NOTES

ON THE MARGINAL UTILITY OF COMMODITIES RECEIVED UNDER SURPLUS DISPOSAL PROGRAMMES

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In an earlier paper[1] the economics of surplus disposals was studied by examining the benefits and defects of disposal operations in the light of a series of criteria, one of which was the marginal utility of the surpluses in consumption. I now present a graphical analysis illustrating the effects of the receipt of surpluses upon the level of utility for the recipient. It will emerge that these effects tend towards situations where commercial purchases are eliminated and/or surplus disposal operations perpetuated.
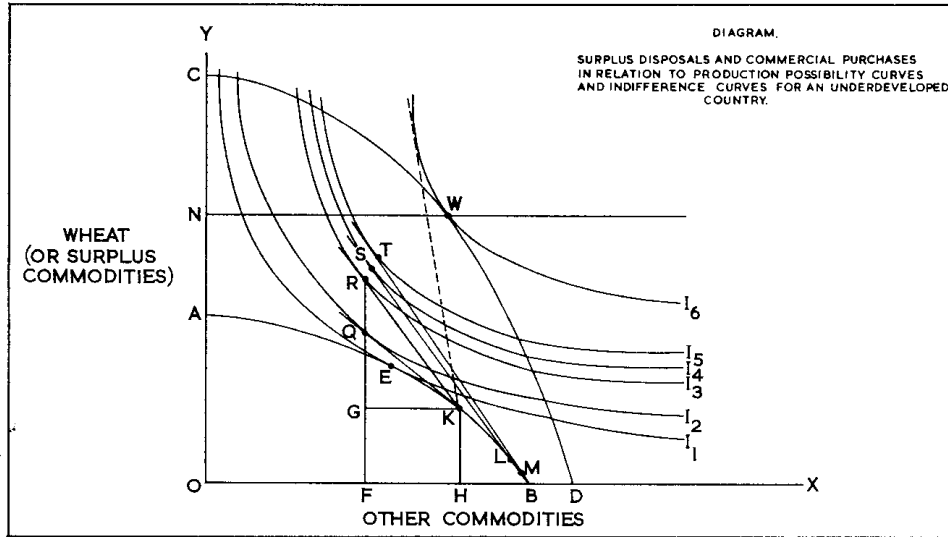
The marginal utility of any quantity of a commodity is the increase in total utility (satisfaction) which results from a unit increase in consumption. The marginal rate of substitution in consumption between this commodity and another is the quantity of the second commodity which will afford the same satisfaction as one unit of the commodity in question. In an economic world, consumers seek to maximise utility. Utility can be represented graphically by means of " indifference curves " which are lines of equal preference. They can be thought of as contours of a three dimensional figure where the two plane axes represent the two commodities between which the choice is being made (or, as here, the commodity in question and all other commodities) while the third dimension measures the position of the various combinations on some scale of preference.

The same analysis can be extended to three or more products. With three products the production possibility curve becomes a production possibility surface ; similarly, the indifference curves become indifference surfaces. More than three inputs cannot be represented geometrically but the same conditions will apply in space of any number of dimensions, namely the entity concerned will normally seek the highest level of utility attainable. No matter how many dimensions there are, conceptually it is possible to simplify them for the present purposes into two dimensions— surplus good(s) along one axis, all other commodities along the other.

Consider an underdeveloped country. In its present state of development, the range of production possibilities open to it is represented by the curve AB in the accompanying diagram, and its map of indifference curves $I_0 I_1 I_2 \ldots I_6 \ldots I_n$[2]. These are actually the indifference curves of the decision-making authority in the country concerned, whether Parliament, the National Planning Commission or the aggregate of private consumers (if free to decide for themselves).

1. Hoffman, E. S., " The Economics of Surplus Disposals ", *Australian Journal of Agricultural Economics*, Vol. 5, No. 1 (Sept., 1961).
2. Those indifference curves such as I_0 which cut the existing production curve have been omitted from the diagram for the sake of clarity.

Y

SURPLUS DISPOSALS AND COMMERCIAL PURCHASES
IN RELATION TO PRODUCTION POSSIBILITY CURVES
AND INDIFFERENCE CURVES FOR AN UNDERDEVELOPED
COUNTRY.

C

W

N

WHEAT
(OR SURPLUS
COMMODITIES)

S T

R

A

I_6

Q

I_5
I_4
I_3

E

G   K

I_2
I_1

L   M

O

F   H   B   D

X

OTHER COMMODITIES

In order to supply the populace with a satisfactory diet it is assumed that a quantity of wheat as represented by ON would be needed. On the basis of the assumed production possibility curve AB it will be seen that even if the country devoted all its resources to wheat production, it could not supply its citizens with an adequate diet. It is however a policy objective of the Government to increase self-sufficiency in wheat.

A country cannot devote itself entirely to wheat production. Other things are required. In the absence of trade, the economy would establish itself as E, where the production possibility curve AB and the indifference curve I_1 are tangential.

Wheat can be obtained from other countries commercially at a price represented by the slope of the exchange line KQ. Maximum utility will be attained by moving along the production curve to the point K (where the exchange line is tangential to the curve) and then proceeding along the exchange line to Q, where the line touches tangentially the higher indifference curve I_2. In this new equilibrium position HK (=FG) of wheat would be produced and GQ imported from abroad in return for the export of FH other goods.

At this stage a donor country offers to supply wheat on concessional terms. Acceptance would avoid the need to expend foreign exchange, or alternatively would enable the wheat to be obtained on conditions that involve a lesser amount of foreign exchange per bushel, but in either case would require the recipient to continue purchasing commercially the same global quota GQ as before. From the view-point of the under-developed country, the price of wheat falls to the weighted average of the global quota plus the quantity being offered by the donor as surplus disposal, in this case QR. The slope of the exchange line becomes KR and the utility level represented by the indifference curve I_3 can be reached. KR is *not* a tangent to AB but is tangential to I_3.

Still greater utility (I_4) could be attained at that average price if the economy moved to L such that LS, parallel to KR, is a tangent to AB and to I_4, and provided the donor is willing to supply additional surplus wheat. The increased quantity of the surplus would alter the average price and increase still further the slope of the apparent price line, so

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that the still higher indifference curve I_5, could be reached by moving along the production curve to M.

Whether to make this adjustment is a policy decision for the recipient Government, since the surplus disposal agreement is an inter-governmental agreement. To do so would mean higher utility and a greater production of other goods. The total production of these other goods, i.e. the horizontal element of the point M, would be distributed as follows: a quantity equal to FH of these other goods would still be needed to be exported to pay for the commercial wheat imports GQ; a portion would have to be given up to meet any local currency that the donor country retained for its own use; the remainder would be available for the domestic market or for export. This remainder will obviously be greater than when the economy stood at K, before surplus wheat became available.

But to move to M means a reduction in wheat production, and makes the recipient continually dependent on the supply of surplus wheat from the donor country. Given a policy of increasing self-sufficiency, domestic wheat production would *not* be curtailed. The economy would be kept at K even though this did not mean maximum utility[3].

Instead the economy would be expanded through saving and investment, including development assisted by the loans or grants associated with the surplus agreement. In other words the economy would move outward to new and wider production possibility curves until eventually it reached the curve CD which would enable an equilibrium at self-sufficiency level W. Unless the developing country intends to become an exporter of wheat (perish the thought!), any further expansion would then take place among the commodities included under the complex of other products.

There is, however, yet another possibility. If, with the economy at K, the under-developed country could negotiate away the global quota condition and induce the donor country to retain little or no local currency for its own use, then the apparent price would fall nearly to zero. There will still be some foreign exchange cost to the recipient, even if only the small indirect external component involved in the handling and distribution of the increased supply of surpluses. As the apparent price falls toward zero, the exchange line will approach the vertical. The recipient will then be able to remain at K and yet attain the indifference curve I_6 via the dotted path KW. Strictly the dotted apparent exchange line will touch I_6 at some point slightly above W. If it is decided to allow the people only the amount of wheat thought desirable and no more, then some still higher indifference curve might possibly be reached, where a near-vertical apparent exchange line touched tangentially an indifference curve I_7 (not shown in diagram) as it crosses the line NW.

It should be noted that a policy of self-sufficiency would push the production possibility curve out toward W and eventually eliminate the need for surpluses. *It would also of course eliminate the need for commercial imports.* But the alternative policy of economic adjustment would tend to reduce domestic wheat production to a low level, and increase the dependence on surpluses, so creating conditions in which surplus disposal programmes become perpetuated. Neither policy affords much satisfaction to commercial wheat-exporting countries.

3. This seeming inconsistency may be avoided if the income levels of farmers is thought of as one dimension in the continuum within which the preference system of the Planning Commission operates.