and who offer a fixed price rather than making variations for quality. Purvis cites Anne Martin's 1956 report and an unpublished (and unavailable to me) Ibadan Master's thesis by S. M. Essang as not supporting my premise. Quite the contrary, Martin does report what I claim. In explaining why the Pioneer mills have not succeeded, she states, "It must, however, be pointed out that mills often receive the poorer quality fruit, i.e., that which, *cet. par.*, would yield less oil" (*1*, p. 13). S. C. Nwanze, Director of WAIFOR and the man who probably has had the most extensive contact with the palm oil economy, reports:

[1] Elsewhere I mention that in proportion to his total raw material purchase requirements, the small operator has the additional advantages of greater local knowledge and personal goodwill.

> A visit to local markets in Eastern Nigeria shows that there is a continuous trade in fresh fruit throughout the year. Hand-press operators buy their fruit on the open market and they vary their price with the season. It is not surprising that in most of the areas where they operate they can and do get the choicest fruit available. They have better contacts with harvesters and are prepared to go out and get the fruit where it can be found. In contrast the mills wait for the fruit to come to them (*4*, p. 237).

Finally, the importance of this phenomenon was reported to the writer in the autumn of 1964 during interviews with the Chief Engineer at Aba, head of ENDC's pioneer Oil Mill scheme, and with four of six Pioneer mill managers whose mills ranged geographically from Amansi to Owerrinta.

The meaning of Purvis' remarks about seasonal and geographical variation of extraction rates is unclear. Does he mean that if these variations were taken into account the extraction rates would be wider apart (which would strengthen my argument) or closer together (which would require establishing that the samples were unrepresentative and non-cancelling)? In fact, Miller points out in his study that the data for all technologies were deliberately collected during the same season, and that Okwigi and Abak were deliberately chosen as being representative of the two dominant palm producing regions in Eastern Nigeria, a low oil-content (80 inch rainfall) area and a high oil-content (100 inch rainfall) area respectively (*2*, pp. 36, 92).

But let us suppose for a moment, contrafactually, that all of Purvis' points are valid—that small processors do not get better fruit, that the true oil-to-fruit ratio is 23 per cent,[2] that the unexpectedly small Pioneer mill—screw press efficiency differential is not explained by differing fruit quality but by differing managerial efficiency.[3] Does this change "the whole construct of policy recommendations" based upon my analysis? Since the model's coefficients are based upon the actually achieved extraction rates rather than the tested extraction efficiencies, nothing is changed other than the loss of irreversibility at lower producer prices. The recommended lowering of the tax on palm oil processors (a producer price closer to

[2] Purvis attacks my use of a 20 per cent oil-to-fruit ratio to interpret the extraction efficiencies of the Pioneer mill and screw press technologies. Given Miller's reported extraction rates, assumptions about oil content will determine the extraction efficiency, as seen below.

Technology	*Extraction rate*	*Extraction efficiency if oil-to-fruit ratio: 20%*	*21%*	*23%*	*24%*
Native method	15.4	77%	73%	67%	64%
Screw press	15.2	76	72	66	63
Pioneer mill	17.2	86	82	75	72
Stork press	15.9	79	76	69	66

Purvis rejects my 20% figure as "not supported by any hard data" and introduces his "more realistic figure of 22–24 per cent" the only evidential support for which is a study by Zeven summarizing fragmentary data which indicates a figure of 21 per cent! I chose, as Helleiner and others before me, 20 per cent because it is given as the best estimate, after a careful weighing of all the evidence, by the largest and most experienced region-wide purchaser of palm produce (*6*, p. 18) and because it was consistent with the tested normal operational efficiencies of processing technologies.

[3] The tested efficiencies of the screw press and Pioneer mill of 65 and 85 per cent do not represent ideal conditions maxima; in both cases this is over 90 per cent (*4*, p. 251). It is made very clear in the WAIFOR annual reports and the Nwanze paper that these represent results that can be expected under normal Nigerian operating conditions. Moreover, unlike the overall economic performance of a processing firm, extraction efficiency is not related to general managerial efficiency but rather to two specific technical factors—the temperature of the pulp at the time of expression and the amount of pressure placed upon it.

the world price) would still result in a net addition to national income, augmented foreign exchange, a reduction in farm household work time, and the stimulation of further palm harvesting. The only apparent offset is that Marketing Board tax revenue would be reduced *if* the combined higher extraction yield and fruit supply response resulting from an increased producer price did not counterbalance the lower tax rate. It is not a real offset because it is possible to substitute another tax—which could hardly help being both more efficient and more equitable.

Mr. Purvis' third criticism relating to the validity of drawing any policy conclusions from my model represents a collection of undeveloped statements, sometimes contradictory, which bear little relation to my paper. The lowering of the Marketing Board tax on all palm oil purchases is hardly analogous to subsidizing an inefficient infant industry—indeed it is just the opposite. Given pervasive and growing unemployment even in Eastern Nigeria's rural towns, any change in wages is unlikely. Whatever additions to the advanced technology's capital stock and subsequent replacement flow are required, they are an insignificant decrement to foreign exchange availability compared to the 31 per cent (or even 13 per cent) annual increment from additional exports. The model is not unspecified; it is (unavoidably) underidentified.

Finally, Purvis closes his comment with a chastisement concerning premature generalization before the necessary field research has been completed. The primary data need is clearly a census of the industry—a task calling for the resources of a government agency or a foundation-sponsored team effort. From a governmental point of view such an undertaking has been feasible since 1946, but neither the Eastern Nigeria Ministry of Agriculture or its predecessor agencies made any moves in this direction. One of the major tasks of the Ford Foundation/AID-sponsored research branch of the Economic Development Institute, opened at Enugu in late 1961, was to carry just such basic research on the native palm oil economy; Mr. Purvis' sponsorship by the AID-financed CSNRD is part of a continuation of this program. Yet the only new primary data collected after more than six years are contained in the two studies of W. L. Miller (*2, 3*). How many more years must pass before one can be permitted to assemble and analyze existing data to expose—and thereby hopefully correct—the criminally unsophisticated tax policy of the Marketing Board and the costs it has imposed upon the Eastern Nigerian economy? Such a study was long overdue.

CITATIONS

1 Anne Martin, *The Oil Palm Economy of the Ibibio Farmer* (Ibadan, Nigeria, 1956).

2 W. L. Miller, "An Economic Analysis of Oil Palm Fruit Processing in Eastern Nigeria" (unpublished Ph.D. dissertation, Michigan State University, 1965).

3 ———, "The Economics of Field Operations of the Stork Hand Hydraulic Oil Palm Press: Report to the Government of Eastern Nigeria" (Economic Development Institute, Enugu, July 1964) mimeo.

4 S. C. Nwanze, "The Economics of the Pioneer Oil Mill," *Journal of the West African Institute for Oil Palm Research,* April 1961.

5 M. J. Purvis, "The Nigerian Palm Oil Industry: A Comment," *Food Research Institute Studies,* Vol. VIII, No. 2, 1969.

6 United Africa Company, *Statistical and Economic Review,* March 1954.