LAND REFORM: REVISITING THE PUBLIC VERSUS PRIVATE OWNERSHIP CONTROVERSY

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ABSTRACT

The objective of this paper is to examine the impact of land reform that was carried out in the mid-1970. In the context of the controversy between public and private ownership of land, this study evaluates the impact of the land reform on economic performance in general and agricultural output in particular. This evaluation is made using a medium-size macro-econometric model to trace the feedback effects of this policy on other sectors of the economy. But the study limits itself to the particular period in which the reform was implemented. The results of this study suggest (1) agricultural output would not have been higher if land distribution were not undertaken; but the margin of improvement due to land distribution is minimal; (2) the results of this study are consistent with most of the studies undertaken in that they all seem to suggest an improvement in agricultural performance, at least in the early years of the land reform.

1. INTRODUCTION

One of the central policy challenges facing economies like Ethiopia is the issue of land ownership. This importance emanates from the fact that economic growth, employment and basic survival of the majority of the population depend (at least in the short- to medium-term) on the productive efficiency of the agricultural sector. Unfortunately, there seems to be no fact-based consensus regarding which type of land ownership enhances productive efficiency with a minimum sacrifice of equity.

To implement its "socialist" policies, the then new military government introduced many fundamental economic policy changes after overthrowing the imperial regime in 1974. Among the fundamental policy changes was the redistribution of rural land and nationalisation of manufacturing industries. These policy changes were a significant departure from the land ownership system and the prevalence of private manufacturing industries that had existed until that time. In essence, the land reform changed both land

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ownership and the administration of its distribution. The objective of this study is, therefore, to shed some light on the available evidence regarding the relationship between type of land ownership and agricultural output. More specifically, it will examine the impact of the Ethiopian land reform on the performance of the agricultural sector. That is, it will attempt to answer the question: what would have the performance of the economy been if these policy changes were not undertaken?

To examine the above policy issue the approach that will be followed is what is usually referred to as counter-factual (or causal) analysis. This has been one of the widely used methods in macroeconometric policy exercise (see Challen and Hagger 1983, p. 194). One of the essential feature of this approach is to determine how different the performance of the economy would have been (from what is actually observed) if certain policy changes were or not made in some past period. Given that the control simulation values reasonably mimic the historical values of the target macro variables, then, the deviations of policy induced simulation values (from the control simulation values) represent the effect of the changes in policy.

In order to examine the effects of the structural shifts that were undertaken in the mid-1970s, therefore, the basic control simulation values will be compared with the shocked-run simulation results obtained using the coefficients of the behavioural equations for total output, agricultural output and manufacturing output prior to the change in policy. That is, while the control-run simulation values represent the actual behaviour of the economy, the shocked-run simulation values that are based on the coefficients prior to the policy change represent the effects of the policy change. The difference between the two is the deviation attributed to the policy changes.

The remainder of the paper is organised as follows. The second section will briefly discuss the basic socio-economic indicators in Ethiopia relative to similar economies, and highlight the state of the agricultural sector both before and after the land reform. It will also briefly review the literature. The third section describes the model and estimation results. Policy issues are addressed in the fourth section using simulation exercises. After reviewing the policies undertaken in the mid-1970s as a background, this section will examine the impact of changes in land ownership on the performance of the agricultural sector.

2. THE AGRICULTURAL SECTOR

2.1. Role, Structure and Constraints

Due to its dominant share in GDP, the performance of the agriculture sector significantly influences the performance of other sectors of the economy. For instance, agriculture accounts for more than 80 per cent of employment and 90 per cent of exports. Ethiopia exports exclusively primary products such as coffee, hides and skins, oil seeds and oil

nuts. These exports are the main sources of foreign exchange, and hence capacity to import. Manufacturing output, which depends on imported intermediate inputs, is, therefore, indirectly influenced by the performance of the agricultural sector. Similarly, other macro aggregates, level of employment, rate of inflation, for instance, are also directly influenced by the performance of the agricultural sector.

The performance of the agricultural sector, and hence GDP, has been unsatisfactory, at least in meeting food requirements. And probably due to low agricultural productivity and the population explosion, food availability has been on the decline. For instance, in 1992, the food production index decreased to 86 per cent compared to 1979-1981. This index is lower than both the averages for Sub-Saharan Africa and all LDCs. Further, Ethiopian food imports increased to 15 per cent of total imports in 1992, compared to only 9 per cent in 1970. The respective 1992 figures for Sub-Saharan Africa and all LDCs were 11 per cent and 9 per cent. The relevant question is, which factor contributes more to food insecurity? And more specifically, does institutional arrangements (ownership types) in the rural area matter?

Clearly, the existing food insecurity does not seem to be due to land scarcity. Population density in Ethiopia is about twice that of the Sub-Saharan Africa average, but only about half of the average for all LDCs. Further, since arable land (as percentage of land area) in Ethiopia is twice that of the Sub-Saharan Africa average, a shortage of arable land cannot explain the poor agricultural performance in Ethiopia. The explanation probably lies in inappropriate agrarian policy, and low rates of resource utilisation, rather than land scarcity. According to some estimates,[1] about 65 per cent (or 78.9 million hectares) of Ethiopian territory is considered either fertile, or sufficiently fertile and therefore suitable for agriculture. And with an average population density of 41.2 persons per square kilometre, land scarcity is not a problem in Ethiopia, as is the case, say, in South and South-East Asian countries. In fact, the size of potential agricultural land that is actually utilised is very small. According to Galperin (1981, pp. 169-170), "[i]n the early 1970s, the area of cultivated land constituted about 10.5 million hectares or 9.3 per cent of the country's territory; ...and in the late 1970s, this area had decreased to approximately 8.7 million hectares, 3.2 million hectares constituting long fallows". Similarly, Griffin (1992, p. 52), on the basis of a relatively recent survey, concluded that, without even introducing any irrigation system or any other technological change, the stock of cultivated land in Ethiopia could be increased by an additional 18 to 22 per cent.

Another low resource utilisation example is the absence of developed irrigation systems in Ethiopia. Only 1.2 per cent of the total arable land is irrigated in Ethiopia, compared to 3.4 per cent in Sub-Saharan Africa and about 23.8 per cent in all LDCs. Being rain-fed, therefore, agricultural output in Ethiopia is vulnerable to rainfall fluctuations, as witnessed by the repeated occurrence of drought over the years. To focus on the issue at hand, in addition to low resource utilisation, backward farming techniques, and inappropriate agrarian policy, the land tenure system is also believed to have contributed

to the poor performance of the agricultural sector. To highlight this point, a brief review of the land ownership structure before and after the 1975 major land reform is in order. Due to regional variations and intricate land ownership and land use relationships within a region, the Ethiopian land ownership system that had existed prior to the 1974 revolution defies any clear classification[2]. Ignoring the intricacies within each tenure system, Rahmato (1984, p. 23) identifies two major land ownership patterns: usufructuary tenures and private tenures. Usufructuary tenure system includes all the land under communal (kinship based), church and state ownership. And the private tenure refers to all the land owned by (originally taken away from peasants and then given to) powerful officials and loyal servants of the imperial government. The term "private" here is misleading because in essence what is termed private land is distributed by the state to individual owners.

No accurate data is available on the proportion of cropland under the respective tenure systems. And what is more, the extent of tenancy which was the main argument for abolishing the land tenure system that had existed prior to 1975 is not well documented at a national level. The sketchy evidence available, based on official survey carried out just before the 1975 land reform, is reported in Table 1. According to this survey, about 33 per cent of the cropland and 36 of total landholdings were in the hands of tenant cultivators. Rahmato (1984, p. 22) cites other estimates that put tenant holdings ranging from 42 per cent to well above 50 per cent of total rural landholdings. Whatever the share of tenant holdings was under the pre-1975 land tenure system, it was not conducive for improving agricultural output. Rahmato (1984, p. 25) noted, "[f]or all tenants, the major factor for their dependency, and the chief obstacle to improved production was the lack of security of tenure. Each share-cropper was never certain how long he would cultivate his holding, or when he would be told to give it up."

Table 1. Pre-1975 Distribution of Holdings by Tenure and Area of Control- %

{PRIVATE }Tenure type	% of Total Holding	% of Total Cropland Area
Communal	11	6
Owned and rented	15	24
Tenant Operated	36	33
Owner Operated	38	37

Source: Rahmato (1984, p. 23), Table 2.

The 1974 revolution fundamentally changed both the landholding system and the land/tenant relationship. After overthrowing the monarchy in 1974, the then military government nationalised rural land in 1975. The No. 31/1975 land reform provision, known as the "Public Ownership of Rural Land Proclamation", declared, among other things, that rural land is a property of the state (Article 3) and prohibited both private ownership of rural land and the transfer of its ownership in any form (sale, exchange, lease, etc.) and for any reason (Article 4). The declaration also prohibited hiring of

agricultural labour by private individuals (Article 5), thus ending not only tenancy but also whatever insignificant "wage" labour that might had existed.

The government also established Peasant Associations to administer land distribution among local farmers who were given access to use, but not to own, the land. Each Peasant Association was organised as part of the central government bureaucracy whose function extended to implementing government policies related to land over an area of 800 hectares and about 2400 families. According to Mulat (1990, p. 57): "[b]y the end of 1985 there were a total of 20,157 Peasant Associations with a membership of about 6 million households covering about two-thirds of the country's rural population". The nationalisation of rural land and the transfer of its administration to local Peasant Associations contrasted with the private ownership of land (mainly landlord/tenant relationships in the south and family ownership in the northern half of the country) that had existed prior to 1974. When the land reform was implemented, about 94 per cent of agricultural output was produced using primitive techniques while the mechanised sector produced the remaining 6 per cent. The few mechanised large agricultural estates producing cash crops were not distributed to individual farmers, but instead put under direct state control when land was nationalised.

In essence, the above measures gave each farmer access right (short of ownership) to a piece of land (up to a maximum of 10 hectares for each self-cultivating rural household). Hence, this freed many rural farmers from being a tenant of absentee landlords (who had been entitled to extract from one-third to one-half of tenant output), at least in the southern part of the country. But the reform also meant frequent redistribution of land among respective inhabitants as the size of the population increased. Consequently, lack of security in land holdings due to the periodic re-distributions and the decrease in the size of allocated land as population increased led to over-utilisation of the cultivable land, with less concern for its appropriate development. That is, there was no incentive for farmers to pay attention to crop-rotation, planting or protecting available trees to safeguard against soil erosion, and other related efforts that affect the future productivity of the land. It is clear, therefore, despite their contrasting structures, both land tenure systems have failed to address the insecurity in landholding.

In addition to nationalisation of rural lands, the government also established the Agricultural Marketing Corporation (AMC) with a mandate to supervise the production and sale of agricultural output. Through this corporation, as Griffin (1992, p. 66) observed: "[t]he government has attempted to control the prices of major agricultural products, particularly food grains, through direct intervention. In addition, it has a monopoly of the distribution of fertiliser and thus is able to control its price directly."

As is clear from Table 2, the price differential between AMC farm-gate and selling prices is substantial. For instance, the AMC average selling price for Teff, Wheat, and Barley

was higher by about 50, 64.4 and 66.6 per cent, respectively, than the AMC farm-gate prices.

Even if one attempts to justify government intervention on equity grounds and/or price stabilisation, therefore, such a huge gap between what farmers earned and what government charged for their produce represents a substantial "hidden" tax. This is particularly true compared to what farmers could earn selling in free market prices. The gaps between free market and farm-gate prices averaged 162 per cent, 155 per cent, and 256 per cent for Teff, wheat and barley, respectively.

It should be noted that, despite some arguments about the government's political motives in undertaking the land reform and its implementation, the nationalisation of rural lands was well received especially by the majority of peasants and intellectuals who had been demanding for such a change for a long time. As the government started to strengthen its control over the production and the marketing of agricultural output, however, even the peasants who were supposed to be the main beneficiaries of the reform, started to lose their enthusiasm. As Rahmato (1984, pp. 66-67) noted: "[t]he price system for agriculture has not been favourably received by a large number of peasants. Peasants felt particularly resentful of the unfavourable price structure, and for comparison they pointed to a long list of goods whose prices had gone up sharply within the last five years. [W]hether or not peasants were accurate in their view that prices of many manufactures and other items at the village market have risen sharply is not the main point: the main point is the growing conviction among peasants that they are not offered commensurate prices for their products."

Table 2. Wholesale Prices of Grain (Birr per Quintal), 1989

{PRIVATE }Grain Type	AMC Farm-gate price	AMC Selling Price	Free Market average price
Teff			
white	48.0	69.55	124.83
mixed	41.0	61.90	112.00
red	37.0	57.55	93.67
Wheat			
white	36.0	57.55	110.6
mixed	32.0	53.15	74.00
black	31.0	52.10	67.83
Barley			
white	30.0	49.90	115.00
mixed	28.0	47.70	63.50
Maize	22.0	44.45	52.00
Chicken peas	30.0	49.90	135.67
Lentils	45.0	66.30	186.50

Source: Abraham (1994), Table 3, p. 209.

The initial enthusiasm generated by the land reform seems, therefore, to have lost its momentum since it was accompanied by inefficiencies in the distribution of inputs and unfavourable pricing structures for both agricultural inputs and outputs.

Other possible factors that might have contributed to poor agricultural performance include: Outdated farming techniques, lack of imported agricultural inputs, ecological degradation of potential arable land, and high underemployment due to relative increase in population. Land cultivation techniques have not significantly changed for decades (maybe centuries) in Ethiopia.

Traditional farming methods which use rudimentary implements (a wooden plough, sickle, etc.) are still the dominant farming methods. Usage of fertiliser, soil conservation methods and other modern agricultural techniques are at their embryonic stage. For instance, according to Mengisteab (1990, p. 106), in 1983-1984 the proportion of farmers using fertilisers, improved seeds and pesticides were 14 per cent, 2 per cent and 0.5 per cent, respectively. Similarly, during the same period, the proportion of fertilised area and new seed area were 12.3 per cent and 1.3 per cent of the total cultivated area, respectively. The situation improved in recent years, but is still low even by African standards. In 1993, for instance, fertiliser consumption per hectare in Ethiopia averaged about 2.3 kilograms compared to 4.6 kilograms for all-Africa.

Table 3 CROP YIELD BY TYPE OF FARMING

(PRIVATE)Ownership & Crop Type	1973/74*	1979/80	1981/82	1983/84	1984/85	1985/86
PEASANT:						
Teff	8.0	9.5	8.2	8.3	6.8	7.5
Barley	10.6	11.7	12.0	10.9	10.7	10.0
Wheat	10.1	11.1	10.1	10.5	10.3	9.8
Maize	43.8	17.3	18.2	18.7	11.4	11.4
Sorghum	19.0	16.2	14.7	13.3	6.1	11.0
Pulse	--	12.1	10.6	9.5	6.9	7.1
CO-OPERATIVE:						
Teff	N/A	7.2	5.0	7.2	5.4	5.8
Barley	N/A	8.3	9.1	1.9	7.7	7.8
Wheat	N/A	7.4	8.2	8.5	6.4	9.3
Maize	N/A	20.2	7.7	13.4	9.6	8.9
Sorghum	N/A	3.8	8.5	11.4	8.3	11.0
Pulse	N/A	5.6	4.6	6.1	3.4	5.2
STATE:						
Teff	N/A	5.8	5.6	4.2	2.8	5.6
Barley	N/A	13.5	18.7	12.1	12.8	16.4
Wheat	N/A	11.9	13.1	13.3	14.8	16.3
Maize	N/A	23.3	27.8	21.3	24.2	24.2
Sorghum	N/A	11.8	14.1	9.1	9.9	5.1
Pulse	N/A	4.6	3.4	3.5	3.6	3.0

Source: Abraham (1994), Table 4, P. 200, and Mengisteab (1990), Table 4.4, P. 78.
Mean yield of unfertilised hectare;
N/A = not applicable.

How much of the decline in per capita food consumption is due to an increase in population, shortage in rainfall or decline in output due to the above policies is hard to discern. Whatever the contribution of each of these factors, Table 3 indicates a declining trend of agricultural output especially beginning the early 1980s. Crop yield (measured as quintals per hectare), was about the same (except for maize) in 1973/74 and in 1979/80, in peasant farming. Beginning the early 1980s, however, yield for most crops declined for all ownership types. For instance, Teff (the staple cereal), probably the most labour intensive among the crop types, declined over the indicated period. And the decline was more significant in state-operated farms than the other two ownership types. Peasant farming consistently outperformed both the co-operative and state-operated farming in terms of the productivity of teff. Given the government's monopoly over the distribution of fertilisers and pesticides, the low productivity in state operated cultivated land suggests bureaucratic inefficiencies in managing the state farms. The overall decline in agricultural output beginning in the early 1980s also coincided with implementation of farm co-operatives.

In summary, it seems, the traditional farming techniques, combined with unfavourable land tenure system prior to 1975, inappropriate agrarian policies (pricing, farm input supply, etc.) since 1975, and sporadic drought occurrences have kept the performance of the agricultural sector below its potential.

2.2. Land Reform Policy Issues: An Overview

The land reform that was carried out in 1974 was radical in the sense that it fundamentally changed both the ownership of rural land and the way it is administered. In short, private ownership of land and tenancy (rent payment to landlords and sharecropping) were abolished without any compensation to previous owners of the land. In essence, the proclamation ended a feudal order and the corresponding land tenure system that had existed for decades, and in some regions of Ethiopia for centuries.

The justifications given for undertaking the land reform were both political and economic. In declaring the land reform (Proclamation No. 31/1975), the government stated that, "[i]n countries like Ethiopia where the economy is agricultural, a person's right, honour, status and standard of living is determined by his relation to the land". It is, therefore, essential, the declaration continued, " ...to fundamentally [sic] alter the existing agrarian relations so that the Ethiopian peasant masses ...be liberated from age-old feudal oppression." Whatever the conviction of the government in liberating the peasants from the feudal land tenure system, its political motive is unmistakable. Prior to 1974, the vocal left-wing movement (which included sporadic peasant uprisings, constant student protests, the labour movement and the teachers union, among others) had been demanding a land reform, "land to the tiller", and other political changes for years. In fact, according to Mengisteab (1990, p.13), "[i]n the 1970s, most of the literature on Ethiopia's agriculture emphatically claimed a causal relationship between the land tenure

pattern that existed prior to 1975 and the stagnation of the country's food production". The initiative to reform the land tenure system was, therefore, in tune with the demands of the political movements in urban areas and the landless peasants in the rural areas. Consequently, the land reform declaration was well received by opposition groups and especially by the peasants in the southern part of the country, where tenancy was relatively widespread. By championing the very issue that was at the centre of the political opposition, therefore, the government managed to put its political opponents on the defensive. Despite their scepticism on the motives of the government and its commitment to implement it effectively, they had no choice but to support the declaration of land reform in principle (Mengisteab, 1990, p. 87).

Whether the government shared the conviction that land reform was necessary to improve the economic performance of the agricultural sector (as its declaration states), or it was drawn into it to pacify its political critics and potential peasant uprising (as its critics claim) is hard to determine.[3] Whatever other political objectives it might have had, the government's officially stated objectives for undertaking the land reform were, Mengisteab (1990, p. 93), "[t]o free the tenants from exploitation by the landowners, to provide land to the landless in order to generate employment, to eliminate poverty and extreme inequality and also to modify the country's position in the international division of labour". These objectives are not particularly unique to the land reform in Ethiopia. In fact most land reform initiatives include most or all of the above objectives, although the degree of reform necessary to achieve these goals may vary (from simply reforming tenant/landlord relationships to abolishing private ownership of land). As El-Ghonemy (1990, p. 95) correctly put it, "[p]ublicly declared aims (of land reform) are usually in stock phrases such as the abolition of feudalism, exploitation, injustice, absentee landlordism, under-utilisation of land, and of the arbitrary market power of landlords, water lords and money lenders". The main variations in land reform initiatives probably lie in the degree of their comprehensiveness, and the ideological tenet under which they are carried out. The Ethiopian land reform is among the most comprehensive and it was carried out, at least in later years, in the context of what the government claims was a socialist development path.

The debate whether land reform is an appropriate tool to achieve all or some of the proclaimed objectives, and, if so, under what conditions, has been an unsettled issue (Mengisteab 1990, P. 27). Those in favour of land reform argue that land reform is essential for economic efficiency (Berry and Cline 1979), employment generation, income redistribution, economic growth, and hence alleviation of poverty (Dorner 1971, 1992, and Griffin 1981, 1992). The efficiency argument in favour of land reform runs as follows (Berry and Cline 1979): Given that there are no increasing returns to scale in LDC agriculture, large size farms under-utilise land, while small landholdings under-utilise labour. Therefore, land reform which remedies such imbalances will increase efficiency in the agricultural sector. Given the weak industrial sector in LDCs, the agricultural sector accounts for a substantial share of employment. Because large farms

tend to be more capital-intensive than small farms, land distribution is likely to generate more employment. Similarly, land distribution in favour of the landless and tenant farmers will lead to more equitable distribution of rural land, and hence alleviate rural poverty.

Opponents of land reform concede that land reform might be a useful instrument to redistribute income in the short run, but it constrains economic growth. Therefore, they argue, the best way to achieve income distribution is by fostering economic growth in the long run. This conclusion is predicated on two assumptions: First, large-scale farming is more productive than small-scale farming, and tenants are not necessarily less productive than owner-farmers; second, economic growth ultimately reduces poverty and redistributes income. Given these assumptions, therefore, land reform is not the most efficient way of achieving both economic growth and equitable distribution of income, at least in the long run.

Whether land reform increases efficiency, generates employment, fosters economic growth, and alleviates poverty or not is, of course, an empirical question. The empirical evidence over the last thirty years seems, however, inconclusive.[4] The lack of consensus is partly due to (1) differences in measurement across studies, (2) variations in country specific characteristics, and (3) type of reform implemented. For instance, due to type of reform and the degree of commitment to follow through in the implementation process, the economic effects of land reforms in Latin America and some Asian countries are different. Dorner (1992, pp. 29-30) noted, "[e]xperience shows that basic reforms can improve the income share of the poor as well as the growth of the economy. The widely heralded capitalist development and land reforms in Japan, South Korea and Taiwan cannot be ignored as mere coincidences. In all cases, economic growth followed major agrarian reforms." Summarising the experience of Latin American countries (based on various studies), on the other hand Dorner (1992, p.56) states that, "[o]verview of Latin American land reforms over the past thirty years allows no clear and definitive judgement about these efforts. Compared to the East Asian reforms (Japan, Taiwan, South Korea), those of Latin America were of a different order". Dorner attributes some of the differences in the impacts of land reform to differences in the degree of commitment of respective governments in providing farm input and lack of political will to carry through the initiated land reforms.

Despite differences in country characteristics and political ideology under which land reforms are implemented, Mengisteab (1990, p. 34) suggests that there are common attributes of a successful land reform. After evaluating the experiences of Japan, Taiwan, China and Cuba, which are considered to have carried out a successful land reform, he concludes that all four cases had the following common characteristics which contributed to the successful implementation of land reform. These attributes include: (1) in all countries, land was distributed in a comprehensive way and landlessness was either reduced or eliminated; (2) agricultural extension services (fertilisers, improved seeds, pesticides and marketing services) were made available to peasants; (3) multiple

cropping and variety of seeds were made possible by significant advances in irrigation system; and (4) all four countries improved rural living conditions by providing health care, education and other related public infrastructures. In the case of Latin America, Mengisteab (1990, p.35), on the other hand, "[t]he reform sectors were largely neglected. The outcome has been that the expected result of land reform has not materialised."

In summary, the empirical evidence regarding the precise impact of land reform on the above-stated objectives in particular and the performance of the agricultural sector in general is inconclusive. In addition to variations in country-specific attributes and evaluation criteria across studies, the difficulty of arriving at a consensus, it seems, is further complicated by two factors: The complex objectives that accompany a land reform package, and the vulnerability of the agricultural sector to external shocks. That is, given that the objectives of land reform range from equitable distribution of income to growth of agricultural output, it is difficult to evaluate precisely the success of a given land reform in the absence of a ranking scheme to evaluate the various objectives, unless all follow a similar pattern. Further, even if one focuses on a single criterion, say agricultural output, to evaluate the impact of land reform, all natural factors and government policies do not remain the same and, therefore, the comparison could only be suggestive rather than precise. Consequently, conclusions may vary depending on how one views the relative importance of the unmeasurable natural factors or policy issues in influencing agricultural output. Even though these limitations are prevalent in most areas of economic enquiry, they are particularly important in agriculture where weather conditions play a significant role. In the policy experiments that follow, these caveats should be understood.

It has been almost twenty-five years since the land reform was implemented in Ethiopia. And few studies have been carried out to evaluate its impact on the performance of the agricultural sector. These studies will be discussed later in relation to the results of this study. Two points should however be highlighted from the outset. First, there is no consensus on the overall impact of the land reform. For instance, Griffin (1992, p. 3) states that, "[i]t is not possible to calculate the extent to which the reform improved the standard of living of the masses of the rural people, but it is evident that the improvement must have been considerable". Mengisteab (1990, p. 35), on the other hand, concludes that "[E]thiopia's land reform is another unsuccessful case... (and this is because) the distribution of land was not accompanied by favourable allocation of other resources to the peasantry". Second, these studies are descriptive analyses of how the economy performed during the period, with no reference to what the path of the economy might have been had it continued its pre-1974 trend. As will be clear from the design of policy experiment, the objective of this study is, as Griffin (1992, p. 4), suggested to "[c]onsider whether the land reform simulated production above what it otherwise would have been". In addition to the impact of the land reform, the other nationalisation measures undertaken in the mid-1970s will also be included in the

simulation exercise. It is hoped an integrated approach of the main policy initiatives will shed some light on the performance the economy might have had in the absence of these policies.

3. MODEL ESTIMATION AND RESULTS

3.1. Model Estimation

In principle, the econometrics literature provides ample estimation methods ranging from single equation estimators (SIEs) to full information system estimators (FISEs). In practice, however, data and other constraints limit the choice of estimation techniques. The simultaneity of the relationships suggests that an estimator that would use all the information available in the system (say, three stage least squares) is appropriate. This leads, however, to what is usually referred to as "The Undersized Sample Problem" or the degrees of freedom problem, since there are only 27 observations available. The choice is, therefore, limited to either SIEs (OLS, for instance) or any of the limited information estimators (2SLS, instrumental variables, etc.).

Accordingly, an attempt was made to estimate the model using the Cochrane-Orcutt procedure (C-O), instrumental variables and some variations of 2SLS in order to test the stability of the parameters. The analysis will depend, however, mainly on the results obtained from the 2SLS estimates.

Before proceeding to examine the estimated results, it is worth-highlighting that the question of data stationarity (invariance with respect to time) and, therefore, model estimation has gained much attention in recent years. Accordingly, more sophisticated methods to test whether a given economic data series is stationary or not, and corresponding estimating procedures have also been and are being developed. No attempt is made in this paper to use some mutivariate time series model (the Johansen procedure, for instance). This is mainly due to the limitation of the data to lend itself to any appreciable potential lag structure that might be required to establish the degree of integration (the number of times a data series has to be differenced to achieve stationarity).

3.2. Estimation Results

In addition to the relevant identities and definitions, the model contains twenty-two behavioural equations pertaining to four sectors. These sectors include: Output supply, labour demand, aggregate demand, and external sectors. The level of disaggregation adopted is, to some extent, influenced by data availability. Due to space limitations, only the estimation results of the equations relevant for this study (those that relate to the output sector) are reported below.

In reading the results, the following points are worth-noting: the reported R square is adjusted for degrees of freedom, numbers in parenthesis are t-statistics, and 'Ln' is the natural logarithm; D.W. and D.h. are Durbin-Watson 'd' and 'h' statistics, respectively, and D is the serial correlation coefficient.

$$\text{Ln (RY/RFCA)} = \underset{(24.013)}{6.0133} + \underset{(15.15)}{0.78508}\ \text{Ln (STR/RFCA)} - \underset{(3.388)}{0.19196}\ \text{D1} \qquad [1]$$

$\bar{R}^2 = 0.94$ D.W. = 0.5671 D = 0.882 SSE = 0.081775 $\bar{Y} = 1.7799$

$$\text{Ln CUR} = \underset{(0.147)}{0.3105} + \underset{(2.506)}{0.26168}\ \text{Ln (RMNT/RMO}_{-1}\text{)} +$$

$$\underset{(2.659)}{0.11844}\ \text{Ln (RMS/RY)}_{-1} + \underset{(3.076)}{0.47893}\ \text{Ln CUR}_{-1} - \underset{(4.723)}{0.754}\ \text{D1} \qquad [2]$$

$\bar{R}^2 = 0.82$ D.h. = 0.49 SSE = 0.085453 $\bar{Y} = 0.097215$

$$\text{Ln RAO} = \underset{(8.163)}{6.0991} + \underset{(8.382)}{1.2593}\ \text{Ln LAFI} + \underset{.678)}{0.0654}\ \text{Ln RF}_{-1} - \underset{(5.731)}{0.036162}\ \text{T} \qquad [3]$$

$\bar{R}^2 = 0.75$ D.W. = 1.6 D = 0.130 SSE = 0.20832 $\bar{Y} = 8.7907$

$$\text{Ln RMO} = \underset{(2.185)}{1.8437} + \underset{(2.688)}{0.45529}\ \text{Ln LM} + \underset{(2.173)}{0.2647}\ \text{Ln RMNT} + \underset{(4.450)}{0.43753}\ \text{Ln RFCA} \qquad [4]$$

$\bar{R}^2 = 0.51$ D.W. = 0.85 D = 0.705 SSE = 0.20925 $\bar{Y} = 7.1508$

where:

CUR	= capacity utilisation rate (RMO/CMO)
D1	= dummy variable (1975 - 1987 = 1)
LAFI	= agricultural labour force index (1980=100)
LM	= labour force in manufacturing-thousands of individuals
RAO	= real agricultural output - million birr
RF	= rainfall-millimetres
RFCA	= real capital stock, adjusted for capacity utilisation-million birr
RMNT	= real imports of intermediate inputs-million birr

RMO	= real manufacturing output-million birr
RMS	= real total money supply (currency + demand deposit)-million birr
RY	= real total output at factor cost-million birr
STR	= total employed labour force in millions of individuals
T	= time trend

The above model (in combination with other sectoral equations) is used for dynamic and deterministic simulation after adding the relevant identities and definitions. All equations are used in the simulation. The main data sources used to estimate the models include: various official publications of international agencies and published and unpublished government reports. Where choice is available, however, data from international agencies are used to maintain consistency in upoating and facilitate comparisons over time. The specific primary data sources include: International Financial Statistics, Government Financial Statistics and Balance of Payments Yearbook published by the International Monetary Fund; Yearbook of National Income Statistics and World Tables published by the United Nations. Additional data from the National Bank of Ethiopia, the Ethiopian Statistical Office and other Ethiopian government agencies were also collected to supplement the international data sources.

4. POLICY ISSUES

As stated in the introduction, the policy question that the model will be used to address is the impact of the land reform on the performance of the agricultural sector. That is, the policy analysis is concerned with what the performance of the agricultural sector would have been if government had not implemented land reform[5].

Since the purpose of the study is to evaluate the effects of the main components of each policy as a package, an attempt will be made to incorporate the policy changes simultaneously instead of one at a time. For instance, to evaluate the effects of land reform and nationalisation of manufacturing industries, both policy changes will be incorporated at the same time. This will be clear when the policy design of each policy experiment is discussed later.

4.1. Re-Estimates Of Policy Variables

To evaluate the effects of these policies, the basic model presented earlier is re-simulated with the following changes. The equations for the total output, agricultural output and manufacturing output are re-estimated for the pre-policy period (1961-1974). Due to the small sample size, the equations are estimated using a single equation estimator (Cochrane-Orcutt). As before, after dropping the dummy variable, the ratio of real output to the real fixed capital stock (RY/RFCA) depends on the ratio of labour force employed to the real fixed capital stock:

$$\text{Ln (RY/RFCA)} = 7.0830 + 0.99116 \text{ Ln (STR/RFCA)} \quad [5]$$
$$(7.7083)\ (5.8642)$$

$\bar{R}^2 = 0.87$ D.W. = 1.723 SSE = 0.01872 $\bar{Y} = 1.7255$.

As can be seen from the t-statistics, the coefficients are significant and the explanatory power of the equation is acceptable. Compared to the 2SLS estimates reported earlier (equation 1) the autocorrelation problem is reduced and the coefficient of the labour-capital ratio is larger in this equation. Further, the coefficient of the labour-capital ratio in this equation is not different from one[5], indicating constant returns to labour as a fixed factor, and zero marginal productivity. But the coefficient for the entire sample is less than one, indicating diminishing returns. The implied marginal products of labour-capital ratios[6] for the entire sample and the short sample also shed some insight on the performance of the economy. The respective marginal products, 0.27 and 0.32, indicate that it was higher for the pre-1974 period than it was for the entire sample period (1961-1987).

Agricultural output depends on the labour force (LAFI), lagged rainfall (RF_{-1}) and a time trend (T):

$$\text{Ln RAO} = 3.5898 + 0.59177 \text{ Ln LAFI} + 0.53308 \text{ Ln } RF_{-1} + 0.011268 \text{ T} \quad [6]$$
$$(2.324)\ (1.792) \qquad (1.5264) \qquad (2.0675)$$

$\bar{R}^2 = 0.69$ D.W. = 1.59 SSE = 0.04198 $\bar{Y} = 8.935$.

The statistical significance of the above coefficients is inferior to the 2SLS estimates reported earlier (equation 3). But the problem of serial correlation is significantly improved in this equation compared to the 2SLS estimate. And in terms of coefficient size, a unit increase in labour input had a greater impact on agricultural output over the entire sample period than pre-1974, as can be seen from the respective coefficients.

Manufacturing output depends on the labour force employed (LM), intermediate inputs (RMNT) and the existing real fixed capital stock (RFCA):

$$\text{Ln RMO} = -2.5599 + 1.0762 \text{ Ln LM} + 0.1191 \text{ Ln RMNT} + 0.26735 \text{ Ln RFCA} \quad [7]$$
$$(3.4368)\ (12.295) \qquad (2.890) \qquad (1.8377)$$

$\bar{R}^2 = 0.95$ D.W. = 1.93 SSE = 0.008748 $\bar{Y} = 7.205$.

The statistical significance of the coefficients is much better in the smaller sample than with the 2SLS estimates (equation 4). The adjusted R square and the Durbin-Watson statistics are significantly improved compared to the previous estimates. The marginal

products of labour and capital in the smaller sample are 2.14 and 1.25, respectively. The respective marginal products for the entire sample are 1.35 and 0.68. The above cited study, Wubneh (1990, p. 321), also reports a decline in the marginal productivity of labour between 1975 to 1984 compared to 1960 to 1974. According to his estimates, the marginal product of labour between 1960 to 1974 averaged 1.95, while the respective figure for 1975 to 1984 averaged 1.44. Despite the differences in model specification and sample size, the values obtained in this study and that of Wubneh seem to be of the same order of magnitude.

4.2. Policy Simulation, 1973-1987

The basic model is re-simulated by substituting the respective coefficients of the smaller sample (1961-1974) for the entire sample. The difference between these simulation results and the basic simulation (control-run) results predicts what would have been the performance of the economy if there had not been any change in policy in the mid-1970s.[7]

As summarised in Table 4, the shocked values of all the endogenous variables are different from the control-run values, suggesting that the above discussed policy changes had a measurable impact on the macroeconomic aggregates concerned.

Agricultural output (RAO) would have been lower, on average, if agricultural reform had not been undertaken. As discussed above, the essence of the reform was to distribute land equally to those who use it (taking it away from absentee landlords). This measure, therefore, must have initially created positive incentives for farmers to increase their production. But agricultural output started to decline beginning in the early 1980s, which corresponds to the formation of farm co-operatives, which enabled the government to control the sale and the price of agricultural produce (see Table 3). Such policies probably created disincentives and bureaucratic obstacles in the production and distribution processes, such that efficiency was compromised causing output to decline, as the results beginning in the 1980s indicate. On the whole, agricultural output would have been about one per cent lower, on average per annum, if the government had not implemented the land reform and related policies.

Manufacturing output (RMO), on the other hand, would have been higher if the government had continued with the pre-1974 policies. Both the level and the rate of manufacturing output would have increased over the simulation period. This might be explained by the unfavourable economic policies taken and the political environment that was created after 1974. That is, in addition to the possible uncertainties created by the nationalisation of manufacturing enterprises, the shortage of foreign exchange and the mismanagement of the public enterprises, and political instability probably contributed to the decline in manufacturing output. Consequently, manufacturing output would have increased by about 7 per cent if the changes in policy had not taken place.

Table 4. The Impact changes in the Ownership of Land and Manufacturing Enterprises on Total and Sectoral Outputs - Deviations from control-run (%)

Year	Capacity Utilisation	Output		
		Agricultural	Manufacturing	Total
1973	-0.67	-12.85	-7.43	-22.29
1974	-019	-6.10	-10.30	-15.62
1975	7.66	-2.12	-10.54	-1.60
1976	10.04	-1.03	-0.57	3.10
1977	11.82	-7.30	-6.05	8.56
1978	13.11	-6.34	26.21	14.44
1979	14.06	-11.22	18.19	20.46
1980	14.93	-14.27	17.28	25.74
1981	15.58	-16.43	9.73	27.14
1982	16.38	-16.75	0.01	29.51
1983	16.88	-25.71	7.38	33.71
1984	17.23	26.65	8.50	36.85
1985	17.74	21.05	16.91	35.61
1986	18.47	29.08	10.80	41.92
1987	18.74	25.24	17.67	46.41
Average	**12.78**	**-1.21**	**6.52**	**18.93**

It is worth-noting that even though the agricultural sector showed at least a small net positive effect while most of the other macro aggregates showed a decline on average following the 1974 reform, the net effect of the policy on agricultural output over the sample period is too small to suggest a clear effect. What is probably more important is how the pattern of positive impact of the reform in the first seven years reversed itself and consistently declined until the end of the sample period. To put the results in context, a brief review of similar studies is in order. As stated earlier, there is no consensus regarding the overall effect of the land reform on the performance of the agricultural sector. But since many authors use different criteria to evaluate the success of the land reform initiative, here the focus will be only on one criterion: Did agricultural output increase following land reform compared to its pre-1975 level?

In answering this question on the basis of his survey, Griffin (1992, p. 4) concludes that "[i]t is unlikely that the growth performance would have been any better had the reforms not occurred." He notes that output per capita was not growing fast enough to improve the living standard of the rural peasants significantly, but he argues that the situation would not have been any better without land reform. Similarly, Ghose (1985), examined the performance of the agricultural sector between 1975 to 1983. Ghose (1985, p. 133) notes that, even allowing for the increase in crop area, "[t]he growth of agricultural output as well as of food output was quite impressive during the first four-year period 1977/78-1982/83". Further, although cautious on the conclusiveness of the data, Rahmato (1984, p. 73) on the basis of regional surveys reaches a similar conclusion when he states that, "[i]f the figures for 1980 are not a result of changes in data collection, and instead

indicate a trend, small-holder agriculture may be showing a promising sign of improvement."

Mengisteab (1992, pp. 115-118) is, however, sceptical that the land reform resulted in any significant improvement of agricultural output. After examining agricultural output between 1961 and 1988, he argues that the variation in agricultural output does not show a consistent pattern that is directly attributable to the redistribution of land. He attributes the stagnation of the agricultural output, however, not to the land reform but to lack of commitment of the government to provide "appropriate agrarian policies". It has to be noted that all these studies are a descriptive analysis of the agricultural sector over time, and do not address the issue of what would have been its performance in the absence of land reform. Hence, direct comparability is not possible.

To recapitulate: (1) the results of this study suggest agricultural output would not have been higher if land distribution were not undertaken; but the margin of improvement due to land distribution is minimal; (2) most of the studies undertaken suggest an improvement in agricultural performance, at least in the early years of the land reform; the qualitative conclusions of most of these studies are, therefore, consistent with this study; (3) since the studies are not directly comparable, and the data are subject to variations (due to weather and other exogenous factors), the results should be viewed as suggestive orders of magnitude.

NOTES

[1]For a detailed discussion of the size of arable land, and rate of utilization by region and at the national level, see Galperin (1981, Chapter 10); and Griffin (1992, Chapter 2).

[2]For a detailed discussion of the land tenure system that had existed in Ethiopia prior to the land reform of 1975, see Mengisteab (1990) and Rahmato (1984).

[3]This scepticism is due to the vague political philosophy of the government just prior to the land reform proclamation, and its lack of commitment in allocating investment funds to the agricultural sector while taxes on agricultural produce were constantly increasing.

[4]For a detailed discussion of the arguments both in favour and against land reform and the corresponding evidence, see Mengisteab (1990, pp. 21-38), and Dorner (1992, pp. 14-57).

[5] Even though this is clear from visual inspection, it could also be verified formally using the following t-statistics:

$t_{N-k} = (-)/s$,

where N-k is the number of degrees of freedom, and are the estimated and the actual (hypothesised) coefficients, respectively, and s is the standard deviation of . Using this test, the hypothesis that the coefficient of the labour capital ratio is not different from one cannot be rejected at the 5 per cent level of significance.

[6]The marginal product of labour is calculated as the estimated coefficient of labour times the actual average product of labour.

[7]For a discussion of why shocked runs (policy experiments) ought to be compared with the control run (model based solution values) and not with the actual historical values of each endogenous variables, see Challen and Hagger (1983, p. 153).

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