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LATEST NOBEL FOR ECONOMICS (OR NOBLE FINANCE?): A GLIMPSE*

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ABSTRACT: *The Nobel Prize for economics in 1990 was shared by three U.S. scholars for their contributions to the discipline of corporate finance in the closely related areas of portfolio theory (Harry Markowitz), capital market theory (William F. Sharpe), and the effect of capital structure on market valuation (Merton H. Miller). The most prominent feature shared by the three models is the critical role played by the risk factor in determining the value of financial assets. A glimpse of their contributions:*

Writing about the Nobel Prize for economics in 1990--shared by Harry **Markowitz** (City University of New York), William F. **Sharpe** (Stanford University), and Merton H. **Miller** (University of Chicago)--the *Economist* (October 20, 1990) credited corporate finance for the award with the additional reminder that the recognition had been long overdue. The three scholars were honored for their original and insightful work in the spheres of **portfolio theory** (Markowitz), **capital market theory** (Sharpe), and the **theory of capital structure and market valuation** (Miller). The rallying point of the three models is inquiry into the nature of value in an environment of uncertainty surrounding the outcome of investment decisions, or the risk-return paradigm.

Portfolio Theory

The genesis of portfolio theory perhaps can be traced back to ancient agrarian society–subsequent to the discovery of the chicken or the egg, whichever came first–when something unexpected happened on the way to the market: man dropped the first basket of eggs. Like the apple drop that serendipitously led to the discovery of the theory of gravity by waking napping Newton with a knock on the temple, the drop of the basket of eggs must have inspired the notion of diversification as expressed in the risk of **putting all one's eggs in one basket**. The egg and basket aphorism remained the conventional wisdom of diversification until 1952, when Harry Markowitz hatched portfolio theory to address explicitly the problem of how many eggs to put in how many

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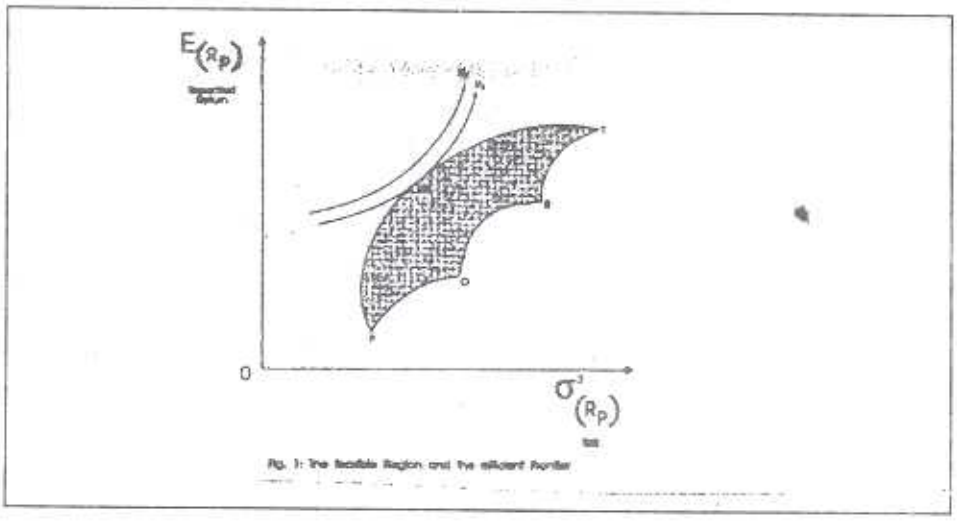
baskets, in his seminal work on **portfolio selection and efficient diversification of investments** [2, 3]. Although portfolio theory in its broadest sense covers all decision environments involving uncertain and interrelated outcomes, it is essentially concerned with the **principles and techniques of efficient diversification** in the context of portfolio of securities.

The portfolio model reduces the attributes of investments to two dimensions: the level of future rewards or **expected rate of return** and the quality of these rewards or the level of **risk** associated with expected rate of return. Visually, securities or portfolios can be described in terms of their rate of return (y-axis) and risk (x-axis) coordinates in a two parameter space, as portrayed in Fig 1.



The **expected rate of return on a portfolio** is a simple **linear** summation of the products of the expected rate of return on individual securities and proportions invested in each of them. But **portfolio risk**, or its surrogate **portfolio variance**, is a subtler and **non-linear** function of three variables: (1) risk or variance of rate of return on securities, (2) **correlation coefficients** or **covariances** between rates of return on securities, (3) and the proportions of investment in each security. Portfolio risk is less than a linear summation of the products of the risk of individual securities and the proportions of investment in each security. The lower the correlation coefficients, the lower the

portfolio risk. A portfolio is said to be **Markowitz efficient** if the lowest risk can be attained for a given level of return, or if the highest return can be achieved for a given level of risk. The **efficient frontier** (curve PMT in Fig 1) is so designated because it meets the Markowitz efficiency test by its **convexity from above**, where each point on the efficient frontier dominates all other investments within its risk or return class.

The primary task of portfolio analysis consists of identifying efficiently diversified portfolios (**efficient frontier**) in a Markowitz sense from possible investment opportunities (**feasible region**). The feasible region refers to all points lying in the shaded umbrella-like area and on its borders in Fig 1. For each point lying on the efficient frontier, a corresponding optimum basket or proportion of investments is generated. The solution of such a portfolio problem involves the optimization of a quadratic objective function (engendered by the non-linearity of portfolio risk) subject to linear constraints, for which Markowitz developed a quadratic programming computer algorithm .

Analogous to the Orwellian le cochon paradox, in which all are equal with some more equal than others, all portfolios lying on the efficient frontier are efficient; but some are more efficient than others. The ranking of efficiently diversified portfolios or **portfolio selection** lies in the eyes of the investor, whose responses to bundles of pleasure and pain (**utility function**) are approximated by **utility indifference curves** in a return-risk space (U_1, U_2 in Fig 1). Abnormal behaviours of peripheral social fringes and virtuous saints aside, the general tendency of average people to be more satisfied with more money--albeit with each dollar accompanied by progressively less satisfaction also known as **quadratic utility function** or **diminishing marginal utility**--gives the indifference curve the shape of **convexity from below**.

A unique portfolio among those efficiently diversified lies at the point (M in Fig 1) where the efficient frontier and the indifference curve just touch like two bananas rubbing backs. At the point of tangency, the investor's preference reflected in utility indifference curves (U_1 in Fig 1) just harmonizes with the particular efficient portfolio (M among points lying on the efficient frontier PMT in Fig 1) both sides expressed in terms of the expected rate of return and risk.

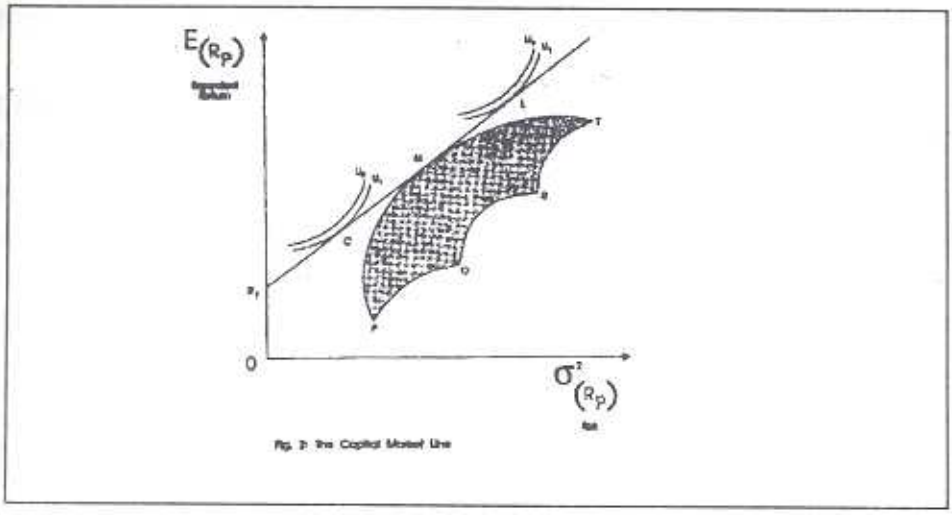
Capital Market Theory

The close kinship between portfolio theory and capital markets is expressed in the tribute paid by William F. Sharpe to his intellectual mentor, with the dedication of his book on *Portfolio Theory and Capital Markets*, "to HARRY MARKOWITZ who taught me portfolio theory and much more" [9]. The two theories focus on a common issue of investment behaviour from normative and positive perspectives. Portfolio theory prescribes rules of conduct for investment behaviour, while capital market theory draws the implications of such behaviour for capital markets and the prices of securities if some conditions are met. Sharpe extended portfolio theory in two important and related respects. First, he simplified the input requirements for portfolio analysis or the task of security analysis with the development of the diagonal or single-index model in which relationships among the rates of return on securities obtain from their common relationships with the rate of return on a common index (GNP, Dow-Jones Index, Standard and Poor's Index, New York Stock Exchange), with significant computational economy over Markowitz's critical line method [6]. Next, he pondered the consistency between portfolio theory and the behaviour of capital markets or the form of interdependence between risk and return in determining the price of securities on stock markets, in his famous model of **capital asset prices under conditions of risk and market equilibrium** [7].

As every shopper has observed from price differences between more or less quantity and low or high quality, value depends on measurable quantity and perceived quality. Similarly, the worth of an investment depends on the quantity and quality of benefits expected from the investment, measured in terms of the expected rate of return and a corresponding risk. By virtue of investor aversion to risk and preference for less risk to more, risk and quality are inversely related: the higher the risk, the lower the quality. Putting all one's eggs in a basket is undesirable for the same reason that more is not better than less to the quality conscious buyer, and a higher return not better than a lower return to the risk conscious investor.

Capital market theory is an inquiry into nature of value with particular focus on capital assets and the form of relationship between the level and quality of expected

benefits from investments--based on an appropriate measurement of risk and return--in determining the prices of securities prevailing on the stock market.



By introducing riskless securities (**lending or borrowing** at the same interest rate) into the investment decision, Sharpe derived the **capital market line**, a graphic representation of the functional relationship between risk and return (line R_f CML in Fig 2), with very interesting properties under conditions of capital market equilibrium: (1) the expected rate of return is a linear function of risk for efficient portfolios as reflected in the slope of the capital market line in Fig 2; (2) there is only one efficient portfolio which is located at the point (**tangency**) where the capital market line and the efficient frontier just caress at point M in Fig 2; (3) the efficiently diversified portfolio is the market portfolio in proportion to the total value of each security relative to that of the market aggregate; (4) the expected rate of return on efficient portfolios is the sum of the pure (riskless) rate of interest (R_f in Fig 2) and the product of the price of risk avoidance and the magnitude of risk measured in terms of the standard deviation or the variance as in Fig 2; (5) investment and financing decisions are independent of each other as depicted by lending portfolios (C in Fig 2) and borrowing portfolios (L in Fig 2).

The standard deviation is an appropriate measure of risk for efficient portfolios; but for inefficient portfolios or a security that do not fall on the capital market line, a more versatile unit of risk is volatility with a scope for both efficient and inefficient portfolios. Volatility is a measure of sensitivity of the rate of return on securities to shifts in those for the whole market index.

The degree of volatility is estimated from the slope of the regression function (**characteristic line**) relating the rate of return on individual securities and the rate of return on the market. Securities and portfolios such as mutual funds are characterized as **defensive** or **aggressive** on the basis of their degree of volatility (**beta coefficient**). A security or portfolio whose **beta** coefficient is less than one is defensive, because a 10% change in return of the index for the whole market is accompanied by a less than 10% change in return on the security or the portfolio. The reverse is the case for aggressive securities or portfolios with a **beta** coefficient of more than one. The **security market** line is a graphic representation of the proportionate relationship between the expected rate of return on securities and the corresponding **risk** measured in terms of the degree of volatility. The expected rate of return on a risky security is the sum of the rate of return on a riskless investment and the product of the premium for risk on the market portfolio and the volatility of the risky security. The price of risk is thus the penalty or reward in rate of return for a unit of risk avoided or assumed: risk premium normalized by the corresponding measure of risk.

The total risk of a security consists of **systematic** and **unsystematic** elements. Systematic risk is made up of the security's volatility and risk inherent in the market portfolio. Unsystematic risk is uncertainty internal to a security and consists of the difference between total risk in terms of the standard deviation and the corresponding systematic risk. The systematic risk of a portfolio is the weighted average of the risk of its component securities, and derives from uncertainty basic to the whole economy, which no amount of diversification can reduce. On the other hand, unsystematic risk can be completely eliminated through diversification.

Given perfect divisibility of securities and a rational behaviour in equilibrium, efficiently diversified portfolios should contain no unsystematic risk. Hence, risk premium on capital assets is explained only by systematic risk. The expected rate of return on a

security is the sum of the risk free-rate of return and a premium for the corresponding systematic risk. The inverse of the expected rate of return on a security or its capitalization rate is the price-earnings ratio which is the multiplier of the earnings per share determining the security's price.

Capital Structure and Market Valuation

In the theory of corporate finance, the frequency of reference to the **Modigliani-Miller hypotheses** on capital structure and valuation--abbreviated as the **M-M model**--is surpassed only by citations of Marx and Engels on socialism. Since its first publication in the American Economic Review in 1958, the controversy generated by this celebrated and classic article, co-authored by Franco Modigliani and Merton H. Miller, has been responsible for stimulating rigorous academic inquiry into the theory of corporate finance more than any other piece of work in the field [4].

The designation of Franco Modigliani, Nobel Laureate for Economics in 1985, as the founding father of corporate finance as an academic discipline, was a most fitting tribute. Those students to whom Miller has always been known as founding half-father of corporate finance, from the hyphenated reference to the joint effort as the M-M model in the financial literature, must feel pleased by his recognition five years after his colleague.

Capital structure essentially refers to the proportion of long-term sources of finance consisting of debt (fixed return) and equity (variable return) in the capitalization of a firm. An important distinction between the two sources of capital lies also in the tax status of interest on debt as a deductible expense item and non-deductibility of income accruing to stockholders. In the theory of corporate finance, the protagonists on capital structure are those who support or reject the validity of optimum capital structure. According to the advocates of optimum debt-equity mix (leverage-dependent hypothesis), the value of the firm or its cost of capital depends on its capital structure. The opposite view point (leverage-independent hypothesis), led by Modigliani and Miller as the standard bearers, totally rejects the effect of capital structure on the value of the firm

or its cost of capital. The position of the leverage-independent hypothesis is articulated in the famous **M-M Propositions** (after Modigliani-Miller):

Proposition I

Under conditions of competitive market equilibrium, commodities which are perfect substitutes must sell for the same unit price. If a product like milk can be classified into different grades in terms of butter content as a measure of quality, the same quality of milk must sell for the same price per unit volume if equilibrium prevails on the commodity market.

According to the M-M scenario, if firms could be classified into equal classes in terms of the quality or risk of their earnings, if they were allowed to borrow at the same interest rate as individuals, and if there were no corporate taxes, their value would only be affected by the level of expected earnings, under conditions of equilibrium in capital markets. **Within a homogeneous risk group, capital structure has no influence--whatsoever--on the value of firms or their cost of capital.** The value of the firm varies only with the level of expected earnings. The capitalization rate is constant for firms within the same risk class, and is defined by the cost of capital for an all-equity capital structure or no leverage. In the event of disparity between the equilibrium price and current price of securities, the **arbitrage** mechanism, involving substitution between corporate and personal leverage, is invoked to restore their parity.

Proposition II

Within a homogeneous risk class, the yield (expected rate of return) on a share of common stock varies in direct proportion to the degree of leverage. The expected rate of return on the equity of a leveraged firm ($E(R_j)$) in a risk class is the sum of the expected rate of return appropriate for an unleveraged firm ($E(R_u)$) in the same risk class and a premium for **financial risk**. As set forth in the second term in the equation below, financial risk is directly proportionate to the debt-equity ratio (D/S) or the degree of leverage.

$$E(R_l) = E(R_u) + [E(R_u) - r] (D/S)$$

When a random variable like the expected rate of return on an investment is reduced by a non-random constant such as fixed interest rate, the range of possibilities (dispersion) in the return accruing to equity widens. Hence, the introduction of debt into the capital structure of a firm is accompanied by increase in both the level of return and risk on common stock. Financial risk refers to incremental risk of return on equity associated with leverage relative to a zero base. An increase in earnings per share arising from more debt is offset by a decrease in its quality reflected in a drop in the earnings multiplier or a rise in the capitalization rate so that leverage effects are effectively neutralized. In the case of overvalued or undervalued securities on account of capital structure in a perfect capital market, arbitrage is cybernetically triggered to correct a divergence between equilibrium and market prices. The effect of the relatively lower cost of interest is washed out by the rising cost of equity with leverage to maintain the composite cost of capital constant irrespective of capital structure.

Proposition III

As every merchandise peddler in any community knows, the wares must sell--at least--for the cost paid for them to avoid being worse off than before the transaction or to grow. Therefore, the cost of a merchandise is the minimum price that must be charged to maintain the worth of the mobile enterprise. Similarly, the feasibility of an investment is judged by relating its expected return to the cost of capital for the firm. The cost of capital is the minimum expected rate of return required on an investment if--at least--the minimum value attained by the firm prior to the investment must be maintained, and is defined by the cost of capital for a non-leveraged firm.

Later Correction

The preceding propositions were couched in a taxless environment where interest expense is not tax deductible. After relaxing that particular assumption in an article published in the American Economic Review in 1963, Modigliani and Miller modified

their position slightly on the effect of capital structure on the cost of capital or the value of a firm when corporate income taxes are taken into consideration [5]. In such a setting, the cut-off rate for return on investments becomes the weighted average cost of capital incorporating income tax effects.

As an abstraction of reality, the value of a model lies more in its predictive or explanatory power rather than the realism of its basic assumption, according to the methodology of positive economics [1]. By that standard, the M-M model of no inter-dependence between capital cost of a firm and its financing decision has proved mightier over time with a broadening consensus; and the introduction of tax effects as a special case does not diminish its general soundness.

Significance for Foreign Investments

The two-parameter, mean-variance or risk-return, paradigm employed by the portfolio and capital market models for investment analysis and evaluation, originally developed for securities as decision variables, is a very fundamental concept with relevance for other forms of decision variables with outcomes characterized by chance or random variables summarized by the expected value and the variance. Hence, the implications of portfolio theory and capital asset model for foreign direct investments and transnational corporations merit some reflection.

Portfolio problems are similar in terms of their objectives, based on optimization of the trade-off between risk and return, and differ to the extent of limiting conditions or constraints governing the decision variables. Conditions of divisibility vary extremely between perfect or near-perfect divisibility for securities to lumpiness--varying from imperfect divisibility to complete indivisibility--for capital assets and firms such as direct foreign enterprises. Another critical difference is the availability and cost of information distinguishing the perfect market of securities from the imperfect market of foreign direct investments. The portfolio approach has been suggested for capital budgeting in which indivisibility of some capital assets is accommodated by introducing integer constraints and for conglomerate diversification [10, 11, 12, 13]. Similarly, in the case of foreign subsidiaries composing the portfolio of the holding parent transnational corporation, full ownership of some subsidiaries desired by the investor and some minimum level local

equity participation required by some host countries can be incorporated as fractional or integer equalities or inequalities. Other factors remaining constant, among different forms of portfolios, efficiency of diversification varies directly with the degree of divisibility of the decision variables. Hence, portfolios of securities are more Markowitz-efficient than those of physical assets and business entities.

Against such background the parent holding transnational corporation can be viewed as a portfolio of local and foreign subsidiaries and affiliated companies whose attributes may be described in terms of the three parameters: rate of return on the equity of each firm, a corresponding measure of risk and interrelationships or covariances among these returns. The distribution of investments among subsidiaries and affiliated companies, disclosed in the annual reports of some TNCs, is the structure of the parent portfolio in a historical sense, and may not be the most efficient combination. As a prospective model, portfolio analysis actually seeks solution to an optimum allocation of investments among subsidiaries and affiliated companies on the basis of expectations.

Transnational corporations are the primary source of securities traded on the major world stock exchanges, whose price formation has been observed to show a definite and direct interdependence between levels of risk and return on investments according to capital market theory, including an empirical study involving evaluation of mutual fund performance by Sharpe [8]. This implies that transnational corporations acting according to the Markowitz rule would evaluate the desirability of foreign direct investment by its incremental contribution to the risk and return complexion of the parent portfolio.

If investment opportunities from Africa open to foreigners were ranked by their risk and return prospects, capital will flow to those countries offering relatively high return within their risk class, or relatively low risk within their return class. When the risk-return outlook in Eastern Europe is perceived to be more enticing than that of Africa, all capital flows to the former. All variables entering into the decisions of foreign investment including political stability, economic and investment policy, product market, level and growth of income, raw material and labour markets, taxes, foreign exchanges, incentives, contractual clauses, infrastructure, etc., in the end reduce to implications for risk and return. Risk and return are the stuff of which all investments are made; and in

the final analysis, foreign direct investments flow to countries with more efficient frontiers.

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EXCHANGE RATE POLICIES AND ECONOMIC PERFORMANCE IN SUB-SAHARAN AFRICA*[1]

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ABSTRACT: *A reform programme known as the structural adjustment programme (SAP) was introduced in the 1980s in over 30 sub-Saharan African (SSA) countries with poor growth performance and severe macroeconomic disequilibria. At the centre of this programme is the exchange rate adjustment aimed at improving economic growth and stabilization by enhancing the incentives to produce tradeables, particularly agricultural tradeables. An examination of data from a sample of 30 SSA countries reveals that the outcome of currency depreciation has not been encouraging. Its impact on output and export was at best insignificant. It has also triggered a high rate of inflation. Current account balance was positively influenced by devaluation but this was largely due to import compression, rather than export expansion. A positive response may have been constrained by structural bottlenecks such as limited technological and administrative capacity, inadequate infrastructure, rising cost of inputs and imperfect markets.*

1. BACKGROUND

Prior to the 1970s, Sub-Saharan Africa (SSA) as a whole experienced a stable and a high rate of growth. But the various shocks in the 1970s altered the internal and external economic environment of developing countries. The stability of the international trading system was shaken following the 1971 decision by the US Government to suspend the fixed-price gold convertibility of the dollar. The new variable exchange rates increased the vulnerability of poor economies to international price fluctuations. As this was combined with the oil shock, unprecedented drought in the case of some countries, rapid population growth, declining commodity prices, rising interest rates and the decline in the net inflow of capital and other resources, many oil-importing Sub-Saharan African (SSA) economies ended up in economic crisis. Between 1973 and 1980, GDP growth in SSA averaged 2.5% per annum in real terms, compared to 5.9% during 1965-73. Over the same period, the sectoral growth rates changed as follows:

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agriculture declined from 2.2% to -0.3%; manufacturing from 10.1% to 8.2%; and export earnings from 15.1% to 0.2%. The growth rates of agriculture have been declining since the mid-70s and have been outpaced by population growth in most SSA countries. SSA's share of world trade for major exports (excluding oil) has declined sharply.[2]

With a worsening balance of payment problems, imports were compressed severely, especially imports of investment goods. Consequently, industrial capacity utilization slowed down considerably. In addition, the growth momentum was seriously disrupted in most SSA countries by supply shortages, the breakdown of public infrastructure, lack of domestically-generated technology and mounting budget deficits in the 1970s and early 1980s. These problems were further compounded by political instability (as evidenced by the frequent military coups or changes of regimes) which led to growing lawlessness, increasing loss of policy directions and severe loss of human capital.

It was against this background that an economic reform program known as the structural adjustment program (SAP) was introduced in many SSA countries. SAP entails two basic components, stabilization measures which aimed at improving the balance between aggregate demand and supply through prudent monetary and fiscal policies, and structural reform which act on the supply side mainly through changes in the relative prices, including exchange rate adjustment or the incentive structure to make the economy more efficient and more flexible. Since the early 1980s, nearly 40 countries have pursued economic reform programmes with exchange rate realignment often constituting a central theme in these programmes.

The purpose of this study is to examine the importance of exchange rates in explaining the performance of output, export and economic stabilization in sub-Saharan African countries. More specifically, the aims of the study are to: (1) undertake a review of the available literature on the impact of exchange rate adjustment, and (2) empirically test the various hypothesis on the influence of exchange rates. Since the stagnation in agriculture is at the center of the economic crisis in Africa, the analysis has been expanded to include the impact of SAP on agricultural performance.

The rest of the paper is organized as follows: section 2 will provide a review of the available evidence. In section 3, the methodological approaches are briefly set out. This is followed by an empirical analysis in section 4 and conclusions in section 5.

2. THE IMPACT OF EXCHANGE RATE POLICIES: A REVIEW

In the 1970s and early 1980s, many SSA countries followed a passive exchange rate policy. The demand for foreign exchange often exceeded its supply, reflecting currency overvaluation, largely as a result of expansionary monetary and fiscal policies that brought higher inflation in the African countries (outside the CFA Zone) than in their major trading partners [46]. As many countries resisted nominal devaluation, their domestic currencies tended to be overvalued. The policies that protected infant industries and favoured industrial import substitution, as well as deteriorating terms of trade[3] further contributed to the exchange rate appreciation and poor performance of the agricultural sector [47].

Moving from overvalued to equilibrium real exchange rates or devaluation is generally regarded as one of the most important policy instruments in developing countries. Devaluation is primarily aimed at improving international competitiveness or the incentive to produce exportables, particularly agricultural exportables. The International Monetary Fund and the World Bank advocate substantial initial devaluations to regain some historical level of real exchange rate, and recommend a transition from a pegged regime (pegged to a single or a basket of currencies) to flexible exchange rate arrangements. The preferred alternative is a free-floating or an auction system, allowing market forces to determine the exchange rate.

In theory, devaluation has both demand and supply effects. On the demand side, it can have both an expenditure-switching and expenditure-reducing effects. The expenditure-reducing effect of devaluation is associated with the rise in prices which reduces private sector financial wealth and expenditure. Since nominal values may not rise proportionately with devaluation, real wages and other factor incomes also tend to fall. The effect of devaluation on domestic absorption can thus be contractionary, i.e. reducing expenditure on all goods. But the expenditure-switching effect of devaluation works in the opposite direction for nontradeables. By altering the relative prices of tradeables and nontradeables, devaluation promotes substitution away from tradeables. Consequently, devaluation reduces domestic demand for tradeables, while the total (domestic and foreign) demand for domestically produced traded goods is perfectly

elastic and therefore is not affected by devaluation [27]. The effect on the demand of nontradeables can be positive if the expenditure-switching effect dominates the expenditure-reducing effect.

On the supply side, the effect of a real devaluation in the traded goods sector is positive. Real depreciation lowers the supply price of capital measured in terms of output price and thereby stimulates investment and production in the traded goods sector. The supply of nontraded goods, on the other hand, can be adversely affected. The rise in the price (in domestic currency) of imported intermediate inputs together with the rise in nominal wages may lead to contraction in their supply. The overall supply (traded and non-traded) effect can be positive, if the positive effect in the traded goods sector outweighs the negative effect in the nontraded goods sector.

Theoretically, it appears that devaluation reduces excess demand in the economy or lowers the current account deficit. But anything can happen with regard to inflation and output. Although devaluation may have favourable effects on external balance, it may have disquieting implications on inflation. This is particularly true if the authorities seek to achieve an overly devalued domestic currency (relative to the equilibrium real exchange rate), exerting considerable pressure on prices to rise. If wages and prices are flexible, the real exchange rate would quickly appreciate, necessitating another round of devaluation. Consequently, persistent attempts to achieve real depreciation through nominal devaluation would merely result in an acceleration of inflation. The problem may be compounded further if the supply response is inadequate. One way of minimizing the risk of losing control over inflation is to adopt tight monetary and fiscal policies [2] but this may have negative consequences on output.[4] Devaluation will have a contractionary effect on output if the depressing effects on aggregate domestic demand are not outweighed by the supply-stimulating aspects. This will hold particularly if the elasticities of import demand and export supply are small and the structure of production is weighted more towards tradeables than towards nontradeables [18].

The theoretical ambiguity, together with the inconsistent empirical findings, has meant considerable controversy over the impact of devaluation. At one end of the spectrum of views are those who cast doubt on the usefulness of devaluation. It is argued that significant devaluations by several competing countries will not produce an

improvement in the external terms of trade unless one assumes (against all the evidence) a highly price-elastic demand for agricultural commodity exports [11]. Krugman and Taylor [24] explained that devaluation can increase the domestic-currency price of imported inputs, and if the demand for them is inelastic, total production will decline. Mengisteab and Logan [23] concluded that there are not clear indications that devaluation has positively influenced growth or external balance. Others stressed that devaluation would have inflationary consequences, increasing the real cost of domestic factors of production and thereby decreasing the competitiveness of local goods and services [14, 37, 40]. It is argued that the effect of devaluation is wiped out by inflation, with little or no change in the real exchange rate.

Other studies tend to see the effects of devaluation as being dependent on a number of factors. For instance, one recent study [17] of 12 least developed countries, eight of which were African least developed countries[5], concluded that devaluation can be an efficient and appropriate method of reducing current account deficits in the least developed countries only if it is accompanied by domestic monetary restraint, if real wages are permitted to fall at least enough to prevent employment from declining and if sufficient foreign capital is procured to avert a reduction of GNP.[6] According to Mosley [33], the impact of a market-oriented policy varies from one country to another depending on the level of technological development, while according to Godfrey [12], there are countries which can benefit from devaluation and those which do not. For instance, Kenyan devaluation in September 1981 increased the rate of inflation and negated itself in less than one year, while the devaluation in Mauritius (1981) and Somalia (1982) brought relative real price changes as the inflationary pressure was kept under control. In Kenya, producers quickly passed on to consumers the increase in the cost of imported inputs after devaluation, leading to price increases that more than outweighed the rate of devaluation [12].

At the other end of the spectrum are those who are convinced that devaluation would have an expansionary effect on output and export (e.g. [3, 16, 49]). Devaluation encourages the production of tradeables by raising producer prices. DeRosa and Greene [9] indicated that simultaneous devaluations could not generate a sufficient deterioration in the terms of trade so as to reduce total export earnings. Because SSA's share of

primary commodities in world exports is generally low, simultaneous devaluations by a number of African countries are unlikely to reduce world commodity prices sufficiently to reduce their export earnings.[7] Khan & Knight [21] undertook a review of various studies which looked into the effects of devaluation on output and concluded that in the majority of the cases output growth would be higher after devaluation rather than lower.

The effects of devaluation on agriculture has attracted the attention of several authors, but disagreements over the issue are as widespread as ever. Much of the argument against devaluation is based on the assertion that non-price factors like technological and structural backwardness constrain the supply response of agriculture in Africa. The supply response of agricultural producers could be limited because of market imperfection, scarcity of labour and land, technological backwardness, lack of capital and inadequate rural infrastructure [5, 6]. Devaluation raises input prices long before higher prices on output are received, thereby failing to provide any incentive for producers [29, 34].

Diakosavas and Kirkpatrick [10] analyzed the relationship between exchange-rate policy and agricultural export performance for a sample of 28 SSA countries and came up with less optimistic results. An improvement in export performance was associated with a depreciation of the exchange rate in the majority of SSA economies, but in only a limited number of countries was there evidence of statistically significant and positive relationship. While exchange-rate policy has a significant role to play in the recovery of agricultural sector's export performance, the study concluded, other supportive measures are equally important. Cleaver [8] also noted that the magnitude of the impact of exchange rate (or price) reform is less important compared to non-price factors such as the efficiency of farm input supply, agricultural research and extension, and credit services. According to Lipton [25], a 10% rise in farm output prices, relative to all other prices, may generate less extra output than a 10% rise in the rate of technical progress (due, say, to agricultural research), or even in general government expenditure on agriculture.

By contrast, raising producer prices through devaluation is viewed by some contributors as a key policy instrument to unlock the constraints in agricultural exports. For instance, a study by the World Bank [47] indicated the connection between changes

in the real exchange rates and the level of agricultural exports as being very close. On average, a percentage fall in the real exchange rate[8] reduces agricultural exports by 0.6-0.8 percentage point in all developing countries and by more than one percentage point in SSA. The higher elasticity of supply in SSA not only confirms that supply responses are high, but also shows that exports are sensitive to exchange rate changes when there is the opportunity of selling in the parallel market. But Green [13] pointed out that such results may confuse the smuggling and production effects of devaluation. The main short term impact of devaluation may be to bring back smuggled goods into the official channels, not raise production.

From the foregoing, it can be observed that the debate over exchange rate realignment is far from being settled. Arguments and research findings in favour of devaluation are being counter balanced by those with negative assessments and further research is required to arrive at a consensus. The following sections are intended to make some empirical contributions to the ongoing debate.

3. METHODOLOGY

Four different approaches have been developed to empirically assess the effectiveness of a policy or a package of policies such as SAPs: (1) the before-after approach, which compares macroeconomic performance after implementation with the performance prior to the implementation of the policy; (2) the with-without approach, which compares macroeconomic performance in reforming (adjusting) countries with the performance in non-programme (non-adjusting) countries; (3) the econometric approach, which evaluates the performance of the policy, often after adjustment is made for various differences in socio-economic and macroeconomic policies and external variables, using various econometric techniques; and (4) the simulation approach which compares the simulated performance of the policies under different sets of assumptions [20].

In this study, the with-without method as well as the econometric techniques are used. The changes between 1980-84 and 1985-88[9] in real exchange rates[10] were used out to divide a sample of about 30 SSA countries into two groups: those whose currency

depreciated (Group A) and those whose currency appreciated (Group B). Within the context of SAP, Group A countries may be considered as adjusting and Group B as non-adjusting countries. Using analysis of variance, each group was further divided into two subgroups - depending on whether the depreciation (or appreciation) was statistically significant or insignificant. Such classification is carried out in order to make a distinction between strongly and weakly adjusting or non-adjusting countries on a more objective way. Accordingly, Group A countries consisted of 19 countries of which 9 experienced significant currency depreciation (See Appendix I). Eleven countries were classified as Group B, and significant appreciation took place in six of them.[11]

The attempt was to find out whether an improved stabilisation and growth performance was associated with the changes in real exchange rates. This was achieved by comparing the performance indicators (e.g. GDP) of the countries in the two groups (or the four sub-groups) in 1985-88. It was hypothesized, for instance, economic performance was better in the group in which exchange rates depreciated (Group A) than in the group in which the rates appreciated (Group B). This approach, referred to as group comparison, nonetheless, attributes differences in performance exclusively to changes in exchange rates, when in fact initial differences in economic, technological, and technical factors are the real causes of the observed variation. A regression analysis was thus conducted to separate the effects of exchange rates from other policies or factors influencing performance. The data are obtained from various statistical publications of the World Bank, IMF, FAO and UNCTAD.

4. RESULTS

4.1 Group comparison

As shown in Table 1, the average growth rate of GDP for Group A was 4.1%, higher than the 3.0% growth rate for Group B. However, the superior performance of Group A was more apparent than real. Among Group A countries, the average performance of countries for which the real exchange rate significantly depreciated (or SD countries) was lower (3.8%) than ID countries or countries with insignificant depreciation (4.3%). Significant rate of currency depreciation was not accompanied by

higher GDP growth. The results at individual country level also confirm the limited importance of exchange rates. For example, three countries with the highest average annual growth rate (over 8%) pursued different exchange rate policies: significant depreciation in Botswana, insignificant depreciation in Mauritius[12] and marginal currency appreciation in Burkina Faso. Growth performance was not closely linked to exchange rate policies. It should be added that Botswana's success is based on diamond export and its experience is not very relevant to other African countries. For instance, the drought in the early 1980s, though punitive for the rural households, had little macro-economic impact on output growth in Botswana [19]. This is in sharp contrast to most African countries where overall growth is heavily dependent on weather conditions. Another SD country, Ghana, achieved above-average growth rates (particularly in comparison with the earlier years), but it too owed its success to other factors including large inflows of capital [44].

The performance of agriculture in Group A was slightly less than in Group B. And within Group A, the growth rate of agricultural output in SD countries (with significant real devaluation) was 4.0%, less than the 4.7% growth rate for ID countries. Significant real depreciation is not matched by a higher growth in the agricultural sector. Moreover, agricultural output grew, on average, by over 11% p.a. in two countries, Burkina Faso and Chad, and both experienced an appreciating currency. For the two countries, the rapid expansion of output in the mid-1980s was rather associated with good weather, not with any kind of economic policy.

The impact of exchange rate adjustment on export appeared positive as exports grew by 5.1% in Group A, compared to 3.8% p.a. in Group B. A strong export recovery was recorded in Group A countries such as Ghana and Mauritius. Nonetheless, on average, SD countries again failed to outperform ID countries. A similar result was obtained for agricultural exports: countries with significant currency depreciation had a lower growth rate (4.6%) than countries with insignificant depreciation (5.2%).

Table 1. Currency Depreciation/Appreciation and Economic Performance

Group A	Annual Average Percentage Changes							
	Real Exchange rate	Current Account Balance (%GDP)	Inflation	GDP	Agricultural output	Export	Agricultural exports	Imports
Botswana	SD	15.820	9.080	8.730	1.930	15.550	2.140	6.200
Ghana	SD	-4.200	26.520	4.950	1.860	22.170	6.320	7.370
Madagascar	SD	-11.530	16.730	1.830	2.000	-5.500	-7.340	2.750
Mauritania	SD	-28.950		3.700	3.420	8.320	-2.880	6.220
Nigeria	SD	-0.050	14.850	2.600	5.330	3.500	12.060	-10.850
Tanzania	SD	-14.930	31.900	3.730	5.150	3.500	-6.360	7.870
Zaire	SD	-12.100	60.900	2.600	3.900	-1.250	2.570	2.750
Zambia	SD	-12.800	46.930	2.880	7.630	-7.280	28.020	-0.250
Zimbabwe	SD	-1.380	10.680	3.400	5.020	5.650	7.090	0.430
Average		-7.791	27.199	3.824	4.027	4.962	4.624	2.499
Burundi	ID	-13.580	5.900	5.780	5.980	8.620	19.690	-3.150
Gambia, The	ID	-7.300	27.520	4.050	4.800	3.000	18.080	4.900
Kenya	ID	-5.650	7.630	6.050	4.200	4.680	1.860	9.470
Malawi	ID	-4.730	20.900	2.230	2.130	-1.450	-1.960	5.800
Mauritius	ID	0.080	4.500	8.830	2.920	18.770	15.210	20.500
Niger	ID	-4.450	-3.050	3.650	8.830	3.600	-5.370	6.470
Sierra Leone	ID	-5.900	92.600	0.400	4.570	-5.150	1.260	-4.550
Sudan	ID	-8.000	44.870	1.480	1.870	-5.520	1.380	-6.370
Swaziland	ID	-7.430	13.950	5.400	5.750	24.100	9.310	
Uganda	ID	-4.150	180.650	5.700	6.130	0.680	-7.790	9.320
Average		-6.111	39.547	4.277	4.720	5.133	5.167	4.710
Group B								
Cameroon	SA	-4.450	5.900	2.180	1.930	-0.650	3.600	6.450
Chad	SA	-30.150	0.400	6.770	13.880	5.900	-2.940	
Mali	SA	-22.300	1.600	4.400	5.930	9.020	0.540	6.900
Rwanda	SA	-10.730	1.930	1.550	-1.030	-2.920	20.800	8.480
Senegal	SA	33.420	3.330	4.300	7.130	6.700	0.050	2.400
Togo	SA	-12.750	0.580	3.680	3.610	11.970	7.630	5.420
Average		-18.967	2.290	3.813	5.242	5.003	4.947	5.930
Burkina Faso	IA	-16.700	1.480	8.130	11.430	13.330	8.800	9.650
CAR	IA	-17.650	0.400	1.930	3.130	1.350	-0.160	0.050
Cote d'Ivoire	IA	-1.150	4.130	0.880	6.830	-0.900	-0.560	6.670
Ethiopia	IA	-7.750	3.500	2.750	1.630	1.530	6.830	6.100
Gabon	IA	-17.380	0.730	-3.080	0.800	-3.800	7.020	-5.580
Average		-12.126	2.048	2.122	4.764	2.302	4.386	3.378

SD = Significantly depreciating exchange rate (at 10% or less); ID = Insignificantly depreciating exchange rate; andSA = Significantly appreciating exchange rate.IA = Insignificantly appreciating exchange rate

Despite significant devaluation, agricultural exports grew by negative rates in Madagascar, Mauritania and Tanzania, while increasing by an average of 20.8% in Rwanda, a country with significant currency appreciation.

Imports were adversely affected by increasing exchange rates: imports grew at a slower pace of 3.6% in Group A, compared to 4.7% in Group B. Moreover, imports grew at a much lower rate of 2.5% in SD countries. For many countries, the growth rates of imports were lower than the growth of exports.

The current account deficit (as a proportion of the GDP) was -6.9% for Group A and -13.0% for Group B countries, indicating that countries whose currencies depreciated had improved their current account position. Excluding Mauritania (a country with an unusually high proportion of deficit), significant depreciation coincided with lower current account deficit.

On the inflation front, the results have been more conclusive. The average annual inflation rate was 34.1% for Group A, nearly fifteen times higher than the rate for group B (2.2%).[13] Among SD countries only Botswana experienced a less than 10% rate of inflation. Four (out of 10) ID countries and all countries in Group B had less than 10% inflation rate, implying that countries with significant currency appreciation had a low rate of inflation.

To sum up, the above results may not be considered as conclusive as the average growth rates were heavily influenced by observation from a few countries, but there are some notable patterns which suggest that the response of output and exports to a significant exchange rate increase for the sample countries was minimal. For most countries, significant currency depreciation led to little or no improvement in economic performance, while the rate of inflation increased rapidly. If allowance is made for some extreme observations (i.e. dropping some countries from the groups), ID countries will emerge as the best performers in terms of output and exports. On the basis of the group comparison, one can thus infer that undertaking substantial initial devaluation, as recommended by the IMF and the World Bank, may not be wholly beneficial.

4.2 Regression analysis

In order to further explore the effects of exchange rate adjustment, taking other factors into account, a regression analysis was carried out using data from the sample countries. The results further confirmed the observation drawn from group comparison.

The output effect:- The average growth rates[14] of GDP and agricultural output for the period 1980 to 1988 were regressed on a number of independent variables, including the average annual percentage change in real exchange rate or the rate of real currency depreciation (RER) during 1980-88. Other independent variables considered in the regression analysis were: (a) the average annual change in domestic credit (DOCR) - a contractionary monetary policy of SAP which entails credit restriction (aimed at dampening inflationary pressures) has been criticized on the ground that it would have a deflationary effect, and it was thus hypothesized that the lower the supply of credit the lower is the growth of output; (b) the annual average changes in public consumption (PCON) - a reduction in public consumption (aimed at controlling inflation) may adversely affect public services with detrimental consequences for output; (c) the annual average changes in financial flows (FLOW) - the higher the level of foreign assistance the higher is the growth of output; (d) the annual average changes in the ratio of domestic investment to GDP (INV) - a positive relationship between output and the ratio of investment to GDP was hypothesized; (e) the annual average changes in merchandise imports (IMP) - since most critical inputs are imported in SSA, higher output growth was hypothesized to be positively related to high growth of imports; (f) technological and social development -a higher degree of technological and social development was generally thought to be correlated with rapid growth, and the level of development was approximated by variables such as the proportion of agricultural population (APOP), per capita GNP (PGNP), the rate of illiteracy (ILLI) and dummy variables for LDC countries (DLDC), i.e. 1 for LDC and 0 for non-LDC countries; and (g) domestic shock -a dummy variable for countries directly or indirectly affected by war and drought (DSHOCK) i.e. 1 for affected and 0 for non-affected countries.[15] As shown in Table 2[16], the rate of depreciation was negatively correlated with GDP. The coefficient of RER remained negative and significant, suggesting that an increase in the rate of depreciation led to a contraction of output for the countries under consideration.

It appeared that the supply-stimulating aspects were too weak and were dominated by demand-restraining or contractionary effects of devaluation. Meanwhile, the coefficients of PCON was significantly positive. This result tends to contradict the policies of structural adjustment programmes which view public consumption as a drag on the economy. By contrast, DOCR[17] was negatively and significantly related to GDP, implying that the claim that tight credit policies lead to contraction of output cannot be substantiated. The coefficient of IMP was positive and was statistically significant in the case of total output.[18] The view that imports play a key role in the production process of African countries has been validated. All the remaining variables (some not shown in the Table) including INV, FLOW, ILLI, APOP, PGNP and DSHOCK had statistically insignificant coefficients. Some variables such as INV and DSHOCK had the expected signs while others like PGNP came out with unexpected signs.

In the equations of agricultural growth, RER had a negative and insignificant coefficient (see Table 2). The data provided no evidence that the relationship between the rate of currency depreciation and the growth rate of agricultural production was significantly positive. A positive and significant relationship was observed between INV and agricultural growth. Consistent with the results for GDP, the coefficients of DOCR in the equations of agriculture were negative.[19] Interestingly, the coefficient of PGNP was negative and significant, indicating that the performance of agriculture tends to weaken at higher levels of income. As is evident from the coefficient of DMINE, the difference between mineral and non-mineral exporting countries in terms of export performance was not significant. All the other explanatory variables were found to have little or no influence on the performance of agriculture. The insignificance of some variables such as DSHOCK could be due to measurement problem or poor quality of data, rather than the absence of any relation between output and weather shock such as drought.

Table 2
Real Exchange Rate and its impact on output and export:
Regression Results

	GDP		Agri. Output		Total Export		Agri. export	
C	2.001	1.698	0.829	1.207	6.459	6.873	-28.457	-25.811
	(1.674)	(1.448)	(0.667	(0.997)	(2.204)	(2.390)	(-1.253)	(-1.114)
RER	-0.046*	..	-0.003	..	-0.078	..	0.430	..
	(-1.850)	..	(-0.130)	..	(-1.081)	..	(0.769)	..
IMP	..	0.123*	..	..	..		..	..
	..	(1.770)	..	..	..		..	..
TERM	..	..	..	..	-0.079	0.073	3.307	3.069
	..	..	..	..	(-0.228)	(0.214)	(1.227)	(1.116)
CONC	..	..	..	..	-3.875	-3.000	50.714	54.039
	..	..	..	..	(-0.799	(-0.628)	(1.349)	(1.404)
DMINE	..	..	..	..	-2.846	-2.581	-14.670	-13.880
	..	..	..	..	(-1.439)	(-1.332)	(-0.957)	((-0.89)
PCON	0.120*	0.112*	..	..	..	..	..	..
	(2.034)	(1.631)	..	..	..	..	..	..
DOCR	..	-0.026	..	-0.013	..	-0.079	..	-0.032
	..	(-1.315)	..	(-0.720)	..	(-1.597)	..	(-0.08)
INV	0.045	0.069	0.169*	0.157*	..	..	..	..
	(0.710)	(1.084)	(2.580)	(2.454)	..	..	..	..
PGNP	-0.001	-0.001	-0.002*	-0.002*	..	..	..	..
	(-1.210)	(-1.598)	(-2.657)	(-2.577)	..	..	..	..
DSHOCK	0.112	0.175	0.114	0.257	..	..	..	..
	(0.180)	(0.267)	(0.178)	(0.391)	..	..	..	..
R^2	0.300	0.376	0.295	.310	0.161	0.205	0.195	0.175
R^2 (adj.)	0.148	0..206	0.178	.194	0.021	0.072	0.061	0.038
F.Stat	1.975	2.210	2.512	2.689	1.154	1.545	1.452	1.275

Figures in bracket are t-stat.
* = Significant at 10% or below level of significance

Export performance:- The average annual changes in total and agricultural exports were regressed on the average annual changes in RER and additional variables such as the barter terms of trade, TERM (worsening terms of trade was hypothesized to reduce the capacity to import essential inputs, thus negatively affecting export activities), export concentration, CONC[20] (the higher the degree of concentration the greater the risk of being affected by the fluctuation of the world market), domestic credit, DOCR, dummy variable for LDCS, DLDC, and dummy variable for mineral (including oil) exporting countries, DMINE,[21] were included. It was not possible to include producer prices due to lack of data. Based on the assumption that currency appreciation and the degree of price distortions are closely related, the response to the latter can, however, be inferred from the former.[22]

The regression analysis (Table 2), like the results from the group comparison, failed to substantiate the view that real exchange rate depreciation will positively and significantly affect exports. The coefficient of real exchange rate was positive and statistically insignificant for agricultural exports and negative, though insignificant, in the case of total exports. The influence of the other variables was minimal, very much in accord with the output equations. Total as well as agricultural exports were negatively (but insignificantly) affected by domestic credit (DOCR). The average change in the terms of trade (TERM) was also insignificantly related and its coefficient was positive only in the case of agricultural exports. As observed by Svedberg [39], the relationship between export performance and barter terms of trade appeared weak.[23] The coefficients of the remaining variables including CONC, DLDC and DMINE remained insignificant.[24]

Stabilization:- The average rate of inflation was regressed on the average changes in real exchange rate (RER), public consumption (PCON) domestic credit (DOCR) and GDP and the results are shown in Table 3.[25] The coefficient of RER was positive and highly significant, suggesting that currency depreciation has led to rising prices. The coefficient of GDP has the expected negative sign (though not significant) in one of the equations fitted. DOCR was positively and significantly related to inflation, while PCON was only marginally related. Overall, inflation was closely related to credit expansion and changes in real exchange rates.

Table 3
Real Exchange Rate and Its Impact on Current Account Balance, Inflation and Import: Regression Results

	Inflation		Curr. Ac. Bal.		Tot.Imports	Tot.Exports
C	6.900	-5.327	-15.564	-15.507	2.200	3.428
	(0.804)	(-1.089)	(-8.824)	(-7.802)	(2.149)	(3.015)
RER	1.130*	..	0.192*	..	-0.124*	-0.093
	(3.441)	..	(1.946)	..	(-1.936)	(-1.322)
PCON	1.095	-0.624	0.455*	0.344	..	..
	(1.329)	(-1.228)	(1.807)	(1.219)	..	..
DOCR	..	1.295*	..	0.107	..	..
	..	(9.714)	..	(1.395)	..	..
GDP	-0.683	0.246	..	..	..	..
	(-0.254)	(0.170)	..	..	..	..
R^2	0.419	0.821	0.231	0.180	0.118	0.061
R^2 (adj.)	0.349	0.799	0.171	0.117	0.087	0.026
F.STAT	6.011	38.146	3.896	2.851	3.749	1.748

Figures in bracket are t-stat.
* = Significant at 10% or below level of significance

The current account balance was positively and significantly influenced by the changes in exchange rate. Considering the observation that exchange rates influence imports negatively and significantly while having no significant impact on exports (see Table 3), the improvement in the current account appeared to have been brought about more by a reduction in imports than by an increase in exports. This suggests that currency depreciation adversely affects output partly because of its negative impact on imports.[26] In other words, an improvement in the balance of payment may have been achieved at the cost of reduced availability of essential imported goods. The coefficient of PCON and DOCR came out with a wrong sign, implying that the external deficit of the sample countries was not directly related to monetary and fiscal policy.

5. CONCLUSIONS

The findings in this study point to four general conclusions. First, the results obtained do not confirm the view that exchange rates positively influence agricultural or total output and export. The evidence from the group comparison showed that; on average, countries with significant currency depreciation were outperformed by countries with insignificant depreciation. The benefit of substantial initial devaluation (as recommended by the IMF and the World Bank) appeared doubtful. High growth rates were also recorded in countries with depreciating as well as appreciating currencies. These observations were consistent with the findings from the regression analysis which revealed that the supply-enhancing aspects of devaluation were outweighed by the contractionary effects on the aggregate domestic demand. These results suggest that unless basic development bottlenecks such as unfavourable institutional arrangements and political instability are resolved, devaluation could not be expected to work under the conditions of most African countries.

Second, the impact of exchange rate on macroeconomic stability has been mixed. The evidence gave support to the widely held belief that devaluation triggers inflation. On the other hand, its effect on current account was positive, but this beneficial effect was obtained at the cost of imports. To the extent that inflation rates rose sharply and imports were compressed as a result of devaluation, the absence of a positive and significant impact on output is only to be expected.

Third, the level of production and export in the sample countries was characterized by a high degree of variability. For instance, the annual growth rate of GDP varied between -4.5% (in 1983) and 17.6% (1986) in Mali and between -10.1% (1984) and 8.4% (1987) in Uganda. The extent of variability was even more visible in the case of agricultural output, rising, for instance, from -22.9% (1984) to 49.2% (1985) in Chad. The same was true for exports. Such large-scale swings were related less to changes in macro-policies than to bad luck such as drought, war and civil strife.[27] For instance, since agriculture is heavily dependent on nature in most cases, production and yield tend to vary more with rainfall than with prices. Until the random shocks associated with weather and political problems are minimized or brought under control,

economic policies such as exchange rates are bound to have no appreciable impact on growth.

It would be incorrect, however, to interpret our results as evidence against 'getting price right'. There is little doubt that currency overvaluation has acted as a disincentive and has harmed agricultural producers by reducing output prices and farm incomes. Studies have shown that the decline in the supply of export crops in various African countries were largely due to overvalued currency and low prices (e.g. [4, 30, 36, 47]). In as much as farmers avoid (via parallel markets) low prices paid by parastatals, currency overvaluation is avoided by smuggling into neighbouring markets. Indeed, the negative consequences of currency overvaluation are obvious. But the point that needs to be emphasized is that various aspects of production have also deteriorated with the distortions of exchange rates in Africa and the crisis cannot be addressed through exchange rate reforms alone. Lack of research and support institutions, unfavourable growing conditions and poor infrastructure often constrain the response of output. Because of market imperfections and institutional problems, devaluation may raise input prices long before the higher prices on output are received and thereby prevent output growth or even force a cutback. The absence of measures to tackle the technological, infrastructural, management and institutional bottlenecks is believed to have rendered the effort of 'getting price right' or exchange rate reforms in most African countries ineffective. A comprehensive package consisting of both price and non-price measures, together with serious attention to the sequencing of the different measures, is required for a successful adjustment programme in Africa.

The implications for Ethiopia are clear. A number of factors need to be taken into account to make devaluation an effective policy instruments. It should be pointed out that agriculture which is the mainstay of the economy is characterized by low and rapidly declining yield levels, diminishing farm size, uncertain land tenure system, worsening weather conditions, severe environmental degradation, decaying rural infrastructure, deteriorating living conditions and weak research and support institutions. The industrial sector has stagnated because of poor agricultural performance, excessive government intervention and policy distortions. Lack of diversification, declining volume of export and unfavourable terms of trade have weakened the export sector. Above all,

the socialist policies of the previous regime have made speculation more profitable than productive activities for the private sector. The present government has yet to restore stability and security in many parts of the country. In this context, a cautious approach to devaluation is imperative.

In order to get a positive response, devaluation needs to be preceded by measures primarily aimed at rehabilitating the physical state of the economy, restoring peace and security and inspiring confidence among investors. This may also include steps such as restructuring and privatization of government enterprises, restitution of confiscated properties to former owners, distributing unoccupied land to would-be private investors, conferring full property rights on land and market liberalisation. Such measures could be simultaneously implemented with stabilization policies such as tight credit policy, mainly to discourage unproductive and speculative activities. Once adequate foundations for directly productive activities have been laid down, stability has been restored and the necessary social and physical infrastructure has been put in place, it becomes prudent to undertake devaluation and liberalisation of the financial sectors. Otherwise, the inflationary pressure of devaluation would be uncontrollable and the expected supply response would not be attained.

It would be a remiss to conclude this paper without mentioning a few caveats to the above findings and conclusions. First, the analysis was based on a quantifiable cross-sectional data with high level of aggregation. As a result, many country-specific events were overlooked. In several countries, transport and communication has been sparse and frequently out of operation; the system of governance has been bureaucratic, undemocratic, corrupt and inefficient; the natural resources have been degraded by massive erosion, desertification and deforestation; and the manufacturing or the technological base has been weak or in a cumulative decline. The effects of such confounding factors can only be fully captured through case studies based on a detailed analysis of specific technical, institutional, political, and social factors. The results from the cross-country studies above, therefore, need to be supplemented with findings from cases studies. Second, exchange rate policy is only one part of the cluster of reforms known as 'structural adjustment programmes' (SAPs). Its effect is crucially influenced by the extent, duration and the sequence in which the other SAP policies are

implemented. A more comprehensive study using a unified analytical approach is required to separate the effects of exchange rates from the effects or lack of other policies and to generate information on the sequence and complementarily between different policies.

NOTES

1. This paper is part of a larger study undertaken under the auspices of the United Nations Economic Commission for Africa (UNECA)

2. The share of developing Africa in the total world merchandise export declined from 4.8% in 1970 to 1.8% in 1989. Over the same period, the share of developing Africa in the total agricultural and mining exports declined form 9.1 to 3.4% and from 10.0 to 4.7%, respectively. In 1988, the whole of SSA, with more than 400 million inhabitants, was reported to have export revenues below those of Singapore, a country of 2.5 million people [39].

3. Deteriorating international terms of trade (as well as a decline in net capital inflow) would normally result in reduced supply of foreign exchange. As a result, the demand for foreign exchange exceeds its supply, leading to currency overvaluation.

4. For example, Van Wijnbergen [42] showed that the deflationary impact of tight monetary policy can be substantial.

5. African countries included in the study were: Botswana, Burundi, Ethiopia, Malawi, Rwanda, Somalia, Sudan and Tanzania.

6. Gylfason and Radetzki also indicated that it is impossible to avoid a small reduction of real wage earnings in favour of profits temporarily, if devaluation is to have a positive effect on the current account.

7. The only exception is the case of cocoa producers, which could face a temporary decline in export earnings. Even for cocoa exporters, however, devaluation could lead to significantly higher volumes of nontraditional exports, as well as greater production of traditional exports.

8. The real exchange rate falls or currency depreciation takes place when the local currency per unit US dollar (after adjusting for inflation) declines over a given period of time. The method by which real exchange rate is calculated is given in section 3.

9. A similar periodization was adopted in a study made by the World Bank and UNDP [49]. The period 1980-84 represented the before-SAP or the initial stage of SAP and 1985-88 represented the period after the introduction of SAP.

10. Real exchange rates are defined as the nominal exchange rate (local currency over US$) multiplied by the ratio of the US consumer price index to the domestic consumer price index. This approach, which is based on the purchasing power parity (PPP), has the drawback of including a large number of nontraded goods which are not important in the determination of international competitiveness. The change in the relative incentives guiding resource allocation across tradeable and nontradeable sectors is not well captured.

Despite these caveats, the method is easier to calculate and can provide a good indication of the changes in the real exchange rate.

11. Most countries belong to the CFA zone.

12. It should be noted that Mauritius, often considered as one of the most successful examples of adjusting countries [32], undertook a moderate (not a significant) devaluation of its currency.

13. The rate of inflation in countries such as Uganda and Sierra Leone has been exceptionally high and it seems to be exacerbated by other factors such as a high degree of credit expansion.

14. The average refers to a simple arithmetic average of the annual growth rates for the period 1980-88.

15. These countries were identified as Burundi, Chad, Ethiopia, Malawi, Mauritania, the Sudan, Uganda, Tanzania, Zaire, Zambia and Zimbabwe (cf. [13]).

16. The change in domestic credit was exceptionally high in Botswana and it significantly affected the regression results. Indeed, the financial system in the country is unique in that the Government is a large-scale long-term lender and the Central Bank is a large-scale short-term deposit taker [1]. Being an outlier, Botswana was thus dropped from the sample in the regression analysis. The Durbin Watson statistic has not been reported since it has no real meaning for a cross-sectional data of the type used in this study.

17. High correlation between DOCR and RER has prevented the inclusion of DOCR and RER in the same equation.

18. Because IMP and RER were highly correlated the two variables have been treated separately in the regression analysis.

19. With no information on credit allocated for agriculture, it was hypothesized that the changes in total supply of credit are closely related to changes in agricultural credit.

20. Export concentration refers to Hirschmann index normalized to make values ranging from 0 to 1 maximum concentration (UNCTAD, Handbook of International Trade and Development Statistics, various issues)

21. This is simply to check if there are differences in the performance of export between mineral and non-mineral exporting countries. The variable was defined as 1 for mineral exporting and 0 for non-mineral exporting countries.

22. This assumption was also based on the findings of Cleaver [8] who showed that because the rate of currency depreciation and the degree of price distortion are so closely related (the latter incorporates to some extent the former) both cannot be included as independent variables in the same equation.

23. Foreign exchange earnings of SSA countries grew rapidly in the early years of 1954-69 and declined in 1970-85, although the terms of trade were unfavourable in both periods [39].

24. Although highly suggestive, it is impossible to draw any firm conclusions from the export equations since the values of F-stat and R^2 were very low.

25. This model of inflation draws on the study made by London [28]. It was hypothesized that GDP is inversely related to output, while PCON and DOCR are positively related.

26. Note that imports were positively and significantly related to output (Table 2).

27. Note that the macroeconomic policy variables, for the most part, explained less than 30% of the variation in output and export. Owing to measurement problems, the influence of non-policy factors such as DSHOCK was minimal according to our model.

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Appendix I
Changes in Real Exchange Rate: Analysis of Variance

Group A	Local currency per US$ (annual % Change)		
	1980-84	1985-88	Kind of change
Botswana	1.23	1.70	SD
Ghana	26.68	87.70	SD
Madagascar	525.70	829.00	SD
Mauritania	62.25	70.73	SD
Nigeria	0.99	2.91	SD
Tanzania	21.69	42.14	SD
Zaire	34.74	53.48	SD
Zambia	2.02	5.34	SD
Zimbabwe	1.26	1.51	SD
Burundi	113.12	122.88	ID
Gambia, The	3.55	3.80	ID
Kenya	14.87	16.31	ID
Malawi	1.44	1.69	ID
Mauritius	11.93	13.42	ID
Niger	344.31	351.03	ID
Sierra Leone	5.83	9.17	ID
Sudan	2.22	2.23	ID
Swaziland	1.55	2.01	ID
Uganda	6.88	8.23	ID
Group B			
Cameroon	389.68	299.70	SA
Chad	487.71	365.61	SA
Mali	395.60	332.24	SA
Rwanda	86.75	83.66	SA
Senegal	428.26	324.51	SA
Togo	401.51	276.89	SA
Burkina Faso	375.58	337.30	IA
CAR	392.58	340.28	IA
Cote d'Ivoire	348.28	308.76	IA
Ethiopia	2.38	2.33	IA
Gabon	389.90	328.37	IA

SD = significant depreciation (at 10% or less); ID = insignificant depreciation; SA = significant appreciation; and IA = insignificant appreciation.

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EFFICIENCY OF ETHIOPIAN PUBLIC MANUFACTURING ENTERPRISES AND THE POLICY ENVIRONMENT

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ABSTRACT: *The paper tries to look into the relationship between efficiency of Ethiopian public manufacturing enterprises and the policy environment to which they have been subjected. Financial performance, allocative efficiency and technical (X-) efficiency are used in the measurement of performance.*

1. INTRODUCTION

The contribution of manufacturing industry to GDP in Ethiopia has been low compared with many sub-Saharan African countries and it has not changed much over the past two decades. For example, the share of manufacturing value added in GDP was about 10 percent in 1970/71; the corresponding figure in 1986/87 was about 12 percent [8].[1]

An important change that has been observed in the Ethiopian manufacturing sector concerns the structure of ownership and the policy environment under which enterprises operated. In 1971/72, for example, the government's share in total paid-up capital in manufacturing industries was 35 percent [6]. This share increased significantly mainly because of the nationalization in 1975 but also due to government policy since then which discouraged private sector involvement in manufacturing activities. Recent data indicate that the public sector is predominant in manufacturing by almost all measures. In 1986/87, the year for which the latest comparable figures are available, 97 percent of the gross value of production and 98 percent of value added in manufacturing originated in the public sector. In the same year about 95 percent of permanent employees and about 52 percent of manufacturing establishments were in the public sector. Virtually all manufacturing export earnings (99.4 percent in 1986/87) have been obtained from this sector [7]. Public manufacturing industries have therefore an important place in Ethiopia's industrialization process.

The industrial sector in general and public manufacturing industries in particular have been faced with a number of problems including shortage of imported and

domestically produced inputs, low level of investment and inefficiency in production. This paper tries to look into the relationship between efficiency of Ethiopian public manufacturing enterprises and the policy environment to which they have been subjected. Accordingly in the remaining part of the paper financial performance, allocative efficiency and technical (X-) efficiency are discussed in that order.

2. FINANCIAL PERFORMANCE

The financial results of public industrial enterprises could influence, among other things, the level and composition of government expenditure, external debt and domestic credit. Depending on the financial policy under which public enterprises operate, a financially profitable public enterprise can make use of the surplus, among other things, to increase its working capital, finance expenditure on expansion projects or cover losses. On the other hand, a public enterprise that incurs large and persistent losses would be a burden to the government.

A look into the financial results of Ethiopia's puolic manufacturing enterprises (the majority of which are administered by the Ministry of Industry (MOI)) reveals that they were generally profitable. For example, the total financial profit of public industrial enterprises administered by MOI measured in millions of Birr was 200.3, 140.5 and 161.5 in 1979/80, 1984/85 and 1987/88 respectively [10]. But there were numerous discrepancies even among corporations. The following table confirms this statement. To make the figures comparable the financial rate of return (FRR), defined as the ratio of operating surplus to book value of fixed assets, is taken as a measure of financial profitability, where operating surplus is defined as value added at factor cost less wages and salaries, employees' benefit and depreciation.[2]

As can be seen from Table 1 above the average FRR for the public manufacturing industries was 20 percent in 1984/85 and 26 percent in 1987/88 but never dropped below 20 percent in the 1980s. The dispersion was, however, large, the range being the difference between 254 percent for printing and -3 percent for cement both in

Table 1. Financial Rate of Return (FRR) of Public Manufacturing Enterprises by Corporation (%)*

Corporation	1984/85	1987/88
Ethiopian Food	33	12
Ethiopian Sugar	19	26
Ethiopian Beverages	31	23
National Tobacco and Matches	108	243
National Textiles	4	4
National Leather and Shoe	30	137
Ethiopian Printing	254	172
National Chemical	139	117
Ethiopian Cement	- 3	2
National Metal Works	51	31
Share Companies	92	49
Average	20	26

*Only those enterprises administered by MOI are included. These enterprises accounted for about 89 percent of employment, 77 percent of value added and 78 percent of the total number of establishments in the public manufacturing sector in 1986/87.

SOURCE: MOI, *Statistical Bulletin VII*, June, Addis Ababa, 1990, pp. 94-99.

1984/85. It was only textiles and cement that recorded an FRR much less than the average, the latter with negative values for most of the 1980s [7].

In spite of the relatively high FRR in the sector, most of the enterprises have been faced with shortage of financial resources which made them increasingly dependent on short-term and long-term loans from the banking system. For example, the financial structure of the enterprises nationalized in 1975 is said to have been weak but then it grew weaker over time. The debt-equity ratio for the sector has been increasing steadily since 1978 growing from 16 in 1978 to 50 in 1988 with the exception of 1984 when there was a decline.[3] This is partly due to the government's financial policy which left enterprises with a small sum of money at their disposal. In particular, in addition to the payment of a 50 percent profit tax, public industrial enterprises have been required by

proclamation No. 163 of 1979 to transfer money to the Treasury in two forms. These are: (1) capital charges the amount of which is 5 percent of the state capital plus the general reserve fund and (2) residual surplus which is about 90 percent of the after-tax profit. Thus enterprises retained only 10 percent of the after-tax profit and this has been put into their general reserve funds until such reserve fund equals 30 percent of the state capital [8].[4] The result is that while profit making enterprises retain a very small proportion of their profit, the losing ones would simply face the problems of shortage of working capital and decline in their equity.

3. EFFICIENCY IN RESOURCE ALLOCATION

In this section we are concerned with economic profitability of the enterprises. An enterprise is said to be economically profitable if the economic value of its output is greater than the opportunity costs of commodities and factors of production utilized in production. Since inter-industry and inter-enterprise comparison of economic profit is not precise, if not meaningless, there is a need for some measures which help standardize the comparisons. The measure that we use here is the domestic resource cost (DRC) coefficient - a ratio which is used as a measure of allocative efficiency. DRC coefficient is the ratio of domestic factor costs to domestic value added (revenue minus the value of tradeable inputs), all measured in economic prices. It can be shown that the DRC coefficient and the NPV formulas are alternative statements of the same benefit-cost rule [1]. The problem, however, is that what is utilized in this paper is a single period efficiency measure which is based on the annual profitability of an enterprise. Thus the relative rankings of enterprises on the basis of allocative efficiency could change over time if there are changes in input-output coefficients and/or economic prices of inputs and outputs. With this caveat in mind, we can discuss allocative efficiency in industrial public enterprises.

The analysis of allocative efficiency is based on World Bank Industrial Survey Mission estimates in 1983 and 1988.[5] The following table shows average DRC measures by corporation for a sample of 35 industrial public enterprises in 1988 (for details and 1983 estimates see Annexes 1 and 2).

In the calculation of the DRC coefficients reported in Table 2 domestic value added (DVA) is measured in domestic currency (the Birr). Thus we say that an enterprise is allocatively efficient if the DRC coefficient takes on a value less than or equal to one but greater than zero.

At least four major conclusions emerge from the DRC coefficients shown in Table 2 and the Annexes. The first is that more than half of the sampled enterprises were allocatively efficient and therefore for this group resources were properly allocated to economically profitable enterprises. But there were also enterprises which were highly inefficient, some with high positive DRC coefficients (e.g., Addis Garment and Ethiopian Rubber and Canvas Shoe with actual long-run DRCs of 14.73 and 14.03 respectively) and some others with negative domestic value added (NVA). The latter case is more serious for it means that the value of the commodity produced is even less than the value of tradeable inputs utilized when economic prices are used in the measurement.

Secondly, some inefficient firms become efficient when short-run DRC coefficients are considered, i.e., when capital is assumed to be sunk cost. This is the case for the Ethiopian Beverages Corporation as can be seen from Table 2. Specific examples in this category include the Ethiopian Tannery and Ambo Mineral Water.

Thirdly, DRC coefficients improve when border prices are converted into domestic currency using a shadow exchange rate, which assumes overvaluation of the domestic currency, in the computation of the coefficients. Some inefficient firms become efficient when this is done, as can be seen from the Annex, suggesting that *ceteris paribus* these firms would be economically profitable after devaluation. But the macroeconomic implications of this should be studied since the multiplier effects could lead to results worse than the situation before devaluation.

Fourthly, the coefficients reported in Table 2 and the Annex are based on actual capacity utilization. Thus an increase in the rate of capacity utilization would lead to an improvement in DRC coefficients. The improvements would be significant for those enterprises with very low rates of capacity utilization such as the Nazareth Tractor Assembly with a rate of 10 percent in 1988.

Table 2
Domestic Resource Cost (DRC) Coefficients for Public Manufacturing Enterprises by Corporation in 1988.

Corporation	No. of Enterprises included in the sample	Official Exchange Rate		Shadow Exchange Rate	
		Long-run DRC	Short-run DRC	Long-run DRC	Short-run DRC
Ethiopian Food	1	0.73	0.29	0.53	0.17
Ethiopian Beverages	5	1.72	0.74	1.23	0.44
National Textile	7	0.91	0.50	0.63	0.30
National Leather and Shoe	11	0.83	0.53	0.55	0.32
National Chemical	5	0.36	0.21	0.25	0.13
Ethiopian Metal Works	6	0.48	0.26	0.34	0.15
Average(Total)	35	0.82	0.45	0.57	0.27

SOURCE: World Bank, *Ethiopia: Industrial Sector Review*, Report No. 7831 -ET, July, 1989, Annex.

A comparison of financial and economic profitability reveals different combinations including firms that are financially profitable but allocatively inefficient and vice-versa. The reason for the divergence is the difference between market prices (on the basis of which financial profits are determined) and economic prices (which represent opportunity costs) of inputs and outputs. The government's pricing and trade policies are the main factors that cause the difference.

The prices of most of the goods manufactured by Ethiopian public enterprises have been controlled and the pricing rule has been cost-plus pricing which does not consider border prices and is based on actual costs which may reflect inefficiency. A look at the nominal protection coefficient (NPC) - which is the ratio of market prices to economic (border) prices - indicates the divergence of market prices from economic

prices and the non-uniformity of the divergence among enterprises. There are enterprises with NPC as high as 2.20 (Ethiopia Fibre Factory) and as low as 0.47 (Addis Ababa Cement). Another point to note is that in spite of price controls, the NPCs are greater than one for most of the sampled enterprises. In this connection we may also note that the average NPC for the sample of enterprises in 1983 and 1988 was generally low (1.11 and 1.23 respectively) which is mainly because of import controls which were more important than import duties and other indirect taxes.

The effect of the government's trade policy on an enterprise is seen from its impact on input and output prices through taxes and subsidies. Thus the structure of protection and domestic trade policies may or may not be in favour of an enterprise depending on their net effect on input and output prices. This can be measured by the effective protection coefficient (EPC) defined as the ratio of domestic value added at market prices to domestic value added at economic (border) prices both measured in the domestic currency.

EPCs calculated for a sample of public industrial enterprises in 1983 and 1988 indicate that while the average EPC was generally low (1.36 in 1983 and 1.26 in 1988), there was a large dispersion. There are enterprises with an EPC as low as 0.03 which is equivalent to -97 percent effective rate of protection (for Addis Ababa Cement in 1983) and as high as 29.05 (for Ethiopian Rubber and Canvas Shoe in 1988). This is excluding enterprises with negative domestic value added whose EPC can be considered as infinity (higher than a high positive EPC). The implication for those enterprises with EPCs greater than one is that the trade policy is in their favour while it acts as a disincentive to those with EPCs less than one. Thus, at least partly due to the high degree of effective protection, enterprises such as the Ethiopian Rubber and Canvas Shoe and Anbessa Shoe are making positive financial profits in spite of their negative economic profits. On the other hand, enterprises such as the Addis Ababa Cement incur financial losses in spite of the positive economic profit the firm makes. Thus we can conclude that under the existing policy environment financial profitability is a misleading indicator of an enterprise's performance.

4. TECHNICAL (X-) EFFICIENCY

Over four decades have passed since the possibility of the existence of technical inefficiency has been noted and attempts made to define and measure it. It seems, however, that the concept has received greater attention since the publication of Leibenstein's article entitled "Allocative efficiency vs. X- efficiency" in 1966.[6] The following is a general definition which Leibenstein gives for X-inefficiency.

> Inputs or factors of production may be allocated to the right units for use. However, there is no need to presume that the decision and performance units involved must use inputs as effectively as possible. We refer to the difference between maximum effectiveness of the utilization of inputs and the actual effectiveness as the degree of X-inefficiency. Quoted in [2, p.4]

Four reasons are suggested by Leibenstein for X-inefficiency connected with the basic notion of variable performance for given units of inputs. These are : contracts for labour are incomplete; the production function is not completely specified or known; not all inputs are marketed or, if marketed, are not available on equal terms to all buyers; and the effective utilization of an input depends on the degree of motivational pressure, as well as other motivational factors [4]. Leibenstein extended his argument to the extent of attacking conventional micro theory and has developed what he calls micro-micro theory as a new foundation for microeconomics.

Two general sources of technical (X-) inefficiency could be identified in the case of public industrial enterprises in Ethiopia: one is inefficiency due to the existing system which applies to all enterprises; the other is inter-enterprise differences in technical (X-) efficiency given the existing system. Analysis of technical inefficiency of the latter type requires estimation of such measures as total factor productivity (TFP) growth and production frontiers using detailed enterprise level data which is beyond the scope of this paper. With respect to the first source - system inefficiencies - there are two areas which seem to have encouraged technical (X-) inefficiency in Ethiopia: the organizational structure and the incentive system.

The problem with the organizational structure is that the decision making system has been highly centralized. In addition to being lengthy, the system left enterprise managers with very limited power since major decisions have been made at the top.

Logically enough, under this system, enterprise managers were not held accountable for the outcomes of those decisions. Nor was there any clearly specified incentive to the managers which motivates them to improve efficiency in resource use.

As regards the incentive system, with the objective of linking incentives to firms' performance, the government introduced some wage policy reforms in 1979/80. There are three elements in the incentive system of these reforms; an increase in the total wage bill for enterprises by: (1) 5 percent if physical output increases; (2) 1 percent if productivity per worker increases; and (3) 1 percent if profit increases over the previous year [9].

Four major problems could be mentioned in relation to the incentive system. First, the most important measure of performance used, i.e., increase in physical output, does not pay attention to quality and more importantly is not necessarily related to an improvement in technical efficiency. An increase in physical output and misutilization of resources may go together. Second, our analysis of financial performance and allocative efficiency has shown that an increase in financial profit does not necessarily mean that the firm is more efficient. On the other hand an enterprise that incurs losses may not necessarily mean it is inefficient in the utilization of resources and therefore does not have to be penalized. Thus, unless the reasons for the increase in profit are specified, workers of an enterprise may be rewarded for an improvement in financial profit caused by factors not related to their performance.

Third, what is considered in the incentive system is an increase in the three variables without paying attention to the rate of increase, which is also important. Fourth, the incentive system applied to those whose monthly income is less than Birr 600 and proportionately more of the benefit went to those in the low income bracket. While this is attractive from the point of view of income distribution the exclusion of those employees with monthly income greater than or equal to Birr 600 would have a negative impact on technical efficiency.

5. CONCLUSION

It should be noted that while arguments in favour of allocative efficiency may be objected to on the ground that there are objectives other than maximization of economic profit such as income distribution, there seems to be no acceptable justification for technical (X-) inefficiency. Moreover, since an improvement in technical (X-) efficiency means that a given level of output can be produced with less of the inputs or more can be produced with given inputs, this will also lead to an improvement in actual efficiency in resource allocation and financial performance because of a decrease in unit costs (both financial and economic). Therefore, irrespective of the acceptability of resource allocation decisions, once they are allocated to specific uses, resources have to be utilized as efficiently as possible and the government should make attempts to make enterprises technically (X-) efficient as much as possible. Thus, it is suggested that the incentive system be linked with real measures of performance such as productivity as opposed to physical output. Moreover, given that management has an important role to play in influencing a firm's performance, enterprise managers should be given more autonomy and at the same time be held accountable for the outcomes of their decisions - i.e., they should be penalized or rewarded as the case may be.

But it is also important to see the other dimension of the real contribution of enterprises to the economy. This point is more important in the case of enterprises with negative domestic value added, for this cannot even be justified by sensible non-efficiency objectives such as income distribution and employment. On the other hand, rehabilitation and restructuring of the marginally inefficient enterprises could make them efficient. In this connection it is suggested that, mainly in the establishment of factories, non-efficiency objectives and externalities be taken into account with dynamic allocative efficiency considerations in mind.

The discussion on pricing and trade policies indicated that financial profitability is not a good indicator of performance. Yet good financial performance is important, for industrial public enterprises could otherwise be a burden to the government. In this respect, it is suggested that attempts be made to avoid discrimination among public enterprises in terms of policy even under conditions where firms are protected from

foreign competition. Two major exceptions that should be considered here are: the really infant industries and those to which non-efficiency objectives apply. But even here the additional costs should be identified so that the government could act accordingly. And under all these constraints attempts should be made to improve efficiency and make firms operate as commercial enterprises. One suggestion in this respect is avoiding special treatment to industrial public enterprises (e.g., subsidized interest rates) which do not apply to similar enterprises in the private sector. Finally, given the limited coverage of this paper and some of the restrictive assumptions used which can be relaxed, a detailed study is required.

NOTES

1 The definition of manufacturing industry used in this paragraph includes small-, medium- and large-scale industries.

2 The FRR figures may be overstated since no adjustment is made for changes in market prices in the measurement of fixed assets due to lack of the relevant information. This may be one of the main reasons for the large values of FRR reported in Table 1 for some of the corporations. Under such conditions comparisons of financial and economic rates of return (ERR) may be unrealistic. But differences in the signs of FRR and ERR figures, as is the case for some of the enterprises considered in this paper, are clear indicators of divergences between these two values, irrespective of the method of measurement of capital employed. Note also that the comparison made in section 3 of this paper refers to absolute measures of economic and financial profitability without division by capital employed.

3 Obtained from unpublished documents of MOI.

4 Some special provisions are given in the proclamation.

5 In the computation border prices are taken as measures of economic prices of tradeables noting that these are the opportunity costs (of exportables or importables as the case may be) and Ethiopia is a price -taker. See [9, 10].

6 Technical and X-efficiency are used interchangeably in this paper although Leibenstein makes a distinction between the two. For details, see [5].

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ANNEX 1. Structure of Protection and Efficiency of Industrial Public Enterprises,1983.

CORP/ENTERPISE	NPC	EPC	Long-run DRC	S.E.R. L.R.DRC	Short-run DRC
I. ETHIOPIAN FOOD					
Dire Dawa Flour Mill	.89	.29	1.02	.79	.83
II. Ethiopian Sugar					
Wonji Sugar Factory	.84	.69	.74	.57	.60
III. Ethiopian Meat					
Dire Dawa Meat	1.11	2.05	1.52	1.17	1.36
IV. Ethiopian Beverage					
Babile Mineral	1.11	1.09	.89	.68	.61
Melotti Brewery	1.49	2.24	1.93	1.49	1.31
Awash Winery	1.88	3.11	1.20	.92	.99
Addis Ababa Glass Works	1.50	5.64	4.37	3.36	1.83
Sub-total	1.55	2.52	1.70	1.31	1.06
V. NATIONAL TEXTILES					
Dire Dawa Textiles	1.14	1.84	1.37	1.05	.84
Asmara Textiles	1.19	8.63	3.45	2.65	2.71
Ethiopia Fibre Factory	2.20	-6.61	-2.94	-2.26	-2.44
Sub-total	1.22	2.64	1.70	1.31	1.11
VI. National Leather & Shoe					
Ethiopian Footwear	1.47	1.77	.84	.65	.42
Awash Tannery	1.00	1.16	.36	.28	.31
Sub-total	1.06	1.27	.45	.35	.33
VII.Ethiopian Woodworks					
Warka Woodworks	.11	.64	2.07	1.59	1.97
VIII.ETHIOPIAN PRINTING					
Ethiopian Pulp & Paper	1.49	-6.10	-4.34	-3.34	-2.06
IX. NATIONAL CHEMICAL					
Addis Tyre	1.16	1.25	1.16	.89	.82
Ethio Plastic	1.14	.97	.83	.64	.43
Sub-total	1.16	1.19	1.02	.83	.73
X. ETHIOPIAN BUILDING MATERIALS					
Addis Ababa Cement	.47	.03	.41	.31	.23
XI. NATIONAL METALWORKS					
Ethiopian Iron & Steel	1.11	.63	2.87	2.21	2.32
Kalite Steel	2.00	-9.89	-2.68	-.21	-.3
Sub-total	1.41	9.45	7.53	5.79	.86
TOTAL MANUFACTURING	1.11	1.36	1.09	.84	.74

SOURCE: World Bank, Ethiopia: Industrial Sector Review, Report No. 5301-ET, Washington, D.C., 1985.

ANNEX 2. Structure of Protection and Efficiency of Industrial Public Enterprises, 1988.

Corporation/Enterprise	NPC	EPC	Actual S.R.D.R.C.	Actual L.R. D.R.C	Actual Capacity Utilization	Financial Profitability	Shadow Exchange Rate S.R. D.R.C.	Shadow Exchange Rate L.R. D.R.C.
Ethiopian Food Corporation								
1. Ethiopian Spice Extraction	1.04	1.02	-.20	.79	82	500	.53	.17
National Meat Corporation								
2. Dire Dawa Meat Canning					25			
Ethiopian Beverages Corporation								
3. Ambo Mineral Water	1.29	1.39	.79	1.45	74	185	1.00	.47
4. Babile Mineral Water	1.54	.40	nva	nva	99	-986	nva	nva
5. Addis Glass & Bottle	2.01	-.38	nva	nva	68	-2346	nva	nva
6. Harar Brewery	1.92	5.39	1.00	4.12	64	2168	3.09	.60
7. Awash Winery	1.14	1.05	.27	.42	33	3371	.28	.16
Sub-total	1.51	2.23	.74	1.72	–	2392	1.23	.44
National Textiles Corporation								
8. Addis Garment	1.16	3.42	10.34	14.73	26	-940	9.75	6.21
9. Adey Abeba Yarn	1.12	.78	.36	.67	92	944	.46	.22
10. Akaki Textiles	1.18	1.00	.49	.61	94	8825	.30	.29
11. Combolcha Textile	2.17	-4.04	nva	nva	24	-21.89	nva	nva
12. Dire Dawa Textile	1.15	.97	.4	.63	96	13141	.42	.24
13. Ethiopian Fibre Products	1.40	2.14	.81	1.16	76	3234	.77	.49
14. Gulele Garment	1.59	-2.02	nva	nva	30	315	nva	nva
Sub-total	1.23	1.11	.50	.91	–	18330	.63	.30
National Leather & Shoe Corporation								
15. Addis Tannery	1.06	1.08	.29	.38	n.a.	1520	.24	.17
16. Awash Tannery	1.01	1.07	.34	.33	88	5229	.22	.14
17. Combolcha Tannery	.98	.98	.15	.22	n.a.	881	.15	.09
18. Ethiopia Fickling & Tanning	.98	1.01	.30	.29	n.a.	1926	.19	.12
19. Ethiopian Tannery	.99	.99	.37	1.12	n.a.	1736	.83	.22
20. Modjo Tannery	.98	.96	.22	.28	18	1905	.18	.13
21. Anbessa Shoe	1.69	8.95	3.86	4.80	51	1283	3.06	2.32
22. Ethiopian Footwear	1.46	2.25	1.03	1.39	n.a.	522	.91	.62
23. Ethiopian Rubber & Canvas Shoe	1.71	29.05	10.18	14.03	55	3017	9.19	6.11
24. Tikur Abey Shoe	1.62	4.40	1.67	1.94	59	3646	1.22	1.00
25. Universal Leather Articles	1.18	3.58	[illegible]	nva	30	-1225	nva	nva
Sub-total	1.17	1.63	.50	.81	–	18524	.55	.32

Corporation/Enterprise	NPC	EPC	Actual S.R.D.R.C.	Actual L.R. D.R.C	Actual Capacity Utilization	Financial Profitability	Shadow Exchange Rate S.R. D.R.C.	Shadow Exchange Rate L.R. D.R.C.
National Chemical Corporation								
26. Ethiopia Plastic	.88	.64	.13	.23	77	3768	.16	.08
27. Addis Foam & Thermoplastic	1.71	2.98	.45	.70	25	3454	.47	.27
28. Gulele Soap	1.85	6.16	.64	.81	93	3686	.52	.38
29. Massawa Salt	1.71	-.91	n/a	n/a	49	-578	n/a	n/a
30. Tesdey Paints	1.10	.78	.14	.16	40	2822	.10	.08
Sub-total	1.22	1.14	.21	.36	–	12152	.25	.13
Ethiopian Works Corporation								
31. Ethiopian Iron & Steel	1.28	1.46	.41	.75	60	3195	.52	.25
32. Kaliti Metal Works	.99	.61	.09	.17	n.a.	3513	.12	.05
33. Kolfe Household Utensils	1.12	1.14	.19	.26	40	1437	.17	.11
34. Kotebe Metal Tools	1.03	.91	.26	.46	75	277	.32	.16
35. Nazareth Tractor Assembly	2.00	12.84	1.17	4.57	10	2639	3.42	.70
36. Wurka Household & Office Furniture	1.54	1.66	.60	.73	96	1046	.47	.36
Sub-total	1.25	1.22	.26	.48	–	13107	.34	.15
Total	1.23	1.26	.45	.82	–	65205	.57	.27

Notes: NPC = Nominal Protection Coefficient
EPC = Effective Protection Coefficient
S.R.D.R.C. = Short-run Domestic Resource Cost
L.R.D.R.C. = Long-run Domestic Resource Cost Coefficient

SOURCE: World Bank, *Ethiopia: Industrial Sector Review*, Report No. 7831-ET, July, 1989, Annex.

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THE PEASANT ECONOMY: A REVIEW OF THE DIFFERENT THEORIES*

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ABSTRACT: *This paper reviews various theories of the peasant economy. It is shown that the theories have differences as well as similarities. The 'formalist' school, profit maximization and utility maximizing peasant theories take efficiency as a central issue in their analysis. In contrast to the profit maximizing assumption, 'risk averse' peasant theory, formalist theory and some of the political economy theories argued that the aim of peasant production is to avoid risk in the production of household food requirements and not to maximize profits by taking decisions involving high levels of risk. Others argued that profit is alien to peasant producers. Still others, argued that 'risk aversion' behaviour does not preclude profit maximization behaviour. No theory can be said to fully explain all aspects of peasant production; indeed, for the present, all of the theories may have relevance in explaining different aspects of the peasant economy.*

1. INTRODUCTION

The aim of this paper is to present a critique of the major theories of peasant household production. Theories are reviewed because of the lack of a single theory of peasant production that covers all aspects of peasant life.

It is important first to define the term 'peasant', to delineate the focus of attention, before embarking on a discussion of the theories of peasant production. Defining the term 'peasant' has been a controversial issue for a long time, and still continues to be so (see, for instance, [21, 117]). Peasants have been defined by identifying their behaviour and attributes of societies: permanence of production system, markets and general exchange relationships; association with outsiders; internal homogeneity of societies; the role of subsistence production; land ownership; intensity of family labour; objective of production; the dominant economic activity; and, culture and attitudes. Several combinations of the above have been used in characterising peasants.

As far as economists are concerned, a number of characteristics have been considered in defining peasants.[1] Peasants do not operate on the basis of 'profit and loss' accounting[48, 115]. Peasant farms are production units as well as consumption units.

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They consume part of their produce and sell part of it to meet their cash requirements (by purchasing goods not produced at home) or to pay for obligations imposed on them (e.g., taxes) by the outside world [64, 102, 117,128]. They are engaged in agriculture (mainly cereal production), pastoralism, gathering (fruits, nuts), fishing and crafts. They are 'part-societies' within a dominant national economy [102, chapter 2], [128]. Their economy has been viewed as a non-self sufficient mode of production [52], but the control they have over their production gives them a certain level of independence [133]. However, this control can be restricted by government interventions [71], as has been the case in Ethiopia from 1975 to 1990, or when they are engaged in sharecropping arrangements.

Some of the anthropologists and sociologists argue that viewing peasants as economic performers alone is wrong [21]. Shanin gives five basic characteristics that could be used to delineate peasants from the rest of the society [117, pp. 52-54], i.e., political organization, tradition, social organization, social reproduction of the social structure, and fundamental patterns and causes of structural change.[2]

It is clear from the above writings that analysts limit themselves in defining peasants because of the complexity of combining the different characteristics as an integral part of a working definition. However, it is important to keep the rest of these characteristics in mind when using the term 'peasants'. The following definition, which draws heavily from Ellis [39], is to be used in this paper.

> Peasants are farm households, with access to a piece of land and utilizing mainly household labour in farm production. They are located in a larger dominant economic and political system that could affect their production behaviour, but fundamentally they are characterised by partial engagement in markets, which tend to function with a high degree of imperfection.

The remainder of the paper is divided into two parts. The first part covers the major part of the paper on the different theories of peasant production: substantivism and formalism (i.e., economic-anthropological writings); political economy theories; and, three alternative economic theories of peasant behaviour namely: 'profit maximizing', 'risk averting', and 'utility maximizing' peasant theories.[3] The second part presents a summary and conclusions.

2. THEORIES OF PEASANT PRODUCTION

2.1. The Economic-Anthropological

Two theories are reviewed here. The major dividing line of the theories is the position they take regarding whether individual actions or institutional factors have a determining factor in peasant production. Substantivists believe that institutional factors determine individual action and that differences in institutions make different societies incomparable; therefore, institutional analysis should receive the greatest stress. On the other hand, formalists argue that institutions have similarities in different societies, and in all societies individuals act so as to maximize their individual gains.

Substantivists start their discussion of primitive and peasant economies by stating what these economies are not [35]. Polanyi [97] defined these economies as the negative of capitalist economies, particularly singling out the profit motive as a hallmark of capitalist production; as was the absence of this motive in the noncapitalist societies. Polanyi regarded production as the process of creating material means for society. According to him, humans adapt to particular environment in order to produce materials necessary for the society and these material production processes could be distinguished from other processes in the society. But, the different institutional arrangements in different economic systems make the systems fundamentally incomparable. Therefore, so the argument runs, the institutions must receive the greatest attention in the analysis of peasant societies. The substantivists emphasised the behavioural differences between non-western societies and western societies. They specified the uniform values, institutions and exchange relations that typify a society [81]. They believed that capitalist institutions are fundamentally different from those in non-capitalist societies, thereby making theories developed to analyze the capitalist system irrelevant for the noncapitalist societies. The same view has been expressed by Manilowski [74, 75]. Dalton [28, 29, 30, 31] and Sahlins [106] added to and refined Polanyi's arguments. Sahlins [106], for instance, argued that it is incorrect to detach the principle of profit maximization from its bourgeois context. Therefore, peasant society is considered to be what capitalist society is not.

Formalists, by contrast, argued that institutions in different societies are not so different that all economies cannot be analyzed using theories developed to explain capitalist economic behaviour. They argued that individuals in any society act so as to maximize their individual gains (e.g. [42, 43, 44, 50, 53]). Later works tried to apply the principle of maximization in the context of different constraints. For instance, Orans [94] regarded Indian peasants as maximizing their interests within a given system of values, moral rules and legal sanctions. Others tried to demonstrate that the principles of neoclassical economics make sense in peasant societies (e.g. game theory by Davenport [32]). However, it was argued that even though neoclassical economics could be applied to peasant societies, it needs adaptations to take into account the institutions of these societies that are different from capitalist economies [107].

2.2. Political Economy Approaches

Most socialist writers have chosen the framework of Marxian political economy to explain peasant production and its role in the capitalist system. Marx held that social development progresses from one mode of production (defined by the sum total of productive forces, i.e. technology and production relations) to another following the law of historical materialism. According to this law, technology advances with the development of science and thus the productive forces of society continually change. Sooner or later, incompatibility develops between the advancing technology and the fixed production relations. The resulting contradiction leads to a revolution and emergence of a mode of production which would be compatible with the development of the productive forces. Accordingly, Marx identified primitive communal, slave, feudal and capitalist modes of production as the dominant and consecutive modes of productions in the world history. Peasant production, according to the classical Marxian analysis, is regarded as a non-dominant transitory mode of production. It is argued that capitalist expansion would penetrate and transform any pre-capitalist production systems. Dispossession of the peasants from their means of production would result in the creation of potential wage workers and expansion of capitalism in agriculture as it did in the developed countries.[4] Recent studies have questioned the validity of this traditional formulation. They argue that the expansion of capitalist exploitation is not incompatible with the existence of peasant production (see for instance [4]).

In the early 1960s, the 'dependency' and 'underdevelopment' schools came up with theories explaining the backwardness of countries dominated by peasant economies (see [93]). Most of these theorists treated peasant production as the end point in the chain of production systems, interconnected by and serving the international capitalist system. Theorists like Baran [10], Frank [45, 46, 47], Dos Santos [36], and Wallerstein [130] had a basic premise that development of some countries actively led to underdevelopment or distorted development of the backward countries of the world making them the periphery of the world capitalist system. Some of them argued that capitalist accumulation (a *sin qua non* of the capitalist system) on the periphery has dynamics of its own which distorts the basic structure of capitalist productive class relations, even creating a new mode of production (see for instance [6, 7, 9, 16, 24]). According to these writers, any analysis of peasant production has to be seen within this context.

However other socialist writers pointed out the 'inefficiency of capitalist development', particularly the failure of capital to penetrate agriculture, as being the factor responsible for the backwardness of these communities (see [62, 63, 131]). These theorists of political economy have counterparts in economic-anthropology, particularly the French anthropologists (see [37, 49, 55, 83, 84, 106, 127]), most of whom wrote in response to the Substantivist and Formalist schools of economic anthropology.

2.3. Economic Theories

Three alternative economic theories of peasant household behaviour are presented below. Each category of theories assumes that the peasant household has an objective function to maximize, with a set of constraints. The first one is the model of the 'profit maximizing' peasant. It assumes that peasants have the objective of maximizing profit. Mostly in reaction to this model, other economists have crafted the 'risk aversion' peasant theory. This model argued that the objective function of peasant households is to ensure the survival of the household by avoiding risk. Significantly, both profit maximizing and risk aversion theories tend to ignore the consumption aspect of a peasant household production. Since the process of decision making of peasant family involves both production and consumption aspects, these models ignore a major side of

the peasant household decision-making process. The role of consumption decision in production is an important factor in explaining peasant decision-making behaviour.

There are economic models that try to incorporate both consumption and production goals of the household. The major theories attempting to do so can be classified into Chayanovian or utility maximizing and the new household economic theories. Chayanov's model shows the influence that family size and structure has on the peasant family farm through the subjective valuation of labour time of the household. It argues that, in order to maximize utility, peasants equate the marginal value of products to the marginal value of labour. The new farm household models are similar to Chayanov's, but are based on a different set of assumptions and have wider scope and predictive power.

2.3.1. Profit Maximizing Peasant Theories

Schultz's hypothesis that, '...(t)here are comparatively few significant inefficiencies in the allocation of the factors of production in traditional agriculture' [109, pp. 37-38], gave rise to a debate among economists that resulted in a new wave of empirical works to test it. Schultz referred explicitly to **allocative** efficiency [optimal combination of units or amounts of inputs so as to maximize profit, i.e., equating marginal value product (MVP) to marginal factor costs (MFC)] and, implicitly, to **technical** efficiency (the manner in which the same units or amounts of inputs are combined in order to maximize output). Reference to allocative efficiency or economic efficiency (attaining technical and allocative efficiency at the same time) drew one to profit maximization behaviour, because, economic efficiency is defined in the context of perfect competition (where inefficient firms are thrown out of business or become competitive by improving efficiency and where entrepreneurs display non-diminishing marginal utility of money income) as happens when profit maximization coincides with maximization of satisfaction [111].

Several studies subsequently used the allocative efficiency criterion (MVP/MFC) to test whether peasants were efficient or not (i.e., whether they were profit maximizers or not). Hopper [57], for instance, tested the Indian peasant behaviour, others applied it to African peasant farms (e.g. [91, 92]). These studies reached the conclusion that

peasants were, indeed, efficient producers. Others found out that peasants were not efficient (e.g. [19]). Still others argued that these studies had mistakenly concluded that peasants were efficient because of a mistake in the method of calculating the allocative efficiency ratio. For instance, Shapiro [118] showed that correction of mistakes in some of the works that established that peasant producers are efficient result in figures that demonstrate peasant farmers are not efficient.

Another criticism of the approach is that the criterion relies on the 'average' production function (as opposed to the 'best practice' firm conditions) thereby not showing the different levels of technical competence between farmers. Moreover, the single point on the production function identifying allocative efficiency poses problems in statistical interpretation [39]. Furthermore, it ignores the technical efficiency aspect of the overall concept of economic efficiency. Since the production function approach, based on the ordinary least squares, by definition averages out the differences between different levels of outputs for the same level of input, it hides the differences in technical efficiency. A linear programming approach has been used and technical inefficiencies were shown to be widespread relative to the 'best practice' firms. Shapiro [118] in the case of Tanzanian farmers and Lingard *et al.* [69] in the Philippines sought to demonstrate this situation. Dawson [33] used a frontier production function analysis to show the inefficiency of peasant farms.

Probably the most important criticism is that the model does not consider uncertainty and the risk in agricultural production. Lipton's [72] criticism sought to show how the existence of uncertainty and risk eroded the theoretical basis of the profit maximizing model. McPherson [82] argued that farmers do not generally try to equate MVP to MFC of their resources but allow for higher order moments of revenue and costs.

2.3.2. The Risk Averse Peasant

Peasants produce under a very high level of uncertainty because of natural hazards (weather, pests, disease and other natural disasters), market fluctuations, and social uncertainty (insecurity associated with control over resources, such as land tenure and state interventions and war) [39]. These pose risk to peasant production and make peasants very cautious in their decision making.

Lipton coined the term 'survival algorithm' to describe the strategy adopted by peasant farmers to overcome disasters [72]. He argued that peasants are of necessity risk averse, because they have to ensure their household needs from the current production or face starvation. There is no room for aiming at higher income levels by taking decisions with a higher risk [70, 71, 72].

A few studies have attempted to analyze the risk taking behaviour (e.g. [17, 18, 34]). Some concluded that peasants are, indeed, risk averse (e.g. [18, 91, 92, 135]). Others reported that peasants are not risk averse at all; for instance, Roumasset [105] concluded that peasants are ready to gamble and they do take risks.

The theory of the risk-averse peasant holds that, if the sources of risk are removed, peasant agriculture could develop. The major argument here is to introduce measures to mitigate the ravages of nature, e.g., by introducing irrigation [71, 72, 73]. Risk aversion behaviour does not preclude efficiency. Some researchers have concluded that peasants could maximize profits within the constraints of risk aversion criteria (see [39, p. 26], [92, p. 88]).

Nonetheless the theories do tend to ignore the social relations of peasant production. For instance, they neglect the existence of non-market forms of economic interaction that are helpful in reducing the effect of uncertainty, such as the social security of the family, the village and the clan provide in the face of disaster. However, the theory does hold when a disaster affects the whole community as in drought.

Scott [112] approached the problem from a different point of view and came up with a theory that emphasised the collective action of peasants as opposed to the isolated peasant household framework. He started his analysis with the premise that the peasant household and the community as a whole have a 'subsistence ethic' (safety first), which compels them to strive for survival in the face of uncertainty about food. In this regard he wrote that:

> (t)he amount of rice a family could produce was partly in the hands of fate, but the local tradition of seed varieties, planting techniques and timing was designed over centuries of trail and error to produce the most stable and reliable yield possible under the circumstances... Patterns of reciprocity, forced generosity, communal land, and work-sharing help to even out the inevitable troughs in a family's farm resources which might otherwise have thrown them below subsistence. [112, pp. 2-3].

Thus, he identified two aspects of peasant production as major determinants of the system: striving to achieve stability of output in order to attain security; and, the development of a set of social relations with a redistributive character to mitigate extreme hardship during unfavourable periods.

Scott did not accept that peasants are driven by a profit maximization motive. He even explained peasant uprisings as being a reaction of peasants when this security of subsistence is threatened by the introduction of institutions such as colonialism, the market, etc. Popkin [100], in contrast, questioned Scott's approach. He argued that peasant uprisings were caused by the desire of peasant households to improve their economic status (not to maintain subsistence production as Scott argued) and increase their political power.

Sharecropping peasant arrangements (both viewed from the point of view of the peasant and the landowners) as well could fit into the category of risk aversion theories. In sharecropping, land rent is fixed as a percentage of total physical output obtained. To a risk averse peasant this is an acceptable arrangement as it ensures that the peasant pays only if crops are forthcoming. Sharecropping had been investigated extensively by economists since the 1960s (see for instance, [12, 19, 22, 26, 121, 123, 125]).

2.3.3. Utility Maximization Theories

There are a number of utility maximizing theories that have been applied to peasant production behaviour. Here, attention is devoted to only one, that of Chayanov's Theory [128].

Chayanov's peasant household model relies on two key elements labour and income, where labour has a disutility while income has utility. Income is a function of labour and stated formally this takes the form:[5]

Maximize:

$$U = u(L, Y)$$

$$\partial U/\partial L < 0 \; ; \; \partial U/\partial Y > 0 \quad \text{(this condition ensures that the indifference curves are convex towards the origin where the maximum L is reached).} \qquad (1)$$

where U is utility
L is labour time
Y is income

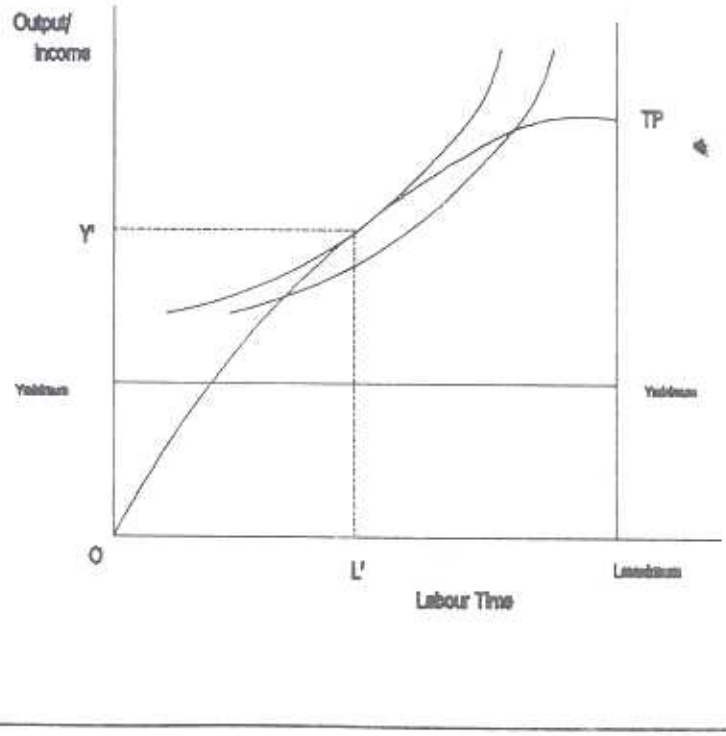
Subject to:

$Y = f(L, P)$; $Y \geq Y$ minimum subsistence; $L \leq L$ maximum labour time physically possible

where P is price.

Chayanov assumed that there is no labour market; farm output valued at market prices may be consumed at home or sold; there are no restrictions on the amount of land available for cultivation; and a social norm determines the acceptable income level per person. Chayanov's model is summarized in Figure 1.

Figure 1. Optimal labour and income level conditions in a family farm



Source: Nakajima [90]

Output or income is depicted on the vertical axis and labour time on the horizontal axis. Total labour time can be used either for leisure or for work. Hence OL' gives the work time. The curve TP depicts the production function (or the family income curve). The consumption behaviour is represented by indifference curves (I) describing given amounts of utility provided by combining leisure and income. The indifference curves are assumed to be horizontal below minimum income levels necessary for the household, as no amount of leisure can compensate for loss of income below this level; and they are assumed to be vertical once L maximum is reached, because it is impossible to increase labour time what ever income is offered. Assuming that it is the production function which is the main constraint, the solution will be where the marginal rate of technical substitution of leisure for income equals the marginal value product of labour.

2.3.4. The New Household Farm Models

The new household farm models have been popular since the 1960s, after the resurgence in the interest to reinterpret Chayanov. Most of the recent studies in this field are associated with the World Bank. We will look at one of the basic and important models in the field.

The new household models start by dropping two major assumptions of Chayanov: non-existence of labour market and unlimited supply of land. This has a major impact on the decision making process of the household as shown below. The household models usually incorporate the 'new home economics' [14] theory to the basic structure developed by Chayanov (later modified by other economists, see [85, 86, 89, 90, 113]). Accordingly the utility function of the household represents its preference ordering between a range of final characteristics of home produced goods and services. The household is conceived as a production unit (instead of a consumption unit) which converts purchased goods and services as well as its own resources into use values or utilities (called Z goods) when consumed.

Nakajima held that the degree of subsistence consumption of own output and family labour usage as proportion of total labour employed could be used as a criteria to identify any farm. In the extreme case where all output is consumed by the household

and all labour is family labour we have pure subsistence production and in the other extreme we get the pure commercial farm where all output is sold and all labour is employed labour. All the rest farms fall in between these two extremes. Nakajima used

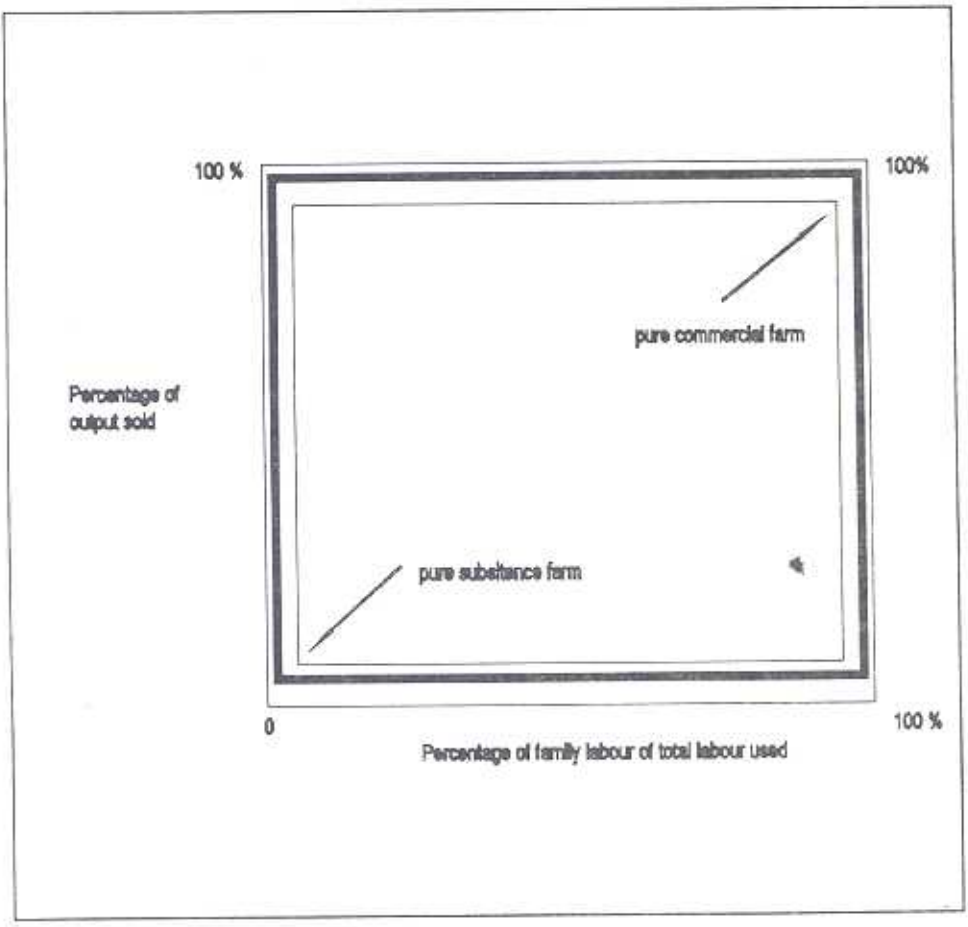


Figure 2. Nakajima's Criteria for Classification of Family Farms.

a two dimensional plane (positive quadrant) to identify any farm in the world (see figure 2).

According to this model the farm decision making process could be divided into production and consumption. The decision flows from production to consumption in condition where the peasant family farm is a price taker and where a labour market

exists. In such a condition the decision making process could be regarded as recursive, because time spent on leisure and used in production become independent. Moreover, family labour utilization will be directly linked to the market determined wage rate. The decision process is shown in figure 3.

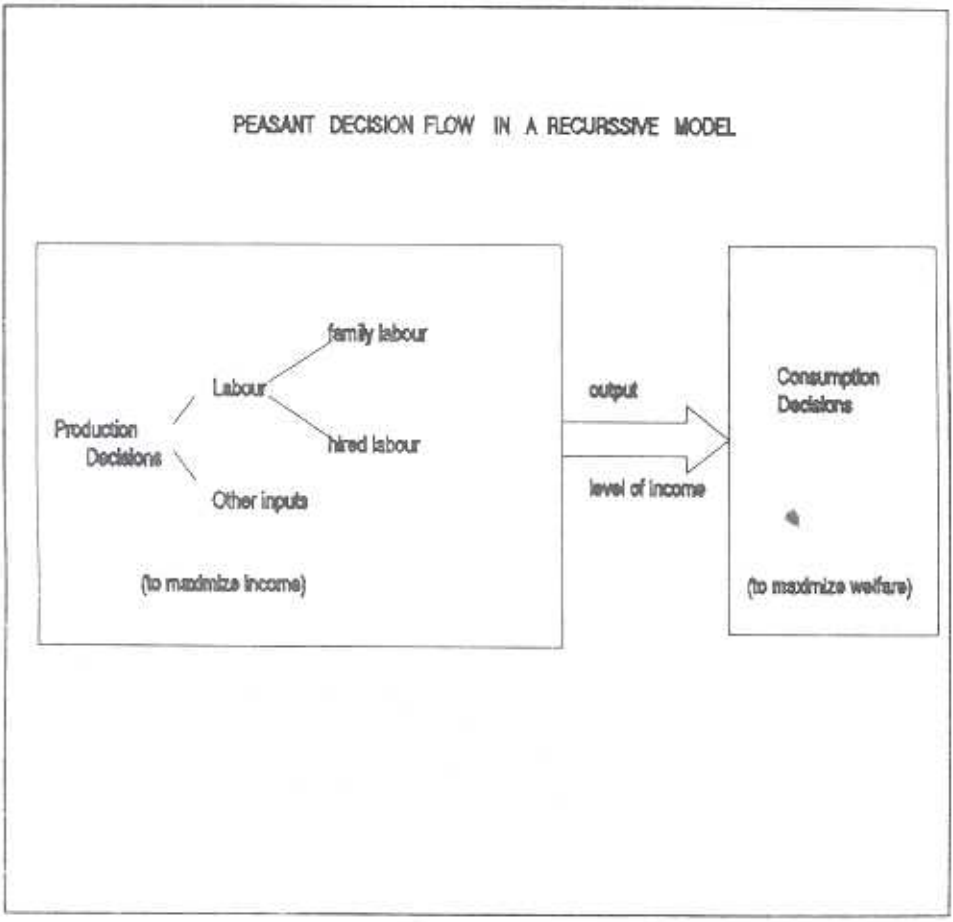


Figure 3. Peasant Decision Making Process under Recursive Model Assumption

Once such an assumption is made, income is singled out as the only link between production and consumption. In the absence of the labour market, the decision may not be recursive because the family will be left to decide on the percentage of its total

available time to be devoted to production (the difference being assumed to be on leisure).[6] Hence the separability condition between consumption and production does not exist. The decision process becomes circular as consumption affects income and income affects consumption. A synthetic model (presented below) combining both on farm consumption and labour market (based on Nakajima's model) has been widely used.[7]

For any production cycle, a farm household is assumed to maximize a utility function[8] (U):

$$U=U(X_a,X_m,X_l) \tag{2}$$

Where X_a = agricultural staple
X_m = a market purchased good
X_l = leisure

U is maximized subject to the following constraints:

i) a cash income constraint:

$$P_mX_m=P_a(Q_a-X_a)-P_l(L-F)-P_vV+E \tag{3}$$

Where P_m = price of the market purchased commodity
P_a = price of the staple
Q_a = the household's production of the staple
Q_a-X_a = the household's marketed 'surplus' staple
P_l = the market wage rate
L = total labour input
F = family labour input
L-F = net labour sold or bought
V = a variable input (fertilizer)
P_v = price of the variable input
E = nonlabour and nonfarm income (it decreases when a family makes payments such as taxes and increases as the family gets income from outside, example children working outside the area sending money to the family)

ii) Time constraint:

$$X_l + F = T \tag{4}$$

Where T is the total stock of household time.

iii) Production constraint (the production function):

$$Q_a = Q\ (L,V,A,K) \tag{5}$$

Where A = the household's fixed quantity of land and K is its fixed stock of capital.

These three constraints can be collapsed into a single constraint by substituting the production constraint into the cash income constraint for Q_a and substituting the cash income constraint for F.

Where :

$$p_m X_m + p_a X_a + p_l X_l = p_l T + \pi + E \tag{6}$$

$$\pi = p_a Q_a(L,V,A,K) - p_l L - p_v V$$

and is a measure of farm profit.

In equation (6) $p_m X_m$ = expenditure on market good

$p_a X_a$ = 'purchase of own product'

$p_l X_l$ = 'purchase of its own time' in the form of leisure.

Hence the left hand side of equation (6) is 'total household expenditure'. The right-hand side is Becker's 'full income' [14]. Maximization of total household utility subject to the single constraint yields the following first-order conditions:

$$p_a \frac{\partial}{\partial} \frac{Q}{L} = p_l \tag{7a}$$

$$p_a \frac{\partial Q_a}{\partial V} = p_v \tag{7b}$$

$$\frac{\partial U}{\partial X_a} / \frac{\partial U}{\partial X_m} = \frac{p_a}{p_m} \tag{8a}$$

Plus the constraints. Equations 7(a) and 7(b) show that the household will equate the marginal revenue products for labour and fertilizer to their respective market prices.

$$\frac{\partial U}{\partial X_l} / \frac{\partial U}{\partial X_m} = \frac{P_l}{p_m} \qquad (8b)$$

Provided second order conditions are met, only L and V appear as endogenous variables and the other endogenous variables, X_m , X_a, X_l, do not appear, therefore, do not influence the household's choice of L or V. Farm labour and fertilizer demand can be determined as a function of prices (p_a, p_l, and p_v), the technology parameters of the production function, and the fixed area of land and quantity of capital. Equations 7(a) and 7(b) represent the standard conditions for profit maximization.

The maximized values of profits can be substituted into equation (2) to get:

$$p_m X_m + p_a X_a + p_l X_l = Y* \qquad (9)$$

Where Y* is the value of full income associated with profit maximizing behaviour. Equations (8a), (8b) and (9) can be regarded as second maximizations. The household having maximized profits [equations (7a) and (7b)], the household then maximizes utility subject to its (maximized value) of full income. Equations 8a, 8b and 9 can then be solved to generate the demand equations for X_m, X_a, and X_l as functions of prices and full income. Given the assumptions made about markets, even though the household's production and consumption decisions may be simultaneous, they can be modelled recursively [61, 90, 124].

The theories have serious shortcomings in fully explaining peasant economies. Like the profit maximizing theories they ignore the uncertainty and risk involved in peasant production. The social context in which peasant production takes place is assumed to be given and no attempt is made to incorporate it. When such analysis is backed by such powerful organizations as the World Bank and has the aim of providing advice to policy makers on how to influence production behaviour, it may have serious implications, for instance to income distribution.

Market imperfections are completely ignored. This has significance to prices and analysis based on the prices. Since all the assumptions of neoclassical economics are based on perfect competition and full knowledge of the participants in the market [110],

market imperfections in the peasant societies is likely to weaken the claims of the results of analyses based on the theories.

These new household utility maximizing models are increasing in complexity. Nakajima's original model as compared, for instance, to Pitt and Rosenweig [96] is a much more simplistic model, yet even the latter models could be regarded as oversimplistic and not descriptively realistic. However, given the limitations imposed by mathematical tools available to economists, these have been stretched to the limit. Despite this technical shortcoming, it is claimed that it has proven value in predicting peasant economic behaviour [124].

3. SUMMARY AND CONCLUSION

This paper has offered a review of various theories of the peasant economy. It has been shown that some theories have many features in common. The 'formalist' school, profit maximization and utility maximizing peasant theories, for instance, take efficiency, i.e., profit maximizing in a competitive economy, as a central issue in their analysis. It has been alleged that the high risk and uncertainty faced by subsistence producers erode the theoretical basis of these theories. In contrast to the profit maximizing assumption, 'risk averse' peasant theory, 'Substantivist' theory and some of the political economy theories argued that the aim of peasant production is to avoid risk in the production of household food requirements. Substantivists argued that profit is alien to peasant producers. The political economy theorists posed profit maximization as an objective of the sectors that use the peasant producers as sources of surplus (i.e., the capitalist sector), not the objective of the peasant producers. Still others argued that 'risk aversion' behavior does not preclude profit maximization behavior. According to these theorists, peasant production could include profit maximization on specific products as well as maintaining risk aversion on subsistence food production.

Some of the theories, for instance the political economy theories, assume that peasant production is a transient production system. This assumption is a point of departure for the analysis of peasant production by Marxists and Neo-Marxists. Others

too assume that peasant production would give way to modern production systems as it did in Europe, converting itself from subsistence to commercial producer.

No theory can be said to fully explain all aspects of peasant production; indeed, for the present, all of the theories may have relevance in explaining different aspects of the peasant economy.

NOTES

1. These characteristics have been taken from different sources as shown and none of the definitions is comprehensive enough to include all the characteristics. Arguably, the most important definitions have been the ones given by Kroeber [64], Redfield [102], and Wolf [134].

2. Rogers gives thirteen characteristics based purely on the attitudes and cultures of peasants [104].

3. It is important to note that these theories are not mutually exclusive, and the categories used here are based on the major themes contained in the theories described.

4. For the writings of Marx regarding social development and the peasants see the following writings in Marx, K. and Engels, F. [80]

a) *Grundrisse: A contribution to the critique of political economy.*
b) *The German ideology* (Section I)
c) *Capital* (Vol. I, II, III)
d) *Eighteenth Brumiere of Louis Bonaparte* (sect. iii-iv).

Lenin [68] argued that the peasants in Russia were already under the grip of capitalist development and were doomed in the pre-Bolshevik period. A detailed anaysis of the writing of classical Marxists is given by Hussain and Tribe [59].

5. This basic model was later modified by Mellor [85], Sen [114] and Nakajima [89, 90]. But the basic structure in these works remains the trade off between total factor income and leisure, even though the constraint of 'absence of a labour market' was removed from these latter works unlike Chayanov's basic model.

6. The time spent ill by ill persons cannot be classified as leisure.

7. The following works could be cited as examples:

Country	Author(s)
India	Yotopoulos & Lau [137]
Taiwan	Lau, et al. [67] and Yotopoulos et al. [136]
Japan	Kuroda & Yotopoulos [65] and Kuroda [66]
Malaysia	Barnum and Squire [13]
Korea	Ahn [5]
Sierra Leone	Varian [129]
Ethiopia	Teklu [126]
Thailand	Adulavidhaya, et al. [3]

8. The presentation and notations closely follow Strauss's work that presents the utility and production functions of the family peasant farm as a recursive model (see [124]). However references are made to other works to clarify the presentation. The diagrams that are drawn to illustrate some of the points in the model are taken from Nakajima [90] with some adaptations.

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የቅሪና መዝገበ ቃላት

Glossary of Economic Terms

ክ 21-50 ቁጥር የተሬቡ ቃላትና ትንተና

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The presentation of coinages in this issue is going to be slightly different. Although the principles and methods of the coinages remain the same, the illustrative examples given in sentences in the first issue are omitted here. Comments on the coinages are made whenever found necessary, however.

21. DEMAND (n)	ተፈላጊነት (ስ)
22. DEMAND CURVE (n)	የተፈላጊነት ኩርባ (ስ)
23. DERIVED DEMAND (n)	ተሸጋጋሪ ተፈላጊነት (ስ)
24. QUANTITY DEMANDED (n)	የተፈላጊነት መጠን (ስ)
25. DEMAND FUNCTION (n)	የተፈላጊነት ግብረት (ስ)
26. DEMAND SCHEDULE (n)	የተፈላጊነት ሰንጠረዥ (ስ)
27. INCOME (n)	ገቢ (ስ)
28. WAGE (n)	ምንዳ (ስ)
29. SALARY (n)	ደመወዝ/ደሞዝ (ስ)
30. REVENUE (n)	ገቢ (ስ)

31. HOUSEHOLD INCOME (n)	የቤተሰብ ገቢ (ስ)
32. GOVERNMENT REVENUE (n)	የመስተዳድር ገቢ (ስ)
33. FIRM INCOME (n)	የንግድ ገቢ (ስ)
34. NOMINAL INCOME (n)	የይስሙላ ገቢ (ስ)
35. REAL INCOME (n)	እዉነተኛ ገቢ (ስ)
36. GROSS INCOME (n)	ያልተጣራ ገቢ (ስ)
37. NET INCOME (n)	የተጣራ ገቢ (ስ)
38. DISPOSABLE INCOME (n)	ተከፋይ የቤተሰብ ገቢ (ስ)
39. TASTES OR PREFERENCES (n)	ምርጫ/ምርጫዎች (ስ)
40. CHANGE IN DEMAND (n)	የተፈላጊነት ለዉጦች (ስ)
41. SHIFT IN DEMAND CURVE (n)	የተፈላጊነት ኩርባ ለዉጦች (ስ)
42. CONSUMABLE (adj.)	ተጠጪ (ቅ)
43. CONSUMPTION (n)	ፍጆታ (ስ)
44. CONSUMER (n)	ጠጪ (ስ)
45. SUPPLY (n)	አቅርቦት (ስ)
46. SUPPLIER (n)	አቅራቢ (ስ)
47. SUPPLY SCHEDULE (n)	የአቅርቦት ሰንጠረዥ (ስ)
48. SUPPLY CURVE (n)	የአቅርቦት ኩርባ (ስ)
49. SUPPLY FUNCTION (n)	የአቅርቦት ግብረት (ስ)
50. QUANTITY SUPPLIED (n)	የአቅርቦት መጠን (ስ)

ትንተና

1. The coinage <u>ተፈላጊነት</u> for 'demand' is derived from <u>ፈለገ</u> 'he (it) wanted'. The passive form is <u>ተፈለገ</u> 'it (he) is wanted'. In English the nominal 'demand' and its verbal counterpart '(to)

demand' are formally identical. The origin of both according to the 1961 edition of Webster's New Collegiate Dictionary, is the Latin detmandare 'to commit to one's charge, command'. The verb 'to demand' is a transitive verb having the meaning of, according to the Advanced Learner's Dictionary of Current English, (1) 'ask for (something) as if ordering, or as if one has a right to' or (2) 'need, require'. ፈለገ is also a transitive verb but the passive ተፈለገ 'it (he) is needed or required' expresses the concept that something has 'demand' or there is a high 'demand' for it. The derived nominal ተፈላጊነት therefore expresses the concept of the English technical term 'demand' but in the passive. Look at the following examples and their Amharic equivalents:

a. The demand for fish this month exceeds the supply.

የዚህ ወር የአሳ ተፈላጊነት ከአቅርቦቱ ይበልጣል።

b. The demand for skilled workers is high; but there is no demand for unskilled ones.

የሰልጠኑ ሰዎች ተፈላጊነት ከፍተኛ ነዉ ፣ ነገር ግን ያልሰለጠኑት ተፈላጊነት የላቸዉም።

c. There is a high demand for butter these days.

ሰሞኑን ቅቤ ከፍተኛ ተፈላጊነት አለዉ። (ሰሞኑን ቅቤ ፈላጊዉ ብዙ ነዉ።)

The above examples illustrate that what some words express in the active vioce in English can be expressed in the

passive in Amharic. In English, the word 'demand' looks at what is 'needed or required' from the point of the person who needs or requires the thing but in Amharic the same idea is expressed from the point of the thing that is needed or required. Once the term for 'demand' is found, therefore, the rest will fall into line.

2. Income, revenue

A single Amharic word ገቢ is used to represent both the English terms revenue and income. Some may argue that we need separate coinages for each term. It is not actually necessary. Some languages have single words for which others have more than one. For example, the English word you is used in contexts where Amharic uses four: አንተ ፡ አንቺ ፡ አርሰዎ ፡ አናንተ. Similarly, the technical term 'solution' has different meanings when used in mathematics and chemistry. In fact, even the English words revenue and income mean the same conceptually but English used revenue because it got it from the Latin. Income is native and refers to something that comes in, identical to the Amharic ገቢ. In Latin, revenue is constituted of two elements re + venire 'to come'. So, the Amharic word ገቢ can accommodate all the ideas that the two English terms express without difficulty.

3. Two other words that need comment are ግብረት (No. 25) and አልጠት (No. 40). The word ግብረት is a Geez word. It is related to ተግባር which is commonly used in Amharic. We could have used this

an acceptable one. No acceptable form could be derived for 'consumer', however. Logically, if ነጂ 'driver' can be derived from ነዳ 'he drove', ፈጂ 'consumer' can be appropriately derived from ፈጀ 'he consumed'. But ፈጂ does not seem to be readily acceptable as is ነጂ. Therefore, we found ሸማች to be an appropriate, and hopefully acceptable, term for 'consumer'. We also found it to be an appropriate counterpart of the word አምራች 'producer'. A word for 'consumable' can thus be derived from ሸማች. We found such a word in the form of ተሸማች and this word can thus be used for 'consumable'.

Terms such as ደሞዝ 'wage', አቅርቦት 'supply', ፍጆታ 'consumption' have been familiarized, especially during the revolution. The terms የአገር ውስጥ ገቢ 'inland revenue' and ደሞዝ 'salary' had been in popular use even before the revolution.

ERRATA

Inside cover page under 'contents': last name Takele Tadesse should read Takkele Taddese. Glossary of Economic Terms Nos. 01-02 should read Nos. 01-20.

Consistency should also be maintained in writing the numbers to identify the coined technical terms. For example, 0 precedes all the numbers from 1-10, except nos. 3, 4, 5.

The Amharic syllabic letter ኽ has not also come out clearly in nos. 3 and 7. The coinage for no. 2 was originally given as ክግኔ, which patterns with such Amharic words as ቁሳቁስ, ዝግጁ, ፍትግ, etc. Instead, the word ክምን, which patterns with ክምር, ጽምር, ስርዝ, ጽልዝ, etc., is opted for. ክግኔ is preferable, however, because the derivations in 3 ክግኔያዊ, and in 7 ኢክግኔያዊ can be symmetrical with it.

Moreover, since there is a certain degree of subjectivity in either accepting or rejecting a coined term, the word ክግኔ sounds better in ክግኔ ክፍል 'economy class' than የክምን ክፍል.

Top of p. 104 (line 2) cosonants = consonants

Bottom of p. 104 (line 23) *unfortunatly = unfortunately

Bottom of p. 105 (line 11) word = words.

Notes to Contributors

1. Draft articles (for publication in the EJE are sent the editor in triplicate, typed double-spaced and on one side only of an A4-size paper. Although no strict limits are imposed on the size of an article, current editorial policy limit this to a maximum of 40-50 pages (for text only).

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3. The references used in the article are arranged according to alphabetical order, numbered sequentially in squared brackets and placed at the end under a heading, References. Quoting a specific reference is effected by writing the serial number of the reference in square brackets at the relevant location in the text. Notes are sequentially numbered using numerical superscripts and placed in the section labelled, Notes, before References.

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