

This work is licensed under a  
Creative Commons Attribution-NonCommercial-  
NoDerivs 3.0 Licence.

To view a copy of the licence please see:  
<http://creativecommons.org/licenses/by-nc-nd/3.0/>

RN 322344

(832)

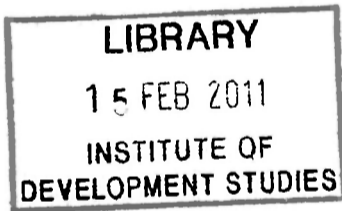
(a) UNIVERSITY OF NAIROBI  
(b) Institute for Development Studies  
Working papers

Estimating the Efficiency of Exports by Means of Brief,  
Feasible Business Interviews

By

Richard C. Porter

Working Paper No. 68



INSTITUTE FOR DEVELOPMENT STUDIES  
UNIVERSITY OF NAIROBI

October 1972

Any views expressed in this paper are those of the author.  
They should not be interpreted as reflecting the views of  
the Institute for Development Studies or of the University  
of Nairobi.

IDS



095418

Estimating the Efficiency of Exports by Means of Brief,  
Possible Business Interviews

ABSTRACT

In this paper I propose, through brief business interviews, an approach to assessing the efficiency of Kenya's exports of processed agricultural products to advanced-country markets. In the paper, I explain 1) why I am interested in these products, 2) the questions I will ask in the interviews, and 3) the various formulas for efficiency which I will calculate. Throughout, the efficiency concept used is the marginal domestic cost of foreign exchange; in essence, it consists of an attempt to find, for each products a rough estimate of the shillings' worth of Kenyan resources expended per (say) U.S.dollar's worth of (net) foreign exchange earned.

Working Paper No. 68



INSTITUTE FOR DEVELOPMENT STUDIES  
UNIVERSITY OF NAIROBI

October 1975

Any views expressed in this paper are those of the author.  
They should not be interpreted as reflecting the views of  
the Institute for Development Studies or of the University  
of Nairobi.

Estimating the Efficiency of Exports by Means of Brief,  
Feasible Business Interviews

Richard C. Porter

27 October 1972

Import substitution has been sufficiently observed in Latin America and South Asia that the process is now well known. As its practitioners move from dependence upon the imports of consumer goods to dependence upon the imports of raw materials and capital goods, with unceasing -- and sometimes growing -- pressure on the balance of payments, the continued neglect of exports eventually becomes infeasible. Because recognition of this is usually belated, many dangers are created for the subsequent export promotion, two of which are particularly serious: 1) that export promotion will become "export maximization", or export "at any cost," without regard to considerations of efficiency; and 2) that the industrial structure will have become so protection-ridden that it will no longer be possible to discover (and utilize) the underlying comparative advantage. It is important to examine the efficiency of Kenya's established, incipient and potential exports of manufactures at an early stage of its industrialization.

Such examination has already been begun by Phelps and Wasow (1972), who estimate the "international viability" of 53 Kenyan industrial sectors.<sup>2</sup> In terms of Kenyan shillings' worth of domestic resources used up per (say) U.S. dollar of foreign exchange earned (by exports) or saved (through import substitution), the range of industrial efficiency they find is vast. Omitting (but not forgetting) the six sectors that display negative value added at world prices,<sup>3</sup> the domestic cost of foreign exchange ranges from \$89.3 per dollar (for "paints") to \$1.5 per dollar (for "R"<sup>4</sup>) -- the official exchange rate being roughly \$7.1 per dollar. A domestic cost of foreign exchange more than twelve times the exchange rate (i.e. 89.3/7.1) indicates that Kenya has, despite the early stage of its industrialization, already found expensive means of earning (or saving) foreign exchange.<sup>5</sup>

The Phelps-Wasow study is a critical first step in the process of forcing recognition of the fact that Kenya is already creating industrial white elephants and of indicating the broad sectors where further growth should be encouraged. Nevertheless, countries export products, not sectors, and there remains the task of showing Kenya's policy-makers the products whose export is efficient. As an example of the heterogeneity within sectors, the Phelps-Wasow study finds a domestic cost of foreign exchange for the three-digit sector (ISIC 315), "soap and detergents", of \$ 5.1 per dollar; elsewhere, the domestic cost of foreign exchange is given separately for soap at \$ 7.5 per dollar and for detergents at \$ 4.8 per dollar.<sup>6</sup> Clearly, the efficiency of a sector does not guarantee the efficiency of all its component products. Even more striking examples of this have been found elsewhere; in a study of Indian exports, the "engineering goods sectors" display a domestic cost of foreign exchange of Rs. 21.42 per dollar, but individual products within "engineering goods" range from Rs. 8.40 per dollar (for stainless steel dissecting sets) to Rs. 124.20 per dollar (for black conduits)<sup>7</sup>-- "the variation in costs among these goods is as large as the variation in costs among all of India's export sectors."<sup>8</sup>

Product studies may usefully supplement sector studies, but, in a world of multi-product firms, the data for such studies are not readily collected. In the remainder of this paper, I suggest a way in which serviceable estimates of the domestic cost of foreign exchange for particular exported products can be derived from (fairly) brief interviews involving no (or few) sensitive questions. The sequence of the paper is as follows. In Section I, the interview questions are given, and relevant variables are defined. In Section II - V, four possible measures of the marginal domestic cost of foreign exchange (MDCFX) are suggested, and the method of their calculation from the interview data is derived. In Section VI, some doubts and worries are discussed. The Appendix lists (tentatively) products that might be examined and firms that might be interviewed.

The tentative list of products is not random (as a glance at the Appendix will show). I am here interested in exports which involve the Kenyan processing of Kenyan agricultural produce for sale in advanced-country markets. I have several reasons for this interest:

1. Such products -- and their export potential -- are too often belittled by the less developed countries (i.e. LDCs) in the process of industrialization as insufficiently altering their status as primary-product producers. To prevent the development of this attitude in Kenya, it is important to show up its irrationality (if, indeed, the study shows it to be irrational).

2. Recent LDC history indicates that, as a by-product of import-substitution policies, not only are exports in general discriminated against but exports which use domestically-produced inputs are especially discriminated against. Overvalued exchange rates, low tariffs on intermediate goods, preferential import-licensing for exporters, drawback systems, subsidies based on gross (rather than net) foreign exchange earnings, and highly protected domestic industry all distort the input mix of exports away from domestic and toward foreign intermediate goods.<sup>9</sup> Special attention to export products which, by their very nature, must use domestic inputs is therefore appropriate.

3. The least developed countries are extremely reluctant to go on and on buying the products of the import-substitution industries of their somewhat more industrialized neighbors. Eventually, they prefer either to turn to the cheaper advanced-country suppliers or to produce the product themselves. The recent experience of Kenyan exports within Africa offers abundant evidence along these lines. While the growing efficiency and broadening structure of Kenyan industry may continually offset this, it seems likely that any rapid growth of Kenyan exports must be based on advanced-country markets.<sup>10</sup>

4. In the past, the typical "cascading" of advanced-country tariff structures has retarded the expansion of LDC agricultural processing industries. To the extent that pressure from LDCs for tariff preferences on manufactures is successful in the future (at least with respect to the processing of tropical products), a rapid expansion of efficient processing industries will be appropriate, and it may help to know now which these are.

## I. The Interview and the Data Generated

The first problem of the interview is to determine the precise exported product being considered -- e.g. nuts, cashew nuts, roasted cashew nuts, dry roasted cashew nuts, dry roasted cashew nuts in cans, etc.. My inclination is to attempt a broad classification, if only because the conventions of cost accounting will otherwise lead to a largely arbitrary distribution of overheads. Then, the questions about this "product":

1. The fraction of the total sales (or production)<sup>11</sup> that is domestic (i.e. within Kenya itself).<sup>12</sup>
2. The ratio of the domestic Kenyan price to the export price.<sup>13</sup> If the export price differs among destinations, some sort of weighted average is needed.<sup>14</sup>
3. The average earnings per employee on this product. Those employees who are involved in several of the firm's products (i.e. in sales, accounting, etc.) should be prorated and included.
4. The ratio of wage payments to total sales.
5. The ratio of nonwage value added to total sales. Nonwage value added includes rent, indirect taxes, depreciation, profit -- in short, everything except wages and the purchase of intermediate inputs.
6. The ratio of imported intermediate-input costs<sup>15</sup> to total sales.
7. The average rate of customs duty on these imported inputs. Where only a few imports are used, a list could be sought (with weights) and the ratio could be later calculated with the help of a customs schedule.
8. The ratio of domestic intermediate-input costs to total sales. These should be divided into those that are, to some extent at least, exported in their unprocessed state and those that are not.
9. For those Kenyan inputs that are exported, the discount below their F.O.B. export price which the processor gets, if any (and weighted across the exported inputs if more than one is involved).
10. The percentage excess cost, if any, of producing a unit of the export product over producing a unit of the Kenyan-sold product.<sup>16</sup>

I also hope to tour the facilities and ask several less quantitative questions, particularly about i) the extent of excess capacity, ii) the constraints on expansion, iii) the degree of indirect taxes (in the nonwage value added) on the Kenyan and/or exported product, iv) the extent of foreign ownership, v) the long-run scope of the advanced-countries markets for the product, and vi) the kinds of marketing problems experienced (or feared).

These questions yield (or permit the derivation of) the following:

- s the fraction of total sales that are domestic.
- $r$  the ratio of domestic to export price (both in shillings, and hence  $r$  is a pure number with, typically,  $r \geq 1$ ).
- q the average earnings per employee.
- w wage costs as a fraction of total sales.
- n nonwage value added as a fraction of total sales.
- m imported inputs as a fraction of total sales.
- c the average customs-duty rate on imported inputs.
- t exportable Kenyan inputs as a fraction of total sales.
- d the average rate of discount below F.O.B. price at which Kenyan tradeable inputs are purchased.
- u untradeable (i.e. not exported) Kenyan inputs as a fraction of total sales.  
( $w + n + m + t + u = 1$ )
- e percentage excess cost of production of exported products over the cost of Kenyan-sold products.

The estimates of marginal domestic cost of foreign exchange, developed in Sections II-V, use only these above data and E, the official Kenyan exchange rate (in, for my convenience, Kenyan shillings per U.S. dollar). But the development of the formulas is facilitated by the use of some additional variables (though their values need not be found):

- $P_k$  the Kenyan price of the product (in shillings per unit).
- $P_f^*$  the export price of the product (in dollars per unit -- throughout, an asterisk by a variable means that it is dollar-denominated).



- $X_k$  units of output sold in Kenya.
- $X_f$  units of output exported.
- $W$  wage value added.
- $N$  nonwage value added.
- $U$  untradeable Kenyan inputs used.
- $T^*$  exportable Kenyan inputs used (denominated in terms of the dollars they would have earned, if exported).
- $M^*$  imported inputs used.

$$(P_k X_k + EP_f^* X_f) = W + N + U + E(1 - d)T^* + E(1 + c)M^*$$

## II. The Basic Formula for MDCCFX

In order to ask whether an export should be expanded or contracted, it is necessary to know something about its efficiency at the margin; but the questions asked in the interviews are -- inevitably, if they are to be simple and answerable -- about averages. In the basic formula for the marginal domestic cost of foreign exchange (hereafter, MDCCFX), we assume simply that the marginals equal the averages or, in other words, that there are constant costs per unit over the relevant range or output. These constant costs are not, of course, necessarily the same for exported and domestically marketed output.

Using the symbols of Section I, writing  $b$  for the per-unit wage cost of domestically sold output and writing  $b(1 + e)$  for the per-unit wage cost of exported output, we have for total wage cost ( $W$ ):

$$(1) \quad W = w(P_k X_k + EP_f^* X_f) = bX_k + b(1+e)X_f \\ = \frac{U}{P_k} (P_k X_k) + \frac{b(1+e)r}{P_k} (EP_f^* X_f);$$

and, simplifying,

$$(2) \quad \frac{b}{P_k} = \frac{w}{s+(1-s)(1+e)r}$$

Thus, the formula for total wage cost is

$$(3) \quad W = \frac{wP_k}{s+(1-s)(1+e)r} X_k + \frac{w(1+e)rEP_f^*}{s+(1-s)(1+e)r} X_f,$$

and the marginal wage cost per unit of exported output is the partial derivative of (3) with respect to  $X_f$ , or

$$(4) \quad \frac{w (1+e)rEP_f^*}{s + (1-s)(1+e)r}$$

In similar fashion, we can derive, for exports, the marginal nonwage-value-added cost and the untradeable-Kenyan-input cost.

For tradeable Kenyan inputs ( $T^*$ ) and imported inputs ( $M^*$ ), the formulas are slightly more complex. Since the ratios,  $t$  and  $m$ , refer to shilling costs, we have:

$$(5) \quad E(1-d)T^* = \frac{tP_k}{s+(1-s)(1+e)r} X_k + \frac{t(1+e)rEP_f^*}{s+(1-s)(1+e)r} X_f,$$

and the marginal tradeable-Kenyan-input cost of exports is

$$(6) \quad \frac{t(1+e)r P_f^*}{s+(1-s)(1+e)r} \cdot \frac{1}{1-d}.$$

Similarly derived, the marginal imported-input cost of exports

$$(7) \quad \frac{m(1+e)r P_f^*}{s + (1-s)(1+e)r} \cdot \frac{1}{1+c}.$$

The  $MDCFX_0$ , with the zero subscript to refer to its basic form, is simply the marginal domestic cost of a unit of exported output divided by the net dollar price of the exported unit -- dollar price is the dollar price of the export less the dollar value of the imported and tradeable inputs embodied in that export:

$$(8) \quad MDCFX_0 = \frac{w + n + u}{s + \frac{(1-s)(1+e)r}{(1+e)r}} - \frac{t}{1-d} - \frac{m}{1+c} E.$$

Because of the identity,  $w + n + u + t + m = 1$ , equation (8) can also be written as

$$(9) \quad MDCFX_0 = \frac{1 - t - m}{s + \frac{(1-s)(1+e)r}{(1+e)r}} - \frac{t}{1-d} - \frac{m}{1+c} E,$$

but (8) is usually more convenient since the application of shadow prices (see Section VI) is more straightforward in that form.

Before turning to the variations on this basic formula for MDCFX, we should note that, although formula (9) bears little superficial resemblance to traditional formulations of MDCFX, it is in fact thoroughly comparable. Traditionally, the assumptions are made that  $e = 0$  and  $s = 1$ , in which case formula (9) reduces to

$$(10) \quad \text{MDCFX}_0 = \frac{1-t-m}{r \frac{1-t}{1-d} \frac{1}{1+c}} E = \frac{P_k - tP_k - mP_k}{P_f^* - tP_k - mP_k} E(1-d) E(1+c)$$

$$= \frac{P_k - t'(1-d)E - m'(1+c)E}{P_f^* - t' - m'} ,$$

where  $t' = (tP_k)/E(1-d)$  and  $m' = (mP_k)/E(1+c)$ . In this form, the comparability becomes apparent.

### III. When the Exporter Has Excess Capacity

The ubiquitous bane of LDC industry, excess capacity, is by no means absent in Kenya. And many exporters have entered foreign markets less from conviction about their long-run profitability than in a short-run effort to utilize more fully their idle capacity. The theory is familiar. With domestic market power, the firm produces for the internal market up to the point of  $MC = MR$ ; as long as the (FOB) price for foreign markets (i.e.  $EP_f^*$ ) exceeds MC, it then proceeds to export. As a result, the social, as well as the private, cost of such export is the marginal resource cost; to the extent that the various cost components (i.e., W, N, U, T, and M) contain elements of overhead costs, they overstate the true resource costs of the exports.

It would be self-defeating in the interviews to ask the respondent to dissect variable from overhead costs, but it is possible to make some plausible adjustments for the difference. I propose that most -- if not all -- of nonwage value added (i.e. N) is overhead and that most of the other cost elements are direct costs. The formula for MDCFX then becomes

$$(11) \quad \text{MDCFX}_1 = \frac{w+u}{\frac{s + (1-s)(1+e)r}{(1+e)r} - \frac{t}{1-d} - \frac{m}{1+c}} E,$$

which is simply formula (8) for MDCFX<sub>0</sub> with the n omitted from numerator.

This formula yields a lower, and almost certainly more correct, value for the MDCFX. But it is appropriate only for industries i) whose chief business is for the internal market, ii) with excess capacity, and iii) which contemplate occasional bursts or marginal incursions into exporting. While this probably describes many present Kenyan exporters, it is not the stuff of which dramatic secular growth of exports is made. Thus, since we are interested in the efficiency of exports on a long-run basis and on a vastly supra-marginal scale, we shall generally rely more on MDCFX<sub>0</sub> than on MDCFX<sub>1</sub>.

IV. When the Excess Cost of Exports Arises Only in the Domestic Components

The basic formulation of MDCFX (i.e. MDCFX<sub>0</sub> of Section II) assumes that the reported excess cost of producing the export product (i.e. e) is evenly distributed across all components of the per-unit cost. In fact, however, to the extent that the extra cost is incurred in order to meet international standards, those inputs which are internationally traded are presumably responsible for little, if any, of the extra cost. In this section, we assume that the extra cost (e) applies only to the domestic components, namely, to W, N, and U.

The cost function for tradeable (and imported) inputs is then not equation (5), but rather

$$(12) \quad E(1-d)I^* = \frac{tP_k}{s + (1-s)r} (X_k + X_f),$$

and the marginal cost of tradeable inputs per unit of export is not equation (6) but

$$(13) \quad \frac{trP_k^*}{s + (1-s)r} \cdot \frac{1}{1-d}$$

And the marginal cost of imported inputs per unit of export is found in like manner.

As before, we now write the MDCFX:

$$(14) \quad MDCFX_2 = \frac{\frac{r(1+e')}{s + r(1-s)(1+e')} (w + n + u)}{1 - \frac{tr}{(1-d)(s+(1-s)r)} - \frac{mr}{(1+c)(s+(1-s)r)}} E,$$

where e' represents not the interview value of e but rather the (higher) rate which is applied to the components, (w + n + u),

so as to yield an overall excess cost for exports of  $e$ . Formula (14) simplifies somewhat to

$$(15) \quad \text{MDCF}_2 = \frac{s + (1-s)r}{\frac{s}{1+e'} + (1-s)r} \cdot \frac{w + n + u}{\frac{s+(1-s)r}{r} - \frac{t}{1-d} - \frac{m}{1+c}} E$$

The value of  $e'$  can be found in terms of the interview value of  $e$ . First, write:

$$(16) \quad 1+e = \frac{\frac{(1+e')(w+n+u)}{s+r(1-s)(1+e')}}{\frac{w+n+u}{s+r(1-s)(1+e')}} \cdot \frac{\frac{t+m}{s+(1-s)r}}{\frac{t+m}{s+(1-s)r}}$$

and then solve (16) for  $e'$ :

$$(17) \quad e' = \frac{1}{1 - \frac{er(1-s)}{s+(1-s)r} \cdot \frac{t+m}{w+n+u}} \cdot \frac{e}{w + n + u}$$

Thus,  $e'$  is somewhat greater than  $e/(w + n + u)$ , but for small values of  $e$  will probably be very close to it.

It is tempting to seek a relationship between  $\text{MDCF}_2$  and the basic  $\text{MDCF}_0$ , but a little inspection (or a lot of algebra) indicates that neither will be consistently the larger of the two. It may well be that the two formulations rarely differ by enough to justify the subtlety involved.

#### V. On the Source of "Tradeable" Inputs

So far, we have been assuming that Kenyan produce, if it is exportable, would indeed have been exported had it not been used as an input into the Kenyan product (that was later exported). Thus, up to now, the  $T^*$  term has always appeared as a deduction in the denominator of the MDCF formulas (i.e. as a reduction in the net foreign exchange earned).

But "tradeables" are not necessarily exported, and a diversion of "tradeables" to use as domestic inputs does not necessarily mean a corresponding loss of exports. Such a diversion may, in principle, equally well derive from 1) increased domestic production or 2) reduced domestic consumption of the "tradeable". And the cost, in each of these last two cases is domestic (i.e. shilling) rather than foreign (i.e. dollar).

The final measure of MDCF<sub>X</sub> treats tradeable Kenyan inputs like untradeable Kenyan inputs -- that is, in the numerator, as a domestic (shilling) resource cost. The formula, then, requires only one change from equation (8):

$$(18) \quad \text{MDCF}_Z = \frac{w + n + u + t}{s + \frac{(1-s)(1+e)r - m}{(1+e)r}} \cdot E.$$

Comparison of the two formulas, MDCF<sub>X0</sub> and MDCF<sub>XZ</sub>, shows that

$$(19) \quad \text{MDCF}_0 > \text{MDCF}_Z \text{ as } \text{MDCF}_0 > E(1-d).$$

In essence, exports that are efficient by the basic formula will appear somewhat less efficient (but still efficient) by MDCF<sub>XZ</sub>; and exports that are inefficient by the basic formula will appear somewhat less inefficient (but still inefficient) by MDCF<sub>XZ</sub>. With the "correct" means of handling tradeable inputs, the MDCF<sub>X</sub> would be somewhere between MDCF<sub>X0</sub> and MDCF<sub>XZ</sub>, so it is reassuring that an arbitrary handling of tradeables will not cause efficient exports to appear as inefficient exports, or vice versa. Calculation of both MDCF<sub>X0</sub> and MDCF<sub>XZ</sub> will nevertheless give an idea of the sensitivity of the results to the choice of assumption with respect to the source of tradeables.

#### VI. Et Cetera

The most obvious omission, to this point, in the various formulas developed for MDCF<sub>X</sub> is any recognition that private and social resource costs may differ. I propose to do something with this, but there are serious difficulties, chiefly, 1) that quantitative knowledge is weak about the extent to which Kenyan factor prices fail to reflect real scarcity, and 2) that questions toward this end quickly lengthen the interview and reach into sensitive areas (e.g. the division of nonwage value added (N) into indirect taxes, profits, etc.). Accordingly, I propose the following exercises in shadow prices:

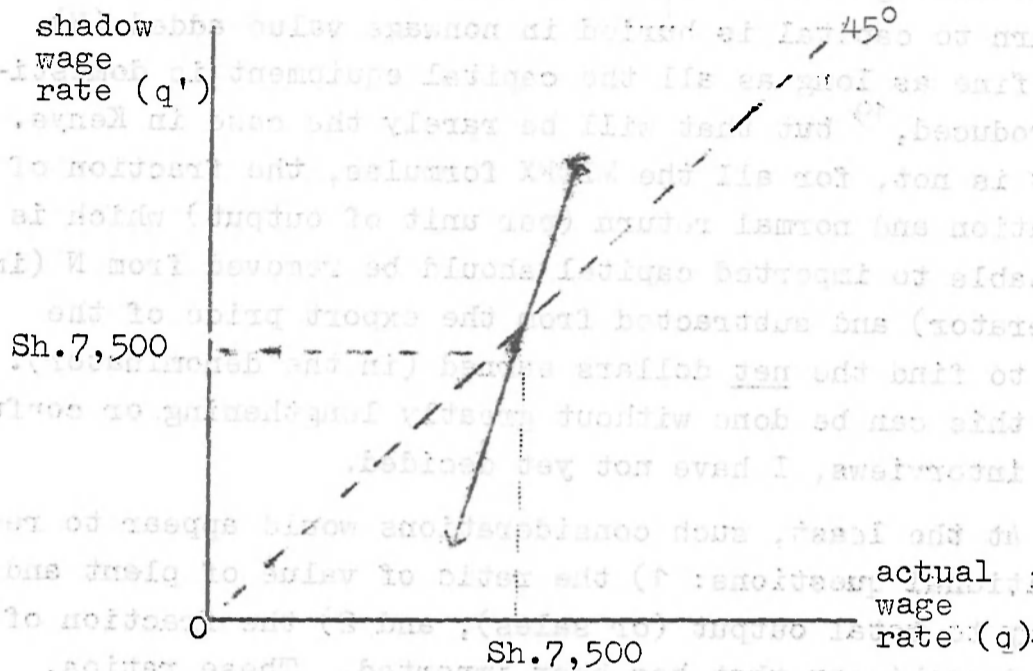
1. Imported and Tradeable Inputs (M\* and T\*). Nothing, on the grounds that they are either in the denominator (i.e. already dollar-denominated) or, when in the numerator (as for T\* in MDCF<sub>XZ</sub>), not readily susceptible to adjustment.

2. Untradeable Kenyan inputs (U). One sort of adjustment is quite feasible (without proceeding to interview the producers of the inputs; and then the producers of the inputs into the inputs...). The sectors of origin of the untradeables could be located in the Phelps-Wasow tables, and their shadow prices raised (lowered) according to whether those sectors used above-average (below-average) quantities of capital and skilled labor (relative to unskilled labor).

3. Nonwage value-added (N). This category is an awkward catch-all, including 1) returns to capital and to managerial and entrepreneurial effort, which are probably more scarce than their market prices indicate, 2) non-resource costs, such as excess profits and indirect taxes, which by definition should carry a zero shadow price, and 3) profits (normal and excess) that are repatriated (or repatriatable?) abroad and depreciation plus normal yield on imported capital, both of which should be counted in the denominator of the MDCFX formulas since they represent reductions in the net dollar earnings of exports. It is not easy, even in principle, to separate these, and in practice I suggest that no shadow-price adjustments can be sufficiently defended (at least on the basis of the data which the interviews might yield). Of course, one can interpret  $MDCFX_1$  as applying a (rather extreme) zero shadow price to all the elements of nonwage value added, and it therefore gives an idea of the sensitivity of the MDCFX measures to possible lesser adjustments.

4. Wages (W). Since it is intended to produce shilling-per-dollar MDCFX estimates which are usefully compared to the existing Kenyan exchange rate, it is important not to succumb to the temptation to place some factors' shadow prices below their market prices (e.g. for unskilled labor) and no factor's shadow price above its market price. I propose to avoid this by adjusting the wage component upward or downward (symmetrically) according to the whether the average earnings per employee for the product (q) are above or below the average earnings per employee for private industry as a whole in Kenya. This latter was somewhere around \$ 7,000 per year<sup>17</sup> to Sh. 8,000 per year<sup>18</sup> -- call it, for now, Sh. 7,500. Then some such adjustment as shown in Figure 1 will not bias, on the average, the

Figure 1



MDCFX figures upward or downward. If the slope of the line in Figure 1 is  $h$  (where  $h > 1$ ), then the shadow-price-adjusted ratio of total wage costs to sales ( $w'$ ) becomes

$$(20) \quad w' = \left[ h - \frac{7,500(h-1)}{q} \right] w$$

Various arbitrary values for  $h$  might be tried -- my past experience suggests that the results will not be seriously affected by plausible (i.e. mild) shadow-price adjustments.

There are a number of worries and caveats that might be raised about the whole procedure outlined in this paper, but two deserve special attention. One, to what extent are the interview responses likely to be self-serving declarations and (hence?) systematically biased toward lower values of MDCFX? My guess is that they will not be so biased, for three reasons: 1) the information sought is sufficiently banal as not to inspire duplicity; 2) since I am not a government employee and Kenya is a country with little tradition of export favoritism, the businessmen interviewed is unlikely to perceive any real possibility of self-service; and 3) the concepts and calculations of the MDCFX formulas are sufficiently complex that the layman will not readily know what data adjustments would make what assessments more favorable.



The second worry is about the treatment of capital equipment throughout. In all the above, the depreciation on and return to capital is buried in nonwage value added (N). This is fine as long as all the capital equipment is domestically produced,<sup>19</sup> but that will be rarely the case in Kenya. where it is not, for all the MDCFX formulas, the fraction of depreciation and normal return (per unit of output) which is attributable to imported capital should be removed from N (in the numerator) and subtracted from the export price of the product to find the net dollars earned (in the denominator). Whether this can be done without greatly lengthening or confusing the interviews, I have not yet decided.

At the least, such considerations would appear to require two additional questions: 1) the ratio of value of plant and machinery to total output (or sales), and 2) the fraction of all plant and machinery that has been imported. These ratios, together with assumed values for the 1) rate of depreciation and 2) rate of return to capital (that its social scarcity deems), would permit the estimation of the portion of nonwage value added that really involves a foreign-exchange cost. Call this, valued in shillings, x. The MDCFX formulas (all) need to have x subtracted from their numerators and x/E subtracted from their denominators. The resulting MDCFX will be larger or smaller than the previous value (i.e. that calculated without this adjustment) according to whether the previous value was larger or smaller than E. Thus, all this difficult and somewhat arbitrary manipulation can never change an apparently efficient export into an apparently inefficient one (or vice versa), but will merely make the apparently efficient exports show up as even more efficient (the more so the larger the imported machinery costs involved) (and vice versa).

#### Appendix

The products listed below are (intended to be) an exhaustive collection of processed agricultural products exported primarily to the advanced countries and of reasonable importance to Kenya's exports.<sup>20</sup> The total exports of the 15 products listed below amounted to Sh. 88 millions in 1971 (excluding any exports to Tanzania and Uganda),<sup>21</sup> of which canned beef comprised about two fifths and tinned pineapples another one fifth.

The list:

<u>No.</u>	<u>SITC Number</u>	<u>Product</u>	<u>Firms</u>	<u>1971 Export Value (\$s. millions)</u>
1	013-301	Meat Extracts and Essences	Kenya Meat Comm. Oxo (EA) Ltd.	5.4
2	013-801	Canned Beef	Kenya Meat Comm. Oxo (EA) Ltd.	40.3
3	051-713	Cashew Kernels	Ambita Cashews Ltd Confresh Ltd Kenya Cashews Ltd. Pan African Foods Ltd. Pims Food Products Trufoods Ltd. Vita Products	0.8
4	053-501	Passion Fruit Juice	Associated Packers D. Epstein and Co. Erskine and Duncan (Mfg.) Ltd. Erskine and Price (Mfg.) Ltd. Kabazi Cannery Ltd. Kenya Cannery Ltd. Kenya Fruit Processors Ltd. Kenya Orchards Ltd. Kenya Sunshine Products Mitchell Cotts (EA) Ltd. Schweppes (EA) Ltd. Trufoods Ltd.	2.2
5	053-502	Pineapple Juice	Cedar Lodge Farm Kenya Cannery Ltd. Kenya Overseas Co. Ltd. Rongai Steam Roller Mills Ltd. Trufoods Ltd.	1.6
6	053-901	Tinned Pineapples	Kabazi Cannery Ltd Kenya Cannery Ltd. Kenya Orchards Ltd. Kenya Sweets Ltd. Limuru Canning Factory Trufoods Ltd.	19.3
7	055-410	Leguminous Flours	Confresh Ltd. Proctor and Allan Ltd.	3.0

<u>No.</u>	<u>SITC Number</u>	<u>Product</u>	<u>Firms</u>	<u>1971 Export Value (shs.millions)</u>
8	061-500	Molasses	Associated Sugar Co.Ltd. Chemilil Sugar Co. Ltd. EA Sugar Ind. Ltd. EA Storage Co. Ltd. Miwani Sugar Mills Ltd.	2.6
9	081-201	Maize Germ Meal	Atta Ltd. Maida Ltd. Maize Ltd. Sava Mills Ltd. Unga Ltd.	2.8
10	081-301	Cottonseed Cake	A. Baumann and Co. Ltd. Kibos Ind. Ltd. Nakuru Oil Mills Ltd. Nyanza Oil Mills Co. Ltd. Produce Dealers and Millers Ltd.	1.9
11.	081-302	Coconut Cake	A. Baumann and Co. Ltd. Coastal Ind. Ltd. Dubois Oil Mills and Soap Factory Ltd. Eastern Ind'l. Works Ltd. Kisumuwala Oil Millers	0.9
12	512-260	Glycerol	EA Ind. Ltd.	1.3
13	551-102	Cedarwood Oil	Amal'd. Saw Mills (EA) Ltd. Kenya Pencil Slat Co. Ltd. Marmanet Saw Mills Ltd. Shah and Patel (EA) Ltd. Thomson's Falls Saw Mills Ltd.	0.5
14	653-901	Sisal Fabrics	Acif Ltd. EA Bag and Cordage Co. Ltd.	0.6
15	655-613	Sisal Rope	Afr. Ropes and Twines Ltd. Athinai Sisal Estates Ltd. Deva Plantations EA Bag and Cordage Co. Ltd. L.T.C. (Kenya) Ltd.	4.7

Total: 87.9

Sources: E.A. Customs and Excise Dept. (1972).

- Notes:
1. Pyrethrum processing has been excluded on the grounds that Kenya's dominant position in this product raises special analytical problems.
  2. The firms listed are known as producers; it has yet to be ascertained which are exporters.

References

- J. Bhagwati, "The Theory and Practice of Commercial Policy: Departures from Unified Exchange Rates", Special Papers in International Economics, No. 8, Princeton, Jan. 1968.
- J. Bhagwati and P. Desai, India, Planning for Industrialization: Industrialization and Trade Policies Since 1951, Oxford Univ. Press, 1970.
- Central Bureau of Statistics, Min. of Finance and Planning, Kenya Statistical Digest, Nairobi, Dec. 1971.
- East African Customs and Excise Dept., Annual Trade Report of Kenya Tanzania and Uganda, 1971, Nairobi, 1972.
- M. Phelps and B. Wasow, "Measuring Protection and Its Effects in Kenya", I.D.S. Working Paper No. 37, Nairobi, 1972.
- Republic of Kenya, Development Plan, 1970-1974, Nairobi, 1969.
- M. Scott, "Comparative Advantage and the Use of Home-Produced versus Imported Materials", in W. Eltis et al. (eds.), Induction, Growth and Trade, Oxford Univ. Press, 1970.
- C. Staelin, "Export Promotion in the Less Developed Countries: A Case Study of India", Univ. of Michigan Ph.D. thesis, 1971.

Footnotes:

1. See, for example, Bhagwati (1968), pp. 58-59. Elsewhere (Bhagwati and Desai, 1970), such a strategy has been characterized as: "India should produce whatever it can, and India should export whatever it produces" (p. 466).
2. By viability they mean efficiency, and one of their measures, the "world price rate of return to factor inputs", is very close (when inverted) to the concept to be used here, the domestic cost of foreign exchange.
3. For which domestic resources are expended and foreign exchange (net) is lost.
4. Because of the small size of the Kenyan industrial sector, the activities of 26 of the 58 sectors could not be revealed without violation of the confidentiality of the industrial survey data on which their calculations were based.
5. While it is not easy to discover how much foreign exchange was being saved by Kenya's "paints" sector, nearly U.S. \$1 million was being "earned" in 1971 by exports of "pigments, paints, varnishes and related materials" (i.e. SITC 533).
6. Phelps and Wasow (1972), App. II and III.
7. Staelin (1971), pp. 197, 220-223. In fact, one of the engineering goods (gas mantles) yields negative value added.
8. Ibid., p. 209.
9. Of course, the reverse distortion, where it exists, is no less unfortunate. See Scott (1970)
10. This agrees with the Plan. See Republic of Kenya (1969), p. 312.
11. I do not anticipate great fluctuations in finished-goods inventories for the products being considered.
12. Many of the products to be considered are exported not only to advanced countries but to other (especially neighbouring) LDCs as well. Where this is the case more questions are needed - but the extensions are straightforward and hence throughout omitted. For example, for this question, two fractions are needed, that of Kenyan sales to total sales and that of LDC exports to total sales. Perhaps it will also prove desirable to distinguish exports to Tanzania and Uganda from exports to other LDCs.
13. Technically, ex-factory prices in each case, although wholesale or F.O.B. prices should suffice.
14. See footnote 12.

15. These should be C.I.F. and inclusive of tariff.
16. Due to quality differences, superior packaging, etc..
17. In 1970 for "private industry and commerce". See Central Bureau of Statistics. (1971) p. 11.
18. In 1969, for "industrial production". See Ibid., pp. 7, 8.
19. There is also the question of divergences between the true depreciation and the accounting rate and between the shadow and market price of capital. These, I fear, must continue to be ignored.
20. Defined, with some exceptions, to be exports of at least Sh. 1 million in 1971.
21. Out of total exports of Sh. 1,464 millions; or out of total exports excluding tea and coffee of Sh.837 millions.