THE IMPACT OF FINANCIAL LIBERALIZATION POLICY ON THE DEVELOPMENT OF FINANCIAL SECTORS IN ETHIOPIA- AN ARDL MODELING APPROACHES

By

Sime, Workenh Eshatuu

THESIS

Submitted to

KDI School of Public Policy and Management

in partial fulfillment of the requirements

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ABSTRACT

THE IMPACT OF FINANCIAL LIBERALIZATION POLICY ON THE DEVELOPMENT OF FINANCIAL SECTORS IN ETHIOPIA- AN ARDL MODELING APPROACHES

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The study analyzes the impact of financial liberalization policy on the development of the financial sector in Ethiopia during the period 1973-2005. Specifically, it investigates whether financial liberalization policy exerts a different effect on the financial sectors development in the short run and long run, whether; there are differences in various financial reform policies. To that end the paper employs persaran's (2001) bound test to the ARDL model. The sources of the data are World Bank, International Monterey Fund, National Bank of Ethiopia and Ministry of Finance and Economic Development of Ethiopia. The finding of the study shows that in the long run financial liberalization policy has positive and statistically significant impact on the development of financial sectors. But in the short run it didn't have any impacts on the development of financial sectors. Liberalization in banking supervision is the most effective and efficient financial liberalization policy in Ethiopia. The positive impacts of the financial liberalization policy show the better implementation status of the Ethiopia governments. The policy implication of the study is that the Ethiopia government should have to fasten the full liberalization of financial sectors to maximize the benefit for the country.

Key words: Financial Liberalization, ARDL model, Financial Development

Dedicated to my Mother and elder sister

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1. INTRODUCTION

Currently, the common question for all economists is why country growth at different rates? Some researchers try to list out the main reason for differences in economic development such as the differences in factor production, institutional development, legal system effectiveness and international trade. Still different scholars found out different factors for the world economic differences. Recently, the roles of the financial sectors start to receive due attention. The financial development and economic growth have direct relationships. This can be proved that in more developed country the financial system is much better than the developing country's financial system (Mohsin and Abdelhak 2000). More developed financial system facilitate the economic development of those country through (i) providing information before funding (ii) for monitoring and evaluation after funding, (iii) easing management of risks, (iv) encouraging saving and (v) facilitating trades(Juzhong et al, 2009). Therefore, it would seem that policies to develop the financial sector would be expected to raise economic growth. The theoretical basis for the relationship between financial liberalization and financial development originates from the seminal work of McKinnon (1973) and Shaw (1973). Both Mckinnon and Shaw argue that the financial liberalization promotes financial development. This study, therefore; examined the nexus between financial liberalization and financial development in Ethiopia during 1973-2005.

There are two main objective of this study; first to identify the impact of financial sectors reform policy on the development of the financial sectors in Ethiopia both in the short run and the long run. It will prove whether financial reform policy causes the development of the financial sectors as stated by McKinnon (1973) and Shaw W. (1973). The second is to identify the promising Financial Liberalization policy in Ethiopia.

The study answered the following questions: What is the short run impact of financial sectors liberalization on the development of financial sectors in Ethiopia? What is the long run impact of financial sectors liberalization on the development of financial sectors in Ethiopia? Which financial liberalization policy is more effective in the country?

There are two extreme points of views on the impact of the financial reform policy on the development of the financial sectors. The first views are those who argue that financial liberalization is the effective strategy for booming of financial sectors. It is supported by McDonald and Schumacher (2007) and Andersen and trap (2003). Their view is that financial liberalization has positive impacts on the development of financial sectors consequently financial development accelerates the economic development of that country. The second view is those who argue that financial liberalization is the cause for financial crisis and it resulted in the down turn of the financial sectors in the country. Supported by Demirgüç-Kunt and Detragiache (2000) and Mehrez and Kaufmann (2000) they argue that financial liberalization induces risk taking behavior and may cause banking crisis.

Having these different arguable issues, the study proved the following hypothesis: First, financial liberalization has statistically insignificant impacts on the development of the financial sectors in the short run. Second, Financial liberalization policy has positive and statistically significant impacts on the development of financial sectors in the long run. Lastly, all indicators of financial reform have important impact on the development of the financial sectors in Ethiopia.

This study is different when we compare with other research conducted in this area in Ethiopia. First, analyzing the short run and the long run the impact of the financial liberalization policy on the development of the financial sectors is the beginning in Ethiopian financial history. Second,

this research is unique in its methodology which used the Autoregressive Distributive lag (ARDL) approach to co integration for analyzing the data.

This study was useful for Ethiopia governments in alarming the policy designer of the country to focus on full liberalization of financial sectors in Ethiopia. In addition to this, one of the specific objectives of this study was to find out the promising financial liberalization policy for Ethiopia government. This objective helps for Ethiopia policy designers to fully explore this specific promising financial liberalization policy at maximum to maximize the benefits for the country. Furthermore, the studies contribute for the financial liberalization literature by identifying and analyzing the time specific impacts of financial liberalization policy i.e. the short run and the long run impacts.

The rest of the paper divided as follows: The second section is the literature reviews; section three discussed the Data and Model specification. The empirical result is covered in section four. Lastly, the study covers the summary and policy recommendation.

2. Literature Review

2.1. Financial Liberalization and Economic Development

Schumpeter (1912) and more recently McKinnon (1973) and Shaw (1973), are the first scholars in analyzing the theoretical relationship between financial development and financial liberalization as well as its impacts on the economic development. They recommend that government restrictions on the banking system hinder financial development and ultimately reduce growth. Similar conclusions are also reached by more recent endogenous growth literature, in which services provided by financial intermediaries (such as information collection and analysis, risk sharing, liquidity provision etc.) are explicitly modeled. These models suggest that financial intermediation has a positive effect on economic growth.

On their paper of the theoretical basis for the relationship between financial Liberalization and Financial Development, McKinnon (1973) and Shaw (1973) and the endogenous growth literature explain how financial development directly related to financial liberalization. In their paper they assume that investments can't take place unless it is preceded by the accumulation of financial capital. McKinnon's model stipulates that the higher real rate of interest, the more willing the investor to accumulate the financial capital. Thus, both McKinnon and Shaw emphasize the real interest rate as the principal determinant of financial capital in the financial system. As such, controls on interest rates keep the real rate of return on deposits artificially low, thereby discouraging the accumulation of financial capital and creating a negative impact on financial development in the process.

2.2. The Evolution of Financial Liberalization

After Second World War, there are three main economic Development model in the world. From 1940 to 1960/70 development through industrialization and accumulation of endogenous scientific, technology and production capabilities, from 1980 to 1990s Stabilization, Liberalization and development through international trade and poverty reduction programmer and from 2000 onwards development through virtuous participation in global knowledge economy. Depending on these general world economic model, all country design different strategies in line with this model. African countries turned to financial liberalization in the 1990s, often in the context of stabilization and reform programs supported by World Bank and International Monetary Fund.

Menzie and Hiro (2006) in their studies on "What matters for Financial Development? Capital Controls, Institutions and Interactions" using a panel data encompassing 108 countries over the period 1980 to 2000. His study shows that financial liberalization has positive effects on the financial development when the institutional set up is better in the country. They also found out that rather than the finance specific legal institutions, the overall legal set up is the best for financial development as well as pre-opening of the goods markets is essential for booming of the financial sectors.

Thierry Tressel and Enrica Detragiachel on their paper "Do Financial Sector Reform Lead to Financial Development?" they investigate the impact of the financial sector reform on the financial development by using the new records of financial sector reform in 91 countries during 1973-2005. Their study showed that financial development of one country depends on the level of legal system structure in the country. These scholars finalize their studies by concluding that

the effectiveness of the financial liberalization policy is highly depending on the political set up of that country.

Hiro Ito 2005 in his study on "Financial Development and Financial Liberalization in Asia Thresholds, Institutions and the Sequence of Liberalization" he analyze the impact of the financial liberalization on the development of the financial sectors through two dimension. One is whether financial openness leads to financial development after controlling for the level of legal/institutional development and the other is whether trade opening is a precondition for the financial opening, focusing on Asia. In his study he used the panel data which includes 87 less developed countries over the period 1980 to 2000. His study suggested that for financial liberalization promote financial development the institutional structure of the country matter. In the same ways the opening of the trade sectors is the pre-condition for the effectiveness of the financial reform. The study also shows that the lower the level of corruption and higher the quality of laws and order facilitate the booming of the financial development in the country.

Kevin Greenidge and Alvon Moore (2007) on there paper "The Impact of Financail Liberlization on the Financail Developemnt: Evidence from the Caribbean" they examines the relationbetween financail liberlization and financail development in a selected group of Caribbean countries. In there study they focus on the single country estimation approach because the success of liberlization policies largely depends on the instituional structure of the countries and thus is likely to be country- specific. The main finding of their studies focus on the direct effects of financail liberlaization on the financail development varied across the coutries and appears to reflect the pace at which such polices were implemented. Barbados took a very gradual approach to both domestic and international financial liberalization and the results suggest that both

dimensions of financail liberalization had a positive impact on the rate and equilibruim level of financail development. However, the reseaerch find out that in Jamaica where the paces of both domestic and internatioanl financial liberlization were quite rapid there appears to be no significant effects of financail liberlization on financail development. In Trinidad and Tobago, domestic financail liberlization occurred at a pace faster than in Barbados but much slower than in Jamaica and here the impacts were positive. On the contrary, international financail liberlization in Trinidad and Tobago took place at a pace just as rapid as in Jamaica and no significant effects were uncovered. They concluded that finanail liberlization policies can havedirect effects on the financail development, over and above that cuased by movements in the interest rate.

All of the reviewed literature didn't analyze the impact of financial liberalization on financial development with respect to time. Financial liberalization has different impacts on the financial development in the short run and long run. In addition to this, all research reviewed didn't identify the promising sectors from financial liberalization indicator. Generally, the reviewed paper have the following research gaps: what are the immediate impacts of the financial liberalization on the development of the financial sectors? What is the long term impact of the financial liberalization on the development of the financial sectors? Which financial liberalization policy is the promising?

2.3. Financial institutions and Financial Liberalization in Ethiopia

Financial institutions are the most important engines of economic growth for any economy in the world. According to Lakew (2000), banks are the dominant financial institutions in Ethiopia.

They account, on average, for 96 percent of total gross financial assets. Non-banks account only for about 4 percent. Financial institutions currently operating in the Ethiopian financial system comprise the central bank, commercial banks, specialized banks, insurance companies, pension fund, saving and credit cooperatives and Microfinance Institutions. The most important functions of commercial banks in the area of financial intermediation are deposit mobilization and lending activities.

In Ethiopia the need for banks, Micro Finance Institutions and insurance companies is very crucial as there are no developed security markets. After the fall of the socialist government the new pro- capitalist regime introduced many financial liberalizations and restructuring measures to strengthen the financial sector by placing legal and regulatory frameworks. Due to the changes in the policies a number of private commercial banks, insurance companies and MFIs were established in the country sharing the former dominance of state owned financial institutions. The participation of private sectors in the economy has brought competition in the financial sector of the country. In the future the dominance of state owned financial institutions seem to cease though still the private banks look far chasing the public banks.

2.3.1. The Pre-Reform Financial Sector

The pre-reform period here refers to the period 1974 to 1991, which noted as the Derge regime. During this period all private banks were nationalized. The National Bank of Ethiopia was at the apex of the banking structure and was engaged in all the functions of central bank. As noted earlier, Commercial bank Ethiopia, Agriculture industry development bank, Development Bank of Ethiopia and Housing and saving Bank were in operation. In addition to these banks, there were also two other financial institutions: Ethiopian Insurance Corporation and the Pension and

Social Security Authority. The commercial banks of Ethiopia followed by the developmental bank of Ethiopia were the most important banks in the country both before and after reform. On average the commercial bank of Ethiopia alone comprises more than 90% of total deposit (while developmental bank of Ethiopia share is 1.3%), and 71% of the total loans advanced in which developmental bank of Ethiopia share being 16% (Alemayehu, 2006).

2.3.2. The Policy Regime in the Pre-Reform Period: Financial Sector and Ideology

In Ethiopian history the period from 1974-1991 is known as the dictator regime in which every national plan is controlled by the central government of the country. Both financial and economic plan of the country were highly controlled by the central governments. So, the National Bank of Ethiopia was established by the proclamation 1976 to facilitate the central controlling of the financial system in the country. According to proclamation 1976 article 6 mentioned the role of the National Bank of Ethiopia which was fostering the balanced and accelerated economic development in the country. In this period, the National Bank of Ethiopia was actively involved in direct controlling of all financial institutions by (a) fixing both deposit and lending interest rates, (b) directly controlling the foreign exchange and credit allocation which was done in a discriminatory manner, by favoring the public sector, and (c) by directly financing government deficit (National Bank of Ethiopia, 1998). Bank supervision/regulation has been largely limited to on and off inspection on a few branches. The Derg regime is also characterized by an economic policy largely informed by the ideology of socialism.

Furthermore, the Derg Socialized government controlled the foreign exchange earnings and credit allocation through the National Bank of Ethiopia. The National Bank of Ethiopia would allocate all the foreign exchange earning to socialize sectors. Similarly, credit allocation was

informed by the same ideological considerations. In consultation with the Ministry of Finance and the Planning Ministry, the National Bank of Ethiopia projects the financial planning of the economy. Based on some statistical survey it would determine the credit need of different sectors by favoring the priority investments. In credit allocation financial institutions used credit policy as a factor of strengthening and expanding the socialized sector and encouraging the socialization of others (Antonio, 1988: 71-72). This favoring of the socialized sector is shown by the fact that a good part of the banks resources were directed to the socialized sector (for instance 68% of Agricultural Development Bank resources were allocated to State farms) and that the state farms and cooperatives were not required collateral when granted loans. As noted by Antonio (1988), this restrictive policy has resulted in excess liquidity in the banking sectors in the 1980 chiefly because of (a) the biased credit policy, (b) the collateral requirement on the private sector, (c) seasonal trends and the (then) existing economic condition as well as (d) The Commercial Bank of Ethiopia's inefficiency (Antonio, 1988).

2.4. The Structure of the Financial System in Post-reform Period

After the new government controlled the power there are many financial and economic reforms that took places in Ethiopia. The financial reform is started in 1991. The strategy that the country follows in the financial liberalization is the gradualism strategy. This strategy is highly criticized by the World Bank and International Monetary Fund because of its sluggish nature. But considering its immature financial system adopting the gradualism strategy is best choice for Ethiopia. The living standard of the society in the country is very low and its economic development is backward because of the civil war during the Derg regime.

To improve the living standard and condition of the society, the country government starts to implement financial and economic reform. In the country the structural reforms concentrated on lifting most domestic price controls, reducing import tariffs, and moving to a market-based system of foreign exchange allocation. Exchange-rate reform, began in October 1992 with a devaluation of 140 per cent from 2.07 Birr to the dollar (the rate at which it was fixed for nearly two decades) to 5 Birr to the dollar. The devaluation's size was justified by the substantial premium on the parallel market, which was 238 per cent at one point. A foreign exchange auction system was introduced in 1993 (Aron 1998).

The financial and economic reform that Ethiopia implemented resulted in increasing the inflow of the financial aids in the support of the reconstruction and transitional program; Ethiopia was the first World Bank clients in the sub Saharan African country in 1998. From the 1993 to 1995 the reform and reconstruction is highly supported by the World Bank structural adjustment program and International Monetary fund enhanced structural adjustment facility. In Ethiopia enhanced structural adjustment program launched in 1996 but it was stopped in 1997 because of the disagreement with the governments. The main reasons for their disagreement are the huge share of the financial assets of the commercial bank of Ethiopia. The other is they require the government to open financial market for foreign financial institutions. Limitations on the operation of foreign exchange bureau were another source of disagreement (Stephen, 2001).

2.4.1. The Four task of Managing Financial Reform

Ethiopia experienced four steps in implementing the financial reforms (Stephen, 2001). This helps the country to pass different stages of the financial development and expansion.

1. **Restructuring the Approach to financial liberalization;** this steps aimed to transform the government sectors to focus on the management and achievement of output and outcome rather than focus on the management and achievements of input.
2 **Improving the scheme of the reform;** this is the principle of add and drop. It focuses on fulfilling those elements that are missing and removing unessential parts.
3 **Managing the implementation of the reform;** the stage of implementation has three minor steps: Design, Pilot and operation. In the case of Ethiopia, the design step involved an assessment of the existing system and the context of the system. Assessment was followed by a detailed procedural design and consultation with federal and regional partners. The second phase of implementing a financial reform involves testing the design through a pilot. Once a pilot is tested, implementation is expanded to full scale operation. With the completion of this third phase, the reform is fully implemented into practice.
4 **Protecting the reform;** Ethiopia is simultaneously implementing devolution, civil service reform and sector development programmers (decentralization support activity project, 1998). Each reform on its own is a challenge. While ultimately complementary, the reforms have different objectives and the different time frames. Devolution is the broadest and most comprehensive reform for it involves the transfer of political and administrative authority to regional and sub-regional governments. The civil service reform is introducing fundamental administrative and management change to make governments at all levels more efficient and effective.

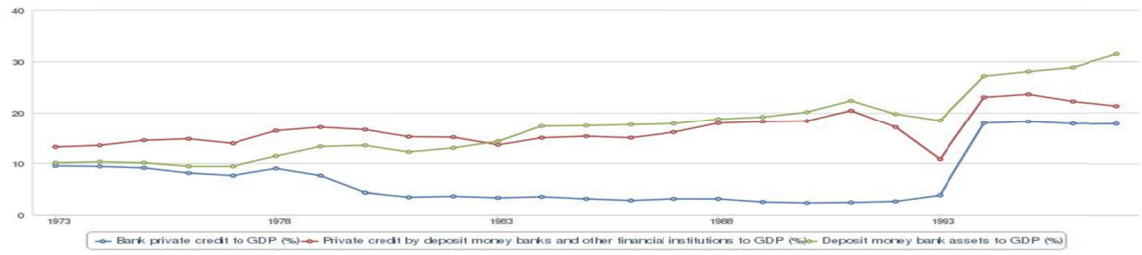
2.5. The outcome of Financial Reform

One of the major changes of the financial liberalization policy in Ethiopia is in the banking industry. In 1994 the government of Ethiopia designs one proclamation which allows the Ethiopian private sectors to invest in banking industry. This proclamation resulted in the dramatic changes in the banking sectors in Ethiopia. In 2010 the number of the private commercial bank is around 17 and three government owned banks. During the same fiscal year, 289 new bank branches were opened by commercial bank of Ethiopia raising the total branch network in the country to 970 from 681 last year. As a result, the bank to people ratio declined from 117,474 people to 82,474 in 2010/11. Even if the banking system in the country improved still the share of the government owned banking sectors is larger than the private banks. (National Bank of Ethiopia, 2010/2011). Because of this proclamation there are also radical changes in the sectors of insurances and microfinance institutions. In 2010/11 there are 14 new insurances company in the country. The number of the branches is 221 in the same year. On the other hand before 1991 there is no microfinance institution in Ethiopia. But after financial reform policy implemented there are around 31 microfinance institutions in Ethiopia. Their total capital increased by 24 percent to Birr 2.9 billion and their assets rose by 27.6 percent to Birr 10.2 billion mirroring their ever growing rose in the economy.

In Ethiopia still the banking industry is highly controlled by the state owned banking sectors. But on the implementation private bank is more effective and efficient than the government owned banking sectors (Alemayehu, 2007). As in many developing countries the financial institutions in Ethiopia provide very limited services. The banking sector faces a number of problems that hindered its proper functioning. Liquidity problems are widely seen which make the private

commercial banks unable to finance big projects. As a result, this creates an imbalance between the demand for loanable fund and their supply (Wondaferahu, 2010).

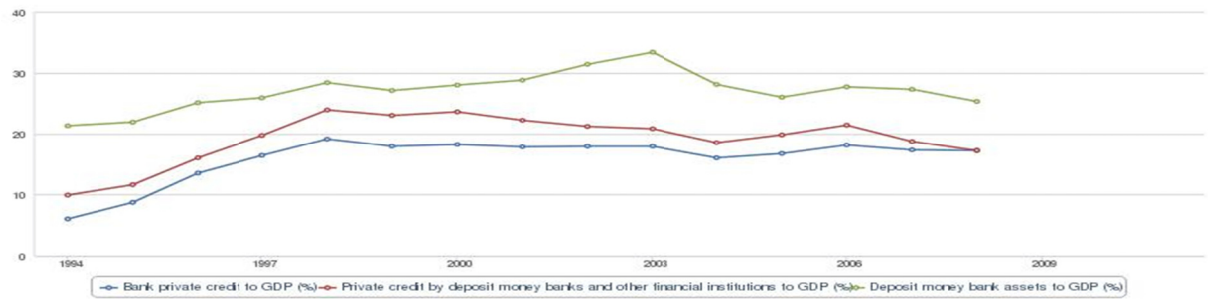
Fig. 1: Financial development indicators before the financial reform



Source: World Bank

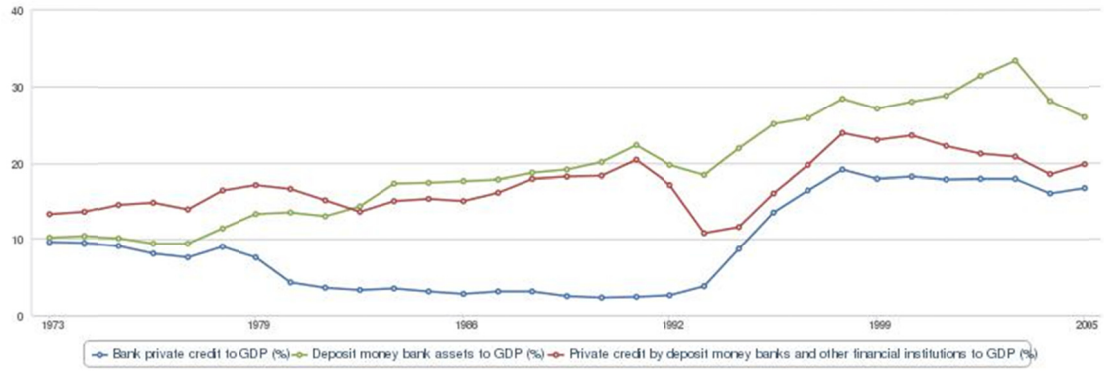
On figure one in average until the financial reform take over in the country all three economic development indicators didn't increased significantly. Specially, the percentage of the bank private credit to the GDP continuously decreases through time until financial reform take over in Ethiopia.

Fig. 2: The financial development indicators after the financial reform in Ethiopia



Source: World Bank

Fig. 3 the trend of *three dependent variables*



Source: World Bank

In the same case figure 2shows the financial development indicators after financial reforms take place in Ethiopia. Financial reform starts to implement in 1992, since then all the financial development indicators continuously increasing.

Table 1: Branches of the Commercial Bank before financial liberalization

Year	Branches	Year	Branches	Year	Branches
1975	2	1983	4	1991	0
1976	2	1984	4	Total	63
1977	5	1985	3		
1978	6	1986	2		
1979	6	1987	6		
1980	11	1988	1		
1981	3	1989	3		
1982	5	1990	0		

Sources: Commercial Bank of Ethiopia Statistical survey

As we can see from table one total number of branch of commercial bank of Ethiopia is around 63 before the financial liberalization. This has effects on the accessibility of financial services in

the country. Before financial liberalization there is no private bank. This makes the commercial bank of Ethiopia as the monopoly banks in the country. But the story was changed after 1992. In the country there are around 17 new private banks in the year 2011. The total branches of commercial bank are more than 970 (National Bank of Ethiopia, 2010).

Financial development is the institutional set up that allows the efficient intermediation and effective financial markets. As the financial institutions in the country are stronger, it offers effective risk diversification and capital allocations. In addition to this it mobilize huge saving capacity as well as funding for big projects. Financial development can be measured by a number of factors including the depth, size, access and soundness of financial system. It can be measured by examining the performance and activities of the financial markets, banks, bond markets and financial institutions. In generally, as the financial development of the country is higher it can provide efficient and effective financial services.

Tony and Alemayehu (2002) on their paper's "Ethiopia's New Financial Sector and Its Regulation" explained what Ethiopia can learn from transitional experiences elsewhere. They explained diverse directionality of the development in the market oriented economic development. The study showed that there is no one true path to market economy.

Ebisa (2012) on his paper of "The Effects of the Post 1991 Era Financial Sector Deregulations in Ethiopia: An inspirational Guide for Agribusiness", found out the impact of financial reform on the financial institution. The financial liberalization policy in Ethiopia resulted in the investment in banking sectors by Ethiopia citizen, the development of the insurances companies and establishment of the Micro Finance institutions. In his study he concluded that for development

of the economy of the country the financial institution of Ethiopia should invest in modern way on the agricultural sectors.

Kozo, Barbara and Robert on their paper the case for the financial sector liberalization in Ethiopia; clearly found out that the nature of financial system in the country in which there is no foreign participation, evidence of a non-competitive market structure and strong capital controls. They also compare and contrast that the Ethiopia's state owned and private banks noting that state owned banks were comparatively inefficient relative to private banks. In their research they found out that the financial liberalization has significant benefits that it may induce. In pursuing liberalization, the stakeholders' concerns need to be acknowledged and addressed with references especially to improvements of financial regulations and oversight. They concluded that the financial liberalization is not a panacea for Ethiopia's broader economic problems. But it may nonetheless serve to ameliorate these problems by improving the efficiency of the banking system and providing the basis for greater financial intermediation and economic growth.

Stephen (2001) on his study of "Financial Reform in a Devolved African Country: Lessons from Ethiopia" found out that financial reform is not simply a slogan or a concept. He found out that reform is a multidimensional process that can't be solved by introducing a single solution, be it double entry accounting, output/outcome budgeting or medium- term expenditure frameworks. He mention the basic requirement for the effective implementation of financial reforms require that political commitments, administrative capacity and significant financial and human resources. It also takes the long time for effective implementation. The researcher also found out the objective of financial development in Ethiopia. He mentioned that the objective of Ethiopia's

financial reform should not be to win the international reform sweepstakes but to build sound financial system through a coherent, appropriate and feasible reform. The researcher concluded his research by highly recommending the importance of financial reform through sharing the Goran Hyden Penned idea that there are no shortcuts to progress in Africa (Hyden, 1983).

All of the reviewed research literature conducted in Ethiopia financial liberalization cases have some common weakness. First all paper uses simple methodology in which it is difficult to know the short run and the long run impact of financial liberalization on the development of financial sectors. Second, all focus on outcome of per and post financial liberalization. Comparing only the outcome of pre and post liberalization is not important for the policy designer to effectively design practical and achievable policy in the financial liberalization area. In general, what we noticed is that the financial liberalization issues are the new concepts not only in the government organization but also in the academic, research institute and for the researcher. So, from reviewed researches the following main research gap identified: First identifying the most potential area in financial liberalization in Ethiopia context is most important for policy designer. Second analyzing the short run and the long run impact of the financial liberalization is important to know direct impact of financial liberalization for the development of the financial sectors.

3. Methods and Methodology

3.1. Model specification:

To examine the effect of financial liberalization on financial development, the study used the bound testing approach for co integration within the framework of Autoregressive Distributed Lag (ARDL) Pesaran (2001). The model specifies the Financial Depth as a function of financial liberalization:

$$\textbf{(Findepth)}_t = \textbf{F (Fin. Liberalization, gdpg, inf.)}_t \text{ ----------1}$$

Findepth = financial depth, Fin. Liberalization= financial liberalization (financial reform) GDPG= annual growth rate of GDP and inf. = annual inflation rate. By recalling the basic form of an ARDL regression model: (http://davegiles.blogspot.kr/2013/06/ardl-models-part-ii-bounds-tests.html)

$$\textbf{(Findepth)}_t = \beta_0 + \beta_1(\textbf{Findepth})_{t-1} + \text{.....} + \beta_k(\textbf{Findepth})_{t-p} + \gamma_0(\textbf{fin. liberalization})_t + \gamma_1(\textbf{fin. liberalization})_{t-1} + \text{.....} + \gamma_i(\textbf{fin. liberalization})_{t-i} + \delta_0(\textbf{gdpg})_t + \delta_1(\textbf{gdpg})_{t-1} + \text{.....} +$$

$$\delta_i(\textbf{gdpg})_{t-i} + \mu_0(\textbf{inf.})_t + \mu_1(\textbf{inf.})_{t-1} + \text{.....} + \mu_i(\textbf{inf.})_{t-i} + V_t \text{ .....2}$$

μ, γ, δ, β = Coefficients to be estimated and v_t = Error term assumed to be white noise. There are several reasons for the use of ARDL model for bound test. *First* this model is more appropriate for small sample size (Pesaran and Tang 2001). *Second* unit root test is not mandatory. Third, bound testing could be implemented regardless of whether the underlying variables are I (0), I (1). But in case of I (2), ARDL technique crashes and it yields spurious results.

With respect to Equation (2) it is assumed that there is a long-run relationship among the financial development and financial reform policy. As the direction of long-run relationship among the variables is unknown, a prior, the following unrestricted error correction model (UECM) can be regressed for determination of long-run relationship:

$$\Delta(findepth)_t = \alpha + \sum^{N}_{i=1}\beta\Delta(findepth)_{t-i} + \sum^{N}_{i=0}\gamma_i\Delta(Fin.\ Liberalization)_{t-i} + \sum^{N}_{i=0}\delta_i\Delta(gdpg)_{t-i} + \sum^{N}_{i=0}\mu\Delta(Inf.)_{t-i} + \psi_1(findepth)_{t-1} + \psi_2(Fin.\ Liberalization)_{t-1} + \psi_3(gdpg)_{t-1} + \psi_4(inf.)_{t-1} + v_t \quad \textbf{3}$$

Where 'Δ' is first difference operator, ψi = Coefficients to be estimated and v_t = Error term assumed to be white noise, 'i' is the number of lags, 'n' is the optimal lags length. The F-test is used for validating of long-run relationship. The null hypothesis for no long-run relationship amongst the variables in equation (3) is

(H0: ψ1 = ψ2 = ψ3 = ψ4 =0)

Against the alternative hypothesis

(H1: ψ1 ≠ ψ2 ≠ ψ3 ≠ ψ4≠ 0).

Two critical values [I (0) and I (1)] are taking from the Pesaran (2001) table. The decision for rejection or acceptance of null hypothesis depending whether, the calculated t value is greater than Pesaran critical value or not. If it is greater than the upper critical value, the null hypothesis will be rejected on the other hand it will be accepted, if it is less than the lower critical value. The result is inconclusive if it is between the upper and lower critical value (Younguck and Muhammed, 2012). To find the maximum number of lags for all variables, $(n+1)^r$ number of regressions will be estimated. Where 'n' is the maximum number of lags and 'r' is the number of variables in the equation. For annual data the maximum lag selected is 2 following the Pesaran

1997. The optimal model can be selected using Akaike Information Criteria (AIC). Once we prove the existence of the long run relationships, the long-run model can be estimated as follows (http://davegiles.blogspot.kr/2013/06/ardl-models-part-ii-bounds-tests.html).

$$\mathbf{(Findepth)_t = \Omega_0 + \Omega_1(Fin.Liberalization)_t + \Omega_2(gdpg)_t + \Omega_3(Inf.)_t + V_t} \text{----------} \mathbf{4}$$

The short run model used to prove the diagnostic test and stability of the model. The error correction of co integration representation of the series can be specified as follow;

$$\mathbf{\Delta(findepth)_t = \rho 0 + \sum^{N}_{i=1}\Delta\Pi(findepth)_{t-i} + \sum^{N}_{i=0}\Delta\Theta(Fin.\ Liberalization)_{t-i} + \sum^{N}_{i=0}\Delta\Omega(gdpg)_{t-i} + \sum^{N}_{i=0}\Delta\Psi(inf.)_{t-i} + \lambda ECT_{t-1} + V_t} \text{----------} \mathbf{5}$$

Where Π_i, Θ_i, Ω_i, Ψ_i, and Φ_i, are coefficients of short-run dynamic parameters and λ captures the speed of adjustment and tells us how much of the adjustment to equilibrium takes place each period.

3.2. Data Description

The country selected for this study is Ethiopia. The data in this study cover the financial reforms conducted from 1973 up to 2005.The main sources of the data are Ministry of Finance and Economic Development, National Bank of Ethiopia, the World Bank Database for the Financial Development Indicators and the new data base of the Financial Reforms – Abdul Abiad, Enrica Detragiache, and Thierry Tressel- International Monetary Fund for the financial reform indicators.

In my study the dependent variable is the depths of financial development indicators which it can be measure in terms of three financial development indicators. Deposit money bank assets to GDP (%) (**gfddd02**), Bank private credit to GDP (%) (gfddd$_1$01) and Private credit by deposit

money banks and other financial institutions to GDP (%) (**gfddd$_1$12**).The bank private credit to the GDP (%) (gfdddi12) measures the financial resources provided to the private sector by domestic money banks as a share of GDP.

Deposit Money Bank assets to the GDP (%) (gfdddi02) is the total assets held by deposit money banks as a share of GDP. Assets include claims on domestic real nonfinancial sector which includes central, state and local governments, nonfinancial public enterprises and private sector. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits. Claims on domestic real nonfinancial sector by deposit money banks as a share of GDP, calculated using the following deflation method: {(0.5)*[Ft/P_et + Ft-1/P_et-1]}/[GDPt/P_at] where F is deposit money bank claims, P_e is end-of period CPI, and P_a is average annual CPI.

Private credit by deposit money banks and other financial institutions to GDP, calculated using the following deflation method: {(0.5)*[Ft/P_et + Ft-1/P_et-1]}/[GDPt/P_at] where F is credit to the private sector, P_e is end-of period CPI, and P_a is average annual CPI.

The independent variables are the financial liberalization indicators. They are credit controls and excessively high reserve requirements, interest rate controls, entry barriers, State ownership in the banking sectors, capital account restriction, supervision of the banking sectors and security market policy as well as the overall financial reform measures and the financial reform index normalized. The detail coding process is explained on the appendix. The study used the e-views and STATA.

According to table 2 the correlation matric showed that most of the variables move in the same direction with some exceptionality. Specifically the correlation between the inflation and all other variables showed inflation moves in the opposite direction.

Table 2; The Correlation Matrix

	Gfdddi01	Gfdddi02	Gfdddi12	credits	intrat	Entry	banking	Intalcap	security	Finrefrom	Finreform_n	Gdpg	Inf
Gfdddi01	1.0												
Gfdddi02	0.6695	1.0											
Gfdddi12	0.6288	0.6857	1.0										
Credit	0.8232	0.8520	0.6857	1.0									
Intr	0.8396	0.7747	0.7501	0.740	1.0								
Entry	0.5466	0.2071	0.0644	0.4837	0.3288	1.0							
Banking	0.9184	0.8389	0.7348	0.8630	0.8579	0.3833	1.0						
Intalcap	0.5644	0.4671	0.3137	0.5299	0.6500	0.4749	0.5440	1.0					
Secu	0.7731	0.6181	0.5244	0.7110	0.7967	0.5647	0.7510	0.8756	1.0				
Finreform	0.8768	0.7170	0.5299	0.8723	0.8212	0.7127	0.8468	0.7909	0.9297	1.0			
Finreform_n	0.8768	0.7170	0.5299	0.8723	0.8212	0.7127	0.8468	0.7909	0.9297	1.0000	1.0		
Gdpg	0.2475	0.1892	-0.0950	0.2749	0.2102	0.1314	0.3031	0.2196	0.1886	0.2540	0.2540	1.0	
Inf	-0.2987	-0.3165	-0.1313	-0.3002	-0.3211	-0.1840	-0.4235	-0.2600	-0.2691	-0.3320	-0.3320	-0.6772	1.0

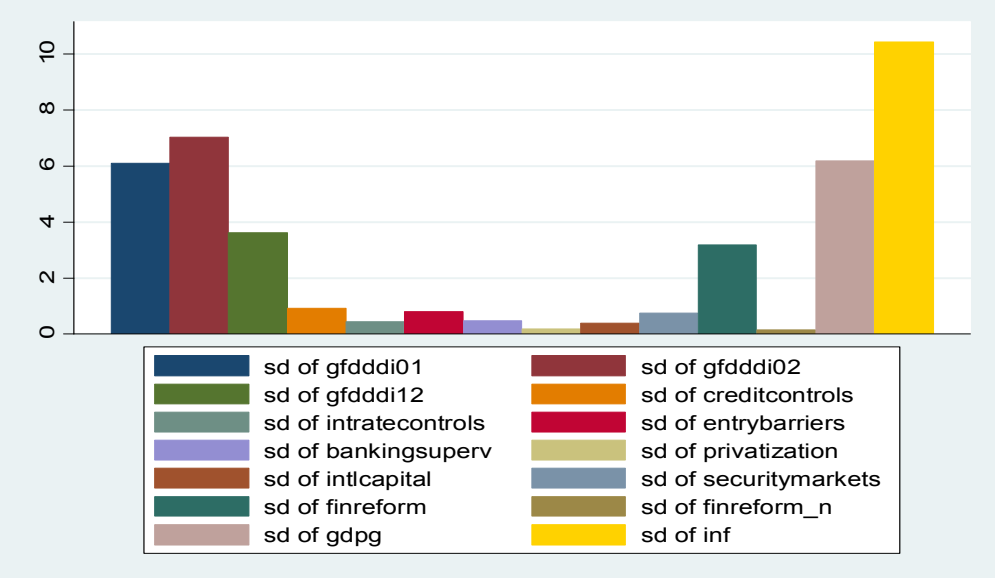
Source: Author estimation

From table two, standard deviation showed that inflation is the major that fluctuates with the comparison of the mean of the variables. It also showed that the finance reform index is the one which has the lowest deviation from the mean. The sample size form this study is 33 years from 1973-2005.

Table 3; Descriptive statistics					
Variables	Observation	Mean	Std. Dev.	Min	Max
GFDDDI01	33	8.794449	6.088997	2.31288	19.072
GFDDDI02	33	16.91564	3.613757	9.89799	23.9202
GFDDDI12	33	19.41673	7.025185	0	33.3986
CREDITCONTROL0	33	0.818181	0.917011	0	2
INTRACONTROL	33	0.242424	0.4351941	0	1
ENTRYBARRIERS	33	0.545454	0.7941545	0	3
BANKINGSUPERV	33	0.303030	0.4666937	0	1
PRIVATIZATION	33	0.030303	0.1740777	0	1
INTLCAPITAL	33	0.181818	0.3916747	0	1
SECURITYMARKETS	33	0.454545	0.7537784	0	2
FINREFROM	33	2.575757	3.1822784	0	8
FINREFROM_N	33	0.122655	0.1515369	0	0.380952
GDPG	33	2.839901	6.183238	-11.1443	13.8596
INF	33	6.616519	10.42723	-17.6274	35.7226
Source: Authors Estimation					

Chart one indicated that the progress of financial development indicators in the year 1973-2005. Especially after financial liberalization implemented in Ethiopia in 1991 the financial development is increasing at increasing rates.

Fig. 4 The mean and standard deviation



4. Empirical Results

4.1. Unit root tests

Even though the ARDL approach for co integration testing does not require the pre-testing of the variables for the unit root, it is imperative that this test is conducted to ensure that the series are not integrated of the order higher than one. The result for the Augmented Dickey-Fuller (ADF) is presented on table four. As showed on this table all of the variables except privatization are stationery. These implies that the ARDL approach of co integration testing technique can be applied as it is confirmed that the complex nature of dependent and independent variables by having I (0) and I (1) from the table four can be compromised by ARDL model.

Table 4; Unit root tests

No	Variables	ADF tests statistics		Criteria	Conclusion
		Level	First differences		
1	Gfdddi01	-1.002433	-2.296502**	None	I(1)
2	Gfdddio2	-3.880658**	-	Intercept and trend	I(0)
3	Gfdddi12	-3.645956**	-	Intercept and trend	I(0)
4	Creditcontrol0	-0.398174	-4.414533*	Intercepts	I(1)
5	Intracontrol	-0.493435	-3.872983*	Intercepts	I(1)
6	Entrybarriers	-5.249229*	-	Intercepts	I(0)
7	Bankingsuperv	-0.596285	-3.872983*	Intercepts	I(1)
8	Intalcapital	-0.402961	-4.416153*	Intercepts	I(1)
9	Securitymarkets	0.330448	-4.874567*	Intercepts	I(1)
10	Finreform1	-0.275758	-6.919787*	Intercepts	I(1)
11	Finreform_n	-0.275758	-6.919787*	Intercepts	I(1)
12	Gdpg	-5.416806*	-	Intercepts	I(0)
13	Inf.	-3.597927*	-	Intercepts	I(0)
Source: Author estimation					

4.2. Existences of the Long Run relationships

On the ARDL analysis the first step is to determine the existences of the long run relationships among the variables. The computed F-statistics together with the critical values computed by pesaran et.al (2001) are shown in table 5, 6, and 7. On table five, for credit control and reserve requirements, finance reform and the finance reform index the computed F-statistics is higher than the upper bound critical value at ten percent significance level. Whereas for liberalization in entry barriers, banking supervision, interest rate control, capital account restriction and security markets, the computed F-statistics is higher than the critical value from the Pesaran et.al (2000) at five percent significance level. So, the null hypothesis is rejected. This establishes that there is a long run relationship among the dependent variables-Bank private credit to GDP (%) (gfdddi01) and the other explanatory variables.

Table 5; F-tests to check the existences of the long run relationship

Model	Long run relation test between gfdddi01	Specification	Computed F-statistics	Level of significances	Critical values (unrestricted intercept and unrestricted trend)		Critical values (unrestricted intercept)	
					I(0)	I(1)	I(0)	I(1)
Model one	Creditcontrol0,	Intercept	4.32*	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	**2.72**	**3.77**
Model two	Intracontrol,	Intercept	4.37**	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	**4.35**
				10%	3.47	4.45	2.72	3.77
Model three	Entrybarriers,	Intercept	4.54**	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model four	Bankingsuperv,	Intercept	5.32**	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model five	Intlcapital1,	Intercept	4.50**	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	**4.35**
				10%	3.47	4.45	2.72	3.77
Model six	Securitymarkets,	Intercept and trend	5.95**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model	Finreform1,	Intercept		1%	5.17	6.36	4.29	5.61

seven			3.94***	5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	2.72	**3.77**
Model eight	Finreform_n,	Intercept	3.79*	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	2.72	**3.77**

- Where ***, ** and * indicates one percent, five percent and ten percent significance level.
- Note the growth of the GDP and annual inflation rate is considered as controlled variable in all model
- The dependent variable is gfdddi01
- **Source: Author estimation**

Table 6 shows the existence of the long run relationship between deposit money bank assets to the GDP (%) with financial liberalization indicators. According to this table all the financial liberalization indicators has the long run relationship with the deposit money bank assets to GDP (%). For Credit control, policies on the security markets and financial reform the computed F-statistics of each variable is higher than the upper bound critical value at ten percent significance level. Whereas for the other variables computed F-statistics is higher than the upper bound critical value at five percent significance level. So, in both case the null hypothesis of non-existences of long run relationships can be rejected.

Table 6; F-tests to test for the existences of the long run relation

Model	Long run relation test between gfdddi02---	Specification	Computed F-statistics	Level of significances	Critical values (unrestricted intercept and unrestricted trend)		Critical values (unrestricted intercept)	
					I(0)	I(1)	I(0)	I(1)
Model one	Creditcontrol0	Intercept and trend	7.86**	1%	**5.17**	**6.36**	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	**2.72**	**3.77**
Model two	Bankingsuperv	Intercept and trend	6.34**	1%	5.17	6.36	4.29	5.61
				5%	**4.01**	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model three	Intlcapital1	Intercept and trend	5.41**	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model four	Securitymarkets	Intercept and trend	4.79*	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	**4.45**	2.72	3.77
Model five	Entrybarriers	Intercept	5.26**	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	**4.35**

				10%	3.47	4.45	2.72	3.77
Model six	Intracontrol	Intercept and trend	6.19**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model seven	Finreform1	Intercept and trend	4.74*	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	**4.45**	2.72	3.77
Model Eight	Finreform_n	Intercept and trend	5.81**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77

- Where ***, ** and * indicates one percent, five percent and ten percent significance level.
- Note the growth of the GDP and annual inflation rate is considered as controlled variable in all model.
- The dependent variable is gfdddi02
- **Source: Author estimation**

On table seven all the financial liberalization indicators has the long run relationship with private credit by deposit money bank and other financial institution to the GDP (%). For all the financial liberalization indicators the computed F- statistics is higher than the upper bound critical values at five percent significance level except the policy for the security markets which is significant at one percent significance level. So, the null hypothesis of the non-existence of the long run relationship can be rejected.

Table 7; F-tests to test for the existences of the long run relation

Model	Long run relation test between gfdddi12	Specification	Computed F-statistics	Level of significances	Critical values (unrestricted intercept and unrestricted trend)		Critical values (unrestricted intercept)	
					I(0)	I(1)	I(0)	I(1)
Model one	Creditcontrol0,	Intercept and trend	5.75**	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	**2.72**	**3.77**
Model two	Bankingsuperv	Intercept and trend	4.54*	1%	5.17	6.36	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	**4.45**	2.72	3.77
Model three	Intlcapital1	Intercept and trend	5.43**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model four	Intracontrol	Intercept and trend	6.53**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77

Model five	Entrybarriers	Intercept	5.59**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model six	Securitymarkets	Intercept and trend	7.36**	1%	5.17	**6.36**	4.29	5.61
				5%	4.01	5.07	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model seven	Finreform1	Intercept and trend	6.35**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77
Model eight	Finreform_n	Intercept and trend	6.03**	1%	5.17	6.36	4.29	5.61
				5%	4.01	**5.07**	3.23	4.35
				10%	3.47	4.45	2.72	3.77

- Where ***, ** and * indicates one percent, five percent and ten percent significance level.
- The growth of the GDP and annual inflation growth rate is considered as controlled variable in all models.
- The dependent variable is gfdddi12
- **Source: Author estimation**

4.3. The Long run Estimate

4.3.1. The long run Estimates on Bank private credit to GDP (gfdddi01)

Table eight shows the long run relationships between B*ank private credits to GDP* (%) and financial liberalization indicators. All financial liberalization indictors are statistically significant at one percent significance level. One level increase in liberalization in credit control and excessive reserve requirements, interest rate control, entry barrier, banking supervision, capital account restriction, and policy for the security markets, overall financial reform and financial reform index normalized increase the development of bank private credit to the GDP (%)by 5.41, 11.52, 3.99, 12.36, 8.42, 6.09, 1.66 and 34.92percent,respectively. Constant has also positive and statistically significant impact on the development of the financial sectors through booming the bank private credit to the GDP (%). In all case the GDP growth rate and annual inflation growth rate have insignificant impacts on the development on the financial sectors. Liberalization in the Banking supervision is the most effective and efficient financial liberalization policy in Ethiopia.

Table 8; The long run relationship gfdddi01 and independent variables					
Model	**Variables**	**Coefficient**	**Std Error**	**R-square**	**Adj. R^2**
Model one (1, 0, 1, 1)	C	4.52***	1.236010	**0.67**	**0.64**
	CREDITCONTROL0	5.41***	0.727694		
	GDPG	0.002738	0.132449		
	INF	-0.021858	0.084658		
Model two (1,2,2,2)	C	5.85***	1.105227	**0.68**	**0.680230**
	INTRACONTROLS	11.51***	1.434612		
	GDPG	0.067495	0.124439		
	INF	-0.006237	0.080539		
Model three (1,0,0,0)	C	6.30***	1.737997	**0.27**	**0.27**
	ENTRYBARRIERS	3.99***	1.179229		
	GDPG	0.158723	0.187876		
	INF	-0.018986	0.122499		
Model four (1,0,0,0)	C	4.37***	0.820942	**0.86**	**0.84**
	BANKINGSUPERV	12.35***	0.989850		
	GDPG	0.032968	0.088730		
	INF	0.077463	0.058089		
Model five (2,2,2,2)	C	7.72***	1.599601	**0.35**	**0.28**
	INTLCAPITAL1	8.42***	2.400054		
	GDPG	0.051669	0.189973		
	INF	-0.080679	0.121011		
Model six (2,0,0,0)	C	6.40***	1.258423	**0.62**	**0.58**
	SECURITYMARKET1	6.09***	0.947735		
	GDPG	0.042058	0.144188		
	INF	-0.066330	0.092571		
Model seven (1,0,0,0)	C	4.56***	1.030621	**0.77**	**0.75**
	FINREFORM1	1.66***	0.176592		
	GDPG	0.014215	0.111662		
	INF	-0.013122	0.071720		
Model eight (1,0,1,0)	C	4.56***	1.030621	**0.72**	**0.68**
	FINREFORM_N	34.92***	3.708445		
	GDPG	0.014215	0.111662		
	INF	-0.013122	0.071720		

Table 9; Short run model for gfdddi01 and independent variables					
Model	**Variables**	**Coefficients**	**Std, Error**	**Sample size**	**Adj. R^2**
Model One (1, 0, 1, 1)	C	-0.042148	0.202037		
	D(gfdddi01(-1))	0.97***	0.188338	31	0.54
	D(creditcontrol0)	1.140142	0.887131		
	D(gdpg)	-0.032203	0.036381		
	D(gdpg(1))	0.052564	0.033881		
	D(inf)	-0.041885	0.025906		
	D(inf(1))	-0.019152	0.025277		
	ECM(cred01)	-.80***	0.265678		
Model two (1,2,2,2)	C	**-0.119973**	**0.180991**	**30**	**0.63**
	D(GFDDDI01(1))	**0.64*** **	**0.128348**		
	D(INTRACONTROLS)	**3.285299****	**0.992596**		
	D(INTRACONTROLS(2))	**3.79*** **	**1.062521**		
	D(GDPG(1))	**-0.007445**	**0.022619**		
	D(GDPG(2))	**-0.033062**	**0.035437**		
	D(INF)	**0.026161**	**0.019535**		
	D(INF(2))	**-0.016728**	**0.018376**		
	D(ECMCONT01(1))	**-0.160786****	**0.093427**		
Model three (1,0,0,0)	C	**0.161081**	**0.235298**	**31**	**0.33**
	D(GFDDDI01(-1))	**0.59*** **	**0.150943**		
	D(ENTRYBARRIERS)	**0.472577**	**0.427847**		
	D(GDPG)	**-0.017338**	**0.035579**		
	D(INF)	**-0.014299**	**0.022929**		
	ECMBARRI01(-1)	**-0.099071***	**0.051853**		
Model four (1,0,0,0)	C	**-0.018849**	**0.205693**	**31**	**0.49**
	D(GFDDDI01(-1))	**0.42*** **	**0.137211**		
	D(BANKINGSUPERV)	**4.65*** **	**1.309011**		
	D(GDPG)	**-0.019826**	**0.030510**		
	D(INF)	**0.008244**	**0.020958**		
	ECMBANK01(-1)	**-0.205967****	**0.096245**		
Model five (2,2,2,2)	C	**0.072473**	**0.257697**	30	0.26
	D(GFDDDI01(-1))	**0.562416****	**0.210338**		
	D(GFDDDI01(-2))	**0.225050**	**0.243144**		
	D(INTLCAPITAL1(-2))	**0.416946**	**0.980859**		
	D(GDPG(-2))	**0.009624**	**0.039875**		
	D(INF(-2))	**0.013382**	**0.025136**		
	ECMCAPI01(-1)	**-0.101014***	**0.062059**		

- **Source Author estimation**
- Where ***, ** and * indicates one percent, five percent and ten percent significance level.

Table (9); Short run Estimation for Bank private credit to the GDP (%)					
Model	**Variables**	**Coefficients**	**Std, Error**	**Sample size**	**Adj. R^2**
Model six (2,0,0,0)	C	**0.082491**	**0.263935**	30	0.27
	D(GFDDDI01(-1))	**0.58*** **	**0.208801**		
	D(GFDDDI01(-2))	**0.150480**	**0.226516**		
	D(SECURITYMARKET1)	**0.697323**	**1.172048**		
	D(GDPG)	**-0.027351**	**0.037726**		
	D(INF)	**-0.022788**	**0.024852**		
	ECMSECU01(-1)	**-0.147167***	**0.090813**		
Model seven (1,0,0,0)	C	**0.117985**	**0.220698**	31	0.43
	D(GFDDDI01(-1))	**0.54*** **	**0.150378**		
	D(FINREFORM1)	**0.489845**	**0.321488**		
	D(GDPG)	**-0.027041**	**0.032414**		
	D(INF)	**-0.017649**	**0.021110**		
	ECMFIN01(-1)	**-0.215390****	**0.084919**		
Model eight (1,0,1,0)	C	**0.081760**	**0.212144**	31	0.47
	D(GFDDDI01(-1))	**0.58*** **	**0.146888**		
	D(FINREFORM_N)	**9.664774**	**6.506978**		
	D(GDPG(-1))	**0.043054**	**0.026275**		
	D(INF)	**-0.014202**	**0.016957**		
	ECMFIN_N01(-1)	**-0.198674****	**0.082319**		

- Where ***, ** and * indicates one percent, five percent and ten percent significance level.
- The dependent variable is Bank private Credit to the GDP (%) (gfdddi01)
- Source authors Estimation

4.3.2. *The long run Estimates of Deposit Money Bank Assets to GDP (gfdddi02)*

Table ten shows the long run impact of the financial liberalization policy on the development of the financial sectors in Ethiopia. According to the results on this table all financial liberalization policy has statistically significant and positive impacts on the development of the financial sectors. All are statistically significant at one percent significance level. Increasing the liberalization of the credit control and excess reserve requirements, entry barriers, supervision of the banking sectors, capital account restriction, policy for the security markets, overall financial reform measures and financial reform index normalized by one level enhance the development of the financial sectors through booming deposit money bank assets to the GDP (%) by 6.58, 0.76, 12.87, 8.26, 5.66, 1.56 and 32.74 percent, respectively. In all model constant has positive and statistically significant impacts on the development of the financial sectors in Ethiopia.

Liberalization in the banking supervision is the most effective and efficient financial liberalization policy in booming the development of the deposit money bank assets the GDP (%).

Table 10; Long run relationship between gfdddi02 and independent variables					
Model	**Variables**	**Coefficient**	**Std. Error**	**R-square**	**Adj. R^2**
Model one (2, 0, 0 , 0)	C	15.47***	1.266218	0.74	0.72
	CREDITCONTROL0	6.57***	0.745479		
	GDPG	-0.170938	0.135686		
	INF	-0.127192	0.086727		
Model two (1,2,2,2)	C	8.60***	0.690567	0.95	0.95
	@TREND	0.715***	0.030011		
	ENTRYBARRIERS	0.753790**	0.350085		
	GDPG	-0.19***	0.056500		
	INF	-0.064309*	0.036407		
Model three (1,1,1 ,2)	C	16.04***	1.333571	0.71	0.67
	BANKINGSUPERV	12.86***	1.607951		
	GDPG	-0.106536	0.144136		
	INF	-0.029424	0.094361		
Model four (1,2,2,2)	C	19.58***	1.949091	0.19	0.27
	INTLCAPITAL1	8.25***	2.924431		
	GDPG	-0.078323	0.231479		
	INF	-0.192444	0.147450		
Model five (1,1,1,1)	C	18.40***	1.775865	0.42	0.37
	SECURITYMARKET1	5.66***	1.337428		
	GDPG	-0.080119	0.203475		
	INF	-0.177793	0.130635		
Model six (1, 0, 0, 2)	C	16.66***	1.693271	0.54	0.49
	FINREFORM1	1.55***	0.290135		
	GDPG	-0.107552	0.183456		
	INF	-0.128004	0.117833		
Model seven	C	16.66***	1.693271	0.54	0.49
	FINREFORM_N	32.74***	6.092831		
	GDPG	-0.107552	0.183456		
	INF	-0.128004	0.117833		
Source Author estimation Where ***, ** and * indicates one percent, five percent and ten percent significance level.					

Table 11; Short run Estimation for Deposit Money bank assets to the GDP (%)					
Model	**Variables**	**Coefficient**	**Std. Error**	**Sample size**	**Std. error**
Model one (2, 0, 0 , 0)	C	**0.638531***	**0.376580**	**30**	**0.25**
	D(GFDDDI02(-1))	**0.026358**	**0.175578**		
	D(GFDDDI02(-2))	**-0.078602**	**0.234734**		
	D(CREDITCONTROL0)	**1.331459**	**1.371485**		
	D(GDPG)	**-0.111509***	**0.046539**		
	D(INF)	**-0.011356**	**0.031383**		
	ECMCRED02(-1)	**-0.244664****	**0.107047**		
Model two (1,2,2,2)	C	**0.739995**	**0.745666**	**30**	**0.09**
	@TREND	**-0.012630**	**0.037035**		
	D(GFDDDI02(-1))	**0.226616**	**0.203575**		
	D(ENTRYBARRIERS(-2))	**0.237817**	**0.575503**		
	D(GDPG(-2))	**-0.036920****	**0.047292**		
	D(INF(-2))	**-0.083161****	**0.029617**		
	ECMENT02(-1)	**-0.715072****	**0.260779**		
Model three (1,1,1 ,2)	C	**0.378428**	**0.347072**	**30**	**0.20**
	D(GFDDDI02(-1))	**0.165704**	**0.245266**		
	D(BANKINGSUPER)	**-0.695398**	**2.008749**		
	D(BANKINGSUPER(1)	**3.714177**	**1.858637**		
	D(GDPG(-1))	**0.054334**	**0.048021**		
	D(INF(-2))	**-0.054762***	**0.027272**		
	ECMBANK02(-1)	**-0.136817***	**0.094901**		
Model four (1,2,2,2)	C	**0.536424**	**0.338607**	**30**	**0.22**
	D(GFDDDI02(-1))	**0.055949**	**0.192796**		
	D(INTLCAPITAL1)	**2.373421**	**1.966275**		
	D(INTLCAPITAL1(-2))	**1.740282**	**1.290545**		
	D(GDPG)	**-0.087517**	**0.063994**		
	D(GDPG(-2))	**-0.075178**	**0.054811**		
	D(INF)	**0.003342**	**0.032709**		
	D(INF(-2))	**-0.042383**	**0.037918**		
	ECMINTLCP02(-1)	**-0.115447***	**0.068646**		

- *****, ** and * indicates one, five and ten percent level of significances level**
- **The dependent variable is Deposit money bank assets to the GDP (%)**
- Source Author estimation

Table 11; Short run Estimation for Deposit Money bank assets to the GDP (%)					
Model	**Variables**	**Coefficient**	**Std. Error**	**Sample**	**Std. error**
Model five (1,1,1,1)	C	**0.329809**	**0.357389**	**31**	**0.30**
	D(GFDDDI02(-1))	**0.259134**	**0.231791**		
	D(SECURITYMARKET1)	**1.268954**	**1.564522**		
	D(SECURITYMARKET1(-1))	**1.261400***	**0.785321**		
	D(GDPG(-1))	**0.066429**	**0.054740**		
	D(INF(-1))	**0.000370**	**0.035456**		
	ECMSECMKT02(-1)	**-0.137732***	**0.088504**		
Model six (1, 0, 0, 2)	C	**0.216492**	**0.331481**	**30**	**0.38**
	D(GFDDDI02(-1))	**0.027519**	**0.162086**		
	D(FINREFORM1)	**2.000264*** **	**0.685904**		
	D(GDPG)	**-0.053025**	**0.043578**		
	D(INF(-2))	**-0.014972**	**0.029417**		
	ECMFNI02(-1)	-0.229858**	0.094276		
- **Source Author estimation** - Where ***, ** and * indicates one percent, five percent and ten percent significance level.					

4.3.3. The long run estimate on the Private credit by deposit money banks and other financial institutions to GDP (gfdddi12)

Table 12 shows the long run estimates between financial liberalization and the financial development indicators. All financial liberalization indicators have positive and statistically significant impacts on the development of the financial sectors. It is significant at one percent significance level. One level increasing in the liberalization of the credit control and excess reserve requirements, banking supervision, capital account restriction, interest rate controls, policy for security markets, overall financial reform measures and financial reform index normalized enhance the development of the financial sectors though booming the private credit by deposit money banks and other financial institutions to GDP (%) by 2.32, 6.49, 3.35, 6.62, 2.71, 0.67 and 13.94 percent, respectively. In all model constant has positive and statistically significant impacts on the development of the financial sectors in Ethiopia. On the other hand, GDP growth rate has negative and statistically significant impacts on the development of the financial sectors. In this study the negative impacts of the GDP growth rate on the development of the financial sectors indicate that economic developments didn't cause the financial

development. Liberalization banking supervision and interest rate control are the most effective and efficient financial liberalization policy in booming the private credit by deposit money bank and other financial institution to the GDP (%).

Table 12; Long run relation between the "gfdddi12" and dependent variables

Model	Variables	Coefficient	Std. Error	R-squared	Adj. R^2
Model one (1, 0, 1and 1)	C	16.05937***	1.042138	**0.36**	**0.29**
	CREDITCONTROL0	2.316284***	0.613552		
	GDPG	-0.20605*	0.111674		
	INF	-0.060478	0.071379		
Model two (1, 2, 2 and 1)	C	15.57862***	0.751663	**0.65**	**0.61**
	BANKINGSUPERV	6.494761***	0.906316		
	GDPG	-0.208795**	0.081242		
	INF	-0.005084	0.053186		
Model three (1, 0, 0 and 0)	C	17.45694***	1.075991	**0.21**	**0.17**
	INTLCAPITAL1	3.346505**	1.614425		
	GDPG	-0.180754	0.127787		
	INF	-0.084834	0.081399		
Model four (1, 0, 0, and 0)	C	16.21812***	0.732081	**0.64**	**0.61**
	INTRACONTROLS	6.628441***	0.950260		
	GDPG	-0.196904**	0.082426		
	INF	-0.046679	0.053348		
Model five (1, 0, 0 and 0)	C	16.82549***	0.976667	**0.34**	**0.28**
	SECURITYMARKET1	2.712128***	0.735541		
	GDPG	-0.19179*	0.111905		
	INF	-0.079705	0.071845		
	C	16.82549	0.976667		
Model six (1, 0, 0 and 0)	C	16.19713***	1.026347	**o.35**	**0.28**
	FINREFORM1	0.663772***	0.175860		
	GDPG	-0.1961*	0.111199		
	INF	-0.057924	0.071422		
Model seven (1, 0, 0 0)	C	16.19713***	1.026347	**0.35**	**0.29**
	FINREFORM_N	13.93923***	3.693065		
	GDPG	-0.1961*	0.111199		
	INF	-0.057924	0.071422		

- Where ***, ** and * indicates one percent, five percent and ten percent significance level.
- Source Authors Estimation

Table 13; Short run relationship between "gfdddi12" and independent variables					
Model	**Variables**	**Coefficient**	**Std. Error**	**Sample**	**Adj. R^2**
Model one (1, 0, 1and 1)	C	0.147713	0.294497	**31**	**0.48**
	D(GFDDDI12(-1))	0.446897***	0.137021		
	D(CREDITCONTROL0)	0.712922	1.267036		
	D(GDPG)	-0.131910***	0.043042		
	D(INF)	0.004825	0.029967		
	ECMCRD12(-1)	-0.320489***	0.106920		
Model two (1, 2, 2 and 1)	C	0.072466	0.351843	**30**	**0.28**
	D(GFDDDI12(-1))	0.376479**	0.176019		
	D(BANKINGSUPERV(-2))	2.208848	2.073532		
	D(GDPG(-2))	0.019564	0.049201		
	D(INF)	0.051800	0.032493		
	D(INF(-1))	-0.010120	0.033389		
	ECMBANK12(-1)	-0.330117**	0.167736		
Model three (1, 0, 0 and 0)	C	0.185716	0.304189	**31**	**0.42**
	D(GFDDDI12(-1))	0.497107***	0.151810		
	D(INTLCAPITAL1)	0.528506	1.878838		
	D(GDPG)	-0.126087***	0.045178		
	D(INF)	0.000173	0.029845		
	ECMINCPT12(-1)	-0.285756**	0.113187		
Model four (1, 0, 0, and 0)	C	0.102667	0.273584	**31**	**0.52**
	D(GFDDDI12(-1))	0.516512***	0.146602		
	D(INTRACONTROLS)	3.428224**	1.654298		
	D(GDPG)	-0.154377***	0.043511		
	D(INF)	-0.003224	0.027172		
	ECMINCONT12(-1)	-0.543643***	0.153027		
Model five (1, 0, 0 and 0)	C	0.247860	0.287861	**31**	**0.49**
	D(GFDDDI12(-1))	0.519015***	0.140699		
	D(SECURITYMARKET1)	0.203028	1.198324		
	D(GDPG)	-0.141303***	0.042915		
	D(INF)	-0.006330	0.027905		
	ECMSEC12(-1)	-0.409551***	0.117917		

- *****, ** and * indicates one, five and ten percent level of significances**
- **The dependent variable is Deposit money bank assets to the GDP (%)**
- **Source authors Estimation**

Table 13; Short run relationship between "gfdddi12" and other regresses

Model	Variables	Coefficient	Std. Error	Sample	Adj. R-square
Model Six (1, 0, 0, 0)	C	0.175064	0.277600	**31**	**0.58**
	D(GFDDDI12(-1))	0.487857***	0.132752		
	D(FINREFORM1)	0.442009	0.379294		
	D(GDPG)	-0.131376***	0.041407		
	D(INF)	0.001826	0.026777		
	ECMFIN(-1)	-0.403194***	0.109203		
Model	Variables	Coefficient	Std. Error	Sample	Adj. R-square
Model Seven (1, 0, 0 0)	C	0.175064	0.277600	31	0.52
	D(GFDDDI12(-1))	0.487857***	0.132752		
	D(FINREFORM1)	0.442009	0.379294		
	D(GDPG)	-0.131376***	0.041407		
	D(INF)	0.001826	0.026777		
	ECMFIN(-1)	-0.403194***	0.109203		

- *****, ** and * indicates one, five and ten percent level of significances level**
- **The dependent variable is Deposit money bank assets to the GDP (%)**
- **Source authors Estimation**

Generally in this study all the financial liberalization policy have positive and statistically significant impacts on the development of the financial sectors in the long run. Liberalization in banking supervision is the most effective and efficient financial liberalization policy in booming the financial development in the Ethiopia. The policy recommendation from the long run estimate is that the Ethiopia governments should have to give much attention in full liberalization of the financial sectors of Ethiopia.

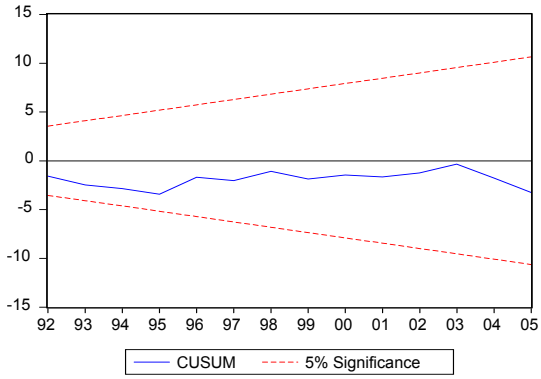
4.4. The Short Run Estimate

In the short run the coefficient of Error Correction Term (ECT_{t-1}) measures the speed of adjustments towards the long run equilibrium. The magnitude or the coefficients of the ECM shows the probability of the disequilibrium from the previous year's shock converge back to the long run equilibrium in the current year. Specifically its value should be negative, less than one in absolute value and it must be statistically significant. In all model the coefficient of ECM has

the required value in the short run which implies all model converge to the long run equilibrium. This study shows that financial liberalization didn't have any statistically significant impacts on the development of the financial sectors in the short run except interest rate controls and banking supervision on table 9, liberalization on security markets and financial reform on table 11 and interest rate controls on table 13. Generally this study shows that in the short run, financial liberalization didn't have any significant impacts on the development of the financial sectors. This indicates the dynamism of the financial development in the short run.

The entire model passes the diagnostic tests for serial correlation, functional form misspecification and autoregressive conditional hetroscedasticity (ARCH) test. The study also tests for all models the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) of recursive residual test, to check the structural stability. All models are stable and correctly specified as both CUSUM and CUSUMSQ test statistics are within the bounds of +5 or -5% level of significance.

Fig. The cumulative Sum of Recursive Residual (Finance reform) with gfdddi01



Cumulative Sum of square of the Recursive Residual (finance reform) with gfdddi01

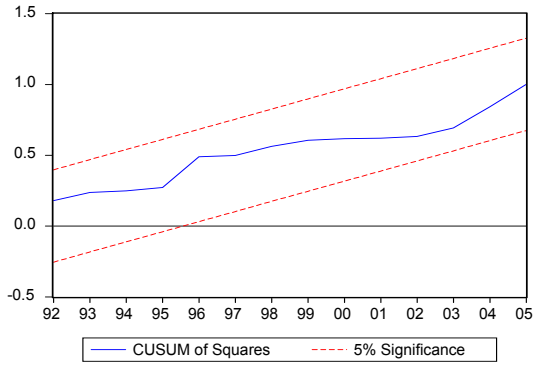


Fig. The cumulative Sum of Recursive Residual (finance reform) with gfdddi12

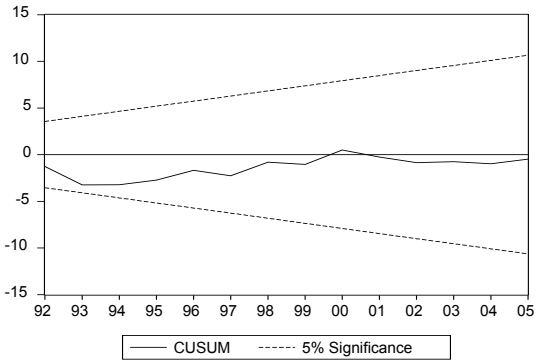


Fig. The cumulative Sum of Recursive Residual (finance reform) with gfdddi02

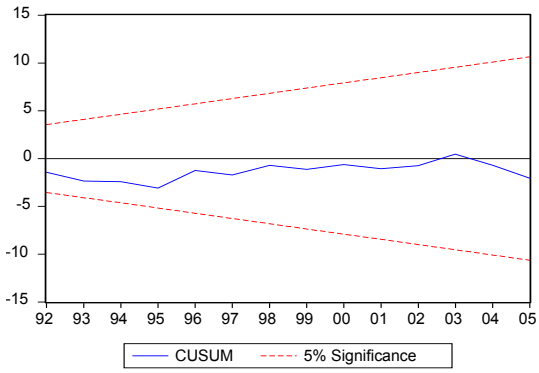


Fig. Cumulative Sum of square of the Recursive Residual (finance reform) with gfdddi12

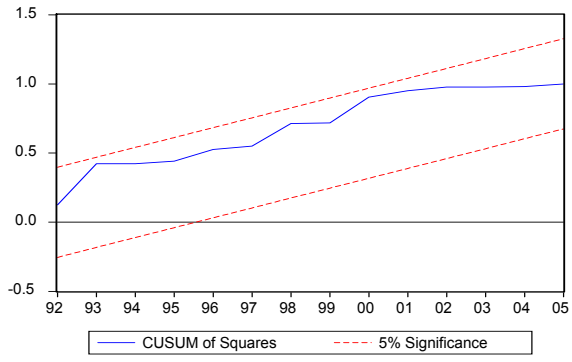
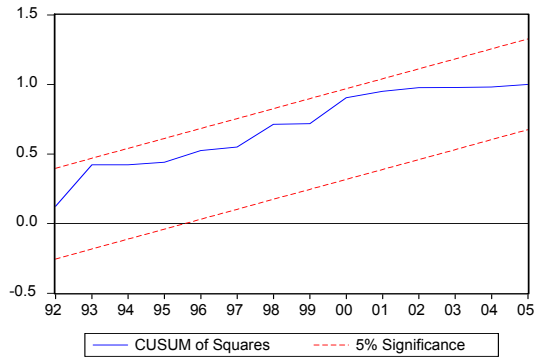


Fig. Cumulative Sum of square of the Recursive Residual (finance reform) with gfdddi02



5. Conclusion and policy Recommendation

The purpose of this study was to analyze the impact of the financial liberalization policy on financial sector development in Ethiopia as well as identify the most promising sectors in the financial liberalization policy. To that end the study used the Autoregressive Distributive lag (ARDL) approaches to analyze the data. The finding of the study supported the theory mentioned by McKinnon (1973) and Shaw (1973), which decreasing the interferences of the states in the financial sectors will deepen the development of the financial sectors. It proves financial liberalizations policy has positive and statistically significant impact on the development of the financial sectors in the long run. Liberalization in the Banking supervision is the most effective and efficient financial liberalization policy in Ethiopia. On the other hand, in the short run financial liberalization didn't have any significant impacts on the development of the financial sectors. According to the ECM test all model in this study have negative, less than one in absolute value and statistically significant value of ECM which implies that all model in study converge to the equilibrium in the long run.

This positive impact of the financial liberalization policy on the development of the Ethiopia's financial sectors implies the better implementation status of the Ethiopia governments. So, by strengthening and expanding the full implementation status of the financial liberalization policy, the Ethiopia government should have to maximize the advantage of the financial liberalization. Specifically, the Ethiopia governments should have to focus in the area of liberalization in the banking supervision which is the most effective financial liberalization policy. Second according to the data set financial privatization is nearly a singular matrix. This is caused by large share of financial assets owned by the government financial institution. To increase the share of

privatization in the financial assets the government of Ethiopia should have to decrease the government owned bank's financial assets and give attention for the private banks. In Ethiopia's financial sectors the entry of the foreign bank is highly recommendable. Especially for developing country like Ethiopia, entry of foreign banks through strategy called as the "Joint Venture or Mergers" strategy is highly recommendable. This strategy is important for both Ethiopia banking sectors as well as external financial institution because external bank can access the domestic information through its merger and the domestic banks also get the risk management skill as well as knowhow from the foreign banks.

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7. APPEND CODING RULES

CODING RULES FOR THE FINANCIAL LIBERALIZATION INDEX

To construct an index of financial liberalization, codes were assigned along the eight dimensions below. Each dimension has various sub dimensions. Based on the score for each sub dimension, each dimension receives a 'raw score.' The explanations for each sub-dimension below indicate how to assign the raw score.

After a 'raw score' is assigned, it is normalized to a 0-3 scale. The normalization is done on the basis of the classifications listed below for each dimension. That is, fully liberalized = 3; partially liberalized = 2; partially repressed = 1; fully repressed = 0.

The final scores are used to compute an aggregate index for each year by assigning equal weight to each dimension.

For example, if the 'raw score' on credit controls and reserve requirements totals 4 (by assigning a code of 2 for liberal reserve requirements, 1 for lack of directed credit and 1 for lack of subsidized directed credit), this is equivalent to the definition of Fully Liberalized. So, the normalization would assign a score of 3 on the 0-3 scale.

I. Credit Controls and Reserve Requirements:

1) Are reserve requirements restrictive?

- Coded as 0 if reserve requirement is more than 20 percent.
- Coded as 1 if reserve requirements are reduced to 10–20 percent or complicated regulations to set reserve requirements are simplified as a step toward reducing reserve requirements
- Coded as 2 if reserve requirements are less than 10 percent.

2) Are there minimum amounts of credit that must be channeled to certain sectors?

- Coded as 0 if credit allocations are determined by the central bank or mandatory credit allocations to certain sectors exist.
- Coded as 1 if mandatory credit allocations to certain sectors are eliminated or do not exist.

3) Are there any credits supplied to certain sectors at subsidized rates?

- Coded as 0 when banks have to supply credits at subsidized rates to certain sectors.
- Coded as 1 when the mandatory requirement of credit allocation at subsidized rates is eliminated or banks do not have to supply credits at subsidized rates.

These three questions' scores are summed and coded as follows:

Fully Liberalized = [4], Largely Liberalized = [3], Partially Repressed = [1,2], Full Repressed= [0]

II. Aggregate Credit Ceilings

- Coded as 0 if ceilings on expansion of bank credit are in place. This includes bank-specific credit ceilings imposed by the central bank.
- Coded as 1 if no restrictions exist on the expansion of bank credit.

III. Interest Rate Liberalization

Deposit rates and lending rates are separately considered, in coding this measure, in order to look at the type of regulations for each set of rates. They are coded as being government set or subject to a binding ceiling (code=0), fluctuating within a band (code=1) or freely floating (code=2). The coding is based on the following description:

FL=4 [2, 2]

Fully liberalized if both deposit interest rates and lending interest rates are determined at market rates.

LL = 3 [2, 1]

Largely Liberalized when either deposit rates or lending rates are freed but the other rates are subject to band or only a part of interest rates are determined at market rates.

PR= 2/1 [2, 0] [1, 1][1, 0]

Partially Repressed when either deposit rates or lending rates are freed but the other interest rates are set by government or subject to ceiling/floor; or both deposit rates and lending rates are subject to band or partially liberalized; or either deposit rates or lending rates are subject to band or partially liberalized.

FR= 0 [0, 0] fully Repressed when both deposit rates and lending rates are set by the government or subject to ceiling/floor.

IV. Banking Sector Entry

The following sub-measures were considered:

1) To what extent does the government allow foreign banks to enter into a domestic market?

This question is coded to examine whether a country allows the entry of foreign banks into a domestic market; whether branching restrictions of foreign banks are eased; to what degree the equity ownership of domestic banks by nonresidents is allowed.

- Coded as 0 when no entry of foreign banks is allowed; or tight restrictions on the opening of new foreign banks are in place.
- Coded as 1 when foreign bank entry is allowed, but nonresidents must hold less than 50 percent equity share.
- Coded as 2 when the majority of share of equity ownership of domestic banks by nonresidents is allowed; or equal treatment is ensured for both foreign banks and domestic banks; or an unlimited number of branching is allowed for foreign banks.

Three questions look at policies to enhance the competition in the domestic banking market.

2) Does the government allow the entry of new domestic banks?

- Coded as 0 when the entry of new domestic banks is not allowed or strictly regulated.
- Coded as 1 when the entry of new domestic banks or other financial institutions is allowed into the domestic market.

3) Are there restrictions on branching? (0/1)

- Coded as 0 when branching restrictions are in place.
- Coded as 1 when there are no branching restrictions or if restrictions are eased.

4) Does the government allow banks to engage in a wide range of activities? (0/1)

- Coded as 0 when the range of activities that banks can take consists of only banking activities.
- Coded as 1 when banks are allowed to become universal banks.

The dimension of entry barriers is coded by adding the scores of these three questions.

Fully Liberalized= 4 or 5, Largely Liberalized= 3, Partially Repressed= 1 or 2, Fully Repressed = 0

V. Capital Account Transactions

1) Is the exchange rate system unified? (0/1)

- Coded as 0 when a special exchange rate regime for either capital or current account transactions exists.
- Coded as 1 when the exchange rate system is unified.

2) Does a country set restrictions on capital inflow? (0/1)

- Coded as 0 when significant restrictions exist on capital inflows.
- Coded as 1 when banks are allowed to borrow from abroad freely without restrictions and there are no tight restrictions on other capital inflows.

3) Does a country set restrictions on capital outflow? (0/1)

- Coded as 0 when restrictions exist on capital outflows.
- Coded as 1 when capital outflows are allowed to flow freely or with minimal approval restrictions.
  By adding these three items,

Fully Liberalized = [3], Largely Liberalized = [2], Partially Repressed = [1], Fully Repressed= [0]

VI. Privatization

Privatization of banks is coded as follows:

FL: Fully Liberalized if no state banks exist or state-owned banks do not consist of any significant portion of banks and/or the percentage of public bank assets is less than 10 percent.

LL: Largely liberalized if most banks are privately owned and/or the percentage of public bank assets is from 10 percent to 25 percent.

PR: Partially repressed if many banks are privately owned but major banks are still state-owned and/or the percentage of public bank assets is 25–50 percent.

FR: Fully repressed if major banks are all-state owned banks and/or the percentage of public bank assets is from 50 percent to 100 percent.

VII. Securities Markets

1) Has a country taken measures to develop securities markets?

- Coded as 0 if a securities market does not exist.
- Coded as 1 when a securities market is starting to form with the introduction of auctioning of T-bills or the establishment of a security commission.
- Coded as 2 when further measures have been taken to develop securities markets (tax exemptions, introduction of medium and long-term government bonds in order to build the benchmark of a yield curve, policies to develop corporate bond and equity

markets, or the introduction of a primary dealer system to develop government security markets).

- Coded as 3 when further policy measures have been taken to develop derivative markets or to broaden the institutional investor base by deregulating portfolio investments and pension funds, or completing the full deregulation of stock exchanges.

2) Is a country's equity market open to foreign investors?

- Coded as 0 if no foreign equity ownership is allowed.
- Coded as 1 when foreign equity ownership is allowed but there is less than 50 percent foreign ownership.
- Coded as 2 when a majority equity share of foreign ownership is allowed.

By adding these two sub-dimensions,

Fully Liberalized = [4 or 5], Largely Liberalized = [3], Partially Repressed = [1, 2], and Fully Repressed = [0]

NOTE

If information on the second sub-dimension was not available (as is the case with some low income countries), the measure was coded using information on securities market development. If information on securities markets only was considered, a 0-3 scale was assigned based on the score on securities markets.

VIII. Banking Sector Supervision

1) Has a country adopted a capital adequacy ratio based on the Basle standard? (0/1)

- Coded as 0 if the Basle risk-weighted capital adequacy ratio is not implemented. Date of implementation is important, in terms of passing legislation to enforce the Basle requirement of 8 percent CAR.
- Coded as 1 when Basle CAR is in force. (Note: If the large majority of banks meet the prudential requirement of an 8 percent risk-weighted capital adequacy ratio, but this is not a mandatory ratio as in Basle, the measure is still classified as 1).

Prior to 1993, when the Basle regulations were not in place internationally, this measure takes the value of 0.

2) Is the banking supervisory agency independent from executives' influence? (0/1/2)

A banking supervisory agency's independence is ensured when the banking supervisory agency can resolve banks' problems without delays. Delays are often caused by the lack of

autonomy of the banking supervisory agency, which is caused by political interference. For example, when the banking supervisory agency has to obtain approval from different agencies such as the Minister of Finance (MOF) in revoking or suspending licenses of banks or liquidating banks' assets, or when the ultimate jurisdiction of the banking supervisory agency is the MOF, it often causes delays in resolving banking problems. In addition to the independence from political interference, the banking supervisory agency also has to be given enough power to resolve banks' problems promptly.

- Coded as 0 when the banking supervisory agency does not have an adequate legal framework to promptly intervene in banks' activities; and/or when there is the lack of legal framework for the independence of the supervisory agency such as the appointment and removal of the head of the banking supervisory agency; or the ultimate jurisdiction of the banking supervision is under the MOF; or when a frequent turnover of the head of the supervisory agency is experienced.
- Coded as 1 when the objective supervisory agency is clearly defined and an adequate legal framework to resolve banking problems is provided (the revocation and the suspension of authorization of banks, liquidation of banks, and the removal of banks' executives etc.) but potential problems remain concerning the independence of the banking supervisory agency (for example, when the MOF may intervene into the banking supervision in such as case that the board of the banking supervisory agency board is chaired by the MOF, although the fixed term of the board is ensured by law); or although clear legal objectives and legal independence are observed, the adequate legal framework for resolving problems is not well articulated.
- Coded as 2 when a legal framework for the objectives and the resolution of troubled banks is set up and if the banking supervisory agency is legally independent from the executive branch and actually not interfered by the executive branch.

3) Does a banking supervisory agency conduct effective supervisions through on-site and off-site examinations? (0/1/2)

Conducting on-site and off-site examinations of banks is an important way to monitor banks' balance sheets.

- Coded as 0 when a country has no legal framework and practices of on-site and off-site examinations is not provided or when no on-site and off-site examinations are conducted.
- Coded as 1 when the legal framework of on-site and off-site examinations is set up and the banking supervision agency have conducted examinations but in an ineffective or insufficient manner.
- Coded as 2 when the banking supervisory agency conducts effective and sophisticated examinations.

4) Does a country's banking supervisory agency cover all financial institutions without exception? (0/1)

If some kinds of banks are not exclusively supervised by the banking supervisory agency or if offshore intermediaries of banks are excluded from the supervision, the effectiveness of the banking supervision is seriously undermined.

- Coded as 1 when all banks are under supervision by supervisory agencies without exception.
- Coded as 0 if some kinds of financial institutions are not exclusively supervised by the banking supervisory or are excluded from banking supervisory agency oversights.

Enhancement of banking supervision over the banking sector is coded by summing up these four dimensions, which are assigned a degree of reform as follows.

Highly Regulated = [6], Largely Regulated = [4-5], Less Regulated = [2-3], Not Regulated =

[0-1]