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TOTAL FACTOR PRODUCTIVITY IN THE ETHIOPIAN MANUFACTURING SECTOR: EXTENT AND TREND

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ABSTRACT

Cognisant of the importance of total factor productivity growth in the process of industrialisation, examining its trend and extent in the Ethiopian manufacturing sector is essential. To this end, this paper employs different statistical and econometric models. Three main findings emerged from this exercise. Firstly, the Ethiopian manufacturing sector as a whole registered negative total factor productivity growth. Secondly, however, there were sub-sector differences: sectors that are light and had long production experience recorded positive total factor productivity growth, while others did not. Finally, the private sector, in general, appeared to be more efficient in resource use than the public ones. These results have relevant implications for industrialisation in Ethiopia. Not only should firms build the necessary technological and managerial capabilities, but should also introduce the necessary mechanisms for adapting, assimilating and modifying them with local conditions. In parallel, the government should create the necessary conducive environment by putting in place the appropriate, incentive structure and institutions.

1. INTRODUCTION

In Ethiopia, resources available for industrial growth are scarce and the prevailing economic conditions (saving rate, purchasing power, debt service ratio, investment confidence) suggest that accumulation of resources will not take place at a massive scale in the short to the medium terms. If there should be any industrial growth, it will come from more intensive use of resources (through increasing productivity) together with capital accumulation. However, efficiency in resource use would be attained only if efforts are made to attain some growth of total factor productivity, which includes the acquisition of technological capability and technical change (which come through accumulation of experience and learning by doing).

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In this regard, growth of total factor productivity is a decisive determinant of industrial growth (Solow 1957; Massell 1960). Solow (1957:316) showed that about one-eighth of the total increase in output (per man-hour) was traceable to increased capital per man-hour, while the remaining seven-eighth was attributed to total factor productivity growth. Massell's (1960:186) work indicated that roughly 90 per cent of the increase in output per man-hour was attributable to technical advance. Other estimates by Brown, Intriligator, Kendrick and Kennedy for the US economy and Aukrust for Norway (see Intriligator 1978) reflected the fact that growth of total factor productivity significantly contributes to improvements in resource utilisation.

On the Ethiopian manufacturing sector, such empirical works are scant. Most works are descriptive. An attempt was made, however, by the World Bank (1989) to measure the efficiency of the Ethiopian public manufacturing industries. The methodology was domestic resource cost (DRC). A survey made on 36 firms arrived at a DRC of 0.82, which, according to Eshetu, was more sanguine about the economic efficiency of Ethiopian public manufacturing enterprises (Eshetu 1992:2). Alemu (1992) measured efficiency by using financial rate of return and DRC (the DRC is based on the work of the World Bank in 1985 and 1989). He then concluded that firstly, public manufacturing industries are in general profitable; secondly, more than half are allocatively efficient. But, measuring the extent of allocative efficiency is not a substitute for measuring total factor productivity growth, since the latter focuses more on the extent of technological capability acquisition in order to catch up with the world frontier. This paper is an attempt to build on this line of argument and has the following specific objectives:

a) substantiating the link between growth of total factor productivity and industrialisation;
b) assess the extent of growth of total factor productivity in the manufacturing sector;
c) testing whether there is sector/ownership differences in rate of growth of total factor productivity; and
d) identifying those factors that cause variations for differences in TFP.

2. INDUSTRIALISATION AND TOTAL FACTOR PRODUCTIVITY: EMPIRICAL EVIDENCE

2.1. Industrialisation as a Learnt Process

Industrialisation is an evolutionary process that signifies the transition from a primitive, low productivity, low-income economy to one that is dynamic, sustained and diversified (Chenery et al., 1986). Such a structural shift of an economy is the

cumulative result of piecemeal efforts of using ideas and eventually transcend to producing ideas.

Industrialisation as a learnt process can be visualised both historically and technologically. Historically, as late as 1750's, only one country was on the way towards a successful industrial revolution-England. Since then, the industrial revolution spread across the world: first towards Northern and Western Europe and Northern America, subsequently it moved towards Japan, Southern and Eastern Europe, and parts of Latin America and Oceania (Easterlin 1981). Thus, if countries in the South entered into the phase of industrial revolution at an increasing number with different paces and patterns, then industrialisation is a learnt process in which the latecomer accumulates knowledge on the successes and failures of the predecessors. Technologically, the process of acquiring technological capability is the process of industrial development and the costs of achieving international competitiveness are the costs of acquiring technological capability (Pack and Westphal 1986). The capacity to operate, assimilate, adapt and modify processes determines industrial development. Stewart (1984:833) argued that any successful industrial expansion is associated with some local technological activity since adaptation to local conditions is part of the process of successful industrial activity.

2.2. Linkages Between Industrialisation and Total Factor Productivity: Empirical Evidence

Empirical evidences justify the strong linkage between industrialisation and growth of total factor productivity. The first source of such evidence is the prevalence of high rate of total factor productivity growth in industrialised economies. From the work of Chenery, it is found that, on average, rate of total factor productivity growth (TFPG) in industrialised countries is much higher than that of developing countries. It was found to be 2.7% in the former and 2% in the latter (Chenery et al., 1986:20-22). Table 1 indicates the extent to which rate of TFPG varies across countries, specifically how significant the difference is between developed and developing economies. In addition, not only the growth rate but also the contribution of TFP to the aggregate economic growth is higher for industrialised economies than for developing economies. The same study reveals that developed economies are characterised by little growth of labour inputs (1.1%), moderate growth of capital (5.2%) and output (5.4%), and a relatively large contribution of TFP to aggregate growth (50%). The developing economies, in contrast, have high growth of labour inputs (3.3%), a higher total factor growth (4.3%) and a relatively small contribution of TFP to aggregate growth (30%). This implies that, at least as the stylised facts indicate, achieving higher growth of total factor productivity leads to higher stage of industrialisation.

Table 1. TFPG in Different Countries in Per Cent

Industrialised Countries		Developing Countries	
Canada (1947-60)	3.50	Argentina (1950-60)	1.05
France (1950-60)	2.90	Chile (1950-60)	0.85
Germany (1950-60)	3.60	Ecuador (1950-62)	2.18
Columbia (1950-60)	0.95	Greece (1951-65)	2.39
Italy (1952-60)	3.80	India (1950-60)	-0.18
Japan (1950-73)	4.50	Peru (1950-60)	-0.70
Holland (1951-60)	2.30	Mexico (1950-60)	1.60
Norway (1953-65)	2.90		

Source: Chenery et al. Industrialisation and growth: A comparative study, 1986:20-22.

Table 2. TFPG and its Share to Growth in Developing Countries

Country	Period	TFPG	Share to Growth
Chile	(1950-60)	0.85	24.3
	(1960-74)	1.2	27.3
Columbia	(1950-60)	0.95	20.7
	(1960-74)	2.1	37.5
Korea	(1955-60)	2	47.4
	(1960-73)	4.1	42.3
Mexico	(1950-60)	1.6	28.3
	(1960-74)	2.1	37.5
Peru	(1950-60)	-0.7	-15.6
	(1960-70)	1.5	28.3

Source: Chenery et al., Industrialisation and Growth: A comparative Study, 1986 20-22.

The second evidence for this linkage is the rise of rate of TFPG, on average, in developing economies with time as their level of industrialisation rises to higher levels. Cases in point are those for Chile, Columbia, Korea, Mexico and Peru, as observed in Table 2. For instance, the rate of TFPG in Korea was 2.10% for the period 1950-60, but grew to 4.10% for 1960-1974 when the Korean economy was considered as one of the newly industrialising economies. Thus, the rate of TFPG attained reflects where the level of industrialisation of an economy is.

3. MEASURING THE SIZE AND TREND OF TOTAL FACTOR PRODUCTIVITY

3.1. Models

In this paper, statistical and econometric models are applied to calculate the rate of growth of total factor productivity. However, no model is selected a priori. This enables us to choose the one that characterises the production process. The alternative models are the following:

1) Compute total factor productivity (TFP) using the expression:

$$A = \frac{Q}{aL + bK} \qquad [1]$$

Where Q is output, L is labour input, K is capital input, A is TFP, and a and b are output elasticities with respect to labour and capital, respectively. Then calculate the rate of growth of TFP. This was how Kendrick (1961) estimated total factor productivity growth for the US manufacturing industries for the period 1899-1953.

2) Solow's Geometric Index:

$$\frac{\Delta A}{A} = \frac{\Delta Q}{Q} - a\frac{\Delta L}{L} - b\frac{\Delta K}{K} \qquad [2]$$

An index of total factor productivity growth for each year can be derived from Equation [2] as:

$$A(t+1) = A(t)\left[\,1 + \frac{\Delta A(t)}{A(t)}\,\right] \qquad [3]$$

A series of A_t can be then constructed setting $A_0 = 1$. The rate of growth of total factor productivity (m) can then be arrived at from the expression $A_t = A_0(1 + m)^t$. The path-breaking work of Solow (1957) for the non-agricultural sector of the USA, Massell's (1960) work for the manufacturing sector of the USA, Mabro & Radwan's (1976) attempt for the manufacturing sector of Egypt and Krueger and Tuncer's (1980) work for the Turkish manufacturing sector followed this approach.

Two variants of Solow's geometric index have also been applied. First, there is Kendrick's arithmetic measure (Mabro et al., 1976:177), which takes the form:

$$\frac{A_2}{A_1} = \frac{Q_2 / Q_1}{a\frac{L_2}{L_1} + b\frac{K_2}{K_1}} \qquad [4]$$

and second we have, the expression utilised by Kazashi et al. (1983:4)

$$GA = a(GQ - GL) + b(GQ - GK) \qquad [5]$$

The shortcomings of these measures are their restrictive assumptions of constant returns to scale, neutrality of technical change, and perfect competition in both output and factor markets.

3) Econometric approaches: The most common technique utilised in this regard is to estimate a linear transformation of Cobb-Douglas production function:

$$LnQ = LnA_o + mt + aLnL + bLnK + c[\text{Ln}\,K - \text{Ln}\,L]^2 + u \qquad [6]$$

Assuming a linearly homogenous Cobb-Douglas production function, equation 6 can be written as:

$$\text{Log}\left(\frac{Q}{L}\right) = \text{Ln}\,A_o + mt + b\log\frac{K}{L} \qquad [7]$$

Where m measures the proportionate growth of total factor productivity and the constant term measures the initial efficiency parameter. Equation (7) increases the accuracy of the estimate since multicollinearity between L and K is minimised, though the assumption of constant returns to scale still holds. But, by adding (Ln L) to the right side of equation (7), returns to scale can be retained since the coefficient of L captures returns to scale. The CES production function specification of Equation [8]

relaxes some of the assumptions imposed by the Cobb-Douglas specification. Arrow et al (1961) used this approach on the US economy. Since direct estimation by OLS is problematic, linear transformation is adopted in this paper:

$$LnQ = LnA_o + mt + aLnL + bLnK + c[\,\mathrm{Ln}\,K - \mathrm{Ln}\,L\,]^2 + u \qquad [8]$$

Where

$$1)\ \gamma = antilog\ A_o,\ 2)\ \delta = \frac{b}{a+b},\ 3)\ \rho = \frac{-2c(a+b)}{ab},\ 4)\ v = a+b$$

To relax the assumptions imposed by the CES, and in case such a specification does not characterise the production process, a translog production function is also estimated.

3.2. Data

In this paper, the period under consideration in this study is 1976-1995. This is a twenty-year data set. The paper considers the manufacturing sector to the three digits ISIC classification. As a result, there are 19 manufacturing sub-sectors in the public manufacturing industries and 15 in the private manufacturing industries since there are sub-sectors where the private sector is not involved.

Output is measured by value-added at factor cost. Wage is used as a measure of labour input because it is the simplest means available to make labour homogenous. Net fixed asset represents capital input. Source of data is "the Results of Surveys of Manufacturing and Electricity Industries" published by CSA.

3.3. Results and Inferences

Assuming different factor elasticities of output, Equation [1] is applied on the Ethiopian manufacturing sector for the period 1976-1995. With the stringent assumptions of constant returns to scale, neutrality of technical change, perfect competition, factor elasticity of output is identical to factor shares. Four alternatives: arithmetic and geometric mean, and the initial and current factor shares are used[1]. The growth rate of TFP is computed using different formulae[2]. The results are reported in Table 3 and Table 4.

The inferences made from the results of the estimate are the following:

a) TFP calculated using Equation [1] revealed a non-increasing trend for the whole period (see Table 3). This holds regardless of types of factor shares considered. The rate, of course, varies depending on the formula used. Despite the general stagnation exhibited for the period under study, there were periods in which TFP showed an increasing trend (for example, 1976-1980). This fluctuation of TFPG went with the economic and political environment of the time. The base year of the period under study - 1976 - was a time of political upheaval; endogenizing management of enterprises that were nationalised was initiated around this period. Ethiopians took over the managerial and other key positions previously held by experienced managers and foreigners and these put the manufacturing sector, and hence TFP, in crisis. It took time for the 'new' Ethiopian managers to gain the lost skills (at least up to 1980). Gaining lost skills back combined with the "production campaign" put TFP at its climax in 1980. This indicates some sort of learning, in a sense that Ethiopians managed to run the nationalised industries. The majority of economic units ceased operation in 1992. Intense shortages of foreign exchange and hence shortage of raw material were encountered. This resulted in a decline in TFP further, the lowest that had ever reached in the period under study.

b) Technology index, assuming $A_{1976}=A_0$ and using different assumptions for factor share, reached about 1.6. Growth rate of total factor productivity (TFPG) exhibited positive growth rate (see Table 6). This, however, does not imply that growth of total factor productivity in the whole period had a positive trend. Moreover, both the technology index and the rate of growth of total factor productivity assumed a different trend when the 1991-1993 was omitted. For instance, if the years 1991-1992 were excluded, technology index in 1995 would be 1.0651 and if 1991-1993 is excluded, the technology index becomes 0.6919. At best this indicates no growth of total factor productivity. However, there were periods when no less than 10% growth rates were registered. For instance, growtn of total factor productivity was increasing by 11.92 per cent for the period 1976-1980.

c) Econometric estimates produced quite puzzling results; some coefficients are theoretically meaningless and others are statistically insignificant. The Cobb-Douglas model gives the initial efficiency parameter a number almost close to zero, implying the whole expression is almost zero. Model (7) gives a negative coefficient for b implying that labour productivity is negatively affected by capital intensity, which is theoretically meaningless. The CES Model, as well, gives a negative capital share, which is unjustifiable. Generally, econometric estimates obtained from the above production functions' do not satisfy a priori expectations. Heterogeneity of aggregate data and small sample size (only 20 observations) might be the cause for such inconsistent outcomes.

The econometric models are re-estimated using panel data. The data is disaggregated by sub-sectors and this procedure enlarges the sample size. There are 19 sub-sectors, each with a 20-year data set. Enlarging the sample size has one clear advantage: it increases the degrees of freedom and reduces the impact of collinearity (Hsiao 1986:2). The results of this exercise are summarised in Table 8. Panel data set changes the natures of all the parameters. Coefficients are theoretically meaningful and statistically significant. Unlike the previous result, the coefficient for T is not different from zero; and the situation does not change after adjusting for heteroscedasticity using White's procedure. The results show that there has not been growth of total factor productivity in the Ethiopian manufacturing sector.

Table 8. Econometric Estimates of Different Models

Models	Coefficients	T-ratio
Model 6		
- Constant	1.3775	4.2085
- T	-0.0071	-0.9199
-Ln L	0.82819	14.0278
- Ln K	0.11537	2.5145
F-ratio	215.35	
R^2	62.92	
D.W	1.1168	
Model 7		
- Constant	0.9249	9.8371
- T	-0.01098	1.5056
- Ln k/L	0.11812	2.5726
F-ratio	4.546	
R^2	1.83	
D.W	1.1185	
Model 8		
- Constant	1.438	4.389
- T	-0.0036	-0.444
- Ln K	0.23385	2.5932
- Ln L	0.6977	6.7114
- Ln $(k-L)^2$	-0.05739	-1.5251
F-ratio	162.67	
R^2	63.05	
D.W	1.1368	
Translog		
- Constant	-2.0824	-1.0758
- T	-0.0035	-0.423
- Ln L	-0.0327	-0.074
- Ln K	1.6104	3.6126
- Ln L^2	0.0423	0.753
- Ln K^2	-0.0836	-2.176
- Ln K*L	0.014	0.171
F-ratio	112.34	
R^2	63.81	
D.W	1.1227	

Source: Own computation

In a nutshell, two pictures emerge from the results in the manufacturing sector of Ethiopia for the period 1976-1995: stagnation and periodic variation. The TFPG is negative or zero. This result should, however, be seen critically, at least, with respect to learning. There were periods where TFP growth rate was substantial. Withstanding the tremendous disruption caused by the 1973 revolution and withdrawal of skills, generating a 10% rate of TFPG for the period 1976-1980 reflected acquisition of knowledge. But this was mainly due to attainment of existing capacity, which did not continue.

4. SECTORAL AND OWNERSHIP DIFFERENCES IN TOTAL FACTOR PRODUCTIVITY GROWTH

"... [L]earning does not occur in all firms.... Technical effort need not proceed in the same direction, even in firms within the same market " (Hebret-Copley 1990:1457-1460). This chapter attempts to examine the validity of this statement.

4.1. Sector Variation

To verify existence of sector differences, Equations [1] and [6] are employed. The TFP, using Equation [1], is estimated for each sub-sector. The results for selected years are provided in Table 9[4], which shows sizeable differences in the productive content of inputs among sub-sectors. For instance, a 29-fold difference was observed in 1976 between tanneries and paper sub-sectors. The same was true in 1995 between tobacco and rubber sub-sectors; the TFP for tobacco was 63-fold that of rubber. These facts reveal the prevalence of differences in total productivity across sectors.

More important is the rate of growth of total factor productivity registered between the period 1976-1995, which reveals the extent of learning or unlearning. A trend function is fitted using time as a regressor to identify such processes. Because some of the causes for excessive fluctuations in TFP were political that impeded full capacity utilisation, the model is estimated using time dummy variables for 1991, 1992 and 1993 to capture these political factors. The results are summarised in Table 10.

Moreover, an econometric model of Cobb-Douglas production function (Equation 6) was run using OLS in order to directly observe the rate of growth of total factor productivity for each sub-sector. But none of the coefficients of the model are significantly different from zero or theoretically justifiable.

A preferable and probably more reliable approach to show that sub-sector variation prevails in the data set is to use the methods of panel data analysis. In a panel data set setting, Equation 6 assumes that rate of growth of total factor productivity (m) is

identical across sub-sectors over the period under study, i.e., $m_1 = m_2 = m_i = m$ where m_i represents rate of growth of total factor productivity of i's sub-sector. Time here assumes an identical pattern for each sub-sector and serves only as a variable whose coefficient is interpreted as a measure of autonomous growth. However, m_i differs across sub-sectors, since their respective internal and external environments (or strengths and potentials) differ. Testing the null hypothesis that $m_i = m$ in all i's against the alternative nypothesis that m_i is not equal to m will prove the case.

Table 9. Total Factor Productivity by Sub-Sector at Different Periods

Sub sectors	Years				
	1976	1980	1983	1992	1995
Food	0.7698	1.9334	0.9116	0.6616	2.0094
Beverages	1.4724	1.4221	1.1417	0.6744	1.5171
Tobacco	1.8515	3.8991	7.8517	1.4328	13.0447
Textiles	1.7383	2.5819	0.8942	0.2846	0.6061
Wearing app	1.4095	1.2982	1.7791	0.7600	1.2107
Tanneries	3.1516	1.077	2.0339	0.3153	2.7497
Footwear	1.9720	4.1626	1.1214	1.2642	1.3434
Wood	1.4740	1.5783	1.8875	0.9841	3.8295
Furniture	1.3081	1.8856	1.9519	1.7675	1.2871
Paper	0.1065	0.8908	2.6405	0.5050	1.7023
Printing	1.8587	2.4880	3.2098	2.5782	1.8768
Chemicals	1.0229	1.1910	1.0788	1.1796	2.3590
Other chem	2.7188	2.1766	3.6767	1.2541	1.9833
Rubber	0.5321	1.4279	2.0194	0.1572	0.2055
Plastic	0.5489	1.0421	2.9894	2.7049	2.0327
Glass	0.5565	0.8096	0.0964	0.2024	0.9100
Non-metal	0.4899	1.3228	0.1809	0.2871	0.7851
Iron and steel	1.7162	3.0203	3.3219	0.7946	8.1940
Fabricated	0.5989	1.7424	2.2198	0.0370	0.3354
Total	1.038	1.9916	1.4044	0.4645	1.0628

Source: Own computation.

Table 10. TFPG by Sub-Sector for 1968-1987 in %

Sub sectors	Trend function	
	Without dummy	With dummy
Food	No trend	No trend*
Beverages	-3.76	-3.09
Tobacco	8.20	8.77
Textiles	-9.09	-7.51
Wearing app	No trend	No trend
Tanneries	5.06	7.41
Footwear	-5.43	-5.42
Wood	No trend	No trend
Furniture	-1.19	-1.4
Paper	7.37	11.34
Printing	No trend	No trend
Chemicals	No trend	No trend
Other chem	No trend	No trend
Rubber	-10.1	-8.73
Plastic	5.09	5.26
Glass	No trend	No trend
Non-metal	No trend	No trend
Iron and steel	No trend	No trend
Fabricated metal	-11.8	-7.77
	-4.15	-2.68

* No trend means that the coefficient of T is either statistically insignificant or the overall model is unfit.
Source: Own computation

To do so, time has to assume two purposes - first, as a sector specific dummy and second, as a variable whose coefficient measures autonomous growth. This will give us 19 sector specific dummies whose values range from 1 for 1976 to 20 for 1995 and 0 otherwise. This, in turn, gives us the following equation:

$$LnY = LnA_0 + \sum m_i T_i + \alpha lnL + \beta lnK + u \qquad [9]$$

Where m, represents sector specific rate of growth of total factor productivity (Hicks neutral type) and T_i represents sector specific dummy variable whose value ranges from 1 to 20 to that particular sector and 0 otherwise.

Fitting Equation [9] and checking the significance of the coefficient for the variables T_i and the general fitness of the model is one way of verifying the existence of growth of total factor productivity variation across sub-sectors. This is done using time specific dummies for 1983, 1984 and 1985 and without; and the result, adjusted for heteroscedasticity (using White's procedure), is reported in Table 11. The regression with time specific dummies did not prove itself better than without and hence is not reported here.

Table 11. Econometric Estimates of Equation 9

Regressor	Coefficients	T-ratio
LnL	0.8949	13.07
LnK	0.1762	2.94
Con	0.3369	0.61
T1	-0.02	-1.27
T2	-0.203	-1.4
T3	0.097	8.87
T4	-0.0788	-4.13
T5	-0.0323	-4.27
T6	-0.0169	-1.11
T7	-0.0351	-5.1
T8	-0.0377	-3.03
T9	-0.0259	-5.03
T10	-0.0113	-0.82
T11	-0.0067	-1.03
T12	-0.002	-0.22
T13	0.0176	1.77
T14	-0.0363	-3.05
T15	0.0117	1.75
T16	-0.0849	-1.96
T17	-0.053	-3.04
T18	-0.0069	-0.38
T19	-0.0493	-3.14
F-ratio	57.61	
R^2	75.82	
D.W	1.6673	

Source: Own computation.

The econometric estimate of Equation [9] shows that the model is generally fit. Besides, the majority of the coefficients for T, are statistically significant at 10% significance level. But the sizes and signs are not identical. This indicates that the rate of growth of total factor productivity is significantly different across sub-sectors.

Formally, the F-test is used to test such hypotheses. In this instance, Equation [9] is unrestricted while the equation without dummy is restricted since it implies that $m_1 = m_2 = m_3 = m$. The calculated F-ratio[5] in this is case becomes 9.44, which is by far higher than the theoretical F-ratio at 1 per cent level (at 18 and 356 degrees of freedom). Hence, we reject the null hypothesis, which states that the m's are identical across sectors.

Hence, a difference in rate of growth of total factor productivity across sub-sectors is strong. Some sectors registered positive rate of growth of total factor productivity and others registered a decline over the period under study.

4.2. Ownership Matters

"While it may be true in theory that a properly managed public enterprise can be as productive and efficient as a private one, the reality is that politics, usually of a virulent nature, intrudes" (Summers 1992:8). Specially, "centralised decision making, lack of profit motive, and absence of competition, which typifies government operations, make government production always less efficient than private sector production" (Diamond 1990:34). To what extent are these statements valid in the Ethiopian context?

To test the existence of ownership differences, TFP and its growth rate are calculated as above for the public and private sector separately. The ratio of TFP of public sector to that of private for selected years is reported in Table 12.

Though the table does not reveal consistent patterns, on the average, the TFP in the private sector is higher than that of the public sector (since the geometric average of the ratio of TFP in the public sector to that of the private for the period 1976-1995 was 0.88). This implies then that the combined inputs in the private sector are more productive than that in the public. Of course, there were sub-sector and temporal variations. While in the late 1970's the public sector was more productive than the private, it was not so in the late 70's and 80's. The public sector was highly affected negatively during 1991 and 1992. In terms of sectors, public sector wearing apparel, tanneries and footwear, wood and furniture and the plastic manufacturing industries were more productive than the private ones. Recently, especially in 1995, the situation seems to have changed; it was only for 4 sub-sectors (textile, rubber, non-metallic mineral products and fabricated metal) that the private sector TFP is better than that of public.

Table 12. Ratio of Public TFP to Private TFP by Sector

Sub-sectors	1976	1980	1987	1992	1995	Average 1976-1995
Food	84.3%	134.0%	77.4%	76.6%	193.4%	89.9%
Beverages	66.9%	52.4%	76.3%	33.5%	1519.5%	85.1%
Textile	73.8%	202.9%	63.1%	28.9%	62.1%	87.6%
Wearing app	118.6%	118.8%	137.2%	553.3%	491.7%	212.2%
Tanneries	871.2%	77.4%	256.4%	370.1%	252.2%	183.2%
Footwear	116.6%	230.2%	67.1%	111.6%	291.9%	135.2%
Wood	68.3%	79.2%	118.7%	114.6%	348.3%	124.6%
Furniture	115.8%	212.3%	145.5%	98.5%	289.6%	164.8%
Paper	52.2%	59.5%	92.7%	47.9%	669.1%	141.0%
Printing	216.6%	240.9%	231.0%	330.6%	231.8%	231.5%
Other-chem	178.8%	147.9%	150.7%	141.9%	258.2%	186.5%
Rubber	13.4%	36.8%	68.3%	8.2%	25.3%	29.9%
Plastic	129.9%	154.7%	217.6%	196.8%	1126.0%	334.9%
Non-metal	60.8%	131.6%	12.4%	16.5%	53.1%	33.5%
Fabric Metal	59.2%	229.2%	201.2%	0.0%	28.6%	92.7%
Total	89.7%	142.1%	87.9%	43.4%	96.0%	88.0%

Source: Own computation

Regarding the rate of growth of total factor productivity (measured by semi-log time trend), the difference between private and public (as can be seen in Table 13) becomes clearer than the picture discussed. While the public sector registered a decline of 4.35% per annum, the private sector assumes no progress or regress; its coefficient (-0.31%) is not significantly different from zero. Such ownership differences are observed across sub-sectors, in most cases, the private sector registering better performance. But the difference did not produce a systematic pattern, in a sense that the private sector did not produce consistently better results in all sub-sectors. For instance, while growth of total factor productivity is positive in the public tanneries and leather-finishing sector, the private sector produces rather no trend.

An econometric estimate of Equation (3) for each group (public and private) supports the above result–a good record of the private sector with respect to rate of growth of total factor productivity (see Table 14). Rate of decline in the public sector (-17.94%) is by far higher than that of the private sector (-1.6%).

Table 13. GTFP by Ownership and Sub-Sectors

Sub-sectors	Public	Private
Food	0.0070583*	0.0010894*
Beverages	-0.040628	-0.079167
Textile	-0.094499	-0.040168
Wearing app	0.03542*	-0.08749
Tanneries	0.057048	0.019797*
Footwear	-0.039488	-0.065817
Wood	0.023646*	-0.0060548*
Furniture	-0.000507*	0.008423*
Paper	.080495*	0.016012*
Printing	.0065772*	-0.0073772*
Other-chemicals	0.0020798*	-0.015624*
Rubber	-0.10088	-0.10069
Plastic	0.058404	0.0015587*
Non-metal mineral	-0.051458	0.040705
Fabricated metal	-0.11655	0.019102*
Total	-0.043509	-0.0031156*

* Statistically insignificant even at 10% significance level.
Source: Own computation.

Table 14. Estimates of Cobb-Douglas function and Equation 9

Regressor	Coefficients	T-ratio
Public sector enterprises		
LnL	2.5893	8.6342
LnK	0.59312	2.2127
Con	-24.5111	-4.8616
T	-0.17944	-5.4348
F-ratio	44.59	
R^2	87.3	
Private sector enterprises		
LnL	1.2317	6.8405
LnK	0.35822	6.3677
Con	-5.2004	-3.433
T	-0.015983	-2.4637
F-ratio	78.12	
R^2	92.4	
DW	1.5339	
Equation [9]-All enterprises		
LnL	1.0742	11.086
LnK	0.2624	3.3284
Con	-2.759	-5.7713
T_1	-0.06	-7.0066
T_2	-0.008	-1.5709
F-ratio	690.12	
R^2	99.28	
DW	1.9642	

Source: Own computation

To verify ownership differences in the rate of growth of total factor productivity, panel data set and F-test are applied. Equation [9] is estimated by attaching ownership specific dummy variables that handle both ownership effects and autonomous growth. The result, adjusted for autocorrelation, is provided in Table 14.

The coefficient of T_1 represents the rate of growth of total factor productivity of the public sector while T_2 is that of the private sector. The result again implies that the decline is not identical in both groups (higher in the public sector, which is 6% per annum). The coefficient for T_2 is not statistically significant even at 10% level while that of T_1 is significant. F-ratio (the test for the hypothesis that rate of growth of total factor productivity is identical in both groups) is 28.9, which rejects the null hypothesis. This confirms that ownership influences the rate of growth of total factor productivity registered in the Ethiopian manufacturing sector.

4.3. Causes for Variation

Difference in the rate of growth of total factor productivity across sub-sectors has been demonstrated. Rate of growth of total factor productivity varies among sub-sectors, between ownership and across time in the Ethiopian manufacturing sector. The causes of this difference are examined in what follows.

Intuitively, sub-sectors are not supposed to have identical strengths, weaknesses, opportunities and threats since the technology, market, extent of import intensity, rate of protection, industrial structure (extent of concentration), incentive structure and accumulated experience they face are different. As a result, the productive content of inputs will differ across time, among sub-sectors and between ownership. How much do these variables explain the outcomes of the Ethiopian manufacturing sector, is a pertinent question. To shed some light on factors that causes differences, a model is formulated that specifies TFP as a function of these variables as follows:

$$A_{it} = a_0 + a_1 q_{it} + a_2 L_{it} + a_3 K_{it} + a_4 S_{it} + a_5 M_{it} + a_6 W_{it} + a_7 I_{it} + a_8 D + u_{it} \quad [10]$$

Where A is the TFP, q is the capital-labour ratio, L is the ratio of payment to production workers to non-production workers, K is the ratio of machinery and equipment to building and infrastructure, S is the ratio of number of enterprises with less than 50 employees (chosen arbitrarily) to the total in that particular sector, M is the ratio of imported raw materials to total raw material consumed, W is the average wage per annum, I is the average incentive payments per annum and D is a dummy variable for light and heavy industries.

Capital-labour ratio is included as a variable to represent production techniques, which has a strong correlation with level of technology. A modern production

technique generally appears to be more productive and capital intensive. Hence, high K/L is associated with high TFP.

The ratio of equipment and machinery to building and other infrastructure is used as a variable to reflect the "intensity of technology" since change in the level of technology does not take place without being reflected in the change in the above ratio. It is assumed that the higher this ratio, the higher will be the "intensity of technology" and hence a higher factor productivity.

Size structure could be an important variable influencing TFP. The premise here is that large firms enjoy economies of scale whereas small-scale firms do not. A sub-sector with high composition of large enterprises might record a higher TFP. In this paper, the number of permanent workers each enterprise employs classifies its size.

Import intensity is an influential variable determining the size and rate of TFPG. A firm with high import intensity, because it cannot procure as much as it needs due to foreign exchange constraint, might frequently run below capacity, which as a result undermines value-added and thereby TFP. Import intensity, in this paper, is calculated using a simple ratio of imported raw materials to total raw materials consumed.

A favourable incentive structure influences the productive content of labour given its production technique; it pressures on each labour input to put as much effort as possible, thereby pushing the production frontier upwards. In this paper, average annual wage and average annual commission, bonuses, allowances, food and lodging are variables to capture the incentive mechanisms; high averages are supposed to lead to high TFP.

Experience in production could be important in influencing TFP. Learning will be higher in these activities which started earlier and whose technology is not complex. In this regard, Ethiopian industries are frequently claimed to be predominantly import-substitute, consumer type and light industries. And most of them were established in 1950's and 60's. Thus, because of the learning and spillover effects, these sectors might register high TFP. Thus, a dummy variable is included to differentiate these sectors; only chemicals, non-mineral product and metal sectors, mostly a recent phenomenon in the context of the Ethiopian manufacturing industries, are considered as heavy industries (which imply that these are less experienced in production).

The model is estimated using a pooled data set from 19 sub-sectors each having 17-year observations. All the above variables are included as explanatory variables to identify the influential variables that cause sub-sector differences in the productive content of combined factor inputs[6]. The data set suffered problems of serious serial

correlation (fifth order) and it is corrected using the Cochrane-Orcutt iterative method. The result is summarised in Table 15.

According to the result, the coefficients for "intensity of technology" and average annual wage did not appear significantly different from zero. This implies, then, that these variables are not the cause for sub-sector differences and hence are excluded in the estimation (see Table 15).

The result, excluding the insignificant variables, becomes not only statistically significant (at 5% level) but also increases the over-all fitness of the model (according to the F-ratio test). Five variables are identified as causes for differences for the rate of growth of total factor productivity across sub-sectors; namely, capital intensity, size structure, import intensity, incentives and the nature of industries. Because these variables differ across sub-sectors, they cause differences in TFP.

Table 15. Econometric Estimates of Equation 9

Regressor	Coefficients	T-ratio
All variables in the model		
Q	-0.1153	-5.1687
L	-0.00273	-1.1386
K	-0.0209	-0.665
S	-1.2174	-2.3782
M	2.0630	4.1959
W	-0.00729	-0.1599
I	0.7675	3.0918
D	-0.60638	-2.7411
Con	1.3174	2.941
F-ratio	28.7005	
R^2	53.18	
D.W	1.9762	
Selected significant variables		
Q	-0.11477	-5.1627
S	-1.2182	-2.3869
M	2.0679	4.2267
I	0.69358	3.6751
D	-0.59376	-2.6927
Con	1.2102	2.9469
F-ratio	37.29	
R^2	53.38	
D.W	1.9743	

Source: Own computation.

An important point to notice is the sign of their coefficients since they indicate the direction of influences. Two outcomes are surprising. The first is the negative relationship between TFP and K/L. Sectors with high K/L appeared to be low in TFP.

The second is the positive relationship between import intensity and TFP; the more a sector is dependent on imports, the higher is its TFP. The latter one is more surprising in countries like Ethiopia where foreign exchange was a severe constraint causing enterprises to operate under capacity. The former can simply be understood to mean that growth of total factor productivity is not capital embodied whereby its cost outweighs its benefits.

The other variables have justifiable sign. The larger the share of small scale in the size structure, the lesser will be TFP in that sector since small scales are claimed to be less efficient than the larger ones. The same is true for incentives and experiences.

5. CONCLUSION

Resources available for industrial growth in Ethiopia are limited and the prevailing conditions (saving, investment, purchasing power, debt, stability, etc.) are not conducive for resources to be accumulated at extensive scale. Industrial growth therefore depends much more on improved productivity and efficiency in resource use. This would be possible, however, only if efforts are exerted to produce growth of total factor productivity.

Attaining high total factor productivity growth calls for building up the capacity to search for and select technologies for use in particular environments, operate, assimilate, adapt and modify processes and products in light of the prevailing conditions and producing minor or more substantial innovations. In turn, the extent and intensity of building up these activities in any economy influences the magnitude and pace of its industrialisation. In a nutshell, the process of acquiring high total factor productivity growth is at the same time a process of industrial development.

Three stylised facts have already emerged on the link between growth of total factor productivity and industrialisation. The first is high contribution of growth of total factor productivity to output growth. Secondly, the rate of growth of total factor productivity is higher in industrialised economies than that of developing countries. Thirdly, rate of growth of total factor productivity increases as a developing economy enters into a higher stage of industrialisation. Thus, developing economies have to ensure that the capacity to generate high total factor productivity growth has taken place in their industrialisation process.

Given its importance in the process of industrialisation, a close scrutiny whether total factor productivity growth is built in the Ethiopian manufacturing sector becomes imperative. For this purpose, different statistical and econometric models are employed. Three points are clearly observed in this effort. First, the Ethiopian

manufacturing sector, regardless of its state of allocative efficiency, registered a negative growth of total factor productivity for the period 1976-1995. This result indicates that there was no growth of total factor productivity generated in the sector. This, in turn, implies that the sector proved itself to be unlearning and the efficiency in resource use did not reveal improvements; rather it was deteriorating. Second, a sub-sector difference in the rate of growth of total factor productivity prevailed. Those sectors which are light, not technologically complex and with long production experience, though not all, produced a positive growth of total factor productivity while the others do not. Finally, the importance of ownership in determining the extent of growth of total factor productivity was clearly observed. The private sector, in general, appeared to be more effective in resource use than the public ones, though it was not across all sub-sectors and through all the years under study.

These results imply, for Ethiopia to industrialise, serious actions have to be taken by firms, and the government has to make conditions conducive for such efforts. Such actions should revolve around the capacity to generate growth of total factor productivity in every firm. Firms should build the necessary technological and managerial capabilities by making every effort to adapt and assimilate technologies to new conditions and to improve on them. This requires investment since technological knowledge cannot be easily imitated, transferred or modified. Parallel with this, the government should create a conducive environment by providing appropriate public goods, incentives and institutions. The government should give due attentions to those activities that are usually underinvested by the private sector, which include launching physical investment, developing human capital and undertaking technological efforts.

Since incentives determine the efficiency with which capabilities are used, affect the pace of accumulation of resources, influence the type of capital purchased and the kinds of learning, and determine the extent to which existing endowments are exploited in production, it should be given due consideration by the government. More importantly, as long as acquisition of technological capabilities requires inward-oriented trade policies, the government has to intervene by initiating these policies. But high level of intervention might frustrate or dissipate the development of healthy capabilities and prop up nonviable enterprises that should die out. Thus, there is a need to contain the costs of protection or subsidy by introducing limits and safeguards through selectivity and flexibility. Sectors must be selected, the appropriate duration of infant industry protection or promotion has to be specified and the means to evaluate performance should be defined. Erecting the right incentives are necessary, nevertheless without institutions, the ability to respond to incentives is bound to be very limited. Thus, building institutions that facilitate the working of the markets are necessary. There must be institutions to promote inter-firm linkages, to provide support to smaller enterprises, help firms to restructure them and overcome infrastructural, information and service deficiencies. Nevertheless, installing

institutions alone is not sufficient, incentives and capabilities should also be built in; one without the other will not produce the required effect.

NOTES

1 Arithmetic mean of factor shares within the period assumes a constant factor elasticity of output, a Hicks neutral growth of total factor productivity and a non-variable elasticity of substitution among factors. The approach gives room for factor shares to vary overtime unsystematically (it implicitly assumes a zero mean and constant variance for the distribution) so that the average becomes a representative. Its drawback is that outliers easily influence the estimate (which could mostly be the case in the Ethiopian manufacturing industries in which the correlation between capacity utilisation and labour employed is insignificant due to lack of management power to fire-and-hire). The geometric mean of factor shares during the period has the same characteristic as that of the average with an advantage of reducing the influence of extreme values. The initial share, i.e. labour and capital shares to value-added at the initial period assumes a deterministic nature of factor shares which does not vary overtime whatever is the environment (the case of stationary process with a mean of its initial value). A year-by-year factor share is quite the opposite of the others; elasticities are variable and growth of total factor productivity is non-neutral and could be embodied, as well.

2. These formulae are

$$i)\ r = \frac{1}{n-1}\sum\left(\frac{yt+1}{yt} - 1\right) x\ 100 \qquad [1]$$

This formula uses all information, but it is sensitive to extreme values.

$$ii)\ r = \frac{1}{n}\left(\frac{y_t}{y_o} - 1\right)x100 \qquad [2]$$

This formula considers only two end values. It is not affected by whatever happened in between. As a result, it heavily depends on the two end values.

$$i)\ r = \frac{1}{n}\operatorname{Ln}\frac{y_n}{y_o}\ x\ 100 \qquad [3]$$

This considers two end values and it basically assumes a continuous process.

$$ii) r = anti\log\left[\frac{1}{n}\log\left(\frac{y_n}{y_o}\right)\right] - 1\ x\ 100 \qquad [4]$$

This considers only two end values, but is a discrete case.

$$i)\operatorname{Ln} Y = \operatorname{Ln} A_o + rt \qquad [5]$$

This is a trend function taking time as an explanatory variable and then computing the growth rate, for the continuous case and it uses all information. The following is for discrete case.

$$ii)\log Y = \operatorname{Log} A_o + [\log(1+r)]t \qquad [6]$$

3. Estimating such production functions has problems, however. In the first place, existence of perfect competitive market, divisibility and homogeneity of output and inputs are assumed in the theoretical formulation of production functions while none of them are realistic. Given these assumptions, the data are assumed to represent points on the production function, i.e., the actual figures are the optimal ones, whereas huge discrepancies exist between them in time-series data like the one in this study due to variation in capacity utilisation at different times in point. Aggregation problems are also prevalent. As a result, estimates tend to be biased and inconsistent.

4. The years selected are those that are the initial or terminal or those years that represent unique characteristics in the history of the manufacturing industries. The climax year of production campaign, the beginning of the second phase of the ten-year perspective plan and the end of the socialist era, respectively, are those selected.

5. F-ratio can be computed using the following expression:

$$F = \frac{(\sum e_R^2 - \sum e_{UR}^2)/c}{\sum e_{UR}^2/(N - K)}$$

Where Se_R^2 = restricted residual sum of squares, Se_{UR}^2 = unrestricted residual sum of squares, N= number of observations, K= number of parameters estimated; and, c= number of restrictions.

6. The sources of ownership differences or the extent of these variables to influence the productive content of inputs across sub-sectors in public and private sector are not assessed. The premise for not to entertain the issue is that, once this done for sectors, it transcends to the other.

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SOCIAL SECURITY AND LABOUR SUPPLY IN ETHIOPIA

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ABSTRACT

This paper examines the effect of social security on labor supply using the traditional labor force participation model. Application of a logit regression to the survey data yields results that go counter to theory. That is, the availability of pension income does not reduce labor force participation rates. It is also found, that as age increases, participation in the labor force is significantly reduced for women than men and also for blue-collar jobs than white-collar ones. This result has a policy implication that there is a need for retirement age discrimination act by sex and by type of job. Logit models were estimated for different age groups and it is found that there is no problem arising due to aging or health, which are the main determinants in setting retirement age, until the age of 60 for participation in the labor force. The results also indicate that the probability to participate in the labor force reduces by 0.09 if one goes from age group of 56-60 to the age group of 61-65.

1. INTRODUCTION

It is estimated that more than half of the world's old people rely exclusively on informal and traditional arrangements for income security (Palacious 1994). They receive food, shelter and care from close relatives or extended family. The proportion of old people is on the increase due to the increase in life expectancy and decline in birth rates. But economic development weakens these informal arrangements. Families become smaller and more dispersed. In urban areas people are likely to withdraw from productive work, to live alone and to depend on non-family sources of income in their old age.

It is difficult to give a direct definition or meaning of Social Security. The expression has acquired a wider interpretation in some countries than in others, but basically it can be taken to mean "the protection which society provides for its members, through

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a series of public measures, against the economic and social distress that otherwise would be caused by the stoppage or substantial reduction of earnings resulting from sickness, maternity, employment injury, unemployment, invalidity, old age and death; the provision of medical care; and the provision of subsidies for families with children" (ILO 1989).

With their historic origins in Bismarkian Germany, societies and governments have developed mechanisms, with varying degrees of success and resources, to provide income security for their older members as part of a social safety net for reducing poverty and to protect citizens from certain social risks such as income loss due to disability, aging, illness or unemployment. These arrangements had a beneficial effect on improving labour safety and maintaining household income levels. They also contributed to increase of life expectancy and possibly reduced mortality rates. But these securities are "a concern for all of us—rich as well as poor, young as well as old—because the arrangements adopted can either help or hinder economic growth" (World Bank 1994).

Social security programs are dependent on a country's social policy and the development (strength) of the economy. ILO's Social Security (Minimum Standards) Convention identifies nine well-known programs. These are: Medical Care Benefits, Sickness Benefit, Maternity Benefit, Work Injury Benefit, Old-Age Benefit, Survivors' Benefit, Invalidity Benefit, Unemployment Benefit, and Family Benefit. However, these programs are not established at once. They are rather established step-by-step depending on the country's economic capacity and the citizens' contingency.

The most useful old-age benefit, in social security term, is a life pension. Such a pension is always granted under universal benefit schemes. A social assistance benefit, once granted, also continues for life unless the recipient acquires further resources and ceases to be in need. Established social insurance schemes are designed to pay life pensions, but members who reach the specified age without a sufficient record of employment or contributions may receive lump-sum grants. Among the nine benefits specified earlier, the one exercised in Ethiopia is the Old-Age Benefit, sometimes named as pension. Thus most of this paper's analysis is for this benefit type.

The role of social security in Ethiopia has been a subject of much interest because it affects the basic macroeconomic variables such as saving, consumption, supply of labour, investment, and thereby economic growth.

Changes in the age structure of the population affect the number of people eligible for pension and hence the benefit payments associated with them. Such changes in population may also affect the size and age composition of labour force. Therefore, there may be consequences for the supply of labour as well, by virtue of effects on the

work incentives of pension recipients. The amount received from pension may reduce the incentive for older people to continue working; and the prospect of receiving one may induce those who are not yet of eligible age to make some substitutions of leisure for income earning activities (i.e. reduce labour participation rate). On the other hand, pension contributions may be viewed as taxes that effectively reduce the current wages of workers and depending on one's assumption of labour force behaviour, they may increase participation rate, as workers seek to offset the reduction in incomes by working longer hours or more weeks in a year.

There may also be other channels of cause and effect between the pension plan and demographic variables. Changes in disposable incomes and work incentives may affect the demand for children and hence levels of fertility. Larger benefit payments to the elderly may have a positive effect on their levels of health care and a negative effect on their mortality rates. Demographic variables, which may be affected by the pension plan, may thus affect both the economic burden of a national pension plan and the ability of the economy to sustain the burden.

Moreover, the contribution process associated with the pension plan may have implications for national patterns of saving and consumption. To the extent that the propensity to save is lower for pension recipients than for the non-recipients, the process will tend to reduce aggregate savings and investments. This reduction, in turn, may lower the rate of economic expansion.

Pension plans thus may affect work incentives, savings and investment, and fertility and mortality rates. Indeed, at the level of an individual household, the decisions that underlie all the effects are best thought of as being made simultaneously. However, this study emphasizes the impact of Social Security benefit on labour supply.

This being so, the objectives of this paper are to test whether:

- the availability of retirement income sources, such as pension (social security benefit) is a powerful inducement to retirement i.e., labour force withdrawal,

- there is a need for legislation outlawing the use of mandatory retirement at age 55, which is a common practice currently

- we need an Age Discrimination Act (by job type or by sex) i.e. does a uniform age retirement policy avoid the disadvantages of discrimination between employees? Or do we need different retirement age for different jobs since for labour intensive jobs age 55 might be late while for highly skilled labour it might be a premature (early) retirement?

2. BACKGROUND OF THE FORMAL SOCIAL SECURITY SYSTEM IN ETHIOPIA

2.1. Historical Background

The history of the formal social security system in Ethiopia dates back to the formation of the Social Security Authority (SSA) in 1993 (Public Service Pension Proclamation No 209/1963). This Decree covered only the military and civil service workers. For these groups the pension scheme was funded by a mandatory contribution. A lifetime payment pension strategy was preferred to a lump-sum pay (sometimes called provident fund) since the latter arrangement may be rendered unworkable by individuals' inclinations to dissave.

The coverage of pensions was greatly expanded due to the nationalization of privately owned enterprises by the Derg Proclamation NO 49/1975: "*Employees of Government-Owned Undertakings Pension Proclamation*". The three groups of employees–civil, military and the newly-added employees of government owned undertakings, precipitated the establishment of 3 Fund categories: public service civilian pension fund, public service military pension fund, and pension fund for employees of undertakings, respectively.

The SSA, which is the responsible agency to handle the case, administers four pension schemes namely: old age pension, invalidity pension, sickness benefit/pension and work injury benefit. To maintain international standard and to benefit from international experience, the SSA became an affiliate member of the International Social Security Association (ISSA) in 1985.

In the SSA scheme, normal retirement age is 55 years for both males and females and the scheme is applicable on any type of work. Minimum years of service to qualify for pension entitlement are 10 years. The percentage of pension payroll tax to total labour cost (wage plus employer share of pension payroll tax) amounts to about 09.4 per cent of workers' income. Payroll tax for pension is paid on gross salary; the workers' contribution to payroll tax is 4 per cent of gross salary while the employer's contribution is 6 per cent of the gross salary. A retiree with 10 years of service qualifies for 30% of gross salary calculated as average of the last 36 months pay. For every additional year of service above 10 years the pension benefit is increased by 1 per cent up to a maximum of 40 years of service and 60 per cent of gross salary.

2.2. Basic Statistical Descriptions of SSA Activities

It is estimated that the population over 60 years of age in Ethiopia was 4.5 per cent of the total in 1990; it is expected to fall to 3.9 in 2020 and rise afterwards to 4.2, 6.8 and 15.1 per cent in 2030, 2050 and 2075, respectively. The dependency ratio

(population over 60/population 20-59) was 11.5 per cent in 1990 and is expected to increase in the future.

Public pension spending is 1.1 per cent of GDP while receipts as a percentage of GDP is 1.5 per cent, which gives a ratio of net saving to benefit spending as 36.0 per cent. These pension-spending indicators show that there is a surplus of pension funds. This and a relatively small old population, in the short run, allows the social security system to accumulate saving; thereby increasing national saving and stimulating investment and growth. Currently, only 4.2 per cent of the receipt of SSA is comes from financial investment. This is because it is only the "undertaking fund" that can be invested.

Moreover, since only government employees are covered by the pension scheme, large portion of the eligible age population is excluded. At present, the total number of pension beneficiaries is 439,363.

Civilian beneficiaries account for 24.2 of the total pension beneficiaries, while the military and undertaking beneficiaries are 61.6 and 14.2 per cent, respectively. The high proportion of military beneficiaries could be explained by the impact of the war that has been ravaging the country for decades.

Beneficiaries can also be classified as pensioners and survivors. Pensioners' account for 49.7 per cent while remaining is the share of survivors. Among the pensioners, 65.5 per cent are military while 21.2 and 13.3 per cent are civilian and undertaking pensioners, respectively; while, out of the total survivors, 57.8, 27.1, and 15.1 per cent are military, civilian and undertaking survivors, respectively. There are three types of survivors: children, wives/husbands and parents. The proportion of survivors in each type is 37.7, 42.6 and 19.7 per cent for children, wives/husbands and parents, respectively.

Though it is conceivable to classify beneficiaries by region as well, it is currently difficult to tell the exact number of beneficiaries in each region due to the new regional structure. However, it is estimated that more than 70 per cent of the beneficiaries live in three regions: Addis Ababa, Oromia and Amhara regions. Some 6 per cent of the beneficiaries are located in Eritrea.

3. LITERATURE SURVEY

3.1. Theoretical Framework

3.1.1. Determinants of Retirement

The mandatory retirement age of 55 is a result of the retirement policy of the government in Ethiopia. Europe and the United States appear to be moving in the opposite direction with respect to changes in the mandatory retirement age. Presumably, to help alleviate problems of youth unemployment, in Europe the tendency is to encourage a lowering of the retirement age. In the U.S., on the other hand, the trend seems to be in the opposite direction. Recent legislation has removed any mandatory retirement age in the federal public service and has forbidden a mandatory retirement age of 70 in most other sectors. The fact that the mandatory retirement age is not immutable suggests that it can change in response to other basic forces that affect the retirement decision and that accounts for the existence of mandatory retirement itself.

Economic theory, in particular the income-leisure choice theory, indicates that the demand for leisure–as indicated, for example, by the decision to retire early–is positively related to one's wealth, and is related to expected earnings. The wealth effect is positive, reflecting a pure income effect: with more wealth we buy more of all normal goods, including leisure in the form of retirement. The impact of expected earnings is indeterminate, reflecting the opposite influences of income and substitution effects. An increase in expected earnings increases the income forgone if one retires and therefore raises the (opportunity) cost of retirement: this has a pure substitution effect reducing the demand for retirement leisure. On the other hand, an increase in expected earnings also means an increase in expected wealth, and just like wealth from non-labour sources, this would increase the demand for retirement leisure. Since the income and substitution effects work in opposite directions, the impact of an increase in expected earnings on retirement is ultimately an empirical proposition.

Features of the social insurance schemes can have a substantial impact on retirement decision. The pension itself, like all fixed benefit payments, has a pure income effect inducing retirement. In addition, for those who work, the implicit tax of the pension reduction associated with the retirement tax, and the explicit payroll tax used to finance the scheme, both lower the returns to work and hence make retirement more financially attractive. That is both taxes involve a substitution effect towards retirement because the opportunity cost of leisure in the form of retirement is lowered by the amount of tax on forgone earnings. To be sure, the tax on earnings also involves an income effect working in the opposite direction, that is, our reduced after-tax income means we can buy less of everything including leisure in the form of

retirement. Thus, both the substitution effect and the (net) income effect of the features of social insurance serve to unambiguously induce retirement.

In addition to the mandatory retirement age, wealth and earnings, and the existence of social insurance, the retirement decision can be affected by other factors. The changing nature of work towards more white-collar jobs and away from physical tasks may make it feasible for many to work longer. The decline of the extended family may make retirement less attractive. On the other hand, individuals may be induced into early retirement to the extent that their jobs disappear due to economic change and dislocation.

Of prime importance in the retirement decision, however, is the potential impact of health. People approaching the usual retirement age obviously can be subject to health problems that could encourage them to retire. This may be the case, particularly if their accumulated wealth or pension income enables them to retire at a reasonable income. The various determinants of the retirement decision are obviously interrelated.

3.2. Empirical Evidence

Teshome (1995) described how non- wage incomes such as pensions adversely affect participation in work (or employment). Such incomes are inversely related to the rate of participation. The implication is that, if social security benefits are higher, participation rates of the labour force (or labour supply) are reduced. Papers by Boskin (1977), Quinn (1977) and Burkhauser (1978) argue that social security that makes benefits conditional on market employment decisions affect the labour supply of older people. Pension rules tie acceptance of a pension to leaving the job and may in some cases restrict work in other jobs. Social security restricts market employment through its effect on earnings. These studies indicate that such constraints on market employment reduce the labour supply of older people.

Feldstein (1974) argues that social security, as inter-generational transfers are not entirely offset by private inter-generational transfers. If this is the case, increase in the wealth of recipients reduces their labour supply during all ages of life. However, if there is no net change in total transfers, as Barro (1979) argues, then no wealth-induced labour supply changes occur. Vincent and David (1981) modelled the effect of social security, pensions, and other form of social insurance on individual retirement decisions. Three strong assumptions: perfect capital markets, actuarial fairness, and certain lifetimes together imply that social insurance has no effect on individuals' incentives to retire. But, they argued that any departure from the above assumptions implies that there is such an effect, which is often systematic. In particular, when capital markets do not permit consumption loans, benefits are actuarially fair and available at retirement, however early, and lifetimes are certain,

raising the level at which workers are required to participate in the social insurance plan advances retirement.

Anthony (1979), using a life cycle model, looked at the effect of social security on one's income. He shows that any change in lifetime income can affect the amount of labour that a person supplies in the market, i.e. if social security raises lifetime income the life cycle model would imply some decrease in labour supply. This could occur as a reduction in hours worked per year in all years of a person's working life or a decrease in the number of years of work, that is early retirement. And constrained to work full time, individuals may choose early retirement as the feasible response to social security's lifetime income effect. Feldstein (1985), in discussing the optimal level of social security benefits, shows that it depends on balancing the protection that these benefits offer to those who lack the foresight to provide for their own old age against the welfare costs of distorting economic behaviour. The primary such cost is the distortion in private saving. In the analysis, he shows that even if every individual is substantially myopic (and would therefore save less for his retirement than perfect foresight utility maximum would imply), it may be optimal to have either no social security retirement pay or a very low ratio of benefits to earnings.

4. MODEL, METHODOLOGY AND DATA

4.1. Retirement Age

In deciding an optimal retirement age, one has to look at the perspectives of the following four interest groups. The first group consists of the employees. By looking at his/her wage and his/her social security benefit (pension), the employee chooses a retirement age that maximizes his/her lifetime utility. The second group is that of the employer. Retiring a worker is one of the ways to deal with declining marginal product that may follow aging of workers. It is also a way to create promotion possibilities for younger ones. Thus, the employer chooses an optimal retirement age maximizing the benefit that he/she can get from each worker. Third we have the interest of the SSA. The institution chooses a retirement age whereby one's lifetime pension payment should not exceed one's contribution throughout his working years. At last, but not least, we have the government. One way to deal with unemployment is to retire older workers in order to generate new job opportunities to the young. The government has also the responsibility to care for the aged.

The fourth aspect is beyond the scope and this paper. While our main concern is the first part, i e. determining the factors that affect the employee's decision of retirement and to look at how one chooses the optimal retirement age using the Lagrangear method, we will also discuss the second and third aspects briefly.

4.1.1. From the Employer Point of View

In an interview conducted with the management of some enterprises, we have noticed that mandatory retirement at age 55 made them lose their experienced workers who can still make a good contribution to the organization. Many organizations overcome this problem by employing retired worker on a contractual basis. We have also noticed that 95% of the organizations interviewed prefer a retirement age between 57 and 62.

One drawback of this paper is that it has not analysed the factors that will affect the employers' willingness to accept a retirement age that is higher thoroughly. Besides, it is difficult to come up with a specific figure on which retirement age has to be. But, one point that the employers agreed about is that, for many groups of workers, the existing retirement age is low and needs adjustment.

Most justifications for mandatory retirement age rely on the following three notions:

a) A worker's productivity declines significantly after some age, say 55, and that mandatory retirement is the employer's way to deal with this reduced productivity.

b) Mandatory retirement creates promotion possibilities for younger workers.

c) A uniform retirement policy avoids the disadvantage of discrimination between employees.

Using the theory of agency, which provides insight on how to compensate an agent in a manner creating harmony of interest between the principal and the agent, economists respond to the defences of mandatory retirement. In this light, the following are the gist of their arguments

Granted that there is a significant diversity of talent in the labour force and no one claims that only the most talented individuals are the ones who can find jobs. Instead, economists believe that differences in wage rates reflect differences in productivity. The same is true of older workers. If older workers were less productive than younger workers, employers in a competitive labour market would pay older workers lower wage rate than they pay younger ones. There is no necessity to layoff older workers simply because their productivity is not as high as the younger workers. In fact, very young workers earn less than middle-aged workers as a reflection of their lower productivity. Yet, we do not find researchers arguing that the minimum age for employment should be 40 (or any higher age). The correct question then is, why does employment rather than wage adjust?

Some have argued that morale would be adversely affected by lowering wages of older workers. But it is not obvious that terminating workers rather than lowering their

wages will improve the morale of the remaining work force. A 50-year-old worker who is faced with approaching termination is not necessarily going to have a better attitude than one who knows his/her wage rate will be lowered 5 years from now.

Another view often expressed is that one cannot judge the decrease in productivity so that it would be impossible to adjust wages accordingly. But, laying-off a worker adjusts his/her wage rate to zero. This seems to be a poorer approximation of his/her true productivity decline than any smooth wage adjustment. Furthermore, employers face a problem of gauging productivity for all workers. There is nothing unique about 55-year-olds in this regard. Thus, a productivity decline is not a sufficient explanation for the existence of mandatory retirement.

The second explanation for maintaining mandatory retirement ignores at least two facts:

i) Young workers know that they will become old workers at some date in the future. They care about the present value of some lifetime wage path rather than the present value of any segment of it. Although they would prefer to be promoted when young, they also would prefer, if their retirement is truly mandatory, to continue working when old.

ii) Promotion may be interpreted as an increase in one's wage rate (and perhaps a change in the accompanying job title) that occurs as one's productivity rises over the life cycle. The firm will, in competition, pay the worker his/her marginal product, no matter how old he/she is. Thus, there would be no incentive for a firm to retire a worker whose marginal product is equal to or greater than his wage rate in order to "promote" a younger worker.

A uniform retirement policy raises two questions:

First, there is no requirement for a uniform retirement policy to be one with a provision for mandatory retirement age. One could easily set up a flexible retirement scheme, where payment varies with length of service and is invariant across individuals, but does not require mandatory retirement at any given age.

The second problem is that employers discriminate between employees at every level: some are promoted, others are terminated, others experience wage gain while others do not, and the existence of differences between workers is dealt with in many ways. So, why should employers or employees favour a system that reduces the ability of the employer to compensate workers differentially?

4.1.2. The SSA's Point of View

The SSA needs to make an actuarial evaluation. This is the calculation of risks involved on the pension fund, i.e., comparing the present value of the likely magnitudes of pension contributions to pension payments. It involves the analysis of life expectancy, replacement ratio and also demographic and socio-economic conditions in the country.

From the theoretical point of view, it is difficult to predict the likely effects of increase or decrease in a retirement age. For example, if we increase the retirement age from 55 to 60 we can notice two effects.

i). The workers contribute for an additional 5 years to the pension fund i.e., causes an increase in the pension fund.

ii). If employees continue to work, they will not be entitled to pension benefit i.e. had they been retired the SSA could have paid them a pension. So, the SSA will save a 5-year pension benefit payment.

But we know that pension payments or calculations are a function of average of the last 36 months salary and number of service years, which are both positively related to pension benefit. So, an addition of 5 working-years means the service years will be higher and also there might be a wage increase that in turn makes the average salary higher. These make future pension benefits larger. And if life expectancy is higher (i.e. if a pensioner is paid for longer period) the net loss will be higher than the net gain that would lead to the drowning of the pension fund. Thus, it a careful actuarial evaluation or study must be undertaken to judge which decision (increase or decrease) about the retirement age benefits the SSA or its fund.

4.1.3. The Employee's Point of View

Here we consider a rational employee (consumer) who maximizes his/her lifetime utility that is a function of his/her income. A person decides to work based on opportunities available inside and outside the market. This involves comparing the value of a pension's time in market and non-market activity, that is, the values for his work and leisure. In the life cycle model these values are influenced by social security. In this section, we deal with two topics: first using the Lagrangean approach we derive the conditions of when to retire, and second, using probit/logit analysis, based on a traditional labour force participation model to which social security benefit was added, we estimate the probability of retirement for different age groups.

4.1.3.1. Optimal Policy to Retire Human Capital

The goals of this section are to derive the conditions leading the worker to decide when to retire, given the wage structure and the retirement benefits, and to study the effects of social security retirement benefits on retirement. The basic framework is based on Chow (1997). Labour services are usually called services from human capital (see Becker 1964; and Schultz 1961). Here a worker has to decide when to retire. The decision variable is u_t, where

$u_t = 1$: the worker decides to continue working, and
$u_t = 0$: the worker decides to retire and receive a pension.

The model used is due to Lumsdain, Stock, and Wise (1992). An important characteristic of this model is its use of discrete control variable[1]. The observed state variable[2] (X_t) is the benefit (wage or pension) in year t, and the unobserved state variable (E_t) is assumed to be iid. The worker's utility function is:

$$r\left(X_t, E_t, u_t\right) = \begin{cases} X_t^{\theta_1}\mu_1 + E_t(1) & \text{if } u_t = 1 \\ \left(\mu_2\theta_2 X_t\right)^{\theta_1} + E_t(0) & \text{if } u_t = 0 \end{cases} \qquad [1]$$

Where μ_1, μ_2 represent time-invariant worker specific heterogeneity.

Concerning the wage and pension benefits X_s, in year s, a worker at age t who continues to work will receive a given wage Y_s, in subsequent years s. If a worker retires at age r, subsequent retirement benefits will be $B_s(r)$. At age t, a worker can calculate the present value of his or her future income stream if he or she retires at age r, using a discount factor β.

$$v_t(r) = \sum_{s=t}^{r-1} \beta^{s-t} U_W\left(Y_s\right) + \sum_{s=r}^{T} \beta^{s-t} U_R\left(B_s(r)\right) \qquad [2]$$

Where T = compulsory retirement age.

$U_W(Y_s) = X_s^{\theta_1} + \mu_1 + E_s(1)$ (i.e. the top half of equation [1]

$U_R(B_s(r)) = (\mu_2\theta_2 X_s)^{\theta_1} + E_s(0)$ (the bottom half of equation [1], when $u_s = 0$)

The worker is assumed to decide which year to retire (setting $u_s = 0$) by maximizing the expectation of $V_t(r)$ subject to a constraint on X_{s+1} given as:

$$X_{s+1} = u_s Y_{s+1} + (1-u_s)B_{s+1}(r)$$

The optimisation problem can be written as,

$$\begin{aligned} &Max.\ E(V_t(r)) \\ &\text{s.t. } X_{S+1} = u_S Y_{S+1} + (1-u_S)B_{S+1}(r) \end{aligned} \qquad [3]$$

Rewriting [2] and using $E_t \sum_t (\cdot) = \sum_t E_t(\cdot)$ gives

$$E_t(V_t(r)) = \sum_{s=t}^{T} \beta^{s-t} E_t\left(u_S U_W(Y_S) + (1-u_S)U_R(B_S(r))\right) \qquad [4]$$

Writing the Lagrangean L:

$$L = \sum_{s=t}^{T} \beta^{s-t} E_t\left(u_s\left(x_s^{\theta_1} + \mu_1 + E(1)\right) + (1-u_s)\left((\mu_2\theta_2 X_s)^{\theta_1}\right) + E_s(0)\right) - \qquad [5]$$

$$\lambda_{s+1}\beta\left(X_{s+1} - u_s Y_{s+1} - (1-u_s)B_{s+1}(r)\right)$$

The Lagrange multipliers, λ_{s+1} are introduced only for those state variables that are constrained by the control variables.

$\beta^{(s-t)+1}$ is introduced so that λ_{s+1} can be interpreted as the marginal contribution of X_{s+1} to total multiplied utility evaluated at period s+l; λ_{s+1} has to be discounted by $\beta^{(s-t)+1}$ to obtain the marginal contribution of X_{s+1} valued at the time t.

To make the problem operational, we need to determine the law of motion of X and Y. For simplicity let's assume that:

$$Y_{s+1} = Y_s + \gamma_{y,s+1} \qquad [6]$$

Where $\gamma_{y,s+1}$ is determined by the "promotion rule". However, it may also be a random variable.

At the beginning of period s, the worker decides whether to continue working or retire. The implications of the choices are:

a). current

$$X_s = Y_s \quad \text{if } u_s = 1 \qquad [7]$$

$$X_s = B_s(r) \quad \text{if } u_s = 0 \qquad [8]$$

i.e. if he continues working he gets a wage and if he retires he gets a pension.

b). future

$$X_{s+1} = Y_{s+1} = Y_s + \gamma_{y,s+1} \quad \text{if } u_s = 1 \qquad [9]$$

$$X_{s+1} = B_{s+1}(r) \quad \text{if } u_s = 0 \qquad [10]$$

Note that $B_{s+1}(r)$ may be equal to $B_s(r)$ depending on the pension scheme.

Thus,

$$X_{s+1} = u_s\left(Y_s + \gamma_{y,s+1}\right) + (1 - u_s)B_{s+1}(r) \qquad [11]$$

Letting $Y_s=X_s$, we can write

$$L=\sum_{s=t}^{T}\beta^{s-t}E_t\left(u_s\left(x_s^{\theta_1}+\mu_1+E_s(1)\right)+(1-u_s)\left((\mu_2\theta_2X_s)^{\theta_1}+E_s(0)\right)\right.$$
$$\left.-\lambda_{s+1}\beta\left(X_{s+1}-u_s\left(x_s+\gamma_{s,s+1}\right)-(1-u_s)B_{t+1}(r)\right)\right] \qquad [12]$$

Then the first order condition are obtained as follows

$$L_x:\beta^{t-s}\frac{\partial L}{\partial X}=E_t\left(u_s\theta_1x_s^{\theta_1}+\theta_1(1-u_s)(\mu_2\theta_2)^{\theta_1}X^{\theta_1-1}-\lambda_s+\beta u_s\lambda_{s+1}\right)=0 \qquad [13]$$

That is, differentiating L with respect to X_s (Leibniz's rule) and noting that X_s appears with λ_s twice (with λ_s and λ_{s+1}).

a) Expectations are formed on the basis of available information, i.e.

$$E_t(Z_s)=E\left(\frac{Z_s}{\Omega_t}\right) \qquad [14]$$

Where Ω_t is the information set at time t

(b) The law of iterated expectation implies that

$$E_t(Z_s)=E\left(E_s\left(\frac{Z_s/\Omega_s}{\Omega_t}\right)\right) \qquad [15]$$

(c) At s; all time-s variables are known (an assumption) such that: -

$$E\left(Z_s/\Omega_s\right)=Z_s \qquad [16]$$

Using (a) - (c) we can rewrite [14] as:

$$L_x:\ u_s\theta_1 X_s^{\theta_1-1} + \theta_1(1-u_s)(\mu_2\theta_2)^{\theta_1-1} - \lambda_s + \beta u_s E_s(\lambda_{s+1}) = 0 \qquad [17]$$

Because one cannot differentiate L with respect to the discrete control variable u_t we consider the difference

$$\Delta Lu = L(u_s = 1) - L(u_s = 0) \qquad [18]$$

Noting

$$L(u_s = 1) = \beta^{s-t} E_t\left(\left(x_s^{\theta_1} + \mu_1 + E_s(1)\right) - \lambda_{s+1}\beta\left(X_{s+1} - \left(X_s + \gamma_{y,s+1}\right)\right)\right)$$
$$+\sum_{\substack{j\neq s\\ j=t}}^{T} \beta^{j-t} E_t \begin{pmatrix} u_j\left(x_j^{\theta_1} + \mu_1 + E_j(1)\right) + \left(1-u_j\right)\left(\left(\mu_2\theta_2 X_j\right)^{\theta_1} + E_j(0)\right) \\ -\lambda_{j+1}\beta\left(X_{j+1} - u_j\left(x_j + \gamma_{y,j+1}\right) - \left(1-u_j\right)B_{j+1}(r)\right) \end{pmatrix} \qquad [19]$$

$$L(u_s = 0) = \beta_{s-t} E_t\left(\left(\mu_2\theta_2 X_s\right)^{\theta_1} + E_s(0)\right) - \lambda_{s+1}\beta\left(X_{s+1} - B_{s+1}(r)\right) +$$
$$+\sum_{\substack{j\neq s\\ j=t}}^{T} \beta^{j-t} E_t \begin{pmatrix} u_j\left(x_j^{\theta_1} + \mu_1 + E_j(1)\right) + \left(1-u_j\right)\left(\left(\mu_2\theta_2 X_j\right)^{\theta_1} + E_j(0)\right) \\ -\lambda_{j+1}\beta\begin{pmatrix} X_{j+1} - u_j\left(x_j + \gamma_{y,j+1}\right) - \\ \left(1-u_j\right)B_{j+1}(r) \end{pmatrix} \end{pmatrix} \qquad [20]$$

$$t \le j \le T$$

Thus,

$$\Delta Lu = L(u_s = 1) - L(u_s = 0)$$

$$= \beta^{s-t} E_t \begin{pmatrix} \left(X_s^{\theta_1} + \mu_1 + E_s(1)\right) - \lambda_{s+1}\beta\left(X_{s+1} - \left(X_s + \gamma_{y,s+1}\right)\right) \\ -\left(\mu_2\theta_2 X_s\right)^{\theta_1} - E_s(0) \end{pmatrix} + \qquad [21]$$

$$+\lambda_{s+1}\beta\left(X_{s+1} - B_{s+1}(r)\right) = 0$$

Using the law of iterated expectations and that $E_s(Z_s) = Z_s$, and multiplying through by $\beta^{-(s-t)}$ we get

$$\Delta Lu = \left(X_s^{\theta_1} + \mu_1 + E_s(1)\right) - \left(\mu_2\theta_2 X_s\right)^{\theta_1} \qquad [22]$$

$$- E_s(0) + \beta\left(X_s + \gamma_{y,s+1}\right) - B_{s+1}(r)E_s(\lambda_{s+1}) = 0$$

Since $\left(X_s + \gamma_{y,s+1}\right) = Y_{s+1}$ and $B_{s+1}(r)$ are assumed known.

Thus, the FOCs are given by equations [17] and [22].

Note that $\left(X_s^{\theta_1} + \mu_1 + E_s(1)\right) + \beta Y_{s+1}E(\lambda_{s+1})$ is the expected discounted utility from continuing employment,

$E(\lambda_{s+1})$ converts Y_{s+1} into utility units and λ is the marginal utility of income, and

$\left(\mu_2\theta_2 X_s\right)^{\theta_1} - E_s(0) + \beta B_{s+1}(r)E(\lambda_{s+1})$ is the expected discounted utility of retiring.

Then:

(a) The worker continues in employment so long as discounted expected utility from doing so exceeds that from retiring.

(b) At the early years of employment (i.e., the further s is from T) it pays to stay in employment. As s approaches T, the differential utility from working declines. One

may postulate that there is a period s*<T at which the worker is indifferent between working and retiring because they provide equal utility, i.e. at s*

$$U^*W = U^*R$$

Assuming that U_W and U_R are monotonic, this implies that:

$$\text{if } s < s^*, \quad U_w^* > U_R^* \quad \Rightarrow u_s = 1$$
$$\text{if } s > s^*, \quad U_w^* < U_R^* \quad \Rightarrow u_s = 0$$

The question is that: what is the level of X_s^* at which $U_W^* = U_R^*$?
To find X* let $u_s = 0$, then from equation [17] we obtain:

$$\begin{aligned} \lambda(X^*) &= \theta_1(\mu_1\theta_2)^{\theta_1}(X^*)^{\theta_1-1} \\ &= \left.\frac{\partial r(0)}{\partial X}\right|_{X=X^*} \\ &= r_x^*(0) \end{aligned} \qquad [23]$$

At X_s=X*, [17] also holds for U_s=1 (since the worker is indifferent between working and retiring), such that:

$$\begin{aligned} \beta E_s(\lambda_{s+1}) &= \lambda(X^*) - \theta_1(X^*)^{\theta-1} \\ &= r_x^*(0) - r_x^*(1) \end{aligned} \qquad [24]$$

Substituting [24] for $\beta E_s(\lambda_{s+1})$ in [22] we obtain:

$$r^*(1) - r^*(0) - \left[Y_{s+1} - B_{s+1}(r)\right]\left[r_x^*(0) - r_x^*(1)\right] = 0$$

$$\Rightarrow r^*(1) - r^*(0) + \left[X^* + \gamma_{y,s+1} - B_{s+1}(r)\right]\left[r_x^*(1) - r_x^*(0)\right] = 0$$

$$\Rightarrow X^*\left[r_x^*(1) - r_x^*(0)\right] = r_x^*(1) - r_x^*(0) - \left[B_{s+1}(r) - \gamma_{y,s+1}\right]\left[r_x^*(1) - r_x^*(0)\right]$$

$$\Rightarrow X^* = \frac{-\left[r^*(1) - r^*(0)\right]}{\left[r_x^*(1) - r_x^*(0)\right]} - \left[B_{s+1}(r) - \gamma_{y,s+1}\right]$$

$$X^* = \left[B_{s+1}(r) - \gamma_{y,s+1}\right] - \frac{\left[r^*(0) - r^*(1)\right]}{\left[r_x^*(0) - r_x^*(1)\right]} \qquad [25]$$

The optimal policy is to continue working until X reaches X* given by [25]. The critical income X* is the difference between the opportunity cost of not retiring and the ratio of the period t net utility gain from retiring to the difference between the marginal utilities from retiring and not retiring.

Equation [25] can be re-written as

$$X^* = \frac{B(r)[r_x^*(0) - r_x^*(1)] - [\gamma_y[r_x^*(0) - r_x^*(1)] + [r^*(0) - r^*(1)]]}{[r_x^*(0) - r_x^*(1)]} \qquad [26]$$

$$X^*: [r^*(1) - r^*(0)] = [(X^* + \gamma_y) - B(r)][r_x^*(0) - r_x^*(1)]$$
$$= [B(r) - (X^* + \gamma_y)][r_x^*(1) - r_x^*(0)] \qquad [27]$$

$r^*(1) - r^*(0)$ = the net utility gain or return to staying in employment

$\left[B(r) - (X^* + \gamma_y)\right]\left[r_x^*(1) - r_x^*(0)\right]$ = the net loss (or opportunity cost of) from staying in employment (not retiring)

Thus, the optimal policy to retire human capital is when the net utility gain from staying in employment equals the opportunity cost of not retiring (staying in employment).

4.1.3.2. The Data

The data used in this paper was obtained from a survey undertaken in five towns including Addis Ababa. The selection of the towns was made based on the concentration of pensioners. Two hundred and seventy nine pensioners were interviewed. Though due to financial and time constraints we couldn't make the sample larger, we have noticed that the responses given are very similar. This assures us that although we do not have large samples, we will not miss much basic information. The variable names and their code are presented in Appendix I.

4.1.3.3. Econometric Specification

The Model

As discussed in section 4.1.3.1 the phenomenon we seek to model is discrete. Thus, a person is either willing to participate in labour force (=1) or not (=0). It will generally turn out that the models and techniques used for such analysis are different. Thus we apply or use **qualitative response models.**

The probability of retirement was estimated using qualitative response models (probit/logit) based on a traditional labour force participation model to which pension income was added. For a bivariate dependent variable, Logit and probit are generally equally good. Though some argue that probit is to be preferred in the bivariate case, while logit should be used for a multivariate discrete variable. In the case of a multivariate discrete variable, logit and probit might give different marginal parameters. If so, it becomes important to compare the goodness of fit of the two models, and select the model, which shows a relatively best fit, given that the results make sense. As discussed in Greene (1997), a goodness-of-fit measure is a summary statistic indicating the accuracy with which a model approximates the observed data. In the case in which the dependent variables are qualitative, accuracy can be judged either in terms of the fit between the calculated (predicted) probabilities and the observed (actual) response frequencies or in terms of the model to forecast observed responses. An analog to the R^2 in a conventional regression model is the likelihood ratio index (LRI) that is found from the maximum likelihood estimate of the models.

The LRI is obviously related to the likelihood ratio statistic for testing the hypothesis that the coefficient vector is zero. Other similar fit measures have been proposed. Although they are suggestive, it is not clear whether they have any relationship to maximizing any type of fit in the more familiar sense. The maximum likelihood estimator is not chosen so as to maximize a fitting criterion based on prediction of the dependent variable, as it is in the classical regression (which maximizes R^2). It is

chosen to maximize the joint density of the observed dependent variables. Here we choose a model with the highest LRI value

The second factor used to choose between the logit and probit is to compare their prediction power i.e. what per cent of the observations are predicted correctly. From the summary table of the models that show the frequencies of the actual and the predicted observations, we sum up only those where the actual and the predicted have the same observation and then divide it by the total frequency. This gives us the proportion or the percentage of the observations that the model predicts correctly. This value sometimes is called count R^2. Therefore, we choose the one with the highest count R^2. Such comparisons, as shown in the next sections, led us to choose the logit model.

The estimated qualitative response models are all non-linear. The coefficients of the models are, therefore, not equal to the marginal effects. Thus, in the LIMDEP package we have computed the marginal effects. The method we used in building the model is to include a lot of parameters from the beginning and then step by step remove the variable with the smallest insignificant value, though one should not remove variables of particular interest. While omitting a relevant explanatory variable is not good, including a variable that is insignificant will not harm the model.

The model included age, wage before retirement, pension income, family size, year of service, retirement age, three dummies for education (primary, secondary and tertiary) and binary variables for sex, existence of other income, job type, health condition, existence of problem that arises due to aging. The model was estimated separately for age groups: 56-60, 61-65, 66-70 and a general willingness to participate model for current age. Other models were estimated for comparing the effect of different attributes by splitting the sample. We have tried to compare the effects of men and women and also the effect of being involved in laborious type of job to the non-laborious for the above specified age groups independently. The result is two tables of estimated parameters from which one can judge the relative difference between the two sexes or type of jobs. By comparing the slope of the marginal parameters of the two groups, we can see if there is any difference in their willingness to participate in the labour force. We can "see" a difference even for insignificant variables, though we have to remember that they are point estimates that are not significant.

Prediction of Effects of Changes in the Explanatory Variable

After estimating the parameters of the explanatory variables, we would like to know the effects of changes in any of the explanatory variables on the probabilities of the dependent variable i.e. willingness to participate in the labour force. To deal with this

problem we used basic ideas underlying the logit model, following Gujarati (1995), which is given below.

The (cumulative) logistic distribution function is given as

$$P_i = E\left(Y = 1/X_i\right) = \frac{1}{1+e^{-Z_i}} \qquad [1]$$

Where $Z_i=\beta X_i$

Xi= a vector of explanatory variables

β= a vector of the coefficients

It is easy to verify that as Z_i ranges from $-\infty$ to $+\infty$, P_i ranges between 0 and 1 and that P_i is nonlinearly related to Z_i.

If P_i, the probability of participating in the labour force is given by (1), then $(1 - P_i)$, the probability of not participating in the labour force, is

$$1 - P_i = \frac{1}{1+e^{Z_i}} \qquad [2]$$

Thus we can compute the odds ratio as

$$\frac{P_i}{1-P_i} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i} \qquad [3]$$

Where $\frac{P_i}{1-P_i}$ is the odds ratio in favor of participating in the labor force.

It is the ratio of the probability that an individual will participate in the labour force to the probability that it will not participate.

If we take the natural log of [3], we obtain the log of the odds ratio:

$$L_i = \ln\frac{P_i}{1-P_i} = Z_i \qquad [4]$$
$$= \beta X_i$$

equation [4] is not only linear in X, but also (from the estimation view point) linear in parameters. L is the logit and hence the name logit models for models like [4]. It is this model that is estimated in this paper.

From running regression of [4], the estimated slope coefficient suggests that for a unit increase in the explanatory variable, the log of the odds in favour of participating in the labour force changes by about the coefficient of the explanatory variable. In general, if we take the antilog of the jth slope coefficient, subtract one from it, and multiply the result by 100, we will get the per cent change in the odds for a unit increase in the jth regressor.

Thus, the coefficients of the logit model do not give the change in the probability of participating in the labour force rather they give the change in log of the odds ratio of participating in the labour force per unit change in explanatory variable. Thus, the change in the probability due to a change in the explanatory variable, say X_j, can be computed from [1] as

$$\frac{\partial P_i}{\partial X_{ij}} = \beta_j P_i\left(1 - P_i\right) \qquad [5]$$

Equation [5] shows that the rate of change in probability involves not only the coefficient β_j but also the level of probability from which the change is measured. Usually this probability value is computed at the mean values of the explanatory variables.

Willingness to Participate Model for Current Age

The LRI for probit equals 0.309 (lnL and $\ln L_o$, equals 122.24 and 176.89, respectively) while for the logit, it is 0.324 (lnL and $\ln L_o$, equals 119.56 and 176.89, respectively). The probit model predicts 230 of the 279 or 82.4 per cent of the observations correctly, while the logit model predicts 232 of the 279 or 83.1 per cent of the observations correctly. Thus, we have chosen a logit model for our analysis.

Our chosen model is a logit model that is highly significant, with a likelihood ratio test of the hypothesis that the coefficients (13 of them) are zero based on a chi-squared value of 114.65 with 13 degrees of freedom at any significance level.*

* Test for hetroskedesticity is not done since the tests are specifically for the probit model and are not well suited to the logit model - which is our choice.

The logit regression results, which are partial derivatives of probabilities with respect to the vector characteristics, are presented below. They are computed at the mean values of the explanatory variables.

Table 1. Logit Regression Result

Variable	Coefficient	S.e.	t-ratio
CONSTANT	-1.24340	0.58411	2.129
AGENOW	-0.01179	0.00853	-1.382
AGEPR	0.44305	0.09920	4.466
SECEDUC	- 0.17408	0.12590	-1.383
TEREDUC	- 0.20245	0.13892	-1.457
FS	0.02446	0.01761	1.389
HEALTH	0.38634	0.10231	3.776
RETAGE	0.04028	0.01408	2.860
SERVYR	- 0.02141	0.00831	- 2.576
SEX	- 0.04594	0.07544	- 0.609
WGBFR	-0.00065	0.00029	- 2.250
JOBTYP	- 0.03085	0.08063	- 0.383
OTHINC	- 0.01831	0.07195	- 0.254
PENINC	0.00134	0.00061	2.191

Source: Own computation.

As can be read from Table 1, the probability that an individual is willing to participate in labour force declines for the factors AGENOW, SECEDUC, TEREDUC, SERVYR, SEX, WGBFR, JOBTYP and OTHINC by the given coefficient for a unit increase in them. This probability will increase for the rest of the variables by their coefficient if they are increased by a unit value.

For this regression, family size, job type, and existence of other incomes are not significant at 10 per cent significant level, while all the rest are significant. This might be due to the small size of the sample. To the model, current age is negatively related with willingness to participate, which coincides with the theory that the higher the age the lower will be the willingness. The existence of age problem, health condition, family size, and job type are positively related to the willingness to participate which accords with the theory.

In contrast to the theory, the existence of social security benefit is positively related to the willingness to participate in the labour force. One reason could be that the substitution effect outweighs the income effect. An explanation for this can be derived from the existing pension rule that, once a person is entitled to a benefit, he/she can be employed in an enterprise which is not covered by the pension scheme and this will not yield to an implicit tax on benefits i.e. he/she can earn his/her wage as well as his/her pension. This would give incentive for an individual to participate in the labour force, thus causing a positive relationship between pension income and willingness to participate.

Regardless of the sign, the probability that the willingness to participate in the labour force will be affected due to the existence of a pension is very negligible i.e. by about 0.0013. Therefore, we can say that willingness to participate in the labour force (or labour supply) is not much affected by the existence of social security. One reason for this is that pension benefits are too small.

Table 2. Marginal Effects for Sexes

Variable	Men	Women	All Observations
CONSTANT	- 1.0408	- 1.4069	- 1.2434
AGENOW	- 0.0099	- 0.0133	- 0.0118
AGEPR	0.3709	0.5013	0.4431
SECEDUC	- 0.1457	- 0.1970	- 0.1741
TEREDUC	- 0.1695	- 0.2291	- 0.2024
FS	0.0205	0.0277	0.0245
HEALTH	0.3234	0.4371	0.3863
RETAGE	0.0337	0.0456	0.0403
SERVYR	- 0.0179	- 0.0242	- 0.0214
SEX	- 0.0385	- 0.0520	- 0.0459
WGBFR	- 0.0005	0.0007	- 0.0007
JOBTYP	- 0.0258	- 0.0349	- 0.0308
OTHINC	- 0.0153	- 0.0207	- 0.0183
PENINC	0.0011	0.0015	0.0013

Source: Own computation.

We have also tried to compare the effects of different attributes. One is for different sexes (see Table 2). The result shows that the probability that each factor will affect the willingness to participate is higher for women than men. For example, the marginal effect that women will not participate in the labour force due to the existence of other incomes is 0.021 while for men it is 0.015. The other important factor is their age. As age increases, the willingness to participate in the labour force is reduced more for women than for men. This result might need explanations such as maternity problems. Without going into detailed explanation, it can be inferred that there could be a need for Age Discrimination Act by Sex.

Table 3. Marginal Effects for Job Types

Variable	Non-laborious	Laborious	All Observations
CONSTANT	- 1.2087	- 1.2812	-1.2434
AGENOW	- 0.0115	- 0.0122	- 0.0118
AGEPR	0.4307	0.4565	0.4431
SECEDUC	-0.1692	- 0.1794	- 0.1741
TEREDUC	0.1968	- 0.2086	- 0.2024
FS	0.0238	0.0252	0.0245
HEALTH	0.3755	0.3981	0.3836
RETAGE	0.0392	0.0415	0.0403
SERVYR	- 0.0208	- 0.0221	- 0.0214
SEX	- 0.0447	- 0.0473	- 0.0459
WGBFR	- 0.0006	- 0.0007	- 0.0007
JOBTYP	- 0.0300	- 0.0318	- 0.0308
OTHINC	- 0.0176	- 0.0189	- 0.0183
PENINC	0.0013	0.0014	0.0013

Source: Own computation.

Table 3 shows that the higher the probability of being not willing to participate in the labour force is higher for those who are involved in the laborious type of job. This result has an implication for Age Discrimination Act by Job Type. The act has to be of a kind that allows early retirement for those who are involved in the intensive-intensive job and a higher retirement age for non-laborious type of job.

The above analysis is based on the reported current age. Next, we will further examine their implications within a specific age interval.

Willingness To Participate Model For Ages Between 56 And 60

The LRI for probit equals 0.314 (lnL and lnL_o equals 121.80 and 177.59, respectively), while for the logit it is 0.321 (lnL and lnL_o equals 120.59 and 177.59, respectively). The probit model predicts 229 of the 279 or 82.1 per cent of the observations correctly, while the logit model predicts 231 of the 279 or 82.8 per cent of the observations correctly. Thus, here also, we choose a logit model for our analysis. The chosen logit model is significant based on a chi-squared value of 113.99 with 13 degrees of freedom at any significance level.

The regression result shows the probability of willingness to participate in the labour force evaluated at the mean values of the explanatory variables.

The results, the signs of coefficients and implications are more or less similar to that of current age regression model except for a little difference on the magnitudes of the probabilities. One important factor which we have to see carefully here is that the effect of age on the probability of participating in the labour force. The probability that age will reduce the willingness to work is 0.108, which is still very small. The result also shows that age and health condition will not be a problem for this age group. The implication here is that if retirement age is raised from 55 to 60, there will not be much problem in the productivity of the worker due to aging or health–the main factors used in setting a retirement age.

Willingness To Participate Model for Ages Between 61 and 65

For this age group, using the same methodology and criteria, we have chosen a logit model. This logit model is significant based on a chi-squared value of 100.86 with 13 degrees of freedom at any significance level. Here also the regression result gives the probability of willingness to participate in the labour force evaluated at the mean values of the explanatory variables.

Compared to the age group of 61-65, those in the age group of 56-60, who favour participating, were larger than those who do not. Also the probability of participating in the labour force declines from 0.546 to 0.455. For all the variables, except SEX, the

change in the probability of participating in the labour force has declined as compared to the previous section.

For this age groups things get a bit complicated. Many explanatory variables, which were significant in the previous regressions, become insignificant now and also the magnitudes of the coefficients are smaller. This implies that the probability to participate in the labour force declines significantly due to health and age problems when the age group is 61-65. This result is derived because the binary variables 'health' and 'problem due to age' are coded by giving 1 for those who are healthy and at the same time do not have a problem due to their age. Thus, the coefficient of these variables being insignificant and very small implies that many have given a response in this age group that they have health or age problems.

Thus, based on our sample result, we can infer that a retirement age policy will not be optimal or best on the employee side, if it exceeds age 60.

Willingness to Participate Model for Ages Between 66 and 70

Here the probit model is not estimable at all. The only possible estimation we have for the marginal effects is the logit estimation. This logit model is significant with a likelihood ratio test based on a chi-squared value of 50.14 with 13 degrees of freedom at 1 per cent significant level. For this age group, our sample data regression shows that no variable is significant. This indicates that, irrespective of the factors, people are not willing to participate in the labour force. This holds true whether they are men or women and also whether the job is labour intensive or not.

5. CONCLUSIONS AND POLICY IMPLICATION

The results of the qualitative response model have shown that social security benefit or pension does not induce retirement or withdrawal from the labour force participation in contrast to the theory, which says that non-wage incomes such as social security benefits will affect negatively, or reduce the supply of labour. One difference between the theory and our analysis is that the theory considers all types of social security benefits while our study focuses only on old age pension. Thus, it is difficult to conclude that the results contradict to the labour force participation theory. Rather at this stage we tentatively conclude that social security (or old age pension) does not significantly influence the intended age of retirement or withdrawal from the labour force for our sample. One of the reasons given for such a result is that pension payments are small or inadequate to cover living expenses. We also found that the probability to participate in the labour force reduces by 0.09 if one goes from age group of 56-60 to the age group of 61-65.

There is also a difference in the willingness to participate in the labour force between men and women as well as between those who are involved in intensive-intensive job and non-laborious job. The result shows, compared to men, women are less willing to continue working after age 55. It is also shown that those who are involved in the labour intensive type of job are less willing to continue working as age increases as compared to those who are involved in non-laborious type of job.

The estimation result, when carried separately for different age groups, has shown that for the age group of 56-60, health and aging does not significantly affect one's productivity or willingness to participate in the labour force. But for the age groups 61-65 and 66-70, these factors significantly affect productivity or willingness to participate.

The above conclusions and observations have policy implications and support policy reforms of the SSA, which correspond to its objectives of reallocation of a person's lifetime income to provide support for his/her own retirement and redistribution of income between individuals to provide an adequate support.

In setting a retirement age, the basic factors used are health and ageing problem in that as one gets older his productivity declines and he/she will be vulnerable to health problems. But our result though should be taken cautiously in making policy, shows that there is no significant problem due to these factors until age 60. The policy implication of this result is that there is a need to revise the existing retirement age rule, which mandatorily retires workers at age 55. The reform would be to increase this mandatory retirement age to 60. This in turn makes pension payments higher and may solve the inadequacy of the pension benefits.

The other policy implication, which we can deduce from the results, is that there may be a need to have an Age Discrimination Act depending on the type of job and sex. The Job Discrimination Act reform would allow early retirement for those who are involved in blue-collar jobs. The Sex Discrimination Act reform would allow early retirement for women.

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APPENDIX 1

The variable names and their code are given as:

AGENOW	The respondent's current age and is taken as given.
AGEPR	If there is a problem that arises due to age.
AGEPR	=0 if the respondent says there is;
	=1 if there is no problem that arises due to age.
AVPRETAG	: Average proposed retirement age (from the respondent's point of view)
FS	: Family Size
HEALTH	: The respondents health condition
HEALTH	= 0 if respondent is not healthy
	= 1 if healthy (for manipulation purposes we have coded as 1 those who respond both good and fair)
JOBTYP	: Type of job that the respondent used to work
JOBTYP	= 0 if type of job is labour intensive
	= 1 if type of job is non laborious
PENINC	: Pension income
RETAGE	: Age at retirement
SERVYR	: Number of years of service
SEX	: Sex of the respondent
SEX	= 0 if respondent is male
SEX	= 1 if female
WGBFR	: Wage before retirement
PEDUC	: Dummy for primary education
PEDUC	= 1 if respondent's education level is primary
	= 0 otherwise
SECEDUC	: Dummy for secondary education
SECEDUC	=1 if education level is secondary
	= 0 otherwise
TEREDUC	: Dummy for tertiary education
TEREDUC	= 1 if education level is tertiary
	= 0 otherwise
WTPLF	: Willingness to participate in the labour force at current age
WTPLF	= 1 if willing
	= 0 otherwise
WTP1	: Willingness to participate in the labour force if age is between 56-60
WTP2	: Willingness to participate in the labour force if age is between 61-65
WTP3	: Willingness to participate in the labour force if age is between 66-70

EXPORT EARNINGS INSTABILITY AND ECONOMIC GROWTH IN SUB SAHARA AFRICAN COUNTRIES

Paulos Gutema*

ABSTRACT

The paper investigates the impact of uncertainty generated by export earnings instability on economic growth. A model that links uncertainty to economic performance is developed, and, from the model, the condition under which outward-oriented economic policy contributes positively to economic growth was set. From panel data analysis, it is inferred that to benefit from an outward-oriented economic policy, the stable component of export revenue of the region has to grow annually by at least 7.5%. If this condition is not satisfied, the policy acts adversely on economic performance by inducing resource misallocation.

1. INTRODUCTION

Sub-Saharan African (SSA) economies have been experiencing very slow growth for the last three and a half decades. According to Sachs and Warner's (1997) estimate, the region's annual average change in GDP per capita was only 0.8% per year over the period 1965 - 1990. By contrast growth in some of South East Asian Countries was 5.8% and that of the rest of the less developed countries (LDCs) was 1.8%.

Such slow growth in SSA has been a point of much concern for African specialists, development economists and other scholars as the prevalence and severity of the problem seem different from that of other developing countries. In the search for the cause of such a problem, some of them consider poor policy as the primary cause while others emphasise on the underlying growth conditions–like colonial legacy, ethnic diversity and tribal divisions, and geographical factors.

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From the latter group, Easterly and Levin (1997), for instance, besides providing evidence for strong relationship between the underlying growth conditions and growth, described how these conditions themselves contribute to poor public policy. That is, poor policy itself is not a self-standing cause, but rather a consequence of other adverse factors. Galup and Sachs (1998), as cited in UNCTAD (1998), for example, indicates that protectionist policies in SSA (considering it to be inappropriate) could be the result of adverse underlying growth conditions.

Based on the uniqueness of these adverse factors to Africa, as Cuddling et al. (1996) note, one often hears the argument that there is no presumption that the usual economic prescriptions should apply in addressing Africa's economic problems. Other scholars prefer to argue the other way round. For instance, Sachs and Warner (1997) find that poor economic policies, and most importantly, Africa's lack of openness to international markets have played a particularly important role in the slow growth than the underlying growth factors. As a result, they prefer to stress that there is no need for special theory for Africa with regard to economic growth.

This study departs from this point of debate by asking the following question: Even if the underlying growth conditions in Africa are considered to be similar to that of the other developing countries, is the policy of openness to international market truly suitable for accelerating SSA economic growth?

While posing this question, the maintained hypothesis is that the effectiveness of outward oriented economic policy (OOEP) depends on the fulfilment of some economic conditions, and if such conditions are not fulfilled, policy could act adversely in the attempts made to accelerate economic growth. This hypothesis is formulated on the ground of the following point.

The advocates of policy failure claim the prediction of neo-classical trade model as the theoretical justification of the OOEP. However, the claimed model relies heavily on a number of heroic assumptions that can not be valid in LDCs' context. One of the assumptions, having special relevance to this study, is the absence of uncertainty. Theory, however, indicates that the prediction of the model cannot hold when this assumption is removed. Moreover, we find ample evidence indicating the volatility of earnings from the export of primary commodities. This volatility, indeed, generates uncertainty in the system in general. From this point it seems reasonable to suspect the attainability of dynamic gains of trade from primary commodity exports.

To examine the hypothesis, a model that links uncertainty with economic growth is developed. The model then examines the conditions under which the outward-oriented economic policy may accelerate economic growth.

To this end, the study follows two main approaches. The first starts from Feder's (1982) formulation. It splits export earnings into its stable and unstable components to derive the model. Having the model developed that way the approach tries to drive a prerequisite for a positive contribution of export-promoting policy to economic growth. This approach makes some behavioural assumptions of the involved economic agents. In addition to the behavioural assumption, the approach also assumes that the underlying economy is bi-sectoral: export sector and non-export sector, which may have factor productivity differential as well as externality between the sectors.

The second approach attempts to estimate the model with statistical data. At this stage, panel data analysis is employed. Based on the estimated parameters, the conditions for effective OOEP for SSA is outlined.

2. LITERATURE REVIEW

Over the last 15 years or so, OOEP has gained strong dominance among academics and development-oriented institutions. Many national aid agencies in the North have been convinced of the suitability of outward approach for the purpose of economic growth. A number of countries have made strong effort to shift from an essentially import substitution to a more outwarded approach, other countries are still trying to do so, and virtually all countries are being urged to take similar measures by aid donors and external economic advisors. But, a very basic question, demanding considerations, is whether all these changes are based on belief or fact. To shed some light on this point, let's try to see the theoretical foundation of the policy from the perspective of uncertainty that has got special relevance to SSA.

Even if the justification of OOEP relies heavily on findings of empirical studies made in the 1970s, the advocates of the policy claim the suitability of neo-classical trade model for explaining the availability of static and dynamic gains from the policy. See, for example, Ram (1985) and Dornbush (1992).

According to neo-classical trade model, countries benefit more from free trade than autarky, and the benefits exist as a result of production specialisation and efficient resource allocation. In fact, the prediction of availability of potential gains from trade heavily rely upon assumptions which may not hold in the real economic life of LDCs. On this point, Strydam (1995) states that neo-classical trade theory provides us with the most unqualified support for international trade as a growth factor, based on a very restrictive assumptions. Among the assumptions used by the model that called the attention of recent researchers are: perfect competition in the international trade, constant returns to scale, rational behaviour of agents that work through utility

maximisation, free factor mobility, full employment of resources, and absence of uncertainty in the trade system.

Recently, there is a large volume of theoretical literature that examines what happens to the prediction of the neo-classical trade model when the model is exposed to elements of uncertainty. Some of these studies tried to mimic the assumption of no uncertainty by saying there exist a complete risk market that serves any form of risk generated in the process of trade and production. Under such situation, they managed to prove the validity of the model Dumas (1980) and Helpman (1988). But a very simple question to be raised here is whether LDCs have risk markets for any form of risk that exists in the process of international trade.

Other studies made on this area build their model without complete risk markets, but assume that firms have fixed levels of utility (e.g. Mayer 1976). The study was able to prove the validity of neo-classical trade model prediction within such circumstance. Here, too, one may ask questions like 'is a firm's utility truly fixed?'

Still others made their study on the issue of uncertainty assuming that the number of firms involved in international trade is fixed. For such studies, see Batra (1975), Sakai (1978), Pomery (1984). Even if the assumption is unrealistics, the neo-classical trade model breaks down under uncertainty. In short, from these theoretical researches, it is possible to argue that the claimed gain is uncertain particularly for developing countries like SSA, whose export earnings are mostly from primary commodities.

In the preceding paragraphs, some of the theoretical works done to analyse what happens to the prediction of neo-classical trade model under uncertainty, from static point of view, was reviewed. Nevertheless, dynamic issue, which is our basic point of interest, requires some more investigation to argue for or against the prediction of the neo-classical model. To move a step towards filling this gap, let us consider uncertainity in export earnings.

Generally speaking, uncertainty in international trade emanates either from supply side or from demand side or from both. The effects of the factors influencing demand side can be reflected through international price, while that of the supply side is reflected through quantity supplied to the international market. On the other hand, the level of export earnings is determined by quantity supplied and the price. Hence, the uncertainty existing in the international trade can be well represented by the uncertainty observed in export earnings, which is manifested through and measured by export earnings instability. However, it is difficult to find a well-established and satisfactory theoretical framework that reveals the impact of such uncertainty on the dynamic benefit of international trade, specially in the long run context. Consequently, one may observe some limitations on some of the existing empirical works.

A common limitation of studies that have relevance to this study is that they lack a satisfactory theoretical estimating equation that links Export Earnings Instability (EEI) with economic growth. That is, most of the equations used in the studies have not been derived systematically starting from a valid growth model, in a way that is consistent with their hypothesis testing. In the absence of a theoretical foundation, regressing different variables is likely to lead to inconsistent and contradictory results. Glezakos (1973), for instance, was criticised by Lim (1976) for its lack of derivational procedure even if the setting of the functional form is logically consistent with the hypothesis to be tested. MacBean (1966) is also criticised for lack of explanations or theoretical ground for choice of the determining variables other than EEI. Moreover, Kenen and Voivodas (1972), even though it is implicitly understandable that it adopted a Harrod-Domar growth framework, is also criticised for the absence of derivation procedure for the estimating equation. Usually, the derivational procedure is expected to start from one of the underlying growth models.

To avoid such arbitrary selection of estimating equations and fill the gap of the absence of systematically derived framework, in this study, it will be derived analytically using Feder's (1982) formulation as a point of departure. In Feder's formulation endogeneous growth model was the starting point.

3. THE MODEL

Feder's (1982) formulation links export expansion to economic growth as follows.

$$\frac{dY}{Y} = \beta_1 \frac{I}{Y} + \beta_2 \frac{dL}{L} + \left(\left(\frac{\sigma}{\sigma + 1}\right) + \lambda\right)\left(\frac{dX}{X}\right)\left(\frac{X}{Y}\right) \qquad [3.1]$$

Where dY/Y, dL/L and dX/X stand for GDP growth, labour growth and export earnings growth respectively, I/Y and X/Y are investment and export to GDP ratios respectively, and β_1, β_2, $\sigma/(\sigma+1)$ and λ are parameters representing marginal physical product of capital, output elasticity of labour, factor productivity differential of export sector and externality of export sector on non-export sector, respectively.

If we assume that there is some part of total factor productivity that is not affected by trade policy the formulation will take a constant term, β_0

$$\frac{dY}{Y} = \beta_0 + \beta_1 \frac{I}{Y} + \beta_2 \frac{dL}{L} + \left(\left(\frac{\sigma}{\sigma + 1}\right) + \lambda\right)\left(\frac{dX}{X}\right)\left(\frac{X}{Y}\right) \qquad [3.2]$$

Equation [3.2] expresses growth as a function of trade, labour growth and investment-GDP ratio. It says that trade affects growth only if there is factor productivity differential (FPD) and positive externality of export sector on non-export sector. In the extreme case, if the sum of FPD and externality is negative, trade has a deterring effect on growth.

We try to extend this model in such a way that it captures a variable of uncertainty, or export earnings instability. The inclusion of the EEI in the growth model presumes that it is transmitted to the rest of the economy, and such instability is detrimental to sustainable economic growth. In fact, this argument depends on the assumption we make about the behaviour of agents; i.e., whether we assume they are risk-averse or not. Moreover, changes in export proceeds will affect the economy by affecting incomes of producers in the export sectors, thereby affecting domestic expenditure for consumption and investment. It influences the multipliers and accelerators as well (Lim 1976). Furthermore, the adversity of EEI can be seen from its impact on the level of investment, which results from business miscalculations and/or the speculative behaviour it encourages (Myrdal 1956).

A lower level of investment means lower economic growth. Instability also results in a discontinuous flow of imports of intermediate and capital goods that are crucial to the implementation of development plans. In stating the link between instability and growth, Barro (1976 and 1980) argues that lack of stability creates an atmosphere of uncertainty, makes it difficult for economic agents to extract the correct signals from relative prices, such as real returns to investment, and thus leads to inefficient allocation of resources.

On the basis of this argument, export earnings, X, is divided into its reliable or certain component, x, and unreliable or uncertain component, u, as

$$X = x + u$$

Fluctuations of revenue are undesirable only in so far as they do not serve as guide to the allocation of resources to bring about appropriate long run adjustment in supply and demand. Hence, in using the term instability to refer to such undesirable revenue fluctuations, there is a problem in distinguishing between those that are desired and those which are excessive or misleading. To proceed in getting the components of exports apart, we have to get some concise definition of export instability. In line with MacBean (1966), Lancier (1978) defined EEI as the residual variability of export values after correcting for trend. Charette (1985) uses EEI to denote unexpected fluctuation in export markets, which agrees conceptually with that of Glezakos (1983). It is possible to consider both definitions by assuming that the agents' expected value of export corresponds to the mathematically derived trend value. In fact, this assumption is not an arbitrary one, rather it is in line with the theory of rational expectation that considers agents as rational thinkers in their decision making.

Having defined EEI this way, next we look for a means of measuring it. It is usually measured as the short-term or yearly fluctuations of export proceeds around the growth trend of exports (Naya 1973). Nguyen (1980) also states that trend value is likely to be the best estimator of long run revenue so that the term instability should refer only to the short-term export earnings fluctuations around its trend.

Accordingly, we transform [3.2] into a time series equation by adding a subscript t as:

$$\frac{dY_t}{Y_t} = \beta_0 + \beta_1 \frac{I_t}{Y_t} + \beta_2 \frac{dL_t}{L_t} + \beta_9 \left(\frac{dX_t}{X_t}\right)\left(\frac{X_t}{Y_t}\right) \qquad [3.3]$$

Where $\beta_9 = \alpha/(\sigma+1) + \lambda$

Assuming constant output elasticity of export, ε, we get

$$\varepsilon \frac{\partial Y_t}{\partial X_t} = \frac{X_t}{Y_t}$$

Substituting $\varepsilon \frac{\partial Y_t}{\partial X_t}$ for $\frac{X_t}{Y_t}$ and $x_t + u_t$ for X_t in [3.3] and a little algebraic manipulation, we get

$$\frac{dY_t}{Y_t} = \beta_0 + \beta_1 \frac{I_t}{Y_t} + \beta_2 \frac{dL_t}{L_t} + \mu\left(\frac{d(x_t + u_t)}{(x_t + u_t)}\right)$$

Which can be rewritten as

$$\frac{dY_t}{Y_t} = \beta_0 + \beta_1 \frac{I_t}{Y_t} + \beta_2 \frac{dL_t}{L_t} + \mu\Psi_{1t}\left(\frac{dx_t}{x_t}\right) + \mu\Psi_{2t}\left(\frac{du_t}{u_t}\right) \qquad [3.4]$$

where $\Psi_{1t} = \left\{\frac{1}{\left(1 + \frac{u_t}{x_t}\right)}\right\}$ and $\Psi_{2t} = \left\{\frac{1}{\left(1 + \frac{u_t}{x_t}\right)}\right\}$

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Here, we are concerned with the long run effect of uncertainty and export, and not with the one time effect like Ψ_{11} and Ψ_{21}. In other words, our interest does not lie with what has happened but also what could have happened but did not, and what will happen. For this purpose Ψ_{11} and Ψ_{21} have to be substituted with their long run expected values denoted by Ψ_1 and Ψ_2 respectively. After such substitution, our growth estimating equation will be:

$$\frac{dY_t}{Y_t} = \beta_0 + \beta_1 \frac{I_t}{Y_t} + \beta_2 \frac{dL_t}{L_t} + \mu\Psi_1\left(\frac{dx_t}{x_t}\right) + \mu\Psi_2\left(\frac{du_t}{u_t}\right) \qquad [3.5]$$

After adjusting the instability variable for scale, small sample bias and degrees of freedom, [3.5] will be

$$\frac{dY_t}{Y_t} = \beta_0 + \beta_1 \frac{I_t}{Y_t} + \beta_2 \frac{dL_t}{L_t} + \beta_3\left(\frac{dx_t}{x_t}\right) + \beta_4\left(\frac{di_t^2}{i_t^2}\right) \qquad [3.6]$$

Where $\beta_3 = \mu\Psi_1$, $\beta_4 = \frac{1}{2}\mu\Psi_2$ and i_t^2, which is Export Earnings Instability Index (or uncertainty index), is given as

$$i_t^2 = \frac{u_t^2}{\overline{X}^2}\frac{N}{N-K}$$

Where N is size of sample included in the study, K is number of explanatory variables used to estimate trend values.

Equation [3.6] relates changes in stable components of export revenue and changes in export instability to economic growth. The parameters β_0, β_1 and β_2 are expected to have positive signs on the ground of economic growth theories. Similarly, the sign of Ψ_1 and Ψ_2 are expected to be positive and negative, respectively. For the proof of this argument see Appendix-1.

4. POLICY IMPLICATIONS OF THE MODEL

We can derive the policy implication of the model after some mathematical manipulations as follows. For trade to contribute positively to economic growth, the sum of the effects of the stable and unstable components of export earnings has to be positive.

That is,

$$\beta_3\left(\frac{dx_t}{x_t}\right)+\beta_4\left(\frac{\mathrm{di}_t^2}{\mathrm{i}_t^2}\right)\rangle 0$$

$$\Rightarrow\left(\left(\frac{\sigma}{\sigma+1}\right)+\lambda\right)\frac{\mu}{\beta_9}\Psi_1\frac{dx_t}{x_t}+\left(\left(\frac{\sigma}{\sigma+1}\right)+\lambda\right)\frac{\mu}{\beta_9}\Psi_2\frac{1}{2}\frac{di_t^2}{i_t^2}\rangle 0 \qquad [4.1]$$

$$\Rightarrow\left(\left(\left(\frac{\sigma}{\sigma+1}\right)+\lambda\right)\left(\frac{\mu}{\beta_9}\Psi_1\frac{dx_t}{x_t}+\frac{\mu}{\beta_9}\Psi_2\frac{1}{2}\frac{di_t^2}{i_t^2}\right)\right)\rangle 0 \qquad [4.2]$$

Conditionality [4.2] can be satisfied if both items in the brackets are positive or if both are negative. Let us consider it case by case.

Case 1. $\left(\left(\frac{\sigma}{\sigma+1}\right)+\lambda\right)\rangle 0$

Under this case,

$$\frac{\mu}{\beta_9}\Psi_1\frac{dx_t}{x_t}+\frac{\mu}{\beta_9}\Psi_2\frac{1}{2}\frac{di_t^2}{i_t^2}\rangle 0$$

Now from the variables di_t^2/i_t^2 and dx_t/x_t, we understand that the former is more or less exogenous to public policies. Hence, we solve for dx_t/x_t and we get

$$\frac{dx_t}{x_t}\rangle -\frac{1}{2}\frac{\Psi_2}{\Psi_1}\frac{di_t^2}{i_t^2} \qquad [4.3]$$

If EEI is exhibiting growth over time, since Ψ_1 and Ψ_2 are expected to be positive and negative, respectively, the coefficient of di_t^2/i_t^2 is expected to be positive. The policy implication of the model according to [4.3] is then, if factor productivity differential and export externality is positive, $(((\sigma/(\sigma+1)) + \lambda) > 0)$, then, to have growth promoting trade, the growth of stable component of export has to be kept above some positive level, where the level is determined by growth of EEI. In this case, if EEI is unchanging overtime, then positive exports growth is a guarantee for trade to promote economic growth.

Case 2. $$\left(\left(\frac{\sigma}{\sigma+1}\right)+\lambda\right) < 0$$

In this case, to have a positive contribution of trade to economic growth, the item in the second brackets of conditionality [4.2] has to be negative. i.e.

$$\frac{\mu}{\beta_0}\Psi_1\frac{dx_t}{x_t} + \frac{\mu}{\beta_0}\Psi_2\frac{1}{2}\frac{di_t^2}{i_t^2} < 0$$

$$\frac{dx_t}{x_t} < -\frac{1}{2}\frac{\Psi_2}{\Psi_1}\frac{di_t^2}{i_t^2} \qquad [4.4]$$

The policy implication of the model based on [4.4] is that if $((\sigma/(\sigma+1)) + \lambda) < 0$, then for trade to promote growth, the growth of stable component of export has to be kept below some level where the level is determined by change in EEI. Here again, if EEI is unchanging, having a negative growth in the stable components of export is a sufficient condition for the contribution of trade to economic growth. Here, too, the implication agrees with the idea of efficient resource allocation. Under such situations, Import Substitution Industrialisation (ISI) serves better than export promoting policies.

Finally, conditionality [4.3] suggests that there is some level below which export-promoting policy may not contribute to economic growth. If the growth rate of stable components of export is above that level, then the conditionality suggests the policy has to be backed up by mechanisms that limit or suppress di^2/i^2 or change in EEI to some minimum possible level. There, then, we do not face resource misallocation by the suggested policy. If such mechanisms are not available, be it from inside or outside, ISI serves better the purpose of accelerating economic growth.

5. ECONOMETRIC ANALYSIS

5.1. The Data

The statistical data used for estimating model [3.6] and conditionality [4.3] or [4.4] is taken from Financial Statistics Yearbook–1997, published by IMF (cf. IMF (1997)). There are four basic variables that are used by the model: Gross Domestic Product (GDP), Investment to GDP ratio, Population, and Exports.

The time series data for the first variable is given in the yearbook as a percentage increase of GDP at constant price over the previous year. The investment to GDP ratio data, as described in the yearbook, is the percentage share of investment in GDP. Investment comprises gross fixed capital formation and increase or decrease in the stocks. The population data were given as a mid-year population estimate of each country. Lastly, export data are value of exports from each country expressed in USD. The export data were further decomposed into their stable and unstable components to generate uncertainty variable that was used as a fifth variable.

The length of the series obtained for each variable varies from country to country and those countries having data series of length below 20 were omitted from the analysis to refrain from committing small sample bias. Moreover, Madagascar and Liberia were omitted from the data set for their data series lengths do not correspond to those of the remaining countries. Accordingly, 15 countries were selected from SSA countries, namely, Benin, Botswana, Burundi, Cameroon, Congo, Ethiopia, Ghana, Kenya, Mauritius, Nigeria, South Africa, Sierra Leone, Swaziland, Togo and Zambia. The length of the time series data was determined in such a way that it maximises the number of sample countries as well as the number of observations for each country. Accordingly, 1971-1990 was chosen for the analysis.

To decompose export data into their components, suitable trend that fits the data properly was needed. Generally one can expect three types of trends–exhibiting declining growth, constant growth and increasing growth. The values of the selected type of trend were considered to be measures of stable component whereas their residuals were taken to represent the unstable component. The choice among the three types of trends was made on the grounds of co-integration tests coupled with explanatory power of the curve fitted to the export data. That is, if the growth of stable and unstable components of the data cointegrate with the other variables (GDP growth, Investment to GDP ratio, Population growth), then it is considered to be a representative trend, and if there exist two or more of such curves then the decision was made on the ground of their explanatory power, R^2. Using data generated in this way, in subsequent sections attempt is made to estimate our analytical model derived in section-4.

5.2. Panel Data Analysis

According to Hsiao (1985), modelling a panel data set offers a number of advantages over traditional pure cross-sectional or pure time service data set. The most obvious advantage is that the number of observations is typically much larger in panel data. This quality is likely to produce more reliable parameter estimates, and most importantly enables one to specify and test more sophisticated models which incorporate less restrictive behavioural assumptions. To gain these advantages for our study and be able to derive a conclusive result for the region of study, in subsequent subsections attempt is made to employ this approach of analysis.

5.2.1. Model Specification

We specify equation (3.6) as ordinary regression model and confront the basic assumptions of this model with statistical test of validation. The model is said to have two basic advantages if its assumptions are valid. First, it is parsimonious–estimating small number of parameters with a large number of observations. Second, it is computationally simple. That is, by pooling the data set, a single equation is estimated by OLS estimation technique.

The model takes the form of

$$Y_{it} = B_{1it}X_{1it} + B_{2it}X_{2it}\ldots+B_{kit}X_{kit} + U_{it}\ldots\ldots\ldots\ldots \quad [5.1]$$

$B_{kit} = B_k$ for all i and t...Assumtion-1

$U_{it} \sim i.i.d\ (0,\sigma^2)$...Assumtion-2. Where i = 1 ... N, t = 1 ... T;

N and T being number of units and time length included in the study. If inclusion of constant term is required X_{1it} will be equal to one and there will be K-1 regressors.

The implication of the assumptions under this model specification is that it considers the uniformity of behaviour across units and in time, and that the observations are homogeneous or drawn from the same population.

Accordingly, the ordinary regression model specification of equation (3.6) will take the form

$$\left(\frac{dY}{Y}\right)_{it} = \beta_{oit} + \beta_{1it}\left(\frac{I}{Y}\right)_{it} + \beta_{2it}\left(\frac{dL}{L}\right)_{it} + \beta_{3it}\left(\frac{dx}{x}\right)_{it} + \beta_{4it}\left(\frac{di^2}{i^2}\right)_{it} + U_{it} \quad [5.2]$$

$\beta_{it} = \beta_k$ for all i and t.....Assumtion-1

$U_{it} \sim$ i.i.d $(0, \sigma^2)$.....Assumtion-2

Where $i = 1 \ldots N$, $t = 1 \ldots T$, (N=15) and (T =20 years) being number of countries and time length included in the study respectively.

5.2.2. Model Estimation

Under model estimation, the first task is testing the validity of the assumption imposed on the model. This test tells us whether or not the specification is adequate. The suitable test statistics for this purpose is F–test. It compares the unrestricted residual sum of squares i.e. model [5.2] without Assumption 1 with the restricted residual sum of squares, the restriction being the first assumption given in the model above. The test result is given in Table 5.1. It indicates that the null hypothesis that states the parameters are similar across the countries can not be rejected at 5% level of significance (P=0.0693). This result implies that there exists a uniformity of behaviour of countries in their economic performance. Non-rejection of the null hypothesis suggests the acceptance of pooling the data set to estimate a single equation. This in turn implies that we can use the total or (plain OLS) estimate as parameter estimates of [3.6]. The estimation result is reported in Table 5.1 below.

The table reports that investment to GDP ratio has the expected positive sign. Moreover, the t-ratio indicates that the variable is a strong determinant of GDP growth. The coefficient is significantly different from zero at 1% level of significance. The estimated coefficient suggests that in the region, a 1% increase (decrease) in the share of investment from GDP (that approximate capital growth) can increase (decrease) the GDP growth by 0.09%.

In the case of population growth variable we find an unexpected sign. From economic theory we know that the more the labour grows the more economic performance will be. However, here the estimate indicates the reverse relation. But, since the estimate could not pass test of significance at 5% level of significance, we can not conclude strongly that we are having a result differing from prediction of economic theory. Even if it passes the test such result can occur due to excessive unemployment and under-employment. Feder (1982), for example, emphasises, with some exceptions of the general prediction, by saying that the coefficient of labour growth should be significantly more than zero if labour surplus was not the prevalent situation in sample countries during the period covered.

The last two variables are the basic areas of attention for this study. The sign of the stable component of export certainly agrees with the claims of OOEP advocates, or with our expectation under the assumption of risk aversity and positive factor

differential in export sector. Moreover the estimate is significantly different from zero at 1% level of significance. The estimate found here does not vary from the estimates reported by different researchers. Feder (1982), for example, based on his cross-sectional study of semi-industrialised LDC's, reports the estimate to vary from 0.390 to 0.422. Berg and Schmidt (1994), based on time series study of Latin American countries, report the parameter estimate to vary from 0.051 to 0.332, which is slightly less than our estimate.

Table 5.1. Regression Estimates Using Panel Data Set
TOTAL (Plain OLS) Estimates

Variable	Estimated Coefficient	Standard Error	t-statistic
INVGDPR	0.099494	0.033277	2.98990**
POPG	-0.021615	0.040537	-0.533202
EXPOG	0.402179	0.062763	6.40790**
EEIG	-0.38286E-03	0.154312E-03	-2.48107*
C	-1.16177	0.693724	-1.67468

* Significant at 5% level. ** Significant at 1% level.

F test of A,B=Ai,Bi: F(65,230) = 1.2143, P-value = [.06931] Critical F value for diffuse prior (Leamer, p.114) = 8.6381, T=20, N=15.

Between (OLS on Means) Estimates

Variable	Estimated Coefficient	Standard Error	t-statistic
INVGDPR	-0.063468	0.099728	-0.636413
POPG	0.316805	0.395557	0.800908
EXPOG	0.623974	0.138863	4.49345**
EEIG	-0.396823E-04	0.821141E-04	-0.483258
C	-0.740459	2.00773	-0.368804

* Significant at 5% level. ** Significant at 1% level.

The estimate obtained here suggests that a 1% increase (decrease) in stable component of export can bring 4 basis point increase (decrease) in GDP growth of the region. In fact, the elasticity here cannot be directly compared with the estimate cited above for we are dealing with the stable component of the variable alone. But the above results may give a rough estimate of our elasticity. The result obtained here supports the claim of OOEP advocates if we could get enough reason to assume absence of uncertainty. However, since we are aiming at examining its absence, it seems illegitimate to make a priori assumption. Hence, we have to consider the presence of uncertainty initially and the regression assigns zero coefficient if it is not really there. Based on the underlying assumptions we made about the agents and the sectors of the economy, we expect the coefficient of variable of uncertainty (β_4) to have a negative sign. The estimated model shows that the coefficient has a sign that

agrees with this expectation. Moreover, the coefficient was found to be statistically significant at 5% level of significance. At first glance, the estimate seems infinitesimal but since the growth in variable of uncertainty i.e. growth of EEI is a very large number, its impact on growth can not be neglected. From the sign and statistical significance of this estimate we can argue that uncertainty has been one of the factors that have been deterring economic growth in the region. Furthermore, we can infer that, if the structure of traded commodities remain unchanging (i.e. if not vertically diversified), uncertainty is one of the factors that deter economic growth of SSA region.

The estimated model from the mean data has additional information concerning the methodological problem faced in estimating the effect of OOEP in 1970s based on cross-sectional data. The between (OLS on means) estimate is similar to cross-section analysis as it runs OLS on the time-wise averages. Two basic points stand clear from this estimate. First, we observe that the coefficient of dx/x is greater in this case than the proceeding one (0.6239 in the latter approach and 0.4021 in the former case). That is, cross-sectional analysis has an exaggerating effect on the parameter estimate. Such results of cross-sectional data have induced empirical researchers of 1970s to conclude their studies in favour of OOEP. The second interesting result is that the variable of uncertainty (di^2/i^2) has extremely small and insignificant coefficient. That is, when we take the time-wise average of uncertainty, its negative impact on GDP growth or economic performance will be unobservable. Thus the–OLS on mean–result, being set in accordance with neo-classical assumption (absence of uncertainty), gives the overstated effect of OOEP on economic growth.

Next ia also of interest to estimate the long run cost/benefit of OOEP on the region by considering the mean of export growth over the twenty years and the mean of variable of uncertainty, by taking the parameter estimates of the fourth and fifth components of the model, and average values of the variables in the study period. The result leads one to conclude that the region has been loosing 0.153% growth of GDP per year (see Annex-1) due to export. That is, the region was not in a position to fulfil condition [4.3]. The estimate here indicates that, as far as the structure of traded commodities is unchanged, the net effect of OOEP in the region in the long run is deterring economic performance rather than what is suggested conventionally.

Finally, as we have seen in section 2, policy choice in the region is not purely made internally. Be it willingly or unwillingly, there are external influences. Hence, one may ask questions like, under what condition will OOEP be effective to serve its face value for the region? Answering such questions demands solving some minimum requirements for stable export growth, given by conditionality [4.2]. Assuming that the pattern of uncertainty generated from export volatility that has prevailed in the past will repeat itself in the future, we can estimate the minimum growth required in stable component of export that could overcome the adverse effect of uncertainty in the long

run. Accordingly, the minimum growth required in stable component of export for the region is 7.1874% per year (see Annex 3). Thus, to have benefited from the policy, the region has to be able to keep its stable export growth above this critical point. Indeed, fulfilment of such condition can be met if there is enough external demand for SSA products and if there is production capacity improvement. On the other hand, the deteriorating nature of demand for primary products has been emphasised by a number of researchers, which makes the attainment of such target very unlikely. Under this circumstance, there should exist trade agreements between the region and other trading partners that make the later absorb some part of volatility, say, like export earnings stabilisation scheme, as far as there is external insistence for OOEP. Otherwise, SSAs better refer to their post independence economic history that gives a better hint for accelerating economic growth of the region.

6. SUMMARY AND CONCLUSION

6.1. Summary

By making a point of departure, Feder's (1982) formulation and decomposing export variable into its stable and unstable components, an equation that links uncertainty to economic growth was developed.

From this derivation, it is possible to conclude that uncertainty deters economic growth if the agents are risk-averse, and if there is a positive factor differential in the export sector and a positive externality of the export sector on the non-export sector. Similarly, if these three assumptions hold, the growth of stable component of export contributes positively to economic growth. Under this circumstance, the point requiring due attention is whether or not the cost incurred by uncertainty from export instability is compensated by the benefit thereof. The analysis implies that if the growth of stable component is very low and the volatility is very high there is a risk of loss of economic growth. This situation resembles the case of agricultural commodity exports, since the demand for these commodities deteriorates overtime and the supply side depends on uncontrollable and unpredictable factors. That is, the prevailing situation on the demand side limits the growth of the stable component of export while the situation on the supply side, coupled with some adverse factors from the demand side, promotes the volatility of export over time. Hence, it is difficult to rely on outward-oriented economic policy for the purpose of accelerating economic growth as far as the region remains primary commodity exporter.

The econometric analysis gives empirical evidence supporting this argument. The analysis was made using panel data to derive concise conclusion about the region, while being refrained from the shortcomings of cross-sectional data. The result of the analysis indicates that the structure of the traded commodities of the region has to allow an

annual growth rate of at least 7.5% in its stable component of export to benefit from implementing such a policy.

6.2. Conclusion

Despite the conventionally held view about the outward-oriented policy, the analytical results obtained here indicate that the policy is effective, in terms of accelerating economic growth, only if some economic conditions are fulfilled. These conditions are specified in terms of growth of stable components of export. To benefit from the policy, the required level of export growth may lie above the reach of some countries since growth will not be determined solely by internal factors. Even if growth is determined by internal factors alone, these factors may not purely be in the hands of economic agents, especially in the case of production of agricultural commodities. Hence, the option of raising the growth of stable component of export may not always be practical. An alternative, for those who could not fulfil the condition, is to suppress volatility of export earnings. This in turn requires either resource mobilisation away from the highly uncertain sector–agricultural–or the existence of some mechanism from trade partners' side arranged to cover the risk of loss emerging from the policy. Otherwise, it is better if SSA countries refer to their post independence policy choice and growth history that provides a good hint for solving the growth problems of the region.

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APPENDIX 1. THE EXPECTED SIGNS OF Ψ_1 AND Ψ_2

1.1. The Expected Sign of Ψ_1

The sign of Ψ_1 is expected to be positive i.e. $\Psi_1 = E(\Psi_{1i}) > 0$

Proof:

Expected utility analysis indicates that uncertainty hampers output level if the agents are risk avers type. That is

$$\sum_{i=1}^{n} X_i < \sum_{i=1}^{n} x_i \qquad [A1.1]$$

Where X_i –export earnings at period t, and x_i –the trend value of export earnings at period t.

Inequality of (A1.1) implies $\sum X_i - \sum x_i < 0$

$$\Rightarrow \quad \sum(X_i - x_i) < 0 ; \qquad \Rightarrow \quad \sum(1 - x_i/X_i) < 0$$

$$\Rightarrow \quad n - \sum(x_i/X_i) < 0 \qquad \Rightarrow \quad \sum(x_i/X_i) \cdot 1/n > 1$$

Accordingly, lets consider the probability density function f(.) of x_i/X_i. Assume uniform distribution in discrete form i.e. f(.) = 1/n and "E"denote the mathematical expectation, then

$$\sum(xt/Xt) \cdot 1/n > 1 \quad \Leftrightarrow \quad E(x_i/X_i) > 1 \qquad [A1.2]$$

$$\Rightarrow E\left[\frac{x_i}{(X_i - x_i) + x_i}\right] > 1$$

$$\Rightarrow E\left[\frac{1}{[(X_i - x_i) + x_i]/x_i}\right] > 1 \ldots\ldots\ldots\ldots i.e. \psi_1 = E(\psi_{1i}) > 1$$

This proof proposes that, if a) all agents are risk-averse and b) export sector has relatively higher factor productivity and positive externality on non-export sector, then expected export growth could promote economic growth keeping other factors unchanging.

1.2. The Expected Sign of Ψ_2

The sign of Ψ_2 is expected to be negative. i.e. $\Psi_2 = E(\Psi_{2t}) < 0$.

Proof:

From [A1.2] above

$$E(x_t/X_t) > E(1) \quad \Rightarrow \quad E((x_t/X_t)-1) > 0$$

$$\Rightarrow \quad E[x_t - X_t)/X_t] > 0 \quad \Rightarrow \quad E[(X_t-x_t)/X_t] < 0$$

$$E[u_t/X_t]<0 \; E[u_t/(u_t+x_t]<0$$

$$\Rightarrow E\left[\frac{1}{[u_t + x_t]/u_t}\right] < 0 \ldots\ldots\ldots\ldots\ldots i.e. \psi_2 = E(\psi_{2t}) < 0$$

This proof, on the other hand, proposes, if assumption associated with [A1.2] holds true, then expected growth in export earnings instability can deter economic growth keeping other factors constant.

APPENDIX 2

From descriptive statistics, we know that average annual GDP growth rate of the region (r^*) will be

$$r^* = \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\left(\frac{dY}{Y}\right)_{it}}{NT} \qquad [A2.1]$$

By substituting the right hand side of equation [5.2] in [A2.1], we get

$$r^* = \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}(\hat{\beta}_0)}{NT} + \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_1\left(\frac{I}{Y}\right)_{it}}{NT} + \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_2\left(\frac{dL}{L}\right)_{it}}{NT} + \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_3\left(\frac{dx}{x}\right)_{it}}{NT} + \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_4\left(\frac{di^2}{i^2}\right)_{it}}{NT} \ldots A2.2$$

To get average annual contribution of trade to growth($r^*_{4,5}$), we take the sum of the fourth and fifth components of the right hand side of A2.2, as

$$r^*_{4,5} = \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_3\left(\frac{dx}{x}\right)_{it}}{NT} + \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_4\left(\frac{di^2}{i^2}\right)_{it}}{NT} \quad \text{.....A2.3}$$

[A2.4] indicates the sought contribution in the past can be estimated by multiplying the parameter estimates by the mean of their respective variables. Accordingly,

$$r^*_{4,5} = \hat{\beta}_3 \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\left(\frac{dx}{x}\right)_{it}}{NT} + \hat{\beta}_4 \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\left(\frac{di^2}{i^2}\right)_{it}}{NT} = \hat{\beta}_3\overline{\left(\frac{dx}{x}\right)} + \hat{\beta}_4\overline{\left(\frac{di^2}{i^2}\right)} \quad \text{.....A2.4}$$

$$r^*_{4,5} = 0.402179 \times 6.807132 + (-0.0003828) \times 7550.16 = -0.153\%$$

APPENDIX 3

To gain long run benefit from trade in the form of growth $r^*_{4,5}$ in [A2.3] of Annex 2 has to be positive, i.e. the net effect of trade has to be positive.

That is

$$r^*_{4,5} = \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_3\left(\frac{dx}{x}\right)_{it}}{NT} + \frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{\beta}_4\left(\frac{di^2}{i^2}\right)_{it}}{NT} > 0 \quad \text{.....A3.1}$$

A sufficient condition to fulfil requirement A3.1 is to keep growth of stable component of export above some level as

$$\left(\frac{dx}{x}\right)_{it} > \frac{-\hat{\beta}_4}{\hat{\beta}_3}\frac{\sum_{t=1}^{T}\sum_{i=1}^{N}\left(\frac{di^2}{i^2}\right)_{it}}{NT} = \frac{-\hat{\beta}_4}{\hat{\beta}_3}\overline{\left(\frac{di^2}{i^2}\right)} \quad \text{.....A3.2}$$

If the region fulfils condition A3.2 then the required target A3.1 can be met. Algebraically,

$$\left(\frac{dx}{x}\right)_{it} > \frac{-\hat{\beta}_4}{\hat{\beta}_3}\overline{\left(\frac{di^2}{i^2}\right)} = \frac{0.0003828}{0.402179} \times 7550.16 = 7.1874\%$$

PROSPECTS FOR A SECURITIES MARKET IN ETHIOPIA[1]

Yishak Mengesha

ABSTRACT

This paper highlights the need for a securities market, the supply and demand prospects for it as well as some of the challenge of the market. It shows that the financial structure of the country is dominated by commercial banks whose major function is mobilising short-term liabilities and largely making short-term loans. The banks' activities in financing long-term loans are limited. On the other hand, a look at the demand prospects for a securities market suggests that there is sufficient ground to start such a market. The ongoing privatization process as well as the existing and newly-formed share companies will be potential supply sources of the market. Government securities may be another source when and if it resorts to indirect monetary policy instruments. Demand for stocks may come from portfolio adjustment of individuals, institutional savers, growth and distribution in income and employment. Initially, the market will be small in size. Nonetheless, it can help fill some of the gaps in the financing of investment activities in the country. Once started, the future growth of the securities market depends on the growth of the overall economy, the extent to which a stable economic, political and regulatory environment is maintained, as well as the capacity to generate professional analysts and managers.

1. INTRODUCTION

Securities markets, where shares and bonds are traded and re-traded, are becoming part and parcel of the financial institutions in many low-income African countries. The need for a securities market, as the next step in the ongoing financial liberalisation is gaining consensus among various groups in the country.[2] A number of efforts,

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notably by the Addis Ababa Chamber of Commerce and the National Bank of Ethiopia, are being made towards institutionalising the market. What is perhaps lacking at this stage is a clearer explanation of what exactly the market is for, and an assessment of the potential sources of supply and demand in the market, as well as the major challenges ahead.

This paper attempts to fill some of the gaps by (a) providing some of the justification for a securities market in Ethiopia; (b) assessing the potential supply and demand for securities; and (c) identifying some of the major challenges that the market is likely to face in the future.

This paper is organised into seven parts. Part two reviews some of the relevant literature. Part three assesses the saving and investment trends. It also looks into the current financial structure in the country identifying the potential role a securities market can play in the economy. Part four deals with the assessment of the potential sources of supply and demand in a securities market. Part five explores the likely size of the market. Part six draws attention to the issues and constraints, both for the formation of the market and the factors likely to determine its size and strength once the market is formed. And part seven provides the summary and conclusion of the paper.

2. A BRIEF REVIEW OF THE LITERATURE

Securities markets play an important role in the financial sectors of many developed and emerging economies. Many African countries are also instituting the market one after the other (Kenny and Todd 1998). Many see the market as a vehicle to mobilise new capital that can be channelled to industries and companies that need it most (Drake 1985; Samuel and Yacout 1981; Kitchen 1987; Jefferis 1995; Popiel 1993). Drake (1977, 1985), Kitchen (1987) and Jefferis (1995) have summarised the main advantages of securities markets, which mainly include:

1. Provide resources that will finance long-term investments; i.e., for new plants and equipment as well as expansion of existing plants.
2. Make available risk capital for which there is no maturity date and the company is not obliged to repay it back (i.e., in the case of shares).
3. Provide the opportunity for a broader public ownership of companies.
4. Enhance competition in the financial sector, and in doing so,
5. Improve the allocation of scarce financial resources among competing projects or companies.
6. Foreign resource inflow may be encouraged provided the market is opened to the rest of the world and the return is sufficiently attractive.

7. A well-developed stock market can also reduce over-dependence of companies on the banking sector and reduce the risk emanating from high debt-equity ratio.
8. Provide an opportunity for institutional savers (e.g. Pension Fund and Insurance Companies) to buy shares and corporate bonds, which would help diversify towards a more balanced portfolio holding instead of exclusively holding government bonds and treasury bills, which are of low return.

Although many of the writers on the stock market are optimistic about the contribution it can make to economic development, there are, nonetheless, others with a dissenting view or at best with a cautiously optimistic view. Pessimistic views (e.g., Calamanti; Singh) or cautiously optimistic views (e.g., Samuel and Yacout) on the securities market in developing countries often spring from the efficiency of the market, and its allocation and distribution impacts on savings, income and wealth. Calamanti (quoted in Drake (1985), and Jefferis (1995)), based on studies he conducted on some African markets, for example, pointed out the undesirability of the market, mainly because of the volatility likely to be introduced by the market might amplify, if not cause, economic fluctuations, which may undermine the financial stability and growth. This, he argued, would adversely affect the allocation of savings, income and wealth.

The point raised by Calamanti is also shared by Singh (Singh 1993). He argued that share prices do not often reflect the true "long-term expected earnings" of companies since, by and large, they are determined by events, speculative and short-term profit motives of those who participate in the market (Singh 1993:14). He asserts that developing countries should develop the banking system rather than the stock market which is often characterised by high volatility and speculative activities, with a consequence of "more harm than good to the real economy" (Singh 1993:23).

Stock price volatility is of course a serious problem for a fledgling market with a few number of listed companies, less liquid and low level of capitalisation. However, the issue is putting the cause and effect in their proper perspective. In most cases, stock prices tend to be unstable when confidence-eroding shocks arise somewhere in the system. It is argued that overall stock price behaviour generally follows the industrial sector's performance and policies (Nishat and Saghir 1991:140; Ahmed 1998:77). Stock market traders simply react to these shocks and policies (Kenny and Todd 1998:837). This suggests that under sound macro-microeconomic and regulatory environment, stock price volatility becomes an unimportant issue.

The debate on bank-based *versus* stock market is an unsettled issue (Demirguc-Kunt and Levine 1999). But in a number ways, the argument for a stock market does not seem to be a matter of choice over banks. First, banks alone may not be able to provide all the necessary financial resources for all type of investors. Banks also operate under strict prudential regulatory limits with no room for investment risk

sharing. In this respect, a stock market would be more preferred in as far as it allows risk sharing among diverse shareholders (Kenny and Todd 1998:837; Craigwell and Grandbois 1999). Secondly, in some respects, banks and stock markets may be mutually supportive to each other. The information disclosure requirement, which raises accounting and auditing standards, and other regulatory and institutional infrastructures required for a securities market may increase the flow and availability of more accurate information that could be useful for banks in their lending decisions. Banks, through their branch network, can facilitate the transaction of securities (Kenny and Todd 1998:837). Evidence is also emerging that shows the complementarity between banks and stock markets (Demirguc-Kunt and Levine 1996:314-316). Boyd and Smith (1996) also concluded that debt and equity markets complement each other rather than substituting.

Based on an analysis of the Nigerian stock market, Samuel and Yacout (Samuel and Yacout 1981), argued that given the small market size, a "fair game" for traders and a "fair pricing" of shares is difficult to expect. Limited supply of shares, excess demand for shares together with the motive of 'buying shares in order to hold', and discontinuities in trading would hinder market prices from fully and instantly transmitting available information and reflect demand and supply situations. Olowe (1998) also contends that stock markets in Africa suffer from poor information disclosure and doubtful pricing methods with the consequence of securities being 'grossly overpriced' or 'under-priced'. He found some empirical evidence from the Nigerian stock market suggesting some 'abnormal returns' from share trading which corroborates the argument advanced by Samuel and Yacout's. His test was based on the semi-strong form of market efficiency[3]. By and large, this may be attributed to some kind of monopolistic access to information and might have a bearing on the saving allocations as well as on the income and wealth distribution as pointed out by Samuel and Yacout. Poor communication infrastructures and low level of literacy in financial analysis and interpretation obviously suggest a weak information processing capacity, with a negative impact on the efficiency of the market (Olowe 1998).

The issue of market inefficiency may not, however, be suggestive of the undesirability of the market. It can only warn against placing undue emphasis on the market. In spite of market imperfections, securities markets are asserting their place in the financial sectors of many developing countries. Market efficiency is strongly linked with the institutional, human capacity and the economic environment at large. It improves as the economic and institutional environment changes for the better. Empirical evidence by Demirguc-Kunt and Levine (1999) based on developing and developed countries shows that "in higher income countries, stock markets become more active and more efficient relative to banks" (Demirguc-Kunt and Levine 1999:36).

3. JUSTIFICATIONS FOR A SECURITIES MARKET IN ETHIOPIA

Obviously, the potential role of a securities market in Ethiopia should be to fill gaps in the financing structure of the economy. The need for a securities market in Ethiopia may be justified on grounds of macroeconomic conditions, particularly on the saving-investment situations, and the structure of the financial institutions involved in the mobilisation and allocation of financial resources. It can be argued that a securities market may be treated as an additional means through which financial resources can be mobilised so as to augment the overall saving rate in the country. The inadequacy of the existing financial institutions, particularly in the financing of investment projects with long-term payback period also calls, among others, for a securities market.

3.1. Saving and Investment Trends

A brief assessment of the saving and investment situations of the country shows that although the ratio of investment to GDP during the Derg (1974-91) was not much different from the imperial era, the saving rate nonetheless went down significantly during the latter period. The rate of capital formation towards the end of the imperial era was about 12.6% (Table 1), of which gross domestic saving financed about 87%. External resource inflow constituted a mere 1.6% of GDP or about 12.7% of the investment expenditure made in the country. The fiscal stance of the Imperial government was also characterised by low levels of budgetary deficit, domestic and external borrowings. Current expenditure was, more or less, in line with current revenue suggesting the saving rate, that stood at about 11%, was entirely due to the private sector. Capital expenditure hardly exceeded 4% during this period, the financing of which was largely from external borrowing (about 3%) and domestic borrowing (less 1%) (Eshetu and Mekonnen 1992). The saving- investment trends observed during this period coupled with the low budgetary deficit led to a low debt-to-GDP ratio.

In contrast to the Imperial period, the saving rate during the Derg deteriorated rather drastically. It went down to about 4%. The rate of capital formation more or less stagnated at about 12.3% on average but the largest proportion of it was financed by external resource inflow. Resource gap grew from 3.2% at the beginning of the Derg era to about 9.8% at the end of the period (Table 1). Nearly 70% of the investment expenditure actually made was financed by external borrowings and assistance. This significantly increased the country's dependence on the external world and raised the debt-to-GDP ratio to a significant degree.

The investment rate during the last seven years of post reform period shows recovery as it went up to about 18% on the average compared to 14% at the end of the Derg period. Still this is largely financed by external resources in the form of borrowing and

transfers. Domestic saving stagnated at about 7% in the post reform period but resource gap grew to about 11% (Table 1) of GDP from 9.8% at the end of the Derg Period. Gross National Savings, however, rose to 15% from 10.6% at the end of the Derg era. At any rate, dependence on the rest of the world has not shown any sign of abatement, and resource gap amounts to nearly 63% of the country's investment expenditure.

At the household level, a recent survey shows that countrywide rate of saving stands at 4.6% (Table 5). This suggests that over 65% of the country's domestic saving comes from the household sector. Urban households save about 8.6% of their earnings as opposed to the 3.6% of the rural households. Table 5 reports the saving and non-saving groups of the households. Of the total households, only about 20% make a positive saving suggesting that the countrywide 4.6% saving rate cited above was entirely due to this group. This group of households is, of course, a relatively well to do as they claim a third of the total households' earnings. About 46% of the households claiming about 31% of the total earnings, on the other hand, spend more than their earnings, while nearly 34% of the households claiming about 38% of the total earnings make neither positive nor negative savings (Table 5). About 84% and 79% of the urban and rural households, respectively, make either negative savings or none[4]. As a reflection of the low level of savings, the households' expenditure pattern shows that consumption expenditure constitutes well over 92% (Table 8).

If saving rate is so low, what resources is the securities market to raise? This is a legitimate question. Low level of domestic saving is generally attributed to a low level of income but need not suggest the absence of potentials to mobilise additional resources for investment through the institutionalisation of additional markets such as those of securities. One can cite a number of reasons why Ethiopia needs a securities market despite low level of income.

First saving mobilisation depends on a number of other socio-economic factors though income is certainly very important. Accessibility to banking and other alternative means of asset holdings, for example, could be an important factor in households' decision to save or not to save[5]. In a recent cross-country analysis of Sub-Saharan African (SSA) countries by Ikhide (1996), in which Ethiopia was included, bank branch per population ratio turned out to be an important variable in determining the gross domestic saving ratio[6]. Second, the current external Debt-GDP ratio, which stands above 100% does not seem to be sustainable and dependence on external resource inflow is less likely to continue for long, at least at the current level let alone at a level that matches the needs of the country (World Development Report 1997). Third, Gross Domestic Saving rate of low income countries on the average stands at 30%. Excluding China and India, this rate stands at about 10% which is significantly higher than the 7% for Ethiopia. The average for sub-Saharan Africa, on the other hand, stands at 16% of GDP (World Development Report 1997). Fourth, in

spite of the fact that income is low, studies show that there are substantial voluntary saving potentialities even among rural population in Africa (Ingham 1992; Mofunanya 1992). Given appropriate strategies including better rate of return and that access to financial services are in place, these potential savings can be mobilised and channelled to more productive investment activities. Fifth, even in the absence of potentials to mobilise, stock markets may induce economic actors to change their asset portfolio holdings away from physical and passive asset holding towards shares which are easily mobile and convertible into cash and investible assets. Finally, a securities market is not new to Ethiopia. Though rudimentary, there was a stock market in the country prior to the 1975 period, known as the Addis Ababa Share Dealing Group. This was formally established in 1960, when the government put up a department that facilities a share dealing and exchange under the state Bank of Ethiopia (Von Pischke 1968; Feyera 1995). Von Piscke (1968) reported that the public response during the first few years was quite encouraging. In about four years, the number of listed companies more than doubled; total value of shares bought and sold to the public significantly increased, which, considering the embryonic stage of the industrial and commercial activities, were quite encouraging[7].

3.2. Current Financial Structure

3.2.1. Institutional Structure

The financial structure of Ethiopia is such that it has completely been dominated by the banking sector for the last two and half decades. Currently, there are three government owned banks, one operating as a commercial bank–the Commercial Bank of Ethiopia (CBE); one development bank–the Development Bank of Ethiopia (DBE), and the Construction and Business Bank (CBB). The DBE is a specialised bank geared towards project financing. The CBB had a tradition of exclusive involvement in the housing and real estate development sector prior to its re-establishment in 1994[8]. Currently, the CBB provides universal banking services. Six private commercial banks established since the country started economic liberalisation are also operating in the market. In addition, one government owned insurance company and eight private insurance companies, and one pension fund are operating in the financial market.

In spite of long banking history, there are only about 270 banking branches operating throughout the country, roughly suggesting a population to branch ratio of 230,000. This is indeed extremely low even compared to many African countries. Evidence from Ghana and Malawi shows a population to branch ratio of less than 30,000 (Nissanke 1991). This, to a large extent, suggests that the effort to mobilise domestic resources for investment have been limited, which perhaps may have contributed to the low level of savings.

The institutional structure of the financial sector further shows that risk sharing and other institutions such as mutual funds, private pension funds, investment banks, money and capital markets, venture capital companies etc. that offer broader opportunities for saving and investment are lacking.

3.2.2. Trends in Bank Credit Allocation

Outstanding loans and advances from the banking system (excluding from the National Bank of Ethiopia (NBE)) extended to the various sectors in the economy is about 36%[9] of GDP. Of the total loans, claims on the central government accounts for nearly 18%, while the rest is accounted for by the non-central government (Table 2). This picture is changing rapidly in favour of the private sector which is growing faster than the central government (Commercial Bank of Ethiopia 1998; Alemayehu Geda 1999).

A sectoral breakdown of loans and advances from the banking sector for 1999 show that credit to the domestic and foreign trade accounts for about 28% followed by the central government which accounts for 17.8% (Table 2). Both of these claims for about 46%, which are indeed short-term loans maturing mainly within or less than a year. Agriculture and industry account for 7 and 11%, respectively. But a good part of this goes to finance fertiliser import and distribution as well as meeting working capital needs of Public Enterprises (PEs) and private companies rather than investment activities[10]. Statistics on the sources of loans show that about 73% of the loan made in 1999 originated from the commercial banks, which by and large, are short-term loans (Table 2). The DBE and the CBB constituted about 22% and 4.8% of the total credit, respectively. As stated above, a good part of the loan extended by the DBE was to finance agricultural inputs such as fertiliser distribution, which often has a maturity period of less than a year. The CBB, though has a wide involvement in the housing and construction sector, shifted towards providing universal banking services including short-term loans. Thus, the size of the long- term credit is likely to be smaller than is suggested by the share of the DBE and CBB.

This perhaps shows that long-term loans are not well received by the banking sector. In the long-term, fundamental economic and financial variables in the economy may change their course, making long- term loans more liable to interest rate and exchange rate risks as well as to liquidity risks than is short- term loans. This would, in the face of short-term maturing liabilities as discussed below, inhibit banks from extending loans to projects with long payback periods. In some cases, it appears rational for banks to prefer excess liquidity build up rather extending credits to finance projects[11]

The share of long-term loans of the CBE, mainly extended in syndicate with the DBE hardly exceeds 10% of its total credit (Commercial Bank of Ethiopia 1998). In addition,

project finance extended by commercial banks has limited grace period. Disbursement is spread over the project life (i.e., implementation period) mainly to avoid mismatch in the assets-liabilities of a bank[12]. It also generally covers about 40% to 60% of project costs. Customers desiring beyond 60% equity finance from the commercial banks are less likely to be entertained.

There is also another dimension to this problem. The high level of non-performing loans experienced by banks in many countries and the consequence cautious attitudes adopted would make banks less reliable to venture into long-term investment activities (Drake 1985). In the African banking sector, the share of non-performing loans for some selected countries such as Kenya at one time was as high as 15%[13] 20-40% for Zambia, 70% for Uganda and 60% for Nigeria (Brownbridge 1996a, 1996b, 1996c, 1996d).

Ethiopia's situation is no better[14]. These situations are not entirely the outcome of allocating banking fund to long-term projects but the consequence of gross misallocation of resources including to wrong lines of activities which ultimately undermines the operation of the banking sector and precipitates banking failure. Nonetheless, the alarming rate of doubtful loans would make banks cautious to extend loans likely to turn out to be non-performing.

Another feature of the banking sector is the collateral requirement. Many of the banks require a minimum collateral of 100% to 150% of the loan depending on the purpose of the loan and type of the collateral. This is the case with the CBE. The DBE as well requires collateral of 125% for a loan extending up to 15 years (Bekele 1998). Collateral requirement is generally a major problem particularly for projects and companies with good growth prospects but without adequate tangible assets. This would negatively impact both short- and long-term credit expansion, and consequently investment activities in the country[15].

Even if one ignores the issue of project financing, the need for a securities market becomes not entirely a matter of preference (i.e., banks versus stock markets). The resource needs of an economy, as large as that of Ethiopia, at least in terms of population size, is unlikely to be met by banks alone. Securities markets can serve as additional conduit through which resources can pass from the general public to the investing community (Craigwell et al., 1999). Moreover, although banks can extend loans to finance investment activities, securities markets may be better than banks in some respects. Securities markets permit risk sharing among shareholders suggesting that companies would be more encouraged to invest and expand their range of operations (Craigwell and Grandbois 1999; Kenny and Todd 1998).

3.2.3. Trends in Deposit Liabilities of the Banking System

The resource base of the banking sector as well suggests that the room to involve in long-term loan by the banking sector is limited. First, nearly 91% of the deposits is in the form of demand and savings deposits which are payable at request or at short notice[16]. The share of time deposits, which roughly match up with the medium and long- term loans, constitute only about 9% of the total deposits (Table 3). Thus, long-term loan is likely to be constrained by the type and size of funds received by the banking system in the form of deposits. Secondly, nearly 93% of the deposits is mobilised through the commercial banks. The DBE, and the CBB which to some extent is thought to involve in medium and long-term loans, mobilise only 7.3% of the total (Table 3). The share of the DBE is extremely low amounting only to 4.4%. It largely depends on the resources mobilised by the other commercial banks, mainly the CBE, and on the NBE (Bekele 1998).

Apart from this, development banks tend to suffer disproportionately from defaults and accumulation of non-performing loans with a negative consequence on their capacity to make further long-term loans. The evidence from Ethiopia as well as from other countries is that banks providing development loans are often undercapitalised, severely liquidity-constrained and often with a negative net worth (Nissanke 1991, Bekele 1998). Moreover, it has been indicated that owing to the weak resource base, the DBE can meet only about 10% of the total project costs approved by the Ethiopian Investment Authority (Bekele 1998).

Inadequacy of resources for long-term projects is likely to be a formidable constraint placed on investment activities in the country, but at the same time, it shows the potential role securities markets could play in the future. Of course, maturity transformation (e.g., borrowing short-term and lending long-term) is one of the basic functions of banks. But the practice shows that granting loans that mature up to ten years or more can only be made under exceptional circumstances and with extreme caution.

4. SUPPLY AND DEMAND PROSPECTS FOR A SECURITIES MARKET[17]

The foregoing assessment shows that the financial structure in Ethiopia is dominated by the commercial banks whose major focus is on mobilising short-term liabilities and extending predominantly short-term loans. The recently established private commercial banks have limited capacity and are less reliable to support project financing[18]. The banks, expected to extend loans for projects with long-term pay back, have limited resources of their own to sustainably support long-term credit supply to the economy. This clearly indicates that a securities market is a missing element in

the financial structure of the country. What follows is an assessment of the demand and supply prospects for establishing a securities market in the economy.

4.1. Supply of Shares

The process of privatisation currently underway, existing share companies, new investors coming into the scene and government securities are likely to be the potential source of supply of shares for the market. These are briefly discussed below.

Privatisation

Country experience shows that privatisation generally deepen and widen an existing securities market as it boosts the supply of shares and increase the number of participants in the market (Freckleton 1995). Market capitalisation and turn over ratios tend to grow rapidly following privatisation. This was in particular notable in Jamaica, among others, in which privatisation has been used to stimulate the stock market (Freckleton 1995). The stock market in Nigeria made significant expansion in the late 1980s and early 1990s when public offer of securities was one of the most popular means of privatisation (Ikhide 1997). Privatisation benefits from the opportunities the securities market provides as it allows the wider public to participate in the privatisation process and help partially, if not wholly, overcome the capital constraints needed for divestment.

The absence of a securities market in Ethiopia may have a negative impact on the speed of privatisation but privatisation itself is likely to create a propitious ground for the establishment of this market by augmenting the potential supply of securities in the near future. So far, Ethiopia has divested over 170 public enterprises (PEs), most of which constitute small shops and hotels. Given the small size of the PEs privatised to date, their conversion to share companies is likely to be limited. Large-scale PEs, numbering over 120, are planned for privatisation over the next three years. The large size of these companies together with the limited financial capacity of the domestic entrepreneurs suggests the need for participating of the general public at large[19] if privatisation is to succeed. And, share floating is the most convenient modality to ensure the participation of the general public (Economic Commission for Africa 1999). Even in this case, successful participation of the public depends on a number of factors including on the efforts made to create awareness, the way share prices are set, and if the public is convinced that share prices bring higher rate of returns than alternative forms of investment. Given a low level of income and saving, the public can be expected to make a notable participation if share prices are set sufficiently low.

The just enacted privatisation law stipulates, among others, that some of the PEs shall be converted into share companies before being transferred into the hands of the private sector (Ethiopian Privatisation Agency June 1999E). Per this proclamation, a

number of the PEs are being converted into share companies to prepare the ground for share floating to the public. This source may at least be an important one in the short to medium period; in the long-term, the driving force for the securities market would be the motive to expand by the existing companies and the establishment of new ones.

Existing Share Companies

Once shares are acquired, they have to be traded and re-traded in the secondary market in response to the motives and needs of individuals for liquidity, and acquire other securities with a better rate of return. However, in a situation where the securities market is a missing element, the possibilities to easily dispose of shares and acquiring other securities appears to be difficult if not impossible. The transaction costs involved under such a situation is likely to be significantly higher than would have been under the presence of a securities market. Moreover, the ease with which shares are transferred matters a lot for individuals' decisions to hold shares.

High transaction cost is unlikely to be true in Ethiopia as a sizeable number of share companies and shareholders exist in the country, partly owing to the deregulation of the economy which made licensing relatively easy for new investments and establishments. Though country-wide data is not available, there are about 133 share companies with a total capital of 1.06 billion Birr, registered with the Addis Ababa Administration, Trade and Industry Bureau[20] (Table 6). Total shareholders of these companies stand at 9,509, and membership ranges from as few as 3 to 1,400. Of these, 17 companies are with shareholders above 100. Of these companies, nine of them have an initial capital of 50 million Birr and above, while about 21 of them have an initial capital ranging between 10 and 50 million Birr. More than 50% of the share companies, however, have an initial capital of less than a million Birr, suggesting majority of them are owned by close relatives which are generally regarded as less willing to let the control of their businesses to outsiders.

Nevertheless, with the opening up of a securities market, more companies in need of resources larger than what their own fund allows may come to the picture. Existing under-capitalised companies may as well be encouraged to issue additional shares to bring their paid up capital to the required level[21]. Large corporations with significant long-term investments may as well be important players in augmenting the supply side of the market in the future, mainly by issuing corporate bonds[22]. In the meantime, the absence of a securities market makes entry and exit of individuals holding equity shares relatively difficult and probably of high cost. This would be sufficient to discourage individuals from holding shares. The establishment of a securities market may thus be expected to provide much more flexibility in the transferability of shares (i.e., through its secondary market) and hence improve resource allocation as entry and exit would be easier than is currently being practised.

New Investors

Newly established companies could be another source of supply of shares to the market[23]. Overall investment activities in the country is generally on the rise, though modestly, as indicated by the investment rate which grew from 14% to 18% over the last seven years. Up until December 1998, about 4817 projects worth about 40 billion Birr, have been licensed by the Ethiopian Investment Authority and investment bureaux of the regions[24]. Of these, about 1358 projects worth 9.0 billion Birr went into operation, which constitutes 22.5% of the total in value terms.

While this may be an encouraging trend, the gap between licensed and those actually implemented nevertheless suggest that investment in the country is not as much as one would have liked. Over 77% of the licensed projects have not been implemented because of several possible reasons. While many of these projects may not show a true commitment on the part of the licensee (Collier and Gunning 1995:238), the financial constraints, particularly obtaining bank credit given collateral requirements cannot be understated at this stage. The banking sector, as discussed above, is hardly in a position to entertain all investment demands. The wide gap between actual investment and licensed projects may nonetheless indicate the potential supply of shares in the future. With the establishment of a securities market, many of the licensees may find the stock market attractive to raise equity funds to finance their projects. Even those having access to bank credit may prefer the stock market so as to reduce their risks associated with bank debt. The fact that risk is diversified among many shareholders would generally make equity finance of lower risk to the issuing company, and motivate companies to involve in higher investment risk than they would be able with bank loan (Kenny and Todd 1998). Companies financing by issuing shares are also relieved from interest payments on a regular basis, which in times of weak performance, may be a source of risk.

Government Securities

A distinction is generally made between shares and bonds with the latter entitling the holder a fixed interest income, and issued mainly by governments, both at local and federal levels and to some extent by corporations. Shares and bonds also differ based on the degree of risk attached to them. Shares are generally high-risk investment to the holder for the return from share holding depends on the profitability of the company issuing it. Bonds, particularly government bonds carry low risk. Inflation is the only source of risk for bondholders. In times of settlement of claims emanating from liquidation, bondholders also get priority over shareholders (The Economist, November 13, 1999).

Nonetheless, both bonds and shares are, in many cases, traded in the same market. In fact, it is often reported that government securities dominate the stock markets in

many developing countries, particularly at the early stage. Transactions of government securities in value terms, for Nigeria, for example, have been above 90% of the total transaction in the 1970s, though constituting only 20% in volume because of the large denomination of the par value so as to reduce transaction costs (Samuel and Yacout 1981). This same market was transformed into an equity market in the 1980s and 1990s, with bonds constituting an increasingly smaller size than equities (Ikhide 1997). This same trend was true with the Abidjan stock exchange (Calamanti 1980).

There are at least two reasons why governments issue bonds and treasury bills. One major reason is to finance budgetary deficits that may principally arise because relative to expenditure and/or overall expenditures may be in excess of total revenue. The record shows that the stock of outstanding Ethiopian government borrowing from the banking sector is quite a sizeable amount, accounting for almost 30% of the GDP (Table 4). About 59% of this is direct advance from the National Bank of Ethiopia[25], while about 30% was raised by issuing bonds. Treasury bills constituted about 11% of the total, but the yearly gross borrowing by issuing treasury bills is much higher than this. Most of the treasury bills being issued have a maturity date of 28 and 90 days and to a limited extent 182 days.

The second reason for a government to involve in securities market arises from the need to regulate the money supply in the economy. The central bank (i.e. NBE) sells bonds and treasury bills whenever it feels the overall money supply is in excess of the amount that would maintain a stable price and exchange rate, and it buys whenever the economy is strangulated by inadequate money supply. In this respect, a government involves not only as a supplier of securities but also as a buyer.

In Ethiopia, open market operation to regulate money supply is hardly practised. But bonds and treasury bills may increase in the future owing to the increased liberalisation of the economy including the financial sector, and consequently, the increased government resort to indirect monetary control as opposed to direct regulation. This, together with the motive to fill financing gaps, are factors likely to increase the supply of securities in the economy in the future. The fact that government bonds are relatively of low risk may make them relatively more preferred form of asset holdings than shares.

4.2. Demand for Shares

Demand for shares may come from various sources. Portfolio adjustments of individual asset holders, institutional savers, and the growth in the middle and high-income groups of the population may be regarded as potential buyers of shares.

Portfolio Adjustment

In a semi-urbanised society such as Ethiopia, assets may be held in the form of cash, bank deposits, physical assets in the form of land, real estates, livestock, precious metals and consumer durables such as vehicles as well as in hard currency. Data regarding the form of asset holdings and the relative size of each is hard to come by. These are traditional forms of asset holdings of the society at large and the establishment of a securities market will create another form of asset holdings and incentives to diversify asset portfolio for individuals. Thus, one may expect significant asset holding adjustments towards shares following the establishment of a securities market in the country. This is likely to be more intensive in the urban areas where commercial activities predominate people's lives. In the long run, farmers may be drawn into the market based on the motives to reduce the impact of uncertainties arising from drought and shortage of grazing land, as well as in anticipation of better returns from securities. Available evidence from some African countries, however, show that the impact of the stock markets on the farming sector was rather limited as the market itself is mainly urban based (Calamanti 1980; Osei 1998) though broad based asset ownership is one of the objectives the market seeks to achieve.[26] On the other hand, even if portfolio adjustment may not help raise overall savings in the urban areas, it can help release resources from passive forms of asset holdings to more active and productive activities, and long-term investments, at least in the long-term. It all depends on the rate of return from share holding *vis-à-vis* other alternative forms of asset holdings. A significantly high returns and low risks from share holdings may encourage individuals and companies to shift to this market.

Small and Institutional Savers

Under current legal and policy environment, small savers have limited choice as to hold their savings. The only available avenue is to put it in the banks in the form of saving and time deposits. The size of private companies and individual saving in the banking sector is fast surpassing that of the public sector, after the start of the ongoing liberalisation process (Commercial Bank of Ethiopia 1998; Alemayehu Geda 1999). Whether individuals and private companies have been motivated by the rate of return banks offer or by the protection motive is an open question. If the former dominates the latter, then one would expect a shift of resources to share holdings provided share-holding offers a return in excess of the bank rate. Opening up a securities market may as well bring about additional options of investment for these small savers, which in some respects, may lead to a competitive situation between the banks and the securities market.[27]

Insurance corporations and pension funds often believed to have a sizeable amount of surplus money (Jefferis 1995) and which can be channelled for long-term investments are the other potential sources of demand for the market. There are

about eight insurance companies, with the Ethiopian Insurance Corporation having over 66% of the total asset (Bekele 1999), and one Pension Authority in the country[28]. A good part of the financial resources of these companies and corporation is generally invested in treasury bills and government bonds, the yield of which is far below the 6% minimum deposit rates of the banking sector[29]. These are obviously investment areas of low return for these companies, and a significant portfolio adjustment towards share holding can be expected following the establishment of a securities market.

Thrift associations mainly of public sector employees, and 'Equbs' and 'Edirs', which are part of the informal financial sector and traditional forms of saving mobilisation in the country can also be good source of demand. The size of resources mobilised by the 'Equbs' and 'Edirs' is not however known at this stage with some degree of certainty. Research conducted in 1976, for example, showed that savings mobilised by 'Equbs' alone was estimated at 8-10% of the GDP (Tschakert 1976; quoted in Bouman (1995:373)). Another study made in 1987 as well indicated that 95% of the 'Equbs' surveyed in Addis Ababa were found to raise funds amounting to 15% of the total household saving deposits with the CBE (Mauri 1987; quoted in Bouman (1995:373)). Such estimates, of course, are likely to involve wide margin of errors. Nevertheless the order of magnitude suggested shows that 'Equbs' and 'Edirs' are likely to be good source of demand for the market. 'Equbs' in particular are widely used among traders in the towns as a means to raise funds to run their business, and may increasingly be drawn into the market to diversify their investments and asset holdings.

Income and Employment

Level, growth and distribution in income, and employment expansion are generally some of the major sources of demand for securities. Overall per capita income in the country is, of course, low and GDP growth picked up only recently, albeit modestly. The level of income as well as growth trends in income determines the size and strength of the market. Low level of income, suggests that the expected securities market is likely to be thin and small in size.

Income distribution pattern may also be another factor with significant implication on the market since it determines the size of the upper and middle-income groups of the population. These groups are potential securities buyers as the experience from other African countries shows.[30] The group consists of traders, professionals, and employees of the public and private sectors including wage earners (Calamanti 1980; Osei 1998). The World Development Report (1993) indicated that in Ethiopia the highest 10% and 20% of the population in 1981/82 used to command about 27.5% and 41% of the income/consumption expenditure, respectively, while the lowest 20% had a share of 8.6% (Table 7b). Although these are relatively outdated statistics, they, nevertheless, indicate that income distribution was significantly asymmetrical even

when the economy was under the command system. With economic liberalisation and further deregulation, income inequality is likely to be worsened, perhaps increasing the size of the population that can potentially be involved in the securities market. Data obtained from a recent household survey seems to suggest that nearly a fifth of the top households claim about 50% of the income/expenditure of the total households, while 40% of the bottom claim only about 16% (Tables 7a and 7b).

Comprehensive data on employment in the modern sector is not easily available. The overall public sector employees as of 1995, is estimated to be about half a million, of which 42% are employees of the public enterprises sector, while the rest belong to the civil service sector (United Nations Development Programme 1998; World Bank 1997). Employment of the public sector is thus extremely low given a population of 61.7 million.[31] The earning structure of the public employees is even more disheartening from the perspective of the securities market. 19% earn less than 200 Birr, while 67% of them earn less than 500 Birr. Those public employees with a monthly earning of 500 to 1000 Birr account for 22%. Only 2.5% earn above 1000 Birr (United Nations Development Programme 1998). This earning structure, by and large, suggests that public employees' participation in the market would, at best be modest.

The number of employees in the large and medium scale manufacturing sector (both public and private) as of 1997, was also about 90,000. This shows a growth rate of 2.2% per annum compared to the 82,644 in 1991/92 (Table 9), still a negligible proportions when compared with the total population of the country. The average wage rate per annum for this sector as well grew from 3379 in 1992 to 5076 Birr in 1997, indicating an average growth rate of 10.7%, in nominal terms. This is an encouraging trend, though not large enough to offset the cumulative erosions in real wages over the years. In addition, over 70% of them earn less than 500 Birr indicating many of them are low-income groups (Table 10).

The number of persons engaged in the wholesale and retail trade as well as in the small service sectors was also estimated at 548,483, of which 28.8% are salaried groups. Of the salaried groups, 7.7% earn above 550 Birr, while about 15.6% earn above 350 Birr. Average net profit per firm per month stands at 10,672 Birr for the wholesale, 472 Birr for the retail, and 365 Birr for the small service sector (Tables 11 and 12). One, however, needs to cautiously read these statistics given the fact that businessmen often fail to record their transactions and understate their income, probably for reasons of taxation. Nonetheless, these are the group of people one would expect as a potential source of demand for the market particularly for shares, mainly because their average income is significantly better than the average citizen and are capable of making some savings.

5. HOW BIG MIGHT THE MARKET BE?

The supply and demand assessment made above is suggestive of the size of the market. Low level of income, employment and urbanisation would mean that a robust demand for shares could only be realised in the long run. In addition, conservative attitudes towards share holdings that characterise many low-income countries of which Ethiopia is not an exception, and the risk likely to be perceived from securities holding would be factors undermining the demand for shares (Drake 1977). On the other hand, a predominantly agricultural economy with the manufacturing sector contributing only about 10 per cent of the gross domestic product would potentially be a limiting factor on the supply side of the market. About 65 per cent of the large- and medium-scale manufacturing industries, both public and private owned, have employment size of less than 50 persons and a paid-up capital of less than one million Birr (Tables 13 and 14). Of the privately owned, about 63% have no book of accounts. For the domestic trade and service sector, this proportion goes up to over 90 per cent (Table 15), suggesting that they are operating on the border of the informal sector. The potential number of companies likely to adopt a corporate form of organisation and willing to let public participation is thus small, to say the obvious. Smallness does not, however, preclude the starting of the market.

Even in the developed countries where equity markets are highly developed, banks and other sources, mainly retained earnings, by and large, dominate the investment financing structures of firms, when judged in terms of the net resources raised[32]. Nonetheless, world stock markets, measured in terms of market capitalisation have been growing at a rapid rate over the last one and half decade. Over the 1985-1994 period, world market capitalisation[33] grew from $4.7 to $15.2 trillion (Demirguc-Kunt and Levine 1999). In Asia and Latin America, market capitalisation grew from $1.6 to $9.6 trillion, showing the fastest growth. For many Asian countries, market capitalisation ratio is well over 100 per cent showing that share markets are significant form of resource mobilisation and allocation in these economies (Feldman and Kumar 1995).

In contrast, stock market development in Africa is incomparably low. With the exception of Kenya and Zimbabwe, the capitalisation ratio is well below 10%. The ratio for Kenya and Zimbabwe, however, stands at about 25%. This leaves much to be desired compared to Asian countries (Feldman and Kumar 1995). The low capitalisation ratio shows that resources mobilised through the stock markets in SSA countries is very small. Numbers of listed companies by themselves are generally in the range of 10 to 50 (Kenny and Todd 1998). Only Nigeria (186), Zimbabwe (64) and Kenya (56) have higher than 50 listed companies in the market. Turnover ratios are also very low, reflecting the low demand for snares (Kenny and Todd: 831).

Although the size of the market is low in SSA, it has nonetheless shown significant growth in the late 1980s and 1990s. Kenny and Moss (1998), for example, reported that over the 1990-1996 period, the number of listed companies and market capitalisation for some SSA countries more than doubled [Kenny and Todd 1998:830]. Turnover ratio is rising indicating an improvement in liquidity. Trading of newly issued shares as a proportion of GDP is low, but growing overtime (Ikhide 1997), showing an increasing resort of investors to the market. These are indeed signs of hope for those countries contemplating to institute the market. The positive association between growth in the securities market and per capita income (Demirguc-Kunt and Levine 1996) is also evidence of the potential role of the market in countries such as Ethiopia. Thus, even if the supply and demand conditions assessed above suggest that the market is likely to be small in size, the recent rapid growth observed in low- income SSA countries is a good indicator of its viability and potentialities in the long-term.

6. AREAS OF EMPHASIS

6.1. Legal and Institutional Infrastructures

Like all other markets, the first requirement for the realisation of a securities market, however small it is, is the existence of both the supply and demand conditions. The above assessment of the potential supply and demand suggests that the prospect for a securities market does seem to be good. There are already a number of share companies and shareholders in the country. Some degree of informal share transactions may thus be taking place owing to the absence of the required institutional and legal arrangements necessary to formalise the market.

What legal and institutional framework is needed depends on the nature of the market. Securities markets, particularly at the early stage, are susceptible to volatility, partly owing to the thinness of the market where the action of individual companies has significant impact on the price of the market. The fact that the market is highly exposed to fraudulent, speculative and insiders' manipulation calls for instituting an appropriate legal and institutional framework to ensure stability, smoothen the operation of the market, protect shareholders and promote public confidence (Horch 1989). Ethiopia's Commercial Code provides the minimum requirements for a share market to take place (Addis Ababa Chamber of Commerce 1999; Porter 1996). But further refinements, mainly in the forms of additional specific regulatory rules, to formalise and create a more propitious ground may be essential for the market to start operation and develop.[34]

Rules and procedures issued as laws or by-laws should be able to define the modes of operation of the market. Companies that raise funds from the market should be listed upon fulfilment of the regulatory requirements. The modalities for share pricing

and the frequencies of trading of shares must be determined depending on considerations of supply and demand as well as the overall environment. Information disclosure procedures of companies need to be clearly stipulated and regularly monitored.

Providing incentive systems may be an essential component of the market, particularly at the early stage. Should capital gain taxes are to be applicable on the share market, this needs to be determined, and the magnitude spelt out. The same is true with dividends. At the early stage, tax incentives to listed companies may be unavoidable to encourage companies and shareholders, as the market itself would be new to potential participants. The experience of other countries such as Korea and Brazil suggests tax relief as an appropriate instrument to encourage the growth and development of the market (Horch 1989).

Institutions that regulate and manage the day to day operation of the market need to be in place, and its mandates defined. Historical records of other countries show that there have been two ways of institutionalising the market. One is through the associations of securities dealers and brokers, with the responsibility of defining the conduct of the market through its own by-laws and managing the day to day operation of the market. This was the way some of the largest stock markets in the world had initially started to operate and evolved over time (Porter 1996). Another is through the establishment of an agency that manages the operation of the market. This is often organised as an autonomous agency. Experience of other countries shows that the agency is accountable to a board of directors reporting to a government ministry such as the ministry of finance (Jefferis 1995; Ikhide 1997; Calamanti 1980). Securities Exchange Commissions (SEC) of this type are very common these days in a number of SSA countries.

Both ways of institutionalising the market may have their own merits. Permitting a securities market to be run by dealers' and brokers' association may help avoid unnecessary government intervention in the market. Establishing a commission or an agency headed by a government appointed board of directors to manage the market, on the other hand, may help obtain a positive support of the government. The latter is also likely to encourage public participation and develop trust in the market, which is an essential element for such markets particularly in countries with low communication and information infrastructures, such as Ethiopia.

6.2. Managerial Capacity

When individuals and companies buy shares of a company they have an implicit or explicit belief in the strength of the company as well as on the management that runs the company. Investors will seek to have a full and up-to-date information not only on the company's performance but also on the status, quality, professional track record

etc. of the management. Good management with the required skill and with unquestioned integrity and honesty is required, among others, to win peoples' confidence and trust on the listed companies if the securities market, once established, is to develop in breadth and depth.

The legal and institutional infrastructures cited above are not too difficult to put in place. However, they are not sufficient by themselves. Implementation requires skilled and professional managers, analysts etc., the generation of which has been extremely limited in Ethiopia.[35] The possibility of conflict of interest between shareholders (owners) and managers running these companies, would also mean that the true financial position of companies may not be revealed by the regular reports made by managers in line with the information disclosure procedures of the stock market. Managers have, at least in theory, an incentive to present rosy reports in spite of difficulties faced by companies.[36] In this respect, the public would find it difficult to differentiate the best performer from an inefficient one.

Poor record-keeping and low accounting rules and standards, which are conspicuous in the country, are also factors to have a compounding effect (Table 15). The absence of independent rating agencies, or audit companies with high quality and reputation, on the other hand, suggest that individual stockholders have to bear the burden of acquiring pertinent information while deciding to buy shares of a company. But the costs involved to do so as well as the lack of skills, at least by most potential share buyers to process information would prove to be one of the handicaps for the growth of the market. The dearth of qualified and career professional managers are thus factors likely to pose significant challenges for the development and viability of a securities market. There also seems to be system-wide corrupt and unethical practices in this country.[37] This would, in particular, have the potential to erode public confidence in the market.

6.3. Stable Environment

A securities market, once established, is shaped by a number of factors, both economic and non-economic. Economic and political events are very important in the developed countries as well. Nonetheless, the amplitude and consequences of economic (e.g. terms of trade shocks, policies change such as major currency devaluation etc.) and political instabilities on the market in low-income countries are much larger than in the developed countries (Kenny and Todd 1998). Narrow industrial and export base of countries such as Ethiopia would mean that terms of trade shock has significant impact on the economy and on the securities markets that are generally thin and small as is the case in other SSA countries.[38] Shocks arising from drought, war and other natural and man made calamities etc. are by no means less important in impacting the economies of low-income countries such as Ethiopia.

A stable environment is thus one of the requirements for the market to operate smoothly and grow over time. And, this is one of the major challenges of many markets of low-income countries such as Ethiopia. It is a challenging task because many of these sources of instability may not always be manageable, and are likely to create significant havoc on the market. Stock markets at best stagnate when the economy performs poorly, as was the case in Jamaica (Freckleton 1995). Muzamani (1993), observing the Zimbabwe stock exchange, concluded that " when the performance of the stock exchange is good with rising indices, firms make extensive use of the stock exchange as a market to raise funds", but shows great reluctance when the market collapses. This shows that investors would find the market less attractive to raise funds when the overall climate determining demand and investment activities is unfavourable and vice versa.

7. SUMMARY AND CONCLUSION

Securities markets are essential elements of a financial market. They help mobilise and allocate resources to long-term investment activities. In doing so, they fill the gap left by the banking sector. In light of this, attempt has been made to assess the prospects for a securities market in Ethiopia. Although securities markets are still at infancy in sub-Saharan Africa, trends show that this is a growing, dynamic and essential component of the financial sector.

The saving and investment situation in Ethiopia reveals that resource mobilisation is not only far below what a rapid growth would require but also compared to countries with similar level of development. The low level of income need not, however, imply the absence of potentials for further resource mobilisation. There are ample evidences from rural Africa showing considerable saving potentials that can be channelled to more productive activities through appropriate mix of incentives and mechanisms. Domestic saving rates of countries with similar level of development in SSA stands at 16% which is more than twice the rate for Ethiopia. Even if overall saving rate is not raised, the establishment of a securities market may help release resources from low productive and passive forms of asset holdings to more active, easily mobile assets. Finally, more than 60% of the investment of the country is financed by external resources but sustained economic growth, to a large extent, would require reliance on domestic resources.

The financial sector in the country suggests that the securities market is a missing element. Nearly 93% of the savings are mobilised by the commercial banks, and 91% of the deposits constitutes demand and saving deposits which are short-term maturing liabilities. Time deposit remains limited in size. A disproportionately large part of the bank loans extended to the various sectors constitute short and medium term loans. Long-term investment finance is marginalized because of its obvious implication on

asset - liability mismatch. The DBE caters to this market but has an extremely limited resource base. The fact, that banks require collateral valued at 100% to 150% of the loan value to ensure repayment of loans is another factor that discourages investments.

A look at the supply and demand side of the market suggests that there are sufficient grounds to start the market. The deregulation of the economy, which made licensing relatively easy and the privatisation process are factors expected to increase share companies in the economy. Government securities are the other supply sources to the market. And, this source is likely to increase with the increased resort of the government to indirect monetary policy instruments, i.e., open market operations.

Demand for shares, on the other hand, may be expected to come from various sources including from portfolio adjustment of individuals, small and institutional savers and growth and distribution in income, and employment. The key motivating factor to prefer shares and bonds to other alternative asset holdings is that their rate of return, adjusted for risk, is sufficiently higher.

Given these developments, the economy does seem ready to have a securities market. The size of the market is likely to be very small initially, but can help fill some of the gaps in the financing of long-term investment activities. Experience in SSA also shows that even if such markets are small, they nonetheless tend to grow at rapid rate. Effective and transparent rules and regulations are needed to ensure the stability of the market and promote public confidence on the market.

Once the market is established, its future growth will depend on the growth of the economy and maintenance of a stable economic and political environment, as well as the capacity to generate professional managers, analysts etc. The fact that the economy is vulnerable to a number of shocks (such as terms of trade, natural and man made calamities etc.) is expected to be one of the constraints to the market. The lack of professional career managers with unquestionable integrity and honesty is likely to pose formidable challenges to the market. The public can involve in the trading of shares if supplied with reliable information and have confidence in the operation of companies listed in the market.

NOTES

[1] Securities markets, capital markets and equity markets are interchangeably used in the literature in spite of some substantive differences (see chart 1 for a clear distinction among these). It should also be noted that a securities market has two interdependent market segments, i.e., the primary and secondary markets. The initial transfer (sale) of shares and bonds from the issuing company to the public constitutes the primary market. The sale and resale of shares and bonds through the intermediary of brokers and dealers, on the other hand, constitutes the secondary market (see Popiel 1993).

[2] See, for example, Addis Ababa Chamber of Commerce (Addis Ababa Chamber of Commerce 1999); and Eyob and Felleke (1998).

[3] Three methodologies are commonly used in the literature to assess the efficiency of a securities market; i.e., a weak form, a semi-strong form and a strong form. A weak form seeks to test whether share prices are independent of historical price trends or not. A semi-strong form is employed to test the sensitivity of share prices of a firm to all publicly available economic and financial information including historical price trends. Predictability of the share prices from these variables suggests inefficiency of the market. The strong form of market efficiency, on the other hand, tests the response of asset prices to information available to insiders, i.e., that are not published (Osei 1998); (Craigwell et al., 1999); (Olowe 1998).

[4] Household saving is defined in the survey to constitute expenditures on 'Equb' , loans given out, loans repaid, bank deposit, pension contribution, interest and 'Edir' contributions (Central Statistical Authority 1998).

[5] Of course, securities markets are urban based and are no better accessible to the large rural population than banks.

[6] Individual country regression, however, showed this variable was insignificant for Ethiopia because the branch to population ratio varied little during the period selected (Ikhide 1996).

[7] This point does not provide the justification for a securities market but to some extent could suggest the kind of response from the various groups and sectors of the economy when the market is instituted in the future.

[8] The Construction and Business Bank used to be called as the Housing and Savings Bank prior to 1994. The bank was re-named and allowed to involve in universal banking services in addition to the construction sector (Council of Ministers Regulation No. 203/1994).

[9] Excludes inter-bank loans and advances.

[10] Of the annual agricultural loans disbursed by the DBE in 1996, 76% constituted working capital while investment loans claimed 24%. Fertiliser loan constituted about 26% of the agricultural loan (Development Bank of Ethiopia Annual Report 1997).

[11] The CBE enjoys some degree of excess liquidity (Commercial Bank of Ethiopia 1998) but the share of its long-term loan remains low, not because there is no demand for long-term loan but largely because of the fear of asset-liability mismatch.

[12] Discussion with the manager, project finance of the CBE, revealed that this is the case with the CBE.

[13] This is significantly higher than the 1-5 per cent observed in the industrialised countries (see Andrew Sheng 1996).

[14] Accurate and official data with regard to non-performing loans are often difficult to obtain for the banking sector; estimates ranging between 20 and 30% is likely to be reasonable estimate (see also World Bank 1998; Alemayehu Geda 1999).

[15] A survey by the CSA for the Distributive and small service sector shows that shortage of capital is one of the major problems, both to start up, expand and operate at capacity level (Central Statistical Authority 1997).

[16] It is stated in the saving passbook that banks have the right to require 30 days notice for withdrawals from savings accounts in excess of certain limits (e.g. in excess of 500 Birr in the case of CBE, and 1000 Birr in the case of Awash International Bank). But this is often less binding in practice.

[17] The discussion on demand and supply is limited to the internal sources. The capital control likely to remain in place for some time, low level of market size, poor communication infrastructures and the

relatively high level of investment risk rating often least developing countries receive (Cohen et al., 1999)) would make the international capital market a less important source in the immediate future.

[18] The share of deposits and loans of the private commercial banks hardly exceeds 8 and 7 per cent, respectively (Tables 2 and 3). However, their loan market share is higher than this if one takes the annual loan disbursement (excluding overdraft loans) (the flow) instead of the outstanding loan (the stock) (see Alemayehu Geda 1999).

[19] Some estimates put the asset value of the PEs slated for privatisation over the next three years at over 40 billion Birr (Reporter, Amharic Newspaper 1998). This is much higher than the resources mobilised by the banking systems in the country, and reliance on domestic resources alone seems to be inadequate to effectively transfer the PEs to the private hands as per the scheduled time period.

[20] This does not include companies registered with the Federal Ministry of Trade and Industry, and with the other Regional states, the data for which proved to be less accessible.

[21] The recent NBE regulation requiring banks (mainly private banks), to raise their paid up capital by almost 100% is a case in point that could have a substantial positive implication on the supply of shares.

[22] The Policy Framework Paper of the government agreed with the IMF and World Bank in 1998 states that Ethiopian Electric Power Corporation, Ethiopian Air Lines and the Development Bank of Ethiopia will be encouraged to raise resources by issuing long-term debt securities (Government of Ethiopia 1998).

[23] Of course, the regulatory procedures for listing companies may not allow newly formed and little known companies, but the securities market may be of help for investors to easily raise capital to form new companies provided adequate publicity work is done.

[24] Data obtained from the Ethiopian Investment Authority.

[25] The policy Framework paper referred to above (footnote 22) also envisages to securitize part of the overdraft position of the government with the NBE.

[26] Investment by profession in the Ghanian stock market shows that farmers and artisans account for 2.8% and 5% of the traded value, respectively; while small business owners, office clerks including teachers, middle managers, chief executives, and pensioners account for 34.2%, 15%, 18.8%, 11.7% and 12.5% respectively (Osei 1998:15).

[27] Banks and stock markets may not always be competitive. The stock market may bring with it ancillary business activities and source of revenue for banks. Shares may serve as collateral to obtain bank loans. Banks may serve as brokers and underwriters of shares particularly at the early stages of the stock market, which through their branch network may help diffuse the spread of shares and make accessible to wider potential buyers. In return, banks may obtain a sizeable income in the form of commission and service charges. In one of the stock exchange centres in Africa, the Abidjan Stock Exchange, share transactions at the early stage used to be carried out by banks (Calamanti 1980). In fact, it is argued that stock markets thrive in countries where there is a well-developed banking and non-banking financial intermediaries (Demirguc-Kunt and Levine 1996).

[28] Institutional savers such as mutual funds, private pension funds, investment banks etc., have not come into the scene showing the undeveloped nature of the financial sector in this area as well.

[29] The yield from treasury bills generally ranges between 3-4%, and the rate of return from investment on government bonds is somewhat higher than this but less than the bank deposit rate *(NBE, unpublished bond yield data)*.

[30] The Ghanian stock market cited earlier shows that, of the participants of the market, middle income group, upper middle income group and high income group constitute 28.3%, 28.3% and 27.5%, respectively [Osei 1998:17].

[31] See World Bank, World Development Report (1997).

[32] A study by Mayer (1990) of eight industrialised countries showed that the net financial resources raised (by non-financial firms) through short-term securities, shares and bonds hardly exceed 5 per cent of the total finance raised for investment. This rate goes up to only 10-12 per cent for the US and Canada where equity and bond markets are more developed than in the other developed countries (Mayer, 1990; quoted in Gibson and Tsakalotos Freckleton 1995:613); (See also Stiglitz 1993:22).

[33] Market capitalisation is generally defined as the ratio of the value of listed shares to GDP.

[34] Porter (Porter 1996) argues that no legal impediment exist in Ethiopia barring individuals from involving in over the counter (OTC) securities market, but a regulatory framework is needed to establish an organised and properly functioning securities market (*Ibid.*).

[35] Gross enrolment rate at all educational level is low even by SSA standard (United Nations Development Programme 1998). The quality of education is generally accepted as poor, considering many indicators including shortage of budgetary resources, qualified teachers, teaching equipment and facilities, poor management, and poor linkage with the economy [UNDP 1998:37]. This is compounded by the brain drain believed to be very high in Ethiopia (The Ethiopian Herald, 19 March 2000:3).

[36] This is the well- known principal-agent problem in the literature.

[37] A workshop under the theme of 'The Danger of Corruption on the Economic Development of Ethiopia' organised by Walta Information Centre, revealed the pervasiveness of corruption in the country (Addis Zemen, Amharic Newspaper 1999).

[38] It is argued that securities market prices strongly depend on the performance of the industrial sector. Empirical evidence shows a strong causality between the industrial sector and the stock market, and share prices vary depending on the performance of the industrial sector (Nishat and Saghir 1991:140).

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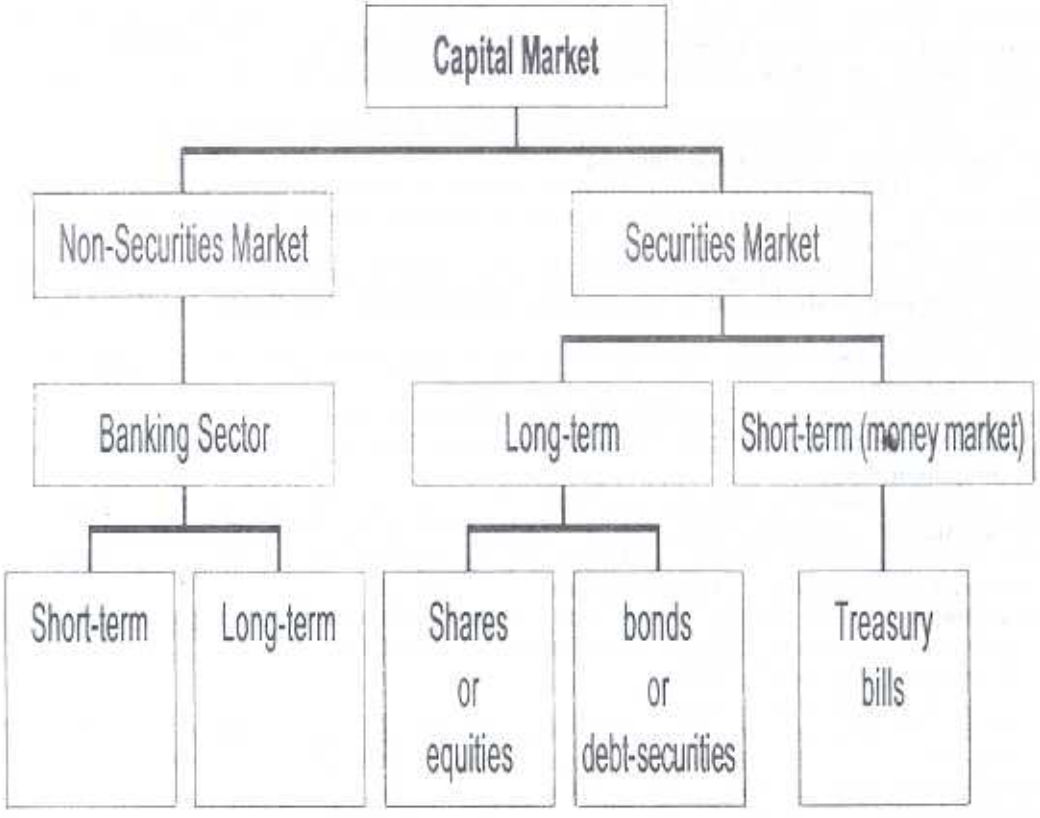
Chart 1*



* I am grateful to Ato Tekle Brahan G.Michael for his suggestion to use this chart so as to avoid confusions in using terminologies related to capital markets (see also Popiel, 1990, pp. 218-222).

Table 1. TRENDS IN MAJOR MACROECONOMIC INDICATORS

	Towards the End of the Imperial Era (1)				1974-1991 period (1)					1992-1997 period (2)
	1967-1971/72	1971/72	1972/73	1973/74	1974/90	1979-83	1984/85	1986/87	1988-90	1992/93-1997/98
Real GDP growth rate	4	4.5	2.5	1.4	1.9	4.2	-5.3	7.9	1.0	5.2
Export of goods and services as % of GDP	10.3	-	13.0	14.8		12.4	12.1	12.0	11.3	13.3
Import of goods & services as % of GDP	11.9		11.0	11.7		18.9	22.9	22.7	21.1	24.5
Resource balance as % of GDP	-1.6		2.0	3.1		-6.5	-10.8	-10.7	-9.8	-11.1
Gross domestic savings as % GDP	11.0		13.3	12.9		3.9	2.6	4.3	4.0	6.7
Gross National savings as % of GDP[2]	-	-	-	-	-	-	6.5	10.3	10.6	15.0
Gross capital formation as % of GDP	12.6		11.3	9.8		8.7	13.4	15.1	13.8	17.8
Resource balance as % of Investment	12.7		17.7	31.6		74.7	80.6	70.9	71.0	62.6
Overall budgetary deficit as % of GDP	4.1*		3.2	2.8		-9.4	-14.8	-11.3	-13.5	-4.0
Current Gov't saving as % of GDP	-2.0*		-0.1	0.4		1.4	4.8	1.1	1.3	5.0
External finance as % of GDP	2.9*		3.0	2.9		5.6	10.2	5.7	7.8	6.7
Domestic saving as % of GDP	1.2*		0.2	-1.9		15.8	26.5	28.6	33.6	2.1

(1) Source: Eshetu Chole and Mekonen Manyazewal (1992) in Mekonnen Tadesse (ed) The Ethiopian Economy, Structure Problems and Policy Issues: Proceedings of the First Annual Conference on the Ethiopian Economy, Addis Ababa.

(2) MEDaC, National Income Accounting Division, unpublished data.

Table 2. Breakdown of Outstanding Loans & Advances from the Banking System by Sector*

(In Million Birr)	June 30, 1997		June 30, 1998		June 30, 1999	
	Mn Birr	% Share[1]	Mn Birr	% Share[1]	Mn Birr	% Share[1]
Central Gov. borrowing	2089.8	15.7	2,203.1	14.3	3,269.8	17.8
Agriculture	907.2	6.8	1,078.1	7.0	1,315.3	7.1
Industry	1,713.8	12.8	1,789.0	11.6	2,078.7	11.3
Domestic Tradr	2,143.4	16.7	2,224.1	14.4	1,901.8	10.4
International Trade	2,502.2	18.7	2,905.5	18.8	3,221.8	17.6
Export	937.1	7.0	1,006.9	6.5	1,176.1	6.4
Import	1,565.1	11.7	1,898.4	12.3	2,045.7	11.2
Housing & Construction	1,452.1	10.9	1,479.8	9.6	1,555.7	8.5
Transport & Communication	990.5	7.4	922.4	6.0	662.8	3.6
Hotel & Tourism	363.0	2.7	424.1	2.7	425.8	2.3
Mines, Power & Water Res	29.9	0.2	31.5	0.2	23.4	0.1
Personal	17.7	0.1	115.7	0.7	18.6	0.1
Others	579.3	4.3	1,765.2	11.4	3,250.0	17.8
Inter Bank Lending	540.8	4.0	496.7	3.2	546.9	3.0
Total (Including Inter -Bank Lending)	13,329.7		15,435.0		18,270.6	
Total (Excluding Inter -Bank Lending)	12,788.9	100.0	14,938.3	100.0	17,723.7	100.0

Source: National Bank of Ethiopia (Annual & Quarterly Reports)

1 As a proportion of total loans excluding inter banking lending.

*Share of banks of outstanding loans and advance 1999

Banks	Mn Birr	Share (%)
CBE	12129.6	66.3
DBE	3996.5	21.8
CBB	891.6	4.8
Awash Bank	392.5	2.1
Dashen Bank	396.5	2.1
Bank of Abyssinia	241.6	1.3
Wegagen	222.3	1.2
Total	18,270.6	100

Source: NBE Quarterly Reports (1996, 1997 and 1998)

Table 3. Breakdown of Deposits by Type and Mobilising Bank (mln Birr)

	June 30, 1997		June 30, 1998		June 30, 1999	
Banks	Mn Birr	% Share	Mn Birr	% Share	Mn Birr	% Share
Commercial Banks*						
Demand	7,270.8	54.8	9,489.8	57.5	9022.0	54.6
Saving	5,424.9	40.8	6,225.7	37.7	6879.6	41.7
Time	587.6	4.4	789.4	4.8	603.7	3.7
Total	**13,282.3**	**100.0**	**16,504.9**	**100.0**	**16505.3**	**100**
DBE						
Demand	35.5	94.1	29.6	4.7	15.0	2.0
Saving	2.1	5.6	2.0	0.3	2.1	0.2
Time	0.1	0.3	600.4	95.0	758.9	97.8
Total	**37.7**	**100.0**	**632.0**	**100.0**	**776.0**	**100**
CBB						
Demand	36.7	6.6	26.8	4.7	39.9	7.5
Saving	260.8	46.8	256.0	45.1	265.3	50.1
Time	259.1	46.5	285.3	50.2	249.2	47.0
Total	**556.4**	**100.0**	**568.1**	**100.0**	**529.5**	**100**
All Banks						
Demand	7,342.4	53.0	9,573.0	54.1	9076.9	50.9
Saving	5,687.4	41.0	6,739.7	38.1	7147.0	40.1
Time	846.8	6.0	1,960.4	11.1	1611.3	9.0
Total	**13876.6**	**100.0**	**17,705.0**	**100.0**	**17835.7**	**100.0**

Source: National Bank of Ethiopia (Annual & Quarterly Reports)

Includes the CBE and the private commercial banks. The share of deposits of private banks for 1999 is:

Type of Deposit	*Amount*	%
Demand	442.5	4.9
Saving	879.5	12.3
Time	166.4	10.3
Total	1488.4	8.3

Table 4. Government Internal Debt by Holder (mn Birr)*

	1997		1998		1999	
	Mn. Birr	%	Mn. Birr	%	Mn. Birr	%
National Bank of Ethiopia						
• Direct Advance	6686.0	54	7845.0	58.8	8636.0	58.7
• Gov't Bonds	2152.9	17.4	1974	14.8	1926.2	13.1
Commercial Banks						
• Gov't Bonds	2089.8	16.9	2089.8	15.7	2089.8	14.2
• Treasury Bills	47.1	0.4	123.3	0.9	401.8	2.7
Others						
• Gov't Bonds	483.8	3.9	429.0	3.2	420.5	2.9
• Treasury Bills	899.4	7.3	877.6	6.6	1226.0	8.3
Total Government Indebtedness	**12359.0**	**100**	**13339.0**	**100**	**14700.3**	**100**

Source: NBE, Quarterly Bulletin Vol. 14, No. 4, 1999.

*

	1997	*1998*	*1999*
Direct Advance	54	58.8	58.7
Government Bond	36.2	33.7	30.2
Treasury Bills	7.7	7.5	11.0
Government Internal indebtedness as % of GDP	29.8	29.6	29.8
Other Sectors' Borrowing (excluding Inter bank loan) from the banking sector (excluding NBE) as % GDP	30.8	33.2	36

Table 5. Percentage of Saving, Non-saving and Dis-saving Household Groups and their Percentage Shares of Income/Receipt

	Urban	Rural	Country-wide
Earnings and Expenditures			
HHs who spend what they earn[1] (%)	18.0	36.6	33.7
Share from total HH Income	43.3	35.6	37.5
HHs who spend more than their earnings[2](%)	66.4	42.4	46.1
Share from total HH Income	28.0	31.6	30.8
HHs who spend less than their earnings[3](%)	15.7	21.0	20.1
Share from total HH Income	28.6	32.8	31.8
Receipts and Payments			
HHs who paid what they received[1](%)	18.2	36.0	33.3
Share from total HH Receipts	48.5	35.2	38.6
HHs who paid more than their receipts[2](%)	66.5	43.6	47.1
Share from total HH Receipts	27.8	33.0	31.6
HHs who paid less than their receipts[3](%)	15.4	20.4	19.6
Share from total HH Receipts	23.7	31.8	29.7
HH Saving out of total Earnings	8.6	3.6	4.6

Note: 1. The Non-Saving Group, 2. dis-saving Group, and 3. Saving Group. HH: Household

Domestic Expenditure: total expenditure incurred by the HH or any of its members. It includes expenditure on consumption as well as non-consumption items.

Payments: Domestic expenditure plus other expenditures such as remittance paid, Pension and other contributions, donations, fines and other related legal expenses, income tax, 'equb' payments, 'Idir' contributions, etc.

Income: refers to consumption of own crops and livestock, wages and Salaries, allowance, overtime, bonus, pension, Commission , discounts (i.e. concessions obtained, imputed rent of free housing (subsidised amount only), imputed rent of owner occupied housing, value of items obtained free, alimony, etc.

Receipts: refers to income plus "Equb" and "Idir", gifts, loans, Repayment of Loans, Insurance, legal damages, withdrawal from saving and sale of HH durable goods and personal effects.

Source: Central Statistical Authority, Revised Report on the 1995/96 Household Income, Consumption and Expenditure Survey. Extracted from the text part of the survey. Bulletin No. 204, Addis Ababa, Ethiopia.

Table 6. Registered Share Companies by Amount of Capital and Shareholder Size (1997)

A. By Amount of Capital

	No. of Companies		No. of Shareholders		Total Capital	
Capital Size	No.	%	No.	%	In thousand birr	%
<1 Million	68	51.5	3032	31.9	13,846.68	1.3
1 Million to 5 Million	26	19.7	706	7.4	61,982.62	5.8
5 Million to 10 Million	8	6.1	1102	11.6	51,766.00	4.9
10 Million to 20 Million	13	9.8	1221	12.8	160,616.93	15.1
20 Million to 50 Million	8	6.1	1694	17.8	209,615.01	19.7
50 Million to 100 Million	7	5.3	1744	18.3	363,000.00	34.2
>100 Million	2	1.5	10	0.1	202,000.00	19.0
Total	132	100.0	9509	100.0	1,062,827.23	100.0

B. By Size of Shareholders

	No. of Companies		No. of Shareholders		Total Capital	
No. of Shareholders of Companies	No.	%	No.	%	In thousand birr	%
<5	17	12.9	22	0.2	24,476.63	2.3
5 to 10	60	45.5	320	3.4	431,071.05	40.6
10 to 50	27	20.5	611	6.4	234,064.75	22.0
50 to 100	11	8.3	798	8.4	46,395.00	4.4
>100	17	12.9	7,758	81.6	326,819.81	30.8
Total	132	100.0	9,509	100.0	1,062,827.23	100.0

Source: Addis Ababa City Administration, Trade Industry and Tourism.

Table 7a. Income Distribution by Income Group (%)

	Urban		Rural		Country	
Income group (Birr)	Share of HHs	Share of Income	Share of HHs	Share of Income	Share of HHs	Share of Income
<600	3.71	0.16	0.65	0.06	1.12	0.08
600-999	4.96	0.45	2.24	0.38	2.66	0.39
1000-1399	7.18	0.98	3.77	0.94	4.29	0.95
1400-1999	10.68	2.07	8.47	2.98	8.81	2.76
2000-2599	8.54	2.21	10.08	4.83	9.64	4.21
2600-3399	9.24	3.18	14.72	9.18	13.88	7.76
3400-4199	7.67	3.29	13.32	10.50	12.45	8.79
4200-5399	10.15	5.52	16.13	15.91	15.21	13.45
5400-6599	8.64	5.86	9.86	12.63	9.67	11.03
6600-8999	9.87	8.77	11.37	17.86	11.14	15.71
9000-12599	6.87	15.19	6.11	13.15	6.23	13.63
12600-16199	4.19	8.04	2.03	5.93	2.36	6.43
16200-19999	2.52	6.04	0.65	2.41	0.94	3.26
20000 and over	5.79	38.25	0.59	3.25	1.39	11.53
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Central Statistical Authority (1998), Revised Report on the 1995/96 Household Income, Consumption and Expenditure Survey, tables 10a, 10b, 10c, 15a, 15c. Bulletin No. 204, Addis Ababa.

Table 7b. Distribution of Income or Consumption Expenditures

Early Period of Command Economy		Early Post Reform Period
Fractiles of Persons	% Share of consumption Expenditure (1981/82)	% Share of Consumption Expenditure (1995/96)
Lowest 10%	-	3
Lowest 20%	8.6	7.1
Second Quintile	12.7	10.9
Third Quintile	16.4	14.5
Fourth Quintile	21.1	19.8
Highest 20%	41.3	47.7
Highest 10%	27.5	33.7

Source: World Bank, World Development Report, 1993 and 1999

Table 8. Percentage Distribution of Expenditures of Households by Items

	Urban %	Rural %	Country %
All Items	**100.00**	**100.00**	**100.00**
Consumption Expenditure	**88.55**	**93.92**	**92.78**
food	47.08	54.23	52.71
beverages	0.39	0.39	0.39
Cigarettes & Tobacco	0.41	0.42	0.42
Clothing & Footwear	9.49	9.60	9.57
House Rent, Con. Mater. Water, Fuel & Power	14.97	15.81	15.63
Furniture, Furnishings & HH Equipment	4.73	4.70	4.71
Medical Care & health Expenses	1.19	1.10	1.12
Transport & Communication	3.19	1.10	1.54
Recreation & Education	1.55	0.38	0.63
Personal Care & Effects	1.40	1.33	1.35
Miscellaneous Goods & services	4.15	4.66	4.71
Non-consumption Expenditure	**11.45**	**6.08**	**7.22**
Equib	4.62	0.80	1.61
Loans given out	1.02	0.55	0.65
Loans Repaid	1.15	0.82	0.89
Insurance Premiums	0.03	-	0.01
Bank deposit	0.43	0.87	0.78
Pension Contribution	0.47	0.02	0.12
Interest	0.01	0.02	0.02
Income tax on Wages & Salaries	0.76	0.13	0.27
Association's membership	0.09	0.07	0.08
Edir Contribution	0.85	0.49	0.57
Religious Contribution	0.11	0.32	0.28
Remittance	0.18	0.03	0.06
Alsm	0.18	0.18	0.18
Gifts	1.16	1.63	1.53
Lottery Ticket	0.29	0.04	0.09
Others	0.08	0.09	0.08

Source: Central Statistical Authority (1998). Revised Report on the 1995/96 Household Income, Consumption and Expenditure Survey, tables 12a and 12b, Bulletin No. 204, Addis Ababa.

Table 9. Total Number of Employees in the Large and Medium Scale Manufacturing Sector-Public and Private

Year	No. of Employees	Growth Rate	Per Capita Wage and Salaries Paid per Employee	Growth Rate
1991/92*	82,644		3,379	
1992/93	82,082	-0.7	4,113	21.7
1993/94	88,242	7.5	4,516	9.8
1994/95	90,213	2.2	4,726	4.7
1995/96	90,039	-0.2	5,076	7.4
1996/97	92,365	2.6	5,301	4.4

Source: *C.S.A., Report on Large and Medium Scale manufacturing and Electricity Industry Survey, Statistical Bulletin No. 178, October 1997, Summary Table 3.3 and 3.4, pages 21-22 and Statistical Bulletin No. 191, October 1998.

Table 10. Total Number of Permanent Employees in Large and Medium Scale Manufacturing Industries by wages and salaries Group– Public and Private 1996/97 (1989 E.F.Y.)

Gross Salary Group	Number of Employees	Proportion of the Total
Under 105	1,748	2.0
105-299	34,359	39.7
300-499	24,573	28.4
500-699	9,616	11.1
700-999	9,334	10.8
1000-1499	4,946	5.7
1500-1999	1,695	2.0
2000 & Over	363	0.4
Total	86,638	100

Source: C.S.A., Report on Large and Medium Scale Manufacturing and Electricity Industry Survey, Statistical Bulletin No. 178, October 1998, Summary Table 4.14, pp. 69-70.

Table 11. Number of Persons Engaged in Distributive and Service Sector by Nationality and Type Establishment and Average Net-profit per Firm per Month: 1996 (National Urban)

Establishment	Number of Persons Engaged					
	Ethiopians	Foreigners	Total	Of which Permanent Salaried Workers	Non-Salaried Groups	Average Net profit per Firm per Month in Birr*
Wholesale Business	37,444	405	37,849	17,719	6,650	10,672
Retail Business	233,016	1,535	234,551	23,179	92,513	472
Service Business	278,028	1,291	279,319	113,077	77,651	365
Total	548,488	3,231	551,719	153,975	176,814	11,509

Source: CSA, Report on Distributive and Service trade Survey, statistical Bulletin No. 179, October 1997, tables 34, 35 and 36, pp 90-93 and * tables 3.10A, 3.10B and 3.10C, pp. 44-46.

Table 12. Total Number of Permanent (Paid) Employees of the Distributive and service Sector Type of National Urban

Salary group (In birr)	Wholesale Business		Retail Business		Retail Business	
	Number	Proportion of the Total	Number	Proportion of the Total	Number	Proportion of the Total
Under 150	4,337.0	23.9	12,568.0	50.9	59,319.0	51.4
150-349	6,589.0	36.3	8,510.0	34.5	42,239.0	36.6
350-549	2,289.0	12.6	2,211.0	9.0	8,063.0	7.0
550-749	1,471.0	8.1	583.0	2.4	2,899.0	2.5
750-949	1,122.0	6.2	234.0	0.9	761.0	0.7
950+	2,349.0	12.9	565.0	2.3	2,175.0	1.9
Total	18,157.0	100.0	24,671.0	100.0	115,456.0	100.0

Source: CSA, Report on Distributive and Service trade Survey, statistical Bulletin No. 179, October 1997, tables 34, 35 and 36, pp 90-93 and * tables 3.10A, 3.10B and 3.10C, pp. 44-46.

Table 13. Plant Size by Employment of Large and Medium Scale Manufacturing Industries

Employment Size	Public and Private		Public		Private	
	No	%	No	%	No	%
10-19	301	40.6	5	3.1	296	51.0
20-49	185	25.0	6	3.7	179	30.9
50 & Over	255	34.4	150	93.2	105	18.1
Total	741	100	161	100	580	100

Source: CSA (1998). Report on Large and Medium Scale Manufacturing and Electricity Industries Survey. Bulletin No 191. Addis Ababa

Table 14. Plant Size by Size of Paid-up Capital of Large and Medium Scale Manufacturing Industries

Size of Paid up Capital	Public and Private		Public		Private	
	No	%	No	%	No	%
Up to 50,000	99	13.6	2	1.3	97	16.9
50,001 - 100,000	76	10.4	1	0.6	75	13.9
100,001 - 250,000	117	16.1	7	4.6	110	19.2
250,001 - 500,000	101	13.9	8	5.2	93	16.2
500,001 - 1,000,000	84	11.5	18	11.7	66	11.5
Over 1,000,000	251	34.5	118	76.6	133	23.2
Total	728	100	154	100	574	100

Source: CSA (1998). Report on Large and Medium Scale Manufacturing and Electricity Industries Survey. Bulletin No. 191. Addis Ababa.

Table 15. Establishments With and Without Book of Accounts

	Number				Percentage		
	With	Without	With but not full	Total	With	Without	With but Not full
A. Large and Medium Scale Manufacturing and Electricity Industry (for 1996/97)							
• Public and Private	369	372	-	741	49.8	50.2	-
• Public	154	7	-	161	95.6	4.3	-
• Private	215	365	-	580	37.1	62.9	-
B. Distributive and Service Trade /1996							
• Wholesale Business	546	6,058	1,175	7,779	7.0	77.9	15.1
• Retail Trade	1,938	114,931	6,859	123,728	1.6	92.9	5.5
• Service Trade	1,719	76,080	3,358	81,157	2.1	93.7	4.1

Source: CSA (1998). Report on Large and Medium Scale Manufacturing and Electricity Industries Survey. Bulletin No. 191. Addis Ababa and CSA (1997). Report on Distributive and Service Trade Survey. Statistical Bulletin No 179. Addis Ababa.

NOTES TO CONTRIBUTORS

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