Ethiopian Journal of Economics

Ethiopian Journal of Economics

ETHIOPAN ECONOMIC ASSOCIATION

Ethiopian Journal of Economics

THE CONTRIBUTIONS OF AGRICULTURAL GROWTH TO POVERTY REDUCTION IN ETHIOPIA[1]

Getahun Tafesse[2]

Abstract[3]

This study investigates agricultural growth-poverty relationships at the national and household levels. A rural household model is used to measure the impact of agricultural growth (or decline) on consumption first and the effect of consumption changes on poverty using regression analyses. Two approaches are used here to estimate the agricultural growth elasticity of poverty. First, the growth elasticity of poverty is determined and then using the agriculture elasticity of growth, the agriculture growth requirement for the change in poverty is estimated indirectly. In the second approach, a two-stage analysis is used to arrive at the growth requirement by estimating first the determinants of welfare (household consumption expenditure) and estimating the poverty impact of a certain growth using the relationship between expenditure and poverty incidence.

Accordingly, a forty-year time-series national account data has indicated that a 1 percent growth in agriculture would lead to a 0.32 percent growth in GDP. Given the GDP growth elasticity of poverty, it also followed that a 1 percent increase in agricultural production would lead to a 0.24 percent decline in poverty incidence at the national level. At the Household level, the base simulation has provided a poverty incidence of 40.2 percent in rural areas with 11.2 and 24.9 poverty gap and severity respectively for the year 1995/96. Given the actual and base simulation poverty measures and assuming the percentage change in percapita value added of agricultural production reflects the same percentage change in consumption per capita (adult) and that income distribution remains the same, the application of the same poverty line in real terms[4], has provided a poverty incidence of 63.6 percent and a poverty gap of .22 for the year 2000/01. Such a rapid increase in poverty level goes very well with the general perception of the public as expressed during the PRSP consultation and with other studies by non-governmental organizations. Here agricultural growth elasticity of poverty becomes -3.62, which is very high. When inflation is ignored the agricultural growth elasticity of poverty becomes -2.12. Based on another assumption that takes the long-term trend in agricultural growth, poverty incidence and gap for 2000/01 become 46.5 percent 13.7, implying agricultural growth poverty elasticity of -0.98, or almost equal percentage change in opposite direction. So, it is likely that a one percentage increase in agricultural per capita value added will result into a one percent decline in poverty level of rural households.

---

[4] Note that, annual inflation based on CPI has been on average 2.64 during the five year period, which means the poverty line has to be increased by 13.9 percent. The poverty line in 2000 becomes, therefore, 1224 birr.

1.   Introduction

Ethiopia is basically a rural society with only a small percentage (15 percent) of the population living in the capital city, secondary cities and small urban towns in different regions of the country. Moreover, the outskirts of so-called urban centers and their surrounding areas are commonly rural. The livelihood of the population in rural areas is mainly based on agriculture – typically mixed farming.

In terms of economic development, Ethiopia is one of the least developed and therefore the poorest country in the world. A recent World Bank rankings of GNP per capita put Ethiopia 206th and last, with income per head of only US $ 100 in 1999, compared to the sub-Saharan Africa (SSA) average of US $ 500 (World Bank, 2000). Poverty in Ethiopia is, therefore, widespread and deep-rooted and constitutes the priority development challenge in the country. Currently it is estimated that close to half of the population is under the national poverty line. Based on exercise undertaken in this study, about 90 percent of the population would fall under poverty line if the international poverty line of a dollar a day per person is used. It is also clearly shown that the incidence and severity of poverty is higher in rural areas.

Agriculture constitutes the principal source of income and employment for the majority of the population. Greater proportion of the foreign exchange the country earns also comes from this sector. The sector accounted about 68.6% of GDP during the Imperial period and about 56% during the last regime. The dominance of the sector has continued during the last decade and currently it stands at 43% (Table 2.1). It is also the leading sector in terms of providing employment in the country. According to the 1984 and 1994 population and housing censuses, about 89 percent of the population was engaged in agricultural activities.

Agriculture in Ethiopia is typically characterized by small holder and subsistence farming which is highly dependent on rainfall. The urban livelihood is also highly dependent on the rural economy and as such small farm constitutes the life support mechanism of the country. Understanding poverty in the country necessitates therefore knowledge about farm economy in the country. Although small scale subsistence farming is the dominant feature there are, however, great diversities and characteristics of different farm systems that operate under this domain. It is possible to categorize the different systems, however, into different sub groups such as Cereal growing, Enset, Pastoral, Subsistence and Cash Crop producing farm systems.

Efforts to estimate the consequences of agricultural policies are often confounded by complex behavioral patters and characteristics of households in semi-

commercialized, rural economies (Singh, et al.). Most agricultural households in Ethiopia, for example, mainly produce for own consumption but also for sale, which can have many purposes – saving, procuring food or non-food items and tax or loan repayment. These households purchase some of their inputs (ex., fertilizer) and provide some (such as family labor) from their own resources. Any change in the policies governing agricultural activities will therefore affect not only production, but also consumption and labor supply.

Poverty in Ethiopia cannot also be analyzed without looking at the larger context of the rural nature of the country, drought disaster, environmental degradation, rapid population growth and general structural features of the economy. The country faces chronic food deficit as a result of which about 5 million people annually depend on food aid.

The broad outline of the government strategy for reducing poverty in Ethiopia as described in the PRSP document comprises the following elements: An Agriculture-Development Led Industrialization (ADLI), continuing implementing economic reform programs, civil service and judicial reforms, decentralization and capacity building. The – Agriculture Development Led Industrialization – strategy (ADLI) comprises the umbrella development strategy for the country. Ethiopia provides an interesting case study considering the ADLI strategy, small-scale agriculture based economy and the recent agricultural products price slumping and the associated factors and aftereffects.

This strategy revolves around making the small-agricultural farmer the engine of growth. It is argued that what the average farmer needs to kick start the growth process is access to combined provision of land, skill, and capital (GOE, IPRSP, 2000). The smallholder farming family is made, therefore, the focus of economic development with a massive agricultural extension (focused on provision of improved seeds and fertilizer) and credit scheme, and expansion of primary education, primary health care, rural water supply and rural roads.

In Ethiopia land is also under state ownership and neither farmers can sell their plot of land nor private investors can purchase land from rural dwellers. With these policy and institutional background, the trends and dynamics of agricultural growth and poverty reduction in Ethiopia are interesting to investigate.

In this study attempt is made to explore the role and externalities of improvement in agricultural production for poverty reduction in the country. The study attempts to specify and measure the different channels under which agricultural growth impacts on poverty. The channels can be broadly divided as those operating through the

market mechanism and those that are not. At the macro level, the degree of relationship between the performance of the agriculture sector and the overall economy is explored using long-term time-series data. Here, the relative contribution of agriculture as compared to other sectors is also investigated. First, the GDP growth elasticity of poverty is determined and consequently the agricultural growth elasticity of poverty is calculated using agricultural growth elasticity of GDP determined earlier. In this way, the contribution of the agriculture sector to poverty reduction at the national level is estimated indirectly. In addition, the direct agricultural elasticity of poverty reduction is determined using two stage approaches, which sequentially linked determinants of income to household expenditure level and using the Foster, Greer and Thorbeck P-α measures, household expenditure levels are linked to poverty measures.

The identification of the main channels through which agricultural growth impacts poverty is highly dependent on the system of agriculture being considered. That is why a broad characterization of the agriculture system is made in the study before identification of possible channels through which agricultural growth impacts poverty. In Ethiopia, agriculture is mainly subsistence farming with huge unemployment and underemployment and operates under a system of public ownership of land. The channels identified in the study are based therefore with this framework in mind.

Moreover, to capture fully the roles and externalities of agricultural growth in poverty reduction, an understanding of the microeconomic behavior of agricultural households is necessary. It is essential to know the determinants of poverty, what factors determine the level of farm production and households consumption and the supply of labor. The agricultural household model is applied here given the advantage models capture both the production and consumption behavior of farm households. The model assumes that households are price-takers and is therefore recursive. Wellbeing is defined in terms of households' consumption expenditure level. Nutritional intake level is also used as an alternative measure of living standard of households. How resources are allocated within a household also determine the level of impact on poverty arising from increase in household income. Intra-household distribution of income is not, however, the subject of this study.

The paper is outlined into eight major sections, which are consequently arranged to provide first background and characteristics of the agricultural system in Ethiopia, discuss the various channels through which poverty is affected, provide estimation of these channels and finally identify key conditions that affect size of impact of agricultural growth and based on which conclusions and policy recommendations are provided.

2.   The macro economy and the agriculture sector
2.1   Long-term relationships

Agriculture is the basis of the national economy. It continues to be the dominant sector in spite of the fact that the contribution of the sector in the GDP has been continuously declining over the past four decades. The share of agriculture in GDP on average was 69%, 56% and 49% during the Imperial, Derge and EPRDF periods respectively (Table 2.1).

Table 2.1: The past forty year relationship between agriculture and GDP

	GDP (In mil.)	Agri. (In mil.)	Share of Agri. (%)	Population (In mil.)	GDP percapita	Agri. percapita
Imperial (1962-73)	6560.7	4463.5	68.6	27.3	238.9	194.9
Derg (1974-1990)	9515.5	5289.2	55.9	39.3	242.9	160.6
EPRDF (1991-2002)	14,214.7	6837.6	48.7	58.5	241.6	136.9

Source: Own computations based on national account data

Overall the agriculture sector grew annually by 1.89 percent on average during the last forty years (1962 – 2002) (Table 2.2). The sector grew annually on average by 2.1, 1.5 and 2.2 percent during the Imperial, Derge and EPRDF periods respectively. As a result the percapita agricultural value added has actually declined by 0.9 percent (Table 2.3).

Table 2.2: Forty year summary of economic performance

	Imperial	Derg	EPRDF	Overall
Agriculture	2.14	1.53	2.21	1.89
Industry	7.53	1.35	6.19	4.46
Distributive Services[5]	8.27	1.26	6.84	4.81
Other Services	7.29	4.97	7.39	6.30
GDP	3.80	1.89	4.50	3.15

Source: Own computations based on national account data

The performance of the remaining sectors in relative terms was much better than the agriculture sector. Industry, distributive services and other services on average grew by 4.46, 4.81 and 6.3 percent annually during the last four decades. Although at very low levels, these sectors have also registered positive growth in terms of per capita value added. GDP percapita in general grew only by average 0.58 percent annually during this long period, showing poor performance of the economy over an extended period.

---

[5] Distributive services include transport and communication related activities while "other services" include general administration and defense.

5

Table 2.3: Forty year summary of economic performance – in percapita terms

	Imperial	Derg	EPRDF	Overall
GDP percapita	1.49	-0.67	1.57	0.58
Agriculture percapita	-0.04	-1.25	-1.36	-0.93
Indus. percapita	4.4	-2.1	1.56	0.80

Source: Own computations based on national account data

It can be concluded from Table 2.4 that the poor performance of the overall economy is mainly due to the poor performance of the agriculture sector. Similar pattern of growth rates under the different regimes is observable between GDP and the agriculture sector. Coupled with relatively higher population growth rates, the sector registered negative percapita growth rates under all the past three regimes.

Table 2.4: Forty year relationship between agriculture and GDP – growth rates

	GDP	Agriculture	Population	GDP percapita	Agri. percapita
Imperial	3.80	2.14	2.3	1.49	-0.04
Derg	1.89	1.53	2.6	-0.67	-1.25
EPRDF	4.50	2.21	2.9	1.57	-1.36

Source: Own computations based on national account data

The share of the various sectors in GDP over different periods in the past is shown in Table 2.5. The decline in share of agriculture in the overall economy does not show, however, structural transformation that usually happens when industrialization occurs. The share of industry has actually declined during the past decade as similar decline was observed in the agriculture sector. These declines were compensated by a rapid increase in other services sector, which is dominated by public administration and defense. So, the long-term trend of the performance of the economy does not seem to be healthy.

Table 2.5: Sectoral percentage shares in GDP

	Imperial	Derge	EPRDF
Agriculture	68.6	55.9	48.7
Industry	9.1	11.4	10.6
Distributive Services	11.4	14.3	14.1
Other Services	10.9	18.4	26.6
	100.0	100.0	100.0

Source: Own computations based on national account data

6

2.2   Contribution to GDP

Another look at the relative importance of the various sectors in the economy is provided through their relative contribution to GDP growth. As is shown in Table 2.6, the contribution of agriculture to overall GDP growth has declined from about 39 percent during the Imperial period to about 22 percent under the current government. Whereas, the contribution of other services has increased from 21 percent to 44 percent during the same period. Hence, in terms of importance to growth performance, other services contribute more than the contribution by the agriculture sector.

Table 2.6: Contribution to GDP growth (in %)

	Imperial	Derge	EPRDF
Agriculture	38.9	38.5	22.2
Industry	17.0	6.5	13.6
Distributive Services	23.5	4.9	20.5
Other Ser	20.6	50.2	43.8
	100.0	100.0	100.0

Source: Own computations based on national account data

Trends in average annual growth rates of percapita value added of the different sectors indicate that GDP percapita value added is highly correlated with agricultural value added than other sectors. Analysis of 50 year national account data has clearly indicated, therefore, the close relationship between the overall performance of the economy and the performance of the agricultural sector.

A simple regression[6] analysis was made to quantify the linkage between agricultural and GDP growth rates in terms of elasticities. The results are summarized in Table 2.7. According to the estimation result, a 1 percent growth in agriculture would lead to a 0.32 percent growth in GDP. The fact that other sectoral elasticities of growth with respect to GDP are lower than this indicates that agriculture is the predominant sector in determining income at the national level.

Growth in agricultural value added is, therefore, the most determining factor of real GDP percapita growth in Ethiopia. Although "other services" has the highest elasticity, the proportion of its contribution to GDP growth is much smaller than agriculture. As s result, during the two regimes, for example, inspite of positive real percapita growth

---

[6] Growth in GDP is modeled as a function of growth in agriculture, industry, distributive and other services.

rates in the non-agricultural sectors, GDP percapita registered a negative growth in line with the growth in agriculture percapita.

Table 2.7: Sectoral elasticities of GDP growth

	ß	Avg	є
Agriculture	.525	1.89	0.32
Industry		4.46	
Distributive Services	.125	4.81	0.19
Other Services	.229	6.3	0.46

Source: Own computations based on national account data

3.   Agricultural growth channels that affect poverty

The identification of the main channels through which agricultural growth impacts poverty is highly dependent on the system of agriculture being considered. For a person who has in mind a highly privatized and large-scale commercialized agriculture, the benefits of growth are mainly conceived from the recipients' end. In this perspective, wage differentials and movement of labour among different sectors and between rural and urban areas also get precedence as the most direct transmission mechanisms. The picture one envisages under small-scale, subsistence and public land holding system could be substantially different, however.

In Ethiopia, agriculture is mainly subsistence farming with huge unemployment and underemployment and operates under a system of public ownership of land. The channels identified in this study are based therefore with this framework in mind. In other words, the most direct benefit of agricultural growth is improvement in welfare of the small-holder assuming price will not decline due to shortage of effective demand. The labour market consequence is primarily envisaged in terms of more labor absorption within the rural areas with little impact on rural wage rate in the short term. Since the agriculture sector is unlikely to attract labour from other sectors and urban areas under such a system, the general equilibrium effect through the increase of unskilled labour wage rate in urban areas need not be automatic.

The effect of higher agriculture output leading to lower food prices should also be seen from two angels: the producers and consumers. In the case of Ethiopia, given that the producers are mainly small farmers, a reduction in food prices could increase poverty among the rural poor rather than decrease it. As the recent experience of agricultural produces' prices slumping has indicated, an increase in smallholders' income need not necessarily follow an agricultural growth. The urban poor is likely to

8

benefit from a reduction in food prices mainly through higher real wage rate the effect of which could be dampened however by traders and brokers profit margins.

The benefits to the urban poor could also come through expanding economic activity comprising mainly increased volume of trade but also from processing activities which augment the demand for labour (both in formal and informal self-employment endeavors). The positive effect of agricultural growth on employment also occurs in rural areas. In Ethiopia, seasonal labour demand associated with harvesting periods for coffee, teff and other grains is common. Hence, an increase in agricultural productivity is likely to increase the demand for labour thereby benefiting rural unskilled laborers.

The poverty reducing impact of agricultural growth through its effects on non-farm production and consumption activities is an interesting area to investigate. The following points are considered in examining this channel:

- Agro-processing industries in Ethiopia are at their embryo and infancy stages dampening the potential impact on poverty reduction of an agricultural growth.
- Lack of infrastructure and isolation of rural communities from the rest of the country and markets.
- The potential release of extra labour from households augmenting the opportunity to engage in non-farm activities.
- The immediate possible effect of increased production and trade in non-food items such as clothing, footwear, etc.
- Increased opportunity for improved utilization of health and education services. And second-round effect of this on enhancing agricultural growth.

Agricultural growth helps to reduce poverty in at least seven main channels: First, it provides those households engaged in agricultural activities with increased level of production thereby increasing their access to food. Secondly, higher output could be converted into higher income, assuming price would remain constant, which would then increase households' access to non-food basic requirements. Poor entitlement or purchasing capacity is a key constraint that makes households vulnerable to famine.

In Amhara region of the country, for example, grain production in 1999/2000 was 20% in excess of consumption needs. Yet 2.8 million people in Amhara (representing 17% of the region's population) became locked into famine zones and faced risk according to FAO. Whereas Amhara's grain surpluses were in excess of 500,000 tons, its relief food needs have been tagged by international community as close to 300,000 tons.

9

Thirdly, growth in agricultural produce is likely to reduce the cost of food for non-agricultural poor communities both in rural and urban areas (through increase in real wages). Fourthly, it provides with an increased opportunity for poor people to be engaged in productive and trade activities and earn income, i.e., as producers of petty items, labourers, brokers, traders of food items and suppliers of basic non-food commodities. It is known, for example, that a decline in the performance of the agriculture sector results into urban wages collapse and drives unemployed seasonal farm workers and the landless peasants into abysmal poverty. Fifthly, it can lead to increased employment opportunities in rural areas, although the potential of this in Ethiopia is limited because of small holder farming dominance.

Sixthly, it leads to increased government income through taxation and possibly increased foreign exchange earning through export. The financial resources generated out of growth taxation can be used to finance government pro-poor services. Finally, it creates spillover effects on social capital and other sectors of the economy. Some of the market failures and other external factors that could prevent the effective contribution of agricultural growth to poverty reduction include:

a) The rural-sector in Ethiopia is largely non-monitized. Rural communities livelihood, on relative terms, is less dependent on the market system. As a result, an increase in level of agricultural production may not effectively translate into an increase in rural households income. *(It is likely that an increase more than the normal average production level could simply be stored with reduced motive for production in the next season).*

b) Besides absence of market, sporadic tiny open-field markets characterize rural settings. The goods available in these markets are limited constraining the choice farm households have for consumption. For example, iodized salt may simply be inexistent leading to Vitamin A deficiency and consequently to blindness – a major feature of poverty in Ethiopia.

c) Institutions and regulations governing a market system are more or less absent in rural areas. The availability of banks and associated functions (saving, credit, checking account, etc.), salary/wage employment, trade/investment/finance bureaus (licensing, tax,) is limited.

d) The impact farm improvement has on the expansion of non-farm activities is likely to be limited. Subsistence life style and farming together with poor knowledge and other constraining variables desired and normally expected clothing, footwear, food processing, etc. may not mushroom as expected following agricultural boom.

e) Rural communities are usually isolated societies who have weak linkage with the rest of the country due to absence of infrastructure such as roads, communication and transport – i.e., barriers to connection with outside markets. Limited opportunities, poor access to commodities, less pressure from

competition, etc. work against incentives and motivation for sustaining agricultural growth and continuous improvement in welfare situation.

f) Lack of effective and sufficient urban food demand also undermines the poverty reducing outcomes of agricultural growth in rural areas. This was remarkably witnessed in recent period in Ethiopia where agricultural products prices slumped down following an increase in agricultural production which were not however matched by commensurate increase in food demand.

g) The impact of agricultural growth on urban poverty is undermined by monopoly of agricultural traders and brokers, undue tariffs and taxes, etc. which make significant differences between farm-gate prices and retail prices. The poor in urban areas also cannot afford to purchase agricultural produce in bulk, which exposes them to further loses. However, the urban poor is destined to benefit from lower food prices.

h) Finally, the pattern of growth whether it is broad based or not and initial inequality conditions matter in determining the impact of growth on poverty.

4. The roles of agriculture to rural farm societies

First and foremost, the benefits of agricultural growth directly accrue to rural farm households. As was discussed earlier, agricultural households are the main form of economic organization in Ethiopia. Most can be described as subsistence farmers given that they produce mainly for consumption. Hence, they are characterized both as consumers and producers. Even these farmers, however, are likely to purchase some of their food items (such as salt, oil, kerosene, etc.) from the market. They are categorized therefore as semi commercial with those households who partially produce with the intention of selling at the market.

An agricultural household model is a model that provides a framework for analyzing household behaviors integrating consumption, production and labor (and therefore leisure) decisions. Here a unitary and recursive household model is used because it fits well into the familiar consumer choice framework. Moreover, the collective household mode could not be applied because of lack of detailed data on the distribution of resources among members of household. The available data is at household level.

4.1 Agricultural growth elasticity of poverty

Two approaches are used here to estimate the agricultural growth elasticity of poverty. First, the growth elasticity of poverty is determined and then using the agriculture elasticity of growth, the growth rate in agriculture is estimated indirectly.

In the second approach, a two-stage analysis is used to arrive at the growth requirement by estimating first the determinants of welfare (household consumption expenditure) and estimating the poverty impact of a certain growth using the relationship between expenditure and poverty incidence.

Note that there is a general agreement that growth is an important and necessary factor for poverty reduction. Growth by itself however is not sufficient unless it is broad-based and allows the poor or low-income group to participate in the process. It should be noted that the degree of poverty depends upon the average level of income and the extent of inequality in income distribution (see, for example, Kakwani, 1993). Hence, agricultural growth affects poverty in so far as it affects average level of income and inequality. Hence, in this analysis inequality is assumed to remain the same.

National income elasticity of poverty

Poverty incidence depends on real per capita (per adult) income (expenditure), poverty line and income inequality. Hence, it is possible to start with a generalized form of poverty function (Ali, 1998, ECA 1999) as given in equation below:

$$Po = P\,(\mu, z, m) \tag{1}$$

Where, Po is index of poverty, μ is mean per capita income, z is the poverty line, m is measure of income inequality.

Total differentiation of the poverty function provides the following formula:

$$\partial P = \frac{\partial P}{\partial \mu}d\mu + \frac{\partial P}{\partial z}dz + \frac{\partial P}{\partial m} + \frac{\partial P}{\partial m}dm \tag{2}$$

Since P is homogeneous of degree zero with respect to μ and z, by Euler's theorem, we will have:

$$\frac{\partial P}{\partial z}dz + \frac{\partial P}{d\mu}d\mu = 0 \tag{3}$$

$$dz = -\frac{\partial z}{\partial \mu}d\mu \quad \text{given that} \quad \frac{dz}{d\mu} = \frac{\partial z}{\partial \mu} \tag{4}$$

Hence,

$$\partial P = \frac{\partial P}{\partial \mu} d\mu - \frac{\partial P}{\partial \mu} \frac{\mu}{z} dz + \frac{\partial P}{\partial m} dm \tag{5}$$

Growth rate in P is given by:

$$\frac{dP}{P} = \frac{\partial P}{\partial \mu} \frac{\mu}{P} \frac{d\mu}{\mu} - \frac{\partial P}{\partial \mu} \frac{\mu}{P} \frac{d\mu}{dz} \frac{z}{\mu} \frac{dz}{z} + \frac{\partial P}{\partial m} \frac{m}{P} \frac{dm}{m} \tag{6}$$

$$= \frac{\partial P}{\partial \mu} \frac{\mu}{P} \frac{d\mu}{\mu} - \frac{\partial P}{\partial \mu} \frac{\mu}{P} \frac{\partial z}{\partial \mu} \frac{\mu}{z} \frac{\partial \mu}{\partial z} \frac{z}{\mu} d\mu + \frac{\partial P}{\partial m} \frac{m}{P} \frac{dm}{m}$$

$$= \eta \frac{d\mu}{\mu} - \eta(\varepsilon)(\delta)d\mu + v \frac{dm}{m} \tag{7}$$

where $\eta \quad = \quad \dfrac{\partial P}{\partial \mu} \dfrac{\mu}{P} \quad$ *and* $\quad \delta = \dfrac{\partial \mu}{\partial z} \dfrac{z}{\mu}$

$\varepsilon \quad = \quad \dfrac{\partial z}{\partial \mu} \dfrac{\mu}{z}$

Using a related formula with above and based on parameters derived from an econometric equation fitted by Ali (1998), the growth elasticity of poverty in Ethiopia is estimated to be 0.76 (Befekadu, *et al* (2002). The formula used by Befekadu, *et al* is slightly different from the above, which is partially derived here.

Given the earlier estimate that the agricultural elasticity of GDP growth is 0.32, it follows that a 1 percent increase in agricultural production would lead to 0.24 percent (.32* .76) decline in poverty incidence. Although this seems to be on the low side, it should be noted that the reduction in poverty is at national level, which indicates that the elasticity of poverty to agricultural growth would be higher if only rural poverty is considered. If for the moment we assume, poverty line and income inequality remain the same, then poverty incidence will be determined by the growth in per capita income.

13

In Ethiopia, currently, there are, however, only two data points that provide poverty incidence and percapita levels at the same time – 1995/96 and 1999/00. Taking average growth rates for the past five years before the respective data points indicate that on average per capita income has declined, whereas the available poverty estimates show a decline in poverty. This will give a positive elasticity, which is unlikely to be true. Hence, it is assumed that poverty incidence in the given years is affected by percapita income levels in the previous years, which provided a growth elasticity of poverty –0.25.

Household expenditure elasticity of poverty

The second approach initially considered a three-stage analysis, which for lack of time and data, however, settled for a two-stage analysis by integrating the first model into the second one.

1st stage: Determining Income: Household's income as a function of yield, labour input and land and determining consumption expenditure (demand) as a function of income, prices and saving and other household welfare determining variables such as household size, asset base and access to infrastructures.

2nd stage: Determining the expenditure elasticity of poverty incidence

Poverty is a function of expenditure, poverty line and income inequality. At the household level, it is possible therefore to estimate the expenditure elasticity of poverty by regressing poverty on expenditure, assuming constant poverty line in real terms and that income distribution remains the same. The models are developed in subsequent sections.

4.2   Different scenario analyses and simulation estimates

As was mentioned earlier, we have two points in time concerning actual trend in poverty situation in the country: 1995/96 and 1999/00. The poverty incidence levels in these two periods are 45.5 and 44.2 respectively. These indicators are used to forecast and simulate different scenarios under conditions of with and without improvement in the performance of the agriculture sector.

Trend analysis

The trend analysis over four decade period indicates that by 2020 the poverty incidence will be 39. The implied average declining rate (annual reduction) is 3%.

This is trend based on five-year period laps. Annual based trend analysis provides similar result as indicated below. Using actual growth rate between the two periods (1995-2000) and extrapolating to 2020 provides a poverty incidence of 39.4. The average annual reduction rate is 2.9%.

The simple forecasting exercise made on poverty incidence demonstrates that Ethiopia needs to undergo fundamental change in productivity levels to meet the millennium goals, if they were to be achievable. Simple forecasting and alternative growth scenarios will be made using the simulation approach below.

Simulation approach

The purpose here is to illustrate the impact of agricultural growth on poverty using estimated parameters of determinants of per adult[7] household consumption expenditure and the relationship of this welfare indicator with poverty incidence functions.

$$\ln(C_j) = \beta' X_j + \varepsilon_j \qquad (1)$$

Using the estimated parameters (β) in the consumption model, predictions of consumption per adult for each household j can be generated as follows:

$$\hat{C}_j = e^{\hat{\beta} x_j} \qquad (2)$$

Corresponding to every predicted level of consumption, there is a probability that the household being poor ($P_{\theta,j}$), which is given by:

$$P_{\theta,j} = \int_0^z \left(\frac{Z - C_j}{Z}\right)^{\theta} f(C_j) dC_j \qquad (3)$$

Where $f(C_j)$ is the probability function of per capita consumption of household j and Z is the poverty line.

Under the assumption that the random disturbance term of the consumption model is normally, independently and identically distributed with mean 0 and variance σ^2, the distribution of per capita consumption follows a log normal distribution. Hence, the probability density function of the per capita consumption is given by

---

[7] Adult equivalent is calculated based on adult equivalents scale developed for East Africa and used by the World Bank.

$$f(C_j) = \frac{1}{C_j \sigma \sqrt{2\pi}} \exp\left\{ -\frac{1}{2\sigma^2}(\ln(C_j) - \beta^t X_j) \right\} \qquad \textbf{(4)}$$

When θ takes a value of 0, the poverty measure boils down to the head-count index, which is given by:

$$P_{0,j} = \int_0^z \frac{1}{C_j \sigma \sqrt{2\pi}} \exp\left\{ -\frac{1}{2\sigma^2}(\ln(C_j) - \beta^t X_j)^2 \right\} dC_j = \Phi\left(\frac{\ln(Z) - \beta^t X_j}{\sigma} \right) \qquad \textbf{(5)}$$

The last term provides, therefore, the estimated probability that a household being poor, measured by the head-count index given that φ is the standard normal distribution function, σ is the standard error of the regression, and ^ indicates estimated values. It is found preferable to compute the probability of being poor associated with any given level of predicted consumption, rather than classifying households as being poor or non-poor depending on the level of predicted consumption relative to the poverty line. The weighted average of the household probabilities of being poor gives the predicted national head-count index[8].

According to the formula derived earlier, poverty is a function of expenditure, poverty line and income inequality. At the household level, it is possible therefore to estimate the expenditure elasticity of poverty by regressing poverty on expenditure, assuming constant poverty line in real terms and that income distribution remains the same.

The above formulas are applied to a national household income consumption and expenditure survey data set that was collected in 1995/96. The data is nationally representative. Given however our interest is to estimate agricultural growth elasticity of poverty, the data set is disaggregated and only the rural data is used in the estimation exercise. First a brief explanation is given below on the variables used in the estimation and the estimation results will follow.

Deflated per adult total expenditure

The dependent variable used is the deflated per adult total expenditure at household level. There is a general agreement that household welfare can be approximated by level of its expenditure. Moreover, since this variable is used in estimation of poverty measures, modeling it directly provides the advantage of simulating different scenarios and consequently determining corresponding poverty indicators.

---

[8] The weight variable used here is the population weight.

To arrive at this figure, household size was converted into adult equivalent using adult equivalent scales. On the expenditure side, spatial price index was developed using the Lasperian price index formula and household nominal expenditure figures were converted into real values so that they are comparable across households and areas.

The list of independent variables estimated using the above formulas include the following:

Age of the head of the household
Participatory assessments have indicated that household heads becoming old aged is a factor that affects the well-being of the household. Hence, this variable is included in the model. Given that this is a continuous variable, the natural logarithm of the variable is included in the model as one of the determinants of the welfare of the household.

Education level of the head of the household
Similarly many studies in the past have established close correlation between the level of education of the household head and the level of its well-being. Given that this is a continuous variable, the natural logarithm of the variable is included in the model as one of the determinants of the welfare of the household.

Household size
Given that the dependent variable takes into account household size indirectly through adult equivalent, the relevance of this variable is diminished. However, it is included given that it is usually used as a determining variable and for the sake of completeness.

A dummy variable for engagement in non-farm activities
This variable is constructed by looking into the actual data sets and differentiating those households that are engaged in non-farm activities, both as a full-time occupation and as supplementary activity, as opposed to those who are purely engaged in farm activities. In this way, some idea could be derived on the importance of non-farm activity in determining consumption.

Owning farm animals
The most important point here is whether farm households have oxen. Since, however, the question in the survey was framed in more general terms, the variable is incorporated as potential determinant of welfare as it is.

Owning transport animals
Given the scattered nature of settlement in rural areas and difficulty of access to market, ownership of transport animals is likely to make significant difference in the wellbeing of rural households. Hence, it is included in the estimation exercise.

17

Land ownership
This is a key variable that plays critical role in the welfare of rural people. Ownership also indicates tenure security and, therefore, long-term investment in agriculture.

Distance to various infrastructure
The variables included under this category include distance from Market, Primary School, Health Center and Transport facilities. Whereas these variables are important in themselves in determining welfare, access to such infrastructure also indicates degree of integration with the rest of society, which has likely positive impact on welfare.

Asset ownership
This is a broad category under which many variables are included in the regression analysis. Key variables selected and incorporated in the model include: ownership of farm tools, radio, and a house.

The following represents the results generated:

LdefPate	Coef.	Std. Err.	T	P>|t|	[95% Conf. Interval]	
LageHead	-.0187325	.0548979	-0.34	0.733	-.1264384	.0889734
LeducHead	.0779454	.0217056	3.59	0.000	.0353605	.1205303
HHsize	-.0874874	.0071496	-12.24	0.000	-.1015144	-.0734605
NonfarmD	-.0886524	.0285051	-3.11	0.002	-.1445775	-.0327273
OwnFanim	.0611495	.0410369	1.49	0.136	-.0193621	.141661
OwnTranA	-.1344421	.0344407	-3.90	0.000	-.2020124	-.0668719
SexHead	.000482	.0725383	0.01	0.995	-.1418331	.1427971
OwnLand	.0753056	.0712039	1.06	0.290	-.0643917	.2150028
DistMark	.0033918	.0023703	1.43	0.153	-.0012586	.0080422
DistPrimS	.003505	.0037922	0.92	0.356	-.0039351	.0109451
DistHeal	-.0061137	.0016166	-3.78	0.000	-.0092854	-.002942
DistTrans	-.0026459	.0005667	-4.67	0.000	-.0037578	-.0015341
OwnTool	.0795843	.0407641	1.95	0.051	-.000392	.1595605
OwnRadio	.3011017	.0350128	8.60	0.000	.2324089	.3697945
OwnHous1	.0418804	.0654668	0.64	0.522	-.0865609	.1703217
cons	7.677969	.2564833	29.94	0.000	7.174766	8.181171

R-squared = 0.2380   Adj R-squared = 0.2286   Root MSE = .45453

Following the above estimations, predicted base values of the dependent variable were calculated using the above regression estimates and model equation 1. The national poverty line, which is estimated based on the same data set is directly

applied. Using the predicted values and the model questions in 2, 3 and 4, the following poverty estimates were obtained for the base year.

Variable	Obs	Mean	Std. Err	[95% Conf. Interval]	
P0j	7094	.4023766	0019878	.39848	4062733
P1j	7094	.1124352	.0007994	.1108681	.1140022
P2j	7094	.2489921	.0004134	.2481818	.2498025
Popul	7503	6266.799	52.63027	6163.629	6369.969

Hence, the base simulation has provided a poverty incidence of 40.2 percent in rural areas with 11.2 and 24.9 poverty gap and severity respectively.

Simulation of poverty to year 2000

Assumption 1.
Given the above actual and base simulation poverty measures for the year 1995/96, attempt is made here to estimate poverty levels in five-year after the base year. The percentage change in percapita value added of agricultural production is assumed to reflect the same percentage change in consumption per capita (adult). During this period percapita agricultural production has declined, on average, by –3.4 percent annually. In other words, percapita agricultural value added has declined by about 15.9 percent during the five-year period. Hence, per adult deflated consumption expenditure is also assumed to have declined by the same level. If we assume, income distribution has remained the same during this period, the application of the same poverty line in real terms, has provided poverty estimates for the year 2000/01 as follows:

Variable	Obs	Mean	Std. Err.	[95% Conf. Interval]	
P0j0	7094	.6364872	.0019024	632758	6402164
P1j0	7094	.2205062	0010994	.2183511	2226613
P2j0	7094	.2754168	0001746	.2750745	.2757591
Popul	7503	6266.799	52.63027	6163.629	6369.969

Note that, annual inflation based on CPI has been on average 2.64 during the five-year period, which means the poverty line has to be increased by 13.9 percent. The poverty line in 2000 becomes, therefore, 1224 birr.

Poverty level in rural areas in the country by 2000 should have increased, therefore, to 63.6 percent with increased poverty gap at 22.0 and severity at 27.5. Such rapid increase in poverty level goes very with the general perception of the public as expressed during the PRSP consultation. A similar level of poverty was estimated

based on survey data that was collected in selected rural areas in the country by the Economics Department of the Addis Ababa University.

Hence, while consumption expenditure and, therefore, agricultural value added per capita declined by 16 percent, poverty incidence has increased by 58 percent, implying agricultural growth elasticity of poverty -3.62, which is very high.

Assumption 2
Given that the majority of farmers are subsistence farmers who are not affected by market price as such, if we assume, inflation level as zero, then the poverty estimates will be:

Variable	Obs	Mean	Std. Err.	[95% Conf. Interval]	
P0j1	7094	.5372192	.0020152	.5332688	.5411695
P1j1	7094	.0635812	.0011546	.0613178	.0658446
P2j1	7094	.2754168	.0001746	.2750745	.2757591
Popul	7503	6266.799	52.63027	6163.629	6369.969

Still, poverty incidence has increased by about 34 percent, providing agricultural growth elasticity of poverty to be -2.12.

Assumption 3
If we assume for the moment that what is to be applied as a trend indicator beginning from 1995/96 is the long-term trend, which is a decline in agricultural value added per capita by 1.61 percent, then poverty estimates by 1999/00, 2004/05, 2009/10 and 2014/15 will be as follows:

Assuming further that inflation will remain constant
Consumption per adult expenditure in rural areas will decline by about 7.8 percent in the first five year period and by 15 percent in 2005, by 21.6 percent in 2010 and by 27.7 percent in 2015. Hence,

Poverty still has increased (by 15.7 percent) with this relatively better long-term trend in agricultural value added percapita growth. In this case, agricultural growth poverty elasticity becomes -0.98, or almost equal percentage change in opposite direction. *So, it is likely that at least or as a minimum a one percentage increase in agricultural per capita value added will result into a one percent decline in poverty level.*

In the year 2000
Variable	Obs	Mean	Std. Err.	[95% Conf. Interval]	
P0j00Lt	7094	.4650446	.0020265	.461072	4690172
P1j00Lt	7094	.1374843	.0008906	.1357384	.1392302
P2j00Lt	7094	.2594333	.0003295	.2587874	.2600793
Popul	7503	6266.799	52.63027	6163.629	6369.969

20

Poverty by 2015

Based on long-term actual trend in agricultural percapita value added, a simulation was made to estimate poverty levels by the year 2015. Inflation level is assumed to remain constant concerning the poverty line, which is taken as fixed and that there will be no change in income distribution. Based on this assumption, poverty measures simulated for the year 2015 are as follows:

Variable		Obs	Mean	Std. Err.	[95% Conf. Interval]	
P0j15Lt		7094	.6521802	.0018739	.6485068	.6558537
P1j15Lt		7094	.2294721	.0011149	.2272866	.2316575
P2j15Lt		7094	.2763801	.0001709	.2760451	.2767152
Popul		7503	6266.799	52.63027	6163.629	6369.969

Indeed, about two-third of the rural population will be in absolute poverty by 2015 if past performance of the sector continues unchanged, i.e., an increase in poverty incidence by 62 percent. During the same period, based on long term trend of agricultural percapita decline by 1.6 percent, the overall reduction in per adult consumption expenditure during the fifteen year period is 27.7 percent. In the face of such mounting challenge, the realization of the millennium goals in Ethiopia is unlikely.

If we assume the last five trends continue as the best scenario

Agriculture value added per capita was growing at .04 percent (i.e., the agriculture sector growing by 3.04 percent & assuming population was growing by 3 percent). So, by 2015, consumption expenditure per adult could be assumed to increase by 8.3 percent. This will provide the following poverty estimates:

Hence, in this case, it was able to reduce poverty level by 2015 by 15 percent. Consumption expenditure per adult has increased by 8.3 percent during the same period. So, agricultural elasticity of poverty growth would be –1.8.

Variable		Obs	Mean	Std. Err.	[95% Conf. Interval]	
P0j15bc		7094	.3431604	.0019077	.3394208	.3468999
P1j15bc		7094	.090816	.0007067	.0894307	.0922014
P2j15b		7094	.2357144	.0004974	.2347394	.2366894
Popul		7503	6266.799	52.63027	6163.629	6369.969

The results of the regression analyses are summarized in the table below. Given past trends, poverty level in the country will increase tremendously in the coming period. If the declining trend in agricultural percapita growth is not reversed, Ethiopia faces deterioration of welfare situation and about two-third of the population will be in

absolute poverty by 2015. However, if agricultural productivity increases and registers a positive percapita growth poverty levels could actually be reduced as the growth elasticities of poverty calculated in different scenarios have clearly shown very high return in terms of poverty reduction from a growth in farm productivity.

Table 4.1: Summary of different scenario simulations

	Annual growth in consumption	Change in Po by 2000	Elasticity	
			2000	**2015**
Last 5 yrs actual trend	-3.4	58%	-3.62	
Last 5 yrs actual trend & no inflation	-3.4	34%	-2.12	
Long term trend and no inflation	-1.61	16%		-0.98
Same five-year actual trend	0.4	-15%		-1.8

The functioning of any individual farm system is strongly influenced by the external and rural environment, including policies and institutions, markets and information linkages. Not only are farms closely linked to the off-farm economy through commodity and labour markets, but the rural and urban economies are also strongly interdependent. Although in Ethiopia the significance of off-farm activity is not as high as commonly observed in other countries, small farm households still depend very much on this source. Farm women and men are also linked to rural communities and social networks, and this social capital influences the management of farms.

5.   Conclusions and policy recommendations

The most important basic deprivation in Ethiopia is lack of access to adequate food. The importance of the agriculture sector is, therefore, starkly clear. In Ethiopia, food insecurity is manifested in its extreme form of hunger and famine. Some 5 million people are estimated to be in need of relief food annually due to the nation's inability to produce and/or acquire its total food requirement as well as the inability of the vulnerable populations to access the food even if it were available on the market.

The problems of food insecurity in Ethiopia should be seen from their chronic and structural natures. Rapid population growth, declining land holding size, soil erosion, deforestation, poor technical know-how and rainfall dependent agriculture are some of the root causes of food insecurity in Ethiopia. Productivity in the agriculture sector is low and reliant primarily on rain fed production. The level of harnessing of available water supplies is also estimated to be a mere 11% of the total potential.

However, limited land of 'acceptable' quality remains available for future agricultural use. Much of the limited available land is probably suited to a narrow range of crops. Hence, further expansion is simply not a promising option. Areas for potential expansion also suffer from one or more soil or terrain constraints and usually are inhospitable from health point of view. Hence, there is a critical need for improving the performance of the agriculture sector by raising its productivity levels.

The long term trend analysis made in chapter 2 has shown that overtime the significance of the sector in the overall economy has been declining as a result of a general decline in growth of percapita value added of the sector. Its share in GDP and overall employment has declined significantly during the past four decades. Yet, it still remains to be the dominant sector.

The trend in the overall GDP was highly determined by the trend in the performance of the agriculture sector. The fact that GDP percapita has shown no improvement over such long period is mainly the result of poor performance in the agriculture sector. The welfare of the people has also shown a declining trend in line with weakening of the agriculture sector.

The different simulation estimates made under different scenarios have also clearly indicated that unless the declining trend of the sector achievement is arrested and reversed, poverty situation in the country will rapidly aggravate as a result of which, say, by 2015, close to about two-third of the population will be in absolute poverty. At the same time, it was shown that with little improvement in agricultural productivity, the trend in worsening poverty could be reversed and poverty actually reduced substantially by 2015. This is especially called for considering the fact that the industrial base of the economy has shown little improvement negatively affected probably by the weak agricultural sector among other factors. The service sector is gaining increasing significance and it has surpassed the contribution of agriculture to GDP in the last three years. This is a worrisome trend given that it cannot be sustainable in the long term.

Some of the key conditions that affect the size of the contribution of agricultural growth to poverty reduction identified in this study include the following: A) Access to market; because the rural sector is largely non-monitized an increase in level of agricultural production may not effectively translate into an increase in rural households' income. B) Absence of infrastructure such as roads, communication and transport, i.e., barriers to connection with outside markets. C) Scattered nature of settlement in rural areas acts as a barrier of benefit accumulation or acceleration. Scattered settlement also makes it difficult and costly to provide access to education,

health and infrastructure services. D) Inadequacy of urban demand which is characterized by small population size and underdeveloped industrial sector.

The overall facts detect the need for addressing the constraints faced by the agriculture sector as top development priority. The long-term declining trend in agricultural value added percapita needs to be addressed at policy level. The decline in the share of agriculture should not come as a result of a decline in the growth volume of agricultural output. Even under structural transformation, it is the degree of relative growth between agriculture and the remaining sectors that vary rather than absolute decline in its performance. Hence, ways should be explored to create dynamism in the sector. In particular, the sector should not be seen as an island on its own but as a driving force of growth in other sectors taking into consideration, therefore, sectoral interdependence and rural-urban linkages.

Ethiopia needs to feed itself on priority basis before any other form of development is envisioned. It simply will not be decent and practical to talk of other dimensions of development without first resolving the food insecurity issue. The current trend in level of hunger is largely determined by the onset of adequate and timely rainfall. Given that the frequency and severity of drought seem to have increased over time, fundamental restructuring of the sector is needed. In particular, giving the growing population pressure and scarcity of land and growing landlessness, the land tenure system needs to be revisited and revised to create conducive environment for rapid development of the sector.

Given the low level of urbanization and consequent inadequacy of domestic demand, the competitiveness of the agriculture sector and its orientation to production for export is crucially demanded. The IFIs have pushed Ethiopia to rapidly remove price controls and subsidies to farmers. Transportation and freight prices were deregulated serving to boost food prices in remote areas affected by drought. In turn, markets for farm inputs including fertilizer and improved seeds were handed to private traders. Given the results obtained in this study which indicated farmers suffering from fertilizer use and slumping prices of agricultural produce, some form of price control and subsidy to farmers need to be considered. The issue of scattered settlement in rural areas where most rural communities are isolated from the rest of the society is identified as key barrier to rural transformation. Hence, carefully planned voluntary villagization and settlement programs need to be implemented.

24

References

Alain de Janvry, Elisabeth Sadoulet, et al. (2002). Geography of poverty, territorial growth, and rural development.

Ali, Ali Abdel Gadir (1998). *Dealing with poverty and income distribution issues in developing countries -- Cross regional experiences*, API, Kuwait.

Alderman, H., Cord, L., et al. (2001). Rural poverty, Source Book, World Bank.

Befekadu Degefe, Berhanu Nega and Getahun Tafesse (2002). Second annual report on the Ethiopian economy, EEA/ EEPRI, Vol. II 2000/2001, Addis Ababa.

Colin Thirtle and Lindle Beyers, et al. (2002). The impact of changes in agricultural productivity on the incidence of poverty in developing countries, DFID report No.7946

Colin Thirtle, Lin Lin and Jenifer Piesse (2002). The impact of research led agricultural productivity growth on poverty reduction in Africa, Asia and Latin America. Research paper 016. The management center research papers, University of London

ECA (1999). the challenges of poverty reduction and sustainability, Addis Ababa.

Eshetu Chole (1995). *The dismal economy*, Addis Ababa.

GOE, IPRSP (2000). MoFED

Inderjit Singh, Lyn Squire, and John Strauss (1986). Modeling agricultural household models: Why and how?

Inderjit Singh, Lyn Squire, and John Strauss (1986). An overview of agricultural household models.

Martin Ravallion, Gaurav Datt (2001). Why has economic growth been more pro-poor in some states of India than others?, World Bank.

_____ (1996). How important to India's poor is the sectoral composition of economic growth?, IBRD, The World Bank.

Nanak Kakwani (1993). Poverty and economic growth with application to Cote d'ivoire, review of income and wealth series 39.

Pranab Bardhan and Christopher Udry (1999). *Development microeconomics*. Oxford University Press, Oxford.

WMU, MEDaC (1999). *Poverty situation in Ethiopia*, Addis Ababa.

Krishnan Ramadas, Bernadette Ryan and Quentin Wondon (2002). SimSIP Goals: Assessing the realism of development targets.

LONG-TERM GROWTH OPPORTUNITIES IN ETHIOPIA[1]

Mihret Alemu[2]

Abstract

The paper attempts to investigate the role of institutions in the long-term growth performance of Ethiopia. In this study, it is hypothesized that the long-term growth of the country, apart from traditional factors of production i.e. capital and labor is largely influenced by institutional factors. To examine this, the study uses a times series data on important variables for the period 1967/68-2002/03, and employed Johansen cointegration analysis. The variables used are, institutional quality indicators, human capital, labor force, capital stock, road network, and rainfall. The findings of the paper support the above stated hypothesis. Institution and physical capital are found to be significant in both the long and short run models while human capital is found important only in the long run.

1.   Introduction

Nations in the world have witnessed a variety of growth experiences in the past half century. Countries have been categorized as "growth disasters", in which per capita income has fallen since early 1960s, and "growth miracles", where per capita income has risen rapidly. Between 1985 and 1995, East Asia experienced the fastest growth of GNP per capita (more than 7 percent a year) while in sub-Saharan Africa the average annual growth rate during the same period was –1.1 percent Temple (1999).

Income differences between the developed and most developing nations are getting considerably high. Asia is the only major region that has achieved significant convergence toward developed countries' level of GNP per capita. Per capita income in the newly industrializing economies of Asia-China, Korea, Singapore, and Taiwan increased from 18 percent of the developed countries' average in 1965 to 66 percent in 1995. At the same time, most of Africa became even poorer in relative terms. The relative average per capita income of many African countries, which was 14 percent

---

of the developed countries' level in 1965, declined significantly to just 7 percent in 1995 Soubbotina and Sheram (2000).

Explaining such disparities has drawn attention of most researchers in the economics field. However, we find no set of identical reasons for growing or not growing. In fact, the real world episode of growth is not fully explained by the growth theories (either the neoclassical or endogenous growth theories). This is one of the reasons why researchers of economic growth kept on investigating for additional explaining factors apart from the conventional factor accumulation, technological progress, education, etc. These factors, according to North & Thomas (1973) don't explain growth, rather they are growth themselves.

North (1990) stated that poor growth performance of less developed countries is explained by the institutional constraints, which define a set of payoffs to political/economic activity that do not encourage productive activity. He proposed insights of economic growth are better found in the institutional context in which economic activities take place. Institutions are considered to provide the "missing links" in efforts made so far in explaining growth disparities Johannes (2003).

Following this insight, the paper aims at answering whether the long-term growth of Ethiopia is determined mainly by the traditional factors of production (capital and labor) or variables which have been getting emphasis in recent years in explaining growth in the African context, particularly institutional changes. Researchers like Easterly and Levine, Sala I Martini, and others give emphasis for the factors like Geography, Colonization, Ethnic fictionalization, and more importantly, institutional qualities in explaining disastrous performance of Sub Sahara Africa.

Conceptualizing institutions

Definitions of institutions are given in a wide continuum. There is no universally agreed single definition for the term institution. As Commons (1931) puts it, it sometimes mean "a framework of laws or natural rights within which individuals act like inmates, or the behavior of the inmates themselves" or, "anything additional/critical of the classical economics" or, anything that is "economic behavior" or, anything that is "dynamic" instead of "static," or a "process" instead of "commodities", or "activity" instead of "feelings", or "mass action" instead of "individual action," or "management" instead of "equilibrium", or "control" instead of "laissez faire", seems to be institutional economics, all of these notions are involved in the definitions of institutional economics Commons (1931).

28

Commons (1970) as reviewed by Osmani Prates Silveira (2004) define institutions as "established societal organizations, which included *inter alia* universities, labor unions, churches, political parties and government". Williamson (1985) on the other hand, defined institutions as "alternative organizational mechanism: markets, hybrids and hierarchies".

The recent and widely used definition of institutions is given by North (1990)[3]. North (1990) defines institutions as the "formal and informal constraints on political, economic, and social interactions". According to North (1990) the informal institutions are unwritten laws, which are normally expressed in norms of informal interaction (within the family, or external social relations, or in business activities) of a given society. Informal institutions are represented by codes of conduct, norms of behavior, conventions, taboos, customs, and traditions. On the other hand, formal institutions include political (and judicial) rules, economic rules, and contracts. Political rules broadly define the hierarchical structure of the polity, its basic decision structure, and the explicit characteristics of agenda control. Economic rules define property rights that are the bundle of rights over the use and the income to be derived from property and the ability to alienate an asset or a resource. Contracts contain the provisions specific to a particular agreement in exchange.[4]

Channel of influence on growth

The quality and type of institutions countries acquire as in North (1990), both formal and informal, shape their development outcomes. This insight is missing from prominent growth theorizing works, neoclassical and endogenous growth theories. The neoclassical growth theory which was largely attributed to Ramsey (1928) in the early days and recently to Solow (1956) focused on the importance of factors like investment, population and technological changes without considering the importance of institutions. Incorporating institutions formally into economic theory is a recent practice, attributed particularly to various works of Douglas North. North (1990) attempted to unravel what the neoclassical economics lacks and fill the gap with formally theorizing institutional economics. According to him the rational expectation assumption makes the neoclassical school an institution free school and further emphasized the systemic absence of institutions from economic theory by stating:

> *"Neo-classical economists have implicitly assumed that institutions (economic as well as political) don't matter and that the static analysis embodied in allocative-efficiency models should be the guide to policy; that is*

---

[3] IMF (2003)
[4] Only the formally institution aspect of the definition given by North (1990) is put into use in this paper.

> *"getting the prices right" by eliminating exchange and price controls. In fact the state can never be treated as an exogenous actor in development policy and getting the prices right only has the desired consequences when you already have in place a set of property rights and enforcement that will then produce the competitive market conditions."*
>
> *Douglas North (1990)*

The rationality assumption of the neoclassical economics imply that markets are always efficient and there is no room for ideas, ideologies and hence, institutions. However, in real world, human interaction in the process of exchange, is constrained by incomplete information and limited mental capacity to process available information. The need to backup development efforts by quality institution arises here. Societies entail institutions as a means to reduce transaction costs that arise from asymmetrically held and costly information.

Hence, appropriate institutions contribute to growth by establishing an incentive structure that reduces uncertainty and promotes efficiency. According to Lora and Panizza (2002), good quality institutions can affect economic outcome of a given country by reducing transaction cost and facilitating market exchange, and by setting up a system of incentives, which involve societies in a productive activity.

How important are institutions empirically?

The central story of economic growth over the last 50 years has been the contrast between the years 1950-74 and 1975-2000. The former was a time of general prosperity, in which all strategies yielded positive outcomes; rich and poor countries, open and closed economies, temperate and tropical countries everyone did well. The twenty-year period between 1974 and 1994, however, was disastrous for virtually everyone except the East Asian Tigers and India; the developing world suffered a twenty-year growth collapse, from which it has only recently emerged. While the causes of the global recession in the 1974-1994 are fairly well-known, it is instructive to examine some of the differences between those countries that weathered the storm, and those that did not. In his study of a large sample of developing countries, Rodrik (1999) finds compelling evidence that weak public institutions and ethnically divided societies responded worse to the shock than did those with high quality institutions and united societies Ritzen, Easterly, and Woolcock (2000).

Moers (1999) empirically examined the relationship between institutions, and investment and growth for the period 1990-95 for 25 countries with a special focus on transition economies where the author believes institutional transformation plays a prominent role in the transition process. With the argument that the robustness of

objective institutional measures is limited in many empirical studies of growth, mainly due to the reason that their economic content is small and they don't capture uncertainties that economic agents perceive as crucial the author used subjective institutional measures[5]. Estimation results suggest that particularly public institutions are significant for growth especially through their influence on foreign direct investment. This suggests that macroeconomic stabilization and peace should be the main policy priorities in transition, closely followed by institution building. Generally, the significant results suggest that some 25 to 30% of the variation in growth across transition countries can be explained by variations in formal institutions. Current estimation results moreover indicate that the quality of institutions is *more* important than a host of variables which are generally considered to have a strong effect on growth and investment. Out of 15 control variables only inflation and war seem to have been relatively more important for growth performance in transition economies than institutions per se, with the latter again gaining some importance on inflation during the more recent period. This suggests that macroeconomic stabilization and peace should be the main policy priorities in transition, closely followed by institution building Moers (1999).

Rodrik, Subramanian and Trebbi (2002) empirically analyzed the respective contributions of institutions, geography, and trade in determining income levels among countries of the world. The authors attempted to answer questions like, how much of the astounding variation in cross-national incomes around the world can geography, integration, and institutions explain? Is there any interaction between these factors or do they operate additively? Does any one of the factors trump the other two? and what is the relative importance of each factor? To address such questions, the authors estimated a series of regressions in which incomes are related to measures of geography, integration, and institutions. Their findings on causal links among the determinants suggest that, there is a two-way positive link between institutional quality and integration/trade, which imply that an indirect effect of trade on income. In terms of the relative importance of the factors under consideration, their result indicates that the quality of institutions "trumps" everything else. According to the authors, once institutions are controlled for, measures of geography have weak direct effects on income, and a strong indirect effect through influencing the quality of institutions while the trade is almost always insignificant and the unexpected sign though it has a positive effect on institutional quality Rodrik, Subramanian and Trebbi (2002).

---

[5] Objective institutional measures refer to universally observable indicators while subjective institutional measures are based on surveys and opinions (Moers 1999)

On the other hand, Sachs (2003) claims the findings and conclusions of Rodrik, Subramanian and Trebbi, 2002 and similar findings of Acemoglu, Johnson, and Robinson (2001); Easterly and Levine (2002) as surprising conclusions. According to Sachs (2003), many of the reasons why geography seems to have affected institutional choices in the past (e.g. the suitability of locations for European technologies, the disease environment and risks to survival of immigrants, the productivity of agriculture, the transport costs between far-flung regions and major markets) are indeed based on *direct* effects of geography on production systems, human health, and environmental sustainability, and many of those very same channels would still be likely to apply today. Thus, the logic of the geography-institutions linkage is also the logic of a direct geography-productivity linkage. Based on these arguments, Sachs (2003) ran a two stage least square regression to estimate income as a function of institutional quality and an alternative measure for geography, malaria risk. Despite the findings of previous studies, in Sachs (2003) after controlling for the quality of institutions, the hypothesis that geography matters only through institutions was rejected. His findings suggest a direct effect of malaria transmission on income. Nevertheless, he also argues that the development process reveals complex interactions of institutions, policies, and geography Sachs (2003).

When we see the case of Ethiopia, though the country shares the same fate of underdevelopment with the other sub-Sahara Africa countries, there is no much record of an attempt to disentangle the factors behind the poor growth and standard of living records. Easterly's (2002) attempt among the few. He examines the growth process in Ethiopia first by conducting a growth accounting exercise. This is done by classifying the data into three distinct periods: the Monarchy, the Derg and the Reformist. He argued that negative total factor productivity is the main source to the recorded slow growth during all the three periods. Total factor productivity was persistently negative for the Derg period while it was positive in the other two periods. The negative total factor productivity during the Derg period, explained a general fact that capital accumulation was overstated since it was directed to non-productive uses, which could not truly be a capital accumulation. On the other hand, about half of the growth during the Reformist period came from policy changes such as financial deepening, real depreciation, and the reduction of the black market premium on foreign exchange. He finally analyzes what he considers the fundamental determinants of economic growth like good institutions, high literacy, high openness to trade, and a high degree of structural transformation. According to Easterly, these are the fundamental determinants, which go a long way towards explaining Ethiopia's currently low level of development Easterly (2002).

Alemayehu and Befekadu (2002) attempt to determine the factors of growth in Ethiopia focusing on the role of political economy factors, institutions/markets and

agent's behavior in explaining the growth process in Ethiopia using a cross-country framework. They made regime-based classification of the last four decades: Imperial, Derg and EPRDF. Unlike the findings of Easterly (2002), applying the augmented Solow model total factor productivity in this case was negative irrespective of the regimes under consideration. Their finding suggest that, in the four decades under consideration, GDP growth was mainly due to the extensive use of capital and labor instead of total factor productivity growth. Factors like drought, international commodity prices, peace and security are the major determining factors of economic growth performance of the country mediated through institutions in a form of underdeveloped product, factor markets and the reaction of economic agents.

Netsanet (1997) attempts to see the relationship between economic growth and human resource development in Ethiopia for the period 1967/68-1994/95. In his study, apart from the physical capital and labor force size, education and nutrition are used as a proxy for human resource development. The conclusion of the study is that education particularly primary education has a positive impact on growth while nutrition is found to be insignificant though positive.

Another empirical work on growth performance of Ethiopia was done by Seid (2000) covering the period 1960/61-1998/99. In this study, in addition to physical capital and labor, variables like export, human development and rainfall are considered. According to his findings, the major determining factors of long run growth are labor, human capital, export, and rainfall.

Some correlations:

	GDP	K	INV	L	INF	h	INS
GDP	1						
K	0.98635	1					
INV	0.97477	0.98382	1				
L	0.97253	0.97461	0.957643	1			
INF	0.97235	0.97260	0.964502	0.987834	1		
h	0.95541	0.93605	0.925845	0.974018	0.980142	1	
INS	0.74784	0.79451	0.840169	0.702468	0.707118	0.613862	1

2. Econometric analysis

Most growth theories predict that long-term economic growth is determined by accumulation of factors of production, physical and human capital, along with the increasing productivity of these factors. Empirical modeling of long term growth however, could easily get complex mainly due to the fact that factors that determine

33

long-term growth are numerous and could be economic, social, political, and ecological conditions. Not only that the factors are diverse but many of them could also be immeasurable and interrelated in a complex manner. This study adopts the following model as it is applied by most studies with the objective of analyzing the role of institutions in economic performance of either a given country or in a set of countries of interest[6].

$$Y = \alpha + \beta_i I + \beta_z Z + \bar{\varepsilon}$$ **(1)**

Where, Y is GDP, I represents measure of institutions, and Z represents other control variables

The Parameters β_i and β_z indicate the effects of institutional measures and other variables on economic outcome.

$$Y_t = (N_t^{\beta n}, K_t^{\beta k}, Lr_t^{\beta l}, H_t^{\beta h}, Inf_t^{\beta i}, Rf_t^{\beta r})$$ **(2)**

Taking log form,

$$\ln Y_t = (\beta_n \ln N_t + \beta_k \ln K_t + \beta_l \ln Lr_t + \beta_h \ln H_t + \beta_i \ln Inf_t + \beta_r \ln Rf_t^{\beta r})$$ **(3)**

Where Y_t is GDP, N_t is institutional indicator, K_t is capital stock, Lr_t is labor force size, ht is human capital indicator proxied by Human development index, Inf_t is the total road network, Rf_t is rainfall. Where, the **β**s represent individual parameters.

The data

The analysis covers the time period 1967/68-2002/03. Initial and recent years data, unavailable for some variables is calculated based on respective average growth rates of immediate following and preceding years. Also some data are generated by own calculation using standard methods like for example, UNDPs human development index calculation method is used to calculate the human capital and International country risk Guide to calculate to measure the quality of financial an economic institutions. Similarly the capitals tock is calculated base on the perpetual inventory method. Individual methods of generating indicators or proxies are explained as follows.

---

[6] Such modeling was used by IMF (2003), Sachs (2003), Rodrik, Subramanian & Trebbi (2002), Moers (1999).

GDP (Y_t)

The dependent variable, Yt represents real GDP. The available data for real GDP from the Ministry of Finance and Economic Development (MOFED) has two different series. One for the period 1960/61-1980/81 and the other for 1980/81 – to date. The two GDP series have been linked using the growth rate of the latter series.

Capital Stock (K_t*)*

There is no ready-made data for capital stock. Hence, the stock of capital used in this paper is generated by own calculation adopting the perpetual inventory method (PIM)[7].

Human Capital (h_t*)*

The human capital is proxied by *Human Development* index, which is generated using UNDP's calculation method as a composite index of health and education. According to UNDP's calculation, the composite human development index is given by education: measured by enrollment rate and adult literacy and health status: measured by life expectancy at birth and income[8]. Each index is calculated based on:

$$\text{Index} = \frac{Actual - Minimum}{Maximum - Minimum}$$

---

[7] Capital stock is calculated using the PIM method following the work of (Hoffman 2000).
　　　The general formula is given by:
　　　　　$K_1 = K_o - Dep + I_1$
　　　　　$K_1 = K_o (1- \lambda) + I_1$
　　Where,　K is capital stock
　　　　　λ is depreciation &
　　　　　I is investment
However, the challenging issue in this task is to estimate the initial year capital stock so as to apply the above formula and get the level of capital stock for consecutive years. According to the following table the average life of capital in Ethiopia is 16.9 years.

Average life years of capital assets

Type of Asset	Asset life year (Service year)	Depreciation Rate
Construction	30	3.33
Machinery	15	6.67
Vehicle	10	10.00
Cultivated Asset	5	20.00
Total	16.9	5.9

Source: MoFED

The assumption used in calculating the capital stock for the year 1968-2003 is that whatever initial capita the country is endowed with it is going to wear out between 15-20 year of time. To allow this assumption the calculation went as back as 1943 taking investment of the beginning year as equal to the capital stock. Then after the above formula is used to calculate the stock of capital up to the year 2003.
[8] Income is not included in the calculation of human development index used in this study.

Where, Minimum and Maximum are the minimum possible observed value for that specific variable. In the case of life expectancy the minimum is 25 years of age where the maximum is 85 years of age. While in the case of enrollment rate and adult literacy the minimum is 0 percent and the maximum is 100 percent. To calculate the composite human development index, health and education index are assumed to have 50 percent weight each.

Labor force size(Lr_t)

As there is no time series data on the active labor force size, the year 1999 is taken from the 1999 national labor force survey and extended for the years before and after 1999 by the average population growth rate. Source for the 1999 national labor force survey is Central Statistical Authority.

Institutional Quality index (N_t)

Institutional quality index is calculated for the whole period under consideration based on the international country risk guide. According to the international country risk guide, the institutional quality index is a composite index of economic, financial and political risk indicators. The economic risk indicator is composed of variables like, GDP per head, real GDP growth, Annual Inflation Rate, Budget Balance as a percent of GDP, and Current Account Balance as a ratio of GDP. The financial risk indicators are, Foreign Debt to GDP ratio, Debt service, Current account balance as percent of Export of Goods and Services, Net international reserve in months of Imports, and Foreign Exchange Rate. The political risk indicator is composed of indicators like, Government Stability, Socioeconomic Condition, Investment Profile, Internal Conflict, External Conflict, Corruption, Military in Politics, Religion in Politics, Law and Order, Ethnic Tension, Democratic accountability and Bureaucracy Quality. According to the international country risk guide all the indicators are given different level of maximum points while the minimum point is zero. In this study, economic and financial indicators are calculated using actual time series data of the indicators and the corresponding risk points given by the international country risk guide. Data for political risk indicator is taken from the international country risk guide and for the years unavailable it is extended by average growth rate[9]. Finally, the composite of this three country risk indicators is taken as a proxy for institutional quality index.

Road network (INF_t)

Total road network per 1000 km². The data source is Ethiopian Roads Authority.

---

[9] Since there is no other data source for the institutional quality indicators, extrapolation has been employed with all its limitations, to fill unavailable data of political indicators for some of the years the analysis covers.

Estimation procedures

Econometric analysis involving time series data, commonly encounter difficulties due to the presence of unit root or non-stationarity of variables where the mean and variance of the variable are not time invariant. Such characteristic of a time series data, if not addressed appropriately leads to either ignoring important information about the underlying data generating process or to a nonsensical regression results. To avoid such a problem the Box-Jenkins methodology suggests differencing or detrending the non-stationary variables. Differencing non-stationary variables removes the problem of nonsensical regression results but it leads to elimination of important long run information. Nevertheless, in a univariate models, this was the conventional way of dealing with non-stationary variables while in multivariate models the possible presence of a linear combination of integrated variables that is stationary /the presence of cointegrated variables/ makes the univariate Box-Jenkins methodology inappropriate. Variables are generally said to be cointegrated if a linear combination of non-stationary variables which are integrated of order d form a series which is integrated of a lesser order. To suppose any long run relationship, cointegration between non-stationary variables is required. Hence, cointegration between non-stationary variables implies the existence of a long run equilibrium to which an economic system converges over time while the absence of cointegration leads to the problem of spurious regression. In the case of multivariate models, the appropriate test strategy for unit root is based on the Augmented Dickey-Fuller test with a generous lag structure which allows for both constant and trend terms. The ADF test in addition to constant and trend terms, involves adding an unknown lagged first differences of the dependent variable to capture auto-correlated omitted variables that would otherwise, by default enter the residual Enders (1995) and Harris (1995).

In principle it is important to test the order of integration of each variable in a model, to establish whether it is non-stationary or not and how many times the variables needs to be differenced to result in a stationary series. Accordingly, the variables in this specific case are tested for unit root and order of integration using the Augmented Dickey-Fuller test. All the variables are non-stationary at level and their first difference is stationary implying an order of integration of I(1). The only exception is the capital stock which is I(2).

Cointegration analysis

Following the Johansen approach, the general representation of a multivariate autoregressive model with k lags is given as follows.

$$X_t = A_1 X_{t-1} + \ldots + A_k X_{t-k} + u_t \quad , u_t \sim IN(0, \Sigma) \tag{4}$$

Where, X_t is an $(n \times 1)$ vector of all possibly endogenous variables

A_i is an $(n \times n)$ matrix of parameters

Such a VAR model is given to estimate dynamic relationship among jointly endogenous variables without imposing strong priory restrictions on exogenity and endogenity of variables. Each variable in X_t is regressed on lagged values of itself and the other variables (Harris, 1995).

Reformulating equation [4] into a vector error correction form:

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \cdots + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi X_{t-k} + u_t \tag{5}$$

Where, estimates of Γ_i and Π contains information about the short run and long run adjustments to changes in X_t, respectively. Moreover, $\Pi = \alpha \beta'$ where, α represents the speed of adjustment to disequilibrium and β represents a matrix of long-run coefficients. For such a system of equation with n possibly endogenous variables, one may face possibilities of 1) no cointegrating vectors and 2) $r \leq (n-1)$ cointegrating vectors. Where, r is rank of matrix Π. The rank of Π determines the number of cointegrating relationships. There is a possibility that Π has a full rank where, $r = n$ and it has a rank of zero where there are no cointegrating relationships. However in practice, the usual case is where Π has a reduced rank, i.e. $r \leq (n-1)$ cointegrating vectors are present. It is generally not possible to apply ordinary regression techniques to the individual system such as [4:12] since what is obtained is an $(n \times n)$ estimate of Π. For such a reason, Johansen (1988) presupposes that Π can be factorized into $\alpha \beta'$, where α and β both can be reduced in dimension to $(n \times r)$ and use the procedure of reduced rank regression to obtain estimates of α and β [See Harris 1995, pp 79].

Following this, equation [5] is rewritten using the specific variables as:

$$
\begin{bmatrix} \Delta LGDP_t \\ \Delta L_t \\ \Delta LH_t \\ \Delta LINV_t \\ \Delta LINS_t \\ \Delta LINF_t \end{bmatrix} = \Gamma_i \begin{bmatrix} \Delta LGDP_{t-i} \\ \Delta LL_{t-i} \\ \Delta LH_{t-i} \\ \Delta LINV_{t-i} \\ \Delta LINS_{t-i} \\ \Delta LINF_{t-1} \end{bmatrix} + \begin{bmatrix} \alpha_{11}\alpha_{12}\alpha_{13}\alpha_{14}\alpha_{15} \\ \alpha_{21}\alpha_{22}\alpha_{23}\alpha_{24}\alpha_{25} \\ \alpha_{31}\alpha_{32}\alpha_{33}\alpha_{34}\alpha_{35} \\ \alpha_{41}\alpha_{42}\alpha_{43}\alpha_{44}\alpha_{45} \\ \alpha_{51}\alpha_{52}\alpha_{53}\alpha_{54}\alpha_{55} \\ \alpha_{61}\alpha_{62}\alpha_{63}\alpha_{64}\alpha_{65} \end{bmatrix} \begin{bmatrix} \beta_{11}\beta_{21}\beta_{31}\beta_{41}\beta_{51}\beta_{61} \\ \beta_{12}\beta_{22}\beta_{32}\beta_{42}\beta_{52}\beta_{62} \\ \beta_{13}\beta_{23}\beta_{33}\beta_{43}\beta_{53}\beta_{63} \\ \beta_{14}\beta_{24}\beta_{34}\beta_{44}\beta_{54}\beta_{64} \\ \beta_{15}\beta_{25}\beta_{35}\beta_{45}\beta_{55}\beta_{65} \end{bmatrix} \begin{bmatrix} LGDP_{t-1} \\ LL_{t-1} \\ LH_{t-1} \\ LINV_{t-1} \\ LINS_{t-1} \\ LINF_{t-1} \end{bmatrix} \quad (6)
$$

Testing for the number of cointegrating vectors that exist in β is equivalent to testing which columns of the α matrix are zero. Cointegration test results of equation [6], using the Johansen procedure are summarized below.

Table 2.1: Cointegration analysis

H_o: rank=p	n-p	$\lambda_{max}=T\,ln(1-\lambda_{r+1})$	T-nm	95%	$\lambda_{max}=T\,ln(1-\lambda_i)$	T-nm	95%
P=0	5	48.45**	40.15*	39.4	114.3**	94.73*	94.2
P≤1	4	23.98	19.87	33.5	65.87	54.58	68.5
P≤2	3	20.6	17.07	27.1	41.89	34.71	47.2
P≤3	2	11.92	9.875	21.0	21.29	17.64	29.7
P≤4	1	7.94	6.579	14.1	9.372	7.765	15.4
P≤5	0	1.432	1.187	3.8	1.432	1.187	3.8

*** and * indicate rejection at 1% and 5% level of significance, respectively.*

As the above table shows, at 5% level of significance, both the λ_{trace} and the λ_{max} statistics reject the null hypothesis that there is no cointegrating relationship and support the presence of one cointegrating vector. For the procedures and details of λ_{trace} and the λ_{max} statistics [see Enders, 1995, PP 390-91]

Table 2.2: Standardized β eigenvectors

LGDP	LL	LH	LINVMIH	LINS0.6	LINF
1.0000	-0.14438	-0.43540	-0.11862	-0.88285	0.078636
0.35921	**1.0000**	0.40372	0.28532	0.1772	-1.3830
0.53937	-0.73221	**1.0000**	0.059174	-0.57775	-0.62003
-1.1919	0.95198	0.81203	**1.0000**	-3.0730	-0.64152
-1.3711	-5.0727	-4.4063	0.21254	**1.0000**	5.4891
0.71413	-2.5100	0.31575	0.0111087	-0.22952	**1.0000**

Table 2.3: α coefficients

LGDP	-0.37131	-0.11761	-0.23759	0.028928	0.0065050
LL	0.037116	-0.033123	0.067664	0.0067795	0.00046715
LH	0.062095	0.061149	0.051477	-0.031183	0.0070984
LINV	0.42558	-0.86838	-0.74333	-0.23374	-0.051255
LINS	0.31185	0.028685	-0.094614	0.0080438	-0.0078961
LINF	-0.40861	0.075750	0.059623	-0.012364	-0.014192

Vector AR 1-2 F(50, 17) = 1.4233 [0.2148]
Vector normality Chi^2(10)= 15.623 [0.1110]
Testing for vector error autocorrelation from lags 1 to 2
*Chi^2(50)=110.6 [0.0000] ** and F-form(50,17)=1.4233 [0.2148]*

Once the cointegration test is conducted and a vector of one cointegrating relationship is obtained, the next step is to identify the unique cointegrating vector that forms a long run relationship. In order to do this, α and β coefficients restriction tests should be conducted. The α coefficient test is equivalent to weak exogenity test while the β coefficient tests the level of significance of each variable in the unique vector.

Table 2.4: Zero restriction tests on α coefficients

	LR-test χ^2 (1)	P-Value
LL	0.7004	0.4027
LH	0.37058	0.5427
LINV	0.17607	0.6748
LINS	7.0888	0.0008**
LINF	8.9482	0.0028**

* indicates rejection at 1% level of significance.

According to the α coefficient tests all the variables are found to be weakly exogenous except the variables LGDP and LINS and LINF. Rejection of the weak exogenity of the variable indicate a possible simultaneous relationship with LGDP.

Table 2.5: Zero restriction tests on β Coefficients of Variables

	LR-test χ^2 (1)	P-Value
LL	1.2011	0.2731
LH	11.076	0.0009**
LINV	9.7451	0.0018**
LINS	22.55	0.0000**
LINF	0.39408	0.5302

** rejection at 1% level of significance

As it is clearly seen in the above table zero restriction tests for β coefficients indicate that all the variables, except for LL and LINF, are significant in the long run model. With this, getting a unique vector of the long run relationship requires further restriction tests on α and β coefficients. Combined restriction test results on endogenous and insignificant variables is summarized bellow.

LGDP	LL	LH	LINV	LINS	LINF	LR-Tests
1.0000	0.0000	-0.45530	-0.10524	-0.87020	0.0000	$\chi^2(1)=1.2152(0.5447)$
-1.1492	0.0000	-0.52321	-0.12094	1.0000	0.0000	$\chi^2(1)=1.2152(0.5447)$

Based on the probability of the above test, both the endogenity of the variable LGDP& LINS and insignificance of the variable LH is accepted. Hence we can proceed with the unique long run vector that is obtained from this test:

$$LGDP = \alpha_{11}\left(\beta_{11}LL + \beta_{21}LH + \beta_{31}LINV + \beta_{41}LINS + \beta_{51}LINF\right)$$
$$LGDP = -0.37131\left(0.45530LH + 0.10524LINV + 0.87020LINS\right)$$

At this stage though the estimation is not fully complete, the above vector from the Johansen cointegration analysis provides indicative information about the long run relationship between the dependent variable, LGDP and the explanatory variables. The sign and magnitude of the coefficient α_{11} shows that there is moderate adjustment towards equilibrium.

Once the Cointegration analysis is complete and the unique vector is obtained, the next step is to estimate the short run model. The short-run structure of the model is also important in terms of the information it conveys on the short-run adjustment behavior of economic variables. In modeling the short run, Hendry approach of general-to- specific modeling is adopted. To obtain the parsimonious representation of the system, a short run VAR is modeled in error correction form (VECM) with the cointegration relationships included.

$$\Delta \ln X_t = \sum_{i=1}^{k} \Gamma_i \Delta \ln X_{t-i} + \alpha\left(\hat{\beta}_1^{'}\tilde{X}_{t-1} + \hat{\beta}_2^{'}\tilde{X}_{t-1}\right) + u_t \qquad (7)$$

Where, $\Delta \ln X_t$ represents a vector of change in endogenous variables, in this case LGDP and LINS. $\Delta \ln X_{t-i}$ represents a vector of lagged explanatory variables including lagged values of LGDP and LINS. $\alpha \left(\hat{\beta_1}' \tilde{X}_{t-1} + \hat{\beta_2}' \tilde{X}_{t-1} \right)$ represents the error correcting terms. The equation is estimated simultaneously using full information maximum likelihood (FIML). As stated by Johnston (1997), in estimating a system equation, FIML is superior than single equation methods of two stage least squares.

Following the above argument the short run dynamics is estimated simultaneously using Full Information Maximum Likelihood Method. The estimation results are summarized below.

Table 2.6: Estimation results of PVECM

The dependent variable is ΔLGDP			
Variable	**Coefficient**	**t-value**	**t-probability**
ΔLINS	0.83596	3.316	0.0033
ΔLGDP$_{t-1}$	0.56398	3.525	0.0023
ΔLGDP$_{t-2}$	-0.45846	-2.600	0.0176
ΔLINS$_{t-1}$	-0.41958	-2.908	0.0090
ΔLRFDM$_{t-1}$	0.00278	2.663	0.0154
ΔLL	0.63844	2.479	0.0227
Constant	2.4525	3.564	0.0021
VECGDP$_{t-1}$	-0.60887	-3.500	0.0024

From the system estimation results summarized in the above table, the variables significant in determining the short run growth in Ethiopia are institutions, labor, and rainfall of the previous period. This variables affect growth performance of the country positively. The error correcting term, VECGDP$_{t-1}$ indicates that a 60.8 % adjustment towards equilibrium every year.

From the long run model it is to be recalled that we found labor to be insignificant. One of the possible reasons for this is perhaps the existence of surplus labor in the economy. Institutions on the other hand are found to be significant in both the short and long run models indicating that one of the possible reason for the disappointing economic performance of the country is weak institutional quality.

Given Human capital on the other hand is only significant in the long run. This should not be surprising the development stage of the economy where traditional agriculture, which highly depends on the vagaries of nature, contributes to nearly half of the annual GDP. Moreover, since activities in the agricultural sector are not modern technology oriented, the importance of human capital in determining growth of the country is unlikely to be apparent unless structural transformation occurs. Note that this only implies skilled labor may not be efficiently used in traditional economies without undermining the role of the former in transforming the latter.

3.   Conclusion and policy recommendations

Although attaining growth is crucial for sustainable development, many developing countries in the world failed so far to achieve persistent growth. Hence, societies suffer from the consequential effect of poor development. Ethiopia is one of the least developed countries in the world where nearly half of its population are living in absolute poverty. Attaining growth and development to bring changes in the livelihood of the people has been a challenge for policy makers for quite a long period of time. In this regard understanding the growth process of the country becomes important as good knowledge about sources of growth is key to designing appropriate policy framework. However, only few researches have attempted to explain long-term growth in Ethiopia.

This study has attempted to study the role of institutional factors in determining growth performance of the country. In doing so the paper has employed a time series econometric technique of cointegration analysis on long-term time series data that covered the period 1967/68-2002/03.

As many empirical works on growth suggest, the paper assumed a two-way link between economic growth and the explanatory variables. Nevertheless, such an interrelationship is found only between economic growth and institutional quality. The research addressed this issue by solving the short run dynamics using Full Information Maximum Likelihood estimation technique.

The findings of the cointegration analysis support long run relationship between the dependent variable and the explanatory variables. In the unique cointegrating vector that forms the long run relationship, the variables labor and infrastructure are found to be insignificant. On the other hand, physical capital, human capital and institutional quality are found to be significant explaining factors in the long run model. The findings confirm the hypothesis of the paper, that accumulation of factors of production as well as institutional quality matter for the growth process of the country.

Furthermore, the error correction model also indicated change in the log of institutions, labor, and rainfall are found to be significant in the short run.

Overall, the results of this study indicate that in addition to factor accumulation, building a good quality and efficient institutions are crucial to free the country from underdevelopment. One of the reasons why institutions are important for growth theoretically is that good quality and efficient institutions reduce the cost of production and make markets work more efficiently. Hence, for better outcome, government policies at macro and micro level should be supported by good quality institutions which insure, law and order, bureaucracy quality, and accountability while preventing corruption and conflicts. Particularly to build a strong and successful market based economy setting appropriate institutions in place is important. Institutions that protect property rights, provide appropriate regulations for different markets (such as – product, factor and financial markets) and that institutions that support macroeconomic stabilization.

Details of institutional design. There is little understanding of what specific institutional forms will work best in any specific context. For example, high levels of income and wealth have been achieved among the advanced economies under a range of institutional structures—including various legal and regulatory approaches, and different degrees of state involvement in the economy. Similarly, fast-growing developing economies such as China, Botswana, and Mauritius have been able to achieve these results under substantially different institutional arrangements.

Reform strategies and priorities. Similarly, we know little a priori about what reform strategies—including priorities and sequencing—will be most effective in any particular set of circumstances. Countries that have experienced significant institutional change over recent decades—including China, Chile, and the central European economies—have done so using vastly different approaches.

It may not be possible—and indeed, as discussed below, may not be desirable—to draw general conclusions and "reform rules" from such experiences. What the two points above *do* imply is that institutional design and reform are likely to have important country-specific components (and sometimes time-specific ones as well). In particular, North (1990) and others have emphasized that institutional arrangements and reform strategies that appear to have worked well in one country are unlikely to perform as effectively if transplanted to another, at least without adaptation and innovation to suit local circumstances. For example, the particular institutional arrangements used to protect property rights and uphold the rule of law in China are in part an outgrowth of broader economic and political developments in that country, and may not be readily adopted elsewhere. Similarly, the concept of international

"best practice" is unlikely to be meaningful when applied to detailed specifications of institutional forms.

What can policy do to spur institutional reform?

That being said, there is a role for policies in fostering institutional development - development that will in turn promote policy sustainability and economic growth. Several mechanisms - some general, others more specific - have been stressed in the literature as being useful in promoting institutional improvement.

• *Competition and trade openness*. A number of studies have found that strengthening competition, including through trade openness, tends to be conducive to institutional improve-

REFERENCE

Alemayehu Geda and Befekadu Degefe (2002). Explaining African growth performance: The case of Ethiopia final draft for the Cambridge series.

Acemoglu D., S. Johnson and J. A. Robinson (2001). The colonial origins of comparative development: An empirical investigation. *The American Economic Review*, Vol. 91, No. 5.

Artadi Elsa V. and Xavier, Sala-i-Martini (2003). The economic tragedy of the XXTH century: growth in Africa, NBER working paper sereies/9865

Bennett T. MacCalum (1996). Neoclassical vs endogenous growth analysis: An overview, economic Quarterly, Federal Reserve Bank of Richmond.

Charles I Jones (1995). *Introduction to Economic Growth*. Text book, W.W Nortorn & Company

Easterly W. (2002). Growth in Ethiopia: a retrospect and prospect center for global development

Easterly and Levine. (1995). Africa's growth tragedy: A retrospective 1960-1989. The World Bank, policy research working paper/1503

Enders W. (1995). *Applied econometric time series* Wiley series in probability and mathematical statistics

_____. (2002). 15 years of growth economics: What have we learnt? Colombia University and Universitat Pompeu Fabra.

Freeman B. and David L. Lindauer (1999). Why not Africa, NBER working paper/6942

Harris R. (1995). *Cointegration analysis in econometric modeling,* Oxford University Press.

Jo Ritzen, William Easterly and Michael Woolcock (2000). On "Good" politicians and "Bad" policies: Social cohesion, institutions, and growth. The World Bank working paper/2448

Johnston J. and DiNardo J. (1997). *Econometric Methods*, Text Book, MacGraw-Hill.

Jutting J. (2003). Institutions and Development: A Critical Review, OECD Development Center Technical Papers No. 210

Kalecki, Michal (1976). *Essays on Developing Economies*. The Harvester Press Limited.

Luc Moers (1999). *How important are institutions for growth in transition countries?*

Luc Moers, Romer D, and Weil N. David (1990). A Contribution to the Empirics of Economic Growth, National Bureau of Economic Research, Working Paper/3541

Masanjala W. and Papageorgiou C. (2003). *Africa Does Grow Differently*. LSU working papers

MoFED (2002). Ethiopia: Sustainable Development and Poverty Reduction Program

_____ (1999). Survey of the Ethiopian Economy, Pre and Post Reform Review

North, Douglass C. (1990): Institutions, Institutional Change, and Economic Performance, New York: Cambridge University Press

North, Douglass C. and Robert P. Thomas (1973). *The Rise of the Western World: A New Economic History*, Cambridge University Press.

Netsanet Walelign (1997). Human Resource Development and Economic Growth in Ethiopia, MSc Thesis, Addis Ababa University, School of Graduate Studies.

Prates Osmani S. (2004): Economic Growth in Bahia, Brazil: The Role of Institutions & Government George Washington University

Romer M, Paul (1990). Endogenous Technical Change, *Journal of Political Economy.*

Robert E. Hall and Charles I. Jones (1998). Why Do some Countries Produce so much more Output per Worker than Others?

Robert J. Barro (1996). Determinants of Economic Growth, A Cross Country Empirical Study, NBER Working Paper

Sachs D. Jeffrey (2003). Institutions Don't Rule: Direct effect of Geography on Per Capita Income, NBER working paper/9490

Sachs D. Jeffrey and Warner M. Andrew (1997). Sources of Slow Growth in African Economies, *Journal of African Economies*, Vol. 6, No. 3

Rodrik D., Subramanian A. and Trebbi F. (2002). Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development, NBER Working Paper Series/9305

Scott L. Baier, Gerald P. Dwyer Jr. and Robert Tamura (2002). *How Important Are Capital and Total Factor Productivity for Economic Growth?* Federal Reserve Bank of Atlanta Working Paper 2002-2a

Seid Nuru (2000). Determinants of Economic Growth in Ethiopia, MSc Thesis, Addis Ababa University, School of Graduate Studies.

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economies*

Tatyana P. Soubbotina and Katherin A Sheram (2000). Beyond Economic Growth: The Challenge of Global Development, The World Bank.

Temple Jonathan (1999). The New Growth Evidence, *Journal of Economic Literature.*

Williamson, Oliver (1985): *The Economic Institutions of Capitalism,* New York: The Free Press.

Xavier Sala-I-Martin (1996). The Classical Approach to Convergence Analysis, *The Economic Journal*, Volume 106 Issue 437,

THE IMPACT OF CREDIT REPAYMENT SCHEDULE POLICY ON COMPETITIVENESS OF GRAIN PRODUCTION IN *WELMERA* DISTRICT, ETHIOPIA[1] [2]

Mesfin Haile[3]

Abstract

In the last few years, agricultural polices were designed to benefit farmers. The agricultural extension program being implemented enabled smallholder farmers to use new agricultural technologies on time and hence increased productivity and output obtained per unit of land. However, credit repayment schedule policy put in place, forced farmers to repay input loans when price of output is very much low. The policy analysis matrix (PAM) was used for this study as a main methodology combined with a seasonal price Index. The study showed *Welmera* district having a comparative advantage for barley but not competitive while it has only a competitive advantage for *tef* and wheat. For two reasons farmers did not receive the actual price of grains that was equivalent with the true price. First, the system confirmed the presence of market failure in fertilizer market. Second, domestic cost of seed production was lower than the world price. The data also clearly pointed out how government policy negatively affected private profitability by undervaluing land. The seasonal analysis demonstrated price variability of grains exists in the study area. Moreover, the repayment period for input loan arranged when output prices are at their lowest levels. Therefore, the removal of credit repayment schedule policy would make grain production more competitive if farmers shift the sale of its produce to peak price periods. This call for review of the existing agricultural polices for the benefit of small scale farmers.

---

1. Introduction

Ethiopian agriculture in general and grain production in particular have gone through different policy regimes. Government usually used to design and implement several policies on national level. In some parts of the country the policy may bring intended benefit while in other parts of the country it becomes unsuccessful. Policy makers are therefore should be aware of the magnitude of policy effects on a separate region, zone or districts of a country. Presenting impact of a policy on different parts of the country serves as a base to prescribe alternative policy that contributes positively to the development of agricultural sector.

According to Pearson *et al.* (2003) policies influencing the agricultural sector fall into one of three categories – agricultural price policies, macro-economic policies, or public investment policies. Following the change of government in May 1991 Ethiopia has implemented Structural Adjustment Policy (SAPs) reforms. Ownership of private property legally recognized, however, ownership of land maintained as a property of the government. The local currency, Birr, was devalued from 2.07 to 5.00 Birr/ US$ on October 1992 and this made domestic fertilizer prices higher compared to the previous years. According to Legesse *et al.* (2004), this called for the formulation of the national fertilizer policy in 1994. National Fertilizer Industry Agency (NFIA) was established to guide and regulate the fertilizer input sub sector. In 1994, in one hand, government approved and implemented direct fertilizer subsidy policy in a bid to avoid discouragement of fertilizer use by smallholder farmers. In 1997, a counteracting policy eliminated the direct fertilizer subsidy and the pan territory pricing. On the other hand, in 1994 from the lesson of SG 2000 project, the Ethiopian government launched a new extension system called Participatory Demonstration and Training Extension System (PADETES). The extension system comprises improved agricultural technologies given on credit basis. For most farmers in Ethiopia lack of credit is the cause why they didn't adopt agricultural technologies (Howard *et al.* 1995). According to CIMMYT (1993), credit may be an important factor in determining adoption of agricultural technologies. In PADETES, the credit is arranged as a package that provides a set of inputs to farmers.

Nonetheless, this credit scheme still needs some improvement for the benefit of the majority farmers. Credit system of the new extension program is more complex having multiple actors. Banks provide credit, regional governments guarantee credit and extension agents approve participants and collect payments (Arega and Rashid, 2003). The credit lacks realistic assessment of the borrowers' needs and the force used to ensure repayment of input loans right after harvest, discouraged many farmers from participating in the extension (Belay 2003; Croppenstedt *et al.* 2003). As

a result, farmers were forced to sell their produce when the prices of agricultural produces are extremely low. The credit policy thus created an implicit price policy to grain production because right after harvest it causes the domestic grain prices to be lower than in the absence of policy. The lower output prices are also a disincentive to the use of agricultural technologies. These show the gap that this research tried to fill. This study was conducted in *Welmera* district in Ethiopia given it is dominated by peasant agriculture and hosted extension program since its inception. In the district barley usually used for consumption purpose while *Tef* and wheat partly serving as a cash crop. The objective of the study is to investigate the impact of credit repayment schedule policy on competitiveness of grain production.

2.   Research methodology

2.1   Methodology

Policy Analysis Matrix (PAM) approach used to evaluate and measure the impact of credit repayment schedule policy on competitiveness of grain production. The methodology is based on the formulation of budgets for representative farm production activities (Monke *et al.,* 1989; Pearson *et al.*, 2003). PAM used by different researchers to evaluate and measure the effect of government policies on crop production. For example, Wiendiyati *et al.* (2002) studied the impact of tariff policy and inter-land transport costs on profitability of soybeans production in Ngoda Regency, NTT. Dipokusumo *et al.* (2003) evaluated impact of agricultural policy on soybean production in west Nusa Tenggara province, Indonesia. PAM used in Zimbabwe to evaluate the effect of removal of the special credit facility for the production of flue cured tobacco requirements (Winter-Nelson, 1991). PAM also used in Kenya to assesses dairy production and marketing in Nyeri. Since the PAM analysis requires the historical data on seasonal price variability, the 12 month moving average technique was used to examine seasonal output price variability. The moving average isolates the seasonal pattern by removing the influence of cyclical price movements and long-term trends. Seasonal price patterns are usually described by means of an index. This method is used by many researchers (Flaskerud *et al.* 2000; Ellis *et al.*, 1997; Tschirley, 1995). The result of the seasonal price variability will be an input for the sensitive approach in order to determine the favorable repayment period of credit.

2.2   Data type

Cross sectional input-output data was used for both financial and economic analysis. These input-output data were collected in a case study conducted in 2003/2004

production year from 48 smallholder farmers. Better off and resource poor farmers, as well as extension participant and non-participant farmers considered during the selection process. The case study include; among others, land holding and area under crop measured by compass traversing. Sides of each crop field measured with the help of measuring tape and compass bearings taken at each angle. Finally programmable calculator used to compute the area. Seeds and fertilizer measured with the weighting balance before it was applied to the field, stop watch used to measure duration of farm activities, outputs obtained weighted after trashing, and etc. The output price data for the period 1988 through 2004 was used to examine seasonal price variability. The 2003/4 production year credit repayment structure for extension participant examined to show when majority of matured credit are repaid for the borrowed loan of improved seeds, fertilizers and herbicides.

3.   Presentation of results

The policy analysis matrix

Macroeconomic assumptions

Macroeconomic variables which affect the economic system include nominal interest rate, inflation rate, and official exchange rate. The information obtained from national bank indicated that nominal interest rate of loans was 10.5 percent per year, and the inflation rate was 9 percent per annum in 2003/4. Hence, the real interest rate per annum adjusted to inflation was estimated to be 1.5 percent. The average official exchange rate in the same year was observed to be 8.67 per US$.

Input and output coefficients

Input-output data records were made in 2003/4. Inputs are divided into two, tradable inputs and domestic factors. Tradable inputs were those traded on international markets. The most important tradable inputs in the study area were seeds, fertilizers (DAP, and Urea), and herbicide. The most commonly growing improved barley varieties in the study area were *Baleme*, HB-42, *Ardu* 1260B, *Dimtu*, *Misrach* and *Shegae* while the local varieties are known as white barley, black barley and *Semereta*. *Baleme* was the most commonly used improved variety grown in the study area. Besides, HB-42 was an improved barley variety distributed for farmers involved in extension package. Farmers in the study area on average applied 187 kg of barley per hectare. *Dashen, Qubssa, ET-13, Kenya, bonde, lakech* and *galama* were among the improved wheat variety grown in *welmera* district. In addition, ET-13, HAR 710, and HAR 1685 were improved wheat varieties distributed for extension package participants. About 245 kg of wheat seeds used for a hectare of land. *Tef* is an

indigenous grain crop to Ethiopia. It is also a peculiar grain grown to prepare the staple Ethiopian food "*Injera*". Two improved varieties of *tef*, namely, DZ-354 and CV-37 were distributed for extension participants in 1995 and 1996 production calendar. Since 1997 no improved *tef* seed was distributed for extension participant farmers in the study area, following the complaint that DZ-354 and CV-37 were not yielding highly. Farmers in the study area on average applied 72 kg of *tef* seed for a hectare of land. To ensure high germination rate as well as reduce the rooms for anticipated weeds, farmers applied higher seeds rate than the recommended.

DAP, and Urea were the most widely used fertilizers in the study area. Application of fertilizer for crop production started in the study area during Haile-Selassie regime. The study showed that farmers apply on average 43 kg of Urea and 50 kg of DAP for *tef*; 69 kg of Urea and 69 kg of DAP for Barley; and 124 kg of Urea and 128 kg of DAP for wheat(Table 3.1). In the study area, 2-4D and U-46 were the most commonly used herbicide for brood leaf weeds.

Table 3.1: Physical input - output coefficient

	Items	Barley	*Tef*	Wheat
Tradable	Seed (kg/ ha)	187.35	72.12	245.35
	Fertilizer(kg/ ha) -Urea	69.19	42.58	123.72
	-DAP	69.19	49.45	128.06
	Herbicides (lt)	0.69	0.62	1.04
Domestic factor	Labor (man-day/ha)			
	Land preparation	26.62	33.14	40.12
	Planting	29.41	8.67	3.10
	Crop husbandry	7.14	25.52	7.38
	Harvesting	51.65	49.24	51.44
	Threshing	22.57	26.48	21.32
	Animal-power			
	Land preparation	45.00	68.18	84.27
	Planting	15.88	4.84	0.40
	transportation	21.49	2.87	52.09
	Threshing	20.29	15.76	30.91
	Working capital	2,558.66	2,321.22	2,712.84
	Land rent (ha)	1.00	1.00	1.00
Output	Productivity (kg/ha)	2,432.35	1,301.82	2,372.00

Source: Own computation

Domestic factors like labor, capital and land were used for grain production in *welmera* district. Land preparation, weeding and harvesting were the three top peak agricultural activity periods that required the use of additional or hired labor. Both family and hired labor used in grain production were unskilled. Of the three grain

crops, *tef* needs repeated land cultivation, soil packing before sowing and careful harvesting because of its small seed/ grain size.

Capital is non tradable and divided into two categories, fixed and working capital. Fixed capitals are those which can be used by farmers for a period of more than a year. These include animals reared for the purpose of traction and transportation, and farm tools. Working capital refers to the money allocated for the purchase of inputs such as seeds, fertilizers, and pesticides. Total working capital was obtained by adding all costs used to purchase inputs, hire labor and oxen-power with the assumption that all labor and oxen are obtained through hiring. Working capital for barley, *tef* and wheat were equivalent to 2558.66, 2321.22, and 2712.84, respectively.

Land was also the other non tradable input fixed in supply. Land was the primary limiting factor in *welemera* district that hindered expansion of cultivated land. Land in the country in general and in the study area in particular is owned by the government. Farmers had only usufruct right since the distribution of land in 1975. Since then, the land redistribution has been made several times until 1990. However, the youth who got married and formed a new household after the last distribution have not got any land as the land can not be sold or mortgaged.

Private Prices

Private prices were the existing market price for all inputs and outputs at the farm-gate. Farmers in the study area get improved varieties from *Holetta* Agricultural Research Center (HARC), bureau of agriculture (BOA), and other farmers. Those farmers who collaborate with HARC get improved seed without payment as a reward for allowing their land to be used for on-farm experiment. Other farmers with interest to participate in the extension package got improved seed on credit basis from BOA. There were cases when farmers got a chance to purchase offspring's of commercial seeds and local verities from other farmers. Hence, the average seed price of barley, *tef* and wheat were 1.7, 2.3, and 2 birr per kg, respectively. In 2003, the market prices of Urea and DAP in the district were 1.8 and 2.4 per kg respectively (Table 3.2). The market price of herbicide was 38 birr per liter.

Domestic factor prices vary depending on the location of production area. The wage rates vary for different crops and farm activities. However, in the entire three crop production cases, wage rate for harvesting and threshing was higher than the rate for land preparation, planting and crop husbandry. Working capital is usually borrowed in June and repaid in February. The cost of working capital was 10.5 percent per annum

of which 3 percent was sales tax. Therefore, the cost of working capital for nine months was equivalent to 7.875 percent.

Table 3.2: Private prices

	Items	Barley	*Tef*	Wheat
Tradable	Seed (kg/ ha)	1.70	2.30	2.01
	Fertilizer(kg/ ha) – Urea	1.80	1.80	1.80
	-DAP	2.40	2.40	2.40
	Herbicides (lt)	38.00	38.00	38.00
Domestic factor	Labor (man-day/ha)			
	Land preparation	7.00	5.00	6.00
	Planting	7.00	5.00	6.00
	Crop husbandry	7.00	5.00	6.00
	Harvesting	8.00	12.00	7.00
	Threshing	8.00	12.00	7.00
	Animal-power			
	Land preparation	7.00	7.50	5.00
	Planting	7.00	8.00	5.00
	Transportation	12.00	8.00	5.00
	Threshing	10.00	7.50	5.00
	Working capital	0.08	0.08	0.08
	Land rent(ha)	17.00	17.00	17.00
Output	Output price (kg/ha)	1.09	2.00	1.47

Source: own computation

Private budget

The private budget was obtained by multiplying the quantities in the input-output table by the prices per unit of each item in the prices table. Private profitability is the difference between the value of grain produced and the costs of all inputs used in the production so as to reach at private budget where all input-outputs are valued in the prevailing market prices.

The tradable input budget was equivalent to 635.6, 384.7 and 1061.6 for barley, *tef* and wheat, respectively. Total working capital was obtained by summing tradable input costs, value of labor, oxen power used, and land rental. It was then multiplied by the interest rate to obtain the opportunity cost of working capital. Cost of capital was about 201, 183 and 214 birr for barley, *tef*, and wheat, respectively. Total revenue obtained from production of barley, *tef*, and wheat were 2656, 2961, and 3486, respectively. Farmers who produced barley incurred a loss of 121 birr from the production of a hectare of land whereas farmers who produced *tef* and wheat

generated a profit of 76 and 543 birr respectively from production of a hectare of land (Table 3.3).

Table3.3: Private budget

	Items	Barley	*Tef*	Wheat
Tradable	Seed (kg/ ha)	318.78	165.88	492.06
	Fertilizer(kg/ ha) -Urea	124.54	76.64	222.70
	-DAP	166.06	118.69	307.34
	Pesticide (lt)	26.25	23.48	39.53
Domestic factor	Labor (man-day/ha)			
	Land preparation	186.32	165.70	240.72
	Planting	205.88	43.35	18.58
	Crop husbandry	50.00	127.58	44.27
	Harvesting	413.24	590.91	360.08
	Threshing	180.59	317.75	149.24
	Animal-power			
	Land preparation	315.00	511.36	421.35
	Planting	111.18	38.74	1.98
	Transportation	257.88	22.96	260.45
	Threshing	202.94	118.18	154.55
	Cost of capital	201.49	182.80	213.64
	Land rent(ha)	17.00	17.00	17.00
Output	Total revenue (kg/ha)	2,656.13	2,597.13	3,486.84
	Total cost (excl land)	2,760.16	2,504.01	2,926.47
	Profit (excl land)	-104.03	93.12	560.37
	Net profit	-121.03	76.12	543.37
	Total working capital	2,558.66	2,321.22	2,712.84

Source: Own computation

Import parity prices for inputs & outputs

Here, it is important to make distinction between 'tradable' and 'non-tradable' goods. Tradables comprise all goods and services produced in an economy which are actually or potentially imported or exported. Non-tradables are goods which do not cross country borders, due to the virtually non-tradable nature of the goods in question. The most notable difference between tradables and non-tradables arises from the process of price formation. The price of tradables is assumed to be determined by world market prices. The prices of non-tradables are assumed to be determined by domestic supply and demand (Thomson *et al.*, 1998). Therefore, for this study purpose wheat was assumed as a tradable commodity whereas cereal barley and *tef* considered as non-tradable outputs. Import parity prices for tradables are equivalent to the world price of that commodity in domestic currency. However,

an alternative approach to calculate import parity prices for non-tradables is to search for the price of a close substitute commodity to use as a proxy (Pearson *et al.*, 2003). The calculation of social price for barley, *tef*, and wheat started from FOB prices. The FOB price of malt barley was taken from Belgium as a substitute to cereal barley. *Tef* is produced and sold to make gluten free bread in The Netherlands. The FOB price of wheat was taken from The Netherlands as a substitute to *tef*. The FOB price of wheat was taken from Italy as most of food aid in a form of wheat imported from Italy. Hence, the FOB price of barley, *tef* and wheat were 137.0, 166.0, and 146.3 US $ per ton respectively. In addition, import parity for Urea and DAP fertilizer was an important input so as to calculate social prices and social budget for barley, *tef*, and wheat. Ethiopia imported DAP fertilizer in bulk from Jordan while Urea was imported in bulk from Baltic countries. Indeed, the FOB prices of DAP and Urea fertilizer were 185.60, and 140.11 US $ per ton respectively.

Table 3.4: Import parity prices for input & outputs[21]

Steps	Items	Barley	*Tef*	Wheat	DAP	Urea
1	FOB price (US $/ ton)	137.00	166.00	146.27	185.60	140.11
2	Fright and insurance (US $/ ton) to Djibouti	86.30	86.30	50.00	42.40	70.87
3	CIF price (US $/ ton)	223.30	252.30	196.27	228.00	210.98
4	Exchange rate (Birr/ US $)	8.67	8.67	8.67	8.67	8.67
5	CIF price (Birr / ton)	1936.01	2187.44	1701.70	1976.76	1829.20
6	Transportation and handling (birr/ qt)	38.00	38.00	38.00	38.00	38.00
7	Parity price at wholesale (Birr/ qt)	231.60	256.74	208.17	235.68	220.92
8	Distribution cost to farm (Birr/qt)	2.00	2.00	2.00	2.00	2.00
9	Social price at farm gate (Birr/qt)	233.60	258.74	210.00	237.68	222.92

FOB= free on board   CIF= cost, insurance and freight

The information obtained from Shipping Lines Ethiopia indicated that Freight and insurance rate for a quintal of grain were 86.30 US $ per ton from Belgium and The Netherlands to Djibouti port in 2003 while it was 50, 42, and 71 US$ per ton from Italy, Jordan and Baltic countries respectively. The exchange rate was 8.67 Birr per US$ in 2003. With this parameter, the CIF prices at Djibouti for barley, *tef*, wheat, DAP, and Urea were estimated to be 1936, 1900, 1702, 1977, and 1829 Birr per ton respectively. The addition of transportation and handling charges from Djibouti to Addis Ababa were equivalent to 38 birr per quintal. The import parity price at farm gate for barley, *tef*, and wheat were about 234, 259, 210 birr per quintal (Table 3.4).

---

[21] Source: Own computation based on the information obtained from WFP, Ethiopian Shipping Lines Agency, Marin- time and Transit Service Enterprise, Export Promotion Department, and Agricultural Input Marketing Department.

Social Prices

The social prices of tradable inputs including seeds, fertilizers and herbicides were assumed equivalent to their import parity (Table 3.5). During the calculation of social prices of domestic factors, different assumptions were taken into consideration. Social wage rate was assumed the same as that of private wage rates. This was due to lack of monopsonies and oligopsonies, or trade union power which might bring market failure. Moreover, distorting policies such as minimum wage laws and pension and health insurance taxes were not common in the study area.

Social interest rate obtained by adjusting private interest rate for 3 % sales tax. Hence, the interest rate for nine months was equivalent to 5.625 percent. In calculating social price of land, the next best alternative return from a hectare of land less its rent was assumed.

Table 3.5: Social prices

	Items	Barley	*Tef*	Wheat
Tradable	Seed (kg/ ha)	2.34	2.59	2.10
	Fertilizer(kg/ ha) -Urea	2.23	2.23	2.23
	-DAP	2.38	2.38	2.38
	Pesticide (lt)	40.00	40.00	40.00
Domestic factor	Labor (man-day/ha)			
	Land preparation	7.00	5.00	6.00
	Planting	7.00	5.00	6.00
	Crop husbandry	7.00	5.00	6.00
	Harvesting	8.00	12.00	7.00
	Threshing	8.00	12.00	7.00
	Animal-power			
	Land preparation	7.00	7.50	5.00
	Planting	7.00	8.00	5.00
	Transportation	12.00	8.00	5.00
	Threshing	10.00	7.50	5.00
	Working capital	0.06	0.06	0.06
	Land rent(ha)			
Output	Output price (kg/ha)	2.34	2.59	2.10

Source: Own computation

Social budget

Social budget was calculated by multiplying tradable inputs, domestic factors, and outputs in the input-output table by their social prices. The rent farmers were paying on land and used for calculation of the private budget was undervalued when it's

compared with the opportunity cost of land. This was due to the policy that protects selling and mortgaging of land. Therefore, cultivated land in *welmera* does not have the value equivalent to its ability to generate other income that made social profitability of *tef* and wheat negative (Table 3.6). Negative social profitability arises mostly from imperfections in the land market.

Table 3.6: Social budget

	Items	Barley	*Tef*	Wheat
Tradable	Seed (kg/ ha)	437.66	186.79	515.24
	Fertilizer(kg/ ha)-Urea	154.24	94.91	275.80
	-DAP	164.45	117.54	304.37
	Pesticide (lt)	27.60	24.80	41.60
Domestic factor	Labor (man-day/ha)			
	Land preparation	186.32	165.70	240.72
	Planting	205.88	43.35	18.58
	Crop husbandry	50.00	127.58	44.27
	Harvesting	413.24	590.91	360.08
	Threshing	180.59	317.75	149.24
	Animal-power			
	Land preparation	315.00	511.36	421.35
	Planting	111.18	38.74	1.98
	Transportation	257.88	22.96	260.45
	Threshing	202.94	118.18	154.55
	Cost of capital	139.02	127.28	143.65
	Land rent(ha)			
Output	Total revenue (kg/ha)	5,681.98	3,371.71	4,981.20
	Total cost (excl land)	2,846.00	2,487.85	2,931.87
	Gross Profit (excl land)	2,835.98	883.86	2,049.33
	Social opportunity cost of land	2,049.33	2,049.33	2,835.98
	Net profit	786.64	-1,165.47	-786.64

Source: Own computation

Policy Analysis Matrix (PAM)

Policy Analysis Matrix (PAM) is an array of numbers which has twelve entries used to measure revenue and costs before and after the imposition of policy to determine the impact of agricultural policy. The PAM for barley, *tef* and wheat farming systems is based on the data from the private and social budgets. The private row in the PAM table uses values from the private budget; while the social row in the PAM was taken from the social budget. The third row of PAM, measuring divergences was found by subtracting the second row from first row (Table 3.7).

Table 3.7: PAM of grain production in *welmera*

Commodity	Profitability	Revenues	Tradable Inputs	Domestic Factors				profit
				Labor	Capital	Land	Others	
Barley	private	2656.13	635.63	1036.03	201.49	17.00	887.00	-121.03
	social	5681.98	783.95	1036.03	143.92	2040.39	887.00	790.68
	divergence	-3025.85	-148.32	0.00	57.57	-2023.39	0.00	-911.71
Tef	private	2597.13	384.69	1245.29	182.80	17.00	691.24	76.12
	social	3254.55	424.05	1245.29	130.57	2040.39	691.24	-1276.98
	divergence	-657.42	-39.36	0.00	52.23	-2023.39	0.00	1353.10
Wheat	private	3486.84	1061.63	812.88	213.64	17.00	838.33	543.37
	social	4981.20	1137.00	812.88	152.60	2831.07	838.33	-790.68
	divergence	-1494.36	-75.38	0.00	61.04	-2814.07	0.00	1334.05

Source: Own computation

Existing policy distortion indicators

Comparisons of different policy scenarios are also possible through a further extension of PAM analysis. A number of ratios can be produced from PAM that indicates the effect of a policy scenario. The resulting ratios can be used to see difference between different commodity systems when there are varieties of policy scenarios. Monke and Pearson (1989) and Shapiro *et al.* (1995) tried to explain the advantage of using coefficients derived from PAM.

The NPCO of grain production in the farming system of welemera was less than a unit. This result implies that farmers did not receive the actual price that was equivalent with the true price. This indicates the system is not protected by policy (Table 3.8). The NPCI of barley, *Tef*, and wheat production in *welmera* was less than 1. This shows that the domestic price was lower than the comparable world prices. This has happened for two reasons. First, the system showed the presence of market failure in fertilizer market. Secondly, domestic cost of seed production was lower than the world price. In the study area, market failure of the fertilizer industry arose due to lack of perfect competition. Different fertilizer importers use many strategies to monopolize the fertilizer market. There were many small scale fertilizer distributors in *welmera* district because of its proximity to Addis Ababa, the center for fertilizer wholesale. To increase the market share in the central highlands, competitors reduce fertilizer price below where they can make normal profit. However, they will compensate the loss incurred by increasing price of fertilizer on remote markets of

the country. As a result, Urea fertilizer was sold at a lower price (180 Birr) than the world price level (223Birr) in 2003 production year.

The PCR of barley, *tef*, and wheat farming in *welmera* was equal to 1.06, 0.97, and 0.78 respectively. This result indicates that *tef* and wheat farming systems have a competitive advantage and are privately profitable. The reverse was true for barley farming system. The DRC was less than 1 for barley and greater than 1 for *tef* and wheat. DRC ratio less than 1 implies that the value added calculated at private prices was less than the value added calculated at social prices. Therefore, the comparative advantage of the barley based farming system was stronger than its competitive advantage whereas *tef* and wheat had stronger competitive advantages than their comparative advantages.

Table 3.8; Existing policy distortion indicators of the barley, *tef*, and wheat production

No.	Ratios	Formula	Coefficients		
			Barley	*Tef*	**Wheat**
1	NPCO (Nominal protection coefficient of output)	A/E	0.47	0.80	0.70
2	NPCI(Nominal protection coefficient of inputs)	B/F	0.81	0.91	0.93
3	PCR (private cost ratio)	C/(A-B)	1.06	0.97	0.78
4	DRC (Domestic resource cost coefficient)	G/(E-F)	0.84	1.45	1.21
5	EPC (Effective protection coefficient)	(A-B)/(E-F)	0.41	0.78	0.63
6	PC (profitability coefficient)	D/H	-0.15	-0.06	-0.69
7	SRP (subsidy ratio)	L/E	-0.16	0.42	0.27

Source: Own computation

The EPC of barley, *tef*, and wheat production in *welmera* was lower than 1. The purpose of this coefficient was to show the joint effect of policy transfers affecting both tradable outputs and tradable inputs. In the absence of commodity price policy, the observed value added was less than the value added that would be produced at efficient prices. The PC value of the barley, *tef*, and *wheat* farming system was negative and less than 1. The negative sign indicates that the entire grain crops didn't have both competitive and comparative advantage at the same time. Private land rental markets undervalue land relative to its ability to produce grains that made social profitability of *tef* and wheat negative. The SRP was 16, 31, and 26 percent for barley, *tef* and wheat. This means that there was divergence between private and social profits. This large transfer arises mostly from imperfections in the land market.

Credit repayment structure and grain price formation

Input credit

Farmers who participated in extension package received credit in kind that were equivalent to 407,000.75 Birr in the crop calendar of 2003 (Table 3.9). This credit consisted of fertilizer (DAP and Urea), improved seeds (barley, *tef* and wheat), and herbicide. The credit was disbursed in July 2003 after the farmers paid a down payment of 102,993.2.

Table 3.9: Input provided on credit basis in 2001/2003[22]

Particulars	2001			2003		
	Price	Quantity	Value in birr	Price	Quantity	Value in birr
DAP	259.55	5,643.00	1,464,641.00	240.00	700.00	168,000.00
Urea	201.55	5,544.50	1,117,494.00	180.00	696.00	125,280.00
Wheat	245.00	28.50	6,982.50	38.25	696.00	26,622.00
Barley	271.00	5.00	1,355.00	298.50	20.00	5,970.00
Herbicide	41.89	5,621.00	235,463.70	38.25	696.00	26,622.00
Sprayer	360.00	34.00	12,240.00	245.00	213.75	52,368.75
Tef	-	-	-	356.33	6.00	2,138.00
Total			2,838,176.20			407,000.75

Source: Welmera district bureau of agriculture

Farmers started the repayment in November 2003 after they had started harvesting their first crop. The credit repayment period policy enforced farmers to repay the loan immediately after harvest and as a result, a large sum of the disbursed credit was repaid between January and March, 2004 (Figure 2). The loan recovery was 100 percent of which more than 95 percent was repaid between the periods November 2003 till June 2004.

Seasonality of grain prices

Grain price data of Holetta retailer grain market obtained from Holetta Agricultural Research Center for the period 1987 to 2004. Statistical analysis of seasonality was made on these data. A 12- month moving average was applied to the monthly price data of seventeen years. Trend and cyclical component of the price were isolated to reach the seasonal index (Tschirley 1995). The analysis indicated that, for example, barley had the lowest Seasonal Price Index (SPI) in January while it had the highest SPI in June (figure 1).

---

[22] In 2002 there is no credit disbursement through extension package program

Figure 1: Seasonal price index of barley
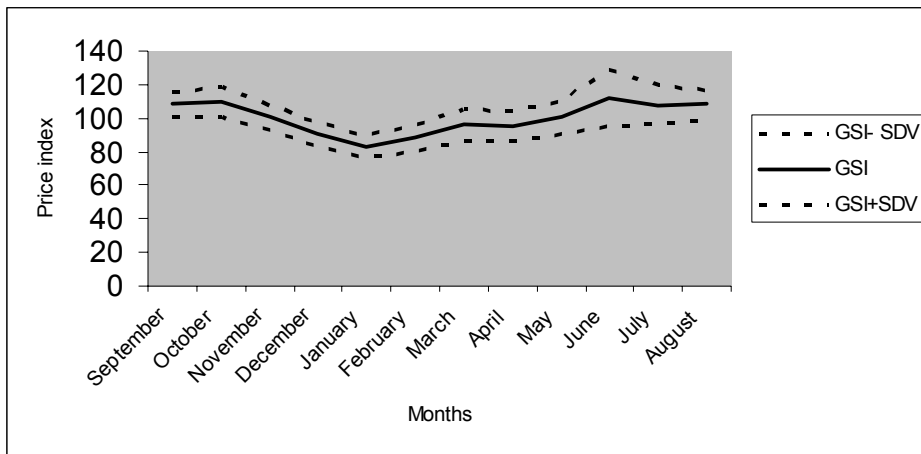
Coincidence of loan repayment period with low prices

Input credit was scheduled to be repaid immediately after harvest. During this period, prices of grain produce were at their lowest level which discouraged farmers from using improved technologies. District administration enforces farmers to repay input credit immediately after harvest with an intention to safeguard the regional budget held as collateral by banks. The 2003/4 production year credit repayment structure showed January to March was a quarter of the year, during which more than 64 percent of matured credit was repaid.

The seasonal price index for barley indicated that December to February was the period during which price reached its lowest level. The seasonal price indices of *tef* started to decline starting from November and reached at its lowest level during March (Figure 2 & Appendices 3). The seasonal price index of wheat reaches its lowest level in the first quarter of the year after harvest from January to March (Figure 2 & Appendices 4). From this analysis it becomes clear that the selling price of grain has a difference of about 35, 23 and 28 percent for barley, *tef* and wheat respectively. Transfers either from the producers to consumers or vice versa made possible through the use of price policy instruments (Pearson *et al.*, 2003). However in Ethiopia, the credit repayment schedule policy seems indirectly favored consumers while it is against the producers. If credit repayment period restriction is removed, farmers can improve competitiveness of grain production by storing their produce until a period when the prices of grain improve.

Figure 2: Seasonal price indices of barley, *Tef* wheat and credit repayment structure of 2003/4[23]
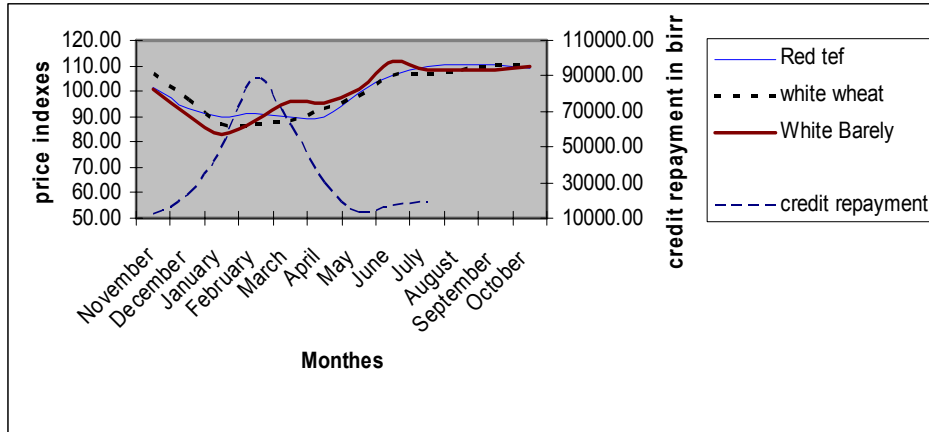
Sensitivity analysis

If credit repayment schedule polices are removed and farmers are able to shift selling period schedule, for all quantities of their produce, to a period when price is at peak level, or for different reasons farmers sell half of their produce with the prevailing price immediately after harvest, and keep the remaining until the price of grain reach at its peak, what would be its effect on private profitability, and competitiveness of the farming system?

The Impact of credit repayment schedule policy

The removal of credit repayment schedule policy enables farmers to sell their produce at price level that is 30 percent higher than price level immediately after harvest. The ratios NPCO, EPC & SRP increase while NPCI & DRC do not change. In contrast, the government credit repayment schedule policy forced farmers to sell significant quantity of their produce immediately after harvest. Without this policy restriction, it's assumed a rational farmer sells the entire farm produce at a period when price is at its peak. Hence, because of credit repayment schedule policy, a farmer fails to make a profit difference of 796.8, 779, and 1046 birr from barley, *tef*, and wheat from a hectare of land (Appendices 1). However, if farmers are able to sell half of their produce at the peak price period, they would get a profit difference which would cover the cost of tradable inputs for *tef* and wheat whereas the profit difference

---

[23]The price study particularly concentrates on white barley, red *tef*, and white wheat

obtained from barley production would just be enough to cover the cost of inputs excluding seeds. The removal of credit repayment schedule policy *per se* would make barley production competitive even when farmers shift the sale of only one-fourth of its produce.

Table 3.10: Policy distortion indicators without credit repayment schedule policy

No.	Ratios	Coefficients		
		Barley	*Tef*	**Wheat**
1	NPCO	0.61	1.00	0.91
2	NPCI	0.81	0.91	0.93
3	PCR	0.76	0.71	0.54
4	DRC	0.84	1.39	1.21
5	EPC	0.58	1.01	0.90
6	PC	0.85	-0.74	-2.01
7	SRP	-0.02	0.60	0.48

Source: Own computation

4. Conclusion and policy recommendation
Summary and conclusion

Barley in *welmera* district is compared with two alternative enterprises that is, *tef* and wheat. The DRC showed that barley production represent the most efficient use of the domestic resources of the study area followed by wheat and *tef*.

A farmer who maintained all quantities of his produce until a period when price is at peak level would get a profit difference of 796, 779 &1046 birr for barley, *tef* and wheat respectively. For a different reason, a farmer who sells half of his produce immediately after harvest and maintains the remaining half of the produce until when price of produce is at peak, would get a profit difference of 399, 390 & 523 birr for barley, *tef* & wheat respectively. Therefore, credit repayment schedule policy made farmers to receive lower profit from grain production and, eventually, making grain production in *Welmera* less competitive.

Policy recommendation
Improving barley productivity

DRC ratio indicated that *welmera* district utilizes domestic resource efficiently if farmers produce barley than *tef* and wheat. The domestic resource cost analysis is an input for research and extension institutes, to decide allocation of scarce resources between commodities or technologies. Therefore, DRC result indicated that effort has to be made in the area of agricultural research and extension to make barley more productive than wheat and *tef*. The comparative advantage of *welmera* district for barley(especially for malt barely) coupled with improving its production and productivity will not only generate foreign currency for the country but will also help to improve the welfare of farmers involved in production of barley.

Relaxing the credit repayment schedule period

Farmers in *welmera* district participating in extension package program acknowledged provision of agricultural inputs on credit basis at the right time without any delay. However, the credit repayment period was scheduled to be paid during periods when price of grains were at their lowest level. Therefore, some improvements have to be made in extension package program to encourage farmers to further use agricultural technologies. Among others, the credit repayment schedule policy has to be relaxed for farmers who want to benefit from change in the seasonality of selling price.

Privatizing the land

There was a significant discrepancy between private and social value of land. This was due to the nationalization of land in 1975. Since then, land was in the hands of elder people. Youngsters only get land from their parents through in heritage. The data clearly show how government policy affected private profitability by undervaluing the value of land. However, privatization of land will have a better advantage to allocate land to the commodity that has its best alternative return.

Setting price floor for producers

The Seasonality price index analysis indicated that there was significant price variability for the selling price of grain. The prices were very low immediately after harvest and continue to increase until the harvest of the next production calendar. The government should set price floor that make producers competitive and maintain

their income to a certain level. If the price level happens to decline below the price floor, the government should purchase grains with the help of its agents. Grain Marketing Enterprise can take this responsibility given that its mission is to maintain buffer stock of agricultural produces.

Areas of further research

Due to lack of sufficient information, this study could not see storage facilities and capacities of small scale farmers in the study area. The importance of this information calls the attention of researchers for further research. In addition, information such as costs of storage in the context of *welmera* district needs to be considered by upcoming researchers.

Reference

Arega D. Alene and Rashid M. Hassan (2003). Measuring the impact of Ethiopia's new extension program on the productive efficiency of farmers. Proceedings of the 25th International Conference of Agricultural Economists (IAAE). August 16 – 22, 2003 Durban, South Africa,

Belay Kassa (2003). Agricultural Extension in Ethiopia. *Journal of Social Development in Africa.* Vol.18 no. 1

Central Agricultural Census Commission (CACC) (2003). Results of 2000/2001 Ethiopian Agricultural Sample Enumeration (EASE).

Croppenstedt, Andre, Mulat Demeke, ane Meloria M. Meschi (2003). Technology adoption in the presence of constraints: the case of fertilizer demand in Ethiopia. *Review of Development Economics*, 7(1), 58-70. Blackwell publishing ltd, Oxford. UK.

Dipokusumo, Bambang, Anas Zaini, Syarif Husni, and Haeluddin (2003). Impact of agricultural policy on soybean production in west Nusa Tenggara province. Faculty of Agriculture Nusa Cendana Univeristy. Indonesia

Ellis Frank, Piyadasa Senayake, and Marisol Smith (1997). Food price policy in Sri Lanka. Food Policy, Vol.22, No.1 pp 81-96.

Flaskerud, George and Demcy Johnson (2000). NDSU Extension service, North Dakota State University

Legesse Dadi and Hailemariam Tekleweld (2004). Effect of fertilizer Market Liberalization on fertilizer distribution and farme level use. Tesfaye Zegeye, Legesse Dadi and Dawit Alemu (eds.). Agricultural technology evaluation adoption and marketing. EARO. (PP. 73-86). Proceeding of the workshop held to discuss the socio-economic research results of 1998-2002, August 6-8, 2002, Addis Ababa, Ethiopia

Monke, E. and S. Pearson (1989). *The policy analysis matrix for agricultural development,* Ithaca, NY, USA: Cornell University Press.

Pearson, Scott, Carl Gotsch and Sjaiful Bahri (2003). Applications of the Policy Analysis Matrix in Indonesian Agriculture. http://www.stanford.edu/group/FRI/Indonesia/newregional/newbook.htm

Raymakers, Benoit (2002). Review and Consequences of Reduction in Agriculture Input sales in 2002: A situation analysis. UN-Emergencies Unit for Ethiopia/OCHA

Shapiro, Barry I. and Steven J. Staal (1995). The Policy Analysis Matrix Applied to Agricultural commodity Markets. In: Scott, Gregory (ed.).1995. *Price, Product, and People: Analyzing Agricultural Markets in Developing Countries.* Lunne Rienner Publishers

Thomson Anne and Manfred Metz (1998). Implications of Economic Policy for Food Security: A Training Manual. Training materials for agricultural planning 40. AO & GTZ. Rome, Italy.

Tschirley, David L. (1995). Using Microcomputer Spreadsheets for Spatial and Temporal Price Analysis: An application to Rice and Maize in Ecuador. Gregory J. Scott, (ed) *Prices, products, and people: analyzing agricultural markets in developing countries* (pp. 277-300)

Wiendiyeti, Umbu Reku Raya and Poulus Un (2002). The impact of Tariff Policy and inter-island transport costs on the profitability of soya bean production in Nagada egency, NTT. Faculty of Agriculture Nusa Cendana Univeristy.

Winter-Nelson, Alex (ed.) (1991). Application of the Policy analysis matrix. Working paper. No. 91-(4). The Economic Development Institute of the World Bank.

Appendices 1. Change in selling period schedule

Sell all produce immediately after harvest

Grain	profitability	Revenues	Tradable inputs	Domestic Factors				profit
				Labor	Capital	Land	others	
Barley	private	2,656.13	635.63	1,036.03	201.49	17.00	887.00	-121.03
	social	5,681.98	783.95	1,036.03	143.92	2,040.39	887.00	790.68
	divergence	-3,025.85	-148.32	0.00	57.57	-2,023.39	0.00	-911.71
Tef	private	2,597.13	384.69	1,245.29	182.80	17.00	691.24	76.12
	social	3,254.55	424.05	1,245.29	130.57	2,040.39	691.24	-1,276.98
	divergence	-657.42	-39.36	0.00	52.23	-2,023.39	0.00	1,353.10
Wheat	private	3,486.84	1,061.63	812.88	213.64	17.00	838.33	543.37
	social	4,981.20	1,137.00	812.88	152.60	2,831.07	838.33	-790.68
	divergence	-1,494.36	-75.38	0.00	61.04	-2,814.07	0.00	1,334.05

Shift a quarter produce to the peak price period

Grain	profitability	Revenues	Tradable inputs	Domestic Factors				profit
				Labor	Capital	Land	others	
Barley	private	2,855.34	635.63	1,036.03	201.49	17.00	887.00	78.18
	social	5,681.98	783.95	1,036.03	143.92	2,040.39	887.00	790.68
	divergence	-2,826.64	-148.32	0.00	57.57	-2,023.39	0.00	-712.50
Tef	private	2,791.91	384.69	1,245.29	182.80	17.00	691.24	270.90
	social	3,254.55	424.05	1,245.29	130.57	2,040.39	691.24	-1,276.98
	divergence	-462.63	-39.36	0.00	52.23	-2,023.39	0.00	1,547.88
Wheat	private	3,748.35	1,061.63	812.88	213.64	17.00	838.33	804.88
	social	4,981.20	1,137.00	812.88	152.60	2,831.07	838.33	-790.68
	divergence	-1,232.85	-75.38	0.00	61.04	-2,814.07	0.00	1,595.56

Shift half of a produce to the peak price period

Grain	profitability	Revenues	Tradable inputs	Domestic Factors				profit
				Labor	Capital	Land	others	
barley	private	3,054.55	635.63	1,036.03	201.49	17.00	887.00	277.39
	social	5,681.98	783.95	1,036.03	143.92	2,040.39	887.00	790.68
	divergence	-2,627.43	-148.32	0.00	57.57	-2,023.39	0.00	-513.29
Tef	private	2,986.70	384.69	1,245.29	182.80	17.00	691.24	465.68
	social	3,254.55	424.05	1,245.29	130.57	2,040.39	691.24	-1,276.98
	divergence	-267.85	-39.36	0.00	52.23	-2,023.39	0.00	1,742.67
Wheat	private	4,009.87	1,061.63	812.88	213.64	17.00	838.33	1,066.39
	social	4,981.20	1,137.00	812.88	152.60	2,831.07	838.33	-790.68
	divergence	-971.33	-75.38	0.00	61.04	-2,814.07	0.00	1,857.07

Shift three quarter of produce to the peak price period

Grain	profitability	Revenues	Tradable inputs	Domestic Factors				profit
				Labor	Capital	Land	others	
Barley	private	3,253.76	635.63	1,036.03	201.49	17.00	887.00	476.60
	social	5,681.98	783.95	1,036.03	143.92	2,040.39	887.00	790.68
	divergence	-2,428.22	-148.32	0.00	57.57	-2,023.39	0.00	-314.08
Tef	private	3,181.48	384.69	1,245.29	182.80	17.00	691.24	660.47
	social	3,254.55	424.05	1,245.29	130.57	2,040.39	691.24	-1,276.98
	divergence	-73.06	-39.36	0.00	52.23	-2,023.39	0.00	1,937.45
Wheat	private	4,271.38	1,061.63	812.88	213.64	17.00	838.33	1,327.91
	social	4,981.20	1,137.00	812.88	152.60	2,831.07	838.33	-790.68
	divergence	-709.82	-75.38	0.00	61.04	-2,814.07	0.00	2,118.59

Shift all produce to the peak price period

Grain	profitability	Revenues	Tradable inputs	Domestic Factors				profit
				Labor	Capital	Land	others	
Barley	private	3,452.97	635.63	1,036.03	201.49	17.00	887.00	675.81
	social	5,681.98	783.95	1,036.03	143.92	2,040.39	887.00	790.68
	divergence	-2,229.01	-148.32	0.00	57.57	-2,023.39	0.00	-114.87
Tef	private	3,376.27	384.69	1,245.29	182.80	17.00	691.24	855.25
	social	3,254.55	424.05	1,245.29	130.57	2,040.39	691.24	-1,276.98
	divergence	121.72	-39.36	0.00	52.23	-2,023.39	0.00	2,132.24
Wheat	private	4,532.89	1,061.63	812.88	213.64	17.00	838.33	1,589.42
	social	4,981.20	1,137.00	812.88	152.60	2,831.07	838.33	-790.68
	divergence	-448.31	-75.38	0.00	61.04	-2,814.07	0.00	2,380.10

Appendices 2: Seasonal price index of barley in Holetta retailer grain market 1988-2004

Year	January	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1988	80.44	82.33	90.53	80.83	99.63	108.70	113.52	121.97	120.40	113.93	98.19	81.55
1989	77.41	84.67	95.70	105.87	106.72	103.00	108.22	97.12	105.85	99.86	101.99	98.45
1990	91.06	96.25	97.34	89.14	88.82	164.50	84.45	98.82	97.64	102.16	89.11	79.15
1991	68.89	69.22	85.94	100.70	114.22	127.35	117.79	116.04	116.66	111.66	103.54	86.60
1992	73.94	79.71	106.94	116.63	118.18	91.13	96.95	109.52	110.79	114.02	100.37	81.28
1993	79.51	89.84	99.42	101.62	102.98	106.61	95.86	98.01	109.44	103.05	97.02	85.78
1994	80.16	88.72	87.25	89.88	114.68	120.35	124.41	120.01	116.55	99.28	83.09	87.53
1995	83.68	102.00	93.85	94.29	101.15	109.98	118.65	108.85	112.59	99.69	88.87	94.26
1996	96.81	98.76	92.99	89.12	89.83	111.25	107.33	101.95	94.83	110.37	104.07	99.24
1997	83.06	77.91	80.68	92.14	87.63	127.42	130.49	111.49	110.40	116.58	106.92	93.52
1998	82.99	81.23	85.93	88.79	92.45	104.46	105.46	108.48	110.49	112.46	99.01	94.02
1999	81.67	87.49	96.42	88.69	105.08	111.06	110.16	112.98	102.29	126.37	103.43	88.25
2000	79.20	89.97	98.02	103.11	103.44	111.09	110.44	111.08	107.89	119.01	100.03	79.43
2001	85.25	95.60	103.38	88.32	97.88	93.14	96.56	90.87	95.59	89.78	104.12	99.47
2002	84.48	91.24	122.29	92.64	84.98	94.55	104.78	107.58	103.21	113.15	110.68	97.92
2003	90.38	91.29	96.91	98.89	94.57	105.18	101.33	114.15	108.10	109.83	108.46	96.70
2004	86.07	91.65	92.53	93.65	99.02	106.33	103.07	103.30	108.71	113.38	104.69	89.81
N	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
Max	96.81	102.00	122.29	116.63	118.18	164.50	130.49	121.97	120.40	126.37	110.68	99.47
Min	68.89	69.22	80.68	80.83	84.98	91.13	84.45	90.87	94.83	89.78	83.09	79.15
Mean	82.65	88.11	95.65	94.96	100.07	111.54	107.62	107.78	107.73	109.09	100.21	90.17
GSI	82.95	88.44	96.01	95.31	100.44	111.95	108.01	108.18	108.13	109.50	100.58	90.51
Std Error	1.58	2.00	2.31	2.08	2.38	4.14	2.75	2.05	1.76	2.17	1.78	1.73
Std Dev	6.52	8.26	9.53	8.58	9.81	17.05	11.36	8.46	7.24	8.95	7.32	7.14
t-value	-10.78	-5.77	-1.73	-2.25	0.19	2.89	2.91	3.98	4.63	4.37	0.33	-5.48
GSI– STD	76.43	80.18	86.48	86.73	90.63	94.89	96.66	99.72	100.89	100.54	93.26	83.36
GSI	82.95	88.44	96.01	95.31	100.44	111.95	108.01	108.18	108.13	109.50	100.58	90.51
GSI+ STD	89.48	96.70	105.53	103.89	110.26	129.00	119.37	116.64	115.37	118.45	107.91	97.65

Source: Own computation
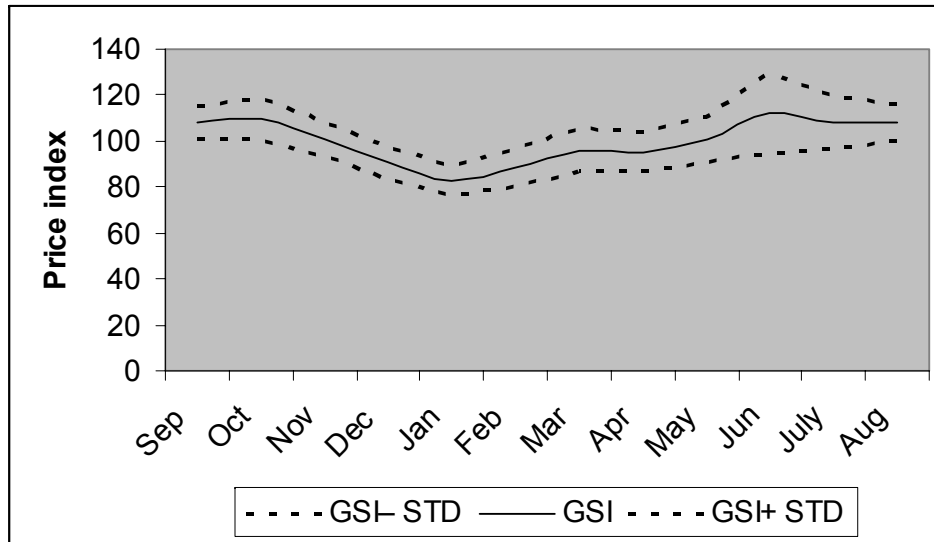
Appendices 3 Seasonal price index of *tef* in Holetta retailer grain market 1988-2004

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
1988	96.07	100.28	90.77	81.65	89.73	97.85	109.76	127.32	121.24	121.75	98.46	85.44
1989	86.44	87.22	93.93	101.27	93.10	94.72	104.72	100.22	99.57	101.71	108.41	107.20
1990	109.09	113.73	84.93	78.69	82.49	102.99	104.53	109.81	107.29	108.07	96.08	84.87
1991	82.56	81.64	91.66	101.36	110.59	119.72	117.15	113.46	105.36	104.85	100.27	87.08
1992	87.24	90.77	93.63	100.84	95.83	102.62	105.65	109.48	112.28	114.84	113.51	97.13
1993	94.00	92.09	90.13	86.39	96.79	100.78	101.24	104.36	104.78	106.02	100.06	87.41
1994	80.64	82.08	82.69	86.83	109.21	118.10	121.04	121.30	119.34	96.29	97.65	87.33
1995	87.15	92.42	94.15	100.40	104.04	107.91	111.01	113.53	105.86	105.68	105.06	98.37
1996	96.85	91.44	88.95	87.14	86.19	99.86	112.15	104.32	106.86	109.37	100.68	93.63
1997	85.61	85.17	82.52	82.89	80.12	116.07	115.87	113.32	116.95	112.71	110.85	100.56
1998	85.77	90.28	86.68	84.00	88.94	108.44	108.07	114.69	118.07	116.22	103.30	81.01
1999	77.30	84.51	89.91	86.44	103.66	119.78	118.89	117.10	118.12	112.56	91.69	81.28
2000	81.96	92.11	95.96	99.27	105.81	112.74	112.58	108.79	110.50	114.50	94.02	93.25
2001	94.22	98.90	97.28	88.74	91.26	88.44	90.42	95.07	101.75	105.97	99.79	97.63
2002	87.35	78.19	78.27	80.72	154.56	101.12	105.14	99.51	98.09	95.45	93.28	106.79
2003	112.49	97.38	88.67	90.49	93.70	106.55	113.26	115.25	116.51	110.82	98.14	91.06
2004	81.67	85.10	95.02	91.89	97.37	107.60	110.13	105.08	105.09	109.02	105.46	98.40
n	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
max	112.49	113.73	97.28	101.36	154.56	119.78	121.04	127.32	121.24	121.75	113.51	107.20
min	77.30	78.19	78.27	78.69	80.12	88.44	90.42	95.07	98.09	95.45	91.69	81.01
Mean	89.79	90.78	89.71	89.94	99.02	106.19	109.51	110.15	109.86	108.58	100.98	92.85
GSI	89.99	90.98	89.91	90.14	99.24	106.43	109.75	110.40	110.10	108.82	101.20	93.05
Std. Error	2.35	2.07	1.28	1.91	4.09	2.18	1.79	1.99	1.78	1.66	1.48	1.97
Std. Deviation	9.68	8.54	5.29	7.85	16.84	9.00	7.37	8.22	7.36	6.85	6.11	8.11
t-value	-4.27	-4.35	-7.86	-5.18	-0.19	2.95	5.45	5.21	5.66	5.30	0.81	-3.53
GSI-SDV	80.31	82.44	84.62	82.29	82.40	97.43	102.37	102.18	102.74	101.96	95.09	84.94
GSI	89.99	90.98	89.91	90.14	99.24	106.43	109.75	110.40	110.10	108.82	101.20	93.05
GSI+SDV	99.66	99.52	95.20	97.99	116.08	115.42	117.12	118.62	117.46	115.67	107.32	101.16

Source: Own computation

74
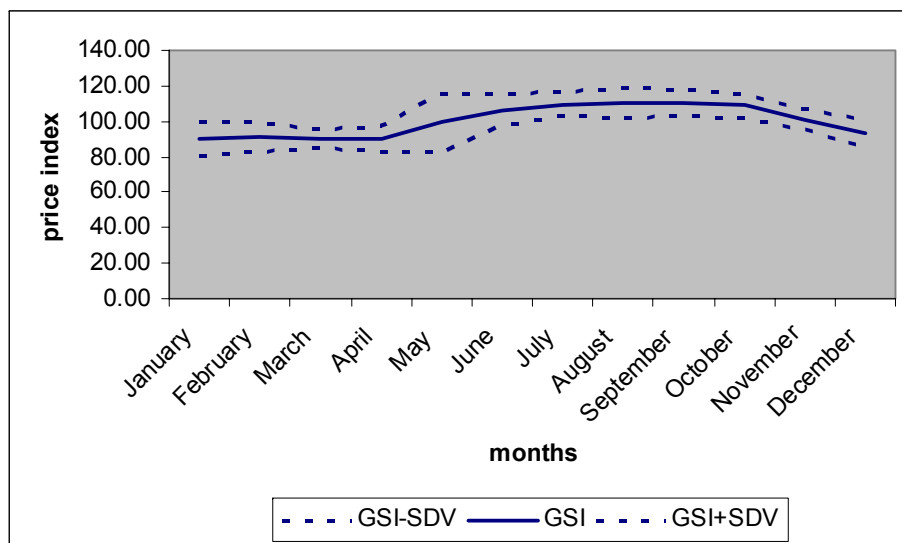
Appendices 4: Seasonal price index of wheat in Holetta retailer grain market 1988-2004

Year	January	February	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1988	87.47	75.52	82.49	79.51	96.62	108.56	107.64	110.09	117.33	118.66	106.80	99.60
1989	83.58	82.89	87.53	98.11	101.89	107.44	103.25	102.18	106.65	105.27	98.08	107.00
1990	102.89	96.98	87.18	92.51	90.14	115.55	90.45	92.66	99.24	106.41	98.68	95.88
1991	83.23	77.98	88.12	97.39	106.21	114.97	113.01	111.37	117.91	114.47	111.94	101.22
1992	82.21	87.68	86.31	91.62	93.02	105.01	101.13	114.08	115.32	116.46	117.35	92.58
1993	84.12	83.16	83.36	91.74	98.03	102.17	106.63	105.89	107.63	107.87	102.97	89.91
1994	82.60	83.90	87.79	93.30	107.41	111.78	113.64	115.65	120.33	109.48	99.59	84.36
1995	80.80	89.78	96.08	106.60	104.07	101.35	112.99	106.06	108.03	110.83	106.00	91.87
1996	92.88	88.39	90.45	91.50	89.17	97.85	109.83	107.11	105.80	111.81	101.04	97.32
1997	84.34	79.25	79.48	90.79	93.70	108.56	108.65	112.77	116.71	113.14	121.46	92.15
1998	87.00	92.21	91.76	92.35	97.16	102.43	103.61	104.55	106.44	107.07	104.29	86.34
1999	85.79	85.87	90.40	91.60	101.81	109.67	116.53	116.19	115.89	118.67	102.11	90.49
2000	80.71	84.40	86.45	93.90	104.98	113.55	114.50	111.85	113.43	114.81	109.67	90.19
2001	88.77	93.79	92.76	88.05	91.53	93.12	93.89	98.11	98.92	99.60	99.36	102.87
2002	95.62	87.49	81.26	86.75	90.35	98.77	103.12	105.17	105.58	108.12	104.77	103.46
2003	100.08	95.73	94.51	96.36	98.66	104.27	107.85	112.31	112.73	103.26	117.54	110.41
2004	70.39	83.59	90.12	94.42	97.98	102.68	103.27	108.34	104.54	107.10	104.27	95.82
n	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
max	102.89	96.98	96.08	106.60	107.41	115.55	116.53	116.19	120.33	118.67	121.46	110.41
min	70.39	75.52	79.48	79.51	89.17	93.12	90.45	92.66	98.92	99.60	98.08	84.36
Mean	86.62	86.39	88.00	92.74	97.81	105.75	106.47	107.91	110.15	110.18	106.23	95.97
GSI	87.04	86.81	88.43	93.19	98.28	106.26	106.99	108.43	110.68	110.71	106.75	96.43
Std. Error	1.89	1.47	1.11	1.36	1.43	1.53	1.72	1.52	1.59	1.30	1.72	1.76
Std. Deviation	7.79	6.06	4.59	5.60	5.90	6.32	7.09	6.28	6.56	5.38	7.10	7.28
t-value	-6.86	-8.98	-10.40	-5.02	-1.20	4.09	4.06	5.54	6.71	8.22	3.92	-2.02
GSI-SDV	79.24	80.75	83.84	87.58	92.38	99.95	99.90	102.15	104.12	105.34	99.64	89.16
GSI	87.04	86.81	88.43	93.19	98.28	106.26	106.99	108.43	110.68	110.71	106.75	96.43
GSI+SDV	94.83	92.87	93.02	98.79	104.18	112.58	114.08	114.71	117.24	116.09	113.85	103.71

Source: Own computation
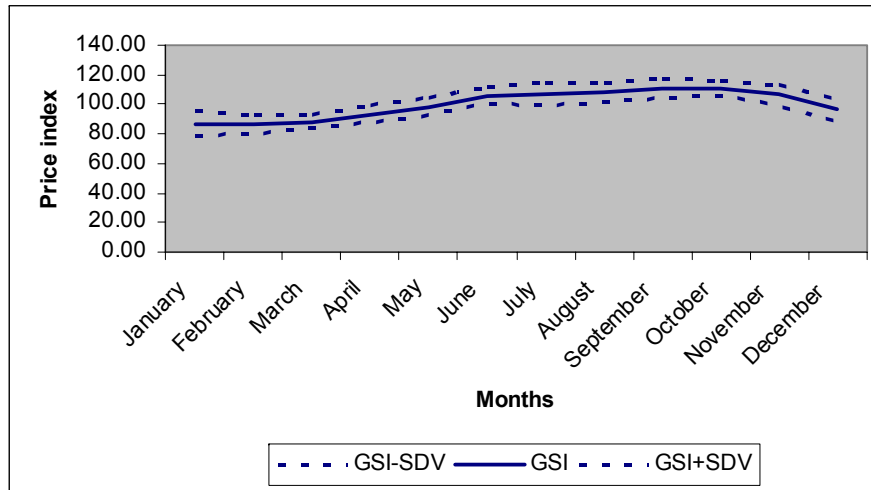
MICRO ENTERPRISES IN SMALLTOWNS, AMHARA REGION, ETHIOPIA: NATURE AND PERFORMANCE[1]

Tegegne Gebre Egziabher[2] & Mulat Demeke[3]

Abstract

It is generally believed that micro enterprises have a significant employment contribution and can operate successfully in places like small towns where large and medium enterprises cannot. This however depends on the nature and performance of micro enterprises. This paper studies micro enterprises in small towns with the view of identifying their nature and performance. The study is carried in six small towns of the Amhara region on randomly selected 332 micro-enterprises belonging to different economic activities. The finding revealed that the enterprises are generally characterized by low productivity and stagnation, low level of employment and capital, limited access to financial services, lack of partnership and networking, absence of technical and business skills. To this is added the limited purchasing power of the local people, limited export and poor business environment. A multivariate analysis revealed that the most critical variables affecting the performance of micro enterprises were capital, access to information, licensing and access to telephone services. In order to promote micro-enterprises in small towns, it is therefore essential to provide them with access to finance, improve information availability, improve local business environment and promote the formalization of businesses. Moreover businesses should be encouraged to form network and associations and tap export market. Local demand should also be enhanced through improved agricultural productivity in the hinterland and increased income of town dwellers.

---

1. Introduction

Small towns are found at the lower level of urban hierarchy and they play an essential role as regional service centers in rural hinterland through direct production linkages and spread effects (Henderlink and Titus, 2002). The collection and distribution roles of small towns link the rural hinterland with the bigger and intermediate towns and cities. These functions of small towns are achieved through myriad of economic activities carried in them. The enterprises housed in them are the ones which enable them fulfill their functions and they also form the basis for their growth and development.

The role of micro enterprises has seen a shift in development literature. Modernization theory assumes that the industrial structure in the third world countries will exhibit a parallel development to what has happened in Europe and USA. Production is concentrated in big towns to exploit agglomeration economies. Small and micro enterprises are believed to disappear eventually. In dependency/dominance theory, small enterprises survive either in direct dependency on the large enterprises or as sub-contractors, petty producers and traders operate in extremely competitive markets with no possibility to earn profit sufficient to invest and grow (Pederson, 1989).

Recently, large scale industrialization schemes have been practiced in many parts of Africa and the developing countries. Under this type of industrialization, most of the expertise, know how, equipments and inputs were imported from abroad. Similarly, most of the profits also left the country in different forms and left hardly a sustainable effect on indigenous micro and small enterprises/informal organizations (MSE/IO) (ECA,1998). This created a space for the development of micro and small enterprises/informal sectors to fill in the development process. Thus the development of MSE/IO began to be seen not as a temporary process but as part of a process of development from below. In this situation small enterprises could grow into large size categories as long as the growth is needed and justified (ECA, 1998).

The MSE/ISO have a number of advantages. They could survive in regions where limited purchasing power and infrastructure prohibit medium and large enterprises. Thus they contribute to decentralized development and regionally balanced growth. MSEs in many developing countries result in higher employment per unit of scarce capital that exceeds their large scale counter parts. Similarly, output per unit of capital is also found out to exceed that which is generated by the larger enterprises (Liedholm and Mead citied in Aeroe, 1992).

The extent to which these advantages are achieved depends on their nature and performance. Those enterprises which are subsistence and survival have lower prospects to grow and play a role in small town's development. On the other hand those firms which have local and external linkages, make use of innovation and information and which operate under favorable business environment have a better prospect for growth and will have a positive role in small town's development. Which of these micro enterprises are found in small towns of Ethiopia are not clearly known. There is a lack of knowledge regarding the economic performance and structure of these enterprises and whether they could be used as a basis to invigorate development in small towns. Such knowledge forms the basis to promote micro-enterprises and thereby assist small towns development.

This paper examines local economic activities (enterprises) in small towns of the Amhara region with the view to understand their nature and economic performance.

The specific objectives are
1. To examine the nature of small businesses in small towns in terms of linkages and business environment which affect their performance;
2. To examine the economic performance of small businesses in terms of their income and capital and identify their determinants; and
3. To derive suggestions for the promotion of micro entreprises in smaller urban centers.

The study is conducted in six small towns of the Amhara region: Dogollo, Werilu, Akesta, Tita, Haik and Bati[2]. Five of the towns except Bati are found in the South Wello Zone of the Amhara region while Bati is located in the Oromiya zone of the region. The six towns differ in their size, location and their hinterland though all of them are designated as small towns (Table 1.1).

Table 1.1: Some characteristics of the study towns

Town	Population	Status of town	Distance from Desse (kms)	Distance from Kombolcha (kms)	Food security status of woreda
Werilu	12,908	Woreda capital	91	111	Food secure
Akesta	3,488	Woreda capital	100	120	Food insecure
Bati	19,504	Woreda capital	65	42	Food insecure
Dogollo	4,959	Woreda capital	119	139	Food secure
Tita	2595	Other town	10	30	Food insecure
Haik	12,000	Woreda capital	30	50	Food insecure

Source: Field survey

The primary data for this study were obtained through a sample survey of enterprises. A new sampling frame of businesses was constructed for each town by making door-to-door visits of businesses with the help of knowledgeable local assistants. The woreda municipalities were also consulted regarding the accuracy of the sampling frame. The newly constructed sampling frame was much more comprehensive and inclusive than the list provided by woreda municipality in each town. The enterprises were categorized into trade, services, food and drinks, manufacturing and processing and handicraft. A total of 332 enterprises were randomly selected from the six study towns. From each town, 50 enterprises or more were selected. The enterprises were selected from each category i.e., trade, services, manufacturing, handicraft, food and drinks proportionate to the size of the category.

A structured questionnaire was administered to each selected enterprise. The questionnaire contains information on general characteristics of the business including business type, structure, location, number and type of workers, socio-economic conditions of the operators etc. In addition, information was also solicited regarding finance, income and sales, credit, business environment, licenses, regulations and taxes.

Frequency tables and means were produced to describe the nature of the businesses. A multivariate analysis was also employed to identify the explanatory factors for the economic performance of the businesses.

The paper is organized in the following way: following this introductory section, section two presents some theoretical views on small and micro enterprises. Section three presents the nature of small businesses in the study area. Section four describes the economic performance of the enterprises by outlining the capital and income characteristics of the businesses. Section five is a multivariate analysis in which factors affecting income and capital of small businesses were discussed. Section six outlines broad policy issues, which have implications for micro enterprise development in small urban centers.

4.   Theoretical views on small and micro enterprises

Among the major concerns of poor countries are extreme poverty and unemployment. The formal manufacturing or service sector has failed to create enough jobs and the poor have increasingly resorted to informal economic activities. But low returns to the small and micro enterprises and failure of various programs to support the sector have given rise to divergent views and arguments among experts and policy makers. A number of studies have been conducted since the 1980s with the objective of

identifying appropriate policies and programs to help operators of small and micro enterprises and bring about sustainable development. The objective of this section is to review some of these studies and provide the theoretical framework for the study.

Two strands of ideas on the success of micro enterprises focus on the role of entrepreneur and the role of the environment for small enterprises (Van Dijk, 2005). Arzeni (1998) states that entrepreneurial behavior is a key to accelerating the generation, dissemination and application of innovative ideas. Entrepreneurship is regarded as a strategic assets owing to its non contestable nature (Yu, 2001) . Yu (1998) shows that the dynamics of small manufacturing firms in Hong Kong were principally attributed to adaptive entrepreneurship. Entrepreneurial vision is the key to determine the future of the firm. This implies that since most micro enterprises are led by owner-entrepreneurs, their experience and socio-economic backgrounds limits the capabilities of these firms. Most entrepreneurs of small firms often gain their industry experience from their previous employment and start their own firms via spin-offs (Yu, 2001). Government can accelerate the development small firms by promoting innovation and improving human resource capacity.

Those who emphasize business environment relate economic performance to investment climate of the country (World Bank, 2005). The term business environment encompasses a wide range of policies affecting the economic setting of firms. Chief among these are the regulatory environment, provision of infrastructure and access to primary inputs such as finance, labor, land etc (Lall and Taye, 2005). But there is no consensus over what a sound investment climate for small enterprise growth looks like. The issue of whether the same or different investment climate is needed for large and small enterprises is still debated among experts and policy makers.

Since the nineties more elaborated theories have been used to explain the success of micro and small enterprises. Some of these recent views include flexible specialization, the industrial district or clustering and the network approach. Flexible specialization is based on the manufacture of custom made products by use of multi-purpose technology and flexible production methods operated by skilled workers (Helmsing, 2000). In flexible specialization, a firm relies on other firms that specialize in the manufacture of certain components or sub-processes and concentrates on its own sub-component and process serving its own requirement and that of others as well. Inter-firm subcontracting is the basis of sectoral specialization.

The industrial district or cluster approach emphasize that firms found geographically and sectorally clustered benefit from external economies and joint actions. The former is gained from labor market pooling effect, intermediate input effects,

technological spillover and also access to market (Krugman cited in McCormick, 1999). Joint actions are results of inter-firm cooperation and are manifested in bilateral or multilateral relations. Humprey and Schimitz, (1995) describe that there are two types of joint action namely individual firms cooperating (e.g. sharing equipment or developing a new product) or groups of firms joining forces in business associations, producer consortia and the like.

The network approach views enterprises not as homogenous and independent entities but in a network of enterprises, organizations and households through which commodity, labor, money, information and innovation flow. The network theory sees the production system as a system of specialized enterprises linked to other enterprises (as customers or as producers of inputs, investment goods or services), consumers and workers by a network of commodity, person and information flows (Pederson, 1989). The approach recognizes individual enterprise as dependent on resources controlled by other member of the network. The enterprise gets access to these resources via its position in the network (Johanson and Mattsson, cited in Aeroe, 1992). Its position is influenced by its ability to innovate, which is a function of technological capacity and financial strength and by its local political power and influential contacts (Aeroe, 1992).

In a network theory, a production network does not have to be clustered in space but can take many spatial forms: networks dispersed over wide territories, networks with a 'territorial core' or networks agglomerated highly. Industrial networks may involve only small industries or a mix of small and large firms. The network theory has a broad approach in that the networks are not limited only to production network but include the reproduction of the owner and his family and others. As such the approach gives insight into economically illogical business strategy in small enterprises since it can be understood in terms of a family's overall 'investment strategy'. The approach is thought to be adequate to the African situations since it advocates that the enterprise is dependent not only on other enterprise but also on a broader social network of the owner and his family.

The above theories suggest relevant variables for the success of micro enterprises. Among these are skilled labor, multi-purpose equipment, local and external linkages, the role of innovative entrepreneur, business environment, inter-firm relations, sector and local business associations etc. The following sections analyze the impact and implications of some of these variables in understanding the nature and performance of micro enterprises

5. The nature of micro enterprises: Business linkages

The discussion in this part examines the nature of micro enterprises by identifying the different business linkages: labor market, financial, partnership and cooperation, local and external relations and relations with local authorities.

Employment levels and participation in labor market

Employment levels vary by type of business types. The total number of people employed in the sampled activities is 601 (Table 3.1). About 64 % of the total employment is accounted by Food and drinks (38 %) and services (26 %). Handicraft and cottage and manufacturing and processing generate less employment.

Most of the businesses are single person operated enterprises. Trade, handicraft and services average 1.43 employees per establishment. Those with over 2 persons per establishment are food and drinks (2.48) and manufacturing (2.71) (Table 3.1).

Family labor is by far the most important source of labor. About 74% of the total workers are family members. Unpaid family labor helps the small enterprises to minimize their cost of operation, but the firms cannot tap the best talents from the labor market.

Table 3.1: Employment in the study area

Activity type	Hired labor			Family labor			Total		
	No	%	Average per establishment	No	%	Average per establishment	No	%	Average per establishment
Trade Activities	12	7.7	1.50	91	20.4	1.26	103	17.1	1.43
Food and drinks	79	50.1	2.19	147	33.0	1.65	226	37.6	2.48
Manufacturing and processing	31	19.9	1.82	34	7.6	1.42	65	10.8	2.71
Handicraft and cottage	9	5.8	2.25	41	9.2	1.21	50	8.3	1.43
Services	25	16.0	1.79	132	29.7	1.22	157	26.1	1.43
Total	156	100	1.97	445	100	1.36	601	100	1.81

Source: Field survey

The gender dimension of enterprises shows there is a gender-based specialization in the different types of businesses since some sectors are entirely dominated by men

while others by women (Table 3.2). Table 3.2 shows that about 19 % of the operators are females. A higher participation of females (78 %) is noted in the food and drinks category.

Perhaps this is not surprising given the fact that businesses in the food and drinks category involve 'injera making and selling'; 'tela and araki making and selling' which are all dominated by women.

The second highest proportion of women, with each accounting for 8 %, are found in trade activities and handicraft sector. There are no women participating in manufacturing and processing. A significant proportion of males (39.2%) is found mainly in the service sector followed by trade (25.7%) and food and drinks (15.6%) in that order.

New entrants dominate the labor market, as the operators prior to their present business were students (25%), farmers (14%), military (11%) and unemployed (10%). These new entrants might face a great difficulty in establishing a reputation in their business. About 8 % had prior experience in the same line of work while another 9 % have worked in different line of work. Thus it is only a few operators who can bring prior experience to the work. The extent to which employees and owners offer technical capability to the enterprise depends not only on his (her) prior experience as entrepreneur but also on the training background both in the formal, business and technical education.

Table 3.2: Sex of operators by activity type

Activity type	Male	Female	Total
Trade Activities	69 (25.7)	5 (7.8)	74 (22.3)
Food and drinks	42 (15.6)	50 (78.1)	92 (27.7)
Manufacturing and processing	23 (8.6)		23 (6.9)
Handicraft and Cottage	30 (11.2)	5 (7.8)	35 (10.5)
Services	105 (39.2)	3 (4.6)	108 (32.5)
Total	268 (100)	64 (100)	332 (100)

Source: Field survey

The educational status of the respondents show that 23 % of the business operators had no formal education. Nearly half or 48 % of the female operators fall in this

category. At the other end of the spectrum, only 4.4 % of the household heads have more than 12 years of education. There is no female respondent with more than 12 years of education. The modal group (32 %) had secondary education. A substantial number (29 %) also had primary education. These indicate that a significant number of business operators in the study towns have had considerable exposure to formal education. Since the age distribution of the operators shows that most of them (about 35 %) fall in the age group of 26-36, it is safe to conclude that opportunity for gaining employment in small businesses goes to younger and better educated persons though there are some opportunity for uneducated, older and female group particularly in some activities such as food and drinks. A three-way classification of education by sex and by activity category revealed that the majority of females (79.3 %) with no education are engaged in food and drinks.

Notwithstanding the operators' exposition to formal education, the overwhelming majority has neither business nor technical training. Only 3 % reported business training that ranged from 1 month to over 1 year while 1.3 % or four males reported technical training. This, in addition to revealing the labor characteristics, indicates the minimal linkages of business with local and external training institutions. In the absence of technical and business training, a significant proportion (about 13 %) of the respondents reported that they are engaged in the business because the family has worked in the same line of activity. These individuals must have learned their trade from their parents.

Partnership and Cooperation

Joint venture has a very significant advantage for small enterprises because it enables them to acquire experience and skills and also helps them to enter new markets and secure additional financing. Almost all the businesses in the study area are sole proprietorship. In total, about 97.3 % are run by single owner. There are no subsidiary businesses or share holding companies. Those who reported some form of partnership are only 2 % of the businesses. This is quite in contrast from the experiences of other countries where small business in small towns tend to be subsidiary plants of big companies located somewhere else.

Business associations help to protect the interests of members. The overwhelming majority (98%) do not belong to any kind of business associations. It is only six enterprises in Tita town, which indicated that they are members of an association. This could be because of Tita's closeness to Dese town which might have prompted some businesses to be part of the association found in Dese. The fact that businesses are not part of any association implies that collective action or joint action

among operators is non-existent. An enabling institutional policy environment cannot be crated without an organization of small businesses.

Financial linkages: Use of Bank Services and Traditional Financial Institutions

A relatively more number of businesses in Haik and Bati have bank account for both business and personal savings. In both cases nearly 25 % of the enterprises have bank accounts for business activity while nearly one-third have bank accounts for personal savings. The use of banks in Akesta and Tita is very minimal.

Very few enterprises reported borrowing in the last 12 months. Only 43 establishments or only 13.6 % have borrowed (Table 3.3). The average amount borrowed is 40255.12 birr. The average is relatively big mainly due to a few enterprises that borrowed a significant sum of money from formal banks. A relatively large number of borrowers needed guarantor to take loan.

Table 3.3: Number of businesses who borrowed and average amount by town.

Town	Number borrowed	Average amount borrowed
Akesta	3	26883
Dogolo	10	17310
Werilu	8	16912.50
Tita	9	544.44
Haik	7	189314.29
Bati	6	1970
Total	43	40255.12

Source: Field survey

The Amhara Credit and Saving and friends and relatives are the main sources of credit for those who borrowed (Table 3.4). Banks and other micro-finance institutions are less important. Those who have borrowed from the banks in total number nine.

Friends and relatives as sources of credit signify the importance of social capital in running a business. In fact about 42 % of the interviewees have indicated that they have a potential to borrow a significant amount of money from friends and relatives at any time. Those who reported that they can rely on friends and relatives as potential borrowers are 43 % in Akesta, 30 % in Dogollo, 28 % in Werilu, 31 % in Tita, 62 % in Haik and 54 % in Bati. The average money mentioned that could be borrowed from friends and relatives is about 8153.37 birr and this could be kept for about 40 days before it is repaid. This signified the importance of friends and relatives as a source of capital for small business in small towns.

Table 3.4: Source of Credit by town

Town	Source of credit					Total
	Amhara credit and saving	Other micro finance	Banks	Friends and Relatives	Other	
Akesta				3		3
Dogolo	7		2	1		10
Werilu	3		2	1	2	8
Tita	6		2	1		9
Haik		1	2	4		7
Bati	1		1	4		6
Total	17	1	9	14	2	43

Source: Field survey

The principal source of fund for initial investment and operating capital is own saving. Over 60 % of the respondents reported own saving for initial investment and over 90 % reported the same source for operating capital. The second most important source of fund to start the business is found out to be friends and relatives. The two sources together form principal sources of initial investment for over 80 % of the establishments while the proportion of those who reported both sources for working capital are much higher. The importance of banks, moneylenders, government loans etc as source of fund to start businesses is not significant.

Suppliers' credit is not very popular among small businesses. On average, only 20 % of the enterprises reported that they buy items on credit. About 37 % in Haik, 17 % in Bati, enjoy supplier credit. The two towns, Haik and Bati, are relatively bigger centers in the study area. In the remaining towns, only 10 to 13% of the business use suppliers' credit. Inadequate banking and credit services are among the major constrains of small business in the study areas. Most of the enterprises are forced to operate using a small amount of capital obtained through own savings.

Participation in Iquib and Iddir

Iquib and iddir are traditional means of raising money for different purposes. Iquib involves revolving fund, which is contributed by members. Iddir has more of a social function, assisting members who lost family members or relatives. About one fourth of the interviewees have participated in iquib. The highest is found in Dogolo where a little over half of those interviewed have participated in Iquib over the last 12 months. The duration of the iqub is mostly for about 10 months during which time members contribute an average of 313 birr. This money could be drawn from the profit of the

enterprise and is an indication that those who are participating have a better saving capacity.

Though only 41 % of those who participated responded to the question on the use of money, the majority use the money for business expansion. This indicates that iquib could be used as instrument to promote businesses in the area. A substantial number of those who responded also use their savings from iquib for consumption purposes particularly for food and cloth purchase.

Iddir is more frequently practiced than iqub. About 79 % of the interviewees participate in iddir. The monthly contribution is very low (about 2 birr). Iddir has no role in business expansion since it does not provide loan or could not be used as source of fund for business. The major purpose of iddir as expressed by participant is assistance at times of death. In the absence of a properly functioning credit market and absence of insurance or welfare services, communities need to retain traditional institutions.

Linkage with the local farm sector

The linkages of business enterprises with the farm sector take three major dimensions. First, the farm sector is a major provider of inputs. Second the farm sector is the major market of the small businesses. Third, the business sector provides inputs to the farm sector. These and other linkages are stronger in situations where the economy is dynamic and growing.

Nearly 38% of the enterprises use farm produces as inputs for their businesses (Table 3.5). These farm produces, however, come both from local and non-local sources. A quarter of the businesses use entirely local farm produces while a combination of local and non-local farm produces are used by about 5% of the businesses. Industrial products seem to be the most important input used by over a third of the enterprises. The extent of backward linkage of businesses to the local farm sector is therefore not significant indicating that local agriculture has limited market in the area. On the other hand, however, most businesses (82 %) rely on both farmers and town dwellers as their customers. The farm sector therefore is an important source of market for small businesses in small towns.

A very small number of businesses are engaged in providing inputs for farmers. It is only 20 businesses or 6 % which reported input provision to farmers. These businesses provide fertilizers and seeds. The linkage with the farming sector in terms of input provision is therefore not well developed. With limited use of non-farm inputs, the productivity and income of the rural population remains very small. The extent to

which farming is also a source of income for business owners was investigated in the study. It is only about 36 business owners or about 11 % who own farm lands with an average size of 0.85 hectares. The farm sector therefore does not serve as supplementary income for the majority of small business operators in the study area.

Table 3.5: Type of inputs used by small businesses*

	Local farm produce	Non-local farm produce	Local and non local farm produce	Industrial products	Locally available raw materials	Others	Total
Akesta	34.4		1.6	59.0	1.6	3.2	100
	(21)		(1)	(36)	(1)	(2)	(61)
Dogolo	42.0	4.0	2.0	36.0	8.0	8.0	100
	(21)	(2)	(1)	(18)	(4)	(4)	(50)
Werilu	41.5	3.8		37.7	1.9	15.1	100
	(22)	(2)		(20)	(1)	(8)	(53)
Tita	16.1	25.0	5.4	25.0	5.4	23.2	100
	(9)	(14)	(3)	(14)	(3)	(13)	(56)
Haik	9.4		15.1	28.3	9.4	37.7	100
	(5)		(8)	(15)	(5)	(20)	(53)
Bati	8.6	12.1	6.9	32.8	20.7	18.9	100
	(5)	(7)	(4)	(19)	(12	(11)	(58)
Total	25.1	7.6	5.1	36.9	7.9	17.5	100
	(83)	(25)	(17)	(122)	(26)	(58)	(331)

Figures in parenthesis are reporting cases

Source: Field survey

* one case did not respond to this question

Local and External Linkage in input sourcing and output distribution

The local and external linkages of businesses could be examined in terms of the sources of inputs and market places for outputs. The sources and market places were designated as local, regional and national[3]. In terms of inputs, 52 % of the businesses receive their inputs from local sources while nearly 46% receive from the regional capitals particularly Desse and Kombolcha (Table 3.6). Only very few or 5% of the enterprises receive their inputs from the national market. Trade and services are by far the most important activities, which receive their inputs from the region. Merchandise trade is involved in locally distributing imported goods from the regional market. The regional linkage is not strong with regard to the outputs of the businesses. All in all about 85% of the businesses have local markets while only 14 % supply for regional market. The national market is very insignificant for the businesses in the small towns. Trade and services are the ones, which have a better

linkage with the regional market. The fact that 85 % of the businesses cater to the local market means that these businesses depend on the low income of the farmers and the residents of the towns. As a result, regional and national exports cannot be the source of growth for the businesses.

Table 3.6: Sources of inputs and destinations of output*

	Input				Output			
	Local	Regional	National	Total	Local	Regional	National	Total
Trade	33.3 (24)	56.9 (41)	9.7 (7)	72	75 (54)	23.6 (17)	0.01) 1	72
Food	64.8 (61)	32.9 (31)	2.12 (2)	94	95 (88)	5.3 (5)	- -	93
Manufacturing	47.6 (10)	38.1 (8)	14.3 (3)	21	76.2 (16)	19.0 (4)	(4.7) 1	21
Handicraft	55.5 (20)	38.8 (14)	5.5 (2)	36	80.5 (29)	16.6 (6)	2.8 (1)	36
Services	49.0 (53)	49.1 (53)	54 (2)	108	85.4 (88)	12.6 (13)	1.9 (2)	103
Total	52.3 (168)	(45.8) 147	(4.9) 16	100 (321)	84.6 (275)	13.8 (45)	1.5 (5)	100 (325)

Figures in parenthesis are reporting cases
Source: Field survey
*seven cases did not respond to this question

Contact with Local Authorities

Small businesses make contacts with local authorities in terms of business licenses. A significant proportion, i.e., 52.1 % of the establishments, in the small towns operates without a license. Handicraft and cottage and Services are the two most important activities where the vast majority has no licenses: about 88 % in handicraft sector and 67 % in the service sector are not licensed.   Manufacturing and processing is more formal in its operation as the majority (91 %) is licensed.

Licensed enterprises are formal and pay taxes, while the non-licensed ones are informal businesses and may not pay taxes. Formality has its own cost. There is an initial cost of being formal (fees for registration, time spent on the same, licensing, permits to construct workshop etc.) and later the costs of maintaining formality i.e., costs related to renewal of licenses, complying to regulations etc. As a result, most of the micro enterprises choose to stay informal. It should, however, be noted that

remaining informal has also its own costs such as the costs of illegality, harassment, eviction, lack of access to banks, credit etc.

It is noted that other than linkages for licensing, there is no any other contact what so ever between local authorities and business. It is known that businesses require the inputs and assistance of local authorities to flourish and grow. This linkage however is non-existent and will have its own impact on the performance and growth of the businesses.

Local Business Environment

Local environment is one of the determinants for the operation of business in small towns. The local environment includes facilities and services available and local policies that could be formulated to impact on local business. These factors influence the performance of business by influencing profitability and production cost.

Tables 3.7 and 3.8 show the economic and financial infrastructure available in the study towns. Economic infrastructure has important implications for business development since they are used as inputs in the businesses. Water and telephone seem to be ubiquitously present in all towns.

Table 3.7: Economic infrastructure available

	Akesta	Dogollo	Werilu	Tita	Haik	Bati
Electricity	No	Yes *	Yes*	Yes	Yes	Yes
Piped water	Yes	Yes	Yes	Yes	Yes	Yes
Stand pipe water	Yes	Yes	Yes	Yes	Yes	Yes
Telephone	Yes	Yes	Yes	Yes	Yes (manual)	Yes
Sewerage	No	No	No	No	Yes	Yes
Bus stations	No	Yes	Yes	No	Yes	Yes
Cattle dip	No	No	No	No	Yes	No
Slaughter houses	NF	No	Yes	No	Yes	No

* has time limit   NF = not functional
Source: Field survey

Electricity is available in bigger towns such as Haik and Bati. In smaller towns electricity is either absent or the service is available for a limited time of the day. Sewerage, bus stations, cattle dip and slaughterhouses are available only in relatively larger towns. Financial services and facilities form important elements of the business environment. Table 3.8 shows that only two towns, Bati and Werilu, have a commercial bank.

Table 3.8: Availability of financial services

	Akesta	Dogolo	Werilu	Tita	Haik	Bati
Commercial bank	No	No	Yes	No	No	Yes
Amhara rural and credit savings	Yes	Yes	Yes	No*	Yes	Yes
Other micro-enterprise credit	No	No	No	No	No	No

* Businesses in town get credit from Dese ; Source: Field survey

On the other hand, the Amhara Savings and Credit Institution is found in almost all towns except Tita. Businesses in Tita also use the service of banks in Dese. Primary and secondary schools are available in all the study towns except Tita. By contrast health services are not widely available. Tita and Dogolo do not have any public health facility. Only Akesta has hospital. Almost all towns except Tita are capital cities of their woreda. Their administrative status helps them attract different government services, which in turn create demand for the businesses and serves as center of attraction for further development.

An attempt was made to identify which elements of the business environment prohibit the growth and development of small enterprises in the small towns. Telecommunication, electricity and access to land were respectively indicated by 43 %, 46% and 41 % of the enterprises as forming major obstacles to their businesses. Tax rates and tax administration were also considered as major obstacle by 33 % and 34 % of the businesses respectively while collateral requirement for getting access to finance was regarded as major problem by 24 % of the businesses. Other aspects of the business environment such as regulations, economic policy, corruption, crime, theft and disorders were regarded as obstacles only by a small number of enterprises. Thus infrastructure, land and tax are the major obstacles for the development of small businesses in small towns.

6. Economic performance of enterprises: Capital and income

Initial investment, current capital and working capital

The initial investment of most of the enterprises is found out to be low (Table 4.1). About a quarter (24.8%) of all enterprises have an initial investment that ranges between 5-100 birr while a little over half of the enterprises have started their business with initial capital of up to 500 birr. Enterprises in the handicraft and cottage and food and drinks category have the highest proportion of enterprises with very low

initial investment. About 48 % and 28 % of the enterprises in handicraft and food and drinks category respectively have started their business with a capital amount ranging between 5-100 birr. Those, which have started business with a capital amount up to 500 birr, are 87 % for handicraft and cottage and 66 % for food and drinks. The low initial investment of enterprises is an indication that there is low entry capital barrier for these firms.

Those enterprises with relatively higher initial capital are found in the manufacturing and processing category. About one-third or 32 % of enterprise have started their business with capital that ranges between 2000-5000 while the majority of enterprises in this category i.e., 36.4 % have started their business with over 20,000.

The amount of working capital used by the enterprises repeats the patterns observed for the initial investment with slight differences. The working capital in the size category of up to 500 birr is reported by 50.8% of the enterprises. Enterprises in the handicraft sector have by far the smallest amount of working capital. It is found out that nearly 61 % of the enterprises in this category have reported a working capital of up to 100 birr and nearly 80 % of the enterprises have working capital of up to 500 birr. Manufacturing and trade are those with relatively higher amount of working capital (Table 4.2). The current capital of all businesses is also very small. Generally about 42 % of all businesses have a current capital that is less than 500 birr (Table 4.3). Some sectors such as services and handicraft have a higher proportion of enterprises with less than 500 birr of current capital.

An attempt was made to examine the extent of scale difference or differentiation within the small businesses. The presence of hierarchies or scale differences in any business sector provides dynamism for the sector since it creates a room for expansion. The bigger sectors can lift smaller sectors or create opportunities for small related business activities. In the Fordist industrialization process, technological development is perceived as being an in-plant process. The result could trickle down to other enterprises within a vertical industrial hierarchy (Aeroe, 1992). Within trade, merchandise retail trade and grain trade were examined and it was found out that the majority (66%) have capital that ranges between 500-10,000. In the food and drinks sector 70 % of the restaurant and cafeteria businesses have capital between 500-5000, 75 % of the tea, pastry, bakery and injera making businesses have capital of less than 500 birr. In the service sector, 74 % of the carpentry, masonry, and plumbing businesses have capital of less than 500 birr. This is an indication that businesses in the small towns are similar and they operate at a similar low level. This prohibits the potential to grow as a result of scale differences. No enterprise is providing opportunity for other enterprises to grow and prosper.

The expansion possibilities of enterprises is examined by comparing the current capital with the initial capital. About 20 % of the businesses have reported a negative change, which indicates that these enterprises are perhaps de-capitalizing. The remaining 80 % have shown a positive increase in capital accumulation but the level is low. For instance, about 9 % have not shown any capital accumulation, as their current capital is similar with their initial investment. About 26 % have shown an increase in capital accumulation up to 20 % per year while 14 % have shown an increase between 20 and 50 %.

The perceptions of operators were sought about the expansion possibilities. A little over half (51.7 %) of the enterprises indicated that it is not at all possible for expansion. Those who indicated that it is possible to expand are only 10 % of the operators. The operators were asked to rank the most important obstacles for expansion. Lack of working capital was indicated by nearly 54 % as the major problem. Lack of demand was considered by about 23 % while those who mentioned lack of premise at affordable rent are about 6%. These three obstacles are mentioned by 83% of the enterprises.

Table 4.1 :Initial investment by activity type*

	Category of Business Activities					
	Trade Activity	Food and Drinks	Manufacturing and Processing	Handcraft and cottage	Services	Total
5-100	16.4% (12)	27.6% (24)		48.4% (15)	26.4% (28)	24.8% (79)
100.01-500	23.3% (17)	39.1% (34)	4.5% (1)	38.7% (12)	32.1% (34)	30.7% (98)
500.01-2000	24.7% (18)	14.9% (13)	13.6% (3)		14.2% (15)	15.4% (49)
2000.01-5000	16.4% (12)	8.0% (7)	31.8% (7)	6.5% (2)	13.2% (14)	13.2% (42)
5000.01-10000	9.6% (7)	4.6% (4)	4.5% (1)	6.5% (2)	5.7% (6)	6.3% (20)
10000.01-20000	8.2% (6)	1.1% (1)	9.1% (2)		1.9% (2)	3.4% (11)
>20000	1.4%(1)	4.6% (4)	36.4% (8)		6.6% (7)	6.3% (20)
Total	100.0%(73)	100.0% (87)	100.0% (22)	100.0% (31)	100.0% (106)	100.0% (319)

* 13 cases did not respond to this question

Table 4.2: Working Capital by business category *

| | Category of Business Enterprises | | | | | |
	Trade Activities	Food and Drinks	Manufacturing and Processing	Handcraft and cottage	Services	Total
0-100	13.5 % (10)	29.5% (26)		61.3% (19)	34.3% (37)	28.5% (92)
100.01-500	12.2% (9)	30.7% (27)	4.5% (1)	19.4% (6)	26.9% (29)	22.3% (72)
500.01-2000	18.9% (14)	18.2% (16)	22.7% (5)	6.5% (2)	15.7% (17)	16.7% (54)
2000.01-5000	17.6% (13)	10.2% (9)	22.7% (5)		9.3% (10)	11.5% (37)
5000.01-10000	24.3% (18)	5.7% (5)	27.3% (6)	6.5% (2)	7.4% (8)	11.5% (37)
10000.01-20000	5.4% (4)	1.1% (1)		6.5% (2)	1.9% (2)	2.8% (9)
>20000	8.1%(6)	4.5% (4)	22.7% (5)	6.5% (2)	4.6% (5)	6.8% (22)
Total	100.0%(74)	100.0% (88)	100.0% (22)	100.0% (31)	100.0% (108)	100.0% (323)

* 9 cases did not respond

Table 4.3: Current Capital by business category*

	Category of Business Activities					
	Trade Activity	**Food and Drinks**	**Manufacturing and Processing**	**Handcraft and cottage**	**Services**	**Total**
10-100	8.1% (6)	13.6% (12)		45.3% (154	25.0% (27)	18.3% (59)
100.01-500	14.9% (11)	33.0% (29)	4.5% (1)	32.3% (10)	25.0% (27)	24.1% (78)
500.01-2000	10.8% (8)	17.0% (15)	9.1% (2)	3.2% (1)	12.0% (13)	12.1% (39)
2000.01-5000	16.2% (12)	14.8% (13)	22.7% (5)	6.5% (2)	13.0% (14)	14.2% (46)
5000.01-10000	23.0% (17)	9.1% (8)	27.3% (6)	3.2% (1)	8.3% (9)	12.7% (41)
10000.01-20000	10.8% (8)	2.3% (2)	9.1% (2)		6.5% (7)	5.9% (19)
>20000	16.2% (12)	10.2% (9)	27.3% (6)	9.7% (3)	10.2% (11)	12.7% (41)
Total	100.0% (74)	100.0% (88)	100.0% (22)	100.0% (31)	100.0% (108)	100.0% (323)

* 9 cases did not respond

Sales (revenues) and trends in income

The sale or revenue data is used to assess the economic status of the enterprises [4]. The survey shows that over half of the enterprises (57%) reported weekly sales of up to 100 birr. About 90 % of the enterprises have weekly sales of up to 500 birr. Nearly two-third (65.2%) of the enterprises in food and drinks category and 59.3 % in services category earn only up to 100 birr per week. Enterprises in 'manufacturing and processing' category are the ones with relatively higher weekly sales. For instance 17 % of the enterprises in manufacturing and processing earn weekly sales that ranges between 500-2000 birr. Enterprises in other categories, which earn income in this category are all less than 9 % (Table 4.4). The distribution of enterprises by revenue category is evident of the low income that is derived by these enterprises.

Notwithstanding, the low level of income, trends in income is an indication whether there is a future for the enterprises in the study towns. The overwhelming majority i.e., 70 % in trade activities, 72 % in food and drinks, 65 % in manufacturing and processing, 71 % in handicraft and cottage and 64 % in services reported that their income is decreasing. The category of enterprises with the highest proportion of enterprises, which reported an increasing trend for income, is services. In this category, nearly 22% of the enterprises reported an increasing trend. It is, however, worthwhile to mention that those business types in the service category which reported an increase in income are dominated by hotels.

Reasons for decreasing trend for the majority of the enterprises were solicited in the survey. Two reasons that were given by over 70 % of the enterprises in all categories of business are the presence of too many operators and weak purchasing power of the customers. The former indicates that there are too many enterprises and that the market is perhaps over supplied while the latter shows the problem of market mainly because of low income of customers. The major customers for micro enterprises are the hinterland farmers. These farmers who are living in food insecure woredas are impoverished and cannot afford to consume the outputs and services of these enterprises.

About 12 % of the respondents indicated that they use the income they derive from the business for reinvesting in their business or adding a new business. About 64 % or nearly two-third of the businesses uses the income for household consumption. Another 8 % of the enterprises indicated that they use their income both for household consumption and for children education. The fact that the majority uses the income for household consumption indicates that businesses in small towns remain at subsistence level. The extent to which business income is supplemented by other sources of income was also solicited in the questionnaire. About 70 individuals or 22.2 % have reported one additional source of income. This is an indication that there is limited opportunity for income diversification in the study area.

100

Table 4.4: Weekly sales/revenue by business category*

	Category of Business Enterprises					
	Trade Activities	**Food and Drinks**	**Manufacturing and Processing**	**Handcraft and cottage**	**Services**	**Total**
0-100	47.9 %	65.2%	4.3%	82.4%	59.3%	57.0%
	(35)	(60)	(1)	(28)	(64)	(188)
100.01-500	42.5%	25.0%	69.9%	8.8%	32.4%	32.7%
	(31)	(23)	(16)	(3)	(35)	(108)
500.01-2000	5.5%	3.3%	17.4%	8.8%	5.6%	6.1%
	(4)	(3)	(4)	(3)	(6)	(20)
2000.01-5000	2.7%	5.4%	4.3%		2.8%	3.3%
	(2)	(5)	(1)		(3)	(11)
>5000	1.4%	1.1%	4.3%			.9%
	(1)	(1)	(1)			(3)
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	(73)	(92)	(23)	(34)	(108)	(330)

* 2 cases did not report

Regression analysis

Two different dependent variables, namely gross sales per week and estimated total capital, were identified for regression analysis in this study. The aim is to understand the determinants of gross sales, which represent business income. Similarly, the scale of operation (captured by total capital of the business) is analyzed to infer about the potential for modernization of the enterprises.

Average weekly sales vary significantly across the different activities and the study towns. For instance, weekly average sales vary from a low of birr 155 for handicraft and cottage to a high of birr 2,803 for manufacturing and processing (Table 4.5). Gross income from services is also low (Birr 271), while those from trade activities and sale of food and drinks are slightly below the overall average. Differences between the towns are also significant, ranging from birr 89 in Tita to birr 1,734 in Bati.

A significant variation is also observed between the different activities and towns with respect to size of business, proxied by total business capital. On the average, the intensity of capital is relatively lower for handicraft and services and higher for food and drinks and manufacturing and processing (Table 4.5). A few relatively big hotels have contributed to larger capital in the food and drink sector.

Table 4.5: Average weekly sales and total capital

	Average weekly sales	Estimated total capital
	Mean	Mean
Activities		
Trade activities	420.37	16093.73
Food and drinks	470.74	33028.09
Manufacturing and processing	2803.04	25406.82
Handicraft and cottage	154.85	1965.70
Services	270.69	7394.02
Total	523.98	17362.19
Towns		
Akesta	109.89	2920.49
Dogolo	179.92	5738.75
Wereilu	181.06	9533.75
Tita	88.71	2383.26
Haik	801.06	59864.62
Bati	1736.50	24458.70
Total	523.98	17362.19

Determinants and results

Determinants

A set of several independent variables is thought to influence sales and business capital. These are: Demographic (Education, age, sex); Access to utilities (use of electricity ,use of telephone); Saving effort (use of bank services (open bank account), membership in *equib)*; Government regulation (own business license); Access to information (own radio, own TV); Asset base and income diversification (Own residence house; own business premise); Number of income sources; Access to capital(current working capital); Site dummies(five dummy variables for the six sites); Activity dummies (Four dummy variables for the five activities).

Results of weekly sales

Demographic factors
None of the demographic characteristics (education, sex and age) was found to have a significant influence on the volume of sales. All other factors held constant, female operators do not perform poorly compared to their male counterparts. This is completely different from rural areas where empirical studies show that agricultural performance of female-headed households is lower than that of male-headed families[5] . Women operators of small business are not constrained as much as their female counterparts in rural areas.

It is often argued that education is important in a modern environment. As shown in the descriptive part, most businesses in the study areas do not use modern technologies and operate using mainly their own finance and family labor. A more dynamic environment is perhaps necessary to make education more useful in managing small enterprises.

Access to utilities
Contrary to the general expectations, the coefficient of electricity is negative and significant. There is no doubt that many small business do not use electric power to undertake their activities. With the exception of some manufacturing and processing plants (e.g. flour mills), electric power is mainly used for lighting purposes. Although access to electric power should have helped to modernize and introduce new technologies and machines, the small business have continued to rely on the same old technologies. Demand constrains as well as lack of finance may have discouraged any modernization effort. Nonetheless, the reasons for failure to utilize the opportunity as well as the unexpected results need further checking and scrutiny. Access to telephone is supposed to remove the constraints to information and

facilitate networking and partnership. However, the coefficient of telephone is not significant, although it has the expected positive sign. It appears that business operators in the study towns have yet to realize the potential of telephone and associated technologies. Lack of partnership and networking could also undermine the importance of telephone.

Saving efforts

In the absence of financial services, operators mainly rely on their own savings. Those who save are thus expected to make more effort to improve the performance of their business than those who don't. In this regard, the influence of maintaining a bank account and participating in *equib* (association for rotation of savings) was tested, and the results show that the two variables positively and significantly influence weekly sales. It appears that business owners with no effort to save face relatively less pressure to perform efficiently.

Access to information

Information is critical to the social and economic activities of human beings. Operators owning TV and/or radio are more likely to make informed decisions than those who don't. The regression results clearly prove that the performance of owners is significantly better. In the absence of alternative sources of information, access to mass media could be vital to gain knowledge and information about new ways of doing business and to learn about markets (e.g. advertisements). Individuals need to recognize the value of information to build their capacity or human resource capital.

Government support and regulations

Evidences of government support are non-existent in the study area. Support in the form of training, and improved access to finance, market and new technology is largely unknown. Small enterprises cannot benefit from investment incentives of the government. Regulatory measures to enforce registration, contracts and standards are either weak or absent. The presence of government is felt only in relation to licenses and tax payment. But even these are not uniformly applied as the majority of the businesses operate without license. Nevertheless, license holders consistently performed better than non-holders. This may be attributed to indirect pressure to innovate, improve performance and compete with the unlicensed operators who have no cost of license renewal and taxes.

Access to capital

The results of the semi-log function for gross revenue showed that revenue is positively and significantly influenced by the amount of working capital. Given that access to credit is very much limited, it is not surprising that enterprises with more capital have managed to produce and sale more. Indeed, the amount of working capital is the single most important determinant of gross revenue in the study towns.

104

Asset base and income diversification (risk-taking capacity)

Operators with stronger asset base and with more sources of income are more likely to have better capacity to take risks. Attitudes towards risk generally begin to change as resource base improves and diversifies, and income moves well ahead of minimum consumption needs. Nevertheless, none of the proxy variables to measure risk-taking capacity, i.e. ownership of residence house and business premise or number of income sources, are significant, although all have the expected positive sign. Once again this might be attributed to the absence of modern economic settings where rewards to innovative decisions are higher.

Table 4.6: Model summary

Model	R	R.Square	Adjusted R Square	Std.Error of the Estimate
1	.824	.678	.650	.9048

Table 4.6 contd.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	464.657	24	15.361	23.649	.000
	Residual	220.226	269	.819		
	Total	684.883	293			

Table 4.6 contd.: Regression results: Dependent variable: natural log of sales per week

	Unstandardized Coefficients	t- value
(constant)	3.304	7.095
Level of education	1.860E-02	.3620
Age square	1.077E-05	.051
Sex	-5.703E-02	-.326
Electricity	-.375	-2.653
Telephone	.200	.936
Radio	.290	2.109
TV	.426	2.108
Own residence	9.679E-02	.682
Own business premise	.131	.884
Working capital (natural log)	.256	6.217
Bank account	.276	1.672
Iquib	.251	1.936
Number of income sources	4.637E-02	.382
D-Akesta	-1.122	-5.800
D-Dogolo	-1.385	-6.321
D-Wereilu	-1.248	-6.285
D-Tita	-.753	-3.485
D-Haik	-.523	-2.772
License	.559	3.377
Age	-4.422E-03	-.231
D-Trade	-.140	-.783
D-Manufacturing and processing	.553	2.159
D-Handicarft and cottage	.104	.465
D-Service	.111	.627

105

Site dummies

All the site dummies are significant and negative, implying that business performance (as measured by weekly volume of sales) in Bati (the control town) is better, holding other factors constant. It should be recalled that Bati has a larger population and is situated on the road to the port of Djibouti/ Assab. As expected, larger population and dynamic business environment positively influence performance.

Activity dummies

Only the coefficient of the dummy variable for manufacturing and processing is significant and positive among the activity dummies. The result suggests that the performance of the manufacturing and processing sector is better than food and drinks (the control sector) and other sectors.

Result of scale of operation

As the results above clearly demonstrate, lack of finance (to serve as working or fixed capital) is the most important constraint to the growth and development of small and micro enterprises. Low level of capitalization is also a major characteristic of the firms. Hence, attempts were made to identify factors correlated with the amount of total estimated capital of the sample enterprises. A similar set of independent variables was used in the regression.

Among the variables positively and significantly related to business capital are: telephone, radio, TV, bank account and *equib,* license and sex. Operators with access to telephone, radio and TV appear to have more capital than those who don't. Similarly, bank account, *equib* and license are positively related to amount of capital. Moreover, male owners operate with more capital than female owners. Unlike sales, there are no major differences between the study areas in the amount of capital.

Table 4.7: Model summary

Model	R	R.Square	Adjusted R Square	Std.Error of the Estimate
1	.845	.714	.692	1.3393

Table 4.7 contd. ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1255.478	21	59.785	33.329	.000
	Residual	504.056	281	1.794		
	Total	1759.534	302			

Table 4.7 contd. Regression results: Dependent variable: natural log of estimated capital

	Unstandardized Coefficients	t-value
(constant)	2.955	4.485
Level of education	9.400E-02	1.249
Age	8.274E-02	3.054
Age square	-8.081E04	-2.700
Electricity	-.158	-.769
Telephone	1.263	4.205
Radio	.624	3.246
TV	.882	3.068
Bank account	.862	3.687
Iquib	.390	2.064
Number of income sources	.132	-.763
D-Akesta	-.479	-1.725
D-Dogolo	-.211	-.678
D-Wereilu	-.440	-1.542
D-Tita	-.284	-.934
D-Haik	.377	1.378
License	1.942	8.939
Sex	.627	2.442
D-Trade	.643	2.532
D-Manufacturing and processing	.669	1.822
D-Handicarft and cottage	-.743	-2.273
D-Service	-.240	-.936

5.   CONCLUSION AND POLICY IMPLICATIONS

The enterprises are generally characterized by low productivity and stagnation. With no other more productive sector, additional employment is sought through engagement in such enterprises. The capital requirement is very small and the technology is traditional in most cases. Demand for output and services is also very limited as the bulk of the hinterland population is dependent on agriculture that suffers from very low levels of productivity and high degree of uncertainty. Export to other regions is very limited. As a result, too many operators chase limited market, creating no incentive for business expansion. The primary aim is to maintain the same level of operation, with little business and entrepreneurial culture. Access to financial services is limited and partnership and networking are unknown. Skills in business training and technical knowledge are lacking making the enterprises benefit less from the innovative capacity of workers and employees. The majority of operators have joined

the enterprises for lack of better opportunity. Contact with the local authorities is limited to licensing though the majority does not have appropriate licensing.

Lack of effective linkage with the rural sector is one of the major features of the enterprises. At present, the small towns are not a source of farm input or new technology in the region. Hence, any attempt to develop the local economy cannot be successful unless capacity is created in the enterprises to provide services for transforming rural areas and improving the productivity of small farmers. Sustainable development requires traders, transporters and processors that closely link and network with producers of crop, livestock, forest products, etc. Lack of purchasing power of the local people is cited by majority of the enterprises as the major bottleneck. The main customers of micro-enterprises in small towns are local farmers and local town dwellers. Any improvement in the agriculture sector would thus enhance local demand for goods and services. There must also be serious thought to raise the income of the town dwellers either through subsidies or government activity.

The business environment in terms of infrastructural availability, financial services are not conducive for sustainable development of the enterprises. The major determinant of performance is working capital. Financial resource is critical limiting factor. Because of the expanded market opportunities, larger urban centers are associated with more sales. Access to mass media information, attempts to save and holding license appear to encourage operators to maintain better performance. However, the overall business environment is so weak that human capital and physical infrastructure do not seem to have significant impact.

The theoretical implication of the study is that those elements suggested by the different theories to be crucial for the performance of micro-enterprises are non-existent or do not seem to explain the performance of enterprises in small towns. Inter-firm relations and other linkages are not features of micro enterprises in small towns. Similarly small towns do not provide conducive business environment critical for the growth and performance.

On the basis of the forgoing descriptive and analytical results policies for small towns businesses could be envisaged. The analytical results point the following:

1. Access to finance: Those enterprises which make use of the bank and iquip are found out to have a higher scale of operation. Adequate provision of finance should be the key element of business development packages. Ways must be sought to ensure that small enterprises benefit from the services of formal commercial banks, specialized banks and micro finance institutions.

2. Information provisions and consultancy: The role of information in business development has particularly shown a bearing in this study. Enterprises should have access to adequate levels of information about market, technology, research etc.

3. Improving local business environment: It was found out that the use of telephone services has a significant impact on the scale of micro enterprises. Telephone services facilitate business transaction and interaction. In addition, enterprises have indicated that lack of access to land, telephone, and electricity to be the immediate obstacles for their businesses. These and other obstacles related to business environment should therefore be alleviated.

4. Promoting the formalization of businesses: Licensed businesses are found to be better performers in terms of sales and capital amount. The reason could be due to the competitive pressure formalization entails in order to succeed in the market. In addition formal businesses may be the ones which are getting some assistance from the financial and other institutions. Businesses should be promoted to operate formally instead of working as hidden entities since this makes it difficult to realize their potential.

Some pointers from the descriptive part include the following:

5. Enhanced capacity through associations and network: One of the major problems of the enterprises are the limited capacity to tap external market, reduce input cost and avoid competition for a limited market. As the enterprises are operating individually they cannot make use of economies of scale to export. Association formation will enhance their capacity and enable them to tap external market and increase their profit. Partnership should also be encouraged under the umbrella of associations and network

6. Enhance local demand through improved agricultural productivity in the hinterland and increased income of town dwellers: Lack of purchasing power of the local people is cited by majority of the enterprises as the major bottleneck. The main customers of micro-enterprises in small towns are local farmers and local town dwellers. Any improvement in the agriculture sector would thus enhance local demand for goods and services. There must also be serious thought to raise the income of the town dwellers either through subsidies or government activity.

7. Tapping export market: On the demand side, enterprises indicated that there is limited market outside the towns. In order to expand the market, enterprises should tap regional and national export markets in the immediate surrounding or big towns. Thus enterprises in Bati should be able to export to the nearest big market,

Kombolcha, while enterprises in Haik and Tita should use Dese market. Those at a distance from the big centers such as Legambo, Jamma and Werilu should also be able to use each other's market by depending on their comparative advantage.

End Notes

[1].This study is sponsored by BASIS (Broadening Access and Strengthening Input Market System), a research project jointly carried by a consortium of Universities from the US and the Institute of Development Research at the Addis Ababa University, as part of a larger non-farm study. The authors acknowledge BASIS for sponsoring this study.

[2].The selection of these towns is guided by the BASIS project. All towns are within the study woredas of the BASIS project. Within, the study woredas, the study towns are selected because they are the largest towns where some businesses operate.

[3]Local refers to the town and the woreda, regional refers to transactions outside the woreda but within the zone including Dese and Combolcha while national refers to places outside these areas.

[4]Net earnings which relates revenues to costs would have been a better indicator but since the cost data from the enterprises were not realistic, this indicator was not used.

[5]See for instance, Mulat Demeke and Bekele Hundie. 2003. The determinants of yield of major cereals: the contribution of new technology in selected villages of Ethiopia, in Mulat Demeke *et al* (eds.), Technological Progress in Ethiopian Agriculture, Proceedings of the National Workshop on Technological Progress in Ethiopian Agriculture, Nov. 29-30, 2001, Addis Ababa, Ethiopia.

REFERENCES

Aeroe, A. (1992). Rethinking industrialization-from a national to a local perspective: A case study of the industrialization process in Tanzania with particular emphasis on the construction industry. Copenhagen: Center for Development Research.

Arzeni S. (1999). Entrepreneurship and job creation OECD observer, January, pp 19-22

Economic Commission for Africa (ECA) (1998). Micro and small enterprises/Informal enterprises. Unpublished manuscript.

Helmsing, A.H.J. (2000). Externalities, learning and governance. Perspectives on local economic development. Inaugural address, ISS, the Hague, unpublished mansucript.

Hinderink, J. and Titus, M. (2002). Small towns and regional development: Major findings and policy implications from comparative research, urban studies, 39 (3): 379-391.

Humprey John and Schimitz Hubert (1995). Principles for promoting clusters and networks of SMEs. unpublished manuscript

Lall Somik V and Taye Mengiste (2005). Business environment, clustering and industry location: Evidence from Indian cities. World Bank policy research working paper 3675. unpublished

McCormick Dorothy. (1999). African enterprise clusters and industrialization: Theory and reality, World Development, Vol. 27, No.9 pp 1531-1551.

Mulat Demeke and Bekele Hundie (2003). The determinants of yield of major cereals: the contribution of new technology in selected villages of Ethiopia in Mulat Demeke et al (eds.). Technological progress in Ethiopian agriculture, proceeding of a national workshop on technological progress in Ethiopian agriculture, AA.

Pedersen, P. O. (1989). The role of small enterprises and small towns in developing and developed countries. CDR project paper, Copenhagen: Center for Development Research.

Van dik Meine Peter (2005). What explains success of enterprises in Africa' in Tegegne Gebre Egziabher and Bert Helmsing (eds.) *Local Economic Development in Africa*, pp 186-196. The Netherlands: Shaker publishing

World Bank (2005). World Development Report (2005). A better investment climate for everyone.

Yu Tony Fu-Lai (1998). Adaptive entrepreneurship and the economic development of Hong Kong, World Development 26(5) 897-911.

Yu Tony Fu-Lai (2001). Towards capabilities perspective of the small firm, International journal of management reviews , Vol. 3, Issue 3, 185-197