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Editorial Note

JADS is consistently carrying on publishing issues that thoroughly discuss scholarly out puts in Africa. This volume has four articles that capture the interest of scholars, practicing managers and policy makers.

The first article is written by Ambachew Mekonnen, which critically analyzes some descriptive facts on the Sub-Saharan Africa Economic Stagnation. The economic stagnation is signified by a trend of de-industrialization and agrarian pre-dominance on one side, and the unabated population growth on the other side are the two main facets of an average Sub-Saharan Africa (SSA) economy, indicative of the deprived living conditions of citizens of the region. He further explained that these longstanding and unpleasant socio-economic features are happening in the era of globalization when SSA economies are exposed to fiercer competition than any other time. This article, finally, proposes that such tangled problems indicate the need for a research attention to be deployed to identify the root causes of the problems and a practical/sustainable remedial action to be enacted.

Zigigu Samuel, in the second article of this Volume, evaluates the role of micro-credit programs in poverty alleviation in Addis Ababa City by comparing two micro-credit institutions: Addis Credit and Saving Institution (ADCSI) and Africa Village Financial Service (AVFS). He collected data from primary sources through questionnaire and interview. Questionnaire was distributed and collected from 50 clients of both institutes. In addition, 4 officials of the two institutes were contacted through interview. Supplementary to primary data, secondary data from different sources were also collected. This study found that ADCSI and AVFS failed to alleviate poverty in Addis Ababa, for very different reasons: ADCSI has effectively excluded the poor, and AVFS has failed to improve the situation of the poor. The result of this study also implies that both ADCSI and AVFS have benefited men than women.

A.K.Vashisht, Karamjeet Singh and Letenah Ejigu have discussed the financial decisions, the sustainability and outreach performances of Ethiopian Microfinance Institutions (MFIs). This study, using a relatively balanced panel data of 13 MFIs from the period 2003-2008, tried to identify the financial decision variables that have an impact on the sustainability and outreach performance of Ethiopian MFIs. Data was collected from the Microfinance Information exchange (MIX), a platform dedicated to the worldwide dissemination of quality microfinance data. Results indicated that all the included capital structure variables (capital to asset, deposit to asset and commercial debt to gross loan portfolio) have negative impact on

Operational Self Sufficiency (OSS). Like Rhyne and Otero's (1992) study it is found that MFIs that mobilize public savings and access commercial debt can increase their number of borrowers at a significant rate. MFIs that charge high interest rate increased sustainability significantly probably because loan demand is interest-inelastic. MFIs that have social mission (small loan size and more proportion of women clients) charge higher interest rate, seemingly paradoxical at the onset but they do it possibly to cover their high cost of reaching marginalized poor people. MFIs with high cost structure, as expected, have lower OSS and finally social oriented MFIs have poor portfolio quality.

In the fourth article of this Volume, Amabchew Mekonnen has investigated the dynamic links between Investment, Trade Openness and Growth in SSA. Some studies are skeptical whether further investment is productive and trade liberalization is promising for SSA economic growth. However, the skepticisms are mostly reliant on single equation estimations of contemporaneous effects that may not account for simultaneity and dynamic interactions. Tackling these econometric problems, this study investigates the dynamic links between investment,, trade and income growth in SSA economies targeting at addressing the question: how the impacts amongst these economic forces flow? The study estimates a system of dynamic simultaneous equations model with SURE using panel data from 32 SSA countries over 1961-2003. The estimated results jointly reveal the existence of a full cycle of impact flows from investment-GDP-trade openness-investment besides the twin feedbacks between GDP growth and growths of investment & trade. The positive impact of trade liberalization on SSA economic growth is found lagging for two years and persisting to the subsequent year. Its growth effect is twofold. It enhances economic growth directly and indirectly through investment while the latter is also found growth spurring. Hence, deepening trade liberalization policies, encouraging investment in the exporting sector through incentive schemes favouring the import of technology embodying capital goods and enhancing their synergetic links have been recommended for better economic performance of the region.

Finally, I would like to extend my gratitude to the Ethiopian Civil Service University for the financial support, and scholars, reviewers and editors for their valuable contribution to make this issue of the highest possible quality.

Editor-in-chief

Some Descriptive Facts on the Sub-Saharan Africa Economic Stagnation

Ambachew Mekonnen *

Abstract: *The economic stagnation signified by a trend of de-industrialization and agrarian pre-dominance on one side, and the unabated population growth on the other side are the two main facets of an average Sub-Saharan Africa (SSA) economy, indicative of the deprived living conditions of citizens of the region. These longstanding and unpleasant socio-economic features are happening in the era of globalization when SSA economies are exposed to fiercer competition than any other time. Such tangled problems indicate the need for a research attention to be deployed to identify the root causes of the problems and a practical/sustainable remedial action to be enacted.*

Key Words: *Globalization, Population, Economic Stagnation, SSA* JEL Classification: *E22, O16.*

******Address for correspondence: Ambachew Mekonnen Sissay, Office B1.07, School of Economics, University of Kent, Canterbury, Kent, CT2 7NP, UK. E-mail: am397@kent.ac.uk, Mobile: +44(0)7901068626.*

1.1 Introduction

The prevailing world incorporates a disarrayed wide spectrum of nations in that people living in different parts of the world are in different living circumstances. Some are in a safer and brighter situation while some are at an extreme edge of the dark end. It is customary to classify countries of the world as rich and poor, or developed and under developed depending on their corresponding development achievements. Based on their performances, some are classified as growth miracles while some are termed as growth disasters/debacles, for their respective astonishing and successive down ward growths (Charles Jones, 1998 P. 4-10).

Nonetheless, all corners of the globe are networked with various economic ties by means of international trade and cross-border investments. International trade economists have long established that a liberal and outward-oriented trade regime is the best strategy for a small open economy that takes international prices as given. The main channels through which an outward trade policy affects growth include the following. The first is the channel of investment in that trade motivates investment and the latter bolsters growth. The second is the productivity channel in that trade facilitates the transfer of knowledge that could provide opportunities to faster growth. The third channel is the impact of trade on increasing government commitment and policies to be intact with growth objectives (Wacziarg, 2001, P. 395-398,

Yanikkaya, 2003, P. 73, Andersen and Babula1, 2008, P. 9, World Capital Forum, 2008, P. 1). The unlimited market access or demand could also be considered as the fourth mechanism through which international trade contributes to growth.

Hence, many countries have been initiating trade reforms either by themselves or the pressure of Bretton Woods institutions, via Structural Adjustment Programs (SAP) and their conditionality. They are geared to produce what they can produce and sell wherever they like based on their profit orientation. The key issue is the ability to produce and sell, profitably; which in turn depends on the actual investment and allocation of resources that could ensure technical and economic efficiencies. Hence, countries are playing a trade-game in a wave of escalating competition. Based on the game results, a list of countries all over the world is formed; in that, every country has its own position in the list starting with winners at the top and ending with seriously affected losers at the bottom. *Countries, therefore, are trying to improve their position despite wide gaps in development stages.*

1.2. Globalization: *Episodes and Evidences*

Over the past few years, the world has witnessed a deepening integration of economies worldwide, irrespective of countries' geographic location. Referring to the contemporaneous global issues, the World Bank (2006) says "In an era of uncertain alliances and global fears, it is striking that the world economy continues to become more integrated" (P. 1). The integration is most notably illustrated by large scale flows of capital, goods and services (Fofack, 2009, P. 2). This phenomenon of international economic integration is propelled by innovative factors like fast transportation, information and communication, and continuous technical progress; and by its behavioral factors such as fewer or lower trade barriers, better economic management and fierce competition based on the technical and economic efficiency of not only a producing industry but also an economy as a whole that contribute to static and dynamic gains. These factors and strong economic ties have shrunk the world in which dwellers are working together to improve their income and living standards continuously. This overwhelming phenomenon has given

the current time period to be known as "the era of globalization".

Nonetheless, globalization is not a single process. It proceeds as people and institutions seek profits and competitive advantage through expanding trade in goods and services and cross-border flows of financial resources and people (The World Bank, 2006, P. 1). Globalization, with its distinct elements including transfer of knowledge, trade liberalization, labor flow, movement of capital (FDI and portfolio investment) and capital market liberalization, is argued to affect growth adversely in developing countries. As Stiglitz (2003) noted, there are eight broad and intertwining channels through which globalization can exercise adverse effects on growth. According to him, globalization affects adversely the pace of job creation, the risks a country faces, macro-economic stability– uncontrolled flow of capital, provision of capital they need to grow, independence of monetary policy, national financial institutions, the domestic political equilibrium and social capital. Under these circumstances, countries that have managed the globalization process well have shown that globalization can be a powerful force for economic growth (as in the West and South East Asia). But more commonly, globalization has not been so well managed. Consequently, many developing countries are becoming losers and exposed to crises. In fact, it is well known that not everyone benefits. There are losers. Even poverty can increase, for example in Africa (P. 505-522). The World Bank (2006) also reinstates this idea as "....not all people have shared in the benefits of an expanding global economy. Compared with other developing country regions, Sub-Saharan Africa lags in this integration process and has not yet been able to take full advantage of opportunities brought by globalization" (P. 2).

A contrast between Southeast Asia (SEA) and Sub-Saharan Africa growth performance is mentioned as a striking one. A number of analysts believe that it is due to the differences in openness to international trade, specifically, the growth of exports and the growth of GDP appear to be highly correlated; and, on average, countries with a more open trade orientation appear to do better through time (Greenaway *et al* 1998, P. 1, Reiss, 2007, P. 94).

However, others argue that a high foreign trade share alone does not guarantee a good growth performance

(Reiss, 2007, P. 94). The structural composition as well as the types and nature of commodities traded also matter. The structural composition of trade particularly export of a country reflects the structure of the whole economy. Hence, as the African economies in general and that of Sub-Saharan African in particular are highly dependent on agriculture, it is justifiable to anticipate their exports to be dominated by primary commodities. Whereas, SEA economies have been industrializing rapidly with a spectacularly aggressive export promotion move to the extent that different metaphoric names such as 'Growth Miracles', 'High-performing economies', 'Tigers' or 'Dragons' (South Korea, Taiwan, Hong Kong and Singapore) and 'NICs' (Malaysia, Indonesia and Thailand) are attached to them. We should also note that Japan is at the core of the success story of that region while China has been recently emerging in unprecedented mome - ntum, flooding the world with manufactured exports and playing a huge additive role in reinforcing the economic power of that sub-region.

A recent World Development Report of the World Bank explains China's rapid trade expansion has not only been a driving force of its continuous high growth, but has also helped its trading partners in East Asia and the Pacific to integrate faster into the global manufacturing sector (2006, P. 311). Another study has also noted the outstanding growth of the Chinese and the Philippines' supply capacities in the period 1992-99 (UNCTAD, 2005, P. 57). Vietnam is moving to join the group. Vietnam is one of the five fastest growing economies in the world from 1990 to 2004 measured by GDP per capita in that all experienced double-digit annual growth in trade (World Bank, 2006, P. 311). Hence, the question 'what factors cause such an extreme deviation between SSA and SEA growth performances?' is worthy of close scrutiny. Furthermore, investigating the growth and trading experiences of these well-performing SEA economies with an intention of learning from their success stories would have high pay-off if the lessons are properly identified and applied consistent to the existing/peculiar nature of the economies where they are exercised.

1.3. Unpleasant Demographic & Economic Situations of SSA: *International Comparison*

Sub-Saharan Africa (SSA) is the largest portion of the continent

comprising 49 out of the 54 independent nation-states of Africa (UNCTAD, 2008, P. 66). Indeed, the number of countries varies over time due to the separation of some off-shooting other independent nations & varying counting criteria. SSA faces unpleasant geographic, demographic, historical & economic circumstances. Tropical climate & land-locked borders (about one-third of the population) are among the geographic obstacles while high fertility, ever-growing population, low life-expectancy & ethno-linguistic fractionalisation are among the demographic challenges complicating the task of policy making.

Sub-Saharan Africa displays more ethnic diversity than anywhere else in the world. One-sixth of the world's total languages (~1000 languages) are in Africa; of which about 80 (8%) are in Ethiopia (Wikipedia, the free encyclopedia, 2010). Easterly and Levine (1997) argue that ethnic diversity leads to social and political divisions that divert attention from sound policy making and harms growth since it leads to poorer policy choices. Studies also mention that policy distortions are partly the consequences of colonialism. In the 1960s, the newly-independent countries pursued state-led development & closed economic policies as a reaction to the colonial past & against fear of foreign domination (in Sachs & Warner, 1997, P. 351-352).

The demographic situation of SSA is unpleasant. Its population is increasing faster than the world average. In 1960, the whole population of SSA was about 7 percent of the world and 56 percent of the low income portion. Attributing to its faster growth, the proportion of SSA population rises by one percentage point in a decade. As an illustration of this inference, it increased from 7 percent in 1960 to 8 percent in 1970, 9 percent in 1980, 10 percent in 1990, 11 percent in 2000 and 12 percent in 2005-2007. The same increasing pattern is also shown when we look at its ratio to that of East Asian and Pacific countries (EAP), as presented in the appendix table. Population growth of SSA as a region has never been below the world, low income group and EAP averages. It has also never been below 2.3 percent, until recently. In fact, up to 2006, rate of population growth in SSA was above 2.4 percent peaking at 3.1 percent in 1980, among the selected years. Whereas, that of the EAP has shown a sharp decline from its highest 2.72 percent in 1970 to below 1 percent since 2000; and, that

of the world average also has followed a declining trend from 2.53 percent in 1960 to 1.13 percent in 2007.

The striking feature of SSA is not only its fast population growth pattern but it is also accompanied by the lowest economic growth, compared to other parts of the world. Contrarily, in EAP, the lowest population growth pace is accompanied by rapid economic growth, as illustrated in appendix figures 1.1 and 1.2. The situation becomes worse when it comes to Ethiopia with a population growth even higher than the SSA average since 1981 and very erratic GDP growth.

The outcome of fast population growth coupled with low GDP growth in SSA and the reverse situation in EAP is divergence in growth of per capita income and the resulting living standards between these regions. In SSA, one can easily observe from appendix figure 1.2 that there are many episodes of negative per capita income growth as there are rates of GDP growth below zero and below the corresponding population growth while GDP growth has been ever-positive in EAP except the pre-1968 period. This fact is also supported by the relative per capita income figures presented in the appendix table. According to the evidences, the ratio of per capita income of SSA to that of EAP region has been declining considerably from above 2 in 1980 to below 0.5 in 2005.

Due to the down turn of its economic situation, SSA became a major destination of aid and jeopardized for deepening indebtedness. Its share in official development assistance of the world total and low income group is increasing overtime. However, its share of the total debt flow to low income group seems stable at around 90 percent. In fact, the ratio of debt of SSA to that of EAP has shown a drastic decline from equality in 1980 to below 0.3 certainly by 2006, partly indicating creditors' loss of confidence on the credit worthiness of SSA *vis-à-vis* EAP (refer the appendix table).

The primary education rate and health coverage proxied by measles immunity of the relevant age group also show the inferior social service provision of SSA to all the groups in the comparison in all of the years considered. If we look at the respective achievements in 2005, education and health coverage had remained below 60 percent and 70 percent in SSA while the world averages reached 86.2 percent and 78 percent and they also reached 97.8

percent and 84.5 percent in EAP. Despite its relative low performance far below the world average and that of EAP achievements, the average education and health coverage even in the low income group are above that of SSA.

The other macro performance indicator that we pay attention is the structural transformation of the economies. Economic theory postulates that changes in structural composition of economies from activities which are subject to diminishing returns to factor inputs - agriculture, primary activities and services sectors - towards a sector which has unbounded productivity possibilities - industry particularly the manufacturing sub-sector - is a pre-requisite for sustainable prosperity and continuous improvements in living standards. For this reason, many developing nations have been trying to industrialize their economies and some are emerging as advanced economic powers.

Unfortunately, the situation in SSA reveals the opposite, ***early stage de-industrialization.*** Appendix figure 1.3 illustrates the structural transformation of the economies of SSA, the world as a whole, low income group, EAP and the case of Ethiopia. For almost 43 years since 1965, the structural composition of the SSA economy does not show a significant change except some transitory fluctuations, the slight decline of the agriculture share to a little below 20 percent and the slight rise of the share of the service sector to a little above 50 percent. The gloomy feature of the economy of the region is indicated by the negatively sloping line fitting the trend of the share of the industrial sector particularly for the post-1980. During the post-1980, agriculture and industry have been gradually losing their shares. Basically, the service sector, with exceptions of some of its constituents, is the other activity subject to diminishing marginal returns. The second drawback of the service sector is that much of its products are non-tradable. Hence, the SSA economy is tending to transform from one diminishing to another diminishing plus none-tradable sector bypassing the stage of industrialization while, in the modern global integration, producing for export is a way to rapid growth.

The Ethiopian economy represents the worst scenario in that the industrial share has been stagnant at about 11 to 12 percent since 1981. Agriculture has been the main source of GDP. Its decline is nearly fully captured by the service sector and their subsequent bounce back of one from the other give an impression as one is

inverted image of the other. In fact, the dominance of the service sector is also reflected in the world average and that of low income group. The world average shows '***economic servicization***' accompanied by the fall in the importance of agriculture. Strong deviation is boldly revealed by the structural transformation of the EAP economy. The share of agriculture is sharply falling. The industrial followed by the service sector is rising (see appendix figure 1.3). This is a typical illustration of ***'healthy economic transformation'.***

1.4. Summary

In sum, the whole situation of SSA economies with many awful outcomes, such as unabated population growth, slow growth, lethargic transformation, high dependency on aid & debt, low human capital (less educated & less healthy) and early stage de-industrialization, all contrary to the features of the EAP economy, indicates as there must be something wrong and malfunctioning systems in the region resulting in a vicious circle of low-economic performance. In a normative sense, these outcomes also would have been retarding growth and adversely causing the external sector and the productive capacity of the economies to be constrained to that extent. But, it is a question of empirical test as the above intuition involves a certain degree of value judgments. Hence, a focused research on the causes of such downward turns should get due attention for rigorous investigation that could indicate future paths for re-industrialization, improved trade and growth performances of the region.

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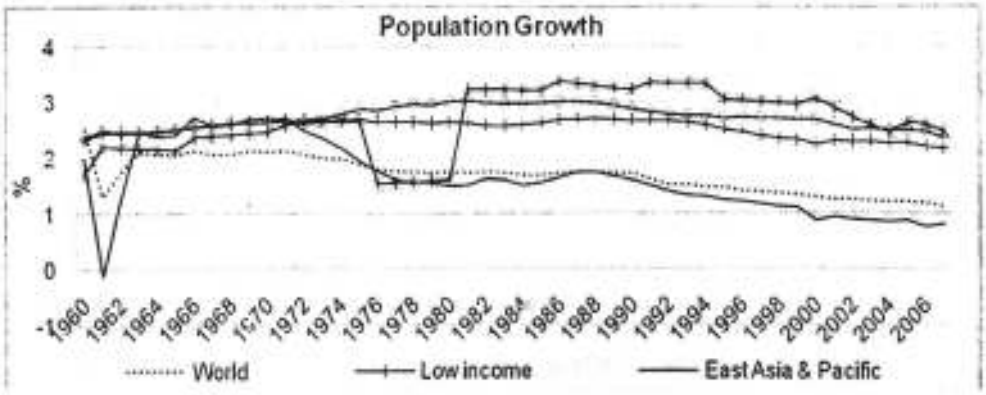
Appendix table: Some Macroeconomic Indicators of SSA, *International Comparison, 1960-2007*

Indicator		Benchmark	1960	1970	1980	1990	2000	2005	2006	2007
Population		As a ratio of the World	0.07	0.08	0.09	0.1	0.11	0.12	0.12	0.12
		As a ratio of low income	0.56	0.56	0.57	0.59	0.61	0.61	0.62	0.62
		As a ratio of EAP	0.25	0.26	0.28	0.32	0.37	0.4	0.41	0.42
GNI Per Capita	Atlas method	As a ratio of the World	-	0.27	0.26	0.14	0.09	0.11	0.11	0.12
		As a ratio of low income	-	-	1.69	1.87	1.51	1.63	1.66	1.65
		As a ratio of EAP	-	1.71	2.27	1.36	0.53	0.46	0.46	0.44
	PPP	As a ratio of the World	-	-	0.3	0.23	0.16	0.19	0.19	0.18
		As a ratio of low income	-	-	1.71	1.5	1.32	1.27	1.26	1.25
		As a ratio of EAP	-	-	2.19	1.09	0.54	0.42	0.4	0.38
Debt		As a ratio of the World	-	-	-	-	-	-	-	-
		As a ratio of low income	-	0.7	0.9	0.83	0.92	0.92	0.86	0.90
		As a ratio of EAP	-	0.81	1	0.75	0.43	0.35	0.26	0.27
Official Dev't Assist. & Aid		As a ratio of the World	0.14	0.17	0.23	0.3	0.23	0.3	0.38	-
		As a ratio of low income	0.71	0.56	0.73	0.91	0.8	0.9	0.91	-
		As a ratio of EAP	1.14	0.86	18.3	2.32	1.54	22.5	5.13	-

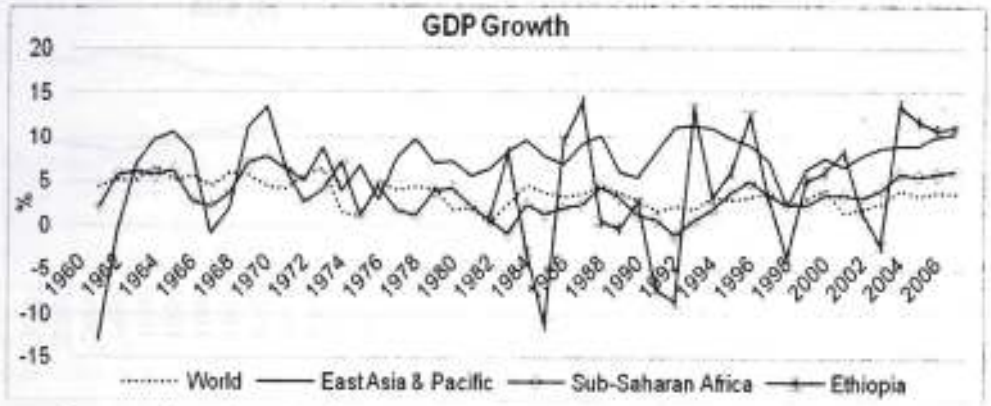
Source: Own computation, Data from the World Bank Group, online Database, 2007

Appendix figure 1.1. Population Growth of SSA Compared to Different Groups of Countries



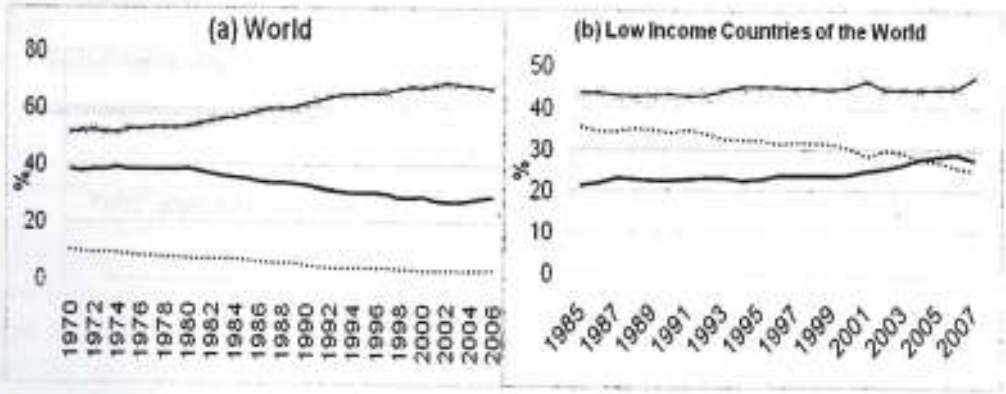
Source: Own plot, data from the World Bank Group, online Database, 2007

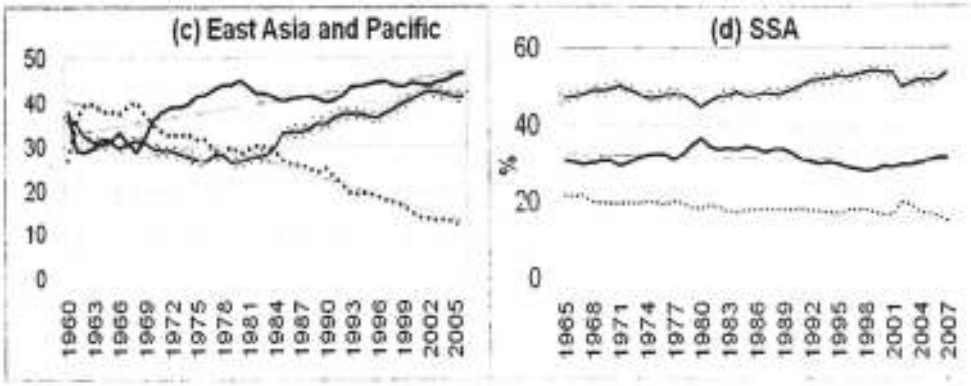
Appendix figure 1.2. GDP Growth of SSA Compared to Different Groups of Countries

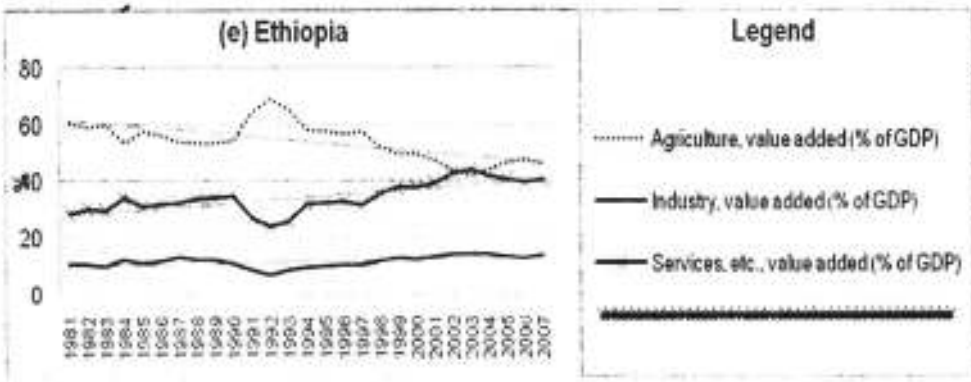


Source: Own plot, data from the World Bank Group, online Database, 2007

Appendix figure 1.3. Structural Transformation of SSA, International Comparison (% GDP)







Source: Own plot, Data from the World Bank Group, Online Database, 2007

The Role of Microcredit in Urban Poverty Alleviation in Ethiopia: A Comparative Analysis of Addis Credit and Saving Institution and Africa Village Financial Service

*Zigiju Samuel**

Abstract: *this paper evaluates the role of micro-credit programs in poverty alleviation in Addis Ababa City by comparing two micro-credit institutions: Addis Credit and Saving Institution (AdCSI) and Africa Village Financial Service (AVFS). Data from primary sources were collected through questionnaire and interview. Questionnaire was distributed and collected from 50 clients of both institutes. In addition, 4 officials of the two institutes were contacted through interview. Supplementary to primary data, secondary data from different sources were also collected. It is found that AdCSI and AVFS failed to alleviate poverty in Addis Ababa, for very different reasons: AdCSI has effectively excluded the poor, and AVFS has failed to improve the situation of the poor. The result also implies that both AdCSI and AVFS have benefited men than women.*

Key words – Micro-credit, poverty, the poor, targeting, urban poverty alleviation

**Lecturer and Head, Department of Development Management, Institute of Public Management and Development Studies, Ethiopian Civil Service University, Addis Ababa, email: readyzi@yahoo.com/readyzi116@gmail.com*

1. Introduction

1.1 Background

The socio-economic predicament in Ethiopia is deep rooted and a result of the interplay of many factors. Mismanagement of the economy on the part of successive governments and three decades of civil war have greatly contributed to the present poor state of the country's economy. Nonetheless, there have been some encouraging developments since 1991 with the end of the civil war and a change of government.

The existing government, with international organizations, launched a sweeping program of economic reforms aimed at macroeconomic stabilization and poverty reduction since 1992/93. This reform resulted in devaluation of currency /the Ethiopian Birr (ETB), commodity market liberalization and a reduction in urban subsidies as part. In addition, the government also laid out a ten-year development strategy, called Agricultural Development-Led Industrialization (ADLI). It envisages fostering economic growth with the aim of reducing poverty (FDRE 2000). Indeed, a recurring theme in these programs is the reduction of poverty amongst the population.

The preoccupation with poverty reduction is warranted since a sizable proportion of Ethiopia's population lives in extreme poverty. The Human Development Report, for instance, reports that 81.3 percent of the population survives on less than $US1 a day (UNDP 2003). Although this may tend to overstate the incidence of poverty since the $1 poverty threshold used by the UNDP is much larger than the amount of expenditure needed to purchase the absolute minimum basket in Ethiopia, it is still the case that poverty is a widespread problem in Ethiopia. Recent estimates suggest that about 31 million people (44%) live below the local poverty line, which is equivalent to US 45 cents or 3 Ethiopian Birr (ETB) per person a day (MoFED 2005). Although poverty is higher in rural Ethiopia, it remains a problem in urban areas as most of the country's urban centres including Addis Ababa are currently facing different social and economic challenges.

In its effort to fight against urban and rural areas, the government recognized micro-credit services as one of the major poverty reduction strategies and set a legal framework for establishment and operation of Micro-credit Institutions (MCIs) to provide financial services to micro and small enterprises (MSEs) and poor rural and urban households. Currently, there are 30 licensed MCIs operating in Ethiopia (Kereta 2007) including the two institutions which are operating in Addis Ababa and the focus of this study, namely: Addis Credit and Savings Institution (AdCSI) established in 2000 as a share company and legally registered by the National Bank of Ethiopia (NBE); and Africa Village Financial Service (AVFS) which established in 1998 and legally registered.

1.2 Problem Statement

Although poverty reduction has remained the declared core objective in the government's Sustainable Development and Poverty Reduction Program (SDPRP), it has been giving inadequate emphasis to the problems of urban dwellers. The government's efforts to improve the living conditions of the rural population have begun to bear fruit, whereas the incidence and severity of poverty have intensified in the urban areas in the recent past. Recent researches suggest that the income gap between the wealthy and the poor has been widening in urban centres. Certainly, some work has been going on in the country to improve the lives of the urban population, especially in the recent past. However, most of the country's urban centres including Addis Ababa are still facing various social and economic problems. Addis Ababa has become the largest and most populous city in Ethiopia being more than 14 times bigger than that of the second larger city Dire-Dawa in the country (MWUD 2006). It contains about 26% of the total urban population. However, Addis Ababa is one of the least developed cities in

Africa facing a major challenge of urban poverty and slum proliferation (Haregewoin 2007:4). Like any other major city of Africa, Addis Ababa is presently suffering from a host of social and economic problems including widening income disparity, deepening poverty, rising unemployment, severe housing shortage, poorly developed physical and social infrastructure and the proliferation of slum and squatter settlements (UN-HABTAT 2007: 1).

Addis Ababa is growing at a rate of over five percent a year. Rapid urbanisation has been accompanied by growing numbers of poor people and a parallel increase in the social and economic needs of local communities. Unemployment remains high whilst nearly half the population earns less than what is needed to buy enough food for basic subsistence. A fifth of the city's population has no access to safe water while many people lack adequate toilet facilities and waste disposal systems (Gebremedhin 2006). Different studies indicate that the economy of the city is service sector dominant and the private; especially the informal economic activity has a greater contribution. So, 80% of the city's dwellers earn very low income of less than 74.5 USD per month (ORAAMP 2002: 24). On top of this, according to Bihon, the high unemployment rate of the city that is more than 40% aggravates the poverty situation of the residents. Hence, most of the households spent more than 50% of their income on food (Bihon 2006: 3).

MC therefore is recognized by the governments and NGOs as one of an effective tool to fight against poverty in Addis Ababa by providing financial services to those who do not have access to or neglected by the commercial banks and financial institutions. It is believed that it helps in reducing poverty by providing the poor with credit facility to start a small business and create employment opportunities. It also regarded as a tool for supporting the economic and social conditions of the poor and women by allowing access to education and health facilities and improves their living standards sustainably.

1.3 Research Objective

The objective of this research is to analyze the role of MCI in urban poverty alleviation in Addis Ababa city by comparing AdCSI and AVFS.

1.4 Research Questions

1) How do AdCSI and AVFS target the poor? What lending modalities do they employ?
2) To what extent do AdCSI and AVFS micro-credit schemes help beneficiaries to create employment opportunities, generate income and help them meet their basic social needs?
3) Do women benefit more from AdCSI and AVFS micro-credit programs than men do?

1.5 Methodological Notes

In order to analyse the role of MC in poverty alleviation in Addis Ababa, this study focuses on a comparative

study of two MCIs cases: AdCSI and AVFS. These two institutions are selected because of such variation in terms of access to subsidy, ownership and performance. Primary data was collected through questionnaire and interview. Closed ended as well as open-ended questionnaires were prepared and distributed to clients of both institutions. Office managers of AdCSI and AVFS were interviewed for qualitative input.

To gather data through questionnaire, 50 respondents (25 clients from each institute) were selected. These institutions are operating in 10 sub-cities in Addis Ababa. Two sub-cities namely Yeka and Kirkos were purposively selected because many of the clients are concentrated in these two sub-cities. In both sub cities, around 500 clients of each institute exist and the researcher selected 5% of the total clients of each institute existing in both sub-cities trough application of systematic random sampling technique. In addition, two officials from each institute were contacted through interview interviewed.

Secondary data like performance report and other relevant information were collected from the Institutions' head quarter as well as branch offices at sub-city level. Moreover, MC and poverty related websites like http://www.themix.com/, World Bank urban poverty assessment reports, country poverty related assessments, AdCSI and AVFS strategic plan and performance report, Association of Ethiopian Microfinance Institution reports were used as a secondary data sources.

2. Review of Related Literature

2.1 Concept and Definition of (Urban) Poverty

The definition and measurement of poverty is vague and fluid. Many authors define poverty in different ways by considering different criteria and indicators of poverty. Some researchers have defined poverty as inability to meet the basic nutritional needs. Others viewed poverty as a function of education and/or health using the measurement of life expectancy, child mortality, etc. Level of expenditure and consumption are other criteria used to define poverty.

In Development as Freedom, Sen (1999: 87) defines poverty as the deprivation of basic capabilities that provide a person with the freedom to choose the life s/he has reason to value. From this perspective, poverty is a condition with many interdependent and closely related dimensions which can be categorised as (a) lack of regular income and employment, productive assets (such as land and housing), access to social safety nets, and command over economic resources; (b) lack of access to services such as education, health care, information, credit, water supply and sanitation; and (c) influence on decision-making that affects one's life. It generally seems accepted that

poverty should be understood in a holistic way including economic, social, and political dimensions.

Urban poverty has various manifestations and characteristics such as inability to acquire adequate income and productive assets, poor access to basic services, homelessness and inadequate housing, lack of support from the social networks, social discrimination and exclusion, and poor access to decision making (Wekwete 1999: 43; Dube 1999: 2).

In identifying the characteristics of urban poverty from that of rural poverty, Moser describes urban poverty based on what she called 'commoditization'. By commoditization, she refers to the fact that urban households are for the most part obliged to pay for their food, shelter, transport and education than rural dwellers. Moreover, employment is frequently unavailable, insufficient or insecure while shelter is frequently illegal and insecure. The urban poor are affected by environmental problems including lack of environmental services (i.e. sanitation, water, drainage, and solid waste management), poor quality housing, overcrowding, and settlement on marginal, which increase health risk to the poor (Moser 1998: 24).

2.2 Debates on MC and Poverty Alleviation

Discourses on MC have presented it as a universal remedy for poverty alleviation. However, when one goes through the literature of impact assessment studies, one can find quite different results.

On the one hand, MC is said to have brought positive impacts on the life of clients. A growing database of empirical studies shows that MC has positive impacts to boost the ability of poor people to improve the conditions in which they live. It allows poor people to increase their income by starting new enterprises or expanding existing one. Research works indicate that the poor have taken advantage of increased earnings to improve consumption levels (Pitt and Khandker 1998), send their children to school and obtain better healthcare services (Morduch 1998), and build assets. In Indonesia 90% of BRI clients surveyed on the Island of Lombok had moved above the poverty line, with income increases averaging 112% (Panjaitan-Drioadisuryo and Cloud 1999). In Zimbabwe, extremely poor clients of Zambuko Trust, a local MCI, increased their consumption of high protein foods at a time when food expenditures across the country as a whole were decreasing (Barnes 2001). In Tanzania/Zanzibar, the income and asset values of borrowers are almost twice that of non-borrowers (Mohamed 2003). In India, in addition to increased economic wellbeing, SHARE clients have shown a striking shift from irregular, low paid daily labour to more diversified sources of income, with a strong reliance on small businesses (Simanowitz 2003). Studies of two separate MCIs in Bangladesh documented a similar shift from informal labour to self-

employment among MCI clients. As a result, overall wage rates in the villages served by the MC programs also increased (Khandker, M. 1998; Zaman 1999). In other words, MC programs are able to alleviate poverty through increasing individual and household income levels, as well as improving healthcare, nutrition, education, and helping to empower women (Khandker, S. 2005).

On the other hand, impact assessment studies have challenged the conventional wisdom of the poverty impact of MC. MC is said to play insignificant role towards mitigating the problems of the poor. Kan, Olds, and Kait (2005) studied the evolution, sustainability and management of ten MCIs in Gossas, Senegal, using the data over a period of three years. They found out that MCIs have helped to create some positive changes, but that there was no clear and marked evidence of poverty reduction and stated that the expectations of what MC can do to help lift communities out of poverty is a bit too optimistic (p. 146). On the basis of a study on DECSI (one of MCIs in Tigray region of Ethiopia), Borchgrevink et al. (2005) concluded that although the program was able to improve living conditions of the households who spent the loan on the intended activities and did not spend it on consumption to some extent; the youth in the age of 18-30 years, female-headed households, the landless, and the extremely poor were marginalized (P. 58). Moreover, considerable number of credit – financed ventures fails with a possible effect on indebtedness and asset depletion of clients. In addition, a high level of school dropout rates of clients' children was registered.

Morris and Barnes (2005) provided an overall assessment of the impact of MC programs in Uganda (FINCA, FOCCAS, and PRIDE). The researcher did not find that MC programs help to alleviate poverty in program areas, though results from this study indicated positive impacts. Based on the study conducted on Amhara Credit and Saving Institution (ACSI) in Ethiopia, Getaneh (2005) found out that it has brought a very little impact in poverty reduction and enterprise development and that the outreach performance is also minimal.

Thus, despite the many positive findings that are reported in some feasibility and impact studies, many studies report the impact of MC programs is insignificant. Many studies also fail to find out the direct link between MC and poverty reduction.

2.3 Subsidy: An Essential Ingredient for MC

If MCIs are supposed to reach the poor, they have to be heavily subsidized. Some argues that subsidized interest rates generally benefit only a small number of borrowers for a short period; and interest rate subsidies are an inappropriate use of donors or

government funds because they distort markets and lead to low repayment rates. Yet, from the practice, it is known that even large MCIs need subsidies in a continuous basis. For instance, Morduch indicated that the well-known MCIs like Grameen, despite reporting profit, are in fact subsidized on a continuing basis. There is a little to indicate that Grameen will be able to survive without subsidies while continuing to serve clients as it does now. Added to this, he mentioned that even when the credit market is functioning perfectly, subsidies might be justifiable on grounds of equity: if raising interest rate means losing clients or decreasing social impacts, subsidy may be justifiable, provided social benefits are commensurate and institutional efficiency can be maintained (Morduch 1999a).

Mallick (2002) also indicated that MC programmes aimed at the poor have, almost without exception, a substantial subsidy provided by governments or their aid agencies. Without this, the interest rates would be too high to be viable and the programmes would therefore be unsustainable. Subsidy enables to lower interest rate, which obviously results in some 'income transfer' to loan recipients.

The study conducted over 1991-93 by Mosley and Hulme (1998: 784) shows that subsidy is an important ingredient for performance of MCIs aiming at poverty reduction. They measured the financial performance of 13 MCIs in seven countries using two indicators: the proportion of loans more than six months in arrears and the subsidy dependence index, which measures the extent to which interest rates would have to be raised to breakeven in an environment free of all subsidy. They found that the higher they (measures) are, the harder it is for the lender to continue in business without subsidy. Clarke and Dercon (2008) also offer support to subsidies for MC programs. In their view, providing subsidies to MCIs may be a cost effective means of reaching the poor and improving their lives.

If subsidy is to work well and contributing towards poverty alleviation, we need to know whom to subsidize. In these regard, the ffirst step is to look at what share of the benefits go to an income group. With respect to this Littlefield in his work on financial intermediation, level applies four categories of income groups: lower middle income, economically active poor, very poor and destitute correspondingly financial intermediation of state and commercial banks, credit unions, financial NGOs and subsidized poverty programs respectively (Littlefield 2002). In other words, for the destitute category of income groups, subsidized poverty programs (including microcredit program) are feasible. From this, one can understand that in order to elevate the living standard of those impoverished segment of society (like majority of the population of many developing nations including Ethiopia who live far

below poverty line) subsidy is an essential ingredient.

2.4 Approaches of MC Lending

There are two major approaches on MC lending – the *financial system approach* and the *poverty lending approach* (Gulli 1998). The financial system approach emphasises large-scale outreach to the borrowers – both borrowers who can repay microloans from household and enterprise income streams, and to savers. It focuses on institutional self – sufficiency and financial sustainability as a pre-condition for greater outreach and implies transition to for-profit mode. Proponents of this school argue that there is no justification for subsidies as future outreach critically hinges upon achieving financial sustainability of the MCIs (Robinson 2001). According to them, the over all goals of MC are to provide sustainable financial services to low income people. But it does not necessarily mean to target the poorest. Furthermore, MC should proliferate in the context of competition because competition will insure high- quality and low-cost services. Thus, for them, the impact evaluation of MCIs should focus on financial indicators and efficiency. They also state that NGOs do not have an important role in MC. This is because NGOs may deliver subsidized credits and may undermine the development of competitive financial system. They emphasize that MC should not be integrated with other development services , because specialization is necessary to reach financial sustainability and large-scale outreach. In addition, luck of institutional capacity is perceived as a more binding constraint on the outreach of MC than availability of funds.

The poverty lending approach concentrates on reducing poverty through credit, often provided together with complementary service such as skill training and teaching of literacy and numeracy, health, nutrition, family planning and the like. Under this approach donor-and government-funded credit is provided poor borrowers typically at below market interest rates. The goal is to reach the poor, especially the extremely poor – the poorest of the poor with credit to help overcome poverty and gain empowerment (Ibid). It believes that this commitment will be affected if stress is given to profit motive. The proponents of this approach claim that the goal of MC is improving the livelihoods and empowerment of the poor. Because of this, subsidies for institutional innovation and expansion are justified. For them, assessing the impact of MCIs should be their effect of the livelihoods and income generating activities of the poor.

2.5 Microcredit Modalities

Individual vs. Group Credit Model

Most individual MCIs provide financial services only to entrepreneurs who are able to pledge collateral. Collateral - covering as a

general both the loan amount and the interest payment - signals the borrower's willingness to fully repay the loan. Therefore, it is seen as the main mechanism tackling all typical problems of a loan contract: adverse selection, moral hazard, and repayment enforcement. Borrowers with satisfactory repayment records may receive access to further loans of increasing volume. This gives sufficient incentives to all entrepreneurs who expect positive utility out of future investments (financed by future loans) to repay their current loan as scheduled. One of the most serious weaknesses of the individual micro-lending contract is that in a high competitive environment the incentives created by progressive lending perspectives receive a severe limitation. As shown in Armendariz and Morduch (2000), "the greater the likelihood of refinancing by a second lender, the weaker will be the incentive to repay the first lender". Group lending model works in such a way that instead of lending directly to individual borrowers, the lenders lend to groups of borrowers, who are jointly liable for a single loan. It minimizes administrative and transaction costs for lenders by replacing credit checks and collateral processing with self-selection of groups by borrowers. Borrowers, who were jointly liable for the loans of their group, had a stake in choosing trustworthy partners. The theoretical analysis of the group lending mechanism shows that the access to further loans as well as the access to higher loans, which is made conditional on the repayment of all borrowers in the group, creates an incentive for peer monitoring, peer support, peer pressure, and discourage default among the borrowers (Stiglitz 1990; Hulme and Mosley 1996).

Progressive Lending vs. Frequent Repayment Model

Progressive lending refers to the system by which borrowers obtain increasingly larger loans if repayment is made promptly. As long as the system is credible and alternative sources of finance are less attractive, this type of incentive can enhance repayments (Murdoch 1999b). Frequent repayment schedules are also seen to act as an added mechanism to secure repayment. As most MCIs collect repayments before investments bear fruit, they are in fact lending against the borrower's steady income stream and, hence, securing part of the loan repayment even if projects fail (Nissanke 2002: 5).

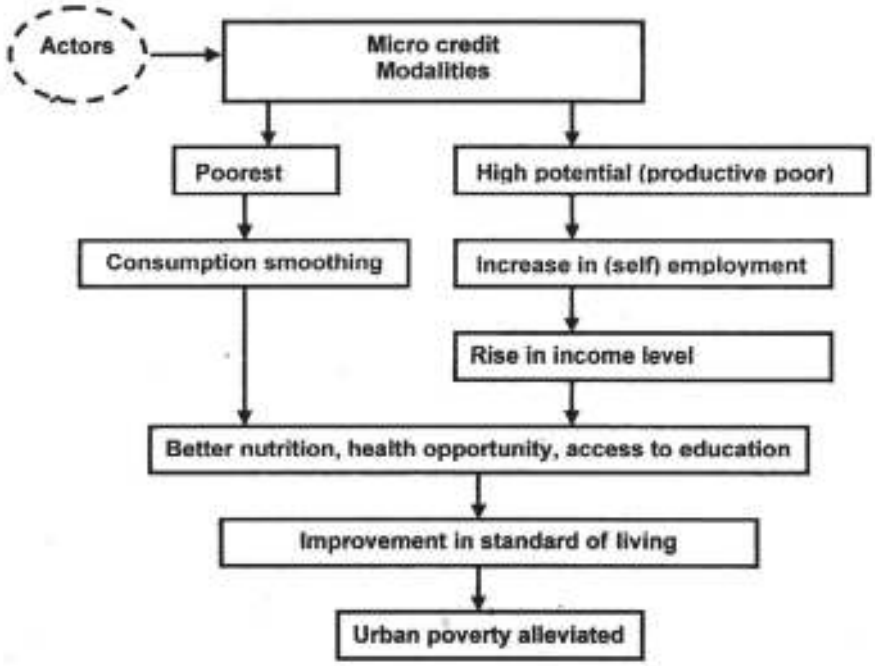
2.6 The Analytical Framework

General Assembly of the United Nations (Report on the Asia/Pacific Region Microcredit Summit Meeting in 2004) has recognized the positive impact of microcredit in poverty reduction. Microcredit impact studies have demonstrated that microcredit helps poor households meet basic needs and protects them against risks. The use of financial services by low-income households leads to

improvements in household socio-economic welfare.

According to Latifee, most of the practitioners believe that credit plays a vital role as an instrument of intervention for a poor person to discover her potential and to stride for better living. How micro-credit can reduce poverty may better be understood by understanding conceptually the mechanisms by which financial services can affect the lives of the poor. It is important to consider the fulfilment of basic needs (food, clothing, shelter, health, education and psychological well-being), the means to achieve welfare at present and in the future, social networks and empowerment and to risk (Latifee 2003).

Figure 1: Diagrammatic presentation of the analytical framework



Microcredit (the independent variable in this case) helps in reducing poverty (the dependent variable) by providing the poor with credit facilities to start small businesses. It not only supports the economic condition of the poor people but also has positive impacts on their social life through better standard of living with greater access to education and health facilities. The major indicators used to measure the independent variable (microcredit) is

targeting and gender sensitivity whereas level of income, access to education, health, housing services are used as an indicator to measure the dependent variable.

3. Results and Analysis

3.1 Targeting the Poor

MCIs need to determine where there is unmet demand for MC services and which target groups match their objectives and deserve their services most (Ledgerwood 1999: 34). Experience shows that unless there is an appropriate targeting tool, the poorest will be missed or tend to exclude themselves because they do not see the programs as being for them. The majority of poverty-focused MC programs incorporate client selection criteria, which attempt to limit participation of non-target groups. This method relies upon field workers to screen prospective members, usually applying objectively measurable eligibility criteria such as income level, asset values and housing conditions (Hickson 1996). Most programs fail, however, to maintain a focus on the poor. Targeting failure occurs when non-target groups are included and when appropriate target groups who deserve the credit service are excluded.

a) How Does AdCSI Target its Beneficiaries?

The major objective of AdCSI as one of MCIs is making the low-income segment of the community (with especial attention to women and making unemployed and new business start-ups its ultimate target clients) beneficiary of reasonable loan and saving service. The loan product/services, lending methodology, target groups, and selection criteria applied by AdCSI to achieve this objective are discussed here below.

Loan Product/Service Design

The service provided by AdCSI include loan, saving, consultancy, and managing third party money. The loan service is given for different activities such as weaving and tailoring, metal and woodworks, food processing, hairdressing, production of construction materials, small trade activities, construction, leather works, urban agriculture, etc. The amount of loan varies depending on the period of repayment-short term, medium term, and long term. Clients shall be residents in Addis Ababa and must be at least 18 years old.

There are different types of loan products/service. These are (a) micro-business loan sometimes called general loan which has a nature of instalment repayment and disbursed for high turn over activities; (b) a small business loan which is disbursed for technical and vocational school graduate students who want to inter in to productive venture and the size of the loan is usually greater than Birr 5000 to 50,000 for each entrepreneur; (c) micro lease loan in which clients choose the machines for their operations and AdCSI purchases these

machines and hand it over to them. The operators assume ownership after completion of payment. This type of loan is rendered mostly to people who are organized into cooperatives; and (d) housing loan product, which aims to enable clients to construct a new house or complete a construction in progress. The maximum loan size is Birr 50,000 with loan term of 60 months and payable monthly; (è) consumer loan product which targets government and related employees that have fixed monthly salary; the loan is guaranteed by employers and deducted from payroll on monthly basis. The loan size depends on the borrower's salary and loan term is up to 24 monfhs; and (f) short-term loan, which is repayable with in a maximum of six months. It targets clients that face very urgent financial problem or working capital shortage to do some urgent businesses.

The saving service rendered by the AdCSI includes two major types: voluntary and compulsory. The first one is saving made by clients and non-clients while the second one is for clients only who are required to save until the loan repayment is successfully completed. The amount of interest rate for saving ranges from 4 to 5% based on the type of saving. The institution charges an interest rate on loan, which ranges from 10% to 15% and additional 3% service charge.

Lending Modalities

Since its establishment, AdCSI has been using solidarity group lending model, which relies on group collateral. Although, such approach is an advantageous because of the group collateral, Borchgreving et al (2005) and others pointed out that group formation is one of the factors that contributed to the marginalization of the youth, the landless, the women and generally the poor. The fact that the youth and the landless are mobile would mean that they would be regarded as high risk by those with land, family and settled life.

The group lending used by AdCSI for delivery of loans itself, has become a barrier and source of marginalization of the poor, and has left them at the mercy of the moneylenders. It turns against the MCIs main objectives because group members and the community level Credit and Saving Committee tend to exclude and screen out individuals with limited asset and perceived to be of high risk, but able to generate income. This leads to the perpetuation of marginalization of the poor and the practice born out is that properties including land are serving as implicit collateral although groups were meant to replace property collateralization as a condition for loan granting. An important group of people-the poor would therefore be outside the service of AdCSI.

AdCSI also employs individual lending model, which depends on personal guarantee and/or collateral basis. The collateral includes property guarantee, which involves land, house,

vehicles, machineries, regular job salary, etc. It has this strong instrument of collateral with too strict requirements which is obviously difficult for the poor particularly women clients because they are usually unable to meet the requirements. Such practice certainly leads to screening out the poor, as they do not have capacity to meet the collateral requirements.

Moreover, AdCSI employs a frequent/regular repayment model. This is seen by AdCSI to act as an added mechanism to secure repayment and it is scheduled on a weekly basis, which begins soon after loan receipt. As most MC organizations collect repayments before investments bear fruit, they are in fact lending against the poor borrower's steady income stream and, hence, securing part of the loan repayment even if projects fail (Nissanke 2002: 5). Such mechanism obviously works against the poor and favour the non-poor since the poor, especially women, cannot pay the loan before they properly start their businesses. In such cases, if the poor have to benefit from the credit, a grace period is needed to be given to let the poor properly start their business without frustration and proceed confidently. Otherwise, the non-poor will continue to be the favoured beneficiary of the credit program while the poor remains marginalized.

Target Groups

Unemployed and new business start-ups are the ultimate target clients of the institution. With the mentioned lending models, AdCSI targets to reach MSE operators and potential operators. These include unemployed youth and women, legally registered co-operatives, local CBOs, and new business start-ups such as fresh graduates of high school, college, or even universities. Such borrowers shall be recruited or selected by the Credit and Savings Committee of their respective local administration (*Woreda*). AdCSI reaches its target groups through the 10 branch offices established at sub-city level and Service Delivery Posts established in *Woreda*. Added to this, there are Credit and Saving Committees to select clients.

Selection Criteria and Requirements

The requirement to access the loan includes: letter of approval from *Woreda* which shows that they are residents in Addis Ababa, certification letter for cooperatives and CBOs from the Trade and Industry Bureau of Addis Ababa City Administration, license and registration for joint ventures, the activity should be implemented in Addis Ababa City only, loan taken from the institution or similar institutions should be settled before hand, and preparation and submission of business plan/proposal. Moreover, comments and decisions by the Credit and Saving Committee at *Woreda* Administration level is one of the major requirements.

Letter of approval from *Woreda* is one of the major requirements needed by

AdCSI to ensure that the poor (applicants) are residents in Addis Ababa. This requirement creates a space for marginalization of the poor through different malpractices in the process of offering this evidence. For the poor people to get this evidence, it takes a long way for different reasons. The poor in Addis Ababa live either dependently in some ways or in rented substandard rooms. The *Woreda* needs the address where the applicant stays in order to give this letter. In this case, the owner of the house with whom the applicant lives is required to sign proofing that the person is living with him/her either as a dependent individual or as a renter/paying guest depending on the situation. However, the owners of the house are usually unwilling to sign for the poor living with them because not only they do not want to add external person as a member of the family but also with the intention to conceal that, they rent a substandard rooms.

The issue of obtaining certification letter as a cooperative, and license as a joint venture from the Trade and Industry Bureau of Addis Ababa City Government are also very complicated task, which is far beyond the access and capacity of the poor. In a situation where the poor people have no sufficient awareness and exposure about the bureaucratic system and where favoritism and patronage networks work more dominantly, it is very unlikely that the poor people can get easy access to obtain the required certification letter and license.

AdCSI also requires the clients to submit business plan/proposal in order to approve the credit for the clients. This is a bit complicated for poor people who are uneducated and mostly lack the required skill to prepare business proposal and obviously, such practice discourages the poor from applying for the loan. Moreover, AdCSI mainly works in line with guaranteeing repayment of the loan and hence gives emphasis to the better off. The *Woreda* level Service Delivery Posts and community level Credit and Saving Committee tend to ignore the poor simply assuming that they do not guarantee loan repayment and this practice apparently leads to the perpetuation of marginalization of the poor.

Exclusion of the appropriate target groups from accessing MC services may result from a simple failure to identify them but very often, it is also the result of deliberate efforts to impede the poor. As largely owned by the Addis Ababa City Government, AdCSI uses the existing bureaucratic structure and works with officials at different hierarchies of the City Government (especially *Woreda* Administration) for activities like selection of clients. The fact that the comments and decisions of the Credit and Saving Committee of the *Woreda* Administration is needed as one of the

major criteria for selection, witnesses that the body of the City Government particularly *Woreda* Administration has a big say in deciding who should be the recipients of the credit. This creates a kind of plat form for the government to intervene in credit service of the institution indirectly in order to use it for a political game. This situation may create and exacerbate, as argued by Gibbons and Meehan (2002), the patronage system and biasness that makes the distribution of credit based on better connections and in favour of the better off.

b) How does AVFS Target its Beneficiaries?

The objective of AVFS is providing credit for creating a sustainable financial base and employment opportunity for the poor or the low-income groups and thereby reducing poverty. Giving priority to women, as they are the most vulnerable groups to poverty, is also one of the major elements of the objective of the institution. In order to reach its target groups and achieve these objectives, AVFS has employed different loan products/service, lending modalities, and selection criteria which are discussed below.

Loan Product/service Design

The services provided by AVFS include saving and credit. It provides three types of loan products to meet the various needs of clients. The first is productive loan, which may be used by the groups, cooperatives, associations or individuals. Productive loan includes such sectors as manufacturing (i.e. metal and wood works), processing (i.e. foods and drinks), textile (i.e. spinning, weaving, and dress making), retailing (i.e. kiosk and shops), transport (i.e. donkey/horse drawn cart and three wheel motors), service (small restaurants and hair saloons), and construction (rooms and barns). The second type of loan called consumption loan is a loan provided for purposes like buying food supply, school uniform and fee payments, buying furniture, medicine … etc. The equipment-leasing loan is the third type, which may be used by individuals, groups, associations, and cooperatives who want to acquire equipment or machinery to start their businesses. The equipment is purchased in the name of AVFS, and when the borrower makes his/her full payment, the ownership of the equipment is passed on. These equipments/machines may include building materials input making machines, water pump, beehive, milk churner, baking oven, sewing machine…etc.

AVFS has four types of savings i.e. compulsory savings, voluntary savings, non-client saving, and loan insurance fund (LIF). Voluntary saving is payable during collects and may be withdrawn only at the time clients leave the program after making all payments while LIF is payable before the loan is disbursed. It is kept

with AVFS until the time clients have made full payment and withdrew from the program. Savings earn interest rate of 4% to 5% per annum based on the type of saving. The institution charges an interest rate 16% on loan and additional 3-4% service charge.

Lending Modalities

AVFS uses solidarity group lending model. This solidarity group model requires that services are delivered to participants after they form a group and are willing to guarantee each other's loans. It provides loan to groups, which are called *Budin* with 5-7 individuals who have mutual respect and trust. In order to give loans to *Budin* it always works with local CBO called *Iddir* from which the *Budin* is formed. The *Iddir* acts as an umbrella organization for the solidarity groups and assign social pressure to rehabilitate/correct members when there is deviation.

However, when the clients in the group reach 4th cycle of loans and are credit worthy the institution starts to provide individual loan on personal guarantee and/or collateral basis. In other words, in order to get individual loan, one should not only organized but also stay as a group until the 4th cycle. This approach is a good mechanism to include the poor and exclude the better – off/the non-poor from the program. The non-poor are not attracted with this kind of approach because they go for large individual loan based on personal guarantee/collateral right from the beginning.

AVFS applies progressive lending or successive higher credit as an added mechanism, which refers to the system by which borrowers obtain increasingly larger loans if repayment is made promptly. This feature serves as an incentive for the clients to repay the loan on time. Moreover, the institution also provides business and entrepreneurial skill development and other trainings in collaboration with Centre for Enterprise and Entrepreneurship Development (CEED) to help clients know how to manage and use the loan for the intended purposes. This indicates that the institution applies the credit – plus/integrated lending which is a comprehensive approach in which loans are combined with training, education, and other social mobilizations so as to maximise the income and opportunities.

Target Groups

The target groups of AVFS are low-income community members who do not have access to financial services to start their enterprises. This target groups are classified in to two categories: group, cooperatives, and association as one category and individual clients as another. The group, cooperative, and association

category of clients is provided loans based on group collateral. Individual target groups are the people who able to fulfill the collateral and guarantor requirements and can graduate to take individual loans. AVFS reaches these target groups mainly through *Iddir* and *Woreda* to some extent. However, as privately owned MCI, AVFS is unlikely to acquire the required support from *Woreda* Administrative.

Selection Criteria and Requirements

The criterion that potential clients expected to meet is that they must belong to the *Iddir*. *Iddir* usually constitutes a large number of people joined together on voluntarily basis for different social purposes. AVFS provides loan to the groups formed out of this *Iddir* by the members. *Iddir* generally plays a supervisory role towards their members and is responsible for taking care of smooth functioning of the whole system. In most cases, *Iddir* are established by the people with common goals, established leadership, undertake specific activities, and are sustainable over the long-term. These features make it effective instrument in reaching and selecting clients and maintaining a smooth operational system.

A person to be selected as a member of the group should bring a valid *Iddir* membership card that can, of course, easily obtained from their respective *Iddir* without many difficulties.

The potential borrowers then required to submit a simple loan application format prepared by the institution. The format has to be filled by applicants with the assistance of the institution's loan officers and then signed by the client and the spouse in order to receive the loan.

Getting the approval and signature of the spouse on the loan agreement form is considered as one of the essential criteria for clients to get the loan from AVFS. This may of course exacerbates the possibility that loans borrowed by women clients spend by their husbands unnecessarily. It is common that some irresponsible individuals, particularly young husbands, use the credit obtained by their women for drinking alcohols, chewing *Chat* (a green leaf with stimulating characteristics), and smoking purposes.

Agreement of the clients to the regular monitoring of his/her business by loan officer and group/*Budin* members in order to follow up how the loan is being used is also one of the requirements. This follow up is mainly to the benefit of the clients because it helps them to get important guidance, comments, and feedbacks to improve their performances and utilization of the loan.

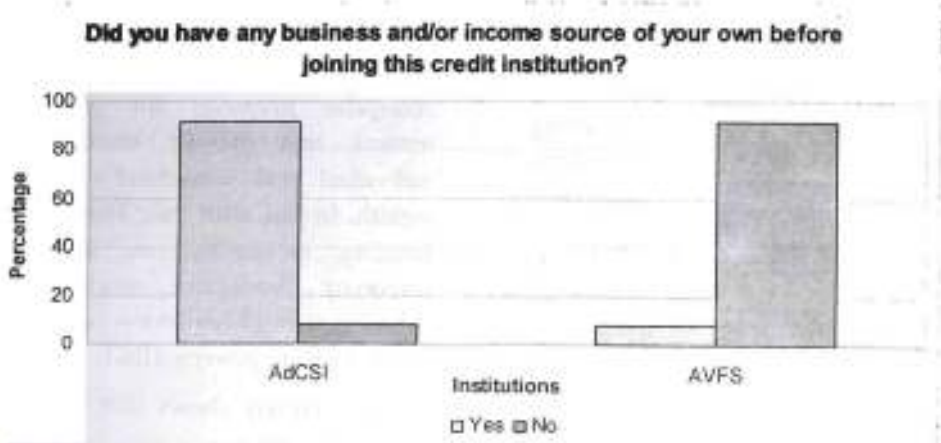
3.2 Previous Business Background and Income Sources of the Respondents

The respondents of both institutions were asked if they had their own

sources of income or any business activities that helped them generate income and create employment opportunity before joining the credit program. As shown in Figure 1, only 8% of the respondents of AVFS had their own business and income sources previously. On the other hand, 92% of the respondents of AdCSI had their own business from which they generate income and creating employment opportunity before joining the credit program. This may be a good indicator that AdCSI is mainly targeting to the better off and non- poor segment of the society in its credit service provision. For instance, AdCSI provides what it calls "consumer loan product" which is based on employer guarantee and/or asset collateral. This is a service provided to monthly paid employees of different organizations. Their employers get involved by providing written comments to AdCSI that they will deduct from the monthly salary of the employee and submit the required monthly payment to AdCSI. According to the interview conducted with the officer of AdCSI, this is working out very well as the repayment is guaranteed and the cost per credit is less.

However, more focus to the well-to-do segment of the community simply by considering that they will be able to pay the loan back may lead to implicit exclusion of the poor. Despite the various positive impact and strengths of MC, some researchers have found the problems and negative impacts produced by the implementation of MC programs. As argued by Morduch (1998), Copestake et al. (2001), and Dugger (2004), MC programs benefit the moderately poor more than the very poor or destitute, and thus impact can vary by income group (better off benefit more from MC). This found to be true from the primary data collected for this research as the data clearly signify and supports it. One of the respondents from AdCSI for instance mentioned that he is working for government and earning a monthly salary of more than Birr 1500. This reveals that AdCSI is serving more of the better off and non-poor who are living far above the local poverty line, which is, according to MoFED, 0.45 dollar a day (equals to 3 Ethiopian Birr). If the credit service is meant to serve the poor, it should be delivered to those people living along the mentioned local poverty line.

Figure 2
Previous business ownership and income source of the respondents



Source: Survey data (2010)

Both institutions have set in their objective that they contribute to poverty alleviation by giving credit and creating a sustainable financial base and employment opportunity for the poor or the low-income groups. Choudhri (2002) found that the main issues [...] confronting almost all MC programs aim at poverty alleviation in varying degrees, are identification of the poor [...] nature and causes of poverty, identification of appropriate income generating activities, and appropriate institutional support mechanism. Although the clients business background and experience is important for proper utilization of the credit and of course for guaranteeing repayment, more focus to the better off and well-to-do segments of the society who have their own business but in need of more money to further expand their business may lead to implicitly neglecting the poor people who can work but unable to start their own business because of financial constraints.

3.3 Improvements in Clients' Income, Savings, Employment Opportunities, Housing Conditions, and Basic Social Services

The major objective of MC is to create income among poor households and thereby alleviate poverty. The increase or decrease in the level of income may have an implication on the living standard of individuals. An increase in income, for instance, can pave the opportunity to open business, employment, entrepreneurship, access to health services, education, and house ownership.

In her Asset Vulnerability Framework (AVF), Moser emphasised that the development of human capital – one of the element of her framework, is closely linked to the economic and social infrastructure provision. Social services such as education, according to her, ensure that people gained skills and knowledge, while economic infrastructure such as water, transport, and electricity – together with health care – ensure that they used their skills and knowledge productively (Moser 1998: 31). There is now a growing evidence that social capital can have significant impact on development processes and outcome, in helping build human capital (Colman 1990), and contributing to household welfare (Narayan and Pritchett 1997). In this regard, both institutions contributed to the formation of social capital because they encourage, work with, and approach borrower groups and individuals through different CBOs.

Critical to the issue of MC services is also its employment creation among the poor society where many can use their "labour – commonly identified as the most important asset of the poor" (Moser 1998: 25) to generate income. It has been noted that in many countries of the world, MC programs, provides access to small amount of start-up capital for entrepreneurial projects which will then presumably help individual to create employment opportunities.

Apart from serving people as shelter, a house is the most valuable asset people should have. In urban area when the house is improved, its value boosts and can be used for rental or enterprise purposes for generating income and thereby increases an individual and household's material wealth. In line with this, Moser found housing ownership as the most important productive asset of the urban poor that cushions households against severe poverty (Ibid: 32).

Table 1 clearly shows that there is a noticeable difference between the two programs and their clients. Improvement for AdCSI participants is remarkable. As shown in Table 1, the income has increased for almost all of them and that led to improvement in the overall quality of living as indicated by improved access to education, health care, housing, employment opportunities, clothing, and nutritional foods. Similarly, in terms of their ability to afford different expenses like clothing, nutritional foods, and basic social services; compared to before, they indicated that they have gained more ability to afford after joining the credit program. This is because as clearly shown in Figure 1, AdCSI is providing credit to non-poor or the better off people who are doing paid jobs, have their own business, and have additional source of income even before joining the credit program.

In terms of improvement in housing conditions, 84% of AdCSI's respondents gave positive response. Among other issues asked to AdCSI participants, this figure is the only one, which is relatively less perhaps because the housing issue is a very critical problem in urban areas even for the better off as it is related to the issue of land and different complicated legal aspects.

On the contrary, only 40% of the respondents of AVFS indicated that their income has increased. Consequently, majority of the respondents reported that their overall quality of life is not improved. This clearly shows that the institution is not so successful in improving the living condition of the poor.

Although, the responses of AVFS clients to the improvement in income and overall quality of their life is less than 50% in each cases, the discrepancies predominantly in terms of savings and to some extent in terms of improvement in housing conditions, and ability to pay for nutritional foods is high.

The discrepancy in terms of savings is clearly higher than all the other factors. It is revealed in Table 1 that for only 24% of AVFS participants, the programs has improved their savings, but for the majority of the people it has even become worse. This shows that the poor are unable to start savings. They are in trouble to maintain the actual standard of expense and are not in a position to think of starting savings. Moreover, the compulsory saving mechanism used by the institution poses additional burden especially in the already limited capacity of beginner clients.

In addition, the divergence in terms of housing condition is relatively higher compared to others. Only 36% of respondents reported that their housing condition has increased. The fact that housing issue, as indicated by Moser, is always attached to complicated process of formal legal title (Moser 1998), makes it procedurally more difficult for the poor people who have no exposure and knowledge to pass related complex legal and bureaucratic constraints.

Similarly, in terms of ability to buy variety of dietary foods, only 32% of the respondents reported that they have got better ability after joining the credit program. This may be related to the reality of the existing living situations and increasing prices of food items. As many respondents indicated, the price of almost all food items is tripled and increasing from time to time. As a result, they said, "we never eat such kinds of foods as butter, meat, egg, fish and the like, since our capacity to buy is limited".

Table 1

Improvement in economic and social factors of clients and benefit by gender

	AdCSI					AVFS				
	M	%	F	%	Total in %	M	%	F	%	Total in %
Income has increased	13	100	11	92	96	6	46	4	33	40
Savings have increased	13	100	12	100	100	5	39	1	8	24
Access to education has improved	13	100	11	92	96	7	54	5	42	48
Access to healthcare has improved	13	100	11	92	96	7	54	4	33	44
Employment opportunities have improved	13	100	11	92	96	8	62	2	17	40
Housing conditions have improved	12	94	9	75	84	7	54	2	17	36
Ability to afford medical expenses (better after joining the credit program)	13	100	9	75	88	7	54	3	25	40
Ability to afford school expenses (better after joining the credit program)	13	100	10	83	92	7	54	4	33	44
Ability to buy clothing (better after joining the credit program)	13	100	10	83	92	6	46	4	33	40
Ability to pay for varieties of foods (better after joining the credit program)	13	100	10	83	92	6	46	2	17	32

Source: survey data (2010

The discrepancies mentioned above in AVFS may attribute to the interest rate. As it is not subsidized, AVFS charges a relatively high interest rate, which seems a bit difficult for clients. One of the respondents said, "You do not believe how headache the interest rate is. For instance if you borrow 3000 Birr, you must pay 3480 Birr. 480 Birr is, therefore, interest rate, which is an additional burden to the loan taker. In this environment how can the poor are helped to reduce their poverty?" Many respondents indicated that they sold their tools and properties

to pay the loan. One woman for instance mentioned that she sold the (gold chain) neck ornament she got when her mother passed away just to pay her loan. This in general can be a good indication that unsubsidized credits programs hardly contribute to improving the living conditions of the poor people.

Generally, in all cases the situation is always good for AdCIS's respondents and bad for AVFS clients and this makes clear that there is a difference between the two institutions along the line of poor and non-poor. In other words, AdCSI addresses the non-poor while AVFS addresses the poor.

3.4 The Benefit of AdCSI and AVFS Credit Programs by Gender

In just three decades a series of breakthroughs has shown that women — especially poor women — are creditworthy and make excellent consumers of financial products.

Today the majority of MC clients worldwide are women. Not only is MC good for women, but it also turns out that women are good for MC. Women are highly motivated savers and repay their loans at a higher rate than men.

In many cases, however, husbands to access the benefit of credit may use women as a mechanism and hence the benefit of most credit program does not reach women. As argued by Goetz and Gupta for instance most MC programs target women (due to higher repayment rates), which may result in men requiring wife to get loans for them (Goetz and Gupta 1995). Debts are therefore registered in the women's names, which leaves them vulnerable in case of death, illness or separation

MC is supposed to safeguarding women's equal access to healthcare, employment, housing, and education. Women are typically targeted for MC initiatives around the globe because studies indicate that involving women in the benefit of MC often plays a role in increasing gender equality. As compared to men, providing women more access to financial resources and enabling them benefit from the outcome of MC program helps increase the stability of the family unit (Cheston & Kuhn 2002).

According to Mayoux (2001), Women need to be targeted to benefit from the outcome of MC programs because of their characteristically high levels of poverty and responsibility for maintaining and running the family unit. Cheston and Kuhn (2002), argue that while women typically contribute all of their financial resources to their families, men rarely do so. According to Mayoux (2001), when women are given decision-making power, they generally make decisions that will be optimal for their families. As a result, women will tend to make financial decisions that will promote nutrition, health and literacy within their families, whereas men may allocate some of their resources towards activities that are not helpful (and sometimes harmful) to the family. Given the consideration that

women are poorer than men, they are expected to benefit more than men from MC programs. In other words, if MC programs are supposed to contribute to poverty alleviation, women have to benefit more than men do from the outcome of the credit programs.

It is revealed in Table 1 that there is no difference between the two institutions in their ability to benefit women because in both cases men benefit more than women from the outcome of the credit programs. But the difference is quit massive in the case of AVFS as indicated in the Table. The reason why such discrepancy is deeper in AVFS than AdCSI is attributed to the fact that AVFS lacks subsidy as an essential ingredient. As addressed else where in this paper, subsidy is an important ingredient for MCIs to help the poor (especially women as they usually constitute larger part of the poor) benefit from MC services. Unsubsidized MC programs contribute less in terms of helping the poor to benefit from the out come of the credit program.

The Table also reveals the difference between men and women within the respective institution in terms of benefit from the outcome of the program. Compared to men clients, especially in AVFS, considerably smaller percentage of women clients accepted that there is an improvement in their situations in terms of all factors. More importantly, there is a great discrepancy with respect to saving, employment opportunities, housing, ability to afford medical care, and ability to buy varieties of foods. As regarding to savings, 39% of male and only 8% of female clients of AVFS accepted that their savings have improved. This huge difference between men and women clients occurred because women usually pay high attention to household matters than men and spend the money for maintaining and running the family unit. Moreover, their money is usually spent unnecessarily by their husbands for non-productive activities.

When paying jobs are available, they usually tend to go to men. Therefore, for poor women to earn money, they often must rely on self-employment, which is supposed to be achieved through MC. In these particular cases, however, this did not work out, since the difference between men and women respondents in terms of benefiting from employment opportunity is very significant especially in the case of AVFS. Table 1 reveals that employment opportunity has improved only for 17% of female respondents while this remains true for 67% of male respondents. This is highly related to the socio-cultural barriers that limit women to household works only. In that sense, though the loan is taken in their name, women are not the direct beneficiary of self-employment.

House is the most essential asset women should have. As Moser argued house ownership is the most important

productive asset of the urban poor that cushions them against severe poverty (Moser 1998: 32). The data in Table 1 shows that women benefit less than men in terms of housing in both programs though the problem is more severe in the case of AVFS. While 54% of male clients accepted that they gained benefit in terms of housing, only 17% of female clients do benefit in that regard. Despite the fact that women are quite happy to be able to avail the housing loans in their names, the benefit goes to the families, as they do not have the land title. In case of separation of a woman from her family and husband, the house remains with the family and the woman ends up with nothing.

The discrepancies between men and women in terms of ability to afford medical care expenses and ability to buy varieties of foods are also significant particularly in the case of AVFS. Regarding the ability to afford medical expenses, 54 % of male and only 25% of female respondents agreed that they gained more ability after joining the credit program. Although the health care problem in Addis Ababa City is generally attributed to both men and women, the latter are the primary victims of the problem. They are more often exposed to health problems because of pregnancy and lack of nutritional food that may lead to diseases like pneumonia and malaria. This is because, among other things, in case when there is inadequate food at a time, they usually give priority to their husband and children.

The number of women clients who reported that they have gained better ability of buying and eating dietary foods is 17%, while men are 46%. The load of keeping house, feeding and taking care of children is remained to be the responsibility of women. In addition to taking these responsibilities, the expensiveness of the living conditions and increase in prices of all food items in the recent years poses additional burden on women and constrain them to increase their benefit from MC as compared to men.

4. Conclusion

Poverty has remained to be a daunting challenge to developing countries. It is a problem for all the countries irrespective of their level of development and can be observed in many forms. It has both income and non – income dimensions. It may be a lack of income or resources, a lack of coping capacity, a lack of basic human capabilities, a lack of institutional defences or in extreme cases a lack of all of these. In a wider sense, it may be a combination of economic, social and political deprivations.

To address this problem, developing countries implemented different strategies depending on their existing situations. Recently MC has been given due weight as one of the means to fight against poverty. MC Programs extend small loans to poor people aiming at enhancing self – employment projects that generate income to improve the living

conditions of the poor and alleviate poverty.

Ethiopia as part of the developing countries has adopted MC programs where many MCIs are delivering credit services to the poor in order to mitigate the effects of poverty among the poor sections of the society. This study examines the role of MCIs in urban poverty alleviation in Addis Ababa by taking two institutions as a case: AdCSI and AVFS. It is found that AdCSI and AVFS are fundamentally different programmes, with almost no overlaps in the actual target groups. They both failed to alleviate urban poverty, for very different reasons: AdCSI has effectively excluded the poor, and AVFS has failed to improve the situation of the poor.

4.1 How does AdCSI keep the poor people out?

AdCSI effectively exclude the poor using different ways. First, it has strong instrument – too strict collateral requirements, which enable to screen out the poor and bring the non-poor in. This collateral includes property guarantee, which involves land, house, vehicles, machineries, regular job salary ...etc. Collateral is obviously difficult for the poor particularly women clients because they are usually unable to meet the requirements. If credit is only to people who have capacity to meet these strict collateral requirements, it is all fine but we cannot call it helping the poor out of poverty trap.

Second, the group lending used by AdCSI for delivery of loans itself, has become a barrier and source of marginalization of the poor, and has left them at the mercy of the moneylenders. The group members and the community level credit and saving committee tend to exclude individuals with limited asset. In addition, properties including land are serving as implicit collateral although groups were meant to replace property collateralization as a condition for loan granting.

Third, AdCSI starts collecting repayments before business activities of the borrowers bear fruit to secure part of its loan repayment. This mechanism in fact works against the poor borrowers. The frequent repayment schedule begins soon after loan receipt before the borrowers properly start their businesses and does not allow a grace period.

Fourth, AdCSI requires the clients to submit business plan/proposal to approve the credit for the clients, which is a bit complicated for poor people who are uneducated and mostly lack the required skill to prepare business proposal. This discouraging criterion implicitly blocks the poor people from applying for the loan. Moreover, AdCSI mainly works in line with guaranteeing repayment of the loan and hence gives emphasis to the better off. It provides credit to the

non-poor people who are doing paid jobs, have their own business, and have additional source of income even before joining the credit program.

Finally, the institution implicitly decided to stay away from the cost of providing small loans to the poor clients and hence provides credit to the non – poor clients by setting such requirements as certification letter for cooperatives; license and registration for joint ventures which is a more complicated task and far beyond the access and capacity of the poor.

4.2 Why AVFS is unable to effectively improve the life of the poor?

AVFS actually reaches and addresses the poor people in its credit service. This is because the groups to which it provides credit is formed out of the local CBO called *Iddir* which is formed by low-income group people having common goals. AVFS works with this *Iddir* in order to reach the group. *Iddir* serves as a smooth object for both the institution and the poor because it is familiar with all situations of the poor and plays a role to assign social pressure to rehabilitate/correct members when there is deviation. It also plays a role in handling the problems of exclusion arise through self-selection.

Moreover, the institution has a good mechanism to exclude the non – poor from the credit. The credit is provided based on personal guarantee and/or collateral basis as an individual loan only when the clients in the group reach 4th cycle of loan and are credit worthy and able to fulfil the collateral and guarantee requirements. The non-poor, as they do not want to join the group, are not attracted with this kind of approach because they go for large individual loans based on personal guarantee/collateral right from the beginning.

In addition, the selection criteria and requirements are not so complicated for the poor to pass through and get credit access. The poor also get all the necessary supports required from the officers as well as *Iddir* in the process of fulfilling the requirements.

However, AVFS is unsuccessful in effectively improving the over all life of the poor it serves. One of the main reasons related to this problem is the absence of subsidy. MCIs need to be subsidized if the poor are supposed to benefit from the credit services. Even when the credit market is functioning perfectly, subsidy may be justifiable on grounds of equity. Plenty of theoretical approaches support that if MCIs are supposed to reach the poor, they have to be heavily subsidized. Even large MCIs need continuous subsidies. The well-known MCIs like Grameen are in fact subsidized on a continuing basis. Without this, the interest rates would be too high to be viable and the programmes would therefore be unsustainable.

Based on the data in this research, it is impossible to say that AVFS is worse in design because with its target group (the poor) the ineffectiveness in performance is not unexpected. This is because its performance is in line with

the expectation from theory i.e. AVFS is a non-subsidized credit program and it is clear from theories that unsubsidized credit programs are not able to help the poor. Hence, the fact that AVFS lacks subsidy has highly contributed to its failure in changing the life of the poor clients it serves. In some cases, of course, it gets funds from different organizations but these funds are required to be repaid at around 5% rate. The problem of high interest rate poses burden in already limited capacity of the clients. As it lacks subsidy, AVFS charges a relatively high interest rate that most clients complain it posing an extra burden.

Getting the approval and signature of the spouse on the loan agreement form is considered as one of the essential criteria for clients to get the loan from AVFS. This has exacerbated the possibility that loans borrowed by women clients spent by their husbands unnecessarily.

Given the consideration that women are poorer than men, to contribute more to poverty alleviation, MC services are supposed to be provided to women. From the analysis and result of the impact of the two programs by gender, however, it is found that both AdCSI and AVFS have benefited men more than women. AdCSI does not benefit women, but if it does, that is only for the non-poor. AVFS, the program for the poor, if it does something positive for the poor, that is only for the men. Therefore, women, specifically poor women, are marginalized from the benefit of the credit programs. This clearly shows that if one is a poor, s/he is unlikely to get the benefit of the credit program; if one is a woman, she is less likely to get the benefit of the credit program; but if one is a poor women then it is really impossible and troublesome for her to get the benefit of the credit program.

Just to revisit the theory slightly, it is important to look at the nature of the two institutions (the cases) in line with some of the theories that have been discussed earlier. As discussed in chapter two, the term MC is an umbrella for at least two very different approaches: One of them is a very simple business approach. Many organizations use MC simply as an income source. They give credit to people who bring collateral and who are not poor. They offer regular commercial credit for productive use at bank-like conditions including requirement of business plan, collateral and/or regular employment, and succeed because incompetent and corrupt (often state-owned) banks offer little competition. It has characteristics of attracting even those with a good business. They do make a profit but behave like a good/an approachable

bank. In this case indeed, we do not have to subsidize credit. The second type is subsidized MC to groups (of women) for consumption and micro-business, using peer pressure and/or successive higher credit as incentives to repay. As plenty of theoretical approaches support, if it is supposed to reach the poor, then this type of MC has to be heavily subsidized.

The nature and performance of the two cases pretty much go with these theories. AdCSI seems to run the former approach disguised as the later; while AVFS runs the latter approach but lacks subsidies as an essential ingredient. This is inline with the finding that AdCSI has effectively excluded the poor and succeeds in giving credit to the non-poor who can prepare business plan and fulfil collateral requirements; and AVFS has reached the poor by providing micro-business through peer pressure and progressive lending, though ineffective in improving their situation because of the absence of subsidy.

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Financial Decisions, the Sustainability and Outreach Performance of Ethiopian Microfinance Institutions

A.K.Vashisht*, Karamjeet Singh & Letenah Ejigu*****

Abstract: *this study, using a relatively balanced panel data of 13 MFIs from the period 2003-2008, tried to identify the financial decision variables that have an impact on the sustainability and outreach performance of Ethiopian Microfinance Institutions (MFIs). All the data are collected from the Microfinance Information eXchange (MIX), a platform dedicated to the worldwide dissemination of quality microfinance data. Results indicated that all the included capital structure variables (capital to asset, deposit to asset and commercial debt to gross loan portfolio) have negative impact on Operational Self Sufficiency (OSS). Like Rhyne and Otero (1992) study it is found that MFIs that mobilize public savings and access commercial debt can increase their number of borrowers at a significant rate. MFIs that charge high interest rate increase sustainability significantly probably because loan demand is interest-inelastic. MFIs that have social mission (small loan size and more proportion of women clients) charge higher interest rate, seemingly paradoxical at the onset but they do it possibly to cover their high cost of reaching marginalized poor people. MFIs with high cost structure, as expected, have lower OSS and finally social oriented MFIs have poor portfolio quality.*

Key terms: *Microfinance, Sustainability, Outreach, Financial Decisions, Panel Data, Ethiopia*
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*Professor of Finance, University Business School, Panjab University, Chandigarh, India. E-mail:akvashisht@rediffmail.com
**Associate Professor, Accounting and Finance, University Business School, Panjab University, Chandigarh, India. E-mail:krjsingh2001@yahoo.co.in
*** PhD Scholar, University Business School, Panjab University, Chandigarh, India and Lecturer, Department of Accounting and Finance, Bahir Dar University, Ethiopia. E-mail:etalem2000@yahoo.com

I. Introduction

Microfinance is defined as financial services to low income clients. Although the industry has a long history, formal microfinance can be traced back to the prior works of Grameen Bank in Bangladesh (Ledgerwood, 1999). Although microfinance has recorded impressive growth over the years (Woller and Schreiner, 2006), still it reaches only a fraction of the world's poor (Christen et al., 2004). Ethiopian microfinance has made remarkable progress over the past decade, reaching almost two million clients in a country of 80 million people. However, the Microfinance Institutions (MFIs) have still limited outreach high transaction costs for clients and weak governance structures (Pfister et al, 2008).

As microfinance get the attention of donors, development partners, practitioners and academics as an innovative method of fighting poverty, a number of studies begin to arise about the industry. In a synthesized manner these studies can be classified into three broad areas as impact, outreach and sustainability studies. Impact studies address the issue of whether the provision of financial service (usually credit and saving) has improved the lives of the poor in terms of economic, social and political indicators of poverty. This is not the focus of the current research as the data collection efforts are intensive.

Outreach studies focus on the issue of whether microfinance reaches the many poor people of the world. Although outreach is a multidimensional concept (Schreiner, 1999), most empirical researches use two dimensions: breadth of outreach and depth of outreach. Conning (1999) defined breadth of outreach as the efforts by microfinance organizations to extend loans and financial services to an ever wider audience and depth of outreach as financial services targeted toward the poorest of the poor. In the current research, like other authors (Cull et al, 2007; Mersland and Storm, 2007) the number of borrowers served by the MFIs is used as a measure of breadth of outreach. Depth of outreach is measured by the average loan size (both unadjusted and adjusted for gross national income (GNI) per capita) and the percentage of women borrowers served by MFIs.

Ledgerwood and White (2006) observes that although the microfinance industry has shown impressive growth for longer than a decade, it still reaches only a small percentage of its potential market worldwide. Financial exclusion is the rule rather than the exception. Such kind of problem needs identification of bottlenecks in expanding breadth of outreach. MFIs are also blamed for not reaching the economically active *poorest of the poor* who is in need of financial services (Hashemi and Rosenberg, 2006). Most MFIs also have no clear rules and criterion to target the poorest of the poor (Hishigsuren, 2004). Such findings are warning signals for the industry as the issue is regarded as mission drift.

Sustainability studies focus on whether MFIs can cover their cost of operation by themselves without relying on government subsidies and donor funds (Conning, 1999). In the current research, like Cull et al (2007) sustainability is measured by Operational Self Sufficiency (OSS), and Adjusted Return on Assets (ROA). The other frequently used measure of sustainability i.e. Financial Self Sufficiency (FSS) is not used as data is not available from the data source used i.e. the Microfinance Information eXchange (MIX) website.

Historically MFIs started operation with donor funds and now the industry has aged more than 30 years. Despite high repayment rates, many MFIs cannot be sustainable worldwide. They still require the hands of donors (Cull

et al, 2007). Some factors (like the high cost of doing the microfinance business and others) may create the disconnection between high repayment rates and the challenge of achieving sustainability. Because of such sustainability challenge and continued subsidization of the industry, economists become divided in to two camps, welfarists favoring and institutionalists rejecting subsidization of the microfinance industry (Brau and Woller, 2004).

One of the widely studied factors that affect the sustainability and outreach performance of MFIs is the various financial decisions made by the management, board, and owners. These include capital structure decision, assets allocation (investment) decisions, interest rate policies, cost management practices, productive use of human resource and efforts made to maintain portfolio quality. The studies by (Cull et al, 2001; Okumu, 2007; Makame, 2008) addressed the impact of such variables on sustainability and outreach performance of MFIs.

In Ethiopia, although some studies addressed the sustainability and outreach performance of MFIs (Kereta, 2006; Ejigu, 2009, Amha, 2007), no study addressed the impact of various financial decisions on the sustainability and outreach performance. There is a greater need for econometrically rigorous study that addresses such gap. The current study is attempted to fill such kind of gap by using data from 13 MFIs over 2003-2008 and a panel data econometric framework.

The result of the research is useful for stakeholders like MFIs management, boards and regulators like National Bank of Ethiopia by indicating the financial decision that affect the sustainability and outreach performance of the MFIs. The study also provide valuable insights to researchers by showing the application of panel data models to performance studies in the financial service industry.

The rest of the study is organized as follows. Section two discusses the relevant literature; section three addresses the data and methodology. Results of the study are discussed in section four and the last section five concludes.

Review of Related Literature

2.1. The Effect of Financial Decisions

The financial decisions made by the MFIs management and boards that are presumed to affect the MFIs sustainability and outreach include capital structure variables, asset allocation decisions, interest rate charged, cost efficiency, staff productivity and portfolio quality measures.

Capital Structure Variables

A significant amount of literature on microfinance has placed much

emphasis on the sources of funds (capital structure) as a major determinant of sustainability and outreach (Christen, 1997; Ledgerwood and White, 2006). Rhyne and Otero (1992) argues that extensive outreach by the MFIs can be achieved and sustained through saving mobilization and access to commercial loans. However a recent study by Bogan (2008) didn't found such claims. Rather he found that share capital to asset is negatively related to OSS.

The source of capital for MFIs can be deposits mobilized from voluntary and compulsory savers, commercial debt, share capital, donor subsidies and retained profits. Due to lack of data and absent literature the effect of donor subsidy and retained earnings are not covered in the present study. Hence the following ratios are used as measure of capital structure variables: capital to asset ratio, deposit to asset ratio and commercial debt to GLP ratio.

Asset Allocation

The use of funds by MFIs for their major activity i.e. lending to poor borrowers is presumed to have a positive effect on breadth of outreach as more borrowers are served. The usual proxy for use of funds is the Gross Loan Portfolio (GLP) to assets ratio (Okumu, 2007). The effect of use of funds on sustainability can be mixed as follows: an increase in GLP to assets results in higher operating revenue and improves sustainability. However, an increase in GLP could also leads to a decrease in operating revenue if more loans disbursed are left uncollected. Coming to the empirical literature, Okumu (2007) study in Ugandan MFIs shows GLP to assets is negatively related with OSS indicating increased repayment problems and positively to breadth of outreach.

Lending Interest Rate

Lending interest rate, measured by yield on portfolio, affects sustainability and outreach through three broad channels (Okumu, 2007). First, an increase in interest rate affects sustainability directly through increased revenue. Higher sustainability is expected to result in higher breath of outreach assuming the profit from increased sustainability is invested in expanding breadth of outreach. The second channel through which interest rate affect sustainability and outreach is through the repayment rate. At higher interest rate borrowers with good projects are unlikely to borrow and mainly bad borrowers may be attracted. This can exacerbate the default rate and cause the flow of revenue to the institution to reduce. The third channel through which interest rates affect sustainability and outreach is through the demand for loan. Lending rates are negatively related to the demand for loans. Lower demand for credit leads to a reduction in breadth of outreach and revenue generated by the institutions.

Empirically, the study by Okumu (2007), Crombrugghe et al (2008) and Cull et al (2007) shows real effective lending rate positively affects sustainability through the direct

channel. Okumu (2007) also found that lending rate is not a significant determinant of breadth of outreach partly because the demand for credit in Uganda, with a large number of the population served by the informal sector, is inelastic or highly inelastic.

Cost Efficiency

Cost affects OSS both directly and indirectly. For instance, an increase in costs leads to a decrease in operational self sufficiency and by extension it leads to a decrease in breadth of outreach. Costs can also affect sustainability and outreach through their effects on the demand for loans. As cost increase, interest rate increases (assuming cost-plus pricing) then demand for loan decrease which in turn reduces sustainability and breadth of outreach. (Okumu, 2007)

A study by Okumu (2007) reveals that unit cost of loan disbursed is negatively related with sustainability and breadth of outreach. In a similar study by Cull et al (2007), they found that capital costs to assets negatively affect profitability, whereas labor cost to asset is insignificant. These authors measure capital cost as the sum of rent, transportation, depreciation, office and other expense. Makame (2008) shows that a higher cost per borrower, another measure of cost efficiency in the microfinance literature, result in larger loan size. In the current research, like Cull et al, (2007), cost efficiency is measured by two factors: capital cost to asset and labor cost to asset ratios.

Borrowers per Staff

Borrower per staff is a productivity measure in the microfinance literature. A higher borrower per staff member can have both negative and positive impacts on sustainability. On the negative side large number of borrowers for a given staff member means, he/she can't effectively educate, select and monitor borrowers which in turn may reduce the repayment rate and sustainability. Positively a larger number of borrowers per staff can contribute to profit making through lower salary costs to the MFIs. Crombrugghe et al, (2008) and Mersland and Storm (2007) found that borrower per field officer is positively and significantly related to financial self sufficiency.

Repayment Rate

Empirical research has underlined the contribution of high repayment performance in the success or failure of MFIs. Chaves and Gonzalez-Vega (1996) attribute the success of a significant number of MFIs in Indonesia to high repayment or low arrears rates. However as the experience of Grameen Bank shows high repayment are only a necessary but not sufficient condition for sustainability (Okumu, 2007). Portfolio at Risk (PAR), an inverse measure of the repayment rate, was used by Bogan (2008) study, but no significant impact is found on sustainability and outreach. For the current research like Bogan (2008),

the PAR ratio is used as a measure of the repayment rate.

2.2. Control Variables

Some control variables, that are presumed to have an effect on the sustainability and outreach of MFIs, are included in the modeling process. This includes lending method (group vs. individual lending approaches), age of the MFI and size of the MFIs.

The study by Okumu (2007) and Mersland and Storm (2007) show negative relationship between group lending and OSS. This is partly because group lending increase transaction cost. On the impact of lending method on depth of outreach, Mersland and Storm (2007) shows that a lender that doesn't need physical collateral to judge credit worthiness could serve poorer clients and achieve deeper outreach, cetries paribus, than a lender that require physical collateral. With respect to breadth of outreach, Mersland and Storm (2007) established that group lending methodology was a major factor in increasing the breadth of outreach. Contrary to this Okumu (2007) found no relation between group lending and breadth of outreach.

On the impact of MFIs age, Cull et al, (2007) found positive relation between financial performance and age of MFI. However, Mersland and Storm (2007) found negative relationship between age of MFI and ROA. Hence the findings are mixed. On outreach, Mersland and Storm (2007) found positive effect of age on breadth of outreach and loan size.

Finally, the study by Bogan (2008), Mersland and Storm (2007) and Cull et al (2008) shows that log of assets (a firm size measure) is positively and significantly related to financial performance. Allied with this Bogan (2008) found that log of assets is positively related to number of borrowers which is unsurprising as the number of borrowers can be another size measure. On the relationship between loan size and size of the MFIs, Hudon and Traca (2006) have found a negative relationship implying that larger MFIs are pro-poor whereas Cull et al (2007) found positive relationship implying the reverse. Hence the impact of size on depth of outreach is somewhat mixed.

III. Data and Methodology

Data

As of 2010, there are 30 MFIs in Ethiopia registered and licensed by the National Bank of Ethiopia (NBE). However, not much time series data is available from many of the MFIs. So only 13 MFIs which have six years data (from 2003-2008) are used as a sample for the study. All the data are taken from the Microfinance Information eXchange (MIX) data base, a platform that works to disseminate microfinance information to the worldwide community. For conformity with the study period of 2003-2008, benchmark figures of variables are taken from the MIX from 2004-2008. A benchmark figure for 2003 is not available. The data collected is a bit unbalanced as many mature MFIs reported the full six

years data whereas few new MFIs have only two years data. But the average number of years for the whole sample is around 5.3, making it a reasonably balanced data with less missing observations.

The Econometric Model

Like Cull et al, (2007) and Okumu, (2007) the model used to reveal the impact of financial decisions of MFIs on their sustainability and outreach is static panel data model and the choice of fixed versus random effect model is done by using the Hausman test.

In the literature, a mix of level and log specification of the dependent variable is observed (Cull et al, 2007; Okumu, 2007). The normality of the dependent variables in different forms (level and log) is used as a criterion to come up with an acceptable specification.

The basic two-way panel data model looks like as follows (Cameroun & Trivedi, 2009):

$$S\ \&\ O_{it} = \alpha + \beta_i FD_{it} + \beta_j C_{it} + \mu_i + \gamma_t + \varepsilon_{it} \text{ ----------(1)}$$

Where, $S\ \&\ O_{it}$ refers to sustainability and outreach indicator for MFI i in period t. This includes OSS, the log of number of borrowers, the log of average loan size and the log of percentage of women borrowers. FD_{it} is vector for financial decisions variables of MFI i in period t. This includes capital to assets, deposit to assets, commercial debt to GLP, GLP to assets, interest rate, capital costs to assets, labor costs to assets, borrowers per staff, and Portfolio at Risk (PAR) ratios. C_{it} is vector for control variables for MFI i in period t. This includes, the proportion of loans disbursed through group lending scheme, the MFI size measured by log of assets, and the MFI age measured in log of age. μ_i is time-invariant unobserved heterogeneity for MFI i. γ_t is time dummies to check the dynamics in sustainability and outreach, the base period being 2003. ε_{it} is time varying error term for MFI i in period t which is assumed to be identically and independently distributed (i.i.d.) with a zero mean under both the random and fixed effect models. In addition the, μ_i is also assumed to be i.i.d in the random effect model.

Some relevant assumptions of Ordinary Least Square (OLS), drawn from the econometrics literature, are checked using pre and post estimation tests. This includes multicollinearity of regressors and Hausman test for the selection of fixed vs. random effect from pre-tests and hetrosedasticity and autocorrelation of the error terms from the post tests.

Multicollineairty is checked using the Variance Inflation Factor (VIF) criterion with a VIF value greater than 10 cause for concern. It is found that capital to assets, labor cost to assets and assets have high VIF values. To solve such multicollineairty problem, three alternative models are estimated by dropping two variables at a time. Model 1 retains capital to asset and drop labor cost to assets and asset variables. Model 2 retains labor cost to

assets and drops capital to assets and assets. Model 3 retains assets and drops capital to assets and labor cost to assets.

Hausman test for the selection of fixed and random effect result in many type of specification. For OSS specification the fixed effect model is appropriate in model 1 and model 2 whereas pooled OLS is appropriate in model 3. For borrowers' specification, all the three models resulted in fixed effect model. For average loan size specification, the fixed effect model works for model 1, and pooled OLS works for model 2 and 3. The fixed effect is the proper specification in model 1 and model 3 of the women regression whereas pooled OLS works for model 2. Generally the fixed effect model seems proper in all specification. This indicates the model suffers from time invariant MFIs specific unobserved variables and these unobserved variables in turn are correlated with the explanatory variables of the model. But fixed effect gives solution to these unobserved variables by removing them using within transformation.

Hetrosedasticity and intraclass (across time) autocorrelation of the error term, ε_{it}, are expected to exist in the model. However, it is not possible to check these two assumptions formally using the software used (Stata 9) as commands are not available in this version. Hence as suggested by Cameroun and Trivedi, (2009) cluster robust standard errors are used to solve both problems.

Although couldn't be checked, endogenity of regressors was suspected. So it is recommended for future researchers to use panel instrumental variable estimators like Arellano-Bond difference GMM estimator or another model in estimating models introduced in this research. But a warning is in order. To use such type of advanced estimators the literature should be first developed and give enough guidance on which variable is endogenous, predetermined, and exogenous. Besides to make a more precise instrumental variable estimation, the literature in this area should recommend appropriate external instrumental variables for the endogenous and predetermined covariates.

Finally, the *testparm* command in Stata is used to check whether the time dummies are jointly significant. Results of this test indicate the time dummies are jointly significant substantiating the superiority of two-way models rather than one-way panel data models.

IV. Results

4.1. Summary Statistics and Univariate tests

The summary statistics, one sample t test (with MIX comparison) of the variables of the study are presented in Table 1.

[Refer to Table 1]

Ethiopian MFIs in general are better than the MIX average in terms of the number of borrowers, a result unsurprising in a country with so

many poor people. They are also better in average loan size per GNI per capita (extend small loan per GNI per capita). However, the percentage of women borrowers served is less than MIX standard, contradicting with the average loan size result. This contradiction needs further probe as the average loan size and the percentage of women borrowers are frequently used as a measure of depth of outreach. Finally the MFIs are at par with the MIX in terms of operational self sufficiency.

The average capital to asset ratio for the MFIs is 53% whereas the MIX average is 33% indicating heavy use of equity finance by Ethiopian MFIs as opposed to debt. This is due to weakness in the debt markets of Ethiopia to serve as a viable source of finance for the economy as a whole. Heavy reliance in equity has the drawback of limited funds coming off to finance expansion. The deposit to asset ratio of the MFIs is 22% and the global benchmark is 20% which are quite similar. The two groups are equally placed in the rate of saving mobilization. This is good news for Ethiopian MFIs as they mobilize savings at par with the global standard. However, as a standalone figure it is low and has to be improved. The commercial debt to GLP ratio of the MFIs is 35% whereas the MIX benchmark is 65% indicating Ethiopian MFIs lagging behind the global average in the use of commercial debt as a major source of finance. This, as said above, is due to under development of debt markets in the country.

The average GLP to assets ratio in the sample MFIs is 71% indicating profound portfolio buildups in the asset structure. The MIX benchmark is 74%, which is significantly higher that the Ethiopian average. Although as a standalone the figure is good, Ethiopian MFIs allocate a smaller proportion of their assets in to GLP as compared to the global standard. This further implies some assets are held in the form of cash and its equivalents (that don't generate returns) or in fixed assets which are considered as perks. The average interest rate charged by the MFI is 21% whereas the global rate is 35% indicating low interest rates in Ethiopia. This practice, although may endanger institutional sustainability, is good as it deepens depth of outreach. The World Bank and its microfinance arm (CGAP) were constantly recommending going for increased interest rates. But the MFIs resisted such policy advice till today because of many undisclosed reasons.

Ethiopian MFIs have an average capital cost to asset ratio of 8% whereas MFIs represented in MIX have 18% capital cost efficiency. This difference is statistically significant indicating the superior capital cost efficiency of Ethiopian MFIs as compared to international benchmarks. The result of labor cost to assets figures also tells the same story like

capital cost to assets although the magnitude of difference narrows down here. The Ethiopian MFIs labor cost to assets ratio is 6% whereas the global standard is 10%. Still Ethiopian MFIs are better positioned in terms of labor cost to asset than the MIX benchmark. The average number of borrowers served by staff members of the MFIs is 216 clients and the MIX average is 139. Hence Ethiopian MFIs can be considered more productive than their global standards. But the higher figure is also indicative of low service quality as the staff handles many clients. This may create client drop out and repayment problems which further endanger institutional variability in the face of increasing competition among microfinance service providers. The average Portfolio at Risk (PAR) of the MFIs is 6% and the MIX figure is 4%. Statistically there is no significant difference between the two PAR figures. This is good and encouraging result as Ethiopian MFIs are at par with global standards.

The sample MFIs has mean assets of $26,700,000 whereas MFIs represented in MIX have a mean asset of $41,945,130 indicating Ethiopian MFIs are significantly smaller in size as compared to the worldwide benchmarks. This is a reflection of the small size of the Ethiopian economy. The sample MFIs has an average age of 7 years in 2008 whereas the average age of MFIs represented in MIX benchmark is 11 years. So Ethiopian MFIs are comparatively younger than the worldwide benchmark. In the MFIs 85% of the loan is disbursed through the group lending methodology. MIX benchmark for lending methods is not available and hence cannot comment of the position on Ethiopian MFIs lending methods. However, it can be said that group lending is the dominant lending methodology used by the MFIs.

4.2. Panel Data Results

In this section the main results of the panel data are presented and interpreted. The impact of each explanatory variable on all dependent variables is presented and interpreted in a synthesized manner by drawing insights from the literature. Table 2 up to 5 present the regression results of all the dependent variables.

[Refer to Table 2-5]

Capital Structure Variables

The capital structure variables whose effect on sustainability and outreach studied include capital to assets ratio, deposits to assets ratio, and commercial debt to GLP ratio. Consistent with Bogan (2008) capital to asset negatively affect OSS. This implies that equity financed MFIs are in a difficult position to generate positive returns. This seems in line with some capital structure theories. Equity finance is associated with high agency costs (moral hazard) as opposed to debt finance which has a disciplining effect. No significant impact is found on the use of equity finance on any of the outreach indicators. Like Rhyne and Otero (1992) study it is found that saving mobilization and access to commercial loans increase breadth of outreach.

The result seems plausible as these two sources of finance strengthen the financial muscle of MFIs besides equity finance, thereby helping to reach more borrowers. It is also found that these two sources of finance reduce OSS. This might be because of their cost implication i.e. interest is paid on deposit accounts and commercial debts. Lastly, these two commercial sources of finance have no significant impact on depth of outreach indicators.

The amazing issue is all the three source of finance, i.e. capital to assets, deposits to assets and commercial debt to GLP ratios are negatively related to OSS. The plausible question to ask is which source of finance will positively affect OSS? This is an empirical question. It has to be underscored that the current research, due to lack of data and relevant literature, don't include all capital structure variables. Variables like subsidy and retained earnings are not included. So, further research is encouraged in investigating the impact of such omitted variables.

Asset Allocation

Consistent with Okumu (2007) study it is found that a higher GLP to assets ratio imply that more borrowers are reached. This seems quite straightforward. Besides MFIs that have large number of borrowers also have large loan size. So MFIs with a large GLP to asset ratio extend large loan size, a result consistent with expectations. In general, it can be said that large GLP to asset ratios MFIs are the commercially oriented ones and the reverse hold for the social oriented MFIs. Finally GLP to asset ratio has no significant impact on OSS. When expanding the loan portfolio, an exact set off effect may arise between increased revenue and increased loan losses resulting in a nil bottom line effect.

Lending Interest Rate

Consistent with many authors finding (Okumu, 2007; Crombrugghe et al, 2008, Cull et al, 2007), it is found that a higher interest rate increase OSS positively. Higher interest rate directly increases the revenue of the MFIs and contributes towards increased sustainability. No significant relationship is found between interest rates and the number of borrowers. This tells the demand for credit is interest inelastic in Ethiopia which seems plausible in a poor country where borrowers have limited financing choices. Surprisingly it is found that higher interest rate is charged by MFIs that have a poverty alleviation mission (small loan size MFIs and MFIs that heavily target women borrowers). This is probably because the MFIs are not cost efficient. The cost inefficiency arises due to small scale of operation, more use of the costly group lending method and other factors.

Cost Efficiency

In the current study, cost is dichotomized into two parts: capital

cost to assets and labor cost to assets. Consistent with (Okumu, 2007; Cull et al, 2007), it is found that cost (particularly capital cost to asset) negatively affect OSS. However a senseless and contradictory finding to Okumu, (2007) also resulted i.e. MFIs with a lower cost to asset ratio (the cost efficient ones) has small number of borrowers. Such finding is surprising because it is felt that the efficient MFIs are large MFIs, not small MFIs. Efficiency in the use of resources is related to the use of professional management structure and it is the large MFIs that are deemed to have such formal working system. Finally Makame (2008) proposition that high cost MFIs extend large loan size is not found. From simple correlation analysis (results not reported), it is found that the high cost per asset MFIs are small MFIs and they extend small loan size. So his proposition seems unconvincing.

Borrower per Staff

In the current study the claims made by Crombrugghe et al, (2008) and Mersland and Storm (2007) are not found. No significant relationship exists between borrower per staff and OSS. This may be due to the set off effect between repayments problems and salary cost savings available from serving large number of borrowers with small staff. Rather the straightforward finding is that MFIs with a productive staff can increase breadth of outreach. A senseless finding is also seen that indicates MFIs having a productive staff extend small loan size. Simple correlation statistics (results not reported) shows that MFIs that have productive staff are more commercial oriented and hence extend large loan size. So it is difficult to believe the regression results.

Repayment Rate

Like Bogan (2008) no significant impact of PAR is found on OSS and breadth of outreach. Especially the OSS result is surprising. MFIs that have higher repayment should show higher OSS, cetries paribus. Now the question is what factors inhibit the MFIs to be sustainable despite high repayment? The answer lies in the high cost nature of doing microfinance business. Another reason may be those MFIs that have an aggressive policy towards loan repayments may have low demand for loan and incur huge costs to collect the disbursed loan. Low loan demand with high cost structure can lead to unsustainable institutions despite high repayment rate. On the impact of PAR on depth of outreach it is found that MFIs that have a poverty focus (low average loan size) have high PAR figure. This seems plausible because the very poor may consume the money rather than use it for productive purpose thereby exacerbating the problem of repayment. Actually one of the challenges for microfinance to bring positive poverty impact is the fact that most loans made to the poor are used for consumption smoothing rather than financing the business (Bateman, 2010).

Control Variables

On the impact of control variables some surprising findings have been observed. To begin with size measured by assets, consistent with the studies (Bogan, 2008; Mersland and Storm, 2007; Cull et al, 2008;) it is found that large MFIs have better OSS, but they have no better breadth and depth of outreach. Especially the no impact on breadth of outreach is a senseless and surprising finding. With respect to MFIs age, Consistent with Mersland and Storm (2007) it is found that over the years MFIs serve large number of borrowers, but they don't extend large loan size. Besides the MFIs become less sustainable may be because of inefficiencies and rent seeking behaviors. No impact of group lending is found on both sustainability and outreach. This is also a senseless and surprising finding. The year dummies included have showed that only the average loan size and the percentage of women borrowers served increased between 2003 and 2008. But such contradiction between the two depth of outreach indicators is surprising.

V. Concluding Remarks

This study has tried to show the impact of financial decision variables on the sustainability and outreach performance of Ethiopian MFIs by collecting data from 13 MFIs over 6 years (2003-2008). Although the short period nature of the panel data may cast shadow on the findings of the study, an attempt is made to extend some important earlier studies such as Cull et al (2007) and Okumu (2007) in a country where there is significant research gap.

Coming to the main results of the study the following picture has emerged. More equity finance reduces OSS possibly because of high agency cost (moral hazard) associated with the use of equity finance. No significant impact of equity finance has been found on breadth and depth of outreach indicators. Commercial source of finance (saving and debt) helps to reach more borrowers. But they have negative impact on OSS probably due to their high cost of capital. No impact of commercial source of finance has been found on depth of outreach. It is also found that MFIs that have more loan portfolio in their assets structure reach large number of borrowers and extend large loan size but this doesn't leads them to be more operationally self sufficient as compared to those MFIs having less loan portfolio to assets ratio. This might be due to the fact that increased revenue from more loan portfolio is set off by repayment problem associated with large number of borrowers.

On the impact of interest rates it has been found that an increase in interest rate helps to boost OSS, a result expected in a credit constrained society. Loan demand is interest inelastic as increase in interest rate doesn't reduce the number of borrowers. It has been further observed that higher interest rates are charged by MFIs that have a poverty

alleviation mission. This result seems paradoxical on the part of the MFIs but these MFIs do it because they are cost inefficient. As expected cost efficiency impact OSS i.e. inefficient MFIs have lower OSS. A senseless finding is observed that cost inefficient MFIs reach large number of borrowers. No significant impact of cost efficiency has been found on loans size.

On the impact of staff productivity, no significant impact has found on OSS. This might be due to the set off effect between repayments problems and salary cost savings available from larger borrower per staff ratio. Expectedly, productive staff reaches large number of borrowers. A senseless finding also arises that MFIs with a productive staff extend small loan size. Portfolio quality measured by PAR has no impact on OSS and breath of outreach. Especially the no impact on OSS is surprising. This may be due to the fact that MFIs that have an aggressive loan collection policy may have lower demand for loans. Somewhat expectedly, MFIs that have a poverty focus has higher PAR figures indicating moral hazard problems by the poor. Finally on control variables, some surprising and realistic findings are observed.

From the findings of the study some useful recommendations to various stakeholders such as MFIs management, boards, owners, donors, policy makers like National Bank of Ethiopia and, MFIs network association like the Association of Ethiopian Microfinance Institutions (AEMFI) can be made. The following points can be taken seriously by those concerned with microfinance development in Ethiopia as a viable business and as a way to eradicate poverty.

The MFIs should work to push for more borrowers because the demand for MFIs credit still exceeds the supply. The key to push for more borrowers is tapping commercial source of finance like saving and debt finance. Saving mobilization and efforts that facilitate it have to be studied by the MFIs. The industry should be savings led rather than credit led microfinance. On tapping commercial source of debt, the network between banks and microfinance has to increase. Industry association like AEMFIs has to be the voice of the MFIs in creating such links. Other international foundation and NGOs that guarantee MFIs loans from commercial banks should also participate in such endeavor. Commercial banks also have to wake up. Instead of keeping idle cash they have to downscale by lending to MFIs. Much research has shown that financial development is a key to economic growth, so National Bank of Ethiopia also has to think developing debt and even securities market in Ethiopia so that firms can access financing cheaply and conveniently.

To be more pro-poor MFIs should monitor the growth rate of average loan size over the years in light of inflationary pressures and repeat loans

made to clients. Trend analysis can help in doing this. Besides, women targeting should be an explicit policy of each MFIs as Ethiopian MFIs are lagging behind world averages. Women movement and gender mainstreaming are slogans in many policy circles with no clear results registered to date. Women bear the burden of poverty. So gender mainstreaming in microfinance also has to be seriously thought of.

To increase their operational self-sufficiency, MFIs should increase interest rates. This is boldly argued because if the industry has to be segmented across commercial and social lines, the commercial MFIs have to increase their small interest rate to be more sustainable and reach more poor borrowers. Actually many international development agencies also advise Ethiopian MFIs to increase interest rate as it is low when compared to MIX averages. They are right. The social oriented MFIs paradoxically charge higher rates. They in reverse should charge low rate. They seem to be confused. Besides, they have to be cost effective. Clearly cost management impact OSS. Cost management doesn't mean reducing costs boldly by downsizing, curtailing investment in fixed assets and like that. Rather cost management means expending necessary resources which are only needed for the proper conduct of the business of microfinance. So the MFIs have to study how much to expend given the size of borrowers and implement the recommendations of such studies accordingly.

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Appendix

Table 1. *Summary Statistics and one sample t test on the sustainability, outreach, financial decision and control variables*

Variables	Mean	SE	MIX benchmark	t	p
LnBorrower	123,034	183,746	67,908	15	0.000*
LnWomen	0.53	0.2	0.65	-4.9	0.000*
LnAvLnSzGNI	0.7	0.3	0.76	-2.97	0.004*
OSS	1.3	0.54	1.18	1.77	0.08
ROA	0.01	0.08	Left		
Capital to Assets	0.53	0.22	0.33	7.09	0.000*
Deposits to Assets	0.22	0.11	0.19	1.86	0.06
Commercial Debt to GLP	0.35	0.23	0.65	-9.46	0.000*
GLP to Assets	0.71	0.11	0.74	-2.03	0.04*
Interest rate	0.21	0.08	0.35	-9.16	0.000*
Capital costs to Assets	0.06	0.04	0.18	-18.43	0.000*
Labor cost to assets	0.06	0.04	0.10	-5.8	0.04*
Borrowers per Staff	216	250	139	2.38	0.02*
PAR	0.06	0.08	0.04	0.92	0.36
Assets	26,700,000	48,600,000	41,945,130	-2.4	0.01*
Age	7.2	2.04	11.6	-16.63	0.000*
Group loan	65	18	Left		

*Shows values sig at 5%

Table 2. *The impact of financial decision and control variables on OSS: Fixed Effect Model for Model 1 and 2 and Pooled OLS model for Model 3 with Cluster Robust Standard Errors. For brevity of the table, the result of time dummies is not reported.*

Variables	Model 1		Model 2		Model 3	
	Coefficients	P values	Coefficients	P values	Coefficients	P values
Capital to Assets	-4.2	0.003*	Dropped	Dropped	Dropped	Dropped
Deposits to Assets	-4.4	0.061*	-0.48	0.708	-0.38	0.618
Commercial Debt to GLP	-2.9	0.003*	-0.03	0.934	0.15	0.436
GLP to Assets	-0.38	0.573	0.95	0.138	1.2	0.106
Interest rate	3.2	0.002*	3.17	0.009*	2.2	0.011*
Capital costs to Assets	-7.25	0.022*	-4.57	0.074	-3.4	0.150
Labor cost to assets	Dropped	Dropped	1.24	0.655	Dropped	Dropped
Borrowers per Staff	-0.0009	0.583	-0.0006	0.691	0.00006	0.936
PAR	1.52	0.376	0.69	0.548	1.05	0.085
LnAssets	Dropped	Dropped	Dropped	Dropped	0.24	0.000*
LnAge	0.21	0.672	0.73	0.259	-0.44	0.041*
Group loan	-0.001	0.648	-0.003	0.447	-0.002	0.428
Constant	5.5	0.015	-0.48	0.748	-2.41	0.002
R^2(F) (P>F)	0.25(186.99) (0.000)		0.08(13.73)(0.000)		0.92	

*Shows values sig at 5%

Table 3. *The impact of financial decision and control variables on the log of number of Borrower: Fixed Effect Model with Cluster Robust Standard Errors. For brevity of the table, the result of time dummies is not reported.*

Variables	Model 1		Model 2		Model 3	
	Coefficients	P values	Coefficients	P values	Coefficients	P values
Capital to Assets	1.83	0.075	Dropped	Dropped	Dropped	Dropped
Deposits to Assets	3.2	0.008*	1.57	0.092	1.02	0.318
Commercial Debt to GLP	2.5	0.002*	1.44	0.001*	0.86	0.051*
GLP to Assets	1.6	0.004*	1.47	0.006*	0.97	0.029*
Interest rate	-0.08	0.867	0.29	0.625	0.03	0.957
Capital costs to Assets	3.32	0.074	3.44	0.055*	1.2	0.574
Labor cost to assets	Dropped	Dropped	-3.94	0.165	Dropped	Dropped
Borrowers per Staff	0.002	0.014*	0.001	0.254	0.002	0.156
PAR	0.7	0.626	1.58	0.292	1.75	0.316
LnAssets	Dropped	Dropped	Dropped	Dropped	0.34	0.287
LnAge	2.9	0.025*	3.00	0.006*	2.01	0.131
Group loan	-0.002	0.390	-0.002	0.195	-0.001	0.656
Constant	0.98	0.649	3.12	0.038	-0.03	0.993
R^2(F) (P>F)	0.69(23.37)(0.000)		0.71(76.64)(0.000)		0.91(19.18)(0.000)	

*Shows values sig at 5%

Table 4. *The impact of financial decision and control variables on the log of average loan size: Fixed Effect Model for Model 1 and Pooled OLS model for Model 2 and 3 with Cluster Robust Standard Errors. For brevity of the table, the result of time dummies is not reported.*

Variables	Model 1		Model 2		Model 3	
	Coefficients	P values	Coefficients	P values	Coefficients	P values
Capital to Assets	-0.35	0.633	Dropped	Dropped	Dropped	Dropped
Deposits to Assets	-0.27	0.736	0.11	0.917	1.00	0.203
Commercial Debt to GLP	-0.3	0.580	0.602	0.145	0.8	0.030*
GLP to Assets	0.64	0.263	1.54	0.01*	1.85	0.006*
Interest rate	-0.48	0.468	-1.06	0.008*	-1.42	0.032*
Capital costs to Assets	-0.32	0.822	2.68	0.366	2.6	0.198
Labor cost to assets	Dropped	Dropped	-5.5	0.122	Dropped	Dropped
Borrowers per Staff	-0.0007	0.633	-0.001	0.051*	-0.002	0.077
PAR	-2.5	0.017*	-1.18	0.078	-1.07	0.180
LnAssets	Dropped	Dropped	Dropped	Dropped	0.042	0.356
LnAge	-1.09	0.224	0.47	0.192	0.026	0.927
Group loan	0.001	0.780	-0.04	0.424	-0.006	0.237
Constant	6.24	0.011	3.68	0.000	3.14	0.006
R^2(F) (P>F)	0.17(12.54) (0.000)		0.94		0.93	

*Shows values sig at 5%

Table 5. *The impact of financial decision and control variables on the log of the percentage of women borrowers served: Fixed Effect Model for Model 1 and 3 and Pooled OLS model for Model 2 with Cluster Robust Standard Errors. For brevity of the table, the result of time dummies is not reported.*

Variables	Model 1		Model 2		Model 3	
	Coefficients	P values	Coefficients	P values	Coefficients	P values
Capital to Assets	0.46	0.853	Dropped	Dropped	Dropped	Dropped
Deposits to Assets	1.02	0.628	-1.2	0.445	-0.01	0.995
Commercial Debt to GLP	0.06	0.971	-0.33	0.598	-0.68	0.465
GLP to Assets	-0.38	0.723	1.22	0.114	-0.5	0.043*
Interest rate	-0.28	0.621	1.62	0.057*	-0.07	0.909
Capital costs to Assets	-0.98	0.584	0.77	0.845	-2.21	0.296
Labor cost to assets	Dropped	Dropped	-0.9	0.805	Dropped	Dropped
Borrowers per Staff	0.001	0.348	-0.001	0.453	0.001	0.683
PAR	-0.86	0.627	-1.06	0.401	0.11	0.953
LnAssets	Dropped	Dropped	Dropped	Dropped	0.40	0.597
LnAge	-2.67	0.066	0.57	0.544	-3.4	0.092
Group loan	0.002	0.702	0.005	0.585	0.003	0.532
Constant	2.77	0.477	-2.4	0.198	-0.94	0.908
R^2(F) (P>F)	0.09 (36.35)(0.000)		0.72		0.27(165.23)(0.000)	

*Shows values sig at 5%

The Dynamic Links between Investment, Trade Openness and Growth in SSA

Ambachew Mekonnen Sisay*

Abstract: *Some studies are skeptical whether further investment is productive and trade liberalization is promising for SSA economic growth. However, the skepticisms are mostly reliant on single equation estimations of contemporaneous effects that may not account for simultaneity and dynamic interactions. Tackling these econometric problems, this study investigates the dynamic links between investment, trade and income growth in SSA economies targeting at addressing the question: how the impacts amongst these economic forces flow? The study estimates a system of dynamic simultaneous equations model with SURE using panel data from 32 SSA countries over 1961-2003. The estimated results jointly reveal the existence of a full cycle of impact flows from investment-GDP-trade openness-investment besides the twin feedbacks between GDP growth and growths of investment & trade. The positive impact of trade liberalization on SSA economic growth is found lagging for two years and persisting to the subsequent year. Its growth effect is twofold. It enhances economic growth directly and indirectly through investment while the latter is also found growth spurring. Hence, deepening trade liberalization policies, encouraging investment in the exporting sector through incentive schemes favouring the import of technology embodying capital goods and enhancing their synergetic links have been recommended for better economic performance of the region.*

Key Words: *Growth, Investment-Trade-Income Links, Dynamic Links, Panel Data, SURE, SSA* JEL Classification: *E22, F13, F43.*

*Address: *Ambachew Mekonnen Sisay, B1.07, School of Economics, University of Kent, Canterbury, Kent, CT2 7NP, UK.* E-mail: *am497@kent.ac.uk*, Mobile: *+44(0)7901068626.*

1. Introduction

The prevailing world incorporates a wide spectrum of nations in that people living in different parts of the world are in different living circumstances. Some are in a safer and brighter situation while some are at an extreme edge of the dark end. It is customary to classify countries as rich and poor, or developed and under developed depending on their socioeconomic achievements. For their respective astonishing and successive downward growths, some are classified as growth miracles while some are termed as growth disasters/debacles (Jones, 1998, P. 4-10),

Nonetheless, all parts of the globe are networked with various economic ties by means of international trade and cross-border investments. International trade economists have long claimed that a liberal and outward-oriented trade regime is the best strategy for a small open economy that takes international prices as given. The main channels through which an outward

trade policy affects growth include: the channel of investment in that trade motivates investment and the latter bolsters growth; the productivity channel in that trade facilitates the transfer of knowledge that could provide opportunities to faster growth; and, the impact of trade on increasing government commitment and policies to be intact with growth objectives (Wacziarg, 2001, P. 395-398, Yanikkaya, 2002, P. 73, Andersen and Babula, 2008, P. 9). Growth facilitating improvements in institutional efficiency and governance, and vanishing rent-seeking behaviors are also the likely outcomes of enhanced trade, encapsulated in government commitment. The unlimited market access/demand is the fourth mechanism through which international trade contributes to growth.

Based on these premises, many countries have been initiating trade reforms either by themselves or the pressure of Bretton Woods Institutions (BWIs), via Structural Adjustment Programs (SAP) and their conditionality (see Edwards, 1993, P. 1359). Countries are geared to produce what they can and sell wherever they like based on their profit orientation. The key issue is the ability to produce and sell, profitably, which in turn depends on the actual investment and utilization of resources that could ensure technical and economic/allocative efficiencies. However, historically, the distribution of the benefits of trade has never been uniform across countries. Some are benefiting particularly those in the industrialized world, newly industrializing and emerging economies, even to the extent, serving as international trade centers like Singapore, Hong Kong and Luxemburg (Jones, 2002, P. 17) while some others are either not gaining or losing from the global integration. Sub-Saharan Africa (SSA) is the part of the world often stated as extremely marginalized from benefiting (World Bank, 2006, P. 2 & 311). So, the question *'why SSA as a region is marginalized from benefiting out of the global integration?* deserves close scrutiny.

The answer to the above question partly hinges on the competitive particularly the productive capacity of the economies. Competitive capacity is meant to meet the global quality standards set by the world market and offer attractive price incentives to buyers; which, in turn, is a resultant outcome of the efficiency stance of the domestic economy. However, UNCTAD (2005) states that the African countries mostly experienced negative growth in their supply capacities up to the mid 1990s in spite of the observed high growth rates since then (P. 58). According to UNCTAD, the difference in supply side capacity is one of the causes for the divergent SSA and South East Asia (SEA) trade performances. Improved supply capacity has been the driving force behind the export

performance of successful Asian countries while it appears to have limited the export performance in African, Middle Eastern and Latin American countries (P. 63). Referring to SSA, Sachs (2005) argues "Targeted investment can trump a region's geographic disadvantage" (P. 273). Thus, investment could be a key solution to build the supply capacity of the region.

The core essence of supply capacity is corded with the extent and quality of investments on physical and human capital, and technologies. Studies also claim to identify the determinants of supply capacity and recommend improvements on domestic infrastructure, FDI, and the efficiency of institutions, administrations and regulations (Redding and Venables, 2003, P. 424, UNCTAD, 2005, P. 60-61). Policy instruments employed by successful countries included selective measures like exemptions from taxes and duties, controls over interest rates and credit allocation, managed competition, phased liberalization, managed exchange rates, facilitating local R & D and flexible international cooperation (Fugaza, 2004, P. 41-42). However, there are counter arguments on the effectiveness of investment and trade liberalization in Africa. Some studies argue that investment in Africa is too high; its relationship with growth in the region is insignificant; and report no evidence supporting that private and public capitals are productive in Africa (Devarajan, Swaroop and Zou, 1996, P. 338-339, Dollar and Easterly, 1999, P. 552, Devarajan, Easterly and Pack, 2001, P. 81). Others also explain that the existing overall evidence on the contribution of trade openness to growth is mixed. According Szirmai (2008), the most successful developing countries like those in SEA are characterized as open to the world and engaged in international trade while trade liberalization in Africa initially led to further economic decline, deindustrialization and stagnation as the non-competitive enterprises were exposed to international competition (P. 25-26).

In general, the economic significances of investment and openness to trade in SSA have not come into grips, and need further empirical study. Some researchers have tried to examine the contemporaneous links among pairs of them. Yet, modelling the dynamic interaction amongst the three variables is a rare practice. Hence, with the purpose of advancing our understanding on the patterns and strengths of causations amongst investment, trade and economic growth in SSA and drawing policy lessons, this article investigates the dynamic links between these economic forces.

2. Literature Review

In the process of economic growth, there are three forces emphasized by economists. Investment (UNCTAD, 2002, P. 1 and Wade, 1989, P. 71), trade (Edwards, 1993, P. 1, Thirlwall, 2000, P. 7, 2003, P. 632) and

technology (Grossman and Helpman, 1994, P. 24-25) have been regarded as engines functioning simultaneously in moving the whole growth machinery. For a sustainable growth performance of an economy, the classical growth theory proposes the idea *'let the market governs the economic order'*; the neoclassical model focuses on *proximate factors* specially on the importance of *capital accumulation* and *total factor productivity improvements*; theories of catch up stress *the advantages of backwardness*, implying a poorer is a country, a faster is its growth opportunity; and the Schumpeterian creative destruction emphasis on *innovation, diffusion and transfer of technology* succeeding into the adherence of endogenous growth theory on the importance of continuous technological progress and the resulting non-diminishing returns to capital accumulation (see Szirmai, 2008, 17-20). From these growth theories, we learn the economic significance of: (i) investment as a way of capital accumulation and building productive capacity; (ii) trade as a conduit for knowledge-technology transference and a vent of surplus products enabling the exploitation of economies of scale; and, (iii) market mechanisms as the main governing forces imposing disciplines on the efficiency of institutions, all favoring growth. Conversely, the investment and trade performances are also highly tangled to and influenced by economic growth. A further discussion on the likely channels how one affects the other would be helpful to unravel the possible intertwined interactions and understand the vessels of the links.

Thus, the subsequent sub-sections highlight some of the possible interactions amongst these economic forces, briefly. The views of economists on the question '*are they equally important and independent of each other?*' have also been reflected. The article emphasizes the three expected feedback links; *i.e., investment-trade, investment-growth and trade-growth links.*

2.1 The Investment-Trade Link

Investment is an act of current spending for expected future return. Trade is a profit seeking activity involving cross-border shipment of goods and services. Profit is the main motive of trade and investment decisions made by private entrepreneurs. Driven by profit motives, business firms invest resources in capital goods and procure/invent new techniques of production. Grossman and Helpman (1994) stressed the importance of technological progress as the real force behind the perpetually rising standards of living. However, technological progress requires an intentional investment of resources by profit seeking firms. Profit seeking investment in knowledge plays a critical role in the long run growth process (P. 24). As technological improvement reduces per unit cost of production, it gives an incentive to

entrepreneurs to spend resources on innovative activities. The possession of cost effective technology that could be acquired through investment gives the owning firm a competitive advantage in the product market. Hence, involvement in international trade induces more investment with an expectation that it would result in strong competitive advantages and ample returns to investors.

Increasing emphasize has been given to the critical roles played by openness to international trade, investment and ideas in encouraging domestic producers to cut costs by introducing new technologies and developing new and better products (World Bank, 1993, P. 85). Economic theory teaches us to think of feedback links between trade and investment. Trade allows the importation of investment goods and thereby leads to greater investment particularly, if the country is developing. Imports could increase owing to two reasons. Firstly, the demand from the exporting firms could be high. Secondly, foreign exchange earnings from exports enable firms to import (Krishina *et al*, 2003, P. 480). Specially, if the investment demand is from the export sector, the process would follow a self-generating circular causation. The exporting sector could facilitate the import of capital goods that are likely to embody state-of-the-art technologies and lead into more exports. If the economy is outward-oriented, domestic firms are encouraged to produce for international market. This lifts the demand constraint that would have been in effect if an economy pursues inward-looking strategies. Thus, production and further investment would not be demand constrained. The learning effects (imitation from foreign practices) could also spark ideas to start a new venture or reinvigorate the existing ones. The acquisition of new ideas and technologies is inevitable as far as trade involves imports and business trips. On top of that, if there is a conscious action to bolster imitation, foreign trade provides greater opportunities for the acquisition of new technologies and ideas (see Thirlwall, 2000).

Let us look at the reverse effect enables us to grasp some of the mechanisms through which investment would influence trade. As investment increases, the volume and quality of products would be improved conferring competitive capability to the producing firm and positive externalities to the economy. If the economy is outward-oriented, the hypothesis would be more realistic as more of the investment is supposed to be in the exporting sector which is not constrained by demand limits. This improves the status of foreign exchange earnings relaxing an obstruction to imports (see Krishina *et al*, 2003, P. 480). Therefore, investment fosters both exports and imports or total international trade. The other channel is that investment increases domestic demand which is

one of the stimuli to greater domestic investment, and attractions for FDI and imports. In this sense, domestic investment increases exports production, attracts imports and FDI. If this argument is convincing, it is sensible for developing countries to begin with the promotion of domestic investment specifically targeting production for international/export markets.

2.1. The Investment - Growth Link

Investment has been regarded as the engine of growth since the formal onset of economics by the classical economist Adam Smith (1776) not only through trade but also directly by building the productive capacity of a nation. According to Thirlwall (2003), the essence of Smith's model is that the growth of output and living standards depends primarily on investment and capital accumulation (P. 127). The views of classical optimists and pessimists (Thomas Malthus, 1798, David Ricardo, 1817, and Karl Marx, 1847), Keynesian, neoclassical and endogenous growth theorists have been consistently similar in that investment and capital accumulation determine the level of living standards of nations.

Despite the fact that the neoclassical model predicts that the long run steady state growth does not depend on the rates of saving and investment, one of its predictions emphasizes on the importance of saving and investment in determining the level of per capita income and living standards in the long run (Romer, 2006, P. 18-19, Sorensen and Whitta-Jacobsen, 2005, P. 77, Jones, 2002, P. 32, Thirlwall, 2003, P. 143). Besides, Sorensen and Whitta-Jacobsen (2005) elaborate the implication of the Solow model that policies to make a nation richer should be policies that can increase the investment share of GDP or policies to improve technology (P. 87). Endogenous growth theory, on the other hand, argues that in the long run savings and investment ratios spur growth. According to this school of thought, societies that save and invest more would grow faster in the long run (Barro, 1991, P. 429, Plosser, 1992, P. 67). The effects of investment on economic growth are two-fold. Firstly, it generates part of aggregate demand stimulating production of investment goods which in turn leads to high economic growth and development. Secondly, capital formation improves the productive capacity enabling an economy to produce more output. Investment in new plant and machinery raises productivity by introducing new technology which could also lead to faster economic growth (Shiimi and Kadhikwa, 1999, P. 4).

Thus, albeit in varying approaches and degrees of emphasis, all growth models extending from the classical to the contemporaneous neoclassical and endogenous growth attach a crucial role to investment in determining the level of per capita income and

standard of living or the rate of growth of output and living standards.

2.2. The Trade - Growth Link

Trade is the other engine of economic growth proposed for its static gains from its role of resource reallocation and dynamic gains that have many links in improving productivity and other channels that it works through. However, the net effect of trade openness on economic growth remains controversial. Trade theories hypothesize many channels through which trade contributes to growth. The Ricardian or Heckscher-Ohlin models emphasize the static efficiency gains from resource reallocation outcomes of specialization, and dynamic gains from the continuous decline of unit costs of production attainable from operating towards the minimum efficient scale, learning and competition, knowledge-technology transfer, international investment and changes in attitudes and institutions; these collectively shift the whole production possibility frontier outwards (Thirlwall, 2000, P. 9). New trade theory due to Krugman and Helpman (1985) takes monopolistic competitive practices through product differentiation as motives of exploiting the advantages of economies of scale and the consequent continuous productivity improvements. In accordance to endogenous growth models, trade openness serves as a conduit for the transmission of results of R & D, technologies, etc and induces productivity growth.

Trade enhances growth by enlarging the availability of capital equipment, intermediate inputs and access to improved technology and potential markets for domestic producers. It allows countries to specialize according to their comparative advantage and greater exploitation of economies of scale. Trade can also affect economic performance through its impact on the political process. Krueger (1974) argues that trade restrictions encourage lobbying and other rent-seeking activities at the expense of productive activities. Trade can also affect countries' access to technologies through sub-channels of direct investment by foreign firms with proprietary knowledge and increase contact with foreigners (Frankel and Romer, 1996, P. 32-33). Hallack and Levinsohn (2004) propose some other channels linked to the efficiency and innovative gains of competition. According to them, trade policy might affect the degree of product-market competition, firm's incentives to innovate, increase efficiency and thereby mark-ups. Trade policy influences the volume of trade and thus the extent of learning that might occur in international transactions. It also stimulates the expansion of efficient sectors that have the ability to generate positive externalities and the contraction of sectors where resources are inefficiently allocated (P. 11-12). For these premises, trade liberalization has been one of the policy prescriptions to the lagging economies for its multifarious contribution to growth.

However, the existing views to the growth attributes of trade do not give equal weight to exports and imports. Often, exports are seen as causing growth and the growth process is export-led. The *big push* or *balanced growth* doctrine explains the occurrence of a vicious circle, where firms do not industrialize because there is no market for their goods, and the latter in turn happens because income is low. Income is also low because economies do not industrialize. Hence, it was argued that this kind of low level equilibrium could be broken by the simultaneous export-led industrialization of a large part of the economy. The *unbalanced growth* camp argues that exports, especially in leading sectors, could break the *'low income-low demand-low growth'* vicious circle and jump-start the industrialization process. Exports enable the importation of technology embodying capital goods. Exporting firms learn from exporting and provide externalities to the economy by disseminating technology to domestically oriented firms (Krishna *et al*, 2003, P. 480).

However, there are counter arguments on the role of export in particular and trade openness in general, linked to the development stages and the nature of exports of economies. For instance, as a conclusive end of his modeling on trade and economic growth, Södersten (1983) says "if a country is faced with sluggish demand in her export market, if her growth is confined to the export sector, and if her adaptability is low, growth by means of trade might be a fruitless venture" (P. 122). Some theories also suggest that opening up to trade might actually reduce long-run growth when a pattern of comparative advantage leads a country to specialize in goods where technological innovations or learning by doing are exhausted (Wacziarg, 2001, P. 394, Astorga, 2009, P. 15). Besides, from the empirical side, Vamvakidis (1999) says "Based on cross country regressions for the 1970s and 1980s, studies have found that economies with low trade barriers grow faster. However, this is not a robust result. Other studies have found that openness variables are not significant in growth regressions that include investment over GDP as an independent variable. Nonetheless, openness is significant in regressions that have the investment share as the dependent variable". Then, he twists the argument as faster growth may be causing more trade and not the other way around; openness variables may be proxies for other country specific characteristics like policy reforms in fiscal and monetary policies, capital flows, financial regulations, and labor markets that have very little to do with trade (P. 43); see also Lall (1995).

Conversely, growth is expected to have positive effects on trade through increased demand for imports and increased supply of exports apart from its indirect facilitation through improvements in efficiency due to more social and physical

infrastructure. However, this would not be the end of the story. There could be counter arguments from intuition or the other end of the theory. Economic growth could reduce trade in cases when domestic production replaces the demand for importables. Particularly, if the expansion is in the import-competing sector, import substitution is the likely outcome of growth. Besides, if a growing economy induces domestic demand for exportables, there is no reason for profit oriented privately-owned firms to export while that requires high transportation, transaction, time, etc costs. Studies have forwarded this possibility as a country becomes larger, internal exchange replaces external trade (Gylfason, 1999, P. 1048, Barro, 2003, P. 240).

Taking a synopsis of the review and recalling the implications of different theoretical models shed light on: (i) the interactive link between investment and income, as in flexible accelerator investment theory and Keynesian income multiplier; (ii) the interdependence between investment and trade performances, as in Redding and Venables' (2003) model of trade determination depicting the importance of investment on export supply capacity and demand for imports; the reverse importance of trade to investment directly by providing market for products, access for foreign supply in meeting the demand for investment goods, and indirectly through its impact on output growth as a mechanism of technology transference; and, (iii) the interdependence between trade and aggregate economic performances.

From the review of the existing empirical studies, we learnt also that the existing evidence obtained from different samples of countries is hardly conclusive. Moreover, SSA economies have seldom been examined in this context. Further investigation on the simultaneous link among these three macroeconomic variables in SSA seems a worthwhile research agenda. Thus, this research is designed to cast some empirical evidence to the debate, exclusively focusing on SSA economies.

3. The Research Question, Objective, Hypothesis and Approach of the study

Targeting at addressing a question *'how the impacts amongst investment, trade and income growth flow?'*, this study investigates the dynamic links between these economic forces in the SSA economies, as its main objective. In doing so, the research hypothesizes *three bi-directional dynamic feedback* links between investment, trade and economic growth.

Relying on theoretical highlights and the existing views, aimed at addressing the research question and meeting the objective of the study, the next section attempts to test the expected investment-trade-growth dynamic links empirically using a long panel data set constructed from 32 SSA countries for a period of 43 years.

The data set is estimated with Zellner's (1962) *Seemingly Unrelated Regressions (SUR)*. The econometric estimations follow the work of Krishna *et al* (2003) in variables set up and Konya (2006) in estimation methodologies. However, it is different from either of them as it considers trade openness in aggregate, employs panel data approaches and exclusively focuses on SSA. The details of the employed data and estimation methodology have been elaborated in the following empirical section.

4. Empirical Investigation: *A System of Equations Approach*

This empirical exercise is a focused extension of our efforts to estimate the extents to that investment influences trade and the latter influences growth in SSA economies and vice versa (forthcoming), rather in a dynamic set up. However, the study employs a different data set and a different estimator, SUR. Since the data set involves a long cross-sectional time series which is likely to hold a memory of the past, the form of the variables and the optimum lag length in the dynamic specification are determined based on panel Unit Root tests and lag structure analysis conducted in the following sub-sections.

4.1. Model Specification and Estimation Methodology

In using a set of time series or long cross-sectional time-series data that could have strong memory of the past, a crucial concern is the realization of stationary processes. Paying attention to the concern, different panel data stationarity tests, i.e., *Multivariate Augmented Dickey Fuller (MADF)* and *Pesaran's Covariate-Augmented Dickey Fuller (CADF)* tests have been employed on the absolute and logarithmic levels and the first-differences of each data series on the panels as a group and on each panel unit of the sample using varying lag lengths.

Following the stationarity test results, the form of the data series to base the analysis has been decided. Since the primary intention of this section is to estimate the dynamic links of the variables of interest, a natural estimator is Zellner's SUR method, which is a form of feasible GLS (Asteriou and Hall, 2007, P. 361). The large sample approximation of the SUR estimator requires larger T and smaller N. Thus, the data set constructed meets this requirement involving a relatively long time dimension. Considered as a multiple time-series estimator, the SUR method is appropriate for our data structure with smaller N than T. The use of SUR estimator (SURE) is justified for its efficiency gains when residuals are contemporaneously correlated across-equations; i.e., $\left[\varepsilon_{it}\varepsilon_{jt}\right]=\sigma_{ij}$, t = s. According to Baum, the higher those correlations, the greater the gains would be (2006, P. 236-237). The SUR model can also accommodate

heteroscedasticity as well as autocorrelation problems (Greene, 2003, P. 361). It is also used to impose and test cross-equation constraints or to estimate equations with constraints in place (Baum, 2006, P. 241).

The SUR model to be estimated should be thought of as a system of Vector Autoregressive of order p equations for a panel of N countries in the sample. The system of equations can be represented in vector notations as:

$$y_{it} = \alpha + \beta y_{it-1} + \eta y_{it-2} + \ldots\ldots + \xi y_{it-p} + \varepsilon_{it} \quad (1)$$

Where y *is a vector of left-hand side (LHS) or dependent variables;*

y_{it-m} *is a vector of pre-determined right-hand side (RHS) variables at lag m (m = 1,2,....p);*

ε *is a vector of random disturbances;*

α *is a vector of constant terms;*

β, η, ..., *and* ξ *are matrices of parameters to be estimated with respect to the vectors of the pre-determined variables; and*

i *and* t *are individual panel unit and time identifiers,* $i = 1,\ldots.N$, $t = 1,\ldots, T$.

In the estimation, the vectors of RHS variables include *1* up to p lags of trade openness, investment and real GDP. The expanded form of the above vector form notation of the model can

$$\begin{bmatrix} trade \\ inves \\ RGDP \end{bmatrix}_{it} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \end{bmatrix} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} \\ \beta_{21} & \beta_{22} & \beta_{23} \\ \beta_{31} & \beta_{32} & \beta_{33} \end{bmatrix} \begin{bmatrix} trade \\ inves \\ RGDP \end{bmatrix}_{it-1} + \begin{bmatrix} \eta_{11} & \eta_{12} & \eta_{13} \\ \eta_{21} & \eta_{22} & \eta_{23} \\ \eta_{31} & \eta_{32} & \eta_{33} \end{bmatrix} \begin{bmatrix} trade \\ inves \\ RGDP \end{bmatrix}_{it-2} + \ldots +$$

$$\begin{bmatrix} \xi_{11} & \xi_{12} & \xi_{13} \\ \xi_{21} & \xi_{22} & \xi_{23} \\ \xi_{31} & \xi_{32} & \xi_{33} \end{bmatrix} \begin{bmatrix} trade \\ inves \\ RGDP \end{bmatrix}_{it-p} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{bmatrix}_{it} \quad (2)$$

However, the forms of the variables and the length of the lags to be included in the regressions should be determined by the stationarity test results and the optimum lag length analysis to that the following section is devoted.

4.2. The Data and Some Observed Patterns

The variables selected to work with are gross investment, trade openness and real GDP. The data for all the variables are taken from Summers and Heston Pen World Tables Version 6.2 for a period 1961-2003. The underlying data include Vamvakidis' *Trade openness* measure *(export + import to GDP ratio), share of*

investment in real GDP and *real GDP* in 2000 constant dollar prices. The investment data series is given as percentage shares of GDP which have been regenerated into the annual gross investment in 2000 constant dollar values that could be employed into the analysis (i.e., multiplying the annual percentage shares of investment in GDP by the respective real GDP values and dividing by 100) while the others are taken as given. The number of countries in the sample and the time horizon covered are dictated by the availability of the required data (the Appendix Figure and Appendix Table 1 display the average overtime trends of the data series while Appendix Table 2 shows the full list of the countries in the sample).

The Appendix Figure and Appendix Table 1 provide a clue on the positive associations of the average growth patterns of investment, trade openness and GDP of the 32 SSA (sample) economies prevailed during the study period that could be classified into 3 concomitant segments; *i.e., the 1961-1974 erratic but often positive growths, the 1975-1993 recessed co-movements and the post-1993 dubious but often positive patterns*. But, the identification of the cause-effect relationships, the quantification of the average magnitude of effects and the statistical significance of the hypothesized links require an appropriate empirical test. Consequently, the subsequent sections try to deal with these concerns passing through steps of panel unit root test of stationarity, specification issues, estimation of parameters, and imposing & testing analytic restrictions.

4.3. Stationary Test and Descriptive Statistics

The constructed panel data have been tested for panel Unit Root firstly using Multivariate Augmented Dickey Fuller (MADF) test (Sarno and Taylor, 1998) that is claimed as 'very much more powerful than ADF test' and gives the test results only at 5% critical values. The MADF joint stationarity test follows Taylor and Sarno's specification:

$$q_{it} = \mu_i + \sum_{j=1}^{k} = p_{ij} q_{it-j} + u_{it}, \text{ for } i = 1,\ldots,N \text{ and } t = 1,\ldots,T,$$

where N denotes the number of series (cross-sectional units) in the panel and T is the number of observations in each panel unit. The vector of disturbances $u_{it} = (u_{1t}, \ldots u_{Nt})$ are assumed to be independently normally distributed with a possibly non-scalar covariance matrix. Taylor & Sarno (1998) apply Zellner's (1962) SURE estimator to estimate their specification on N equations defined for N units of the panel taking account of contemporaneous correlations among the disturbances, and to test jointly the N null equations specified as

$$H_0 : \sum_{j=1}^{k} = p_{ij} - 1 = 0, \forall i = 1, \ldots N_i$$

mplying non-stationarity, taking the resulting Wald statistics as the MADF statistics (P. 287). The results from MADF Unit Root test on our panel data are displayed in Table 1. According to the test results, all the calculated MADF statistics are very large and greater than the corresponding 5 percent critical values for all forms of the variables. The test results reject the null hypotheses stated as *'all the series are non-stationary'*.

Table 1. MADF Stationarity Test on Each Variable series of the Panel, *1961-2003*
H0: all the time series in the panel are I(1) or non-stationary processes

		On Absolute Levels			On log Levels			On First-Differences		
Variables	Lags	Obs	MADF	5% CV	Obs	MADF	5% CV	Obs	MADF	5% CV
inves	1	42	270.016	22.744	42	440.767	22.744	41	2916.580	22.974
trade	1	42	475.768		42	517.739		41	3065.782	
rgdp	1	42	295.774		42	318.245		41	2142.384	
grgdppc	1	42	2441.592		-	-		-	-	
inves	2	41	377.635	22.974	41	393.721	22.974	40	1442.481	23.218
trade	2	41	368.208		41	352.870		40	1951.703	
rgdp	2	41	323.547		41	320.328		40	1229.897	
grgdppc	2	41	1221.922		-	-		-	-	
inves	3	40	453.901	23.218	40	489.664	23.218	39	1231.492	23.476
trade	3	40	281.039		40	349.629		39	1290.381	
rgdp	3	40	304.164		40	291.519		39	675.071	
grgdppc	3	40	592.014		-	-		-	-	
inves	4	39	355.424	23.476	39	373.560	23.476	38	730.617	23.751
trade	4	39	280.541		39	305.149		38	892.421	
rgdp	4	39	330.940		39	314.699		38	582.576	
grgdppc	4	39	640.604		-	-		-	-	

Note: *MADF statistics greater than the critical value signifies the rejection of the null hypotheses.*

However, the MADF test is a joint test. It does not identify each series. On the other hand, the null, i.e., *all series are I(1) process* is wide for rejection. If one series is stationary while the others are not, the null would be rejected. That is why Johansen's Liklihood ratio test applies the opposite hypothesis that: *'at least one of the series in the panel is a unit-root process'* with the alternative being that *'all series in the panel are stationary processes'* (Delcoure *et al*, 2003, P. 88). Furthermore, the calculated MADF statistics are unexpectedly large for all the variable series at all forms. These situations do not make us comfortable about the adequacy of the test. Hence, the test has been extended to a *country-by-*

country MADF test. The results are summarised in Appendix Table 2. According to the *country-by-country* test results, the calculated MADF statistics are less than the 5 percent critical values for all the variables in absolute and log levels. However, nearly all of its values on the first-difference series of all the variables considered and the growth rates of per capita income are greater than the 5 percent critical values, with the exceptions of Δlninves in Nigeria, Δlnopen in Ghana, Tanzania and Zimbabwe and Δlnrgdp in Comoros. Thus, the tests generally have not rejected the '*non-stationarity*' null hypotheses for all the absolute and log levels in all countries while they do on first-differences. Even, many of the exceptional failures hold MADF statistics slightly below the 5 percent critical values.

Due to the observed contradictions between the joint and panel level stationarity test results, the scrutiny has also been extended using Pesaran's Covariate-Augmented Dickey Fuller (CADF) stationarity test, '*PESCADF*'. Assuming that the stochastic process, y_{it}, is generated by the first-order autoregressive process:

$$y_{it} = (1-\phi_i)\mu_i + \phi_{i+1} + \sum_{j=1} p_{ij}\Delta_{t-j} + \varepsilon_{it},$$

$i = 1, \ldots, N$; $t = 1, \ldots, T$ where initial values, y_{i0}, are given. PESCADF test, as elaborated in Pesaran *et al* (2003), runs the t-test for unit root test in heterogeneous panels in the presence of cross-section dependence to test the null hypothesis of unit roots $\phi_i = 1$ for all i.

Defining $a_i = (1- \phi_i)\mu_i$, $\beta_i = -(1- \phi_i)$, $\Delta y_{it} = y_{it} - y_{it-1}$, and subtracting y_{it-1} from both sides of the main specification yield $\Delta y_{it} = a_i + \beta_i y_{it-1} + \sum_{j=1}^{p} p_{ij}\Delta y_{it-j} + \varepsilon_{it}$. The null hypothesis of the test then becomes H_0: $\beta_i = 0$ for all i, against the alternative, H_1: $\beta_i < 0$, $i = 1, 2, \ldots, N_1$; $\beta_i = 0$, $i = N_1 + 1, N_1 + 2, \ldots, N$ (Pesaran *et al*, 2003, P. 55). This test has been conducted on our data. In conducting stationarity test, considering lags equal to the number of series plus one (for e.g., 3 + 1 in this case) is a standard practice. Table 2 displays the test results up to the fourth lag.

As displayed in the upper and middle panels of the table, except per capita GDP growth (grgdppc) and the 1st lag of openness measure, the results show that all the levels series hold unit root processes. It is signified by the |t-statistics| that are less than the corresponding |critical values| and the p-values that do not reject the 'non-stationarity' null hypotheses.

Table 2. Pesaran's Stationarity Test, *PESCADF with Constant*

H0: All Series are non-stationary

	variables	Lags	(N,T)	Obs	t-bar	Critical Values 10%	5%	1%	Z[t-bar]	P-value
On Absolute Levels	*inves*	1	(32,43)	1312	-1.704	-2.05	-2.11	-2.23	0.396	0.654
	trade	1	(32,43)	1312	-2.239				-2.824	0.002
	rgdp	1	(32,43)	1312	-1.761				0.054	0.522
	grgdppc	1	(32,43)	1312	-4.587				-16.95	0.000
	inves	2	(32,43)	1280	-1.654	-2.05	-2.11	-2.23	0.698	0.758
	trade	2	(32,43)	1280	-1.833				-0.380	0.352
	rgdp	2	(32,43)	1280	-1.695				0.451	0.674
	grgdppc	2	(32,43)	1280	-3.398				-9.797	0.000
	inves	3	(32,43)	1248	-1.681	-2.05	-2.11	-2.23	0.533	0.703
	trade	3	(32,43)	1248	-1.799				-0.175	0.431
	rgdp	3	(32,43)	1248	-1.731				0.232	0.592
	grgdppc	3	(32,43)	1248	-3.062				-7.773	0.000
	inves	4	(32,43)	1216	-1.743	-2.05	-2.11	-2.23	0.160	0.564
	trade	4	(32,43)	1216	-1.710				0.362	0.641
	rgdp	4	(32,43)	1216	-1.801				-0.187	0.426
	grgdppc	4	(32,43)	1216	-2.619				-5.110	0.000
On Log Levels	*lninves*	1	(32,43)	1312	-1.902	-2.05	-2.11	-2.23	-0.795	0.213
	lntrade	1	(32,43)	1312	-2.273				-3.026	0.001
	lnrgdp	1	(32,43)	1312	-1.657				0.680	0.752
	lninves	2	(32,43)	1280	-1.802	-2.05	-2.11	-2.23	-0.192	0.424
	lntrade	2	(32,43)	1280	-1.958				-1.130	0.129
	lnrgdp	2	(32,43)	1280	-1.540				1.383	0.917
	lninves	3	(32,43)	1248	-1.779	-2.05	-2.11	-2.23	-0.057	0.477
	lntrade	3	(32,43)	1248	-1.906				-0.817	0.207
	lnrgdp	3	(32,43)	1248	-1.497				1.642	0.950
	lninves	4	(32,43)	1216	-1.736	-2.05	-2.11	-2.23	0.203	0.580
	lntrade	4	(32,43)	1216	-1.829				-0.353	0.362
	lnrgdp	4	(32,43)	1216	-1.489				1.693	0.955
On First-Difference	*Δlninves*	1	(32,42)	1280	-4.724	-2.05	-2.11	-2.23	-17.779	0.000
	Δlntrade	1	(32,42)	1280	-4.798				-18.221	0.000
	Δlnrgdp	1	(32,42)	1280	-4.481				-16.317	0.000
	Δlninves	2	(32,42)	1248	-3.736	-2	-2	-2	-11.829	0.000

Δlntrade	2	(32,42)	1248	-3.729				-11.786	0.000
Δlnrgdp	2	(32,42)	1248	-3.350				-9.506	0.000
Δlninves	3	(32,42)	1216	-3.127	-2.05	-2.11	-2.23	-8.164	0.000
Δlntrade	3	(32,42)	1216	-2.997				-7.385	0.000
Δlnrgdp	3	(32,42)	1216	-2.858				-6.550	0.000
Δlninves	4	(32,42)	1184	-2.580	-2.05	-2.11	-2.23	-4.874	0.000
Δlntrade	4	(32,42)	1184	-2.659				-5.348	0.000
Δlnrgdp	4	(32,42)	1184	-2.480				-4.274	0.000

Contrarily, in addition to the growth of per capita GDP (grgdppc), all the first-differences of all the variables series are found stationary at all significance levels at least up to the fourth lag. Compared to the MADF test, the PESCADF test results sound as expected. The rejection of the 'non-stationarity' null by the panel MADF test for all the series is a practical demonstration of the incapability of the test to identify non-stationary series with the inclusion of a stationary series while the others are not. Hence, according to the MADF unit root test results on each country and the Pesaran's panel unit root test results, estimating equations using the level values would lead into spurious regressions. Hence, the dynamic system of 'investment-trade-growth' equations is estimated with the first-differences (growths) of the variables.

The next step that needs cautious analysis prior to the estimation is to specify the number of lags. Causality test results may depend on the lag structure and, both too few and too many lags may cause problems. The use of too few lags may cause specification error while too many lags waste many observations, increase standard errors making the results less precise (Konya, 2006, P. 982). Noting the absence of simple rule to decide on the maximum lag (Ibid), we follow the advice of Davidson and Mackinnon in the spirit of Hendry's top-down approach starting from large lag length and seeing whether the fit of the model deteriorates significantly when it is reduced, as discussed in Gujarati (1995). According to Gujarati, if there is some true lag length, choosing fewer lags will lead to the omission of relevant variable bias, whose consequences can be very serious. On the other hand, choosing more lags than necessary will lead to the inclusion of irrelevant variable bias whose consequences are less serious; the coefficients can be estimated consistently although their variances may be less efficient (P. 615).

Hence, our optimal lag length determination exercise begins from

considering longer (up to the 4th) lags, checking the significance of the estimated coefficients and taking the one where at least one coefficient is significantly different from zero. From this exercise, significant coefficients are found only in the specifications that consider up to the third lags following our regression that indicate the insignificance of all the fourth lags in all of the equations in the system while no considerable change on the fit of the estimation and significance of the other lags is observed. Hence, the first 3 lags are suggested to be included in the specification for the intended estimation.

Briefly, the results from the stationary test and lag-length analysis suggest to specify the model in first-differences of the variables with the inclusion of 1-3 lags[1]. Thus, the ultimate model to be estimated becomes the following enabling to obtain the dynamic growth-effect coefficients.

$$\begin{bmatrix}\Delta lntrade\\ \Delta lninves\\ \Delta lnrgdp\end{bmatrix}_{it} = \begin{bmatrix}\alpha_1\\ \alpha_2\\ \alpha_3\end{bmatrix} + \begin{bmatrix}\beta_{11} & \beta_{12} & \beta_{13}\\ \beta_{21} & \beta_{22} & \beta_{23}\\ \beta_{31} & \beta_{32} & \beta_{33}\end{bmatrix}\begin{bmatrix}\Delta lntrade\\ \Delta lninves\\ \Delta lnrgdp\end{bmatrix}_{it-1} + \begin{bmatrix}\gamma_{11} & \gamma_{12} & \gamma_{13}\\ \gamma_{21} & \gamma_{22} & \gamma_{23}\\ \gamma_{31} & \gamma_{32} & \gamma_{33}\end{bmatrix}\begin{bmatrix}\Delta lntrade\\ \Delta lninves\\ \Delta lnrgdp\end{bmatrix}_{it-2} +$$

$$\begin{bmatrix}\xi_{11} & \xi_{12} & \xi_{13}\\ \xi_{21} & \xi_{22} & \xi_{23}\\ \xi_{31} & \xi_{32} & \xi_{33}\end{bmatrix}\begin{bmatrix}\Delta lntrade\\ \Delta lninves\\ \Delta lnrgdp\end{bmatrix}_{it-3} + \begin{bmatrix}\varepsilon\\ \varepsilon\\ \varepsilon\end{bmatrix}_{it} \qquad (3)$$

The statistical summary and correlation matrix of the variables have been organised in Table 3. According to the descriptive summary of the data from 32 SSA, in the period 1961-2003, real GDP had been growing at a low average rate of about 0.7 percent annually while investment did at an average of 1.2 percent. Relatively, investment followed by trade ratio growths show more variability than real GDP growth. From the correlation matrix, we observe that there seems a modest significant positive association between investment and real GDP growths but a negative association between growths in trade openness and GDP while that between trade ratio and investment growths is positive but weak despite statistically significantly different from zero.

[1] *"The use of the lag makes sense economically as this is a longer-term effect. It also makes the regressor pre-determined, avoiding potential problems of endogeneity" (Astorga, 2009, P. 16).*

Table 3. Statistical Summary and Correlation Matrix of the data, *1961-2003*

Variable	Descriptive Statistics					Correlation Matrix			
	Obs	Mean	St Dv.	Min	Max		Δlninves	Δlntrade	Δlnrgdp
Δlninves	1344	0.012	0.246	-1.477	1.814	Δlninves	1.000		
Δlntrade	1344	0.005	0.159	-1.110	1.361	Δlntrade	0.055 **0.044**	1.000	
Δlnrgdp	1344	0.007	0.082	-0.546	0.357	Δlnrgdp	0.250 **0.000**	-0.161 **0.000**	1.000

Note: Bold faced numbers beneath the correlation coefficients are significance P-values.

4.4. Estimation Results

The parameter estimation and diagnosis test for the system of three equations have been undertaken following the above specification, equation (3). The system of equations is estimated using SURE with the simultaneous inclusion of the first three lags of the first-differences of trade openness (Δlntrade), investment (Δlninves) and real GDP (Δlnrgdp). In spite of the consideration of the growth of real per capita GDP in the stationarity test as an optional indicator of economic growth, we prefer the use of real GDP growth to see the impact of aggregate economic growth on trade and gross investment growths and vice versa. Five cross-equation and within-equation constraints have also been imposed and tested. The estimates and the test results on the imposed constraints have been reported in Tables 4 and 5, respectively. Before discussing the results, evaluating the appropriateness of the SURE for the data would be helpful.

The validity of SUR estimation requires the explanatory variables to be orthogonal to the residuals. With the application of OLS regression and pair-wise correlation of the residuals onto/with the pre-determined variables, we find that no one of the pre-determined variables is correlated with the residuals from each equation in the system. It ensures that the pre-determined variables are exogenous. Besides, the efficiency gain from the application of SURE over the use of single equation OLS estimations depends whether the residuals are contemporaneously correlated or not. The results from Breusch-Pagan $\chi 2$ joint-test of independence also show the existence of sizable contemporaneous correlation of residuals across equations ensuring the gain from and justifying the use of SURE for our estimation and the results for the analysis. The $\chi 2$ tests have well rejected the null *'independent residuals'* at 1 percent significance level in the system of equations (see Appendix Table 3). These conditions justify the use of SURE for its efficiency gain over its

OLS & GLS counterparts (Baum, 2006, P. 237). Thus, the results are discussed as follows.

Table 4 presents the parameter estimation and significance test results. Signifying the omission of important variables, the estimated models generally have low explanatory power as revealed by the extremely low R^2 although all are significantly different from zero. However, the models could give important information on the dynamic link between the variables of interest.

According to the results, the effect of trade on investment is positive and persistent. The estimated coefficients on the first and second lags of growth in trade ratio are closer in magnitude while the third lag holds small and insignificant coefficient. The imposed equality constraint on the positive effects of the first and the second lags of trade openness on investment is far from rejection (see Table 5). Hence, we find the lagging and persistent impact of trade openness on investment. The impact of one period lagged economic growth on investment is found to be positive with relatively higher magnitude (0.48) relative to that on trade while both the second and the third lags turn insignificant. According to the significant coefficient, current investment grows faster by about half of the preceding growth rate of real GDP.

As displayed in the third column of Table 4, the parameters estimated for trade openness equation support the one period lagged positive role of real GDP growth to trade in SSA (0.2) while all the other lags of GDP growth and all the lags of investment growth are estimated insignificant at all conventional significance levels. According to the significant estimate on the first lag of real GDP growth, a 1 percent increase in real GDP brings about a 0.2 percent positive growth of trade ratio in the subsequent year. Hence, the lagging influence of economic growth on trade openness is supported. The results may justify the increase in appetite for imports and the pressure of domestic production towards more export (outward pressure of growth) when SSA economies grow. The test result on the equality constraint of the impact of real GDP growth on both trade ratio and investment growths has been rejected at 1 percent significance level (Table 5). Hence, in SSA, on average, the lagging investment boosting impact of economic growth is stronger than that on trade openness.

The last column of Table 4 presents the estimation of GDP growth equation. The estimation comes out with positive but relatively small and insignificant coefficient for the first lag, significantly positive coefficient with the highest magnitude for the second lag and positive and significant with a middle magnitude for the third lag of trade openness variable supporting our hypothesis that proposes a lagging role of trade openness in the SSA economic growth process (see Table 4 and Appendix 4

for the joint significance of the estimated effects). This pattern of coefficients was revealed in Greenaway *et al* (1998) where they draw a "*J-curve*" type effect of trade liberalization on income growth despite the different trade measures they use (Sachs and Warner, 1995, Dean *et al*, 1994, World Bank, 1993). In their growth equations, the lag coefficients turn negative but insignificant for the first year, positive but insignificant in the second year, and, positive & significant in the third year, implying the first impact of liberalization is negative and its positive effect starts a year after; i.e., its positive effect lags (Greenaway *et al*, 1998, P. 1556).

Table 4. SUR Estimation on the Link between Trade, Investment and Growth

Pre-Determined Variables	Investment Equation *(Δlninves)*		Trade Equation *(Δlntrade)*		Growth Equation *(Δlnrgdp)*	
	Coef.	P-Value	Coef.	P-Value	Coef.	P-Value
Δlntrade_1	**0.157**	**0.000**	**-0.064**	**0.030**	0.023	0.116
Δlntrade_2	**0.141**	**0.002**	**-0.053**	**0.077**	**0.046**	**0.002**
Δlntrade_3	0.043	0.345	0.010	0.749	**0.032**	**0.039**
Δlninves_1	**-0.199**	**0.000**	0.005	0.805	0.005	0.593
Δlninves_2	**-0.066**	**0.025**	-0.010	0.622	0.014	0.148
Δlninves_3	-0.022	0.467	0.005	0.808	**0.023**	**0.024**
Δlnrgdp_1	**0.478**	**0.000**	**0.201**	**0.001**	-0.043	0.149
Δlnrgdp_2	0.056	0.528	0.041	0.490	**-0.076**	**0.012**
Δlnrgdp_3	0.036	0.686	-0.030	0.615	0.029	0.334
Constant	0.009	0.191	0.006	0.203	0.004	0.074
No. Obs	1248		1248		1248	
R^2	0.054	0.000	0.021	0.002	0.027	0.000
Root MSE	0.240		0.160		0.081	

GDP Growth

Investment Growth

Trade Openness

According to our estimation, the growth impact of investment in SSA is also found lagging for two years. Despite the coefficients on the first and second lags are estimated positively, their magnitudes are small and more importantly they are not significant at all conventional levels while the third lag turns with positively the highest and significant coefficient at 5 percent significance level. Consistent to its weakness and small magnitude revealed in our single

equation growth estimations (forthcoming) albeit employing different data sets with varying measurement units and time horizons, the magnitude is small (0.023). However, the apparent small magnitude could be because of the distribution of its growth effects into several lags. Hence, the other part of the hypothesis is also supported as the growth impact of investment is found lagging to the third year. Thus, the presumption 'investment spurs growth and growth spurs investment' is also verified. Besides, the idea that states trade openness fosters growth and growth favours trade is witnessed in SSA. Moreover, consistent to our findings from Three Stage Least-Squares (3SLS) estimation (forthcoming), the impact of growth on both investment and trade growths is greater in magnitude than the respective reverse effects (compare the coefficients in Table 4).

Shortly, from the investment-trade-growth nexus analysis based on the SURE results, we claim two positive dynamic feedbacks and a uni-directional positive link; i.e., (i) a bi-directional positive feedback between investment growth and GDP growth, similar to the finding from the 3SLS results (forthcoming); (ii) a bi-directional positive feedback between trade openness and GDP growth, ensuring the positive growth effect of trade; and, (iii) a uni-directional direct positive causal effect of trade openness to investment growth. In a nut shell, in this class of analysis, a full cycle of dynamic causal growth flows from investment-GDP-trade openness-investment is supported regardless of where it starts, consistent to the full cycle identified from 3SLS estimation in our forthcoming work on the same question (see the diagram next to Table 4).

In this analysis, we have also tried to impose and test five main restrictions on the statistical differences between the magnitudes of the significantly estimated dynamic influences of one variable over the other. The set up of the restrictions and the test results have been reported in Table 5. Firstly, the investment spurring positive role of trade openness after a period or two periods is equal which is not rejected by the test. Secondly, the one-period lag positive effects of GDP growth on growths of investment and trade ratio are restricted to be equal. However, it has been rejected at 99 percent confidence level. Hence, in SSA, on average, the results suggest that the investment spurring impact of lagged economic growth is greater than its impact on trade openness. Thirdly, the growth effect of trade, two or three years latter is constrained to be the same which in turn is constrained to be equal to the third-lag positive growth impact of investment. The test results do not reject the imposed restrictions. But, the sum of the growth effects of the first three consecutive lags of trade is found to outweigh the third-lag growth effect of investment (see sub-constraints 3.1-3.4).

Table 5. Tested Restrictions on the Parameters of the Estimated Equations

H0: the corresponding effects are equal

Constraints: [Effect]Cause			χ2	P-Value
(1) [Δlninves]Δlntrade_1	=	[Δlninves]Δlntrade_2	0.05	0.823
(2) [Δlninves]Δlnrgdp_1	=	[Δlntrade]Δlnrgdp_1	7.21	0.007
(3) [Δlnrgdp]Δlntrade_2	=	[Δlnrgdp]Δlntrade_3 = [Δlnrgdp]Δlninves_3	1.66	0.437
(3.1) [Δlnrgdp]Δlntrade_2	*=*	*[Δlnrgdp]Δlntrade_3*	*0.54*	*0.462*
(3.2) [Δlnrgdp]Δlntrade_2	*=*	*[Δlntrade]Δlninves_3*	*1.65*	*0.199*
(3.3) [Δlnrgdp]Δlntrade_3	*=*	*[Δlnrgdp]Δlninves_3*	*0.22*	*0.638*
(3.4) [Δlnrgdp]Δlntrade_2	*+*	*[Δlnrgdp]Δlntrade_3 = [Δlnrgdp]Δlninves_3*	*4.52*	*0.034*
(4) [Δlnrgdp]Δlntrade_2 + [Δlnrgdp]Δlntrade_3 = [Δlntrade]Δlnrgdp_1			3.81	0.051
[Δlnrgdp]Δlntrade_1 + [Δlnrgdp]Δlntrade_2 + [Δlnrgdp]Δlntrade_3=[Δlntrade]Δlnrgdp_1			*2.28*	*0.131*
(5) [Δlnrgdp]Δlninves_3	=	[Δlninves]Δlnrgdp_1	26.32	0.000

The fourth test is on the imposed equality of the sum of the significant lagged growth effects of trade openness and the reverse significant effect of GDP growth (lag-1) on trade growth. This restriction has been rejected at 0.051 significance level implying the effect of GDP growth on trade is greater than the sum of the growth effects of trade openness lagging for two & three years.

However, the difference disappears when the insignificant positive effect of the first-lag of trade is taken into account. The last test is a comparison on the significant feedback between investment and GDP growths. The test rejects the imposed equality constraint at 1 percent significance level supporting the stronger impact of GDP growth on investment growth than the reverse effect.

5. Conclusion

The evidence from the investment-trade-income growth link analyses, employing SURE on a long panel data set from 32 SSA economies over 43 years, 1961-2003, suggests the existence of a full cycle of growth flows (route) running from investment-GDP-trade openness and then back to investment. The lagging positive effects of one over the other have been supported except the non-existent dynamic effect of investment on trade openness.

Based on the findings, we suggest that African growth strategies should bolster the circular positive growth flows. Trade liberalization is a beneficial policy option for SSA economies for its growth enhancing role directly, and indirectly through investment as the latter is also supported to be growth spurring. According to the estimated dynamic model, the economic significance of openness to trade is twofold. Firstly, it contributes positively to the growth process of the region directly, attributable to its role in transmitting productive technologies and providing access for export markets such that the growth process would not be demand constrained. Secondly, while investment in SSA is growth spurring, the effect of trade openness on

investment is also found to be positive, persistent and faster. The positive growth impact of trade liberalization policy lags for two years while its effect on investment starts a year after and persists up to the second year from its adoption. Hence, a trade liberalization policy targeted at promoting investment in productive particularly exporting sectors through the import of technology embodying capital goods is among the recommended policy directions so that growth in the region would benefit from investment expansion and would not be demand constrained.

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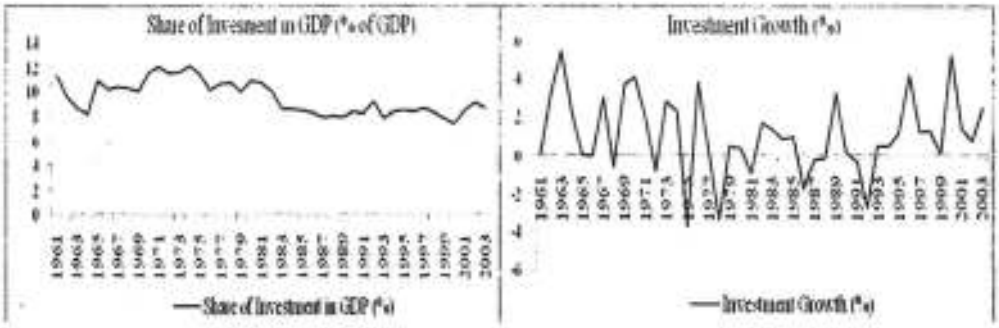
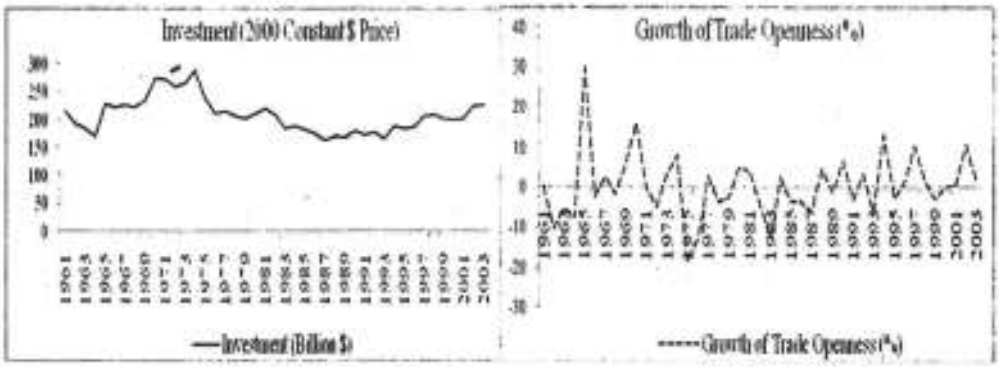
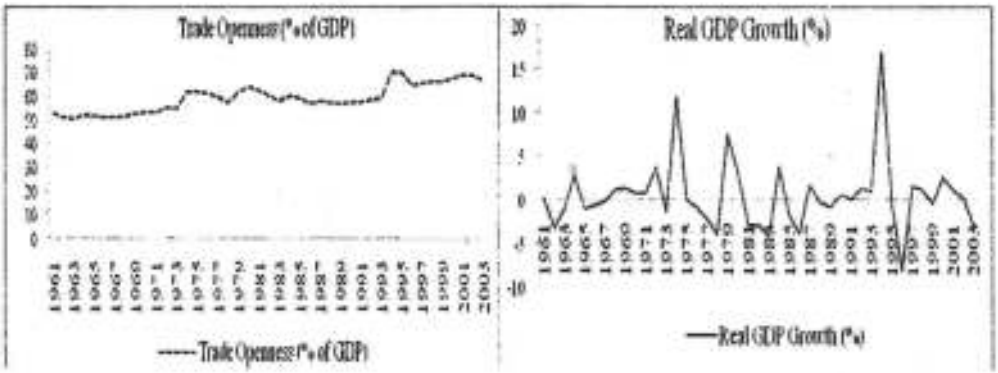
Appendix Figure: The Overtime Trends of the Variables, *Annual Averages of the 32 SSA Economies (1961-2003)*







Appendix Table 1. Overtime Trends of Investment, Openness to Trade and Growth Performances,

Annual Averages of 32 SSA Economies (1961-2003)

Year	Real GDP (Bill $, 2000)	Share of Investment in GDP (%)	Investment (Billion $, 2000)	Trade Openness (% GDP)	Real GDP Growth (%)	Investment Growth (%)	Growth of Trade Openness (%)
1961	1531.723	11.317	211.860	53.349	-	-	-
1962	1579.310	9.484	190.810	51.638	-3.259	3.059	-10.465
1963	1668.052	8.645	180.808	51.111	-1.025	5.467	-5.384
1964	1707.664	8.057	167.802	52.597	2.866	2.347	-7.465
1965	1707.563	10.857	225.255	52.062	-1.022	-0.006	29.445
1966	1706.899	10.118	219.428	51.759	-0.586	-0.039	-2.621
1967	1759.383	10.307	224.364	51.678	-0.157	3.028	2.225
1968	1748.893	10.254	219.912	52.323	1.242	-0.598	-2.005
1969	1813.478	9.932	231.787	53.062	1.401	3.626	5.259
1970	1889.017	11.603	271.448	53.499	0.820	4.081	15.795
1971	1925.629	12.050	270.192	53.937	0.817	1.920	-0.464
1972	1909.556	11.442	256.813	56.062	3.863	-0.838	-5.079
1973	1963.685	11.589	264.392	55.303	-1.362	2.795	2.908
1974	2009.376	12.097	285.710	62.240	11.816	2.300	7.754
1975	1935.754	11.397	236.386	62.227	-0.020	-3.733	-18.951
1976	2010.595	10.028	207.391	61.622	-0.978	3.793	-13.086
1977	2017.783	10.619	212.468	60.225	-2.292	0.357	2.419
1978	1950.444	10.680	204.748	57.854	-4.018	-3.394	-3.701
1979	1959.455	9.927	198.891	62.274	7.364	0.461	-2.902
1980	1966.765	10.801	208.719	64.297	3.196	0.372	4.823
1981	1948.191	10.666	216.496	62.421	-2.962	-0.949	3.659
1982	1982.051	9.982	206.942	60.625	-2.919	1.723	-4.513
1983	2009.667	8.552	182.341	58.177	-4.122	1.384	-12.656
1984	2027.311	8.559	186.090	60.550	4.000	0.874	2.035
1985	2047.845	8.456	179.100	59.433	-1.863	1.008	-3.829

1986	2013.950	8.249	172.458	57.190	-3.846	-1.669	-3.779
1987	2009.510	7.889	161.789	58.218	1.780	-0.221	-6.386
1988	2006.193	8.019	168.633	58.032	-0.319	-0.165	4.143
1989	2072.897	7.901	165.684	57.576	-0.789	3.271	-1.764
1990	2076.100	8.306	176.749	57.964	0.671	0.154	6.464
1991	2069.650	8.136	170.718	58.043	0.138	-0.311	-3.471
1992	2014.830	9.143	175.721	58.820	1.329	-2.684	2.688
1993	2024.637	7.760	164.353	59.443	1.054	0.486	-6.688
1994	2034.741	8.334	186.789	70.448	16.985	0.498	12.797
1995	2058.634	8.458	181.095	70.101	-0.494	1.167	-3.096
1996	2147.890	8.360	183.336	64.644	-8.104	4.244	1.229
1997	2175.540	8.647	202.946	65.701	1.622	1.279	10.162
1998	2202.822	8.277	205.061	66.458	1.146	1.246	1.037
1999	2204.285	7.814	196.750	66.118	-0.513	0.066	-3.126
2000	2323.250	7.354	197.928	67.855	2.593	5.256	-0.415
2001	2356.846	8.430	198.645	68.684	1.216	1.436	0.361
2002	2375.152	9.012	220.560	68.950	0.386	0.774	10.465
2003	2433.788	8.581	223.699	67.008	-2.857	2.439	1.413

Appendix Table 2. Multivariate Augmented Dickey-Fuller (MADF) Stationarity Test, with 1 lag

Ho: the time series in the Panel is I(1) Process

Country	Code	MADF-Statistics									
		Absolute Levels (42 Obs.)				Log Levels (42 Obs.)			Growth Rates (41 Obs.)		
		inves	trade	rgdp	grgdppc	lninves	lntrade	lnrgdp	Δlninves	Δlntrade	Δlnrgdp
Benin	1	6.23	7.96	1.57	46.03	6.51	9.36	2.15	47.68	63.82	54.52
Burk. Faso	2	5.41	2.65	0.69	63.37	6.09	2.52	0.08	59.77	49.4	46.85
Burundi	3	2.20	5.73	7.07	65.69	4.37	5.42	7.65	108.63	100.25	71.87
Cameroon	4	4.49	5.05	0.97	13.61	6.48	4.34	1.14	36.54	47.99	49.09
Cape Verde	5	1.18	7.90	5.65	40.52	1.45	9.16	0.22	55.11	44.39	26.63
Chad	6	0.45	5.31	4.91	29.04	2.13	5.73	4.76	42.64	80.41	42.55

Comoros	7	6.64	8.81	0.33	35.14	6.25	8.96	0.18	55.22	68.22	21.87
Congo, Rep.	8	3.19	11.59	3.95	32.53	2.18	10.18	6.16	23.02	46.69	37.07
Cote d' Ivoir	9	2.36	4.46	8.18	46.33	6.96	4.15	9.99	69.96	49.24	49.26
Ethiopia	10	2.45	0.09	2.25	94.61	2.76	0.90	3.21	44.9	42.32	86.85
Gabon	11	7.42	17.8	11.86	35.45	5.47	16.09	15.10	49.81	65.45	45.38
Gambia, The	12	4.32	7.29	14.34	72.60	2.96	6.52	13.31	39.59	155.25	55.41
Ghana	13	10.77	0.62	2.91	112.14	5.19	1.39	2.72	66.63	22.59	34.73
Guinea	14	4.60	12.42	1.73	44.79	3.45	10.26	2.15	57.39	42.55	53.08
Guinea-Biss	15	4.21	3.9	15.34	68.97	2.33	3.94	16.63	77.86	72.59	68.92
Kenya	16	4.62	11.0	5.23	57.5	4.25	10.02	5.32	44.07	64.43	70.79
Lesotho	17	0.90	2.37	0.36	63.87	9.66	2.77	0.31	48.48	37.29	62.24
Madagascar	18	2.85	7.57	0.05	51.95	3.22	7.17	0.02	91.11	51.75	62.63
Malawi	19	10.80	15.38	1.39	33.39	5.62	15.38	2.38	109.23	71.54	62.90
Mali	20	13.86	3.32	0.020	67.79	17.73	3.25	0.17	71.85	64.72	74.60
Mauritius	21	0.04	3.73	5.27	40.4	1.22	3.81	0.06	88.23	45.85	25.72
Mozambique	22	0.12	1.63	0.07	24.67	0.23	2.84	1.20	62.50	25.80	40.42
Niger	23	3.07	6.48	1.76	35.27	4.7	8.72	1.63	52.93	67.11	36.47
Nigeria	24	2.27	2.06	5.17	23.38	3.15	2.35	4.67	22.62	97.25	32.53
Rwanda	25	7.06	14.49	4.89	64.51	5.92	7.40	5.53	81.30	76.65	54.84
Senegal	26	3.22	4.08	7.33	71.42	6.53	3.24	6.70	88.52	53.88	47.34
South Africa	27	6.13	5.19	1.47	23.58	7.42	4.81	3.87	31.11	29.55	29.38
Tanzania	28	5.12	3.7	0.02	41.21	6.12	3.13	0.28	47.77	17.94	31.23
Togo	29	4.42	1.88	2.02	28.34	8.11	2.57	1.26	25.39	57.96	61.29
Uganda	30	2.25	3.61	0.85	25.92	2.23	5.72	0.98	40.93	69.09	27.61
Zambia	31	1.14	3.10	0.58	51.62	1.12	2.95	0.19	38.12	81.97	33.74
Zimbabwe	32	8.07	0.37	4.23	32.22	8.19	13.21	3.81	40.08	0.00	39.51
5% Critical Value			22.744			22.744			22.974		

Appendix Table 3. Exogeneity Check of the RHS Pre-Determined Variables (SURE)
(Correlation of Residuals with the Regressors)
(H0: Residuals are uncorrelated with the regresses)

Variable	(a) OLS Regression of Residuals			(b) Pair wise Correlation of Residuals		
	Equations			Equations		
	Δlntrade	Δlninves	Δlnrgdp	Δlntrade	Δlninves	Δlnrgdp
Δlntrade_1	-0.000	0.000	0.000	-0.000	0.000	0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlntrade_2	0.000	0.000	0.000	0.000	0.000	0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlntrade_3	0.000	-0.000	-0.000	0.000	-0.000	-0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlninves_1	0.000	0.000	-0.000	-0.000	0.000	0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlninves_2	0.000	0.000	0.000	0.000	0.000	0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlninves_3	0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlnrgdp_1	-0.000	0.000	0.000	-0.000	0.000	0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlnrgdp_2	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Δlnrgdp_3	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	1.000	1.000	1.000	1.000	1.000	1.000
Constant	0.000	0.000	-0.000	*Correlation Matrix of Residuals*		
	1.000	1.000	1.000	*Δlntrade*	*Δlninves*	*Δlnrgdp*
				Δlntrade 1.000		
N	1248	1248	1248	*Δlninves* 0.054	1.000	
R^2	0.000	0.000	0.000	***0.054***		
R^2_a	-0.007	-0.007	-0.007	*Δlnrgdp* -0.159	0.276	1.000
RMSE	0.160	0.241	0.081	***0.000***	***0.000***	
Breusch-Pagan test of Independence				*χ2 = 0.131*	*P- Value = **0.000***	

Note: 1. Numbers beneath regression/correlation coefficients are the corresponding significance P-values of the coefficients.

2. The sizable contemporaneous correlations of residuals across equations justify the efficiency gain of the use of SURE.

Appendix Table 4. Tests on the joint significance of the effects of the three lags
H0: No causal Influence (Rejection of the null reveals the existence of causality)

Constraints:	[Effect]Cause	χ^2	^{2}-Value
(1. 1)	[ΔlninvesL]Δlninves + [ΔlninvesL2]Δlninves + [ΔlninvL3]Δlninves = 0	24.35	0.000
(1.2)	[ΔlninvesL]Δlntrade + [ΔlninvesL2]Δlntrade + [ΔlninvesL3]Δlntrade = 0	15.64	0.000
(1.3)	[ΔlninvesL]Δlnrgdp + [ΔlninvesL2]Δlnrgdp + [ΔlninvesL3]Δlnrgdp = 0	12.15	0.000
(2.1)	[ΔlntradeL]Δlntrade + [ΔlntradeL2]Δlntrade + [ΔlntradeL3]Δlntrade = 0	3.54	0.060
(2.2)	[ΔlntradeL]Δlninves + [ΔlntradeL2]Δlninves + [ΔlntradeL3]Δlninves = 0	0.00	0.998
(2.3)	[ΔlntradeL]Δlnrgdp + [ΔlntradeL2]Δlnrgdp + [ΔlntradeL3]Δlnrgdp = 0	3.80	0.051
(2.1)	[ΔlnrgdpL]Δlntrade + [ΔlnrgdpL2]Δlntrade + [ΔlnrgdpL3]Δlntrade = 0	12.22	0.000
(2.2)	[ΔlnrgdpL]Δlninves + [ΔlnrgdpL2]Δlninves + [ΔlnrgdpL3]Δlninves = 0	4.66	0.031
(2.3)	[ΔlnrgdpL]Δlnrgdp + [ΔlnrgdpL2]Δlnrgdp + [ΔlnrgdpL3]Δlnrgdp = 0	2.63	0.105

Note: Δ represents the change in variables; L, L2 and L3 represent the 1st, 2nd and 3rd lags, respectively.

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