Foreign Direct Investment-Economic Growth Nexus: The Role of Domestic Financial Development in Portugal

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Abstract:

The aim of present paper is to examine the role of financial development on FDI-Growth nexus using annual data over the period of 1975-2008. The results show that financial development is playing its role well but not satisfactory. This study will provide new guidelines for policy making authorities for Portuguese's economy. The manuscript applies the unrestricted error correction model (ECM) estimator advanced by Inder (1993) while ARDL bounds testing approach is employed to find cointegration among variables. Stationarity issue is investigated by Ng-Perron unit root test. The results show that financial development stimulates economic growth for the case of Portugal. Foreign direct investment also good promoter of economic growth while investment in public capital stock is contributing more as compared to financial development and foreign direct investment. Inflation declines economic growth

JEL Classifications: C32, F21, O1.

Keywords: Foreign Direct Investment, Growth, Cointegration, Portugal.

1. Introduction

The relationship between foreign direct investment (FDI) and economic growth has been under investigation for a long time now but there still remain perspectives that warrant additional research. Though the share of FDI in total capital inflows has increased tremendously since 1980 (Omran and Bolbol, 2003 and Alfaro et al. 2003), the developing economies are still trying to attract FDI to reap benefits from positive effects of direct capital financing which in resulting may contribute to economic growth. The positive effects of direct capital financing include productivity gains, technology transfers, introduction of new process, managerial skills and know-how to the domestic market, employee training, international production networks and access to markets.

Firms in host countries are benefited from accelerated transmission of new technology by foreign firms (Alfaro et al. 2003). Findlay, (1978); Wang (1990) and, Hsu and Wu (2009) argue that there is direct proportional relationship between technical progress in the host country and extent to which the domestic country opens up to FDI. The spillover effects of FDI are also empirically tested in literature [see, Caves (1974), Globerman (1979), De Gregorio (1992) and Kokko et al. (1996)]. However, the effect of FDI may be negative or positive or neutral for the recipient countries. Haddad and Harrsion (1993) reject the growth enhancing-spillover hypothesis for Morocco by using panel data. Aitken and Harrsion (1999) find no evidence of positive technological spillover effects from FDI. Several studies have been conducted at national level with cross-country growth regressions which seem to provide less support for exogenous positive effects of FDI on economic growth [for example, Borensztein et al. (1998) and Carkovic and Levine, (2005)].

In the presence of such uncertain effects of FDI on economic growth, many economists have given different arguments. Some believe that FDI effects on economic growth mainly depend on the circumstances of the recipient countries as is explored by Alfaro et al. (2003), Hsu and Wu, (2009) that recipient country's domestic government policy, availability of productive assets, human capital, infrastructure and institutions play a major role to attract FDI. It means that recipient countries must have absorptive capacity to take advantage of FDI. In the substantial literature on relationship between FDI and economic growth there are few studies which have been conducted to test the role played by the local conditions to exploit the positive spillover effects of FDI (Hermes and Lensink, 2003). In such scenario, role of financial institutions is important in establishing relationship between FDI and economic growth effectively. A good financial system enhances the efficient allocation of resources which in turn improves the absorptive capacity of a country with respect to FDI inflows. Despite its importance, there are very few studies which have investigated the role of financial sector.

The country case study to examine the effects of FDI on economic growth through financial development is crucial. The main reason is that the complexity of the financial environments and economic history are different for different countries. The

results obtained from case studies can be used to shape better the institutional structure and to exploit the benefits of FDI. However, to the best of our knowledge, such a country specific case study is rare with the exception of Ang (2009) and, Shahbaz and Rehman (2010) and, Rehman and Shahbaz (2011). This paper is an effort to fill gap regarding Portugal in economic literature. The empirical findings of paper will help the policy makers of Portugal in adopting the appropriate policies with regard to attract more FDI.

2. Analytical framework and review of literature on FDI, financial system and economic growth

In this section, we present a theoretical survey on FDI, financial development and economic growth. Theoretically, the positive effects of FDI for the host countries are multidimensional, some of which are mentioned above. FDI not only directly increases capital formation of the recipient country but also creates technological positive externalities and knowledge spillover effects (Mansfield and Romeo, 1980; Blomström, 1989 and, Markusen and Venables, 1999). Caves, (1974); Blomström et al. (1994) and, Koko and Blomström, (1995) and many others also support this argument by their empirical findings. The researchers explored that positive externalities and knowledge spillovers of FDI can only be successfully achieved if relevant infrastructure is abundantly available in the recipient country and well-developed financial sector is one of the most important factor.

Savings have direct effect on capital accumulation and better savings mobilization can improve resource allocation and boost technological innovation [Cotton and Ramachandran, (2001); Maureen, (2001); Omran and Bolbol, (2003); Ahmad et al. (2004) and Alfro et al. (2004)]. A well-developed financial sector is effective at pooling the savings of individuals and may have a strong effect on economic growth. FDI brings competition and linkages effects for domestic producers. These effects persuade them to upgrade their technologies for which they need finances, especially for new and promising entrepreneurs who face financial problems. In this situation, developed financial sector can play a vital role by ensuring access to external finance and better allocation and monitoring of these funds. The presence of developed domestic financial sector is also crucial in determining the extent of foreign firms' borrowing to broaden their innovative activities to the domestic economy (Omran and Bolbol, 2003). Furthermore, well-functioning financial markets lower the cost of transactions and ensure proper capital allocation to high performing projects. This leads to enhanced growth rates. Alfro et al. (2006) argue that undeveloped local financial sector could limit the economy's ability to take advantage from potential FDI spillovers. If the local entrepreneurships want to integrate and adopt the best technological practices provided by FDI, then poor financial markets limit the potential positive FDI externalities [Alfaro et al. (2006); Hermes and Lensink, (2003); Bailliu, (2000) and, Omran and Bolbol, (2003)].

There is huge literature based on cross-sectional studies, which provides evidence about importance of well-functioning financial markets to attain positive spillovers from FDI to stimulate economic growth. The more developed the domestic

financial system is the better it mobilizes savings, and screen and monitor investment projects, which will contribute to speed up economic growth (Hermes and Lensink, 2003; and Omran and Bolbol, (2003). However, Hsu and Wu, (2006) argue that cross-country evidence cannot support the growth effects of FDI through financial development. It may be inferred that economies with better-developed financial markets are not essential to get benefits from FDI to accelerate their economic growth.

Studies show strong positive and significant effect of FDI to economic growth. For instance, Ljunwal and Li, (2007) investigate the relationship between FDI and economic growth with role of financial sector in China. Time series data set starting from 1986 up to 2003 has been used over 28 Chinese provinces. Their empirical findings seem to support the view by Bailliu, (2000); Hermes and Lensink, (2003); Alfaro et al. (2004) and, Krogstrup and Matar, (2005). Ang, (2008) examines relationship between FDI and economic growth under the role of financial sector for Malaysian economy. The results indicate that financial development and FDI exert positive impact on economic growth. Causality analysis shows that economic growth tends to cause FDI in the long-run, but no feedback relationship is found in short run. Ang, (2009) investigates role of financial development and FDI on economic growth for the case of Thailand. The findings reveal that financial development stimulates economic development but FDI has negative impact on output expansion. It is also inferred that an increased level of financial development enables Thailand's economy to get benefit from FDI. Similarly, it suggests that the impact of FDI on output growth can be improved through development of financial markets.

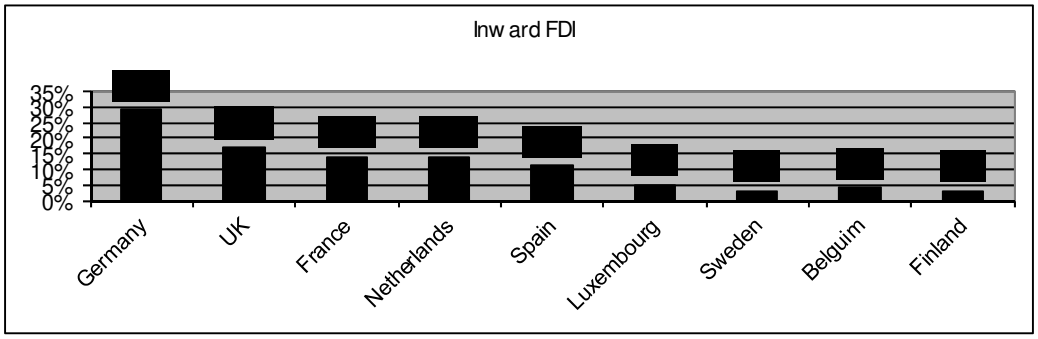
Choong and Lim, (2009) discuss endogenous growth model to analyze the role of financial development and FDI in improving Malaysia's economic growth. They examine a dynamic endogenous growth function that includes the impact of FDI and financial sector development with locational determinants. They conclude that FDI, labour, investment, and government expenditure play a crucial role in promoting local economic activity and hence prosperity. The interaction between FDI and financial development has positive and significant impact on economic growth of Malaysia. Shahbaz and Rehman (2010) also explored the roles of foreign capital inflows and domestic financial sector development on economic growth in case of Pakistan. Their empirical findings reveal that financial sector's development and public investment or public capital stock stimulates economic growth. Human capital stock boosts up economic growth. Inflation contributes to economic growth positively and significantly. Further study suggests that Pakistan's government should undertake further financial reforms to improve the efficiency of the domestic financial sector.

Therefore the above discussion indicates that findings are mixed. To the best of our knowledge, this study seems to be a good contribution in literature with reference to Portugal by employing the unrestricted error correction model (ECM) estimator developed by Inder (1993). Furthermore, ARDL bounds testing approach to cointegration is applied to test long run relation between the variables. The main objective of present endeavor is to investigate the links between FDI and economic growth through financial sector's development in case of Portugal in long run.

2.1 Current FDI situation in Portugal

Portugal became a member of European Economic Community in 1986. The foreign direct investment (FDI) in Portugal improved only after Portugal's adhesion to European Economic Community. The Portuguese economy has been a net recipient of FDI. According to Figure-1, the major Portuguese investors in terms of inward investment in Portugal are Germany, United Kingdom, France, and Netherlands and together these four countries account for more than 70% of Portuguese inflows.

Figure -1: Countries Investors in Portugal, 2007 (Millions of Euros)



Source: Bank of Portugal

3. Empirical Model and Data

Based on theoretical specification discussed in literature allows us to explore the relationship between FDI, real GDP per capita and financial development (FD)[1]. In doing so, log-linear specification has been used. Bowers and Pierce (1975); Ehrlich (1975); Ehrlich (1977) and Layson (1983) claim that log-linear functional form is more superior to simple regression model. Moreover, they seem to posit that log-linear regression gives more comprehensive and reliable results as compared to latter one. Following the above arguments, empirical equation for estimation is modeled as following:

$$\ln GDP_t = \alpha_1 + \alpha_2 \ln PCS_t + \alpha_3 \ln FD_t + \alpha_4 \ln LFDI_t + \alpha_5 \ln FD_t * \ln FDI_t + \alpha_6 \ln INF_t + \mu_1 \qquad (1)$$

Where GDP shows real GDP per capita, PCS is for public capital stocks proxies by gross fixed capital formation, FD indicates financial development [two indicators have used for financial development (i) domestic credit to private sector as share of GDP and (ii) money and quasi money (M2) as share of GDP]. FDI stands for foreign direct investment or foreign inflows. FD*FDI shows the interaction between financial development and foreign direct investment whose expected signs are ambiguous. INF denotes inflation and we expect its impact on GDP growth is negative.

[1] All series are in absolute and real form before converting them into log form

The descriptive statistics and correlation matrix reveals that the expected impact of financial development on GDP per capita is positive through causal channels (see Levine, 1997 for more details). High public capital stocks enhance the potential of an economy and in resulting it stimulates output. The FDI or foreign inflows can affect economy either positively or negatively i.e. the effect is ambiguous.

Table-1: Descriptive Statistics and Correlation Matrix

Variables	$\ln GDP_t$	$\ln FDI_t$	$\ln FD_t$	$\ln M2_t$	$\ln PCS_t$	$\ln INF_t$
Mean	25.2346	0.2680	4.4273	4.6161	3.2199	1.9972
Median	25.2874	0.2865	4.2924	4.5061	3.2277	2.1907
Maximum	25.6060	1.7802	5.1945	5.2470	3.4700	3.3597
Minimum	24.6761	-1.2641	3.8422	4.1880	3.0364	0.7708
Std. Dev.	0.2939	0.9056	0.4215	0.3017	0.1174	0.9228
Skewness	-0.2582	-0.0335	0.4967	0.6982	0.3461	0.0456
Kurtosis	1.7094	1.9365	1.8548	2.2252	2.2748	1.3990
Jarque-Bera	2.8179	1.6557	3.3520	3.7191	1.4658	3.7498
Probability	0.2443	0.4369	0.1871	0.1557	0.4804	0.1533

The data for all variables is available from 1975 up to 2009[2]. World Development Indicators (WDI-CD-ROM, 2009) has been used to obtain data for GDP, FDI, INF, FD and PCS[3]. Table-1 describes descriptive statistics and pair-wise correlations.

4. Empirical Methodology

We used the unrestricted error correction method (UECM) estimator developed by Inder (1993) to estimate long run relationship among the macroeconomic variables in case of Portugal. Inder (1993) finds problem of endogeneity biasness during the use of Monte Carlo estimates that makes the estimators minimal and unimportant in many cases. The approach introduced by Inder (1993) also seems to correct the biasness of omitted lagged variables. This indicates that suitable conclusions can be drawn for long run estimates using valid asymptotic theory (Ang, 2009). Appropriate adjustment of standard errors involves empirical estimation for long run parameters by including adequate dynamics into the functional form as given below:

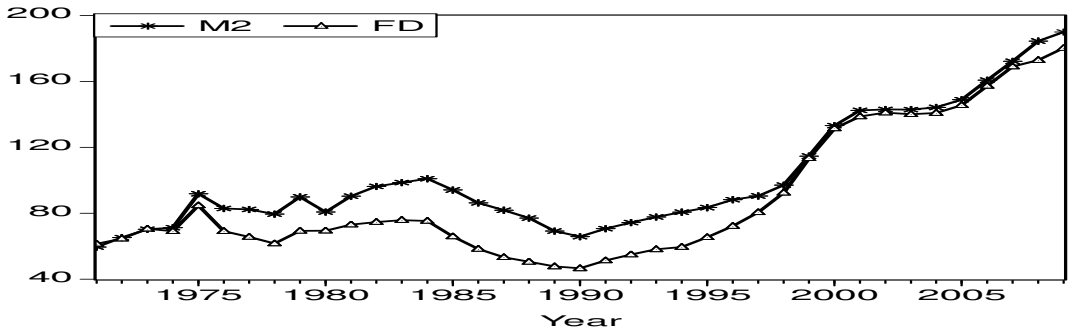


Figure-2 = Financial indicators

[2] Time span of present is shortened due to unavailability of data on FDI from 1971.
[3] Credit to private sector as share is better indicator of financial development (Shahbaz, 2009)

$$\ln GDP_t = \beta_1 + \sum_{j=1}^{k} \beta_X \ln X_{t-j} + \sum_{i=0}^{p} \beta_{GDP} \Delta \ln GDP_{t-i} + \sum_{i=0}^{p} \sum_{j=1}^{n} \beta_X \Delta \ln X_{j,t-i} + \mu_t \quad (2)$$

Where GDP is real per capita GDP and X indicate the vector of k factors affecting real GDP per capital in Portugal that includes PCS, FD, FDI and FD*FDI. The above equation shows that this approach is not asymptotically optimal because it does not seem to explain the possible endogeneity problem among the fundamental macroeconomic actors (variables) discussed in the equation-1. To remove this problem, we can use instrumental variable (Case –IV) introduced by Bewley (1979). This approach seems to incorporate first lags of running variables as instruments for current differenced terms to handle the problem of endogeneity biasness. This estimate comes with standard errors and helps to draw reliable conclusion from required empirical exercise. The reduced form for long run model for GDP is modeled from equation-2 making all differenced terms of regressors equalant to zero, i.e. i = 0, 1,…, p, j = 1,2, …, k. Finally, steady state solution is found and equation-3 is modeled for empirical purpose as follows:

$$\ln GDP_t = \delta_1 + \delta_2 \ln GDP_{1,t} + \delta_3 \ln GDP_{2,t} + ... + \delta_k \ln GDP_{k,t} \quad (3)$$

5. Results Interpretation

The old unit root tests such as ADF, P-P[4], and DF-GLS mislead the findings. The results are not reliable due to some shortcomings for said unit root tests (Shahbaz et al. 2010). These tests seem to reject the null hypothesis when it is right and accept when said hypothesis is false.

Table-2: Unit Root Estimation

Ng-Perron Test at Level				
Variables	MZa	MZt	MSB	MPT
$\ln GDP_t$	-4.3332	-1.1689	0.2697	18.4806
$\ln FD_t$	-3.4427	-1.2216	0.3548	24.8281
$\ln M2_t$	-3.8394	-1.2895	0.3358	22.4482
$\ln FDI_t$	-13.941	-2.6384	0.1892	6.5465
$\ln PCS_t$	-28.2847[a]	-3.7377	0.1321	3.3539
$\ln INF_t$	-6.7406	-1.8339	0.2720	13.5200
Ng-Perron Test at 1st Difference				
$\ln GDP_t$	-21.5045[b]	-3.2787	0.1524	4.2391
$\ln FD_t$	-19.7927 [b]	-3.1449	0.1588	4.6096
$\ln M2_t$	-17.9123 [b]	-2.9926	0.1670	5.0875
$\ln FDI_t$	-30.9055[a]	-3.9298	0.1271	2.9550
$\ln PCS_t$	-27.5937	-3.7124	0.1345	3.3137

[4]Both tests to find out integrating order for variables are often used by researchers.

$\ln INF_t$	-23.7678 [b]	-3.4427	0.1448	3.8611

Note: [a] and [b] denotes the significance at 1% and 5%

In such small data set as we are using in our study, mentioned tests provide inconclusive results due to their poor size and properties. To overcome such problems, we have used Ng-Perron test to find out order of integration for the variables. The results reported in Table-2 show that $\ln PCS_t$ is stationary at level while other variables have unit root problem at level. At 1st difference $\ln GDP_t$, $\ln FDI_t$, $\ln FD_t$, $\ln M2_t$ and $\ln INF_t$ are stationary. This shows that variables are having mixed order of integration. The dissimilarity of integrating order for variables in model suggests us to apply ARDL bounds testing by Pesaran et al. (2001) to test the existence of cointegration relation.

ARDL[5] bounds testing approach can be estimated within two steps. Initially, lag length is selected following Akaike Information Criteria (AIC) which is 2[6]. The appropriate selection of lag order enables us to calculate appropriate value of F-statistic to examine cointegration between the variables. The total number of regressions estimated following the ARDL method in the equation-1 is $(2 + 1)^4 = 81$. The empirical evidence on cointegration is reported in Table-3. The results indicate that calculated F-statistic with both indicators financial development and money and quasi money are significant at 10% level of significance. The calculated F-statistics are 5.296 and 5.805 more than upper critical bound tabulated by Pesaran et al. (2001) and Turner (2006) at 10%. This confirms the existence of cointegration relation among variables.

Table-3: ARDL Cointegration Analysis

Dependent Variable			F-Statistic	
Lag			2	
$F_{GDP} = f(FD, FDI, PCS, INF)$			5.296***	
$F_{GDP} = f(M2, FDI, PCS, INF)$			5.805***	
Critical Values	Pesaran *et al* (2001)		Turner (2006)	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound
1 %	6.340	7.520	7.763	8.922
5 %	4.870	5.850	5.264	6.198
10 %	4.190	5.060	4.214	5.039

Note: *** denote significance at 10%

The results regarding cointegration are conclusive and there prevails long run relationship between real GDP per capita, foreign capital inflows or foreign direct investment, financial development, public capital stock and inflation.

[5] Theoretical formation of ARDL bounds testing is available extensively in literature

[6] Results are reported but are available upon request.

The marginal impacts of the variables are detailed in Table-4. Financial development is used as proxy variable by two indicators domestic credit to private sector (FD) and M2 in real terms. Unit root tests show that residuals of equation-3 (with both indicators of financial development) do not indicate any unit root problem at level and stationary at 1 percent and 5 percent level of significance respectively[7]. This implies that the long run relationship between real GDP per capita, financial development, public capital stock, foreign direct investment and inflation is confirmed.

Table-4: Long-Run Determinants of Per Capita Real GDP

Dependent Variable: $\ln GDP_t$				
Variable	Coefficient	Prob-value	Coefficient	Prob-value
Constant	24.8188	0.0000	24.5835	0.0000
$\ln FD_t$	0.0604	0.0215	….	….
$\ln M2_t$	….	….	0.0901	0.0254
$\ln FDI_t$	0.0766	0.0000	0.0734	0.0000
$\ln PCS_t$	0.1528	0.0578	0.1833	0.0968
$\ln FD_t * \ln FDI_t$	0.0143	0.0000	….	….
$\ln M2_t * \ln FDI_t$	….	….	0.0139	0.0001
$\ln INF_t$	-0.1872	0.0000	-0.1924	0.0000
R2 = 0.9719 Adj-R2 = 0.9669 AIC = -2.9464 SBC = -2.6771 F-Test = 193.8629 Prob(F-Test) = 0.000			R2 = 0.9731 Adj-R2 = 0.9683 AIC = -2.9992 SBC = -2.7227 F-Test = 203.1797 Prob(F-Test) = 0.000	
Diagnostic checks	F-statistics	Prob-value	F-statistics	Prob-value[8]
Normality Test	2.0390	0.3607	2.0350	0.3581
LM Test	0.8493	0.3807	0.7797	0.4001
ARCH Test	0.1115	0.7407	1.8441	0.1775
Ramsey Test	0.8901	0.3700	0.175	0.6847
CUSUM Test	Stable	5%	Stable	5%
CUSUMsq Test	Stable	5%	Stable	5%

The results imply that FDI is positively associated with real GDP per capita documenting that a 1 percent increase in FDI is linked with 0.0766 percent rise in real GDP per capita. The impact of FDI on real GDP per capita is minimal. Investment in public capital stock appears to be linked positively and significantly with GDP per capita. A 0.1528 percent per capita income seems to be enhanced with an increase in public investment by 1 percent. This finding is consistent with Barro (1991); Levine and Renelt

[7] Results are available on request from authors

[8] Diagrams of both CUSUM and CUSUMsq of recursive residuals for both models are pasted in appendix-A

(1992); Mankiw et al. (1992); Barro and Lee (1994); Ang (2008, 2009) and, Shahbaz and Rahman (2010). The impact of financial development on GDP per capita is positive by both indicators of financial development. The long run elasticity of financial development is satisfactory which shows reasonable impact of financial development on GDP expansion. It posits that financial development plays its fundamental role to boost GDP enhancement proved by King and Levine (1993); Levine et al. (2000); Ang and McKibbin (2007); Ang (2009) and Shahbaz (2009)].

The interaction term between financial development and foreign direct investment ($\ln FD_t * \ln FDI_t$) by both indicators is showing positive impact on GDP expansion for Portugal. The signs of interaction terms are according to the expectations in the economic literature. It concludes that beneficial impact of foreign direct investment on GDP expansion can be stronger by developing the local or domestic financial markets. The marginal effect of interaction terms indicates the need to develop financial markets to obtain fruitful impacts of inward FDI. This shows that development of financial markets directly and indirectly through FDI contribute to improve economic growth and same is by FDI for economic growth in the case of Portugal. The second indicator of financial development (M2) also provides same empirical picture like domestic credit to private sector with little bit difference in estimates. Finally, inflation is showing retarding effect on economic growth. It is noted that a 1 percent increase in inflation declines economic growth by 0.1872 percent.

6. Conclusion and Policy Implications

The present paper tests the relationship between foreign direct investment and economic growth in the presence of financial market development. The unrestricted error correction model (ECM) estimator advanced by Inder (1993) while ARDL bounds testing approach to cointegration is employed to test the existence of cointegration between the variables. Stationarity issue is handled by Ng-Perron unit root test.

The results confirm long run relationship between the variables. Empirical evidence shows that financial development stimulates economic growth in case of Portugal. Foreign direct investment is also a good promoter of economic growth while investment in public capital stock is contributing more as compared to financial development and foreign direct investment. On the contrary, inflation declines economic growth.

In the context of policy implications, government must give her attention to develop financial markets particularly and introduce new schemes to attract foreign direct investment. This will not only increase the volume of FDI in Portugal but also make the country able to attain fruitful benefits from inward FDI.

The mixed findings obtained by the literature about the FDI-growth nexus have stressed the debate about the expected benefits of these capital inflows. Current empirical research suggests that the ability of countries to exploit FDI efficiently seems to be related to a set of absorptive capacities in host economies. This would explain the conflicting evidence about this subject. As has been argued by Lipsey and Sjöholm,

(2005), heterogeneity in host country factors is the most likely source of the inconclusiveness of empirical research.

This paper has some limitations. Furthermore, an expansion of the research would be to use the GMM estimator. This estimator permits to solve the serial correlation and endogeneity of some explanatory variables.

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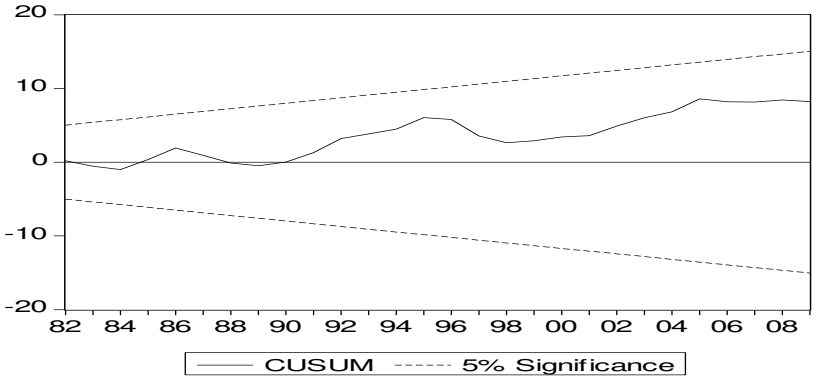
Appendix-A

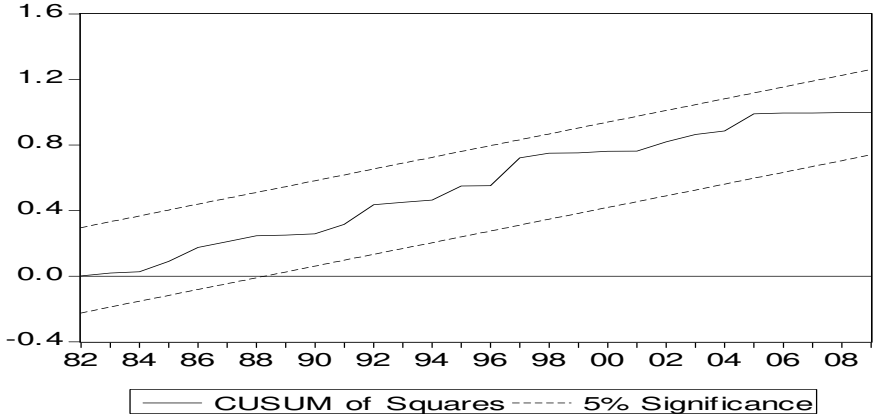
When $\ln FD_t$ is indicator of financial development

Figure-1: Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level.

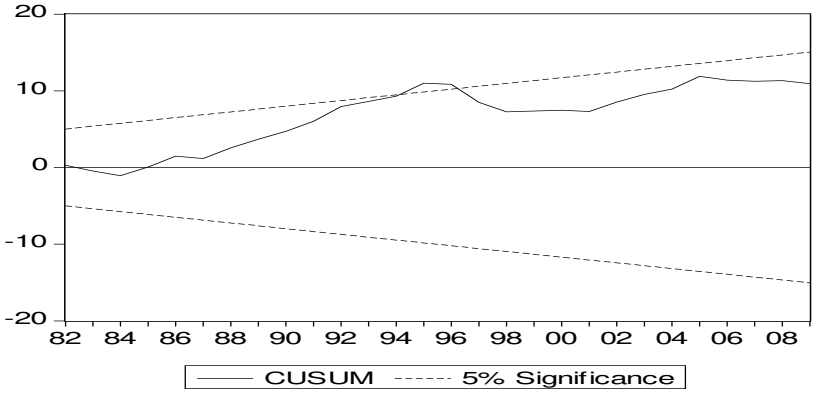
Figure-2: Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level.

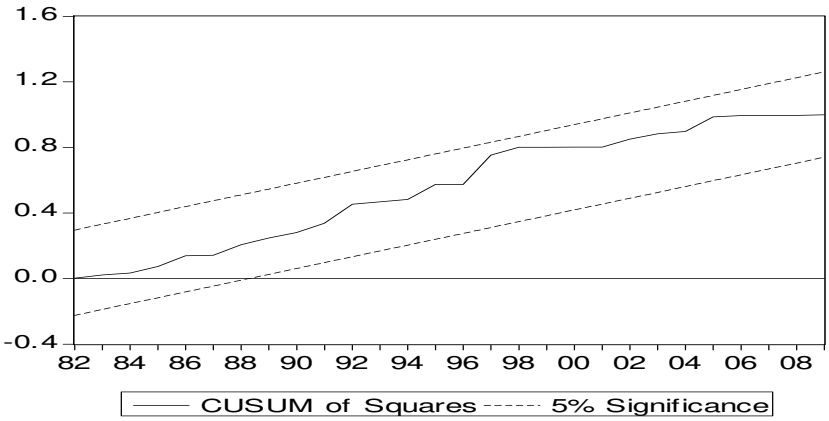
When $\ln M2_t$ is indicator of financial development

Figure-1: Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level.

Figure-2: Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level.