Private capital inflows and economic growth in Kenya

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Abstract

Most studies on private capital inflows and economic growth are cross-country and give more weight to foreign direct investment than the other components of private capital inflows. In addition, the question as to whether it is private capital inflows that promote economic growth or it is economic growth that attracts private capital inflows has not been investigated in Kenya. This study investigated the causality between foreign direct investment, portfolio investment and cross-border interbank borrowing and economic growth; and analyzed the effect of foreign direct investment, portfolio investment and cross-border interbank borrowing on economic growth in Kenya. The study found that there was a unidirectional causality from foreign direct investment to economic growth and from economic growth to cross-border interbank borrowing. The coefficient of foreign direct investment as a ratio of gross domestic product was positive and statistically significant, and the coefficients of portfolio investment as a ratio of gross domestic product and cross-border interbank borrowing as a ratio of domestic product were positive and statistically insignificant. Following these results, the Government of Kenya should work towards an environment that attracts foreign direct investment and pursue a high and sustainable economic growth rate so as to attract cross-border interbank borrowing.

Keywords: private capital inflows; causality; economic growth

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1. Introduction

To overcome the high poverty levels and improve the standard of living in developing countries there is need for a substantial inflow of external resources in order to fill the savings and foreign exchange gaps. This will increase the rate of capital accumulation and growth. One of these external resources is private capital inflows. For this reason, the effect of private capital inflows on economic growth has received a lot of attention especially in the recent past after the global financial crisis of 2008(Macias and Massa, 2009). This is because private capital inflows which include foreign direct investment (FDI), cross-border interbank borrowing, bond flows and portfolio equity flows are accompanied by investible funds. They provide new technologies and may enhance the efficiency of existing technologies.

Mwega and Ngugi (2006) assert that private capital inflows especially FDI may facilitate access to export markets, enhance skills and management techniques and provide cleaner technologies and modern development systems. In addition to providing needed capital for investment, private capital inflows, may increase competition in the host economy and aid local firms to become more productive by adopting efficient technology or by investing in human and/or physical capital. Ajayi (2006) asserts that private capital leads to job and employment creation. It also facilitates access to foreign markets and assists in the integration of the host country to the global economy.

However, Herz (2000) argues that there is no consensus on the exact benefits of foreign private capital inflows in the context of globalization. There is the argument that MNEs are big and their sales exceed the GDP of some of the African countries. Also, there are no trickle-down effects from FDI, and MNEs pay abysmally low wages. Moreover, the freedom of policy makers in developing countries is increasingly constrained by the need to cater for the interest of big business. In Kenya the incentives given to foreign investors in the form of tax holidays, stamp duty exemption and value added tax (VAT) exemption on company inputs by the Export Processing Zone (EPZ) may impact negatively on the development of indigenous entrepreneurship (Republic of Kenya, 1990). If Kenya has to transform itself into a newly industrialized, middle income country as envisioned in the Kenya Vision 2030, capital inflows in the form of foreign direct investment and more portfolio inflows should be encouraged. Only then can an economic growth of 10 per cent be attained and sustained(Republic of Kenya,2007).

1.1. Situational analysis of private capital inflows to Kenya

1.1.1. FDI inflows

Net FDI were highly volatile and generally declining in the 1980s and 1990s despite the economic reforms and the progress made in the business environment (Mwega and Ngugi, 2004).Figure 1.1 shows FDI inflows over the period 1970 to 2010.
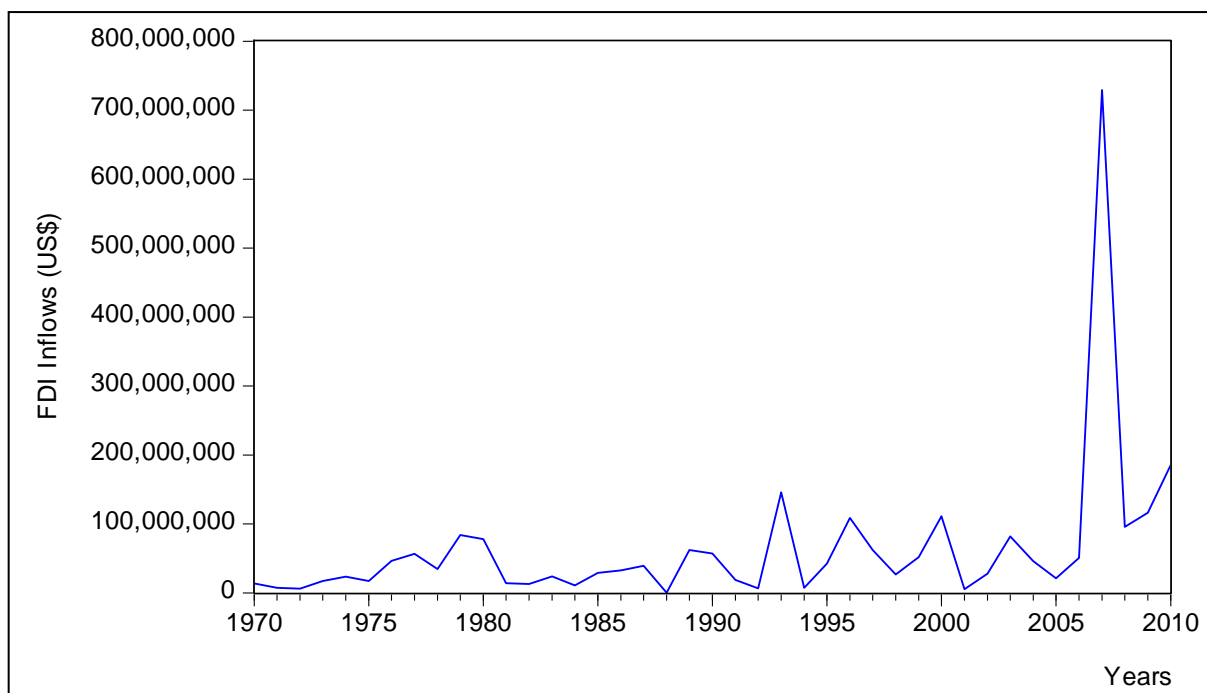
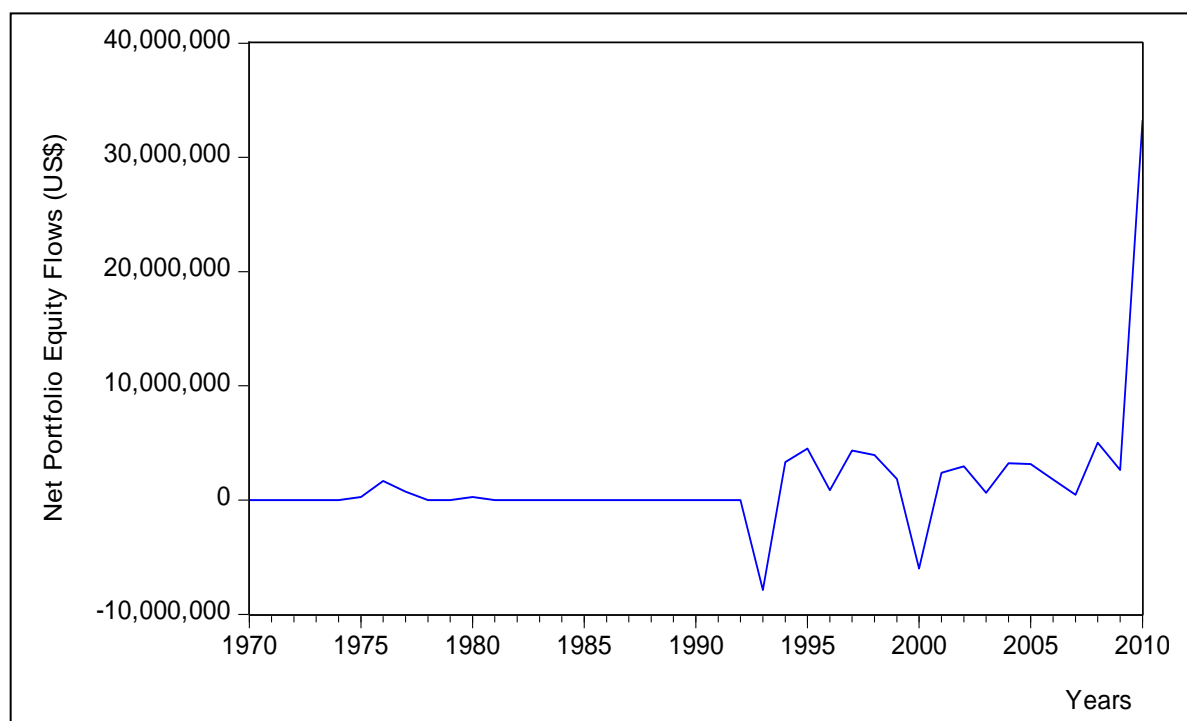**Figure 1.1.** Net FDI Flows to Kenya (1970 – 2010)
(Data Source: http://unctadstat:unctad.org/Tableviewer/tableview)

For example, FDI rose in the 1970s from US$14 million in 1970 to US$84 million in 1979. The early 1980s saw a decline in FDI to a low of US$11 million in 1984 before picking up in 1989 to US$62 million. The 1990s saw FDI decline to a low of US$2 million in 1992 before a rise to US$ 146 million in 1993. FDI rose from US$5 million in 2001 to US$729million in 2007 (UNCTAD, 2011). In general, FDI flows to Kenya have been on the increase reaching US$335 million in 2011.

The fluctuations in FDI may be accounted for by a number of reasons. First, the recurrent tribal clashes every time Kenya was approaching the election period. For example the 1992 and 1997 tribal clashes in the Rift Valley and Coast Provinces had led Nairobi to be rated as one of the most dangerous cities in the world by the United Nations' International Civil Service Commission and downgraded to class C from class B station. Secondly, in 1990, aid and any form of financial assistance to the Kenya Government were suspended by the Brettton Woods Institutions and other bilateral donors who were supporting political pluralism and good governance. Similarly in 1997, there was suspension of the Structural Adjustment Support due to the strained relationship between Kenya and its development partners. These two factors scared off investors. Third, the sharp rise of FDI in 2000 was due to new investment in the mobile telephone sector and the accelerated borrowing by the private sector to finance electricity generation because of the drought at the time (Ngugi and Nyang'oro, 2005). Fourth, the change in trade policy from that of import substitution (IS) to export promotion (EP) which led to the establishment of the Export Processing Zone (EPZ) in 1990, led to increased FDI directed to specific industries like the garment industry to take advantage of the African Growth Opportunity Act (AGOA) initiative.

The latest increase in FDI is attributed to the interest by the Chinese in not only the construction industry but also the shift to manufacturing and communications as witnessed in the setting up of Xinhua News and the China Central Television African headquarters in Nairobi. The second reason for the latest upsurge is exploration of oil activities in Turkana (IMF, 2012) and the Titanium mining in Kwale.The relationship between FDI and economic growth is not very clear. This calls for a country specific investigation to determine the growth effects of FDI.

1.2. Net portfolio investment

Except for the years 1975-1977 and 1980, net portfolio equity flows to Kenya were zero up to 1992.From 1993 net Portfolio equity flows to Kenya have shown fluctuations. For example, they rose from US$6million in 2000 to US$3.2million in 2005, and then followed by a drop to US$0.5 million in 2007 as shown by Figure 1.2.

Figure1.2. Net Portfolio Equity Flows to Kenya (1970 – 2010)

(Data Source: World Bank, Global Development Finance Database, 2010)

The lack of net portfolio flows to Kenya from 1970 to 1992 is explained by the country operating a closed capital account then. The large flows between 2003 and 2005 are explained by the liberalization of the communication sector. This is the time the mobile telephone firms were established in the country. The drop in the flows in 2007 is explained by the uncertainty of the investment climate because the country was going for a general election which was followed by violence. The resurgence in 2008 is probably explained by the formation of a new government and therefore a renewed confidence in the political stability of the country.

Just like FDI, there is need to investigate the role of net portfolio equity inflows in the economic growth of Kenya.

1.3. Kenya's GDP Growth

Kenya's economic growth has been unstable since independence as shown in Figure 1.3.
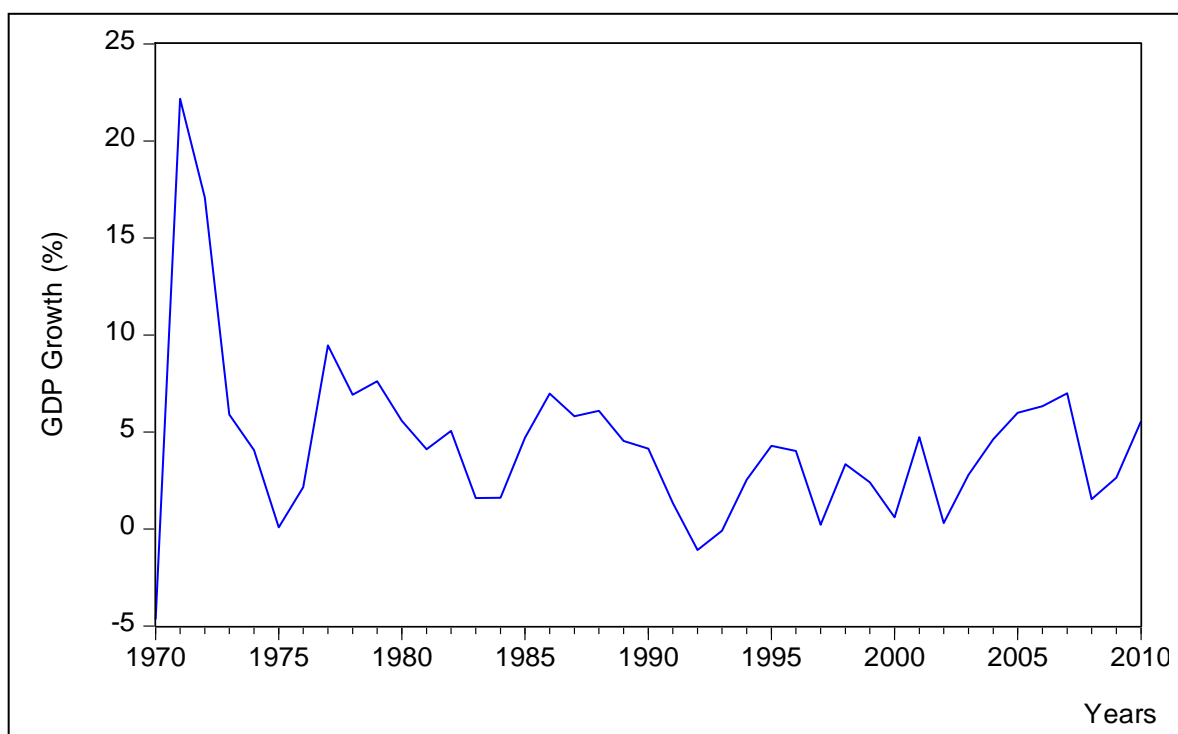
Figure 1.3. Kenya's GDP Growth (1970-2010)

Data Source: World Bank's Global Development Finance Database-various issues; Republic of Kenya: *Economic Survey*

Kenya's GDP growth was high in the first two decades after independence in 1963. This was due to public investment, encouragement of small holder agricultural production and incentives for private investment. There was notable decline in Kenya's economic performance from the 1970s to 2004 when GDP growth was below 10%. The worst years were 1974 to 1975, 1978, 1981, and 1990 to 1999, 2000-2003 and 2008. The worst performance in these years is explained by both the internal and external factors. For example, the period 1974-1990 was marked by Kenya pursuing the import substitution (IS) policy and the time also coincided with high oil prices which made Kenya's manufacturing sector uncompetitive. Additionally, in the early 1990s, there was failure by the Government to sustain prudent macroeconomic policies, the structural reforms that had started in the 1980s had slowed down and there was the problem of governance. In 1991, bilateral and multilateral donors suspended aid to Kenya.

In 1994-1996 there was improved economic performance because in1993 Kenya started a major economic reform programme. With the assistance of the IMF and the World Bank, Kenya had eliminated the price control and import licensing, had removed foreign exchange controls, had embarked on privatization, had started retrenchment of the civil service and pursued conservative fiscal and monetary policies. Other factors that have had negative effects on the macroeconomic performance include the adverse weather conditions and the general elections.

1.4. The statement of the problem

One of the aims of the Kenya Government is to inspire economic growth. However, this is driven by a number of factors among them capital. Capital can be sourced internally or externally. External capital includes private capital inflows. The role of private capital inflows in economic growth has been controversial Whereas some studies (Mosley, 1980; Carkovic, 2002; Durham, 2003; Prasad, 2006) find that private capital inflows have a negative relationship with economic growth, others (Vita and Kay, 2009; Macias and Massa, 2009; Vihn, 2010) find a positive relationship between private capital inflows and economic growth. In addition, there has been a question as to whether it is private capital inflows which promote economic growth or if it is economic growth that attracts private foreign capital inflows. Some studies show that there is some endogeneity of the explanatory variables (Bailliu, 2000). However, the role of private capital inflows in economic growth of Kenya and the causality between private capital inflows and economic growth in Kenya is not well understood.

A lot of existing literature on the effect of private capital inflows on economic growth covers FDI (Blomstrom, 1986; Aitken and Harrison, 1999; Ayanwale, 2007; Njimanted, 2009; Esso, 2010). Other studies that have investigated the impact of various components of private capital inflows on economic growth are cross-country thereby employing panel data (Bailliu, 2000; Durham, 2003; Gheeraert and Mansour, 2005; de Vita and Kyaw, 2009; Macias and Massa, 2009). Sethi and Sucharita (2009) in their single country study did not include cross-border interbank borrowing as one of the components of private capital inflows.

The objective of this study was to analyze the relationship between various components of private capital inflows and economic growth in Kenya. The specific objectives of the study were to:

- Investigate the causality between FDI, portfolio investment and cross-border interbank borrowing and economic growth.
- Analyze the effects of FDI, portfolio investment and cross-border interbank borrowing on economic growth.
- Draw policy implications from the research findings.

The rest of the study is structured as follows:

- **Section I**   is an introduction that provides relevant information about Kenya's private capital inflows and economic growth, during the period under study.
- **Section II**   presents selected empirical literature.
- **Section III**   focuses on methodology;

- **Section IV** presents the findings of the study while SectionVprovidesthe conclusions and policy implications.

2. Selected empirical literature review

Most studies on the effect of private capital inflows on economic growth have focused on FDI. The microeconomic evidence on the growth effect of FDI provides contradicting findings. With a sample of 282 pairs of foreign owned and private Brazilian firms, Willmore (1986) found that foreign firms operated fewer plants, had higher ratios of value added to output, did a higher level of advertising and royalty payments, exported more, had higher labour productivity, paid higher wages and had greater capital intensity. These findings therefore indicate that FDI, a component of private capital inflows, has a beneficial impact on growth.

Haddad and Harrison (1993) investigated the impact of FDI on development in Morocco. They considered the period 1985-1989. Prior to 1983 the Moroccan government had a restrictive regime for FDI, requiring joint ventures and accepting less than 50 per cent foreign ownership. However, between 1983 and 1985, there was some liberalization in foreign investment. The authors found that foreign investment did not show higher levels of labour productivity or greater outward orientation for most sectors than domestic firms. Although foreign firms showed high levels of total factor productivity, domestic firms showed higher rates of productivity growth. The reason for this was that domestic firms were well prepared to cope with the distortion effects of protected markets. They concluded that foreign investment did not make a large contribution to the development of the Moroccan economy.

Aitken and Harrison (1999) using panel data to investigate the impact of FDI on the performance of domestic firms in Venezuela for the period 1976-1989 found that foreign equity participation was positively correlated with increases in productivity with recipient plants with less than 50 employees. Also, the increase in foreign ownership negatively affected the productivity of wholly domestically owned firms in the same industry. They did not find any evidence to support technology "spillovers" from foreign firms to domestically owned firms. They concluded that gains from foreign investment appeared to be captured by joint ventures. However, in their study, they did not consider other gains from FDI such as employment creation, increase in human capital through training and learning by doing. They also failed to capture the long-run effects of FDI.

Macroeconomic studies suggest that FDI exerts a positive impact on economic growth in particular contexts. For example, Balasubramanyam, et al. (1996) found that the effects on growth of FDI are more significant in the presence of trade openness. Borensztein, et al. (1998), in investigating the effect of FDI on economic growth and the channels through which FDI can be beneficial to growth, found that FDI has positive impact on growth although the magnitude of this effect depended on the stock of human capital available in the host country. They found that for a country with very low levels of human capital, FDI effect on growth was actually negative. In addition, they found that FDI has a positive impact on domestic investment.

Levine and Carkovic (2002) conducted a Generalized Method of Moments (GMM) panel analysis on pooled data from 72 countries in the period 1960-1995 and suggest that FDI flows do not exert a positive impact on economic growth. Alfaro et al. (2003) investigated the role of financial markets and the link between FDI and growth. The study used cross-country data for the period 1975-1995, and employed Ordinary Least Squares estimation. The study found that FDI is beneficial to economic growth when the country has sufficiently developed financial markets.

Chowdhury and Marrotas (2005) examined the causal relationship between FDI and economic growth for three developing countries, namely: Chile, Malaysia and Thailand. The study used time series data for the period 1969 to 2000 and employed the Toda-Yamamoto test for causality. The findings indicated that GDP causes FDI in the case of Chile and not vice versa, and that there was bidirectional causality for Malaysia and Thailand.

Fortanier (2007), in investigating the growth consequences of FDI from various countries of origin, used a data set on bilateral investment stocks of six major investor countries in71 host countries for the period 1989-2002. The study employed Ordinary Least Squares estimation. This basic model was extended to test whether the effect of FDI differs across host countries by level of human capital development, institutions and trade openness. The study found that the effects of FDI differ by country of origin, and that these country of origin effects vary depending on the host country characteristics.

Esso (2009) looked at the long-run relationship and the causality between FDI and growth in ten Sub Saharan Africa countries. The author employed two new econometric approaches: the Pesaran, et al.(2001) approach to co integration and the non-causality test of Toda and Yamamoto (1995). This study found a positive relationship between FDI and economic growth.

Ray (2012) investigated the causal relationship between FDI and economic growth and the effect of FDI on economic growth in India. The study used data for the period 1990/91 to 2010/11and employed Granger Causality to test for the causality between FDI and economic growth and Ordinary Least Squares to determine the effect of FDI on economic growth. The study found a unidirectional causality from economic growth to FDI and that FDI had not contributed much to the growth of the Indian economy for the period 1990/91 to 2010/11.

Adeniyi et al. (2012) did a study on the link between FDI and economic growth for Cote d'Ivoire, Gambia, Ghana and Nigeria for the period 1970-2005. The study employed Granger Causality and the Vector Error Correction Model (VECM). The findings indicated that there was no causal relationship from either FDI or financial development to economic growth and that there were statistically insignificant coefficients on both lagged FDI and financial development in Nigeria. Further findings showed that there was lack of both short- and long-run influence of FDI on economic growth in Sierra Leone, that economic growth and FDI are better linked by sound intermediating financial institutions, and that the overall size of the financial sector is important for the FDI-economic growth interaction. It is evident from these findings that there is no conclusive evidence on the impact of FDI on economic growth.

2.1. Literature on FDI, portfolio equity flows and cross-border interbank borrowing

Reisen and Soto (2001) investigated the growth effect of different types of capital flows. They considered bond flows, FDI, portfolio equity flows, official flows and short-term and long-term bank lending on a sample of 44 developing countries around the world over the period 1986-1997.The study found that portfolio equity flows exert a significant effect on economic growth and that short-term and long-term lending had a negative effect on economic growth on the recipient country, except when local banks are sufficiently capitalized.

Durham (2003) used a sample of 88 countries from 1977-2000 to determine the growth of different types of private capital flows. The study employed a simple Ordinary Least Squares cross-sectional regression. The study found that foreign bond investment, foreign portfolio investment and other foreign investments including cross-border lending had no effect on economic growth.

Massa and Macias (2009)examined the long-run relationship between economic growth and four different private capital inflows (cross-border bank lending, FDI, bonds flows and portfolio equity flows) on a sample of selected Sub-Saharan African countries over the period 1980-2007. They used a panel co integration regression on pooled data. The study found that FDI and cross-border bank lending have statistically significant and positive impact on SSA growth. A drop by 10 percent of FDI may lead to 0.5 percent decline of SSA's income per capita, whereas a 10 percent decrease in cross-border lending may lead to a decrease in growth of about 0.7 percent. Portfolio equity flows and bond flows had no growth impact.

Duasa and Kassim (2013) examined the relationship between foreign portfolio investment and Malaysia's economic performance. They used time-series data for the period 1991-2006 and employed the Granger Causality test and the Toda-Yamamoto Non-Causality test to establish the direction of causality between the foreign portfolio investment and economic growth. In addition they used the simulating variance decomposition and impulse response functions for further inference. The study found that economic growth causes changes in foreign portfolio investment.

2.2. Overview of literature

Most previous studies have dwelt on the relationship between FDI and economic growth (Wilmore, 1986; Haddad and Harrison, 1993; Balasubramanyam, 1996; Borensztein et al.,1998; Aitken and Harrison, 1999; Fortainer, 2007 and Esso, 2009). There is little work on the effects of other private capital inflows on economic growth except work done by Berkeart and Harvey, 1998, 2000; Carkovic and Levine, 2002; Durham, 2003; De Vita and Kyaw, 2009; and Vihn, 2010.Most of the work on the effects of various components of private capital inflows on economic growth is cross country.

This study is country-specific and focuses on the causality between various components of private capital inflows and economic growth; and the effects of various components of private capital inflows on economic growth in Kenya.

3. Methodology

The study estimated the following set of equations in order determine the causality between private capital inflows and economic growth.

$$\ln g_t = \alpha_0 + \sum_1^n \alpha_i \ln g_{t-i} + \sum_1^n \beta_j \ln PCI_{1-j} + \varepsilon_{1t} \qquad (3.1a)$$

$$\ln PCI_t = \lambda_0 + \sum_1^n \lambda_i \ln PCI_{t-i} + \sum_1^n \delta_j \ln g_{t-j} + \varepsilon_{2t} \qquad (3.1b)$$

where, n is the maximum number of lagged observations included in the model, α's, β's, λ's and δ's are parameters, and lng is the log of GDP growth.

ln*PCI* is the log of private capital inflows comprising of foreign direct investment, portfolio investment and cross-border interbank borrowing. 3.1a postulates that current economic growth is related to past values of itself as well as those of foreign direct investment, portfolio investment and cross-border interbank borrowing. Similarly, 3.1b postulates that current foreign direct investment, portfolio investment and cross-border interbank borrowing are related to their past values as well as those of economic growth.

Equation 3.1 was estimated with the expectation of three results. First, that foreign direct investment, portfolio investment and cross-border interbank borrowing granger cause economic growth or economic growth granger cause foreign direct investment, portfolio investment and cross-border interbank borrowing (a unidirectional relationship).Secondly, foreign direct investment, portfolio investment and cross-border interbank borrowing granger cause economic growth and in turn economic growth granger cause foreign direct investment, portfolio investment and cross-border interbank borrowing (bi-directional relationship). Lastly, that foreign direct investment, portfolio investment and cross-border interbank borrowing does not granger cause economic growth and economic growth does not granger cause foreign direct investment, portfolio investment and cross-border interbank borrowing.

The second objective of determining the effect of foreign direct investment, portfolio investment and cross-border interbank borrowing was achieved through Ordinary Least Squares estimation. The Ordinary Least Squares estimation included other determinants of economic growth. These variables were selected on the basis that they have been identified in the literature as determinants of economic growth. The variables included were human capital (HC), macroeconomic stability (MS), trade openness (NX), financial development (FD),government expenditure (G) and remittances (RM).

Thus the effects of foreign direct investment, portfolio investment and cross-border interbank borrowing on economic growth were captured by running an ordinary least squares estimation of the following equation:

$$\ln g_t = \alpha_0 + \alpha_1 \ln FDI_t + \alpha_2 \ln PI_t + \alpha_3 \ln IBB_t + \alpha_4 \ln G_t + \alpha_5 \ln FD_t + \alpha_6 \ln MS_t +$$
$$\alpha_7 \ln NX_t + \alpha_8 \ln HC_t + \alpha_9 \ln RM_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3.2)$$

where α's are parameters, lng, lnFDI, lnPI, lnIBB,lnG, lnFD, lnMS, lnNX, lnHC and lnRM were log of economic growth, log of foreign direct investment as a ratio of GDP, log of portfolio investment as a ratio of GDP, log of cross-border interbank borrowing as a ratio of GDP, log of government expenditure as a ratio of GDP, log of financial development as a ratio of GDP, log of macroeconomic stability, log of trade openness as a ratio of GDP, log of human capital, log remittances as a ratio of GDP and ε_t was white noise.

The logs of the variables were stationary at levels and there was no multicollinearity, thus the OLS estimators were consistent. The errors were homoscedastic and serially uncorrelated making the OLS estimators optimal.

In addition to the use of the traditional ordinary least squares regression estimation, the study employed another time-series technique, impulse response function and variance decomposition (together called 'innovation accounting') to analyze the dynamic relationship between foreign direct investment, portfolio investment and cross-border interbank borrowing and economic growth. Impulse response function analysis traces out the time path of various shocks of the endogenous variable to such shocks whereas variance decomposition allows inference over the proportion of the movement in a time series due to its own shocks versus shocks to other variables in the system (Enders, 1995).

Based on the above, a Vector Auto regression (VAR) incorporating the growth model of the form 3.3 was built:

$$V_t = A_0 + \sum_{i=1}^{k} A_i V_{t-i} + \varepsilon_t \qquad\qquad (3.3)$$

where V_t = (log of economic growth, log of foreign direct investment as a ratio of GDP, log of portfolio investment as a ratio of GDP, log of cross-border interbank borrowing as a ratio of GDP, log of financial development as a ratio of GDP, log of government expenditure as a ratio of GDP, log of human capital and log of macroeconomic stability), ε_t = error terms for the variables included andA₁ to A_k are nine by nine matrices of coefficients and A_0 is an identity matrix.

4. Empirical findings

4.1. Causality between foreign direct investment, portfolio investment, cross-border interbank borrowing and economic growth

The first objective of this study was to determine the causality between foreign direct investment, portfolio investment, and cross-border interbank borrowing, and economic growth. To achieve this objective, a Granger causality test was carried out and the results are summarized in Appendix 6 Table A7.

Log of economic growth does not granger cause log of foreign direct investment, whereas log of foreign direct investment granger causes log of economic growth at 5 per cent. The log of cross-border interbank borrowing does not granger cause log of economic growth while the log of economic growth granger cause log of cross-border interbank borrowing at 10 percent level of significance. It was concluded that there was a unidirectional causality from foreign direct investment as a percentage of GDP to economic growth and from economic growth to cross-border interbank borrowing as a share of GDP.

4.2. Effects of foreign direct investment, portfolio investment and cross-border interbank borrowing on economic growth

To achieve the second objective, first an OLS estimation was carried out followed by an innovation accounting (impulse response and variance decomposition) to complement the ordinary least squares estimation. The results of the regression analysis where log of economic growth was the dependent variable are summarized in Appendix 6, Table A8.

The results show that the coefficient of log of foreign direct investment as a ratio of GDP was 0.089 and was statistically significant at 5 percent level. It shows that a 10 per cent increase in the ratio of foreign direct investment to GDP will lead to an increase in GDP growth of about 0.9 percent.

Further to the regression analysis, the study traced the impact of foreign direct investment on economic growth. To this effect, an impulse response analysis was done to trace the path of a one-time shock in foreign direct investment on economic growth. The result is shown in Figure 4.1.
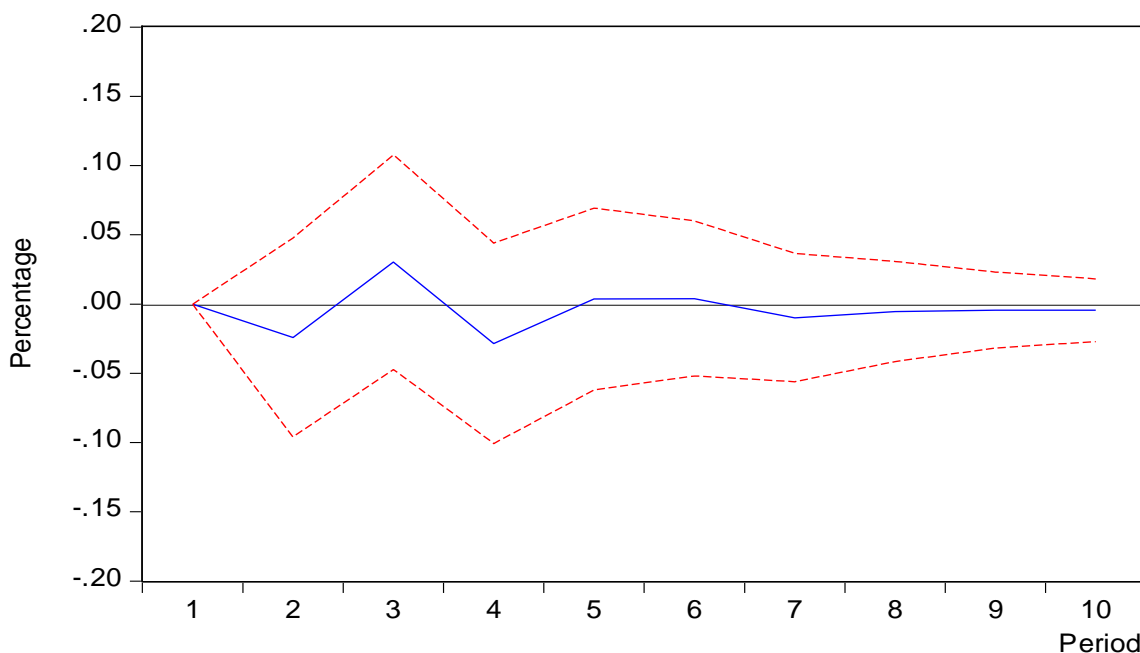
Figure 4.1. Response of economic growth to foreign direct investment (%)

The result shows that a shock in the ratio of foreign direct investment to GDP leads to a decline in the growth rate of economic growth in the second period. The rate of change of economic growth picks up in the third period through the fourth period. By the fifth period, the impact of foreign direct investment fizzles out and economic growth follows its natural path. The result implies that a shock in foreign direct investment has little short term impact on economic growth (it has an effect of less than 2 percent). The response function agrees with the regression result which shows that though FDI has a statistically significant coefficient, this coefficient is inelastic. This means that FDI needs to be complemented by other factors that explain growth.

In addition to the impulse response analysis, to disaggregate the variations in economic growth into component shocks to the exogenous variables, variance decomposition was done and the results are presented in Table A9, Appendix 7. The results indicate that foreign direct investment explains less than 1 percent of the variations in economic growth in the first three periods and about 2 percent of the variations in economic growth in the fourth period. For the remaining forecast period, foreign direct investment explains less than 2 percent of the variations in economic growth.

Though the coefficient of the log of portfolio investment as a ratio of GDP was positive (0.005), it was statistically insignificant. However, a positive coefficient is a good show that portfolio investment can play an important role in the growth of the economy.

Similar to the analysis done on foreign direct investment, an impulse response analysis was carried out for portfolio investment to trace the path of a shock in portfolio investment on economic growth. The impulse response function for economic growth to portfolio investment is shown in Figure 4.2.
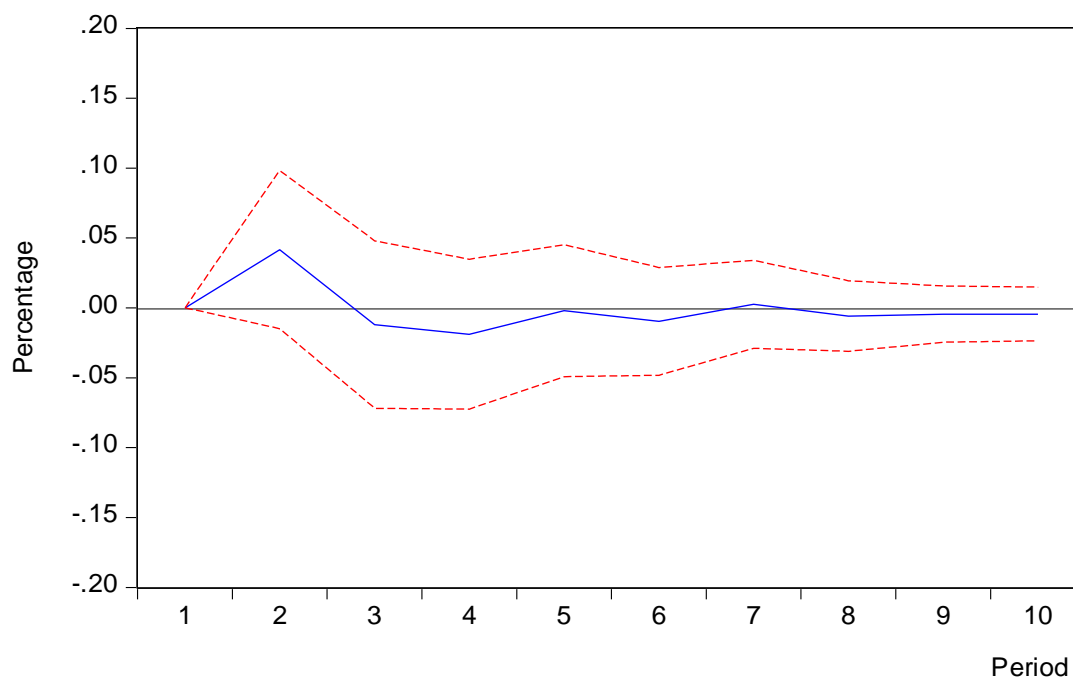
Figure 4.2. Response of economic growth to portfolio investment (%)

The result indicates that a shock in the ratio of portfolio investment to GDP in the first period leads to a fluctuation in economic growth in the second period of about 2.5 percent. The fluctuations in economic growth tend to be minimal by the seventh period. This implies that a shock in portfolio investment has a minimal impact on economic growth.

Further, the variance decomposition results indicate that portfolio investment accounts for about 4 percent of the variations in economic growth in the second and fourth periods. From the sixth period it accounts for about 9 percent of the variation in economic growth. This implies that variations in portfolio investment will have a slightly bigger impact in economic growth than FDI. From the innovation accounting, this study has shown that portfolio investment can play an important role in economic growth of Kenya.

The coefficient of log of cross-border interbank borrowing as a ratio of GDP was positive (0.057) but statistically insignificant. This implies that cross-border interbank borrowing does not play an important role in the economic growth of Kenya. This could be because Kenya operated a closed capital account for long (Schneider, 2000).

Apart from the regression results, the impulse response analysis was done to trace the path of a shock in cross-border interbank borrowing on economic growth and the result is presented in Figure 4.3.
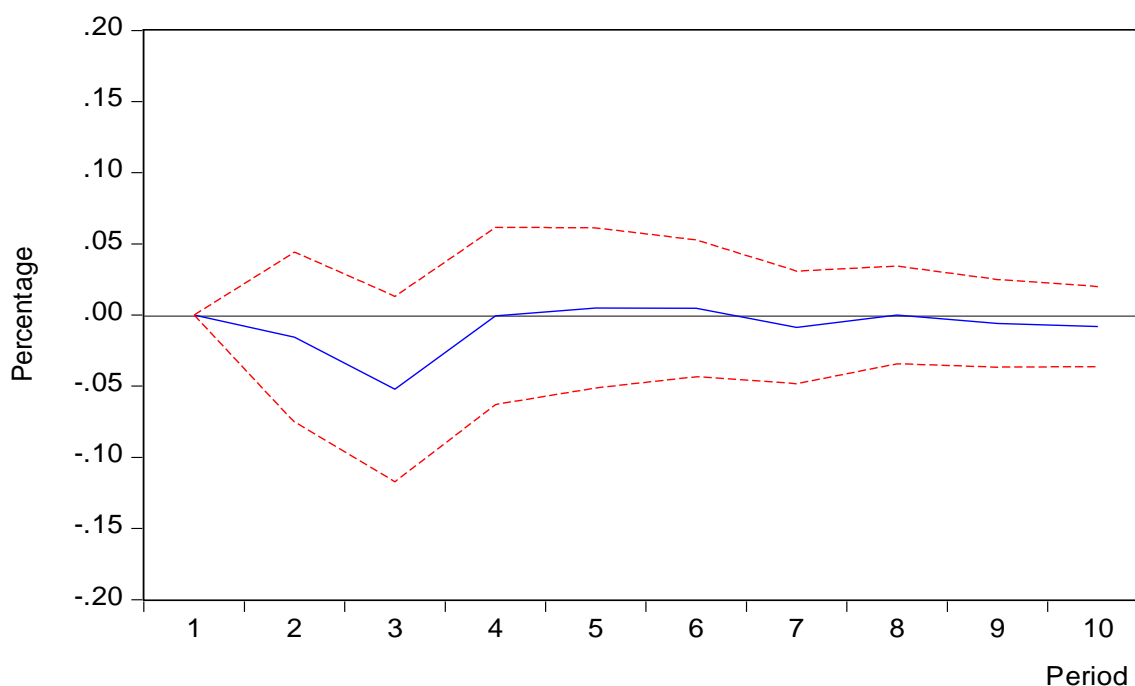
Figure 4.3. Response of economic growth to cross-border interbank borrowing (%)

A shock in cross-border interbank borrowing leads to a decline in economic growth up to the third period. Economic growth then picks up and follows its normal growth path from the fourth period. It is important to note that this shock has a negative effect on economic growth. The implication is that a shock in international

lending and borrowing can negatively affect economic growth. Similarly, the variance decomposition results in Table A9 Appendix 7 show that cross-border interbank borrowing accounts for about 9 percent of the variations in economic growth in the third period and about 15 percent of the variations in economic growth in the fourth period. Cross-border interbank borrowing accounts for about 19 percent of all the variations in economic growth for the rest of the forecast period. This implies that any disturbance in the international lending may have long term implications on Kenya's economic growth.

Therefore, innovation accounting has shown that cross-border interbank borrowing has an impact on economic growth. However, regression estimation had indicated that cross-border interbank borrowing had a statistically insignificant coefficient.

5. Conclusions

This study has established that there is a unidirectional causality from FDI as a ratio of GDP to economic growth and a unidirectional causality from economic growth to cross-border interbank borrowing as a ratio of GDP. It has also found that FDI as a ratio of GDP has a positive impact on the economic growth of Kenya. Consistent with existing literature, this study has established that, gross domestic capital formation as a ratio of GDP, secondary and tertiary enrolment as a ratio of the total population, openness as a ratio of GDP and remittances as a ratio of GDP have a positive and statistically significant effect on economic growth in Kenya. On the other hand, government expenditure as a ratio of GDP and inflation had a negative impact on economic growth.

The Government of Kenya should work towards an environment that attracts FDI. The liberalization of prices, divestiture and privatization of public enterprises is a good step towards attracting FDI. The establishment of the Privatization Commission is a move in the right direction. The commission should fast track the privatization process. Although the giving of incentives to foreign firms in the Export Processing Zone has attracted FDI, the government should provide more infrastructural facilities such as construction of roads, the extension and improvement of the rail services, the growth of information and communication technology to attract more FDI.

The Government of Kenya should continue to pursue a high and sustainable economic growth rate to attract cross-border interbank borrowing. This can be through devoting more resources to development expenditure than is current, opening up to the global economy to tap knowledge and technology, maintain a low inflation rate, and avoid excessive debt. The funds got from banks across the border will supplement the local resources.

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APPENDICES

APPENDIX 1. DATA USED IN THE STUDY

Table A1. Raw Data

YEAR	G	PI	MS	HC	RM	FDI	G	NX	PI	IBB
1970	-4.67	0	2.19	1.241	7260000	13800000	1566400000	969919612	391187844	
1971	22.17	0	3.78	1.327	7260000	7400000	1735800000	1135119826	425319830	20.10
1972	17.08	0	5.83	1.458	1386000	6300000	2138100000	1165639534	470399812	7.707
1973	5.90	0	9.281	1.526	12540000	17260000	2526900000	1402773070	645834271	-1.09
1974	4.07	0	17.81	1.64	18480000	23420000	2978000000	2214799364	764959414	-5.64
1975	0.09	272361	19.12	1.735	13200000	17158748	3476900000	2096909245	591296426	-1.64
1976	2.15	1673211	11.45	2.063	9900000	46371851	3530400000	2230869807	703226909	-7.49
1977	9.46	7249389	14.82	2.295	18480000	56545226	4485600000	2991097750	1063243908	-5.90
1978	6.91	0	16.93	2.508	26400000	34414130	5307900000	3586574861	1578393092	6.71
1979	7.62	0	8.00	2.625	19140000	84009903	6091300000	3576306534	1130468168	4.13
1980	5.57	269,535	13.87	2.796	27719999	78093746	7095400000	4752734899	1780520445	0.94
1981	4.1	0	7.90	2.571	78540001	14147557	6682700000	4406079027	1570599613	1.41
1982	5.05	0	13.82	2.584	67980002	13000893	6434400000	3744199900	1405960283	2.61
1983	1.59	0	11.61	2.837	58080002	23738843	5984100000	3238499700	1251152763	3.57
1984	1.6	0	20.67	2.847	56759998	10753527	6233900000	3640800000	1226585449	3.84
1985	4.70	0	11.40	2.373	66000000	28845949	6131100000	3401599900	1553688208	5.26
1986	6.98	0	10.28	2.398	52139999	32725777	7240600000	4035199900	1575819841	4.86
1987	5.81	0	13.01	2.624	66000000	39381344	7971600000	3802300100	1936066122	8.16
1988	6.09	0	4.80	2.653	76559998	394431	8353000000	4175600100	2126364307	8.03
1989	4.54	0	7.62	3.041	89099998	62189917	8329200000	4396951994	2056523927	6.82
1990	4.13	0	11.2	2.864	139259995	57081096	8593500000	4898423929	2075834343	7.33
1991	1.34	0	19.10	2.805	124080002	18830977	7987400000	4532382848	1709538402	5.75
1992	-1.08	0	27.33	2.783	114839996	6363133	8221100000	4351297610	1391014478	1.83
1993	-0.10	-7864561	45.98	2.321	118139999	145655517	5751800000	4190664374	1012914646	3.41
1994	2.53	3334328	28.81	2.572	137279999	7432413	7148500000	5094203040	1379108624	16.43
1995	4.29	4518603	1.55	2.544	298320007	42289248	8883300000	6490357930	1973888014	15.80
1996	4.01	853893	8.96	2.563	288420013	108672932	9130800000	6903723432	1807336023	-5.78

YEAR	G	PI	MS	HC	RM	FDI	G	NX	PI	IBB
1997	0.22	4341938	11.92	2.599	351779999	62096810	10279100000	7089985181	1985851037	16.88
1998	3.33	3936773	6.72	2.546	347820007	26548246	10780000000	6891200000	2352542654	21.10
1999	2.41	1850803	5.75	2.522	431640015	51953456	10916300000	6214900000	2001649461	17.45
2000	0.60	-5988208	9.96	2.805	537900024	110904550	11392600000	6765599509	2210070810	15.33
2001	4.73	2378862	5.73	2.593	550000000	5302623	13059000000	7265546970	2440211303	17.81
2002	0.30	2951029	1.97	2.841	433000000	27618447	13191000000	7254800000	1990563881	17.34
2003	2.79	642255	9.81	2.898	538000000	81738243	15036000000	8067675027	2456439294	9.77
2004	4.62	3220886	11.79	2.952	620000000	46063931	16091000000	9573483668	2750309461	5.05
2005	5.98	3145428	9.87	2.978	805000000	21211685	18739000000	12082000000	3169203484	7.61
2006	6.33	1805250	6.04	3.178	1128000000	50674725	22504000000	14116000000	4038903760	5.42
2007	6.99	454264	4.26	3.557	1588000000	729044146	27167000000	17125579167	5183506686	7.60
2008	1.53	5022022	16.18	4.006	1692000000	95585680	30031000000	20853917511	6109391647	1.93
2009	2.65	2636777	10.55	4.332	1686228027	116257609	29394000000	18665994832	6135348837	7.61
2010	5.55	33285057	4.09	4.606	1776986938	185793190	32163000000	20382449186	6674997035	10.08

Table A2. Refined Data

Year	g	FDI	PI	IBB	G	HC	FD	MS	NX	RM
1970	6.83930	0.860600	0.000000	NA	23.28000	1.241000	21.60700	2.188500	29.82570	0.463500
1971	-5.091500	0.416100	0.000000	20.06939	27.27000	1.327000	25.07700	3.780200	28.63940	0.409300
1972	-11.18590	0.299000	0.000000	7.701927	25.03000	1.458000	22.88800	5.831600	26.58780	0.648200
1973	-1.830900	0.689800	0.000000	-1.092377	24.33000	1.526000	22.01200	9.281200	27.39380	0.496300
1974	-3.977380	0.788600	0.000000	-5.643527	20.55000	1.640000	20.03200	17.80990	33.67590	0.620600
1975	2.065780	0.526400	0.007800	-1.640906	25.84000	1.735000	20.72100	19.12020	29.82370	0.379600
1976	7.299800	1.334600	0.047400	-7.490084	26.11000	2.063000	20.32100	11.44900	32.45050	0.280400
1977	-2.541300	1.258100	0.016200	-5.902336	24.98000	2.295000	23.77100	14.82100	34.95890	0.412000
1978	0.702700	0.648900	0.000000	6.712202	33.01000	2.508000	28.74100	16.93180	28.93550	0.497400
1979	-2.043200	1.347500	0.000000	4.128561	35.25000	2.625000	27.30600	7.979400	25.75310	0.314200
1980	-1.472000	0.782000	0.000300	0.942589	23.02500	2.796000	23.02500	13.86600	29.51700	0.274500
1981	0.952000	0.148700	0.000000	1.410506	24.33500	2.571000	24.33400	7.895000	30.46000	0.825600
1982	-3.459000	0.141900	0.000000	2.605412	22.05200	2.584000	22.05200	13.82100	21.64200	0.742600
1983	0.007000	0.280700	0.000000	3.572394	21.70500	2.837000	25.70500	11.60300	19.56400	0.685700
1984	3.103000	0.122400	0.000000	3.835120	20.28900	2.847000	20.28900	20.66700	19.89300	0.645900
1985	2.279000	0.343900	0.000000	5.257538	26.40000	2.373000	26.40000	11.39800	20.84900	0.786900
1986	-1.171000	0.315100	0.000000	4.864495	23.60000	2.398000	23.60000	10.28400	20.45800	0.502000
1987	0.280000	0.345800	0.000000	8.157390	24.37500	2.624000	24.37500	13.00700	20.69900	0.579600
1988	-1.551000	0.003300	0.000000	8.026232	24.66300	2.653000	24.66300	4.804000	21.31300	0.648500
1989	-0.406000	0.531300	0.000000	6.815212	18.98300	3.041000	18.98300	7.617000	21.81800	0.761200
1990	-2.795000	0.468600	0.000000	7.332797	23.71900	2.864000	23.71900	11.20000	22.98200	1.143300
1991	-2.419000	0.163700	0.000000	5.745513	20.99200	2.805000	20.99200	19.10400	21.98500	1.078900
1992	0.985000	0.056200	0.000000	1.825329	15.07000	2.783000	15.07000	27.33200	23.54200	1.013900
1993	2.626000	1.851000	-0.099900	3.413472	16.68800	2.321000	16.68800	45.97900	25.30900	1.501300
1994	1.756000	0.078900	0.035400	16.42811	14.89800	2.572000	14.89800	28.81400	25.14100	1.457000

Year	g	FDI	PI	IBB	G	HC	FD	MS	NX	RM
1995	-0.276000	0.354100	0.037800	15.80165	14.70800	2.544000	14.70800	1.554000	23.17700	2.497700
1996	-3.791000	0.902100	0.007100	-5.776589	12.53000	2.563000	12.53000	8.962000	22.92300	2.394300
1997	3.110000	0.467600	0.032700	16.87957	13.45900	2.599000	13.45900	11.92400	23.39700	2.547300
1998	-0.923000	0.192800	0.028600	21.09633	12.78800	2.546000	12.78800	6.716000	22.55700	2.526500
1999	-1.808000	0.403300	0.014400	17.45405	10.87700	2.522000	10.87700	5.753000	20.20900	3.364300
2000	4.127000	0.900700	-0.486300	15.32743	14.67900	2.805000	14.67900	9.955000	20.56600	4.368600
2001	-4.427000	0.046100	0.018200	17.81250	16.76100	2.593000	16.76100	5.730000	22.36700	4.211700
2002	2.486000	0.209400	0.022400	17.35814	12.00300	2.841000	12.00300	1.970000	23.46700	3.282500
2003	1.831000	0.543600	0.004300	9.770511	13.12300	2.898000	13.12500	9.810000	23.32200	3.578100
2004	1.365000	0.286300	0.020000	5.045258	14.43200	2.952000	14.43200	11.79000	22.74300	3.853100
2005	0.345000	0.113200	0.016800	7.609988	16.91200	2.978000	16.91200	9.870000	24.28400	4.295900
2006	0.667000	0.270400	0.008000	5.423177	17.94700	3.178000	17.94700	6.036000	24.71900	4.999100
2007	-5.465000	2.683600	0.001800	7.597247	19.07900	3.557000	19.07500	4.256000	26.22400	5.845300
2008	1.117000	0.318900	0.016700	1.929493	20.34200	4.006000	20.34300	16.18100	27.55600	5.634200
2009	2.907000	0.395500	0.009000	7.614281	20.88700	4.332000	20.88600	10.55200	29.05000	5.736600
2010	5.552000	0.577700	0.103500	10.07844	22.58600	4.606000	22.58600	4.086000	31.42300	5.524900

APPENDIX 2. DESCRIPTIVE STATISTICS
(BASED ON REFINED DATA)

Table A3. Descriptive statistics

	G	FDI	PI	IBB	G	HC	FD	MS	NX	RM
Mean	-0.28	0.54	0.00	6.70	20.41	2.67	19.72	11.99	25.03	2.03
Median	0.14	0.37	0.00	6.23	20.72	2.61	20.33	10.42	23.50	1.05
Maximum	7.30	2.68	0.10	21.10	35.25	4.61	28.74	45.98	34.96	5.84
Minimum	-11.16	0.00	0.49	-7.49	10.88	1.33	10.88	1.55	19.56	0.27
Std. Dev.	3.36	0.53	0.08	7.32	5.69	0.67	4.75	8.26	4.07	1.85
Skewness	-0.59	2.16	-5.15	0.14	0.39	0.64	-0.15	2.03	0.72	0.84
Kurtosis	4.46	8.34	30.85	2.50	2.84	4.63	1.96	8.63	2.58	2.25
Jarque-Bera	5.87	78.61	1469.55	0.54	0.90	7.14	1.96	80.37	3.75	5.62
Probability	0.053	0.00	0.00	0.76	0.64	0.028	0.38	0.000	0.15	0.060
Sum	-11.07	21.61	-0.14	268.10	816.28	106.77	788.77	479.54	1001.38	81.37
Sum Sq. Dev.	441.55	11.09	0.27	2091.91	1260.82	17.34	881.43	2660.42	645.60	132.93

	G	FDI	PI	IBB	G	HC	FD	MS	NX	RM
Observations	40	40	40	40	40	40	40	40	40	40

Where G is economic growth, FDI is foreign direct investment, PI is portfolio investment, IBB is cross-border interbank borrowing, GOVT is government expenditure, HC is human capital, FD is financial development, MS is macroeconomic stability, NX is total exports and imports and RM is remittances.

APPENDIX 3. TIME SERIES TESTS

Table A4. Findings of Unit Root Tests

Variable	Type of test	Form of test	Test statistic	Critical value at 5%	Conclusion
Log of economic growth	ADF PP	C-level C-level	-5.692379 -5.747963	-2.936942 -2.936942	Stationary Stationary
Log of Foreign Direct Investment	ADF PP	C-level C-level	-5.394832 -5.419378	-2.936942 -2.936942	Stationary Stationary
Log of cross border interbank borrowing	ADF PP	C-level C-level	-3.821021 -3.898093	-2.938987 -2.938987	Stationary Stationary
Log of Portfolio Investment	ADF PP	C-level C-level	-4.911189 -4.911189	-2.936942 -2.936942	Stationary Stationary
Log of Government Expenditure	ADF PP	C-level C &T-level C-level C&T-level	-1.224294 -7.048089 -0.925090 -7.048089	-2.936942 -3.526609 -2.936942 -3.526609	NonStationary Stationary Nonstatinary Stationary
Log of Financial Development	ADF PP	C-level C &T-level None C-level C&T-level None	-1.066295 -2.282204 2.172882 -1.066295 -2.320979 2.2262274	-2.936942 -3.526609 -1.949319 -2.936942 -3.526609 -1.949319	NonStationary NonStationary Stationary NonStationary NonStationary Stationary
Log of Human Capital	ADFs PP	C-level C &T-level None C-level C&T-level None	-1.576023 -2.009824 2.113413 -1.609151 -2.143076 1.732167	-2.936942 -3.526609 -1.949319 -2.936942 -3.526609 -1.611711	NonStationary NonStationary Stationary NonStationary NonStationary Stationary
Log of Macroeconomic Stability	ADF PP	C-level C-level	-4.736314 -4.676458	-2.936942 -2.936942	Stationary Stationary

Variable	Type of test	Form of test	Test statistic	Critical value at 5%	Conclusion
Log of openness	ADF PP	C-level C &T-level None C-level C&T-level None	-1.012598 -2.088394 -0.424327 -1.024997 -2.223280 3.295249	-2.936942 -3.526609 -1.949856 -2.936942 -3.536609 -1.949319	NonStationary NonStationary NonStationary NonStationary NonStationary Stationary
Log of Remittances	ADF PPs	C-level C &T-level C-level C&T-level	-0.925223 -5.176775 -0.362012 -5.119208	-2.936942 -3.526609 -2.936942 -3.526609	NonStationary Stationary Nonstatinary Stationary

Table A5. Correlation Matrix for the independent variables of log of economic growth

	LnFD	lnFDI	lnG	lnHC	lnIBB	lnMS	lnNX	lnPI	LnRM
lnFD	1.000								
lnFDI	0.030	1.000							
lnG	0.069	0.118	1.000						
lnHC	-0.155	-0.086	-0.257	1.000					
lnIBB	-0.257	-0.334	-0.328	0.245	1.000				
lnMS	0.152	0.082	0.148	-0.052	-0.385	1.000			
lnNX	0.296	0.394	0.400	-0.198	-0.506	0,075	1.000		
lnPI	0.128	-0.159	0.134	0.017	-0.130	-0.111	0.227	1.000	
lnRM	-0.628	-0.053	-0.681	0.628	0.454	-0.299	-0.210	-0.130	1.000

Where lnG is the log of government expenditure, lnFDI is the log of foreign direct investment, lnIBB is log of net private external debt, lnPI is log of portfolio investment, lnNX is log of total exports and imports, lnMS is log of inflation, lnHC is log of ratio of secondary and tertiary enrolment to total population, lnFD is log of gross domestic capital formation and lnRM is log of remittances.

APPENDIX 4. DIAGNOSTIC TESTS

Series: Residuals	
Sample 1972 2010	
Observations 39	
Mean	1.56E-15
Median	-0.000215
Maximum	6.332319
Minimum	-4.809453
Std. Dev.	2.272750
Skewness	0.538445
Kurtosis	4.154249
Jarque-Bera	4.049474
Probability	0.132029
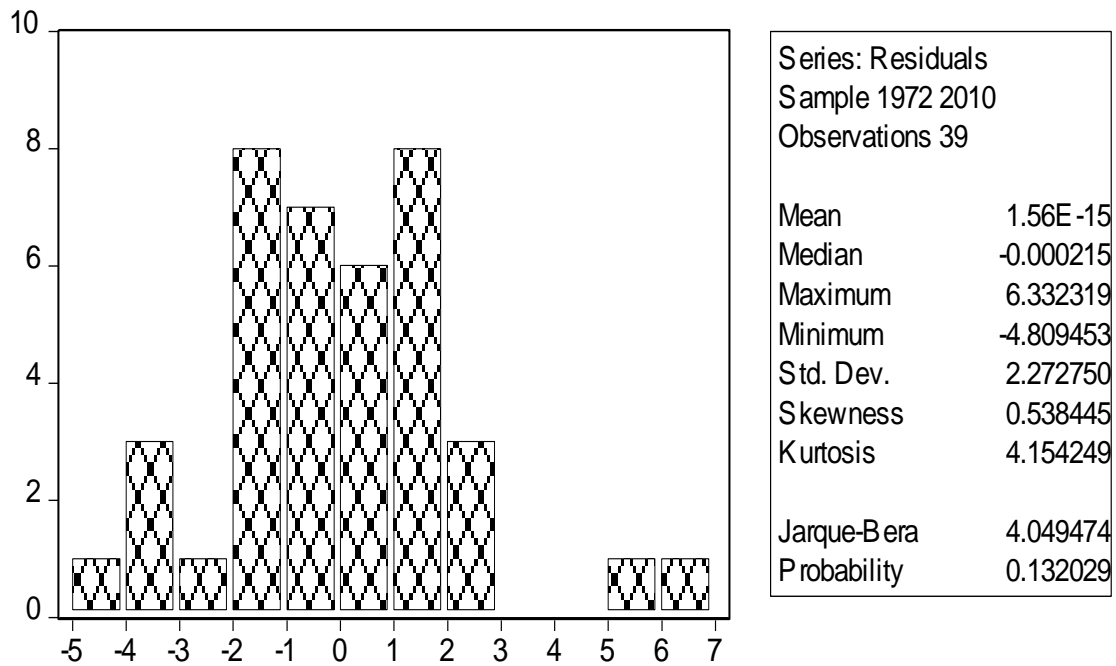
Figure A1. Normality Test

Table A6. Ramsey's RESET Test Results

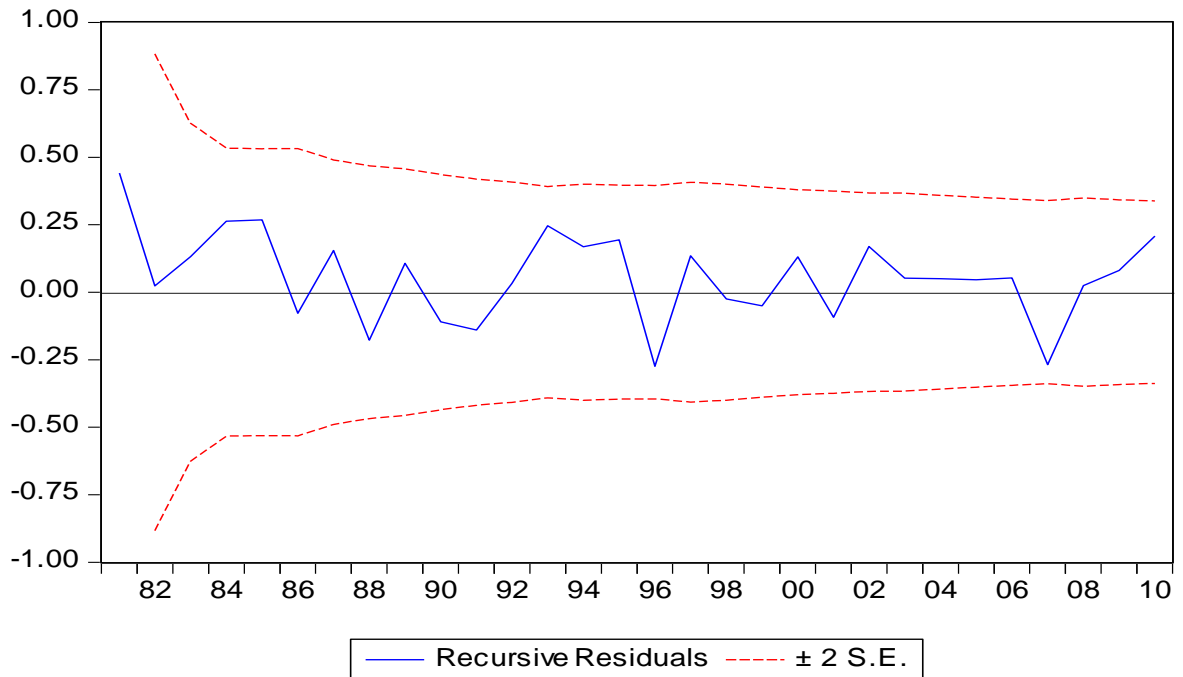| Dependent Variable	Number Terms	Test Statistic	
		F-Statistic	Probability (F-Statistic)
Log of economic growth	1	1.18503	0.2853
	2	0.639007	0.5353

APPENDIX 5. RECURSIVE TESTS

Figure A2. Recursive residuals from the log of economic growth equation
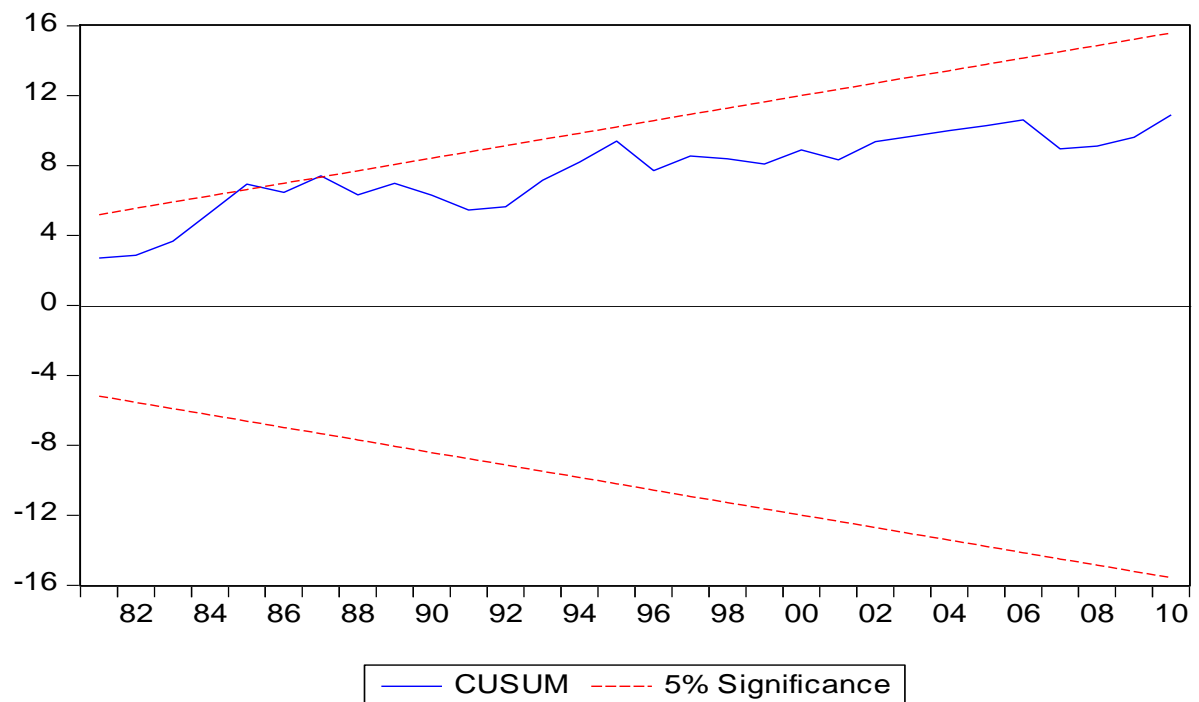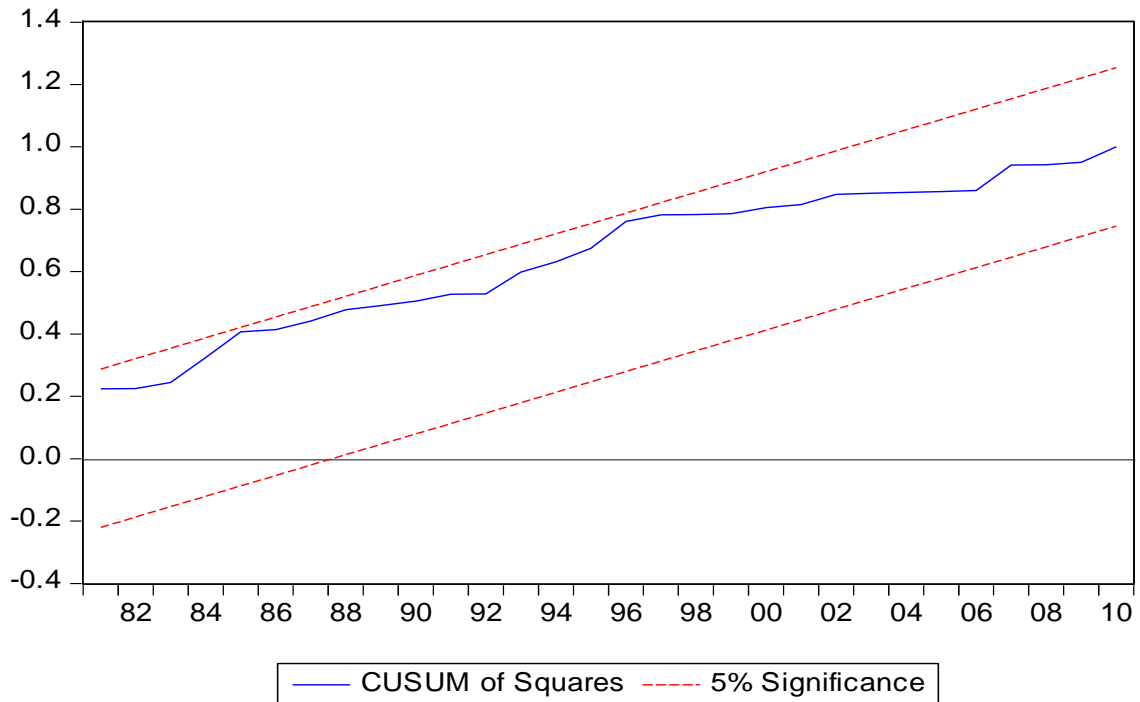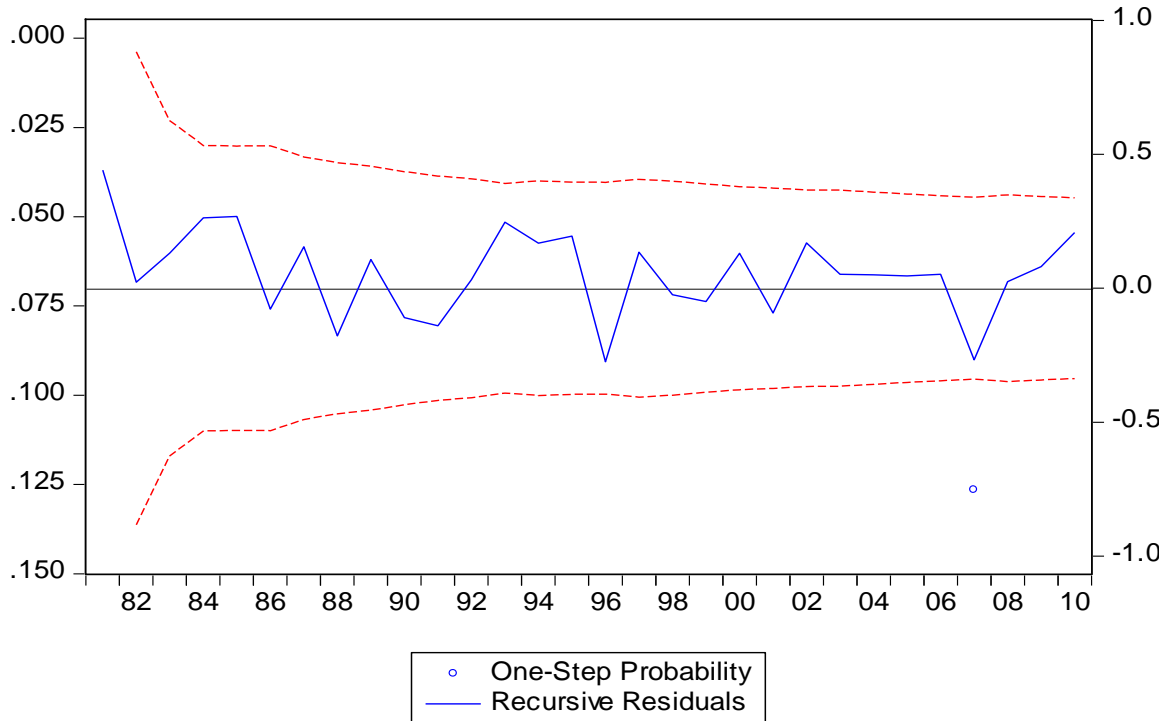

Figure A3. CUSUM test for the log of economic growth equation

Figure A4. CUSUM of squares test for the log of economic growth equation

Figure A5. One-step probability test on the log of economic growth equation
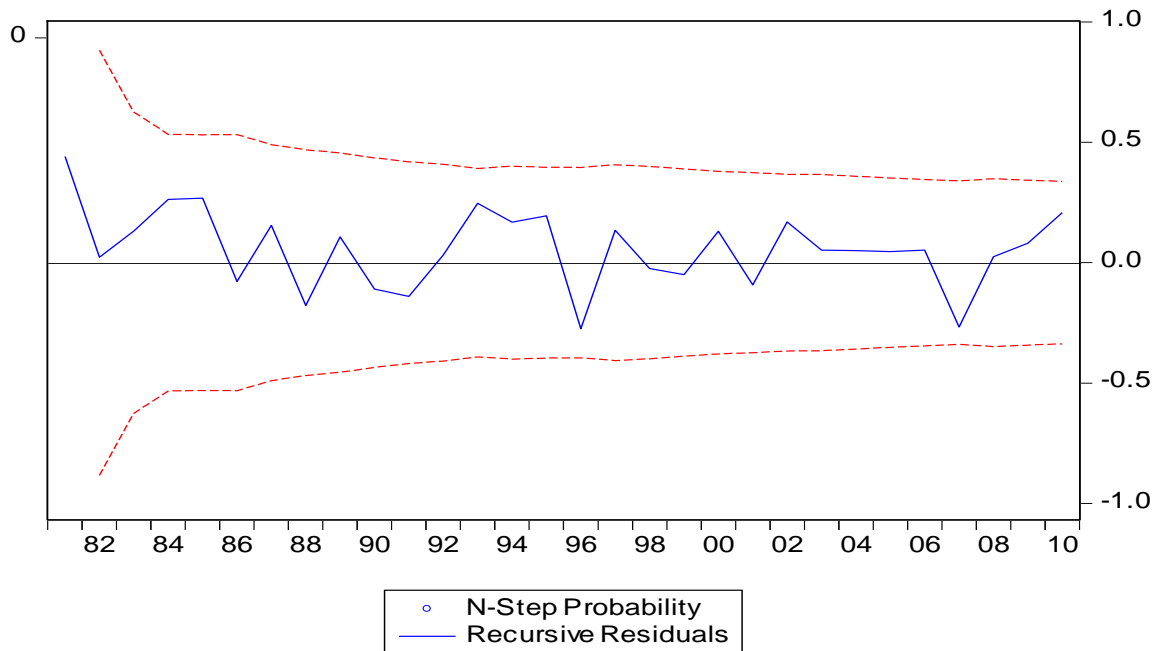
Figure A6. N-step probability test on the log of economic growth equation

APPENDIX 6. REGRESSION RESULTS

Table A7. Granger Causality Results

Null Hypothesis	Observations	F-Statistic	Prob.
Log of FDI does not Granger cause log of economic growth	39	5.23399	0.0046
Log of economic growth does not Granger cause log o FDI	39	0.12176	0.8857
Log of cross-border interbank borrowing does not Granger cause log of economic growth	39	0.37907	0.6874
Log of economic growth does not Granger cause log of cross-border interbank borrowing	39	2.74403	0.0790
Log of portfolio investment does not Granger cause log of economic growth	39	1.89718	0.1655
Log of economic growth does not Granger cause log of portfolio investment	39	0.16296	0.8503

Table A8. Log of Economic Growth Equation Results

Variable	Coefficient	t-statistic	Probability
Log of foreign direct investment	0.089**	2.511	0.017
Log of portfolio investment	0.005	0.093	0.927
Log of cross-border inter-bank borrowing	0.057	1.395	0.173
Log of remittances	0.151***	3.793	0.007
Log of financial development	0.326**	2.504	0.018
Log of government expenditure	-0.092**	-2.296	0.039
Log of human capital	0.612***	3.083	0.004
Log of macroeconomic Stability	-0.062*	-1.870	0.071
Log of openness	0.148**	2.881	0.010
Constant	3.923	1.687	0.102

Note: *** shows the coefficient is statistically significant at 1%, ** shows that the coefficient is statistically significant at 5% and * shows that the coefficient is statistically significant at 10%. (Source: Researcher's calculations)

APPENDIX 7. IMPULSE RESPONSE GRAPHSAND VARIANCE DECOMPOSITION

Figure A7. Impulse Response Graphs

Table A9. Variance decomposition

Variance Decomposition of log of economic growth									
Period	**LnG**	**lnFDI**	**lnIBB**	**lnPI**	**lnNX**	**lnMS**	**lnHC**	**lnGOVT**	**lnFD**	**lnRM**
1	100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	87.80	0.35	0.00	4.32	1.82	0.00	3.23	0.00	0.60	1.87
3	74.00	0.35	8.52	3.73	2.02	0.12	2.75	1.35	3.08	4.06
4	65.55	2.01	15.42	3.28	1.78	0.29	3.44	1.26	3.15	3.80
5	58.85	1.80	18.59	7.74	1.71	0.34	3.60	1.16	2.82	3.40
6	57.06	1.76	18.90	9.26	1.68	0.32	3.69	1.15	2.83	3.36
7	56.70	1.74	19.07	9.26	1.68	0.34	3.69	1.21	2.86	3.44
8	56.38	1.74	19.43	9.20	1.67	0.35	3.68	1.24	2.89	3.42
9	55.99	1.75	19.59	9.530	1.66	0.36	3.65	1.23	2.86	3.38
10	55.90	1.75	19.57	9.64	1.68	0.36	3.65	1.22	2.85	3.37

Where lnG is the log of economic growth, lnFDI is the log of foreign direct investment, lnIBB is log of net private external debt, lnPI is log of portfolio investment, lnNX is log of total exports and imports, lnMS is log of inflation, lnHC is log of ratio of secondary and tertiary enrolment to total population, lnGOVT is log of government expenditure, lnFD is log of gross domestic capital formation and lnrM is log of remittances.