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CONTENTS

THE LEONTIEF DYNAMIC INVERSE: METHODOLOGICAL ISSUES

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ABSTRACT. *The article is an expose' of the literature on the so-called Dynamic Inverse of the open dynamic input-output model. It first briefly describes the underlining assumptions and properties of the model. This is followed by a comprehensive discussion of the intricacies, controversies and difficulties of the dynamic model in practical applications.*

1.INTRODUCTION

From the outset, I wish to reveal that the article assumes some basic knowledge of the input-output scenario and no effort is made here to make an exposition of the input-output system and the range of assumptions on which the whole theory is built[1]. The paper first introduces the dynamic input-output system and the concomitant notion of the dynamic inverse. Stipulated solution methods and the associated controversies are then discussed at length.

2. THE DYNAMIC INPUT-OUTPUT SYSTEM

We shall first define the economic meanings of the variables and then introduce the open dynamic input-output model.

Let

X_t denote the n sectoral outputs

d_t represent deliveries to final demand or consumption

A_t stand for the matrix of technical coefficients and

B_t for the capital coefficient matrix, all in year t.

It is assumed all through that d_t does not include that part of output going to capital formation; and capital goods produced in year t are used in the production process in year $t+1$.

The workings of the economy are explained by the equation

$$X_t = A_t X_t + B_{t+1}(X_{t+1} - X_t) + d_t \qquad \dots (1)$$

where $t = 0,1,...,m$.

The first term on the right-hand side shows intermediate demand for goods by the industries; the second determines the allocation of inputs to investment; X_t and d_t are as defined earlier.

Letting $G_t = I - A_t + B_{t+1}$, it follows from equation (1) that

$$G_t X_t - B_{t+1} X_{t+1} = d_t \qquad \dots (2)$$

3. LEONTIEF'S BACKWARD INTEGRATION METHOD

The method pursues the aim of, *inter alia*, finding X_t starting from given or estimated A_t, B_t and d_t. One may think of iteratively proceeding by ordinary matrix inversion assuming some initial condition X_o. However, economic reality has revealed that B_t is usually singular as there are only a few sectors that produce capital goods implying that many rows of B_t are zero.

In view of overcoming this difficulty, W. Leontief has designed and applied the so-called Backward Integration Method [6, pp. 17-46] to the American economy (1947-1958). This procedure is discussed hereunder.

Equation (2) above generates a system of inter-locked equations that determine the path followed by the national economy in a period of $m+1$ years. In matrix form, it becomes

$$
\begin{bmatrix} G-B & & & \\ & G-B & & \\ & & \ddots & \\ & & & G-B \\ & & & G \end{bmatrix} \begin{bmatrix} X_o \\ X_1 \\ \vdots \\ \vdots \\ X_{m-1} \\ X_m \end{bmatrix} = \begin{bmatrix} d_o \\ d_1 \\ \vdots \\ \vdots \\ d_{m-1} \\ d_m \end{bmatrix} \quad \ldots \quad (3)
$$

The method of analysis therefore assumes $X_{m+1}=0$. It is also assumed that A and B are constant over a period of $m+1$ years but not an absolute requirement. As elaborated by Leontief, technological changes can be introduced if we want to. The unknown Xs are computed starting with the last equation $GX_m = d_m$; substitute this solution into the second from the last and continue in that fashion until the solution of X_o is obtained. This is what Leontief calls the Backward Integration Method. In matrix notation, the solution will be

$$
\begin{bmatrix} X_o \\ X_1 \\ \vdots \\ \vdots \\ X_{m-1} \\ X_m \end{bmatrix} = \begin{bmatrix} G^{-1} & \cdot & \cdot & R^{m-2} & G^{-1} R^{m-1} & G^{-1}R^m G^{-1} \\ & & & & \cdot & \\ & & & & \cdot & \\ & \cdot & \cdot & \cdot & \cdot & \cdot \cdot G^{-1} & RG-1 & G^2G^{-1} \\ & & & & \cdot \cdot & G^{-1} & RG^{-1} \\ & & & & \cdot & \cdot \cdot \cdot \cdot & G^{-1} \end{bmatrix} \begin{bmatrix} d_o \\ d_1 \\ \vdots \\ \vdots \\ d_{m-1} \\ d_m \end{bmatrix} \quad \ldots \quad (3)
$$

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$$
\begin{bmatrix}
G-B & & & \\
& G-B & & \\
& & \ddots & \\
& & G-B & \\
& & & G
\end{bmatrix}
\begin{bmatrix}
X_o \\
X_1 \\
\vdots \\
\vdots \\
X_{m-1} \\
X_m
\end{bmatrix}
=
\begin{bmatrix}
d_o \\
d_1 \\
\vdots \\
\vdots \\
d_{m-1} \\
d_m
\end{bmatrix}
\quad \ldots \quad (3)
$$

The method of analysis therefore assumes $X_{m+1}=0$. It is also assumed that A and B are constant over a period of $m+1$ years but not an absolute requirement. As elaborated by Leontief, technological changes can be introduced if we want to. The unknown Xs are computed starting with the last equation $GX_m = d_m$; substitute this solution into the second from the last and continue in that fashion until the solution of X_0 is obtained. This is what Leontief calls the Backward Integration Method. In matrix notation, the solution will be

$$
\begin{bmatrix}
X_o \\
X_1 \\
\vdots \\
\vdots \\
X_{m-1} \\
X_m
\end{bmatrix}
=
\begin{bmatrix}
G^{-1} & \cdots & R^{m-2} & G^{-1} R^{m-1} & G^{-1}R^m & G^{-1} \\
 & & & & \cdot & \\
 & \cdots & \cdots & G^{-1} & RG-1 & G^2G^{-1} \\
 & & & \cdots & G^{-1} & RG^{-1} \\
 & & & & \cdots & G^{-1}
\end{bmatrix}
\begin{bmatrix}
d_o \\
d_1 \\
\vdots \\
\vdots \\
d_{m-1} \\
d_m
\end{bmatrix}
\quad \ldots \quad (3)
$$

Here R stands for $G^{-1}B$. The matrix on the right-hand side of (4), which is in fact the inverse of the matrix on the left-hand side of (3), is called Leontief's Dynamic Inverse.

4. CONVERGENCE OF THE DYNAMIC INVERSE

By definition, the matrix on the left-hand side of (3) is infinite since there is no limit on the time horizon $t=m$ or $t=0$. The existence and convergence of its inverse is of practical importance. Leontief extends his analysis and includes the mathematical requirements for the existence of a convergent inverse [6, pp. 38-39]. These conditions are:

i) G^{-1} exists

ii) the so-called Frobenius theorem requires that all the eigenvalues of R fall within the unit circle.

Condition (i) is normally satisfied. A closer examination of the second condition is pertinent.

$$R = G^{-1} B$$
$$= (I-A+B)^{-1} B$$
$$= [(I-A) \{I+(I-A)^{-1} B\}]^{-1} B$$
$$= \{I+(I-A)^{-1} B\}^{-1}$$

Setting $Q = (I-A)^{-1}$,

$$R = (I+QB)^{-1}$$

Hence, if QB has eigenvalues e_i, those of R will be e_i/He_i which shows $|e_i/He_i| < 1$ except when $e_i \leq -0.5$. In case some of the eigenvalues fall below -0.5, the problem is resolved by manipulating [6, p.40] the time lag of matrix B so that we get a spectrum of less than 1 for matrix R.

4

5. ECONOMIC INTERPRETATION OF THE DYNAMIC INVERSE

It may be recalled that in the open static version of the model, the jth column of the inverse, $(I-A)^{-1}$, specifies the direct and indirect input requirements generated by one unit of the jth product for final demand. From equation (4) the same is true for the dynamic inverse but these input requirements are distributed backwards in time.

For example, if we were to deliver one unit of final demand in the year m, then G^{-1} shows the input requirements to be fulfilled in the year m; RG^{-1} stipulates the input requirements to be delivered in the preceding year m-1; $R^2 G^{-1}$ specifies the input requirements to be provided in the year m-2, etc,. The last term $R^m G^{-1}$ determines the input quantities required in the year 0. As in the static inverse, the row shows the industry producing the input and the column indicates the industry making the supply for final consumption.

Given this background, it can be justified that the static inverse, $(I-A)^{-1}$, is in fact an aggregation of the dynamic inverse [2, p.160]. Consider the last column of the dynamic inverse in equation (4). For purposes of analytical convenience, let the terminal year m=0 and go backwards infinitely in time to effect the addition. It can be shown (see Appendix I for the verification) that each column of the infinite dynamic inverse adds to the static inverse $(I-A)^{-1}$. That is,

$$G^{-1} + RG^{-1} + R^2G^{-1} + \dots + R^tG^{-1} + \dots = (I-A)^{-1}$$

Hence, each column of the infinite dynamic inverse adds to the static inverse $(I-A)^{-1}$.

6. AN ALTERNATIVE APPROACH - FORWARD INTEGRATION

Kendrick pinpoints a drawback with Leontief's procedure and puts forward an alternative approach to the problem [4, pp. 693-696]. The shortcoming in the backward integration method is that Leontief assumes X_{m+1}, output corresponding to the year following the terminal year m, is zero. The assumption has resulted in negative inputs to investment in his empirical investigations toward the final year [6, p. 20].

It is therefore suggested that X_{m+1} be set at $\hat{H}X_m$ where $\hat{H}$ is a diagonal matrix designating the envisaged rates of growth in the different sectors for the year m+1 and proceed with the backward substitution procedure [4, pp. 694-695]. The computation is worked out in an iterative manner for various choices of X_{m+1} until the computed X_0 converges toward the prevailing conditions in year t=0. As can be anticipated, the calculation is not going to be easy particularly if the number of economic sectors involved is large.

In case of this latter difficulty, Kendrick proposed a forward integration approach starting with exogenously determined initial conditions [4, pp. 695-696]. The ensuing lines feature this alternative approach.

The procedure begins with the partition of matrix B that the first n_1 rows are non-zero and the remaining $(n-n_1)$ rows are zero. Corresponding transformations are made on A, G, X_t and d_t. The partitioned forms are thus

$$B = \begin{bmatrix} B_{11} & B_{12} \\ B_{21} & B_{22} \end{bmatrix} = \begin{bmatrix} B_{11} & B_{12} \\ 0 & 0 \end{bmatrix} \; ; \; X_t = \begin{bmatrix} X_t^1 \\ X_t^2 \end{bmatrix} \; ; \; A = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} \; d_t = \begin{bmatrix} d_t^1 \\ d_t^2 \end{bmatrix}$$

Following the above rearrangements, equation (2) is expressed as:

6

$$G_{11}X^1_t + G_{12}X^2_t - B_{11}X^1_{t+1} - B_{12}X^2_{t+1} = d^1_t \quad \dots (5)$$

$$G_{21}x^1_t + G_{22}X^2_t = d^2_t \quad \dots (6)$$

We can now solve for X^2_t in terms of X^1_t from equation (6); substitute the solution into equation (5) and obtain the solution of X^1_{t+1}. The derivation (see Appendix II for the proof) shows

$$X^1_{t+1} = [B_{12}G^{-1}_{22}G_{21} - B_{11}]^{-1} [d^1_t - G_{12}G^{-1}_{22}d^2_t + B_{12}G^{-1}_{22}d^2_{t+1} - (G_{11} -$$

$$G_{12}G^{-1}_{22}G_{21}) X^1_t] \quad \dots (7)$$

With a given initial condition X_o, this last equation can be integrated forward to determine X^1_t for all $t = 0,1,\dots, m$ as d_t is exogenously determined. Equation (6) is then utilized to obtain X^2_t.

The forward integration method was also analyzed from the point of the notion of the so-called Penrose's generalized inverse and justified in an article by Kreijger and Neudecker [5, pp. 505-507].

7. THE GENERALIZED VERSION OF LEONTIEF'S DYNAMIC INVERSE

The forward iteration method has overcome the commonly acknowledged singularity problem. It has also been possible to incorporate given initial conditions into the system to ensure consistency. In doing so however, Leontief's intertemporal multiplier properties discussed in section 4 have been skipped from the analysis [8, p. 641].

In view of these considerations, A. Schinnar provides a restatement of model (1), procedures for including initial output levels, and some computational techniques for use in practical planning [8, pp. 641-653]. The analysis remains within the bounds of the backward iteration approach as intended by Leontief. Equation (1) is rewritten in the form

$$X_t - RX_{t+1} = C_t$$

where

$$R = G^{-1} \text{ or } (I-A+B)^{-1}B \text{ and}$$

$$C_t = (I-A+B)^{-1} d_t \text{ or } G^{-1} d_t$$

Using matrix representation, equation (8) reduces to

$$\begin{bmatrix} I-R & & & \\ & I-R & & \\ & & \cdot & \\ & & & I-R \\ & & & R \end{bmatrix} \begin{bmatrix} X_o \\ X_1 \\ \cdot \\ X_{m-1} \\ X_m \end{bmatrix} + \begin{bmatrix} O \\ O \\ \cdot \\ O \\ -R \end{bmatrix} X_{m+1} = \begin{bmatrix} C_o \\ C_1 \\ \cdot \\ \cdot \\ C_m \end{bmatrix} \quad \ldots \quad (9)$$

If we set $X_{m+1} \neq 0$, ordinary matrix inversion does not give a solution. A generalized inverse solution [8, Appendix] is sought. Upon premultiplying (9) by

$$
\begin{bmatrix}
I-R & & & & \\
 & I-R & & & \\
 & & \cdot & & \\
 & & & \cdot & \\
 & & & & I-R \\
 & & & & \ I
\end{bmatrix}
=
\begin{bmatrix}
I & R \ldots R^{m} \\
 & I \ldots R^{m-1} \\
 & \cdot \\
 & \cdot \\
 & R \\
 & I
\end{bmatrix}
$$

The general Leontief solution becomes

$$
\begin{bmatrix}
X_o \\
X_1 \\
\cdot \\
\cdot \\
X_m
\end{bmatrix}
=
\begin{bmatrix}
I & R & \cdot & \cdot & R^{m} \\
 & I & \cdot & \cdot & R^{m-1} \\
 & & & & \cdot \\
 & & & R & \\
 & & & I &
\end{bmatrix}
\begin{bmatrix}
C_o \\
C_1 \\
\cdot \\
\cdot \\
C_m
\end{bmatrix}
+
\begin{bmatrix}
R^{m+1} \\
R^{m} \\
\cdot \\
\cdot \\
R
\end{bmatrix}
\ldots \quad (10)
$$

where X_{m+1} is arbitrary. In the original Leontief system X_{m+1} was assumed zero.

Two interesting properties of the dynamic inverse deserve special considerations.

1. The dynamic inverse enjoys a property similar to that of the inverse of the Leontief matrix in the open static model [10, pp. 142-150] [3, p. 301]. We know under certain conditions, $(I-A)^{-1} = 1 + A + A^2 + \ldots + A^n$ for n sufficiently large. In the case of the dynamic inverse , first observe that for $t \geq m$, the matrix

$$
\begin{bmatrix}
O & R & & & \\
 & O & R & & \\
 & & \cdot & & \\
 & & & \cdot & \\
 & & & R & \\
 & & & & O
\end{bmatrix}^{t}
\rightarrow 0
$$

thus showing a spectrum of less than 1. Upon the so-called Neumann series expansion, consider the simple case m=3 for our exposition, then

$$
\begin{bmatrix} I-R & & \\ & I-R & \\ & & I \end{bmatrix}^{-1} = \left[\begin{bmatrix} I & & \\ & I & \\ & & I \end{bmatrix} - \begin{bmatrix} O & R & \\ & O & R \\ & & O \end{bmatrix} \right]^{-1}
$$

$$
= \begin{bmatrix} I & & \\ & I & \\ & & I \end{bmatrix} + \begin{bmatrix} O & R & \\ & O & R \\ & & O \end{bmatrix} + \begin{bmatrix} O & R & \\ & O & R \\ & & O \end{bmatrix}^2 + \begin{bmatrix} O & R & \\ & O & R \\ & & O \end{bmatrix}^3 + \ldots
$$

$$
= \begin{bmatrix} I & & \\ & I & \\ & & I \end{bmatrix} + \begin{bmatrix} O & R & \\ & O & R \\ & & O \end{bmatrix} + \begin{bmatrix} O & O & R^2 \\ O & O & O \\ & & O \end{bmatrix} + O + \ldots
$$

$$
= \begin{bmatrix} I & R & R^2 \\ & I & R \\ & & I \end{bmatrix}
$$

2. In line with the famous Frobenius theorem R^{m+1} approaches $d^{m+1} r_1 r_2$ where r_1 and r_2 are respectively right and left eigenvectors of R associated with the largest eigenvalue d such that $r_2 r_1 = 1$. Substitution in equation (10) yields

$$
X_o = C_o + RC_1 + \ldots + R^m C^m + d^{m+1} (r_2 X_{m+1}) r_1 \quad \ldots (11)
$$

for sufficiently large values of m.

It is therefore argued by Schinnar that X_{m+1} is fixed at zero by Leontief may not be conceived as the major source of inconsistency with initial conditions. Changes in the value of X_{m+1} will only have a scalar effect on X_0. In lieu of the forward iteration method and the cumbersome iterative but backward integration, Schinnar proceeds with initial consistency as follows.

Let X_0 be an identified initial condition. From equation (11) then

$$R^{m+1} X_{m+1} = X_0 - (C_0 + R C_1 + \ldots + R^m C_m) \qquad \ldots (12)$$

As R_{m+1} is not of full rank, solution of X_{m+1} is sought using the notion of generalized inverses. Hence

$$X_{m+1} = \bar{P}(X_0 - C_0 - R C_1 \ldots - R_m C_m) + (I - \bar{P} P)^Y \ldots (13)$$

where P stands for R^{m+1}, $\bar{P}$ for the unique Moore-Penrose generalized inverse of R^{m+1} and Y is an arbitrary vector.

The choice of Y should be such that $X_1, X_2, \ldots, X_m \geq 0$ and this requires

$$\begin{bmatrix} R^{m+1} \\ R^m \\ \cdot \\ \cdot \\ \cdot \\ R \end{bmatrix} X_{m+1} \geq - \begin{bmatrix} I & R & \cdot & \cdot & \cdot & R^m \\ & I & \cdot & \cdot & \cdot & R^{m-1} \\ & & & \cdot & & \\ & & & \cdot & & \\ & & & I & R \\ & & & & I \end{bmatrix} \begin{bmatrix} C_0 \\ C_1 \\ \cdot \\ \cdot \\ \cdot \\ C_m \end{bmatrix} \qquad \ldots (14)$$

Feeding back (12) into (10), the remaining output levels $X_1, X_2, ..., X_m$ are obtained via backward substitution.

8. CONCLUSION

We began our task with the specification of the open dynamic input-output model. The plausibility of the Dynamic Inverse was then examined for projection purpose. W. Leontief stipulated the Backward Integration Method but it suffered the serious drawback $X_{m+1} = 0$. To overcome the shortcomings of Leontief algorithm, two attempts were thus made. The first is that of Kendrick's Forward Iteration Method starting with a given initial condition. This procedure, though elegant, was developed at the heavy cost of violating Leontief's inter-temporal dynamism. The controversy was finally settled by Schinnar consistent with Leontief's backward substitution method but with an identified initial condition and $X_{m+1} \neq 0$.

APPENDIX I

$$G^{-1} + RG^{-1} + R^2G^{-1} + ... + R^tG^{-1} + ...$$

$$= \sum_0^{\infty} [(I-A+B)^{-1} B]^t (I-A+B)^{-1}$$

$$= [I-(I-A+B)^{-1} B]^{-1} (I-A+B)^{-1}$$

$$= \{(I-A+B)^{-1} ((I-A+B)-B)\}^{-1}(I-A+B)^{-1}$$

$$= ((I-A+B)-B)^{-1}((I-A+B)^{-1}(I-A+B)^{-1}$$

$$= (I-A)^{-1}$$

APPENDIX II

Derivation of Equation (7), on page 7

First it is to noted that the equivalent form of equation (6) at time $t+1$ is

$G_{21} X^1_{t+1} + G_{22} X^2_{t+1} = d^2_{t+1}$ which implies $X^2_{t+1} = G^{-1}(d^2_{t+1} - G_{21} X^1_{t+1})$,
as $X^2_t = G_{22}^{-1}(d^2_t - G_{21} X^1_t)$ at time t. Substituting these expressions of X^2_t and X^2_{t+1}
into (5), we get

$$G_{11}X^1_t + G_{12}G_{22}^{-1} (d^2_t - G_{21}X^1_t) - B_{11} X^1_{t+1} - B_{12} G^{-1}_{22} (d^2_{t+1} G_{21} X^1_{t+1}) = d^1_t$$

If we effect the necessary multiplications, the result shows

$$G_{11}X^1t + G_{12}G_{22}^{-1}d^2_t - G_{12}G_{22}^{-1}G_{21}X^1_t - B_{11}X^1_{t+1} - B_{12}G_{22}^{-1}d^2_{t+1} + B_{12} G_{22}^{-1}G_{21}X^1_{t+1} = d^1_t$$

Fully keeping all the terms involving X^1_{t+1} on the left hand side, collecting the rest on
the right hand side and solving for X^1_{t+1}, we obtain

$$X^1_{t+1} = [B_{12}G_{22}^{-1}G_{21} - B_{11}]^{-1}\{(d^1_t - G_{22}^{-1}d^2_t + B_{12}G_{22}^{-1}d^2_{t+1}) - (G_{11} - G_{12}G_{22}^{-1}G_{21})X^1_t\}$$

NOTES

[1] The pioneer of input-output analysis is W. Leontief. An expository treatment of the problem together with most of his empirical findings is provided in [7].

REFERENCES

[1] Ben-Israel, A. and Greville, T., *Generalized Inverses: Theory and Applications*, (New York: John Wiley and Sons, 1974)

[2] Brody, A., *Prices, Proportions and Planning*, (Budapest: North-Holland Publishing Company, Amsterdam, London, 1970)

[3] Gale, D., *The Theory of Linear Economic Models*, (New York, Toronto, London, McGraw Company, 1960)

[4] Kendrick, D., "On the Leontief dynamic Inverse", *Quarterly Journal of Economics*, No. 4, (1972) pp. 693-396.

[5] Kreijger, R.G. and Neudecker, H., "Kendrick's Forward Iteration Method and the Dynamic Leontief Multisectoral Model", *Quarterly Journal of Economics*, No. 3, (1976), pp.641-653

[6] Leontief, W., "The Dynamic Inverse", in A. Carter and A. Brody, eds., "*Contributions to Input-Output Analysis*, Vol. 1, (Amsterdam: North-Holland, 1970), pp.17-46.

[7] _____, *Input-Output Analysis*,(New York, Oxford University Press, Sec. Ed., 1986.

[8] Schinnar, A. P., "The Leontief Dynamic Generalized Inverse", *Quarterly Journal of Economics*, Nov. 4, (1978),pp. 641-653.

[9] Stolenu, I., *Economic Equilibrium and Growth*, (Amsterdam: North-Holland, 1975)

[10] Waugh, F.V., "Inversion of the Leontief Matrix by Power Series", *Econometrica*, XVIII, No. 2 (1950), pp. 142-154.

TAX FINANCING OF GOVERNMENT AGRICULTURAL EXPENDITURE IN ETHIOPIA

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ABSTRACT: *Recent improvements in agricultural tax performance (indicated by the tax revenue growth) can be traced back to tax reforms in earlier periods. But, rapid growth in government agricultural expenditures and public expenditures generally could not be covered by tax and other non-inflationary revenues alone. The system of deficit financing pursued by the Government has resulted in the manifestation of the so-called "recurrent cost problem" and the "monetization of deficits".*

1. INTRODUCTION

For a number of poor African countries a central economic management problem today is how to finance agricultural expenditures. On the one hand, there are many sources of finance including taxation, external loans and assistance, price policy and domestic borrowing. Part of the problem stems from the failure to identify, develop and determine the optimal level and configuration of agricultural finance. On the other hand, the problem may be focussed around expenditure management. There is the view, currently in vogue, that government expenditure, regardless of its structure, would "have a deleterious effect on growth performance" [1]. The reasons given are many but centered on the relative inefficiency of government production, i.e. relative to that of the private economy. But this is not an uncontested position. There are those (the "structuralists" in particular) that consider economic development in poor countries an unlikely proposition without government intervention to remove impediments to growth and active participation in the management of economic production and distribution.

The purpose of this short study is to examine the relationship between government finance and expenditure in agriculture in a poor country, Ethiopia.

There are important justifications for focussing on agricultural taxation and expenditure. First, the traditional dominance of agriculture is long established and sustained. In 1980/81 agriculture accounted for 49.4 percent of GDP (at current factor cost) and in 1990/91 it is estimated at 45.7 percent of GDP. Almost all the foreign exchange earnings of the economy originate in agriculture [13]. Over 70 percent of the population is rural and depends for its livelihood on agricultural activities. The pervasive stance of agricultural activities in the Ethiopian economy is further underscored by the fact that even the small and fragile manufacturing sector depends for its inputs and finance on agriculture, so that if a broader classification system were used, a large share of the "manufacturing output" in the economy would be designated agricultural. Since economic surplus of some magnitude obtains mainly in agriculture, economic strategists have always argued that agriculture should finance not only agricultural expenditures but also economic growth generally [7,20, 25, 26].

Second, there have also been significant economic resource transfers from the private to the public sector. Until recently, and as a direct outcome of government policy the private sector and the market system had diminished roles in the economy and a condition of heavy reliance on the State for economic growth and development prevailed. During the past two or so decades, the Ethiopian Government attempted to draw resources from agriculture by means of a nationalization drive, heavy taxation, reduced grain procurement prices paid to private farmers/peasants and the establishment of many multi-purpose state institutions and systems [15,1985]. Because of these developments agricultural development in particular and that of the economy generally are made dependent on the level and pattern of government expenditures.

Thirdly, during the late 1970's there have been some significant revisions of the tax laws including those pertaining to agricultural taxation. These discretionary changes have

altered both the rate of taxation and the efficiency of tax collections. An important consideration would be to analyze and measure the relative potency of agricultural taxation as a means of financing government expenditure.

Finally, another important justification for this development had been the failure of traditional agriculture to reform itself. The traditional Private and communal agriculture could not sustain production levels in consonance with population growth and the growth needs of the economy. Absence of incentive systems in communal land holdings, abuse of the physical environment and lack of private investment have resulted in land degradation and reduced land and labour productivities in agriculture. Recurring drought, famine and economic stagnation were manifest outcomes of these processes and underscore the need for government action. The destructive wars have also aggravated the problem of agricultural finance and broadened the bases of the economic crisis.

Is the problem one of deficient supply of agricultural finance or the inefficiency in the management of government agricultural expenditure? Both constitute important problems of agricultural expenditure finance in Ethiopia. Limited range of policy options (tax instruments used are few, external loans and foreign assistance are both small and unstable and other sources including domestic borrowing and pricing policy are not properly developed for the purpose) and low taxable capacity have caused the generation of insufficient finance. On the other hand, government expenditures show allocational inefficiency (imbalances in the sectoral allocations of government expenditures and in the distribution between current and capital expenditures are noted, for example) and are not always cost effective.

The mode of financing too affects the pattern of agricultural expenditure finance. The evaluation of the agricultural tax laws in terms of their effectiveness and contribution to agricultural expenditure finance would have been relatively easy if the taxes were formulated on the basis of the so-called "benefit principle". Only the defunct education and health tax laws (which were paid as one with land taxation) are possible candidates of earmarked taxation [5, 6, 8]. But the tax revenues generated by these sources have been

relatively small and the great disparity between revenue and expenditure and the inequity they create among the beneficiaries (for example, agriculturalists pay for the education of urban children under these tax systems) disqualify these taxes from becoming good examples of earmarked taxation. Presently, the overt tax system consists of land use fees (which are fixed and are in the nature of a poll tax) and agricultural income taxation which is designed on the basis of the "ability to pay principle" [22, 24]. Government agricultural expenditure is financed from general government revenue and not from earmarked sources. However, the failure to develop varied and versatile agricultural tax systems has constricted the yield from this source and forced government agricultural expenditures to rely increasingly on nontax finance.

2. AGRICULTURAL TAXATION AND EXPENDITURE

One of the major consequences of government economic policy changes since 1975 (when the Provisional Military Administrative Council, which supplanted the Monarchy, gradually transformed itself into the Socialist Government of Ethiopia) has been the dramatic rise in the tax/GDP ratio. This ratio averaged a low 5.2 percent per year for the period 1950-1960, rose to the average yearly level of 8.5 percent during the 1960-1975 period and reached the level of 17.6 percent per annum during the period 1975-1990.

Tax effort indices computed for a number of developing and industrialized countries show that the Ethiopian effort is relatively high, indicating the trend toward "larger government" and improvements in budgetary performance [30,1988]. According to some of these estimates the Ethiopian tax/GDP ratio is much higher than its expected or predicted value by world wide experience[1].

2.1 Agricultural Taxation

Agricultural taxation makes a contribution to this overall tax performance improvement. The principal elements of the tax system include direct agricultural taxes, indirect domestic taxes and export taxation. Total agricultural tax revenues can thus be defined as the sum of direct agricultural tax revenues, indirect domestic agricultural taxation and the taxation of agricultural exports. In theory, agricultural import taxation may be included in order to provide a system of comprehensive accounting for agricultural taxation. However, the exclusion of the taxation of agricultural imports is justified for the following reasons. During earlier periods only small amounts of grain (and other agricultural products) were imported and their tax revenues must have also been small since even the high digit commodity classification tax records do not report them. In recent years grain imports were coming in mainly as food aid with very little contribution to tax revenues. Agricultural import taxation is thus excluded, not only because of data lacunae, but also because it does not form a significant and stable source of (government) tax revenue.

The system of direct agricultural taxation evolved over the years (since the 1920s), first as a complex system of land taxation. In later years (during the late 1960s) some form of income taxation was added to the system of land taxation until 1976 when eventually a unified system of income taxation was introduced. This was revised in 1978 and remains to this day the basis of agricultural taxation in Ethiopia.

Domestic indirect taxation also evolved as a complex system until 1991 when it was replaced by a unified system of sales taxation. In addition to specific commodity taxes (such as tobacco taxes) domestic indirect tax laws relate to manufactured products and basically consist of excise, transaction and turnover taxes. The *Transaction Taxes Proclamation No.205 of 1963* as well as its amendment, *Transaction Taxes (Amendment) Proclamation No. 159 of 1979*, are applied on imports and locally manufactured goods and not on domestic agricultural production or on its sales. Of the domestic indirect taxes only the turnover tax is of some relevance because, according to its broad provisions, it applies to all sales,

including the sale of grains and other agricultural produce. But the tax yield from turnover taxation is very small, accounting for about 3.6 percent of total tax revenue. Since the bulk of locally traded items are products of domestic industry and imports, the share of turnover tax revenue collected from agriculture would be insignificant. Furthermore, according to proclamation N0. 254 of 1967 the sale by a farmer or agricultural producer of his/her produce is exempted from the payment of the 2 percent turnover tax normally levied on sales. Therefore, it may be concluded there is no agricultural tax revenue generated by the system of indirect domestic taxes.

Finally, agricultural export taxation has a long history in Ethiopia and includes export duties, transaction tax levied on exports, surtax and *cess* (paid on coffee exports). By far the largest share of export tax revenues come from the taxation of coffee exports, and coffee export taxation may thus be used as a proxy for total agricultural export tax revenue. But total agricultural export tax revenues can also be approximated by total export taxation since almost all of the visible export trade from Ethiopia is made up of agricultural products. It is this latter approximation of agricultural export taxation that is used in this study.

The revenue from agricultural taxation was increasing steadily over the years (see Table 1). Agricultural tax revenues (measured in real terms) increased at the rate of 7.2 percent per annum during the period 1950-1964, at 9.3 percent during 1965-1975 and had an average yearly growth rate of nearly 11.4 percent during the 1975-1989 period. This increase is accounted for by the growth of both agricultural direct and indirect tax revenues.

The last three rows in Table 1 show the continuing decline in the rate of revenue growth in all the tax systems due to the erosion of the tax base and failure of the system of tax administration in the years 1989, 1990 and 1991. Furthermore, for the post-1964 period, the rate of increase of total agricultural tax revenues have been higher than the rate of tax revenue growth generally. This is perhaps a reflection of the relative revenue effectiveness of the discretionary measures introduced in agricultural taxation.

The relatively high tax revenue growth rates observed for the period 1976-1989 are due to the tax reforms during the period, which broadened the tax base, increased the rate of taxation and introduced efficiency in tax administration. The *Rural Land Use Fee and Agricultural Activities Income Tax Proclamation 77/1976* and its amendment *Proclamation 152/1978* not only replace (and put an end to) the archaic and complex system of agricultural land and income taxation with its many qualifications, varied exceptions and limitation clauses, but also increase the government tax revenue intakes from agricultural activities significantly.

Table 1: Real Agricultural Tax Revenues
Annual Rates of Growth
(percent)

Period	Number of Observations	Total Tax Revenue	Agricultural Tax Revenue		
			Total Agricultural Tax Revenue	Direct Agricultural Tax Revenue	Indirect Agricultural (Export) Tax Revenue
1950 - 1964*	16	11.33 (11.32)	7.23 (16.02)	3.31 (8.33)	22.83 (57.19)
1965 - 1975	11	5.15 (4.80)	9.32 (34.55)	0.40 (33.75)	15.50 (39.02)
1976 -1989	13	7.85 (9.29)	11.42 (47.13)	14.96 (45.41)	8.96 (45.70)
1976 -1990	14	6.45 (10.34)	7.09 (48.10)	12.76 (44.40)	3.22 (48.88)
1976 -1991	15	5.29 (10.93)	4.44 (47.50)	10.48 (43.69)	-0.63 (49.4)

*This first row calculations are based on monetary values (because the implicit GDP index series are unavailable for the pre-1960 period

NOTE: The figures in parentheses are the (sample) standard deviations of the annual growth rates.

SOURCE: Based on Data from the Ministry of Finance, *Government Revenue and Expenditure*. (various years)

Regarding agricultural indirect (export) taxation the major reforms were undertaken in 1976 when *The Customs Tariffs Regulations of 1976 (Legal Notice No.42/1976)* and *The Cess (on coffee exports) Regulations, Legal Notice No.47/1976* replaced the 1964 provisions and resulted in a significant increase in the taxation of agricultural exports. In addition to these discretionary changes there were also important reforms made in tax administration. The most important of these was the reorganization of rural administration (involving the use of the peasant associations in land administration and taxation) which brought a measure of efficiency in tax collections. The overall tax effect of these reforms had been to "double the agricultural tax receipts for the post-1976 period over the pre-1976 levels" [16].

The increase in the rate of agricultural taxation may be justified on grounds of both efficiency and equity considerations [20]. The relative supply inelasticity of agricultural goods and the need to transfer resources to sectors of relatively higher rates of return (in this case from agriculture to industry) favour heavier agricultural taxation and constitute an important efficiency argument for turning the terms of trade against agriculture.

An important equity argument is that the application of progressive and increased rate of taxation penalizes the rural rich more than it does the poor and so tends to diminish rural income differentials. Furthermore, the contribution of agricultural finance through improved (increased) taxation may have to be gauged to the relative productivity share of agriculture in the economy, an argument already made in the introduction of this essay.

Another way of looking at the growth of agricultural tax revenue would be to analyze the trend of its relative revenue shares over time. Despite the remarkable growth of agricultural tax revenue, its share in the total tax revenue was declining over the longer term (i.e. over the 1950-1990 period). This share was 28.0 percent per year (on the average) for the 1950-1964 period, 15.9 percent for the 1965-1975 period and 19.1 percent for the period 1976-1991. The main explanation for this development is the relatively higher revenue yield

from the indirect tax system generally. Agricultural taxation (both direct and indirect) accounts for less than a fifth of total tax revenue at present.

Indeed, the share of total tax revenue in the total domestic government revenue was also falling over the years. It made up 87.5 percent of the total domestic revenue per year (on the average) during the period 1950-1964, 85.9 percent during 1965-1975 and 75.3 percent during 1976-1991 (see Table 2). The main explanation for this phenomenon is to be found in the relative growth of non-tax revenues in recent years. It is thus to be concluded that the share of agricultural taxation in the total tax revenue was falling as were the shares of taxes in the domestic revenue system generally. The declining shares have become particularly marked in the last few years (since 1989).

Table 2: Agricultural Tax Revenue Shares
(Yearly Averages)

Period	Number of Observations	Total Tax Revenue/Total Domestic Government Revenue	Agricultural Tax Revenue/Total Tax Revenue	Direct/indirect Agricultural Tax Revenue
1950 - 1964	16	87.49 (2.26)	28.02 (5.01)	226.77 (175.53)
1965 - 1975	10	85.85 (1.86)	15.87 (2.97)	82.50 (24.47)
1976 - 1991	16	75.32 (7.21)	19.07 (8.78)	73.92 (81.42)

NOTE: The figures in parentheses are the standard deviations of the annual values
SOURCE: Based on data from the Ministry of Finance, *Government Revenue and Expenditure*. (various years)

It is also interesting to note that, whereas direct agricultural taxes contributed more to government tax revenue than indirect agricultural taxes in the earlier periods, they gradually loose their relative importance over the years as agricultural export taxation

becomes a major tax revenue source. The direct/indirect agricultural tax ratio was 226.8 percent per year for the 1950-1964 period, 82.5 percent for the 1965-1975 period and only 73.9 percent for the period 1976-1991. It appears that the relative decline in the share of total agricultural taxation is associated with this rise in the indirect/direct agricultural tax ratio.

2.2 Government Agricultural Expenditures

Measurements concerning the level of agricultural government expenditure during the decade of the 1980s show strong variations across regions and countries but they indicate little change over time. The level of government expenditure on agriculture averaged (with little variation from year to year) about 1.0 percent of the GDP per year for the world, 0.8 percent of GDP for the industrialized group of countries and around 2.0 percent for the developing countries. The average agricultural expenditure ratio for the African region varied slightly from time to time but remained higher than the 2.0 percent shown for the developing countries [9, 1990]. In Ethiopia, the agricultural expenditure/GDP ratio was a low 0.2 percent in 1960, 0.7 percent in 1970, 1.8 percent in 1980 and 3.1 percent in 1990[2]. The cross-section data above suggests that the ratio is a declining function of the process of economic development. On the other hand, the Ethiopian time series data shows the government agricultural expenditure/GDP ratio is an increasing function of time. The relationship between the ratio and level of development cannot be established from these trends and the only fact that the data reveal is that the rate of government agricultural expenditure increase was relatively high in Ethiopia.

Indeed, post-1974 developments in Ethiopia are marked by a relatively high growth of government agricultural expenditure. During the period 1965-1975 real government agricultural expenditure had an average annual rate of growth of 23.5 percent and during the period 1976-1989 the growth rate was still a high 13.2 percent per annum (see Table 3).

These growth rates are higher than the corresponding growth rates for agricultural tax revenues or the general level of government expenditure.

Following the rural and urban land proclamations of 1975 and 1976 and subsequent declaration of the Government's socialist *Programme of the National Democratic Revolution of Ethiopia (PNDRE)*, there was a significant restructuring of property ownership patterns. These processes transferred large economic resources from the private sector to the state sector and greatly increased state participation in agricultural activities [21]. Sweeping nationalization of private commercial farms were carried out and, in order to effect a new land management system, an enlarged state machinery was established.

The Ministry of National Resource Development was established early in 1975 to serve as the government "receiver" of nationalized private farms and other private economic assets. The Ministry of Agriculture was greatly expanded to meet the challenge of food self-sufficiency and agricultural development. Within the Ministry new departments were created (such as, the Agricultural Marketing Corporation, Forestry Department, and agricultural research and training institutions) and new functions (including the responsibility of organizing service and producers cooperatives) were also added. Since April 1978, a Ministry of State Farm Development was established, which at the beginning had a personnel of 8000 [14]. Presently the Ministry consists of "... 7 corporations, 14 organizations, 58 state farms, 16 animal husbandry centers, 17 factories and two abattoirs" [14, p.10]. In addition, a Ministry of Coffee and Tea development was established to enhance quality production and export promotion of the indicated cash crops.

Table 3: The Growth of (Real) Government Agricultural Expenditure
Average annual Growth Rates (percentages)

Period	Number of Observations	Total Government Expenditure	Government Agricultural Expenditure		
			Total(Government) Agricultural Expenditure	Agricultural Recurrent Expenditures	Agricultural Capital Expenditures
1960 - 1964	5	16.23 (12.06)	33.10 (33.37)	22.17 (31.97)	56.80 (44.93)
1965 - 1975	10	8.08 (10.44)	23.47 (31.95)** 57.87 (100.1)*	9.94 (12.27)** 75.97 (244.4)*	38.93 (59.35)** 39.96 (61.72)*
1976 - 1989	13	9.53 (12.91)	13.20 (42.77)	9.35 (10.27)	15.11 (51.96)
1976 - 1990	14	8.38 (13.13)	12.37 (41.21)	8.82 (10.06)	14.13 (50.06)
1976 - 1991	15	7.29 (13.34)	10.24 (40.55)	7.35 (11.25)	11.73 (49.12)

NOTE: *The figures for 1971/72 are obtained by taking the average for the previous and subsequent year. The recurrent cost is obtained by subtracting the capital expenditure from total agricultural expenditure and unusually large recurrent agricultural expenditures obtain for 1971/72.

**Based on actual figures for 1971/72

SOURCE: Ministry of Finance, *Government Revenue and Expenditure.* (various years)

Among the important functions of the Ministry of Agriculture had been organizing the peasantry into service and producers' co-operatives. By June 1984, the number of service cooperatives reached 3813 embracing 17716 peasant associations with a total membership of 4.4 million households [18, 25], [26, p.41]. The number of producers' co-operatives established by the Ministry fluctuated and by the end of the six annual plan period in 1984 there were 1489 producers' co-operatives with a membership of 94368 households [18, p.46], [26]. State activity in the agricultural sector was given a further boost by two other developments - the villagization and land settlement programmes of the socialist government. Actively pursued after the disastrous drought and famine of 1983-1985 the government sponsored settlement programmes transferred and permanently relocated more than half a million persons from the drought and war ravaged areas in some 88 large

settlement centers (excluding those resettled in less densely populated peasant associations under the *sigsega* scheme[3]) [26, p.43], [28]. Apart from expensive transport and up-keep costs, there were large expenditure finances needed in rehabilitation and establishment programmes. Some of these are "transient" or "one-time" costs, others are covered by international assistance and there remain still other cost elements requiring government budgetary provisions and commitments on a permanent basis.

The villagization programme was also extensive. According to a National Villagization Coordinating Committee report, by 1987 13083 villages were established in the country embracing 1.2 million household heads or 6.3 million household members [19]. Although carried out as a campaign programme (involving the transfer of human, material and financial resources from other uses) and thus in a somewhat cost-effective manner, there were residual activities the programme generated which required the longer term commitment of the central government toward economic development [10, 11, 19].

The expanded bureaucracy and the extension of the functions of government into the spheres of economic production and distribution created large establishment and operational expenditure requirements. The government was also providing fertilizers, improved seeds and pesticides at reduced prices to farmers, was running extensive subsidy programme to the state farms and cooperative sectors, and managing massive agricultural extension services and training programmes. Regarding the last item, for example, during the six campaign years (1978-1984), training was given to 1300 employees of the Ministry of Agriculture (in local institutions and abroad), and some 300000 members of cooperatives were given training in diverse fields (including in accounting, animal husbandry, plant science, soil and water conservation and home economics) [18, p.25]. All these result in a significant growth of the level of government expenditure.

Regarding the actual mechanism of this growth, typically, the government was drawn into "campaign" programmes and expansion activities (of existing institutions and functions) which required large initial financial injection and also resulted in the (permanent)

institutionalization of new government expenditure budget lines. The campaign periods are often prolonged and tend to be succeeded by new campaigns. For example, the Somali war of aggression of 1978 and the war of cessation in the North siphoned off extensive finances relating to food production and distribution activities. Similar increases in government expenditure resulted following the land reform, resettlement, villagization and state farm development campaigns and activities. Much of these campaigns are financed by extra-budgetary sources but also caused extreme budget imbalances. In effect, the Peacock and Wisemans's "displacement, inspection and concentration effects" of government expenditures[4] are at work [29]. To the initial "campaign" finances, additional and more permanent budget lines are needed to sustain the resultant high level of public expenditures.

The failure to provide for the greatly increased government expenditure levels leads to serious economic difficulties. Development projects are abandoned with only a fraction of the phases covered or the implementation period is extended, project workers remain unpaid for prolonged periods of time, (production) activities are operated with intermittent stoppage and fluctuating pace, and the process of currency debasement (and inflation) is greatly accelerated. At the same time the capacity to increase the level of non-inflationary (or less inflationary) revenues, especially tax revenues and foreign aid and loans, are eroded and, as the data of the last three years reveal, tax revenues may even be falling. The stable and non-inflationary revenue system fails even to cover the recurrent budget expenditures, let alone contributing to the finances of capital budgets. This crisis of government finance characterizes fiscal developments in much of the Sahel countries as well as in Ethiopia and is dubbed "the recurrent cost problem" [4].

Agricultural expenditure growth is also associated with the agricultural capital expenditure budgetary allocations. In particular, there had been a marked growth of capital agricultural expenditure which in turn influenced, in a profound way, the general level and structure of government agricultural expenditures. Between 1960 and 1964 government agricultural capital expenditures were half the value of the recurrent expenditure. But the

ratio changes quickly and by 1990 agricultural capital expenditures (in Agriculture) rise to five times the level of recurrent costs[5]. The main subsector where capital expenditure growth is most marked is the state farm subsector. The Ministry of State Farm Development was established to serve as the government arm for agricultural modernization activity - including agricultural mechanization, heavy construction and improved farm management practice [14, pp.9-15]. Accordingly, most of the government investments in agriculture took place in the state farm subsector. Within the Ministry's Agricultural Machinery and Technical Services Corporation alone the level of expenditures on tractor and other machinery purchases and the purchase of spares and parts, on land surveying work, interior road and local airport construction, irrigation network laying and other heavy construction activity accumulated to well over 600 million birr during the decade 1978 - 1988 [14, pp.43-44]. These capital investments cause the establishment of permanent expenditure budget lines in maintenance and management activities. Here again, the investment multiplier is at work. Other than requiring relatively higher financial outlays, the rapid increase in the level and share of investment appears to have a "snowball effect" on agricultural as well as on general expenditure levels (through many expenditure linkages and associated multipliers).

The growth of government agricultural expenditure was also such that, in later years, it could not be covered by agricultural tax revenues alone. While in 1959/60 agricultural tax revenues collected had been six times the level of government agricultural expenditure, they were only twice as much in 1980/81, and in 1990/91 agricultural tax revenues covered only 27 percent of agricultural government expenditure. Furthermore, for the period after 1984/85 agricultural tax collections consistently remained below the level of government agricultural expenditures (see Table 4). Contrary to the commonly held position that in agrarian economies agricultural taxation should finance economic development (and beyond paying for agricultural expenditures), in the Ethiopian case it fails even to cover government agricultural expenditures.

Table 4: Government Agricultural Tax Revenue
to Agricultural Expenditure Ratios

Period	Yearly Averages (standard Deviations)
1960 - 1964	6.7457 (2.8597)
1965 - 1975	2.4944 (1.0647)
1976 - 1991	1.0615 (0.6664)
1984/85	0.5657
1985/86	0.7777
1986/87	0.5148
1987/88	0.5929
1988/89	0.6449
1989/90	0.3223
1990.91	0.2693

SOURCE: Computed from Data obtained in Ministry of Finance, *Budgetary Revenue and Expenditure*. (Various years)

3. DETERMINANTS OF AGRICULTURAL EXPENDITURE

From the foregoing analysis it may be hypothesized two sets of factors constitute the most important determinants of agricultural expenditure: the structure of government finance and expenditure. Changes in the level and structure of government expenditures affect agricultural expenditures and can be measured in many ways. The most common measurements of these changes include the level (and rate of change) of total government expenditures (GE), the share of agricultural expenditure in the total government expenditure (AEGE) and the allocation of agricultural expenditure between "capital" and "recurrent" expenditures (ACEARE).

The level of total government expenditure affects the level of government agricultural expenditure in a direct way. This is not necessarily a tautology since the possibility exists for a change of government expenditure emphasis away from agriculture. The ratio AEGE,

on the other hand, looks into the sectoral allocation of government expenditures. Government agricultural expenditure levels may rise as a result of deliberate government plan expenditure allocation in favour of agriculture. It is already shown that agricultural expenditure was growing faster than total government expenditure and, as a consequence, the share of agricultural expenditure in the total is rising (see Table 3). Thus, these changes in the level of total expenditures and sectoral allocation of government expenditures are reflected in the growth of total agricultural expenditure levels.

The second factor relates to the structure of capital expenditure which affects agricultural productivity and has profound economic growth implications. In general, investment resource allocations improve future economic development prospects more than consumption expenditures do. Among the various measurements concerning this variable, the Ethiopian data suggests the following possibilities: agricultural capital/recurrent expenditure ratios (ACEARE) and the sectoral capital allocation, agricultural capital expenditure/total capital expenditure ratio (ACETCE). Concerning the factor ACEARE, the point is already made a) that it is increasing over time and, b) that the growth of capital expenditure affects directly agricultural expenditures generally and through the investment multiplier. With regard to the latter measurement, ACETCE, it can be shown that capital expenditure allocations have favoured agriculture since non-agricultural sectors were receiving decreasing shares. For example, during the period 1960-1964, the yearly average ACETCE was only 4.14 percent. However, this ratio rises to the level of o.1639 for the period 1965-1975 and during 1976-1991 the yearly average share reaches the high level of 0.3073.

Concerning the level and structure of government finance and its agricultural expenditure effects, similar conceptual and measurement problems arise. First, there are many elements in government finance. For example, these may include direct agricultural taxes (DAT), indirect agricultural taxation (IAT), total tax revenues (TTR), domestic government revenues (GR) and total government finance (equal to total government

expenditure, GE). All these may be considered as alternative measurements of government finance. Which of these is to be used in the determination of agricultural expenditures is an outcome of a selection process involving various measurements for each explanatory variable and related correlations with the dependent variable, AE.

Changes in the structure of finance may be approximated by many ratios including: direct agricultural taxation/total agricultural tax (DATTAT), indirect agricultural tax/ total agricultural tax (IATTAT), total tax revenue/government domestic revenue (TTRGR) and total tax revenue/total government finance (TTRGE). Since, in most recent years it is known that government expenditures are being financed by domestic bank borrowing, the inflationary effects of such a process aside, domestic deficit financing (measured here, say, by the ratio of domestic bank borrowing/total government finance (BBGE or BBGR) becomes a factor to consider. Again, which to take as the best measure of changes in the structure of finance depends on the selection trials involving various definitions and measurements of these factors and their correlation with the dependent variable, government agricultural expenditure (AE).

Finally, there is a problem concerning the use of monetary values of variables since these include the effects of inflation. The dependent variable, government agricultural expenditure, is measured in real terms. The deflator used for the purpose is the implicit GDP index, which is given as the ratio of GDP at current factor cost to GDP at constant factor cost of 1980/81 prices. The same indices are applied to deflate all revenue and expenditure variables. Inflationary effects are also removed in those cases where variables are measured as ratios of monetary values.

The determination of agricultural expenditures is indicated by the results in Table 5. The specific transformation used is arrived at after some trials (using scattergrams) and gives a better fit to the data than other results tried. The coefficents are unstable and change with changes in variables and measurements. Clearly multicolliniarity is a serious problem since we are dealing with closely related variables.

Table 5: Determinants of Agricultural Expenditure

Regressor	Coefficient	T-ratios
A	-8.3819	-5.7443
LRGR	1.2413	16.7935
BBTAT	0.0223	2.6139
AENAE	7.0560	3.1930
ACETCE	1.5363	2.7100
R^2 = 0.9880 R bar squared= 0.9861 F(4,26) = 533.2404 Standard error of estimate = 0.1519 DW statistics = 1.1019		

Where,
    A = a constant
 LRGR = natural logarithm of (real) government domestic revenue
 BBTAT = domestic bank borrowing to total agricultural taxation
 AENAE = government agricultural expenditure to non-agricultural expenditure
ACETCE = government agricultural capital expenditure to total government capital expenditure

It is to be noted, for example, that DAT and IAT are excluded in the reported regression because consistently the coefficients are found to be small and statistically insignificant (at the five percent level). However, aggregated measures of finance such as the level of domestic revenue (GR) and the level of total government finance (GE) (and to a lesser extent TAT) yield better results. In these cases the coefficients are stable, high and statistically significant (at the one percent level). These confirm the view that agricultural expenditures are financed from and depend on general government budgetary expenditure appropriation and not on earmarked taxation. Furthermore, both GE and GR can be looked at as indicating similar concepts (GE equals total government expenditure or finance and differs from domestic government revenue (GR) by the latter's exclusion of foreign resources) and are highly correlated. While, therefore, both can not be kept in the same regression, whichever is to be retained depends on relative correlations with the other explanatory variables and with GE. For example, when GE is kept and GR excluded bank

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borrowing would have no effect on agricultural expenditures and the sectoral allocation effects of government expenditures would be reversed (i.e. the coefficient will have a negative sign).

All the coefficients in the reported regression (Table 5) are statistically significant (at the one percent level) and they all have the expected signs. The selected measure of the general level of government expenditure and its sectoral allocation is AENAE, and the results show that overtime the share of agricultural expenditure in the total has been rising. This deliberate government expenditure emphasis toward agriculture is a factor explaining the increase in the level and rate of growth of government agricultural expenditures. Likewise, increasing shares of government capital expenditures (see the coefficient of variable ACETCE) went into agriculture, which it is argued not only raises the general level of government agricultural expenditures directly, but also through the investment multiplier. While it may prove interesting to differentiate between these direct and indirect capital expenditure effects, it is the overall effect of the capital expenditure structure that is reflected in the coefficient of ACETCE. Other measures of this factor tried include the ratio of agricultural capital expenditure to agricultural recurrent expenditure (ACEARE) and the share of agricultural capital expenditure in the total government expenditure (ACEGE), but these did not yield satisfactory results. That agricultural expenditures (measured by LRAE) are responsive to the changes in the level of domestic finance is indicated by the relatively high value and statistical significance of the coefficient of LRGR. Regarding domestic bank borrowing, the results in Table 5 show that the increases in government agricultural expenditures are indeed covered (albeit only partially) by such borrowing. However, LRAE is relatively inelastic with respect to the changing shares of deficit finance, BBTAT.

But, recent trends (especially in the last three years) indicate that the government is becoming increasingly dependent on deficit financing to cover its bulging public expenditures, including expenditures on agriculture. With no concomitant increase in the

levels of production of goods and services, the expected inflationary effect of such a development is already being felt. For example, according to the Central Statistical Authority, the general price index for Addis Ababa (1963 = 100) was 145.0 in 1970, 353.5 in 1980, 544.2 in 1990 and a high 738.7 in 1991. This trend is continued into 1992 (for example, the March 1992 index is 781.2). The growth rate of this composite price index (our measure of inflationary trends) was particularly high during the past three years and, this development coincides with rapid increases in money supply, a major component of which is government borrowing from the banking system.

4. CONCLUSION

During the course of the past twenty years, the continued rise in the level and relative shares of defense and related expenditures, a rapid expansion of state activity in the production and distribution spheres and a heightened effort at the centralized management of the economy have led to the dramatic growth of the public sector and public expenditures. A contributive factor to this growth of the public sector has also been a rapid increase in the level of agricultural expenditures. Both recurrent and capital agricultural expenditures as well as the relative share of capital expenditure in the total government outlay were on the increase.

At the same time recurring drought, gross economic mismanagement and wars exerted additional demand on the public coffers while contributing to a decline in the growth of domestic finance. Economic mismanagement were in evidence in agriculture where many public sector enterprises were operating with loss and were sustained by continued government subsidy.

An important feature of the dramatic expansion of the public economy and the rise in public expenditures had been a strong manifestation of the so-called "recurrent cost problem" - a condition characterizing fiscal developments in the poorest African countries

[3, pp. 101-117]. In Ethiopia investment projects (agricultural projects included) are abandoned for lack of funds, some have their construction phases over-stretched, completed projects have extended running-in periods and existing plants are operating with considerable excess capacity. The problem of expenditure finance is fast approaching crisis levels with government revenues failing to cover recurrent budgetary expenditures and with this gap (between total government finance and recurrent budgetary expenditures) ever widening.

Tax revenues, inspite of impressive improvements in tax performance, are declining in their relative importance as sources of government finance, judging by the most recent trends. Agricultural taxation too increased considerably, following tax reforms and improved tax administration, but its relative share in the total tax receipt has been decreasing (see Table 2). Increasingly, the bulging public expenditures (including expenditures in agriculture) are being covered by deficit financing. The principal mode consists of overdraft from the National Bank of Ethiopia (NBE), although Treasury Bills (mainly from the Commercial Bank) are also used to finance short-term expenditures and Bonds from the NBE to finance both short- and long-term expenditures [13, 1976]. Unfortunately this mode of financing government expenditures leads to the "monetization of deficits" and the aggravated inflationary state of the economy [1, pp. 39-73].

NOTES

[1] Using Tanzi's results [27], the tax/GDP (at current factor cost) for Ethiopia is estimated at 3 percent which is far below the 17 percent actual for 1981

[2] Using data obtained in Ministry of Finance, *Government Budgetary Revenue and Expenditure* (various years) [12]

[3] The Amharic word *Sigsega* refers to the accommodation (or absorption) of settlers in already existing relative low-density peasant associations located far away from base

[4] They showed that public expenditure grows in step-like fashion and they also established the down-ward rigidity of these expenditures

[5]Government Agricultural Capital/Recurrent Expenditures
Yearly Averages (percent)

Period	Yearly Averages (and Standard Deviations)
1960-1964 1965-1975 1976-1991	53.13 (22.48) 172.75 (118.68) 501.20 (204.10) 484.97 (207.59)

SOURCE: Computed from data obtained from the Ministry of Finance, [12]

REFERENCES

[1] Blinder, Alan S., "On the Monetization of Deficits", *Portfolio: International Economic Perspectives, Volume 2, Number 4*. Reprinted from the book, *The Economic Consequences of Government Deficits*, edited by Laurence H. Meyer, Kluwer-Nighoff Publishing, 1983. pp. 39-73.

[2] Eshetu Chole and Teshome Mulat, "Land Settlement in Ethiopia: A Review of Developments", in A. S. Oberai (ed.), *Land Settlement Policies and Population Redistribution in Developing Countries: Achievements, Problems and Prospects*. New York and London: Praeger, 1988. pp.161-206

[3] Diamond, Jack, "Government Expenditure and Growth", *Finance and Development*. (A quarterly publication of the International Monetary Fund and the World Bank), December 1990. pp. 34-36.

[4] Gray, Clive and Martens, Andre, "The Political Economy of the 'Recurrent Cost Problem' in the West African Sahel", *World Development*, Vol. 11, No. 2, 1983. pp. 101-117.

[5] The Imperial Ethiopian Government, *Proclamation No. 94 of 1947: Proclamation for the Establishment of a Tax for Education*.

[6] --------, *The Health Decree No. 36 of 1959*.

[7] --------, *Five Year Development Plan, 1957-1962, The Second Five-Year Development Plan, 1963-1968* and the extended *3rd. Five-Year Development Plan, 1968-1974*.

[8] --------, *Proclamation 279 of 1970: A Proclamation to Provide for Imposition and Expenditure of Additional Education Taxes*.

[9] International Monetary Fund (IMF), *Government Finance Statistics Yearbook*. (various years, esp. Vol. XIV,1990)

[10] Alemaychu Lirenso, *Villagization and Agricultural Production in Ethiopia: A Case Study of Two Regions*. IDR Research Report No. 37, Institute of Development Research, Addis Ababa University, October 1989.

[11] *MESKEREM*, Volume 6, Number 25, March 1986. (in Amharic)

[12] Ministry of Finance, *Budgetary Revenue and Expenditure*. (various years)

[13] Ministry of Planning and Economic Development (formerly ONCCP), *National Income Accounts*. (various years).

[14] Ministry of State Farm Development (Public Relations Office), *A Ten-Year Report*. Addis Ababa: Artistic Printers, May 1989. (in Amharic)

[15] Mulat, Teshome, "Planning in Ethiopia", in Ndegwa, p., Mureithi, L. P. and Green, R. (editors), *Development Options for Africa in the 1980s and Beyond*. Nairobi: Oxford University Press, 1985, pp. 85-100.

[16] -------, *Agricultural Taxation and Expenditure in Ethiopia*. prepared for FAO, Rome, 1990.

[17] National Bank of Ethiopia, *Annual Report 1988/89*. p. 20

[18] National Revolutionary Development Campaign and Central Planning Supreme Council (NRDC & CPSC), *Evaluation of the Implementation of the Six Annual Plans 1978/79 - 1983/84*. Addis Ababa: NRDC-CPSC, December 1984. (in Amharic)

[19] National Villagization Coordinating Committee (NVCC), *Mender Establishment*. Addis Ababa, 1987. (in Amharic)

[20] Newbery, David, "Agricultural Taxation: The Main Issues", in Newbery, David and Stern, Nicholas (editors), *The Theory of Taxation In Developing Countries*. A World Bank Research Publication, Oxford University Press, 2nd. Printing 1988.

[21] Provisional Military Government of Ethiopia, *Programme of the National Democratic Revolution of Ethiopia*. Addis Ababa, 1976.

[22] -------, *Rural Land Use Fee and Agricultural Activities Income Tax Proclamation No. 77/1976*.

[23] -------, *Proclamation No. 99 of 1976: Monetary and Banking Proclamation*

[24] Provisional Military Government of Socialist Ethiopia, *Proclamation No. 152 of 1978: The Rural Land Use Fee and Agricultural Activities Income Tax Amendment Proclamation*.

[25] -------, *Annual Plans*. (Six such annual plans were produced between 1978/79 and 1983/84 all in Amharic)

[26] -------, *Ten-Year Perspective Plan 1984/85 - 1993/94*. Addis Ababa: Bole Printers, September 1984.

[27] Tanzi, Vito, "Quantitative Characteristics of the Tax Systems of Developing Countries", in David Newbery and Nicholas Stern (editors), *op. cit.*.

[28] UNICEF et. al., *Integrated Rehabilitation Project (IRP) Baseline Survey: Main Report*. Addis Ababa: UNICEF, 1988.

[29] Wiseman, J. and Alan T. Peacock, *The Growth of Public Expenditure in the United Kingdom*, Princeton University Press, 1961.

[30] The World Bank, *World Development Report 1988*. Oxford University Press, June 1988. p. 82.

PUBLIC POLICY, MARKETS AND TECHNICAL PROGRESS
IN THE GRAIN PLOUGH CULTURE

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ABSTRACT: *Based on an inter-activity analysis of a village economy of the grain-plough culture of Ethiopia, this paper is a critique of some of the premises of current rural development programmes in the country and approaches to reforms in agrarian policy. Contrary to these premises, the paper argues, final demand injections may be superior to transfer injections as means of raising the incomes or the marketable surplus of rural economies in the culture. Final demand injections may also be more effective in those terms when directed at home activities rather than farming and at traditionally less traded grain types rather than those observed as the main traditional "exports" of the economy. Furthermore, it is a strong possibility that the same injections are a viable substitute to projects of technological intervention should these be not feasible in a locality. The agronomic bias characterising such projects at the moment also seems to be unjustified. Results supporting the case for final demand injections imply that technological interventions may be more effective when directed at home activeties rather than farm activities and at less known crops of a rural economy rather than at traditional major "exports".*

1. INTRODUCTION

That "everything depends on everything else" is an axiom in economics but has never been of formal use in the formulation or assessment of agrarian policy in Ethiopia. And yet changes in such policy have always come as a package of public measures of often conflicting goals[1]. Some of the measures in the past consisted of rural development projects mainly for the diffusion of innovations in farming techniques[2]. These were often supported or undermined by change or lack of it in this or that aspect of the marketing environment or institutional structure of the rural economies targeted[3]. Some changed the relative prices or fiscal parameters faced by villagers or the institutional structure of their activities[4]. These too either hindered or facilitated the success of rural development programmes in the diffusion of agronomic innovations[5]. The appraisal or evaluation of any policy measure or development project is therefore misleadingly incomplete if it ignores the concurrence of all forms of "external shocks" to the economies the intervention is directed at.

However, the hindrance that public policy has so far represented to many rural development projects in as far as it influences the marketing and institutional context of the projects seems to have been known too well. So well that the question is seldom raised whether or not public policy could have been flawed also in terms of the choice of the elements of the research and extension component of the same projects. Project documents do often appraise the chosen package of elements - and - find it acceptable - on grounds of high benefit cost ratios that could have been even higher had government marketing or institutional policy been better[6]. It is as often overlooked, though, that the same ratios are based on a partial analysis that suppresses inter-activity linkage effects and can therefore be misleading measures of the worth of the selected package relative to other alternatives. The result has been a a tacit but general condoning of "the agronomic bias" of most rural development projects in the country. The bias may be understood in two senses. The first is the focus of research, extension and credit schemes on improving farming techniques to the exclusion or relative neglect of improvement in the technology of home activities. Secondly, projects rarely pay attention to less predominant items in the traditional crop-mix of project areas[7].

Although exaggerated in one sense, the importance of the marketing environment of rural economies also seems to have been generally underestimated in a second. The possibility is rarely considered that, incomes in a rural locality could be raised higher by means of an appropriate marketing policy than through poorly targeted efforts at improving production techniques. It is not sufficiently stressed either that, should projects for the diffusion of improved techniques be unavailable to a community, there may be an alternative in the right form of public intervention in the market for their produce. The latter does not necessarily involve government intervention in the market to manipulate relative prices of rural produce through fiscal measures or price controls or purchase schemes, although these have become synonymous with marketing policy in the country.

As a critique of the current approaches to rural development programmes along these lines, this paper advances some hypotheses regarding the response of economies of the grain plough culture to positive policy interventions. By positive interventions we

mean those increasing the net incomes of rural households or their marketable surplus without reducing one or the other.

The paper is based on an analysis of the 1988-89 social accounts of the economy of a village [30]. This is the village of Ude located some 60 kilometers southeast of Addis Ababa along the Addis-Nazareth highway. The following section provides an overview of the grain-plough culture as the background to a discussion of the structure of Ude's economy in the next section. This is aimed at bringing out those linkages in the village that are common to most of the culture while suppressing the peculiarities of Ude stemming from its exceptional natural resource endowment and relatively urbanized regional environment. A model of the village economy is then used to deduce the following propositions in the last section. First, policy interventions that increase the demand for rural produce at stable market prices raise both rural incomes and marketable surpluses more than those involving the net transfer of resources to villagers in the form of, say, subsidies to external supplies, price support to sales or straight forward grants. The former amount to a final demand injection into village economies. We may refer to the second as "transfer injections". Secondly, final demand injections may generate more incomes and marketable surpluses when they are directed at home activities than when they are at the production of traditionally exported grains. Final demand injections may also be more effective on the same criterion if they are directed at the less known crops of an economy. Thirdly, projects for the diffusion of improved techniques of production in home activities are not necessarily less effective than the more traditional project of agronomic intervention. Within the latter category those directed at traditionally dominant crops may be inferior to those focussing on the less known items of the crop-mix of the targeted rural economy.

2. THE GRAIN-PLOUGH CULTURE

2.1 The Village as an Economy

The grain-plough culture is one of the many classes used by Westphal [32] in his taxonomy of technological systems of peasant agriculture in Ethiopia. It is distinguished

from others by the dominance of cereals and pulses in cropping pattern to the point of "near exclusion of permanent crops, vegetables and tuber crops".

Extending over the central, southeastern and northern highlands of the country, and probably engaging the larger part of its rural population, the culture straddles scores of types of rural economies that differ from one another in several respects. These include the nature and degree of natural resource endowment as reflected in cropping pattern and farm yields, internal institutional structure or profile and the strength and pattern of commercial ties to the rest of the countryside and urban centers. Diversity in these terms is indeed generally recognizable at the lowest possible level of definition of a rural economy, i.e., the village. Following Connel and Lipton [6], we understand the village economy to be a rural territorial administrative unit inhabited by a small population of farming households that are tied to one another by internal transactions of greater diversity and intensity than transactions with outsiders as well as by the sharing of land titles that define the territory as their work place and domicile.

The similarity between any two adjacent villages is likely to be more striking than their differences. Villages in both share the same languages and religion and the norms of social and economic behaviour associated with these. The technology of production and consumption and natural resource endowment is also no doubt the same as is the institutional profile of farming if not its institutional structure. As we extend the boundary of the neighbourhood of comparison to include more and more villagers, however, we are bound to observe differences, first, in farm yields, next in institutional structure and the structure and strength of external commercial ties, then in institutional profile and, eventually, in cropping pattern, consumption habits and social norms.

2.2 Institutional Profiles

A rural economic institution is understood here as an organization of villages administration or a distinctive combination of the mode of access of households to primary factor of production, the households' role in the management of production, the households' place in the village's work force, and the mode of realization of their share in the net output of the village.

Smallholder farming has always characterised the grain-plough culture. However, it is a concept that is too abstract in the Ethiopian context to constitute a type of economic institutions as understood here. This is because at least six different forms of it can be identified in recent agrarian history of the country, i.e., over the past thirty years or so alone. As indicated in Table 1, these are distinguished from one another by the forms of land tenure on which they are based. For convenience, the latter have been classified in the table by region and into those of the Imperial and the post-Imperial periods.

Table 1: **Recent Types of Economic Institutions of the Grain-Plough Culture**

Forms of land tenure	Types of rural households		
	Landlords	Small-holders	Amratch*
Imperial North			
1. Rist system	Type 1	Type 1	--
2. Deisa system	--	Type 2	--
3. Northern peasant tenancy	--	Type 3	--
Imperial South			
4. Freehold ownership	Type 2	Type 4	--
5. Southern peasant tenancy	--	Type 5	--
Post-Imperial Ethiopia			
6. Meret-Le-Arashu system	--	Type 6	Type 1/ Type 2

*This is the popular name of the *wolba* (Type 1) or *malba* (Type 2) collectivisation institutions of the 1980s. See the appendix for a glossary of local terms.

Each system of tenure has always corresponded to a unique institutions of village administration: the *rist* or *deisa* system of tenure to the *atbia* court, the freehold system of the imperial south to the *chika* court and the *Meret-Le-Arashu* form of tenure to the "village (peasant) association".

The institutional profile of a village is the system of institutions found in it and differs from the village's in institutional structure by which we mean the relative importance of different institutions in the village in terms of control over resources in general and farmland in particular. Since the 1960s village economies of the grain-plough culture have operated in the framework of four major institutional profiles. These are: (1) the *rist*-based profile (or profile A) understood as a system of Type 1 landlords, Type 1 smallholders, Type 3 small holders and the *atbia* court; (2) the *deisa*-based profile (or profile B) as a system of Type 2 smallholders and the *atbia* court; (3) the freehold profile (or profile C) as a system Type 2 landlords, Type 4 smallholders, Type 5 smallholders and the *chicka* court; and (4) the *Meret-Le-Arashu* profile (or profile D) as a system of Type 6 smallholders and the village association or a system of Type 6 smallholder, *amaratch* farmers and the village association. Each village economy of the imperial period was characterized by profile A or profile B in the North and by profile C in the south. The 1975-82 agrarian reform replaced all these by introducing profile D throughout the country[9].

2.3 External Environment and Public Policy

That we should speak of a technological system as a "culture" should be connotative of the fact that the system essentially remains to be the same as what it was centuries ago except for its geographical expansion and the infrequent diffusion of marginal innovations here and there. However, economies of the culture have undergone major transformations both in internal institutional structure and external linkages within the last half of the century. The maturity of the modern day Ethiopian state in the fifties broadened their external environment to include public policy of ever expanding scope and increasing dimensions. The urbanization process that accompanied the development of the state also created a network of regional markets in agricultural produce that terminated in the Capital and two or three other major urban centers [12]. This network has been deepening fast over the last three decades and is tying more and more village households to urban economies and the rest of the countryside as suppliers of farm produce and consumers of urban goods and services as well as agricultural produce of other regions and localities.

These relatively new aspects of the external environment of village economies have grown so much in importance today that, given the relative stability of their technology, changes in the welfare of their communities have become results of "shocks" resulting as much from shifts in public policy or markets or both as from changes in climatic conditions. Indeed, we have reached a stage where changes in their institutional structure or technology depend more on public policy than anything else. The Institutional profiles, A, B and C of the grain-plough culture as described above were mainly outcomes of the process of the abolition of the *gult* institution in the course of the evolution of the central Imperial Government. Likewise, their replacement by the *Meret-Le-Arashu* profile of the post-imperial period was a direct result of the land-reform and *wolbanisation* drive that followed the fall of the monarchy[10]. And just as the marketing environment of villages for this period was the outcome of the "socialization" policy of the new government, the marketing regime it supplanted was supported by of the laissez faire policy of the government of the time [1, 10]. Other domains of public policy vis-a-vis the culture include fiscal measures, rural settlement schemes and rural development programmes [2, 4, 22].

2.4 The Study Village

At the time of our case study, the village of Ude had a population of 972 in 195 households on its territory of 680 hectares. It was villagised in 1985 when all its households were moved to three residential blocks of newly built tin-roofed mud houses of an average of two rooms. Together with the paths connecting them, the homestead plots attached to each house, the village church yard, school compound and association and other official premises, the residential blocks occupied about 45 hectares of the villages, territory. About 33 hectares of the same territory were enclosed as the site of a Ministry of Agriculture Re-afforestation Programme on the hillsides of the village. Another 127 hectares of land was used as communal grazing fields leaving the remaining 495 hectares as fields for growing *teff*, wheat, barely, broad beans, peas and chickpeas.

During the Imperial period the village was characterized by the freehold institutional profile in which most households operated as small holders of Type 5 in tenancy to mostly absentee landlords under contractual agreements that involved the

payment of a fixed quantity of *teff* grain per hectare as an annual land rent. The 1975 land reform introduced the *Meret-Le-Arashu* profile to the village when the newly established village association distributed the village farmland to resident households with an average holding of three hectares per household on a usufructuary basis subject to redistribution as the need arose. By the time of the study the number of households had grown to the point where average holdings fell 2.5 hectares. The period between 1975 and 1982 also saw the development of the village association into the local arm of the central government its domain extending beyond the administration of the distribution of village land to include the administration of justice the collection of taxes for the central treasury, the levying of cash or labour "contribution" to local public projects, the administration of compulsory grain delivery schemes and the implementation of projects of this or that ministry of the central government. In 1982, a *wolba* was established the membership of which grew to 74 households at the time of the study and held 241 hectares or 49 per cent of the village farmland including 74 per cent of the area of the highest yielding soil variety of the locality. The remaining 121 households continued to operate as smallholders of Type 6 with an average holding of 2.1 hectares of crop fields against a per household figure of 3.3 hectare under the *wolba* or *ameratch* institution.

As elsewhere in the grain-plough culture, farming in the village is a mixture of crop production with animal husbandry but the latter playing the subsidiary role primarily as means of raising "breeders needed to produce ploughing team replacement". Any cattle raised above the requirement are kept mainly on the natural pasture of communal grazing fields the size and quality of which depends on what is left of the village territory once the demand for cropping fields is met. Animal husbandry is, nevertheless, a crucial link in the entire complex of farming activities to the extent that more than half of the cost of production of cereals or pulses produced in the village is the cost of up-keep of plough oxen as the only source of traction power in land preparation and of donkeys as the only means of transport of grain and straw.

The most important crop in the village is *teff* taking up more than 50 per cent of total crop acreage. Wheat accounts for 18 per cent of the same area while peas, broad beans and chickpeas take up another 20 per cent. Barley is also substantially grown.

Most of the homestead plot of each household is used for growing maize for home consumption but considerable space having been left for trees and for growing pepper, onion and a variety of vegetables. Barring occasional backyard tree plantings and communal participation in the village reafforestation programme, there is little activity in permanent cropping.

Of no less significance than cropping or animal husbandry in terms of the employment of village resources is a series of home activities that connects grain harvested from the fields to what is served as food or beverages at household tables. Apart from cooking and brewing, this includes various forms of post-harvest processing, the fetching of water, and the collection and processing of fuel material. Water is fetched by household members form three wells spread out in the village at considerable distances from each other, donkeys often being used as means of transport. The most important fuel·material in the village is cow dung and is supplemented by twigs collected from the acacia trees dotting crop fields and straw of pulse crops. *Injera* and *wot* made of *teff* or wheat flour or some combination of these are the main diet while home-made *tella* is the favourite beverage. Post-harvest processing produces the ingredients of these in the form of flour of various types, *kik, shiro, asharo, bikil, enkuro*, pepper powder and the like.

Home activities are basically organized at the household level involving the labour of mostly of the female and younger members of the household with a variety of traditional cooking, processing, and brewing utensils as capital. Regardless of the institutional framework of farming in the village, the household has also been the basic unit of supply of farm labour. However, most smallholders also use substantial migrant wage-labour during the harvesting season. And, as in the other areas of the grain-plough culture, farm capital has mainly consisted of plough oxen the market value of a pair of which is several times that of farm implements and other livestock combined. At the time of our study there were 1.85 and 1.62 oxen per smallholder and per *Amratch* respectively in the village. Ownership of livestock other than oxen averaged 2.6 per household.

Ude is thus very much like any other village of the grain-plough culture in terms of the structure of production activities and that of the resource base of these. Its institutional structure is typical of the same culture except for the exceptionally high degree of its *wolbanisation* at the time of the study. However the village and, indeed, its broader regional setting of the Ada area have always been different most from economies of the rest of the culture in three major respects. First this is an area that is endowed with farmland of possibly the highest yield in the country of high value varieties of *teff* and wheat as food grains of the greatest demand in major urban centers throughout the country. The national average yield for *teff*, for instance, has been in the neighborhood of eight quintals per hectare while nearly twice that much is reported in Ude. Besides, the *Ada-Netech-teff* variety of which the area is the major supplier, has always fetched the highest price of all varieties, sometimes twice as much as that of some varieties.

Lying along the busiest highway in the country at a drive of an hour or two from Addis Ababa, Nazereth, Debre Zeit, or Mojo, or Akaki as the largest agglomeration of townships in the country, villages of the Ada area also have the most urbanized and commercial environment of all rural economies of the grain-plough culture. This has meant greater exposure of Ada villagers to goods and services of urban origin and, possibly, greater urban influence in their economic behaviour and social attitudes, than is usually the case in the culture. It also has meant that Ada villagers had better access directly to consumers as suppliers of grain as a result of which they obtain a higher share of the price of their produce at terminal markets than most villages in the country. At the time of study, this was of particular significance as it allowed villagers of Ude to more than make-up for the loss they incurred through the compulsory grain delivery scheme of the Agricultural Marketing Corporation (AMC).

Thirdly, its relatively urbanized regional context and comparatively rich agricultural potential has made Ude and the neighbouring villages among the first in the priority list of the government as targets of new policy packages. This has been to the advantage of the village in as far as the policy takes the form of rural development programmes and to its disadvantage when policy assumes such forms as the *wolbanisation*

and compulsory grain delivery schemes of the post-Imperial period. Being within the area of one of the earliest rural development projects, the Ada District Development Project, Ude was among the villages of the culture earliest exposed to agricultural extension and credit schemes. And at the time of the study, it was of one of less than a dozen villages covered by a pilot project of a relatively intensive training and visiting extension and credit programme. The latter included the distribution of chemical fertilizer, herbicides, and improved seed varieties for *teff* and wheat and improved input for cattle fattening. At the same time the village saw the strongest enforcement of the *wolbanisation* and compulsory grain delivery programmes of the 80's and probably lost more resoruces than any other through both [29].

3. UDE - THE STRUCTURE OF ITS ECONOMY

3.1 Social Accounts

All said and done, the picture of an economy must be painted as an array of figures in "dollars and cents", that is, as a system of social accounts. In rural economies like Ude a large part of the flows of resources take place outside of the market and, hence, without actual price-tags. The drawing up of such accounts has therefore to involve some sort of shadow pricing. The social accounting matrix of Table 2, is based on unit accounting prices of village products computed by adding to the market price of "imported" inputs a net income mark-up directly proportional to the total of direct and indirect village labour input. The coefficient of proportionality is the weighted average of the "wage rate" implicit in the market prices of tradable village produce. On the assumption that the consumption of own produce by villagers takes place at a level of a subsistence minimum, this "wage rate" has been defined as rate of return to labour over and above this minimum i.e., as a "surplus wage rate". Such a procedure clearly involves the assumption of homogeneity of labour and uniformity of capital intensity across village activity lines and allocates net incomes between these accordingly. The resulting vector of relative prices expresses the exchange ratios that would rule in the village if all resources were to circulate between activity lines through exchange while maintaining the

physical output proportions observed during our accounting year[11]. The same prices respect market prices in as far as the cost of imported inputs is valued at and the "surplus wage rate" derived from such prices.

The social accounting matrix reported in Table 2 has been extremely aggregated and is in figures in per household terms in order to facilitate comparison with other rural economies of the grain-plough culture and beyond. It has only two village institution accounts: one for smallholders and a second for the *wolba* and village association of the time combined. Production accounts have been aggregated into one for home activities and a second for farming. Other combined accounts are one for each of external supplies, capital, and external institutions. Each account in the table consists of a row of receipts by accounts of origin and a corresponding column of expenditure of the same account by entries of destination.

We read from the first row of the table that, at our accounting prices, a total income of Birr 3950.60 per household accrued to smallholders of Ude during the 1988/89 crop year of which Birr 1538.20 or 39 per cent was due to home activities and the remaining Birr 2412.40 due to farming activities. The entry of the first row in column 7 is the amount of total transfers from external institutions per village household to the smallholder account. Total smallholder receipts per household at market prices for marketed village produce but at accounting prices for the rest add up to Birr 4,324.20.

The column of the same account, that is, column 1, shows that Birr 116.70 of this total receipt was transferred to the village association and *wolba* (row 1), Birr 150.60 was transferred to external institutions (row 7), Birr 91.20 was the value of consumption of external supplies by smallholder (row 5) and Birr 3820.80 the value of consumption of food, beverages and other household services (row 3), leaving annual per household savings Birr

Table 2: A Social Accounting Matrix of Ude, in Birr and Per Household Terms, March 1, 1988 to February 20, 1989.

			EXPENDITURE							
R			1	2	3	4	5	6	7	Total
E	Village institutions	1. Smallholders	--	--	1,538.20	2,412.40	--	--	373.60	4,324.20
C		2. Other	116.70	17.30	511.90	828.00	--	--	137.70	1,611.60
E	Production	3. Home activities	3,820.77	1,273.80	2,358.00	--	--	--	--	7,452.60
I		4. Farming	--	--	1,973.70	2,180.50	--	204.10	1,780.60	6,138.90
P	Other	5. External supplies	91.20	37.80	1,070.80	717.90	--	132.20	--	2,049.90
T		6. Capital	144.90	191.30	--	--	--	--	--	336.20
S		7. External institution	150.60	91.30	--	--	2,050.00	--	--	2.291.90
		Total	4,324.20	1,611.60	7,452.60	6,138.80	2,050.00	336.20	2,291.90	

*Row entries may not exactly add up to column totals due rounding-off errors.

144.90 (row 6). It should be noted that, of the total transfers of Birr 116.70, Birr 84.80 was the value of labour services smallholders provided free of charge to the village *wolba*, the rest being the sum of fees paid to the village association office or cash contribution to the association's projects. Of the total transfers to external institutions, Birr 138.10 is an accounting transfer to the urban public sector implicit in the excess of accounting prices over official prices for grain sold under the AMC's compulsory delivery scheme.

We read from the production accounts that the village farming output per household in 1988/89 was worth Birr 6,138 of which Birr 2,180.50 was input to farming itself, Birr 1973.70 input to home activities, Birr 204.10 investment expenditure and Birr 1,780.60 the value of sales of village produce to urban economic units. Reading the capital account, we see that the value of total investment per household for the same year was Birr 336.20 of which Birr 132.20 was expenditure on external supplies of capital goods and Birr 204.10 the cost of village resources invested mainly in the form of labour on construction and tree planting (column 6). Birr 144.90 of the same total investment was on account of smallholders and Birr 191.30 on that of other village institutions (row 6). In the external institutions account (row 7 and column 7) we read that such institutions bought village produce worth Birr 1,780.60 per village household at our accounting prices or Birr 1979.66 at market prices and sold to villagers goods and services worth Birr 2,050 at market prices. Of the total external supplies to the village 27.3 per cent were by other rural units, 61.7 per cent by the urban public sector and only 11 per cent by the urban private sector. External institutions benefitted from a total transfers of Birr 150.60 per village households on account of smallholders and Birr 91.30 per village household on account of the other village institutions of which more than 85 per cent was an implicit transfer to the urban public sector. On their part, villagers benefitted from a total external transfer per household of Birr 373.60 on account of smallholders and Birr 137.70 on account of other village institutions. Disaggregated accounts show that the village transferred more resources to the public sector than it received and received more from the urban private sector than it transferred to the same, but, on balance, benefitted from a net transfer of resources from the urban sector as a

whole due to favourable free market conditions and despite the rather extractive package of marketing, pricing and fiscal policies it faced.

Of the total value of the village's output of Birr 7079.30 per household, 32 per cent was actually traded and 25.2 per cent the cost of "imported inputs", which makes Ude one of the most monetised of village economies in the country. If we suppress the net output of home activities on account of being non-traded, gross income will fall to Birr 3697.40 at market prices of which Birr 1520.60 or 41 per cent is cash receipts.

3.2 Modelling the Village Economy

As already pointed out, the economy of Ude is much more complex than the impression given by Table 2. The fully disaggregated matrix of the village is a system of 46 accounts of which three are village institutions current accounts, nine external supplies accounts, three external institutions accounts, one combined capital and 30 production accounts.. Of the 30 production activities identified, nine are activities of supply of food, beverages and other household services, ten activities of post-harvest processing, three activities of fuel and water supply and eight farming activities.

Given the technology of village production activities, social norms as determinants of preferences of villagers as consumers of village produce, and the institutional structure of the village economy as reflected in inter-institution transfer rates, the dependence of the structure of village production and the distribution of the output and net income it generates on villagers' decisions is stronger than that of entries into accounts of external supplies or external institutions. It also seems safe to assume that investment or saving decisions of villagers are determined as a by-product of consumption decisions. In this sense, entries of external supplies, external institutions and village capital accounts can be regarded as exogenous to the economy of Ude while those of the current accounts of village institutions and production accounts are endogenous.

If we aggregate receipts of exogenous accounts as "leakages" of the endogenous accounts and outgoings from the exogenous accounts as "injections" into the endogenous ones, the structure of Ude's economy as observed in 1988/89 can be described by a matrix of 34 accounts the format of which is shown in Table 3. In the table, T_{11} is a 3x3 sub-matrix of inter-village institutions transfers, T_{12} a 3x30 sub-matrix of the distribution

of village net incomes by lines of production activity and village institutions, T_{21} a 30x3 matrix of the distribution of village consumption by activity of source and village institution, and T_{22} a 30x30 matrix of intermediate flows of village production. Dividing the entries of each endogenous account by the corresponding column total leads to a 33x33 matrix of coefficients

$$A = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix}$$

This is a description of the structure of the villages economy in terms of a sub-matrix of average rates of inter-institution transfer, A_{11}, a sub-matrix of input coefficients, A_{22}, a sub-matrix of average budget share of consumption items, A_{21}, and a sub-matrix of the relative income shares of institution by activity lines, A_{12}.

Table 3
Format of Ude's Social Accounting Matrix

			EXPENDITURE			
			Endogenous accounts		Injections	
			1	2		
R E C I E P T S	1	Village institutions	T_{11}	T_{12}	x_1	y_1
	2	Production	T_{21}	T_{22}	x_2	y_2
	3	Leakages	l_1	l_2		t_x
	4	Total	y_1	y_2	t_x	

In identifying the production and current village institution accounts as the endogenous part of Ude's system of accounts, we have already gone a long way towards a model of the village's economy. The following assumptions can also be made as safe

approximation to reality in the village: (1) unitary income elasticity of consumption demand for village produce, i.e., constancy of the A_{21} coefficients matrix; (2) constant marginal rates of inter-institution income transfer, i.e., constancy of the A_{11} matrix; and 3) constant relative distribution of net incomes across village production activities and village institutions, i.e., constancy of A_{12}. If the village economy is not subject to climatic or ecological shocks or innovation in techniques of production, the technology matrix A_{22} also becomes fixed. If we further suppose that all village resources are underutilised, the village economy can be described by the system of equations [26]:

$$\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} \begin{bmatrix} y_1 \\ y_2 \end{bmatrix} + \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} \dots (1)$$

or $\quad y = Ay + x$ -(2)

where y_1 = vector of total receipts of village institutions

y_2 = vector of village output

x_1 = vector of injections into village institution accounts

x_2 = vector of injection into village production accounts

$y = (y_1, y_2)$ and $x = (x_1, x_2)$

This is a model whereby the structure and level of incomes of village institutions, y_1 and the level of village production activities, y_2 are entirely determined by the structure and level of injections since the solution to the system of equation is

$$y = Mx$$ - (3)

where

$$M = (I-A)^{-1}$$ -(4)

Each element m_{ij} of the multiplier matrix M measures the total effect of one Birr worth of injection through the jth endogenous account on the total receipts of the ith endogenous account.

The assumption that all village resource are not fully employed is not one that is warranted for all village economies of the grain-plough culture and certainly not for Ude. Injections into rural economies in the form of public sector transfers have also often been mainly the cost of rural extension services. As these are generally expected to introduce changes in the matrix A_{22}, the assumption of constancy of input coefficients despite changes in x_1 is therefore unrealistic at least in villages where rural development projects are in progress. The model of the village economy just set out is therefore a rather poor basis for the precise measurement of the impact of a package of policy interventions or other external shocks on a particular village economy. However, once computed from actual accounts, the coefficients matrix A and the multiplier matrix derived from it can be used to great advantage in a comparison of alternative forms of policy intervention without any restrictive assumptions.

4. UDE - PATTERNS IN ITS RESPONSE TO POLICY INTERVENTIONS

4.1 Forms of Policy Interventions

The model of Ude's economy just set out is a useful devise of classifying the external shocks that the village may be subject to without subscription to the more questionable assumptions on which its predictive worth depends. There are at least four types of such shocks. First we have what we may call "institutional shocks". These are shocks that are generally associated with the institutional transformation of the village economy and find expression in changes in the sub-matrices A_{11} and A_{12} of the coefficients matrix A. As such, they must involve changes in the nature of village institutions or the parameters of distribution of incomes or average rates of transfer between existing ones or a combination of both. Then we have shocks that alter the input coefficients sub-matrix, A_{22}. These are "technological shocks" that represent technical progress when they have the overall effect of increasing village net incomes

with a given level and structure of primary factor inputs. The third category of shocks includes those changing the vector, x_1, of external transfers to villages or its counterpart, l_1, of leakages. These are "transfer shocks". We also have "final demand shocks" as a fourth category that consists of changes in the vector of final demand injections, x_2 or in its counterparts, l_2. Changes in x_2 involve changes in the structure or extent of the market for village produce or of investment expenditure of village output at given prices while those in l_2 mean a different level or structure of village spending on external supplies.

As indicated earlier, institutional shocks in recent history of the grain-plough culture have been results of radical shifts in agrarian policy, particularly in as far as it relates to land tenure and settlement. In contrast, the other forms of shocks are observed to be outcomes of public measures or the lack of these as often as they have been due to events autonomous of the state of policy. Technical progress wherever observed has been in areas of extension and improved input supply schemes but we have also the positive technological shocks of exceptionally good harvests associated with the more fortunate phase of the "climatic cycle" to which the culture seems to be subject. Negative technological shocks of crop failures due to drought are probably the most noticeable features of many areas of the culture and are quite rightly not directly attributed to public policy.

Transfer shocks also seem to have generally originated as much in changes in public policy as they have in autonomous changes in the prices of village produce relative to those of external supplies. Transfer shocks are said to be due to public policy when they are a result of one or more of the following: changes in direct tax rates in villages; changes in rates of indirect taxation or subsidies to external supplies of villages; out-right grant of public sector services to villages or grants of cash or services by villages to the public sector; and changes in the farmgate price of villagers relative to shadow or bench mark prices as a result of direct government intervention in transactions. Final demand shock are attributed to public policy when direct government intervention in markets alters the extent and structure of the demand for village produce at given prices.

As part of the external environment of rural economies like Ude, agrarian policy or reforms in such policy can then be seen as some combination of the following types

of government intervention in villages: technological intervention in the form of rural extension and input distribution programmes; public transfer injections (or withdrawals) in the form of fiscal measures and pricing policy; and final demand injection in the form of agricultural marketing policy as distinguished from fiscal measures or pricing policy; and institutional interventions of one form or another.

Policy changes with respect to the last of these are much less frequent than those with respect to the other three and seem to figure rather low on the current agenda of reforms in the country. It appears then that if and when a new agrarian policy unfolds, it will have involved a choice from a menu of options that differ from one another in terms of (a) the relative weight attached to technological interventions, transfer injections and final demand injections, and (b) the content of each of whichever of these as are included.

4.2   Multipliers, Linkage Effects and Constraints

Table 4 is the multiplier matrix, M, derived from a moderately aggregated version of Ude's 1988/89 accounts. In what will follow we shall use it to compare transfer injections, final demand injections and technological interventions, on the one hand, and broad variants of each, on the other. The comparison is in terms of efficacy as complementary or alternative components of a hypothetical policy package aimed at increasing village incomes and marketable surpluses and will be done under the alternative assumptions of the full employment of all village resources or the underemployment of the same resources.

On the second assumption, each entry m_{ij} of the multiplier matrix measures the amount by which "receipts" of the ith account will have increased when the effects of a unit of injection through the jth account on the village economy have fully worked out. If both i and j are production accounts, m_{ij} is the amount by which the output of i will have increased for every Birr of final demand injection into j by the time the repercussion of the injection on the entire system of accounts has been observed. If j is a production account but i an institution one, m_{ij} measures the full effect of every Birr of the final demand injection on the net income of the relevant institution. If we assume

Table 4: The Multiplier Matrix, y = Mx of Ude, 1988

S.No.	Institution current	INSTITUTION CURRENT			PRODUCTION ACCOUNT							
		1	2	3	4	5	6	7	8	9	10	11
1	Smallholders	2.028	0.704	--	9.220	2.961	9.624	4.453	1.209	7.065	0.563	1.259
2	Wolba	0.412	1.270	--	3.525	1.126	3.862	1.712	0.486	3.110	0.458	0.479
3	Village association	0.018	0.015	1	0.094	0.030	0.098	0.045	0.012	0.075	0.008	0.013
PRODUCTION												
4	Food and drink preparation	1.911	1.309	--	15.635	3.088	8.160	4.660	1.277	7.620	0.728	1.315
5	Household services	0.053	0.036	--	0.267	2.083	0.281	0.128	0.035	0.210	0.021	0.037
6	Post-harvest processing	0.439	0.301	--	4.255	0.708	12.318	1.072	0.294	1.754	0.291	0.302
7	Fuel and water	0.478	0.327	--	4.369	1.975	3.047	4.162	0.319	1.903	0.181	0.329
8	Draft animal power	0.183	0.126	--	1.800	0.584	1.976	0.990	1.335	1.673	0.070	0.298
9	Temporary crops	0.968	0.663	--	9.716	2.810	8.595	4.411	1.856	9.166	0.368	1.644
10	Permanent crops	--	--	--	--	--	--	--	--	--	1.000	--
11	Livestock and dairy products	--	--	--	--	--	--	--	--	--	--	1.000

the full employment of resources instead, each m_{ij} of final demand injection through j measures the constraints to the realization of every Birr of planned marketable surplus or investment. This constraint will be in the form of additional output requirement of if the latter is a production account and required increment in incomes if i is an institution account. Likewise m_{ij} measures the income or production multiplier effect on the ith account of every Birr of a transfer to institution j if all resources are underutilized, but the income or production constraint posed by the ith account for the absorption of the transfer if there is full employment of resources.

Table 4 can also be used for comparing different forms of technological intervention although these by definition must alter the A-matrix of the village and the corresponding M-matrix. If we assume full employment at the point of interventions of this kind, the M-matrix is a basis for comparing alternative forms of intervention by the strength of constraints to increasing incomes, investment or marketable system they are intended to remove or relax. If resources are underemployed throughout, the pre-intervention M-matrix can be used to estimate the effect of interventions on the village net output provided the scope of the intervention is limited to one or two activity lines.

4.3 Public Policy, Transfers and Markets

One of the results the study on which this paper is based was that, as was often reported by others, smallholders were more efficient in the utilization of resources than the wolba institution of village farming [9, 33]. This is borne out by the first two columns of Table 4. If we were to assume that village resources were underemployed at the point of a hypothetical transfer injection, the first three entries of column one suggest that village incomes would increase by a further Birr 1458 for every Birr 1000 of external transfer of one form or another to the villages smallholder account. On the other hand, the additional income generated would fall to Birr 974 for the same transfer if this were made through the wolba account. This result, that transfer injections would raise real incomes higher when made to the account of the more productive institution in the village, can further be seen in that the same injection would not have any multiplier effect at all if made to the account of the village association office (column 3) which is

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the least productive of all village institutions. The same figures could be interpreted as an ex-post measure of the opportunity cost of a transfer leakage from the village in terms of foregone incomes regardless of whether or not village resources are fully utilized. In that case the more productive is the institution of the account subject to "leakage" the greater the cost of transfer of resources from the village to external institutions.

The economy of Ude is thus clearly sensitive to transfer interventions in the sense of a high opportunity cost of leakages or multiplier effect of injections. However, a comparison of column 4 to 11 with the first three columns of Table 4 shows that the village is by far more sensitive to final demand interventions. Column 9, for instance, shows that for every Birr 1000 of increase in the external demand for grain at accounting prices there would be an increase of Birr 10,250 in village incomes assuming village resources are all underemployed. The same figure can also be interpreted as the loss in village incomes due to a 1000 Birr fall in the external demand for Ude's grain. Either way the figure is several times higher than the income generated or foregone through an equal amount of transfer injections or withdrawals. The effect of final demand interventions on the village is also far stronger than that of transfer interventions when the former directly impact on all production activities except in the case of injection to the production of permanent crops, which, as pointed out, is rather marginal to the production system of Ude and, indeed, that of villages of the grain-plough culture in general.

What this means is simply that a marketing policy that widens the market for village products while stabilizing the prices of these at the increases village incomes far higher than any transfer injection be this in the form of support of farm prices above opportunity cost, subsidizing external supplies to villagers, or outright grants of cash or services. Conversely a marketing policy that would result in shrinking market at stable prices for village produce would cost the village far more incomes than one that would transfer resources from villagers by keeping prices of village produce below opportunity cost or raising tax rates on village incomes, property or external supplies.

4.4 Public Policy, Markets and Technological Interventions

Supposing Ude faced a project aimed at a wider market for its products at stable cost prices and assuming that its resources were all underemployed at the point of project commencement, column 4-11 of Table 4 can be interpreted in an interesting way. Although villagers in Ude are making substantial sales of fattened cattle and are beginning to sell processed grain and *kubet* as fuel material, village "exports" have predominantly been those of unprocessed grain mainly *teff*, wheat and pulses in that order of importance. However, comparison of column 9 of the table with columns 4 and 6 shows that an expansion of the traditional grain markets would increase village incomes by far less than an equal expansion in its market for processed grain or the opening up of new markets for the traditionally non-traded but potentially tradable items of food or beverages such as *injera*, *dabo* or *tella*. Column 7 and 11 show that an expansion of the market for Ude's fattened cattle or dairy products would generate less income than an equal amount of expansion of the market for such products. It thus turns out that if the project for widening the market for Ude's produce has to be targeted to only a selection of products, the targets are not necessarily the traditionally dominant "exports".

If we drop the assumption of underemployment of resources in the village the same project of expanding the markets for its produce will not be feasible unless it is supported by a project for the introduction of new techniques of production that would relax constraints to increasing marketable surpluses. Projects of the latter kind have operated in Ude for nearly two decades in the form of extension services and credit facilities for access to improved inputs. These have always focused on the production of traditional marketable, i.e., *teff* and wheat grain to the exclusion, not only productive home activities, but also the production of other crops and, until very recently, animal husbandry. As already pointed out, this has been a general characteristic of extension and credit programmes throughout the grain-plough culture. However, columns 4 to 11 of Table 4 indicate that this bias may conflict with the programmes declared objectives of maximizing rural incomes or marketable surplus. Even if we assumed that the only marketable village produce is unprocessed grain, the productivity of home activities is a greater constraint to increasing the marketable surplus of the same produce than

productivity in farming. It should follow that technological interventions aimed at raising the productivity of home activities could be a more efficient way of increasing the village marketable surplus of grain than those intended to increase productivity in farming. However, extension programmes in Ude as elsewhere also often exhibit bias in the sense of unwarranted targeting of research and extension services on the one or two crops of traditional village "exports". In the case of Ude, these have been *teff* and wheat. And yet the M-matrix of the disaggregated system of accounts of the village - not reported here - shows that productivity in other farming activities is almost as strong a constraint to increasing the marketable surplus of *teff* or wheat as is productivity in *teff* or wheat farming.

The use of Table 4 to compare technological interventions by targeted activities under the assumption of underemployment of resources also show that interventions targeted at home activities in general have a greater multiplier effect on net incomes or aggregate output than those directed at farming activities. The M-matrix of the disaggregated accounts shows that, within the sub-category of agronomic interventions, those targeted at pulses or barely, for instance, would have greater multiplier effects than those focusing on *teff* or wheat [30].

5. CONCLUDING REMARKS

At a rather general level, this paper makes the economic case for integrated rural development programmes in the wider sense of "integration", that is, in that of the comprehensiveness of programmes to include policy interventions in the marketing, fiscal and institutional framework as well as in the technological basis of the entire range of rural production activities. And if and whenever and wherever such programmes are affordable and feasible, the paper's propositions should be relevant to the problem of the optimal sequencing of their components. However, a stronger case has long been made against integration as a strategy at the countrywide level: that their components of technological intervention are not affordable. The complementing of these

components by appropriate final demand or transfer interventions is not necessarily feasible either due to political, administrative or fiscal constraints.

Our propositions are therefore better interpreted in relation to the prioritization and sequencing of the affordable and feasible "top-something" interventions into a "minimum package". The argument that final demand interventions are an effective means of raising rural incomes is a case of their inclusion in such a package. The argument that the same interventions are more efficacious than transfer injections is a case for minimal role for fiscal measures and maximum role for interventions in the market for rural produce as components or part of the policy context of rural development programmes. At the level of marketing policy, both propositions lead to the advocacy of a policy aimed at expanding and diversifying the demand for rural produce at stable prices while avoiding the manipulation of relative prices as a means of supporting rural incomes. Such a policy is liberal to the extent it does not restrict the interplay of market forces but is at the same time activist to the extent it must involve public investment in the infrastructure for rural marketing and may involve the use of public enterprises as dealers in rural produce.

The paper's critique of the agronomic bias of past and present rural development projects applies not only to the minimum package programmes (MPPs) of the 70s and early 80s but also the recent the Peasant Agricultural Development and Extension Programmes (PADEP) and the relief and conservation-oriented "integrated" programmes of international NGOs. And although presented here in rather formal terms, this is an argument the validity of which is quite often supported by the opinions of target communities about individual components of these programmes. Villagers generally appreciate and take advantage of extension service and credit facilities in farming activities. But they are also often observed to resist or reject the adoption of some innovations particularly in the form of some improved seed varieties that project personnel believe should be attractive to farmers on grounds of having higher yields than traditional varieties. Project personnel are often puzzled by such resistance and are surprised to observe that the digging of water wells or the installation of flour mills are often ranked higher by villagers than credit facilities for high-yielding farm inputs. However, the difference in points of view between the local community and project

personnel involved in such cases does not seem to be due to the irrational conservatism of the former as is sometimes supposed to be the case. If irrationality is involved at all, it appears, it is on the part of project personnel whose "economic" appraisal of agronomic innovations is short-sighted to the point of suppressing the repercussions of individual interventions through the entire production system that tightly links each farming activity to every other, each home activity to the others and the sub-system of home activities to that of farm activities.

The argument for greater attention to home activities and less prominent items in traditional cropping mix in technological and final demand injections is also consistent with the emphasis of increasing marketable surplus as a policy objective. In the early days of rural development programming in the grain-plough culture, village marketables were limited to a grain type or two. Agronomic bias in the programmes of the time might therefore have been harder to detect and, possibly, also justifiable. This is no longer the case today. It is true that rural "exports" continue to be dominated by traditional marketables. However, products the export of which was unimaginable twenty years ago are now important sources of cash earnings by villagers. More and more of them are selling such items as *kik*, *shiro*, bread, or *kubet* in the nearby townships and it may not be long before we observe the selling of village baked *injera* in urban centres. And if there is anything in the notion of "rural industrialization" in development thinking it is something for which policy support can only start in the form of the humble projects of providing infrastructure and intermediation to quicken the pace of growth of infant markets of this kind. With the fast rise of the prices of the less prominent items of farm produce relative to those of traditional marketables the choice of targets for technological intervention as means of increasing supplies to urban centers is also becoming an increasingly difficult task.

It is undoubtedly true that technological interventions in home activities are increasing in importance as components of rural development programmes. However, it seems also to be mostly the case that recognition of the importance of such interventions is a grudging and misconceived one. Too often such interventions are a one-shot affair and are not formally appraised for their relative worth in terms of increasing incomes or marketable surplus. Sometimes they are included in a project as

a means of soliciting acceptance for boldly innovative and less popular agronomic interventions [30].

APPENDIX

GLOSSARY OF LOCAL TERMS

1.	*Amratch*	Amharic word meaning "producer" that came to be adopted as the popular name for agricultural producers' cooperatives.
2.	*Atbia*	Literally means village in Amharic; the atbia court was the office at the village level magistrate or headman in Amharic and Tigrean speaking areas.
3.	*Chika*	The Southern equivalent of the Atbia in Northern Ethiopia during the Imperial Period.
4.	*Dabo*	Homebaked traditional bread.
5.	*Deisa*	A communal system of land-tenure based on periodic redistribution of farmland in Tigrean areas during the Imperial Period.
6.	*Gult* Institution	A traditional rural policy in Ethiopia whereby a lord kept law and order in a particular territory and extracted tribute from inhabitants in the name of an overlords up in the hierarchy of regional power.
7.	*Kik*	Crushes and cleaned dried peas or beans used as ingredient of currey.
8.	*Kubet*	Dried cake of cow-dung used as fuel.
9.	*Malba*	Official name for agricultural producer cooperatives established in the 1980s in Ethiopia and in which all farmland but not equivalent was collectively owned by cooperative members.
10.	*Mere-le-arashu*	Literally means "land-to-the tiller" in Amharic and was the for the political movement for the land reform that was carried out in 1975.
11.	*Wolba*	Official name for agricultural producers cooperative established in the 1980s in Ethiopia and which farmland, draft animals are farm implement and equivalent were commonly owned.
12.	*Rist*	Landholding rights inherited through gene descent in Northern Ethiopia of the Imperial Period.
13.	*Shiro*	Power of pulses used as ingredient in the making of traditional currey.
14.	*Teff*	Stape crop of Northern Ethiopia.
15.	*Tella*	Traditional alcoholic beverage brewed from barley, maize or sorghum.

NOTES

[1]An often cited example of such conflict was that between policy measures of the Imperial period that were intended to encourage the growth of large-scale commercial farming in the south and those designed to promote the "green-revolution" technology in smallholder farming [28]. Another instance of the same conflict is that between the land-reform of the mid seventies and the new marketing and fiscal policy regime that was to follow in the eighties [1, 20, 25].

[2]These include the minimum and comprehensive package projects of rural development of the 70's and the first half of the 80's and the Peasant Agricultural Development Programme introduced towards the end of the last decade [7, 10, 14].

[3]The "package projects" for the development of smallholder agriculture, for instance, were generally hampered by the the land-tenure system of the 60s and the 70s in the south [16, 28]. Likewise, the growth in farm incomes, investment and the rate of adoption of improved technology that the 1975 reform was expected to lead to did not materialise due to, among others, the heavy implicit taxation of farmers through the compulsory grain delivery scheme introduced in 1981 [1, 25, 30].

[4]The 1975 land reform and the subsequent "collectivisation" programme are the most obvious examples of the second category while the programme of the 80s for the establishment of parastatal monopoly in rural trade was an instance of the first.

[5]The 1975 land reform, for instance, was believed to have provided greater momentum to the minimum package programme by relaxing the collateral constraint to smallholder participation in credit schemes just as the pre-reform institutional setting was believed to have been the major obstacle to projects reaching a large portion of their traget population in the south [28].

[6]See, for instance, Ministry of Agriculture [10,11,13].

[7]This applies not only to minimum package projects [10] of the past but also to the current peasant Agriculture Develoment Programme [14] as well as comprehensive package projects of the 60s and 70's [21].

[8]Westphal's taxonomy broadly tallies that of Huffnagel [18].

[9]The institutions of profile A are described in Hoben [17] while Cohen [6], Markakis [19] and Pauswang [24] provide accounts of profiles B and C. Dessalegn [8] is the best account of profile D.

[10]The term *wolbanization* is used here to describe the plicy initiative of the 1980s to organise many rural households as possible in units of communal farming offcially named *wolba*'s allocating public investment in the development of peasant agriculture and adjusting the instruments of agrarian policy accordingly. The official justification of the initiative was the related terminlology was introduced in a government decree issued in 1981 [15].

[11]The vector of priices in question is a special case of price systems computable from input-output models discussed in Brody [3], Skereka, et. al. [27], Pasinnetti [23] and Taylor [31].

REFERENCES

[1] Alemayehu Lirenso, "Towards a Rationalisation of the Food Grain Marketing System in Ethiopia", Paper persented to the National Seminar on Food Strategy in Ethiopia, December, Alemaya Agricultural University, Alemaya, 1986.

[2] _____, "Villagisation and Agricultural Production in Ethiopia: a Case of Two Regions", *IDR Research Report No. 37*, Addis Ababa University, Addis Ababa, 1989.

[3] Brody, A., *Porportions, Prices and Planning*, Amsterdam: North-Holland Publishing Company, 1974.

[4] Cohen, J, and Weintraub, D., *Land and Peasants in Imperial Ethiopia*, The Netherlands: Van Gorcum and Company, 1975.

[5] Connel, J., and Lipton, M., *Assessing Village Labour Situtations in Developing Countries*, New Delhi: Oxford University Press, 1977.

[6] Dejene Aredo, "The Evolution of Rural Development Policies", in Pauswanf, S.,et. al., (eds.), *Ethiopia: Rural Develpment Options*, London: Zed Book Ltd., 1990.

[7] Dessalegn Rahmeto, *Agrarian Reform in Ethiopia*, Uppsala:Scandinavian Institute of African Studies, 1984.

[8] _____, "Cooperatives, State Farms and Smallholder Production", in Pausewang, S. *et. al.* (eds.), *Ethiopia: Rural Development Options*. London: Zed Book Led., 1990.

[9] Eshetu Chole, "Agricultre and Surplus Extraction", in Pausewang, S. *et. al.* (eds.), *Ethiopia: Rural Development Options*. London: Zed Book Ltd., 1990.

[10] Ethiopia, Ministry of Agricuduture, *A Master Plan for the Extension and Project Implementation Department*, Addis Ababa: 1970.

[11] _____, *Minimum Packaage Project Programme Loan Application to IBRD/IDA*. Addis Ababa:EPID Publication N°. 6, 1972.

[12] _____, *Findings of a Market Structure Survey and Analysis*. Addis Ababa: 1973.

[13] _____, *MPP Annual Report (1981/82)*. Addis Ababa: 1982.

[14] _____, *Peasant Agricultural Development Programme Status (1988/89)*. Addis Ababa: 1989.

[15] Ethiopia, PMAC, *Directives for the Formation of Farmer's Producers' Cooperatives*, (in Amharic). Addis Ababa: 1982.

[16] Henock Kifle, *Investigations on Mechanised Farming and its Impact on Peasant Agriculture*. Assela: CADU Publications N°.74, 1972.

[17] Hoben, Allan, *Land Tenure Among the Amhara of Ethiopia· The Dynamics of Cognative Dissent*. Chicago: The University of Chicago Press, 1973.

[18] Huffnagel, H.P., *Agriculture in Ethiopia*. Rome: FAO, 1961.

[19] Markakis, J., *Ethiopia: Anatomy of a Traditional Polity*. Oxford: Claerndin Press, 1974.

[20] Mulugeta Dejenu, *et. al.*, "Agrarian Reform and Rural Development with Particular Reference to Peasant's Production' Mimeo 1987.

[21] Nekby, B., *CADU: An Ethiopian Experiment in Developing Peasant Farming*. Stockholm: Prima Publishers,1971.

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[22] Pankhurst, Alula. "Resettlement: Policy and Practice" in Pawsewang, S. *et.al.*(eds.) *Ethiopia: Options in Rural Development*. London: Zed Books Ltd., 1990.

[23] Passinetti, L., *Lectures on the Theory of Production*. London: The MacMillan Press, 1977.

[24] Pausewang, S., *Peasants, Land and Society, A Social History of Land Reform in Ethiopia*. Munchen, Weltform Verlag, 1983.

[25] _____,"Alternatives in Rural Development in Ethiopia" Paper presented for the Xth International Conference on Ethiopian Studies. Paris,1988.

[26] Pyatt, G. and J. Round. "Accounting and Fixed Price Multipliers in a Social Accounting Framework," *The Economic Journal*, December 1979, pp. 850-873.

[27] Skereka, B. *et. al.*, "Price Systems Computable from Input-Output Coefficients" in Carter, A. and A. Brody (eds.) *Contributions to Input-Output Analysis I*. Amsterdam: North-Holland Publishing Company, 1970.

[28] Stahl, M., *Ethiopia: Political Contradictions in Agricultural Development*. Uppsala: Political Science Association, 1974.

[29] Taye Mengistae, "Farming and Cooking: The Value of Home-Activities in The Grain-Plough Culture in Ethiopia" *Ethiopian Journal of Development Research*. Vol. 12, N°.1, October 1990.

[30] _____, "Social Accounts of Three Ethiopian Villages: A Study in Institutions and Policy" in Doss, C.K. and C. Oslonn (eds.) *Issues in African Rural Development 1991*. Arlington:

[31] Taylor, L., "Static Input-Output Analysis", in Blitzer, C., (ed.), *Economy-Wide Models for Development Planning*, New York: Oxford University Press, 1975.

[32] Westphal, E., *Agricultural Systems in Ethiopia*, Wagenningen, CAPD,1973.

[33] Wogene Yirko, "The Development of Agricultural Producers' Cooperatives in Ethiopia: Cases from Arsi Region", Unpublished M.A. Thesis, Addis Ababa University, 1989.

EXCHANGE RATE POLICY IN ETHIOPIA: AN AGENDA FOR ACTION

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ABSTRACT: *The balance of payments of the country has been characterized by a widening current account deficit and a depletion of reserves. This is mainly due to the fact that exports have declined in recent years both in volume and value terms. One of the main factors which contributed to the decline in exports is the lack of incentives to produce. The major disincentive to produce exportables is the unattractive producer price. It is, therefore, important "to get the prices right".In this paper attempts are made to establish the overvaluation of the Birr using some quantitative and qualitative indicators. The expected effects of devaluation are also briefly discussed. Since the economy is operating below capacity and to mitigate the social cost of adjustment substantial results could be achieved by exchange rate adjustment coupled with an increased inflow of external assistance to finance the import of inputs such as raw materials, fertilizers and spare parts. In order for devaluation to be effective it must take place in tandem with economic reforms aimed at eliminating distortions that reduce economic efficiency. In addition to mitigating the negative impact of devaluation in different ways and means, it is also important to educate the public on the need for it, because it might cause political instability.*

1. INTRODUCTION

The most complicated of all prices is perhaps the price of foreign exchange. Its adjustment has far reaching repercussions. The main reason why it is worthwhile giving special consideration to exchange rate policy is because it is directly related to the balance of payments problem of the country and contains both demand and supply management issues. For example devaluation makes imports expensive and restrains demand for imports on the one hand and, on the other, it stimulates the production of exports through increased prices measured in domestic currency.

It is often argued in the literature that in developing countries, since most imports are vital, it is difficult to restrain demand for imports, and because of the structural

rigidities and market imperfections, supply could not respond to prices. Hence, the intended objective of devaluation could not be achieved.

The author has no intention of denying the structural problems of the country and overemphasize the role of exchange rate policy in bringing domestic and external financial stability, but attempts to indicate the opportunities that lie under exchange rate adjustment in improving the country's balance of payments position when accompanied by appropriate supportive measures.

In the short-run total expenditure on imports may rise by almost the full extent of devaluation while customers search for cheaper domestic substitutes. But, it is difficult to see what else can be done than to try to generate more foreign exchange which could finance the rising import bill if a longer-term positive impact is envisaged.

Although a thorough empirical research is necessary to show the full impact of devaluation on the economy, the author has only tried to use secondary and tertiary information for the purpose of the analysis.

The paper is organized in the following way. Section two briefly explains the balance of payments situation of the country. Section three addresses the exchange rate developments of the Birr and some indications of its overvaluation. In section four the need for devaluation and its impact on the cost of living; the government budget and production response are discussed. Section five briefly deals with the determination of the "right" exchange rate and considers the possibility of shifting to another exchange rate regime. Section six presents the concluding remarks.

2. BALANCE OF PAYMENTS SITUATION: AN OVERVIEW

The country's balance of payments has seldom been favourable in the last decade (Annex 1). It has generally been characterized by a widening current account deficit and a depletion of reserves. Although there have been occasional increases, exports have declined over the decade. The value of exports which has been Birr 950 million in 1979/80 has gone down to Birr 570 million in 1990/91.

The decline in exports is mainly due to recurrent drought and continuous civil strife in the country that seriously affected agricultural production and export supply negatively. In addition, unfavourable terms of trade; due to falling world prices mainly of coffee, increase in domestic consumption as a result of rapid population growth, inadequate domestic price incentives, transportation problems and inadequate investments in the export sector have contributed to the decline in export performance. The priority given to military expenditures in the allocation of foreign exchange, had negative impact on the operations of productive enterprises in the agricultural and industrial sector; which heavily depend on imported inputs.

Imports, on the other hand, have shown a marked increase from Birr 1,384 million in 1980/81 to Birr 2,130 million in 1990/91. The increase in import demand has been on account of import-intensive development expenditures, which heavily depend on external loans and assistance.

The net earnings on services could not offset the trade deficits, thus leaving the current account deficit unimproved. The deficit in the current account was financed by external loans, official grants and reserve draw downs. Official development assistance has been very low because of the growing disenchantment of donors with the previous government's policies. The per capita ODA to Ethiopia was US$ 14.2 in 1989, which is below the Sub-Sahara African average of US$ 27.7.

External financing of the current account deficit grew in early and mid 1980s mainly to support investment projects increasing the external debt and debt service payments. Debt service payments as a percentage of export of goods and non-factor services increased from 6.2% in 1980/81 to about 40% in 1988/89 and 77% in 1990/91.

3. EXCHANGE RATE DEVELOPMENTS

The Ethiopian Birr has been pegged to the US dollar since the 1940s. Under the Bretton Woods exchange rate system exchange rates were essentially fixed to gold parities and fluctuation was allowed only within narrow limits. After the breakdown of

this system in 1971 the industrial world converted to a flexible exchange rate system. Since then the country has been pursuing a passive exchange rate policy leaving the Birr to depreciate and appreciate with the dollar. Only on two occasions has it appreciated the Birr against the dollar. In 1971 the exchange rate was fixed at Birr 2.30 = US$ 1. Since February 1973 the exchange rate was set at Birr 2.07 = US$ 1. But there are some indications which point to the overvaluation of the Birr.

3.1 Indicators of overevaluation

Although the official exchange rate of the Birr remains the same for a long time, the real effective exchange rate (REER), i.e. the trade weighted exchange rate adjusted for the differences in inflation between Ethiopia and its trading partners has been rising (Annex 2). It rose to a peak in 1985 and has subsequently declined from 168.6 to 116 in 1988, but remained nearly 50 percent above the level of the mid-1970s.

In parallel with the official exchange arrangements there is also an illicit market for foreign exchange. In the black market, a US dollar exchanges for anything between Birr 7 and 8 currently. But this does not reflect the true price of the dollar, because the illegal market usually includes a considerable amount of risk-premium. In addition to the strict exchange control, the franco valuta import arrangements could also have pushed its illegal market price upwards. Therefore, proper caution should be exercised in using the black market rate as an indication of the exchange rate adjustment that is necessary to attain balance of payments equilibrium (Mansur 1983).

Although it might reflect, to some extent, the inefficiencies of parastatals, the domestic resource cost (DRC) of many exportables, which is calculated by dividing the f.o.b. value at domestic prices in local currency by the f.o.b. value at world prices in foreign currency (US dollar), is found to be very high. The average DRC (the domestic cost of earning a dollar) of some important tradables calculated for the period 1984/85-1988/89 is Birr 4.00.

Table 1: The Domestic Resource Cost of Some Important Tradables
(1984/85 - 1988/89 average)

	commodity	DRC Birr per US dollar
1	Leather Articles	3.19
2	Textiles	3.32
3	Bevarages	3.39
4	Sugar (refined)	2.81
5	Sheep and Goats	4.53
6	Meat	4.93
7	Fruits & Vegitables	5.92
	Unweighted Average DRC	4.01
	Official Exchange Rate	2.07

SOURCE: ONCCP, Trade and Tourism Department

The aforementioned facts clearly depict that the Birr is an overvalued currency vis-a-vis the US dollar, thus dampening the profitability of exportable commodities and consequently worsening the trade deficit in terms of Birr.

A variety of exogenous or endogenous factors can lead to balance of payments deterioration. Among the external factors, the most important one is the worsening terms of trade which was caused by successive oil shocks and the fall in the price of coffee. Nevertheless, a rigid trade and exchange regime had also contributed to a loss of competitiveness and consequent balance of payments difficulties.

3.2 Consequences of the Exchange Rate Misalignment

In the preceding section an attempt has been made to show the overvaluation of the Birr vis-a-vis the US dollar. This section will survey the consequences of the overvaluation of the Birr.

3.2.1 Reduced Profitability and Competitiveness of Exportables

Due to supply shortage domestic consumers and industries are competing for exportables by paying more attractive prices. Fruits, vegetables, oilseeds, some pulses are fetching at least 50 percent higher prices than f.o.b. export prices. Coffee and sugar fetch even higher prices.

The government's response to this was to restrict the domestic trade of many exportables mainly coffee. The procurement and exportation of a large percentage share of exportables was held by state trading enterprises. The share of the state in coffee export which was about 29 percent in 1978/79 rose to 87 percent in 1989/90 (Annex 3). In the export of pulses and oilseeds its share has reached 80 percent.

In recognition of the fact that the overvaluation of the Birr has become a disincentive to exporting, the authorities have resorted to subsidizing the loss of state enterprises which they incur in exporting. The financing was made possible by imposing a 5% import levy on certain imports. Export of livestock, oilseeds and pulses, leather, fruits and vegetables, textiles and clothing have all received export subsidies, which in the years 1982/83 to 1989/90 has reached Birr 71 million out of which Birr 34 million is paid to subsidizing coffee farmers (Annex 4).

Reduced profitability of legal exports has also contributed to the expansion of illegal exporting. The illegal export trade involves coffee, gold, live cattle, sheep, goats, camels, fruits, vegetables and Chat. It is estimated that about 225,000 head of cattle, 750,000 head of goats and sheep and 100,000 camels are illegally exported annually by traders and pastoralists to Djibouti, Somalia, Kenya and Sudan. About 8,000 kg. of Chat per day is exported illegally to Djibouti and Somalia (World Bank 1987).

Although there are no reliable estimates of smuggled exports, some sources believe that coffee and livestock alone amount to Birr 258 million (US$ 125 million) per annum (World Bank 1989). This is about 45 percent of official exports in 1990/91.

In addition to encouraging illegal trade, reduced profitability of coffee and the shortage of food, has led to the cutting of coffee trees and replacing them with food

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grains and Chat. According to a study presented in "World Coffee Survey" in 1968, in the then Hararghe province about 56,700 hectares of land was covered with coffee trees. A survey made 17 years later in 1985 by the Ministry of Coffee and Tea Development covering 32 major coffee growing weredas shows that only 21,790 hectares of land is covered with coffee. This indicates a decrease of about 53 percent (ONCCP 1989). Although the extent differs from region to region similar trends are expected in other coffee growing areas.

3.2.3 Stricter Foreign Exchange Rationing

Foreign exchange rationing has become the order of the day since the supply of foreign exchange falls short of demand at the current official exchange rate. Even holders of valid import licenses have to queue up for foreign exchange. The foreign exchange allocation is discriminatory, especially, against the private sector. In addition, there is uncertainty and delay of allocation because it is hard to predict the availability of foreign exchange. The government has relied heavily on import restrictions and exchange control rather than devaluation to conserve foreign exchange. This has led the private sector to manipulate the system by over-invoicing imports and under-invoicing exports and by resorting to illegal imports and most recently to franco valuta imports. This means a heavy cost in terms of distortions in resource allocation.

3.2.3 Use of Capital-Intensive Production Techniques

An overvalued exchange rate could also encourage the use of capital-intensive production techniques instead of labour-intensive, imported intermediate goods instead of local materials and imported consumer goods instead of indigenous substitutes because imports are cheap at the existing official exchange rate. Although it has other reasons too, the heavy dependence of the manufacturing sector on imported inputs could be a good example to illustrate this fact.

Illicit (but remunerative) transactions in inward remittances are also the negative consequences of the overvalued exchange rate.

4. EXCHANGE RATE ADJUSTMENT

Different studies conducted on Ethiopia's export sector indicated that, overvalued exchange rate, low level of investment in the export sector, unfavourable terms of trade and high domestic consumption have contributed to the poor performance of the sector. But it has been emphasized that overvalued exchange rate has played a significant role. This makes exchange rate adjustment an agenda for action. In light of the issues raised it has become apparent that the exchange rate of the Birr has to be adjusted. The price of postponed adjustment will be higher. The question has to be the timing and the extent of devaluation and the accompanying measures which could ease the possible negative impact of devaluation.

4.1 The Need for Devaluation

Since 1982/83 the Government has been trying to promote exports by paying subsidies to exporters - both traders and producers. But claims of subsidy by government enterprises are made ex-post and the claims are not guaranteed automatically. Fiscal pressures sometimes limit the size of the subsidy. Thus, subsidies have failed to be proper incentives for export promotion. Subsidies have also aggravated the inefficiency of public export enterprises, since the government's effort concentrated only on exporting more commodities at any cost. Another weakness of the compensation system has been its failure to incorporate the private sector as a result of which private entrepreneurs withdrew from export trade or decrease the extent of their involvement and engage themselves in other more lucrative domestic trade activities.

Balassa (1981) suggests that if the right combination of import tariffs and export subsidy are applied, they could have the same impact on productive activities as devaluation. However, these could trigger retaliatory measures by other countries. While exchange rate actions can be taken at any country's own discretion, import protection is the concern of other countries too. Deliberate and unwarranted devaluation could also provoke retaliatory action from trading partners. That is why a

devaluing country usually engages in a round of secret negotiations with other countries and international financial institutions such as the World Bank and the IMF. The Ethiopian experience has shown that export subsidies have not yielded the intended results of encouraging exports - if they have to some extent, it is obtained solely at the expense of efficiency.

Devaluation encourages exports by increasing the local currency (Birr) payment of any given dollar amount of exports, hence increasing revenues to domestic exporters, but also discourages imports by keeping the Birr payments higher. Invisible transactions such as tourism are also expected to respond to exchange rate action. Through devaluation it is intended to increase emigrant remittances, and reduce or curb the capital flight which has been carried out by over-invoicing and under-invoicing foreign trade transactions.

In addition, devaluation is necessary also to lure back illegal trade to official channels and to encourage labour - intensive production methods.

However, it is very difficult to determine *a priori* the net outcome of devaluation. It has a number of partly offsetting repercussions and the net results will depend on the country's specific situation and the type and extent of supportive measures accompanying it.

4.2 Impact of Devaluation

While exerting a positive impact on the balance of payments by stimulating exports and restraining imports, devaluation also has an influence on the cost of living, on the government budget and on production.

Although a thorough analysis of the impact of devaluation requires substantial amount of information and detailed empirical work, it is here attempted to assess the repercussions by using secondary data and qualitative explanations.

4.2.1 Devaluation and the Cost of Living

The effect of devaluation on the cost of living could be felt directly or indirectly. An increase in the Birr price of imported consumer items has a direct bearing on the

cost of living. The increase in the price of raw and intermediate materials could also push the cost of production of domestically produced consumer goods upwards. Devaluation could also induce the price rise of import competing home goods. The price of exportable goods which are consumed at home will also rise, because of an increase in their f.o.b. price and the competition of local traders. In addition to the above direct and indirect effects, devaluation could also trigger off a wage-price spiral.

The majority of the urban population is very poor and is ill-equipped to cope with economic policy changes which sharply increase the cost of living. The groups which are the most susceptible to falling living standards, as devaluation becomes effective, will be the low income urban population. In order to ease the impact of devaluation on the cost of living the government could apply targeted food subsidy schemes and/or make wage increment which doesn't fuel inflation and dampen the positive impact of devaluation.

Producers in the agricultural sector which constitute about 89 percent of the population and producers in industry would be better off by getting better prices through the devaluation effect.

4.2.2 Devaluation and the Government Budget

Devaluation can have a direct negative impact on the government budget deficit through an increase in the Birr value of the foreign exchange component of current and capital expenditures such as direct import of consumables, debt service on foreign borrowing and the import component of capital outlays. Devaluation can also increase government expenditure indirectly through the increase in domestic cost of production of goods and services which use imported inputs. The problem could be exacerbated if the government decides to index wages due to the price effect of devaluation. Although there is no accurate information, 25 percent of the current budget and 60 percent of the capital budget is expected to be affected by devaluation (World Bank 1987).

While devaluation can be expected to raise government expenditure through imported capital outlays and other expenditure items, it is also expected to improve the profitability of public enterprises which produce for export and thereby decreasing or removing the subsidy paid to them.

The positive and immediate impact of devaluation on the government budget is to expand the Birr value of import and export taxes which constituted 19.6% of total government revenue in 1989 (see Table 2).

However, one can argue that, since devaluation discourages import demand it might lead to a decrease in the revenue derived from import taxes. But by providing incentives to export producers, devaluation is also expected to lead to increased import demand as the capacity to import increases. By diverting the illegal export-import activities into the legal channel through price and other incentives, devaluation could also expand the base of foreign trade taxes.

Table 2:   Central Government Current Revenue
(percentage of total current revenue)

Ser. No.	Revenue Sources	1972	1989
1	Taxes on income, profit and capital gain	23.0	26.6
2	Social security contribution	n.a	n.a
3	Domestic taxes on goods and services	29.8	21.0
4	Taxes on international trade	30.4	19.6
5	Other taxes	5.6	2.2
6	Current non-tax revenue	11.1	30.7
7	Total current rev. as percent of GNP	10.5	25.2

SOURCE: World Bank, *World Development Report*, 1991.

The positive impact of devaluation could not be fully realized if there are tax exemptions and specific taxes (certain excise taxes on domestic sales). Therefore, specific taxes have to be changed into ad valorem. In principle it is not desirable to put a surcharge on coffee because it substantially decreases the producer price and becomes a disincentive to produce. However, it is the major source of government revenue (Annex 6). If it is decided to continue levying surtax on coffee, the base has to be changed from the US dollar ICO indicator price to Ethiopian Birr, otherwise tax revenue would not rise with the increase in domestic currency export prices.

Although it is not directly related to the impact of devaluation, there is a need to consider the possible positive influence of external grant to development activities, whose release by the donor community has been contingent upon the conditionality that the country make macro economic adjustments in which exchange rate adjustment is a part. An increase in external grants and the easing of debt service burden, mainly through debt cancellation and debt rescheduling, could greatly help in mitigating the negative impact of devaluation on the government budget deficit.

4.2.3 Devaluation and Production Response

Since agriculture accounts for a large share of GDP and exports, two strategic pricing policies namely; exchange rate and agricultural prices, are critical. The main justification for devaluation in Ethiopia is to raise the relative prices of export commodities thereby making them more profitable and stimulate production ultimately leading to higher exports.

It is often argued that supply response to higher prices in Africa might not yield as high results as can be expected in developed economies, where there is more room for flexibility and adaptability. However, recent studies (World Bank, 1987) indicate that the short-run and long-run price elasticities for Ethiopia's total agriculture are 0.24 and 0.56 respectively. These results are higher than the short- and long-run elasticities calculated for nine Sub-Saharan African Countries which were 0.18 and 0.21 respectively (Bond, 1983).

Because of the vulnerability of agricultural exports to world market price changes it is essential to diversify into manufactured products. But this calls for new investment: and might be viewed as a long-term objective. In the short-run the objective should be to reverse the previous decline in traditional exports. The share of export of goods and non-factor services from GDP has declined from 23 percent (1965) to 12 percent (1989). Since the productive sectors are operating well below capacity, there exists a room for export expansion. Most of the industries are operating at about 50 percent of their capacity. There is a very big potential for expansion in the coffee sub-sector, which is a major source of export earning. Since the gestation period for coffee is about 5 to 7

years, an increase in production in the short-run could only be achieved by improved capacity utilization. UNDP/EEC financed studies made by Food Studies Group show that through improved cultural practices the current 140,000 to 160,000 tons of annual coffee production could be raised to 260,000 tons. If the estimated domestic consumption of about 120,000 tons is deducted about 140,000 tons could be left for export, which nearly doubles the current average annual export.

In order to achieve these results, incentives for farmers have to be improved mainly through the increase in the share of producers from international prices. The producer share of the f.o.b. prices of exports remains relatively low. For coffee, the share of the producer price is only about 40 percent. Average share of producer price from f.o.b. price of coffee for 20 major coffee producing countries between 1976 and 1985 was 66.5 percent. Coffee farmers in Nicaragua and Kenya were exceptions, receiving 121.86 percent and 102.57 percent respectively. By contrast the producer share for coffee in Uganda during the same period was 38.57 percent.

Table 3: The Share of Taxes, Marketing Margin and Producer Price
(average percent share of f.o.b. cofee price)

Particulars	1961/62 - 1974/75	1976/77* - 1986/87
F.O.B. Price	100.00	100.00
Taxes	20.40	41.60
Marketing Margin	17.90	18.00
Producer Price	61.70	40.30

*Surtax was introduced in 1976/77

SOURCE: ONCCP (Price Studies and Policy Department), *Coffee Producer Price Study*, 1989. (in Amharic)

As shown in table 3 the share of producer price could only be improved at the expense of taxes and marketing margin. Although a decrease in coffee taxes might lower government revenue, the negative impact of tax reduction could be offset by the increase in the export quantity which ultimately widens the tax base.

The major constraint for capacity utilization could be the lack of foreign exchange to import raw materials and production inputs. Hence, an exchange rate adjustment coupled with an increased inflow of external aid to finance imported inputs, raw and intermediate materials and spare parts could generate substantial result in the short-run. Very good examples to be followed by the donor community in this regard are the EEC financed Sector Import Programmes and the Peasant Coffee Improvement Project.

Similar possibilities of capacity utilization also exist in other traditional agricultural and agro-based manufactured exports. The wealth and income distribution effects of devaluation could stimulate savings and investment. If they are accompanied by appropriate fiscal incentives they may produce a long-run gain of increased capacity.

4.2.4 Devaluation and the Balance of Payments

Export volumes may show little change immediately after devaluation, although their export value in terms of domestic currency increases. The increment in local currency import expenditures is also obvious, because customers will need time to shift to cheaper domestic substitutes. Therefore, the deficit in the trade account is likely to worsen during the months following devaluation. But after a while production is expected to respond to favourable export prices and producers will have time to find domestic substitutes for imported raw and intermediate materials. It is also expected that devaluation will lure back contraband trade to official channels which also improves the performance of the trade account. This phenomenon is known as the J-Curve effect. The J-Shaped adjustment path implies an initial drain on foreign exchange reserves. This is the time when external aid is needed to carry the country over the adjustment period (Morely, 1988). Since there will be a shortage of inputs to support export production, additional foreign assistance needs to be mobilized for importing inputs for crop, livestock and industrial production.

5. DETERMINING THE RIGHT EXCHANGE RATE AND PEG

5.1 The "Right" Exchange Rate

Although it is beyond the scope of this paper to discuss in detail the mechanisms by which the price of foreign exchange is determined, it is deemed essential to briefly touch upon some aspects of exchange rate determination.

In Section 3 attempts have been made to establish the overvaluation of the Birr using different indicators such as real effective exchange rate indices (REER), the domestic resource cost (DRC), the parallel market price and other qualitative explanations. But it is difficult to determine the "right" exchange rate because of the weaknesses these indicators have.

1. The REER index is a fixed weight index based on the market share or the trade partners' share in the country's trade for a given year. It fails to indicate the dynamism that occurs during the shifting of partners and commodities. Since it overvalues the price effect (Laspayers Index) it also tends to over estimate the real exchange rate appreciation.

2. Although the very existence of the parallel market is *prima facie* evidence on the need for devaluation it does not provide accurate information because the parallel market rates usually contain a significant amount of risk-premium.

3. The domestic resource cost (DRC) also tends to over estimate the price of foreign exchange because the domestic costs of exports, to a certain extent, reflect the inefficiencies of export marketing enterprises.

A simple solution in determining the "right" exchange rate would be to let the currency float freely. But this doesn't seem feasible because of the market imperfections, lack of capital markets and structural rigidities that exist in the country. If a single currency peg is decided to be maintained, the optimum level of exchange rate could be found in between the rate calculated on the basis of REER and the parallel market rate.

Getting only the price of foreign exchange right is not a panacea for improving the performance of the economy; however, getting it wrong has proved to be detrimental. For devaluation to be more effective it has to be part and parcel of a comprehensive

economic reform which aims at promoting efficiency. Such a reform includes the creation of an attractive climate for local and foreign investors, trade liberalization, tax reform, strict monetary discipline, fiscal deficit reduction, privatization, creation of financial markets, etc.

5.2 Choosing an Exchange Rate Regime

The choice of an appropriate exchange rate system is a complex decision that has to take a variety of factors, such as a country's size; its openness; the degree of international financial interaction; inflation and the foreign trade pattern, into account. There are two extreme systems - the fixed exchange rate (pegged exchange rate) system on one end and, fully flexible (freely floating) exchange rate system on the other. In between the two there are a variety of systems which could lie closer to one of the two extremes or could be a hybrid of the two.

In most developing countries a fixed exchange rate regime is favoured because in a floating system exchange rate fluctuations could be exacerbated due to the thinness of the market for their currencies. In a fixed exchange rate regime the effects of transitory supply shocks, such as crop failure, oil price rises, etc., could be cushioned by the use of reserves because the monetary authorities commit themselves to maintaining a substantial amount of foreign exchange reserves, usually equivalent to the value of six or more months worth of imports for intervention purposes. As to the choice of an appropriate peg, the trade shares are very important.

While pegging to a single currency may stimulate trade, investment and capital flows with countries of the same currency area, pegging to a single currency in an environment of generalized floating among major currencies could increase the volatility of the pegged currency in question. An alternative form of pegging to an external standard is pegging to a composite or "basket" so as to minimize the impact of external shocks on domestic income and prices.

Although a single currency peg continues to be the most common exchange rate system among developing countries, the number of currencies that are "pegged to a single currency" decreased from 69 to 53 between 1977 and 1985. The number of currencies

that are classified by the International Monetary Fund (IMF) as "pegged to a basket" increased from 30 at the end of 1977 to 43 at the end of 1985 (Takagi, 1988).

When choosing a "basket peg" exchange rate system the following important points have to be borne in mind.

1. The initial level of the exchange rate has to be established, as with a single currency peg.

2. The composition of the basket has to be determined.

3. The method of valuing (averaging) has to be chosen.

4. The operation of the basket peg needs to be flexible.

5. The authorities have to decide whether to disclose the basket to the public or not.

The determination of the adjusted initial level is already discussed in the preceding sub-section. As to the choice of the composition of the basket the major currencies as well as trade shares play very important role.

The presence of a number of currencies in the basket necessitates the choice of averaging methods depending on the policy the authorities want to pursue. This is due to the fact that the same set of currency weights yield different average values. If the authorities want an in-built depreciation bias they can use arithmetic average. If they choose to maintain the predetermined currency weights indefinitely they prefer the geometric average method. Should they desire to have a built-in appreciation (anti-inflation) bias, hey can use the harmonic mean. The arithmetic average and the harmonic average share the property of variable currency shares, but the effect of depreciating currencies dominates in the former case, where as the effect could be minimized in the latter.

There is also the so called "standard basket" method which is almost identical to harmonic average. But standard basket method allows the exclusion of some minor currencies that are not traded in the forward market from the basket. SDR is one such proxy basket.

made ex-post and are not automatically guaranteed. In addition the scheme doesn't include the private sector.

Despite considerable risk-premium incorporated in the parallel exchange rate, its existence *prima facie* calls for exchange rate adjustment. Furthermore, the tapping of a substantial unrecorded import-export activity demonstrated a strong case for exchange rate action, which could have an immediate positive effect on the improvement of recorded balance of payments and the widening of the tax base.

Exchange rate action could also have an impact on the cost of living, government budget deficit and production. The increase in the cost of living due to devaluation could be mitigated through food subsidies or wage-indexation which doesn't fuel inflation. The negative impact on the government budget is expected to be offset by the increase in tax revenue generated due to devaluation effect. In the case of an increase in the government's foreign exchange denominated expenditures on capital outlays and debt-service on foreign borrowing, an increase in external grants and debt-relief arrangements could greatly help in easing the negative impact of devaluation on the budget. Now, that the war is over, the defense budget which accounted for about 54 percent of the government recurrent expenditure in 1989/90 is estimated to have dropped substantially. This could be an opportune moment to make an exchange rate adjustment without widening the budget deficit.

Despite arguments in the literature that supply response to higher prices might not yield the expected results, the Ethiopian agricultural sector has shown higher short- and long-run elasticities than the Sub-Saharan average. New investments might take time to mature. An increase in production and consequently in export volume could be achieved through capacity utilization since the productive sectors are operating well below capacity. If foreign exchange shortage, which will be a major constraint for capacity utilization, could be mitigated through an increased external aid, substantial results could be achieved in the short-run. However, for devaluation to be meaningful it has to be part and parcel of a wider economic reform programme.

Although they have some weaknesses, the indicators of exchange rate overvaluation; such as REER index; DRC and the illicit market rate used in this paper, could be the basis for the determination of the right exchange rate.

While devaluation makes good sense in terms of the economic interests of the country, it might not make sense to that section of the society whose standard of living will seriously be affected. Hence, it might cause political instability. In addition to mitigating the negative impact of devaluation through different measures, it is also very important to educate the public on the need for exchange rate adjustment.

It might also be wise to consider pegging the Ethiopian Birr to a "basket", because, pegging to a single currency in an environment where major currencies are floating, might expose to external shocks. But care should be taken not to lose the public confidence on the government's reliable and stable monetary policy when shifting to another peg.

Annex 1. Balance of Payments on Cash Basis (in Millions of Birr)

Fiscal Year	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91
Trade balance	-517.6	-532.7	-863.5	-943.4	-1137.4	-1026.8	-1277.4	-1426.9	-1486.5	-1192.2	-1067.3	-1558.3
Exports	950.6	851.5	778.1	809.6	929.6	743.6	923.8	809.8	788.1	918.2	756.9	572.1
Coffee	631.8	524.3	480.3	495.9	590.4	466.3	664.8	524.3	439.2	626.4	405.4	268.5
Others	318.8	327.2	297.8	313.7	339.2	277.3	259.0	285.5	348.9	291.8	351.5	303.6
Imports	1468.2	1384.2	1641.6	1753.0	2067.0	1770.4	2201.2	2236.7	2274.6	2110.4	1824.2	2130.4
Services (net)	28.1	70.3	60.2	85.9	112.0	103.1	107.8	99.8	78.2	96.6	143.3	64.7
Travel	7.7	9.8	13.3	9.0	6.3	8.0	5.0	0.4	5.9	-4.2	-7.4	-10.1
Other transportation	22.5	44.1	50.9	72.4	77.8	72.5	111.4	110.3	127.4	176.2	186.9	153.1
Investment income	-13.5	-14.6	-18.2	-28.0	-39.7	-68.4	-82.8	-98.1	-133.7	-166.2	-102.1	-97.3
Government n.i.e.	6.7	5.3	16.5	25.3	58.2	64.0	53.7	51.8	61.0	69.1	58.0	68.8
Other services	4.7	25.7	-2.3	7.2	9.4	27.0	20.5	35.4	17.6	21.7	7.9	-49.8
Private transfers (net)	41.3	51.2	93.6	175.8	220.0	403.7	353.8	306.4	245.3	389.1	354.6	413.9

Fiscal Year	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91
Current account balance	-448.2	-441.2	-709.7	-681.7	-803.4	-520.0	-815.8	-1020.7	-1163.0	-706.5	-569.4	-1079.7
Trade balancePublic transfers (net)	124.0	123.9	139.8	191.4	335.2	617.6	607.1	438.6	388.7	433.0	345.5	604.3
Capital account	169.5	322.0	679.4	401.7	395.8	423.7	547.5	407.1	570.1	452.1	575.1	698.4
Errors and ommissions (net)	71.1	-158.3	15.8	-59.4	-15.2	-425.5	11.5	131.4	-179.1	-131.3	-504.3	18.8
Overall balance	-83.6	-123.6	125.3	-148.0	-87.6	95.8	350.3	-43.6	-383.3	47.3	-153.1	241.8
Monetary movement (net)	83.6	123.6	-125.3	148.0	87.6	-95.8	-350.3	43.6	383.3	-47.3	153.1	-241.8
Financing gap											390.8	456.1
Net Foreign assets (inc. Djibouti CBE branch)	367.0	243.4	368.7	220.7	133.1	228.9	579.2	535.6	152.3	199.6	46.5	288.3

Source: National Bank of Ethiopia

Annex 2

Real Effective Exchange Rate Indices

(1980 = 100)

Year	REER
1965	109.6
1966	106.9
1967	107.8
1968	108.3
1969	106.5
1970	110.7
1971	104.6
1972	96.9
1973	95.0
1974	81.9
1975	80.7
1976	102.6
1977	109.4
1978	109.0
1979	110.2
1980	100.0
1981	110.3
1982	119.8
1983	125.8
1984	140.9
1985	168.6
1986	129.1
1987	113.6
1988	116.0

Source: The World Bank, *Ethiopia: Policy Agenda for Economic Revival*, 1989

Annex 3
Annual Coffee Export (1978/79-1989/90)

No.	Fiscal Year	Total Export		Government Export			Private Export		
		Total Quantity (in tons)	Total Value (in million Birr)	Quantity (in tons)	Value (in million Birr)	Birr per ton	Quantity (in tons)	Value (in million Birr)	Birr per ton
1	1978/79	83,133	519.5	24,339	149.4	6,138.30	58,794	370.1	6,294.86
2	1979/80	84,975	671.4	53,932	430.1	7,974.86	31,043	241.3	7,773.09
3	1980/81	85,499	493.0	60,435	339.2	5,612.64	25,064	153.8	6,136.29
4	1981/82	83,229	497.1	59,384	352.9	5,942.68	23,845	144.2	6,047.39
5	1982/83	90,391	513.6	61,551	342.3	5,561.24	28,840	171.3	5,939.67
6	1983/84	94,017	576.9	71,018	436.8	6,150.55	22,990	140.1	6,091.57
7	1984/85	75,641	445.6	64,437	372.4	5,779.29	11,204	73.2	6,533.38
8	1985/86	74,972	669.6	59,283	602.1	8,817.71	6,689	67.5	10,091.19
9	1986/87	72,876	439.7	66,529	390.2	5,865.11	6,347	49.5	7,798.96
10	1987/88	72,262	458.1	65,039	408.2	6,276.33	7,224	49.9	6,907.53
11	1988/89	83,000	482.9	78,000	455.5	5,839.74	5,000	27.4	5,480.00
12	1989/90	83,251	360.5	72,483	304.2	4,196.85	10,768	56.3	5,228.45

Source: Ministry of Coffee and Tea Development, Coffee and Tea Development and Trade Report (1978/79-1989/90)

Annex 4: Export Subsidy (1982/83 - 1989/90)

		1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
1	Sheep and Goats	1,177	1,582	14,978	19,356	12,245	21,336	21,990	11,032
2	Meat	5,256	5,205	8,545	9,433	7,255	5,726	3,856	1,602
3	Bovine cattle	-	-	-	-	-	-	-	1,863
4	Leather & leather products	5,547	3,223	6,861	6,259	2,231	1,502	1,622	832
5	Textiles & clothing	133	81	249	900	1,526	4,445	5,925	7,025
6	Pulses & oilseeds	1,408	9,327	3,472	280	-	-	-	1,191
7	Spcies	372	369	2,416	4,035	-	-	-	1,078
8	Oilseed cakes	1,500	-	-	-	416	-	-	-
9	Sugar	2,255	7,783	7,199	3,633	5,335	2,397	795	6,605
10	Salt	541	337	1,163	1,406	445	-	-	-
11	Fruits & vegetables	332	582	3,870	2,771	3,766	6,180	6,942	5,539
12	Beverages	-	-	202	20	137	215	129	346
13	Raw hides and skins	458	775	687	353	-	-	-	-
14	Cotton seed	-	1,570	-	-	-	-	-	-
15	Coffee	-	-	-	-	-	-	-	34,000
	Total	18,979	30,834	49,642	48,455	33,356	41,801	41,259	71,113

Source: ONCCP, Trade & Tourism Department

Annex 5: Summary of Government Finance 1984/85 - 1990/91
(in millions of Birr)

Fiscal Year Ending July 7	1984/85	1985/86	1986/87	1987/88	1988/89*	1989/90*	1990/91*
Total Revenue & Grants	2954.6	3249.2	3247.9	4103.0	4077.8	3358.5	2990.0
Revenue	2323.3	2806.1	2925.9	3467.1	3732.6	3097.8	2647.1
of which Nontax	(645.8)	(930.0)	(833.7)	(1139.0)	(1363.5)	(935.5)	(581.4)
External Grants	631.3	443.1	322.0	635.9	345.2	260.7	342.9
Expenditure	3823.4	4062.3	4002.9	4881.6	5206.1	5130.6	4759.9
Current Expenditure 1/	2636.4	2590.5	2619.8	3422.4	3406.4	3735.7	3419.2
Capital Expenditure	1187.0	1471.8	1383.1	1459.2	1799.7	1394.9	1340.7
Overall Deficit (-) Including Grants	-868.8	-813.1	-755.0	-778.6	-1128.3	-1772.1	-1769.9
Excluding Grants	-1500.1	-1256.2	-1077.0	-1414.5	-1473.5	-2032.8	-2112.8
Financing	868.8	813.1	755.0	778.6	1128.3	1772.1	1769.9
External (Net)	335.7	478.3	392.7	402.0	615.4	397.9	346.6
Gross Borrowing	376.9	544.7	493.7	539.2	759.1	461.0	400.6
Amortization	(41.2)	(66.4)	(101.0)	(137.2)	(143.7)	(63.1)	(54.0)
Domestic (Net)	533.1	334.8	362.3	376.6	512.9	1374.2	1423.3
Bank	474.9	359.0	423.4	365.0	451.0	1295.5	1230.5
Non-Bank	27.0	15.0	25.0	35.0	25.0	-	-
Others 2/	-	-	-	-	-	-	43.5
Residual	91.2	-36.7	-53.0	15.9	76.1	111.3	162.2
Amortization	(60.0)	(2.5)	(33.1)	(39.3)	(39.2)	(32.6)	(12.9)
Memorandum Items: Total Revenue & Grants	29.8	29.8	28.5	34.6	32.8	26.7	23.4
Total Revenue	23.4	25.7	25.7	29.3	30.1	24.6	20.7
of which Nontax	(6.5)	(8.5)	(7.3)	(9.6)	(11.0)	(7.4)	(4.6)
External Grants	6.4	4.1	2.8	5.4	2.8	2.1	2.7
Expenditure	38.5	37.2	35.1	41.2	41.9	40.8	37.3
Current Expenditure	26.6	23.8	23.0	28.9	27.4	29.7	26.8
Capital Expenditure	12.0	13.5	12.1	12.3	14.5	11.1	10.5
Overall Deficit (-)							
Including Grants	-8.8	-7.5	-6.6	-6.6	-9.1	-14.1	-13.9
Excluding Grants	-15.1	-11.5	-9.4	-11.9	-11.9	-16.2	-16.5
Financing							
External (Net)	3.4	4.4	3.4	3.4	5.0	3.2	2.7
Domestic (Net)	5.4	3.1	3.2	3.2	4.1	10.9	11.1
Bank	4.8	3.3	3.7	3.1	3.6	10.3	9.6

Source: Ministry of Finance;
* Perliminary actual;
1/ Excludes external & internal debt amortization;
2/ Settlement of debt to Customs from the Treasury on behalf of government agencies.

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Annex 6. Foreing Trade Taxes (1977/78 - 1989/90)

No.	Year	Total Import Tax Revenue	Total Export Tax Revenue	Foreign Trade Tax Revenue	Customs duty	Sur Tax	Cess Tax	Transaction Tax	Total Export Tax on Coffee	The share of Coffee Taxes from Total Export Tax
1	1978/79	333.7	229.1	562.8	12.2	203.4	.	7.0	222.6	97.2%
2	1979/80	247.1	297.3	544.4	13.7	264.7	3.6	9.8	291.8	98.2%
3	1980/81	296.7	188.3	485.0	13.3	154.7	5.1	9.5	182.6	97.0%
4	1981/82	284.7	190.4	475.1	12.4	158.7	4.2	9.4	184.7	97.0%
5	1982/83	306.8	203.8	510.6	14.0	174.0	4.6	8.3	200.9	98.6%
6	1983/84	321.3	257.9	579.2	14.3	225.6	4.4	9.4	253.7	98.4%
7	1984/85	289.6	172.8	462.4	10.1	146.7	3.9	7.0	169.7	98.2%
8	1985/86	291.3	262.9	554.2	9.1	236.7	3.1	9.4	258.3	98.3%
9	1886/87	408.4	153.7	562.1	12.2	125.3	3.1	10.4	151.0	98.2%
10	1987/88	437.8	147.1	584.9	10.6	119.4	4.2	10.0	144.2	98.0%
11	1988/89	356.0	163.2	528.2	11.1	134.8	3.9	9.8	159.6	97.8%
12	1989/90	430.6	49.8	480.4	12.9	19.5	5.0	9.7	47.1	94.7%

Source: ONCCP, Department of Finance and Budget

REFERENCES

[1] Gillis, Malcolm; Perkins, Dwight H.; Roemer, Michael and Snodgrass, Donold R., *Economics of Development*, Second Edition, W.W. Norton & Company, New York, London, 1987.

[2] Balassa, Bela, "Structural Adjustment Policies in Developing Economies", World Bank Staff Working Paper No. 464, July 1981.

[3] World Bank: *Accelerated Development in Sub-Saharan Africa, An Agenda for Action*, World Bank, 1981.

[4] Yagci, Fahrettin; Kamin, Steven and Rosenbaum, Vicki, "Structural Adjustment Lending: An Evaluation of Programme Design", *World Bank Staff Working Paper No. 735*, May 1985.

[5] Edwards, Sebastian and Montiel, Peter, "The Price of Postponed Adjustment', *Finance & Development*, Volume 26, No. 3, IMF and the World Bank.

[6] Morely, Richard, *The Macroeconomics of Open Economies*, Edward Elgar, Hants, England, 1988.

[7] The World Bank: *Financing Adjustment with Growth in Sub-Saharan Africa*, 1986-90, The World Bank, Washington, D.C., 1986.

[8] Gulhati, Ravi; Bose, Swadeshi and Atukorola, Vimal, "Exchange Rate Policies in Eastern and Southern Africa, 1965-1983", *World Bank Staff Working Paper No. 720*, 1985.

[9] International Monetary Fund: "Formulation of Exchange Rate Policies in Adjustment Programs", International Monetary Fund, Occasional Paper No. 36, Washington, D.C., August 1985.

[10] Khan, Moshin S. and Knight, Malcolm D., "Some Theoretical and Empirical Issues Relating to Economic Stabilization in Developing Countries", *World Development*, Volume 10, Number 9, (September 1982), pp. 709-728.

[11] May, Ernesto, "Exchange Controls and Parallel Market Economies in Sub-Saharan Africa, Focus on Ghana", *World Bank Staff Working Papers, No. 711*, 1985.

[12] Takagi, S., "A Basket Peg Policy: Operational Issues for Developing Countries", *World Development*, Volume 16, Number 2, (February 1988), pp. 271-278.

[13] Mansur, Ahsan H., "Determining the Appropriate Levels of Exchange Rates for Developing Economies: Some Methods and Issues, *International Monetary Fund Staff Papers*, Vol. 30, No. 4 (December 1983), pp. 784-818.

[14] Cleaver, Kevin, "The Impact of Price and Exchange Rate Policies on Agriculture in Sub-Saharan Africa", *World Bank Staff Working Papers, No. 728*, 1985.

[15] Bond, M.E, "Agricultural Responses to Prices in Sub-Saharan African Countries", *IMF Staff Papers*, Vol. 30, pp. 703-726.

[16] The World Bank, *Ethiopia: An Export Action Programme, Report No. 6432-ET*, June 30, 1987.

[17] The World Bank, *Ethiopia: Policy Agenda for Economic Revival, Report No. 8062-ET*, October 23, 1989.

[18] Office of the National Committee for Central Planning, Price Studies & Policy Department, *1989: Coffee Producer Price Study* (published in Amharic).

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የከመና መዝገበ ቃላት

GLOSSARY OF ECONOMIC TERMS

ከ 01-20 ተራ ቁጥር የተረቡ ቃላትና ትንተና

ከታከስ ተደሰ

01. ECONOMICS (n)

- The economics of publication

- Development economics

- Economic science

ከመና (ስ) («መ» ይጠብቃል)

የህትመት ከመና

የዕድገት ከመና

የከመና ሳይንስ

02. ECONOMY (n)

- We are in an economy drive

- Economy class

-The state of the economy

-The economies of Japan and Ethiopia

ከምን (ስ) («ግ» ይጠብቃል)

በከምን ዘመቻ ላይ ነን

የከምን ክፍል

የከም ኑ ሁ ኔታ

የጃፓንና የኢትዮጵያ ከምኖች

3. ECONOMIC (adj)

-The government's economic policy

-It is economic to drive buses

ከግ ኔያዊ (ት) («ግ» ይጠብቃል)

የመንግሥቱ ከግ ኔያዊ (የከመና) ፖ ሊሲ

በእውቶ ቡስ መኄድ ከግ ኔያዊ ነው

4. ECONOMICAL (adj)

-An economical car to run

-Economical use of salt

-An economical style of writing

ከግን (ት) («ግ» ይጠብቃል)

ለእያያዝ ከግን የሆነ መኪና

ከግን የጨው አጠቃቀም

ከግን (የሆነ) አጻጻፍ

5. ECONOMIZE (V)

-He economized on fuel

-We need to economize on fuel

መከመን (ግ) (2ኛው «መ» ይጠብቃል)

ነዳጅ ከመነ

ነዳጅ መከመን ያስፈልገናል

6. ECONOMIST (n)   ከግኝ (ስ) («ግ» ይጠብቃል)

-The great economist   ታላቁ ከግኝ

-The economist says   ከግኙ ይሳል

07. UNECONOMIC (adj.)   ኢከግ ኔያዊ (ት) («ግ» ይጠብቃል)

-To destroy bridges may advance the   ድልድዮችን ግፍረስ የሞርኔትን ግለግ

cause of war but it is uneconomic   ሊያራምድ ይችላል፤ነገር ግን ኢከግ ኔያዊ ነው.

08. UNECONOMICAL (adj.)   ኢከግን (ት)   («ግ» ይጠብቃል)

-An uneconomical car to run   ለእያያዝ ኢከግን የሆነ መኪና

-Uneconomical use of salt   ኢከግን የጨው አጠቃቀም

-An uneconomical style of writing   ኢከግን አጻጻፍ (ኢከግን የሆነ አጻጻፍ)

09. SAVING (s) (n) (pl.)   ቁጠባ (ስ)

-A saving of time and money   የጊዜና የገንዘብ ቁጠባ

-He kept his savings in two banks   የቁጠባውን ሁለት በንከች ውስጥ አኖረ

10. SAVE (d) (v)   መቆጠብ (ቆጠባ) (ግ)

-It is good to save   መቆጠብ ጥሩ ነው

-I saved a lot form the last sale   ከለረው ሽያጭ ብዙ ቆጠብኩ

-We must save foreign exchange   የውጭ ምንዛሪ መቆጠብ አለብን

11. INVESTMENT (n)   አውሉት (ስ)

-There is little investment in the economy   በከግ ኔው ውስጥ አነስተኛ አውሉት ይታያል

-Large-scale investment is required for   ለክፍለ ከግ ኔው ዕድገት ሠረ አውሉት

 sectoral development   ይጠይቃል

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12. INVEST (v)

-Invest in leather

-They invested in new technologies

ግዖል (ግ)

ገንዘብህን በቆዳ ላይ አውል

ገንዘባቸውን በዲስ ቴክኖሎጂ ላይ አዋሉት

13. INVESTIBLE(adj)

-Investible fund

ዋይ (ቅ)

ዋይ ፈንድ

14. INVESTOR (n)

-The company is a large investor in chemicals

አዋይ (ስ)

በኬሚካሎች ላይ ከፍተኛ አዋይ ኩባንያ ነው

15. TAX (es) (n) (pl.)

-The merchant must pay taxes

-He is a tax collector

ቀረጥ(ሞች) (ስ) (የብዙ)

ነጋዴው ቀረጥ መክፈል አለበት

እሱ ቀረጥ ሰብሳቢ ነው

16. TAX (v) (ed)

-Tax both the rich and poor

መቅረጥ (ግ) (ቀረጠ)

ሀብታሙንም ደሀውንም ቅረጥ

17. TAXATION (N)

-Agricultural taxation

-High rate of taxation

ቀረጣ (ስ)

የግብርና ቀረጣ

ከፍተኛ ቀረጣ

18. TAX- ABLE (adj)

-Taxable goods

-Taxable income

ተቀራጭ (ቅ)

ተቀራጭ ሸቀጦች

ተቀራጭ ገቢ

19. TAX PAYER (n)

ቀረጥ ከፋይ (ስ)

-The taxpayer's money	የቀረጥ ከፋይ ገንዘብ
20. <u>TAX-FREE (adj)</u>	<u>ከቀረጥ ነፃ (ት)</u>
-Tax-free goods	ከቀረጥ ነፃ የሆኑ ሸቀጦች

ትንተና

ከ01 - 08 በታዩት ቃላት ሰይ

The concept of ecomomics is new to Amharic. Therefore, either the English word has to be borrowed or a new word has to be coined in Amharic. However, coining technical terms for unelaborated languages such as Amharic is difficult. Certain methods and principles have to be followed. A certain amout of creativity is also necessary. Although it is difficult to exhaust all methods and principles here, some will be shown below in relation to the coinage of a few economic terms.

In a discussion, the following terms in Amharic were suggested:

i.	ECONOMICS (n.)	ኢኮኖም (ስ)
ii.	ECONOMY (n.)	ኢኮኖሚ (ስ)
iii.	ECONOMIC (adj.)	ኢኮኖሚ (ቅ)
iv.	ECONOMICAL (adj.)	ኢኮኖግዊ (ቅ)
v.	ECONOMIZE (v.)	ግከነም (ግ)
vi.	ECONOMIST (n.)	ኢኮኖሚስት (ስ)
vii.	UNECONOMIC (adj.)	ኢ-ኢኮኖግዊ (ቅ)

A number of problems can be seen in the above suggestion. For instance, all the words begin with the vowel «ኢ», but Amharic words, especially nouns, rarely begin with this vowel. Some such words as ኢየሱስ, ኢየሩስሳም, ኢያሱ do exist but the ending -om as in (i) is rare. In addition, while the word in (ii) is borrowed with some modificaton, the one in (vi) is borrowed nearly as it is in English. Finally, the suggested Amharic terms in (iii) and (iv) do not make the distinicion the coresponding English words make since the same form of Amharic word is suggested; and the word in (vii) cannnot be an Amharic word since no word in Amharic can be formed with two vowels occurring consecutively in the initial position. Therefore, none of the suggested words follow the Amharic word formation pattern.

One solution is to use a certain amount of creativity. We start from the basic fact that the fundamental meaning of the Amharic word is carried by cosonants. Thus, the phonetic representation of the term ecomomics is ikɘ́nɘmiks.

The last vowel and the consonants following it belong to the suffix - ics. This leaves us with the three consonants k n m. The Amharic language can allow the formation of a word with these three consonants. The word thus formed can look like **መከነም** "to economize" but it is not easy to pronounce. This problem is solved through metathesis, i.e., through the exchange of the position of n and m as some people do to certain words e.g. **ከበር/ከረበ**. Thus, instead of **መከነም** we can have **መከመን** with a geminated m. This word is exactly like **መተመን** **መለመን** etc... in its pattern. Once we agree that this word stands for the English "to economize" the rest can easily fall into pattern (see the proposed words 1-8)

A cursory comparison of the two sets of suggestions reveals that the frist set is based on a clumsy application of the principle of borrowing whereas the second suggestion is based on the semantic and morphological structures of Amharic. The suggested word **መከመን** is not "an actual word" but it is a possible one. It may sound strange at first but can be easily adopted as people get used to it.

2. **ከ 09-10 በተዮት ቃስት ስይ**

These pair of words deal with Saving (s). Again, in the course of discussions the folowing words were suggested:

ix. SAVING (s) (pl.)	**ቅሪት (ቅሪቶች) (ስ)**
x. SAVE (D) (V)	**ግቅሪት (እቅሪተ) (ግ)**

The word suggested in (ix) seems to be obtained from the verb **«ግስቅሪት»** 'to save' or to cause to stay behind' or **«መቅሪት»** 'to stay'. But unfortunatly,the word **«ቅሪት»** means" conception. 'of woman' "and does not bring the idea of saving to mind. Moreover, the verb **ግቅሪት** gives the semblance of coinage but does not actually exist.

A better word could have been **እትርፍት** a derivative from **አስተረፈ** 'he caused to be saved' or **አተረፈ** 'he made a profit'. However, in this case there are already words in use in Amharic and these are shown under nos.09-10

3. **ከ11-14 በተ ዩት ቃስት ሰይ**

The next set of words is associated with the English word <u>investment</u>. The following is an example of suggestions in Amharic.

i. INVESTMENT (n)		**እድልበት (ስ)**
ii. INVEST (v)		**ግደስብ (ግ)**
iii. INVESTIBLE (adj.)		**ተደስቢ (ተ)**
iv. INVESTOR (n)		**እድስቢ (ስ)**

The above suggestion relates to "animal fatening". on the other hand the proposed word 11-14 are less confusing and may be recommended for adoption.

4. **ከ 15-20 በተ ዩት ቃስት ሰይ**

The word suggested under 15-20 do not involve coinage since there are existing Amharic words that can be used in the form of translation. The words:**ግብር ፤ መግበር ፤ ግበረ ፤ ግበረ** convey concepts relating to "payment of tributes" or "submission", and do not relate well to tax or taxation. On the other hand, **ቀረጥ** involves use of money or cash and. thus conveys the concept of tax better than does **ግብር**.