



# The Effect of Capital Flows on the Kenyan Economy

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**Master of Commerce in Development Finance Degree**

By

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**Signed**

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**Njoki Muthuri**

## Acknowledgment

I would like to thank the following people, without whom this thesis report would not have been possible:

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## The Effect of Capital Flows on the Kenyan Economy

### ABSTRACT

Foreign capital inflows (FCI) play an important role in the economic development of the recipient country as they fund investments and promote growth. However, the size and composition of such inflows are determined on the basis of country specific requirements. The study investigates the impact of capital inflows on the economy of Kenya at a time when the government implemented economic reform measures to stabilize the economy and restore sustainable growth. More specifically, the study examines the impact of foreign capital flows remittances such as overseas workers remittance, official development aid, and external debt, on selected macro-economic variables using monthly time series data and a single-equation empirical approach.

The study findings reveal that some forms of FCI are not influenced by the macro economic variables in the country but by other factors such as political stability and policy variables.

***Keywords: Kenya, Capital flows, overseas workers remittances, Foreign Direct Investment, external debt, official development aid.***

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## Glossary of Terms

<b>CBK</b>	Central Bank of Kenya
<b>FCI</b>	Foreign Capital Inflows
<b>FDI</b>	Foreign Direct Investment
<b>GDP</b>	Gross Domestic Product
<b>GOK</b>	Government of Kenya
<b>Hawala</b>	Informal value transfer remittance system popular among Somali's in Kenya. Somali's in the diaspora transfer money to Kenya using the Hawala system.
<b>IMF</b>	International Monetary Fund
<b>KIPPRA</b>	Kenya Institute for Public Policy Research and Analysis
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>NSE</b>	Nairobi Stock Exchange
<b>OWR</b>	Overseas Workers Remittances
<b>SSA</b>	Sub-Saharan Africa

## 1. Introduction

### 1.1. Background of Study

Capital flows are typically defined as physical (in the case of FDI) or liquid capital moving between countries as a consequence of trade, consumption or investment in and out of the countries through capital markets, real estate and cross border mergers, and acquisitions (Maina 2008). This has allowed countries with limited savings and poor financial markets, such as in Africa, to attract international capital for investment projects and at the same time to promote development in the international financial markets (IMF 2009). These flows also bring substantial gains to recipient countries by augmenting local savings and improving technology. Capital flows between developed and developing economies may be subject to official flows (aid flows and accumulation of international reserves), driven by factors such as the basic rate-of-return equalization motive considered in benchmark neoclassical models (Prasad et al. 2007) or the potential for higher rates of return and portfolio diversification.<sup>1</sup>

Nonetheless, economic growth of a country is broadly determined either directly or indirectly through smooth and regular flow of investment (Reinhart and Reinhart, 2008). Direct effects include financial sector development, improved liquidity and increased domestic investment (Kim and Yang, 2008) , while indirect effects arise from spill-overs such as employment generation, increase in aggregate demand, technology advancement, and increase in human capital especially when domestic resources fall short (Borensztein, *et al.*, 1998). However, the magnitude of the impact of foreign flows depends on composition, utilization, efficiency, underlying motives and continuity of such inflows and these characteristics, efficiency in particular, are primarily determined by the recipient country's preconditions (Bailliu 2000). Such preconditions include how developed the financial system of the host country is. A poorly developed financial system can cause the flows to have a negative impact on the economy as the capital does not find productive investments (Soto, 2000). Likewise a developed financial system brings in exponential increase in capital movements due to financial globalization in instances such as new financial products, joint ventures between enterprises and greater integration (Salvatore, 2004).

In this thesis report, the effects and importance of financial capital flows (FCI) on the economy of Kenya is empirically assessed from January 2005 through December 2012. It is during this period that the country headed towards a positive growth path after the end of a 24 year tyrannical reign by the second president of the country Daniel Arap Moi. President Moi's 24 year reign was characterized by endemic corruption, human rights violations, and poor economic

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<sup>1</sup> Bosworth and Collins (1999) in their study found that, on average, for the period 1978–1995, a dollar of external flows raised domestic investment by more than 50 cents, concluding that external flows had a significant influence on host country investment.

policies. A grade 8 school dropout, President Moi's economic policies saw Kenya's economy steadily decline from one of the best performing economies in Africa to near collapse. A new opposition government took over the difficult path of economic recovery in 2003. The new government was led by President Mwai Kibaki, an Economist from the London School of Economics. The new government established "Vision 2030" a development program covering the period 2008 to 2030 to help transform Kenya into a "middle-income country by the year 2030". By 2006 the country's GDP had grown to 6.1% from a low of 0.6% in 2000 after the new government embarked on an economic recovery strategy plan for wealth and employment creation. Due to the new political stability in the country, FCI's increased in the form of Remittances, Foreign Direct Investment (FDI), and Official Development Assistance (ODA).

This study attempts to investigate the relationship of FCI's with economic growth. FCI's in this study include foreign direct investment (FDI), overseas workers remittances, and external debt. Although all these inflows serve a common purpose i.e. filling the resource gap, their determinants, transmission mechanisms and spillovers differ widely. Foreign capital is expected to promote economic growth but may negatively affect economic growth in the absence of certain conditions. In a developing country context, foreign capital is normally expected to serve as a catalyst to economic growth and help in reducing poverty and income inequality levels but high volumes of capital flows could also lead to significant financial crises as witnessed in Asia and Latin America of the late 1990's.

Studies however show ambiguous results when it comes to the causal relationship between foreign capital and key economic indicators (Alfaro *et al.*, 2003; Berument and Dincer, 2004; Calvo, Izquierdo and Talvi, 2003; Kim and Yang, 2009; Reinhart and Rogoff, 2009). Their views differ regarding growth effects of foreign capital especially in the host countries though they agree that any change tends to have a positive and negative effect. Reinhart and Rogoff (2009) report that large inflows may induce expansionary monetary and credit policies, distort asset prices, and increase currency vulnerability, consequently leading to increased imports causing inflation, exchange rate appreciation, an uncompetitive domestic sector, and an increase in the current account deficit. Eventually there is a sharp decline in the inflows turning the economic explosion into burst. A case in point is the East Asia and Latin America countries which experienced a real form of currency appreciation due to capital inflows. The problems faced included a loss of domestic competitiveness due to exporters, and the undermining of a strategy to achieve monetary stability by pegging the exchange rate during 1990-1994 (Frankel and Okongwu, 1995). Eventually this resulted in an outflow of the capital which was attributed to the Banking Sector's aversion to emerging markets risk. This aversion to risk is linked to the fact that financial markets are influenced by hedge fund managers with a short term philosophy as they are evaluated based on short term returns (Jones, 1998). This behavior maximizes the investor's returns but minimizes the benefits to the recipient country as these managers move in and out of markets on the quest for short term returns.

On the other hand, foreign capital brings cheap and relatively less risky access to international funds in addition to transfer of technology (Njoroge, 2007), while also fostering economic growth in host countries through financial sector development, increased welfare by facilitating consumption smoothing, improved liquidity, and heightened domestic investment despite the high level of exposure to global crisis and policies of investor countries (Kim and Yang, 2008).

## **1.2. Objectives of the study**

This study examines the effect that OWR, external debt, FDI and ODA have had on the Kenyan economy during 2005 to 2012 period. The primary research questions that the paper seeks to explore are:

- 1.2.1. What is the impact of selected FCI on various macro-economic variables?
- 1.2.2. Are the macro-economic variables determinants of FCI?
- 1.2.3. What are the policy responses of the government to increases and decreases of FCI's?

This paper contributes to the literature on the determinants of capital inflows to developing countries, and on the role of capital flows in economic development. This paper is organized as follows. Chapter 2 gives stylized facts on capital flows in Kenya. Chapter 3 reviews the literature underlying the premise that capital inflows lead to higher economic growth. Chapters 4 and 5 present the data and research methodology. Chapter 6 discusses the empirical results, and Chapter 7 concludes with a summary of the key findings and policy implications.

## **1.3. Ethics and Informed Consent**

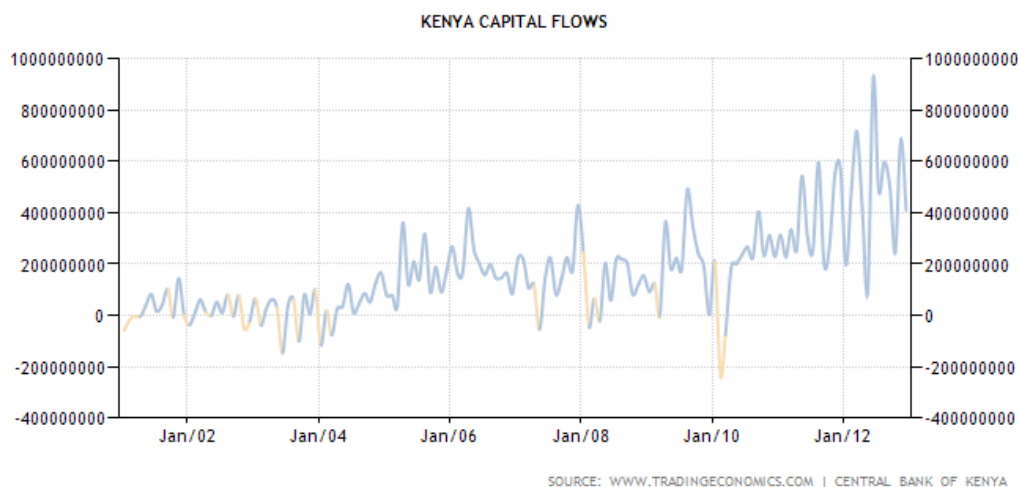
No human subjects were used during this thesis report but historical data was used from publicly accessible databases. The required ethical clearance protocol was followed and provided by UCT.

## 2. Stylized Facts

### 2.1 Capital Flows in Kenya

Kenya has had a long history with foreign capital flows. In the 1970s it was one of the most favored destinations for FCI in East Africa and Africa. However over the years, Kenya lost its appeal to foreign firms due to a lack of political democracy and heightened endemic corruption (Cecchetti, Genberg, and Wadhvani, 2002). When a new opposition government took over from the Moi government the country embarked on a recovery process and launched “Vision 2030” where it hopes to achieve global competitiveness and prosperity of the nation. This initiative was seen as a renewed commitment to attract FCI to assist in the industrialization process. Figure 2.1 illustrates this increase of FDI during the new Kibaki government.

Figure 2.1



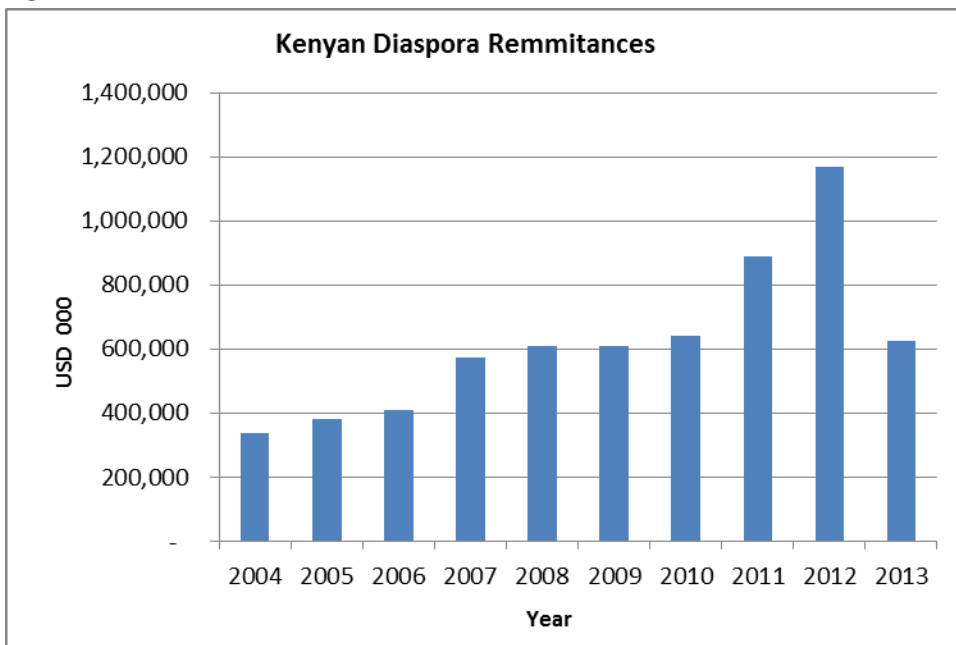
Amongst the three flows examined in this study, OWR are Kenya’s single largest source of foreign exchange rivaling big earners such as tea and tourism; in addition they are a key social safety net as they provide an alternative means of financing investments and overcoming liquidity constraints. Kenya has an estimated diaspora of over 3 million of which 45 percent of the Kenyan Diaspora is believed to be in the U.S and 22 percent in the U.K. Reasons for Kenya’s Diaspora was Kenyan youth escaping the economic hardships caused by the Moi regime during his 24 year rule (Mwega 2007)

Data from CBK indicates that in 2012, the amount of diaspora remittances grew by 24 percent to USD 105 Million as compared to USD 85 Million in 2011. Inflows surged by 45 percent on a year-on-year basis from 2004 to 2012 in part because the weak Kenyan shilling made it more attractive to invest in local currency assets. The sustained increase was also an indication of the increasingly importance of diaspora remittances to the economy as a foreign exchange earner

and key social safety net. In addition, the increase in remittances is also attributed to improved data collection techniques by the central bank, and more participation by the Diaspora in the local bond market (CBK, 2011).

In 2009, recorded remittance inflows equaled 5 percent of gross domestic product (GDP), more than the amount the private sector rose in capital markets for the corresponding period (World Bank, 2011). Furthermore, Kenya plans to issue Diaspora bonds in an effort to acquire additional sources of financing for development, and to increase the development impact of remittances and Diaspora contributions. According to the Kenyan Treasury, the first Diaspora Bond is expected to be issued in early 2014. The issuance of this bond helps mobilize savings to finance projects such as infrastructure, power plants, sewage, and irrigation, water and building education institutes, moreover Diasporas' home bias and lower perception of sovereign risk makes Diaspora investments more stable relative to foreign investments (Okonjo-Iweala and Ratha 2011). Figure 2.2 below illustrates the increase of diaspora remittances over the 2004 to 2013 period.

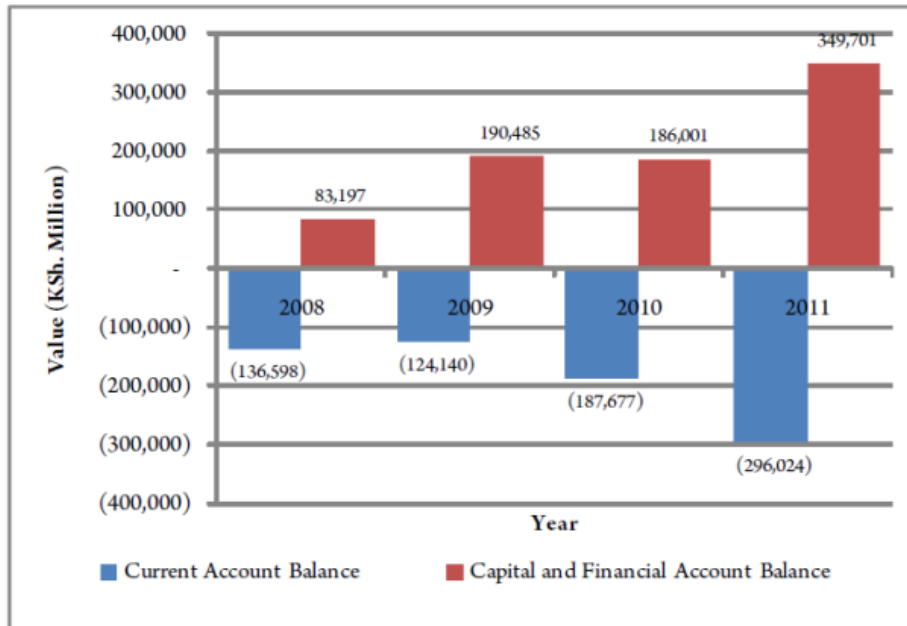
**Figure 2.2:**



*Source: Central Bank of Kenya (2013)*

**Figure 2.3:**

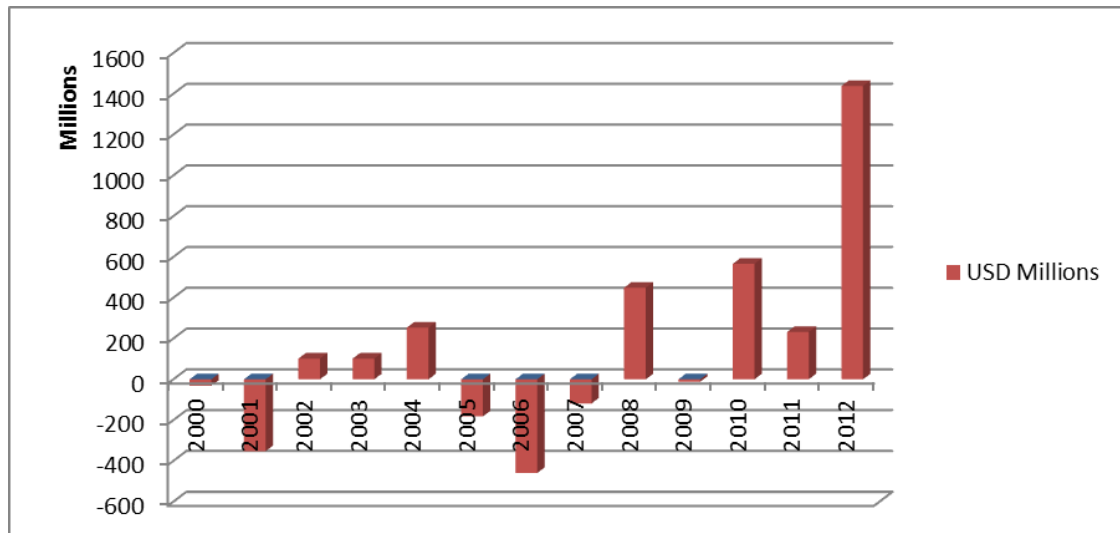
**BALANCE OF PAYMENTS, 2008-2011**



Source: Kenya National Bureau of Statistics (2012)

During the past decade, the Central Bank of Kenya (CBK) reported that international capital flows averaged USD 156 million per year reaching an all-time high of USD 960 million in June 2012 and a record low of USD -232 million in February of 2010 (CBK, 2012). Increased capital mobility in Kenya with increase rates of investment and growth reflects a vote of confidence by external and internal investors (IMF, 2009). External financing on the other hand represents only 15% of the government's total budget as the country is not aid dependent (CBK, 2011). As compared to other countries in the East African Region whose public expenditures are 40% reliant on foreign aid, Kenya's public services are financed through tax collected due to the country's strong performance in revenue collection. As illustrated in Figure 2.4, aid to Kenya is quite volatile due to the on and off donor relations as the government fails to comply with stringent donor conditions.

**Figure 2.4: External Debt3**

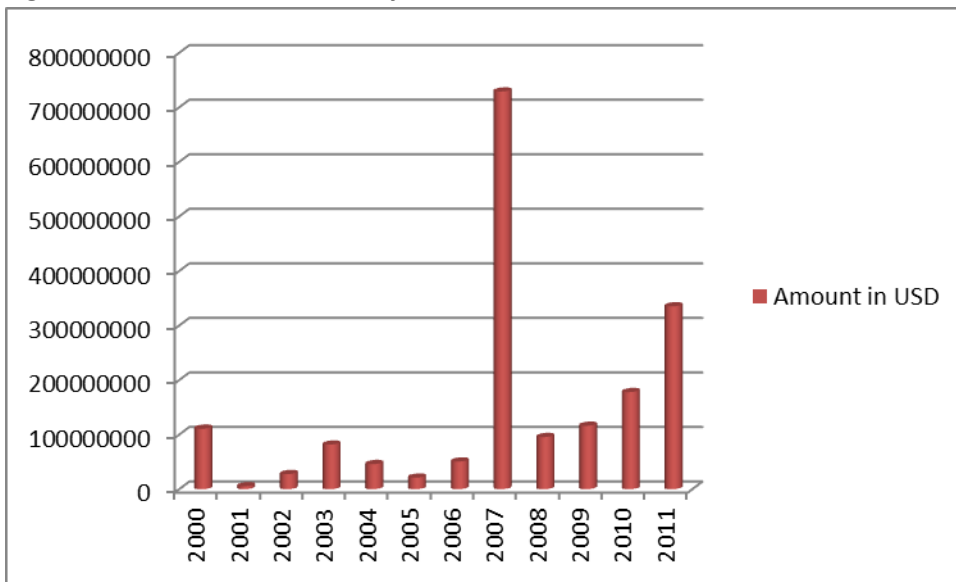


Source: Central Bank of Kenya (2012)

In contrast, an additional significant source of capital is illicit inflows and outflows. According to the report by Global Financial Integrity (GFI), during the past 10 years Kenyans have stashed illegal earnings from crime, corruption, and tax evasion amounting to more than KES 96 billion in foreign accounts. The highest amount of capital outflows reported by CBK was USD 312 million (KES 26.8 billion) in 2003, followed by USD 258 million (about KES 22 billion) in 2007, USD 234 million (KES 20.1 billion) in 2005, USD 203 million (KES 17.4 billion) in 2004, USD 72 million (KES 6.1 billion) in 2001 and USD 43 million (KES 3.7 billion) in 2006. Statistics published by the central bank of Kenya in 2010 also showed an unexplained amount of USD 2.1 billion in the current account fuelling concerns that the country may be turning into a money laundering destination for drug cartels and Somali pirates (World Bank 2010).

Although Kenya was among one of the most favoured destination for FDI in the 1970s in East Africa, it is now among the countries with very low levels of FDI due to political instability, crime, and government corruption (Kinuthia, 2010). FDI is beneficial to the host country as it contributes to gross fixed capital allocation through domestic investment, transfer of skills and technology and the creation of employment (Nyamwange, 2009). However, FDI can also be potentially harmful without stringent regulation resulting in resource exploitation, pollution, and abuse of market power (Kinuthia 2010).

**Figure 2.5: Net FDI flows to Kenya 2000 to 2011**



Source: Central Bank of Kenya

Despite the low FDI levels, the country still attracts some significant FDI due to its Human Resources and infrastructure. Kenya has a high literacy level, a well-developed port and air freight services, competitive utility costs and the export processing zone (EPZ) that has strengthened the operating environment for zone based industries (Kinuthia, 2010).

The above factors have caused FDI to be concentrated mainly in the manufacturing sector which is mainly export oriented. According to UNCTAD 2005, the number of multinational companies in Kenya is more than 200 with a huge number coming from US, Britain, South Africa, Netherlands, China, and India.

## **2.2 Liberalization Process in Kenya**

In the 1970s the Kenyan economy was based on capital controls that were implemented to respond to the repercussions of expansionary policies and balance of payment problem (Ngugi, 1999). The controls were placed on domestic interest rates, foreign exchange transactions, importation and licensing, wage guidelines, export taxes, domestic retail and producer prices and on bank borrowing.

During the 1990s, the country embarked on various economic reforms that covered financial and foreign exchange market liberalization, external trade liberalization, domestic price controls, capital account liberalization and domestic market liberalization (Ndungu, 2001). Interest rates were liberalized in 1990 and in 1992 foreign exchange bearer certificates were issued that allowed the bearer foreign exchange without having a foreign exchange license.

This allowed the country to have an official dual exchange rate and provide significant relief to the foreign exchange availability. The certificates were purchased at the official rate from the Central Bank in foreign exchange without having to declare the source of foreign exchange.

However there were a few handicaps such as in 1993 when prices were increasingly being quoted in dollars as the country faced a high risk of the shilling flight. This was as a result of foreign aid suspension which caused the government to have a deficit as Kenya had grown increasingly dependent on Aid, for instance there was a balance of payment support which amounted to more than USD 400 million which was equivalent to the current account deficit, net of foreign loan payments (Ngugi, 1999). Growth in GDP stagnated, and agricultural production shrank at an annual rate of 3.9% with Inflation reaching a record 100% in August 1993.<sup>2</sup>

By 1994 policies were put in place to intervene, however interventions in the foreign exchange market increased money supply (Ngugi, 1999). By 1995, efforts to lower the interest rates down led to a substantial outflow of capital due to an increased redemption of treasury bills and thus a depreciation of the shilling. To defend the shilling from the depreciating trend the central bank drew down international reserves to as low as 60 day import cover. What followed was a high interest rate regime to stabilize the shilling and build up foreign reserves. By 1999, a severe drought compounded by the above difficulties, reduced overall agricultural output and by 2000 the GDP had contracted by 0.2%. (IMF 2002) This consequently led to low investor confidence and a halt of donor support due to political infighting.

Consequently after the change in government, the country experienced a surge in capital flows as the government improved the quality of macro-economic policies and domestic financial governance creating an ideal atmosphere for capital mobility. The renewed flow of capital was perceived as vote of confidence in the host country's policy programs and a valuable opportunity to invest in the domestic market.

The growth of the economy picked up as did credit to the private sector as well as investments in treasury bills. The reduction of the cash ratio from 10% to 6% in 2003 increased the liquidity of the banking system, inducing a reduction in lending interest rates. Low lending rates

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<sup>2</sup> During this period, government corruption also escalated the fiscal deficit as they embezzled national wealth resulting in massive capital outflows estimated to be USD 2 Billion per year (Ngugi, 1999). As a result excess money was printed to finance the deficit and also to finance the elections through electoral bribery which led to excess liquidity in the economy. The excess money supply led to a severe shortage of foreign exchange and price decontrol due to inadequate supply of commodities resulting in a strong rise in consumer demand (ibid). To clean up the excess liquidity the government issued Treasury bills with discount rates as high as 98%, increasing the inflation rate and depreciating the Kenya shilling (KES) from 22.79 to in 1991 to the dollar (USD) to a high of 76 in 2000 (IMF 1998). This encouraged the flow of capital as the currency depreciated despite the consequent increase of imports.

undoubtedly led to increased economic activity, with economic growth accelerating from 2.9% in 2003 to 5.1% in 2004, to 5.8% in 2005 and then to 6.1% and 7.0% in 2006 and 2007, respectively.

**Table 1: Growth of Bank Credit to the Private Sector, 2001 -2008**

	2001	2002	2003	2004	2005	2006	2007	2008
Nominal growth in total credit (%)	-3.4	6.8	5.2	24.2	27.9	14	14.3	25.6
Nominal growth in private sector credit %	-3.9	4.7	5.9	25.7	10.3	16.3	21.4	24
Average Inflation (%)	5.9	2	9.8	11.6	10.3	14.5	9.8	26.2
Real growth in total credit (%)	-9.3	4.8	-4.6	12.6	17.6	-0.5	4.5	-0.6
Real growth in private sector credit (%)	-9.8	2.7	-3.9	14.1	0	1.9	11.6	-1.4

*Source: Central Bank of Kenya Statistical Bulletin*

Credit to the private sector dominates the asset portfolio of commercial banks in Kenya and as shown in the table above, private sector credit in nominal terms increased in 2001 – 2008. However, during the financial crisis demand in 2008 was stifled by strict benchmarks adopted by commercial banks over fear of contagion (Mutua, 2013)

Increased financial integration in Kenya also encouraged foreign flows through the entry of foreign banks (Kamau, 2009) and increased foreign investment in the Nairobi Stock Exchange (NSE). Foreign banks comprise of a quarter of the 46 banks in the country and accounted for 9.2% of the core capital of the banking system (CBK, 2007). Despite financial liberalization foreign currency deposits account for 13% of total deposits and 9.7% of total loans therefore banks were not adversely affected by the global financial crisis. The stock exchange was however affected as net portfolio inflows in 2005 to 2008 declined from a peak of USD 15 Million in 2005 not only by the financial crisis but the post-election reducing the NSE market capitalization significantly. The NSE 20 share index slumped by 35% in 2008 and by a further 2000 points the following year offsetting the gains made during the previous three years (the largest offsets in SSA).

This thesis report investigates the extent to which capital flows have affected some macro-economic variables such as exchange rate, interest rate, GDP, and inflation from January 2005 through December 2012.

### 3. Literature Review

This section considers the literature on the effects of capital flows on economic growth. The review looks at the benefits and detriments of FCI's arising from both theoretical and empirical studies, thereafter examining the effects that capital flows (FDI, OWR, and external debt) have on economic growth and more specifically GDP. The theoretical foundations under the premise that capital inflows lead to higher GDP and economic growth will motivate the empirical analysis that follows.

#### 3.1. Theoretical Literature

Theoretical arguments presented for the relationship between capital inflows and economic growth have concentrated on whether capital flows promote economic growth by increasing the domestic investment rate and/or by leading to investments associated with positive spillovers, such as the transfer of technology or skills and the influence on domestic financial intermediation (Bailliu 2000).

Obstfeld (1994) posits that in a financially open economy, domestic residents can diversify their asset portfolios to include those issued by foreign firms and financial institutions in addition to domestic ones. The increased ability to diversify risk allows firms in emerging markets to reduce the cost of capital adjusted for risk and hence invest more than otherwise. Levine (1997) and Soto (2000) further argue that an increase in capital mobility between rich and poor countries, allows a high rate of investment and hence a high rate of growth in capital-poor emerging markets while offering a higher rate of return on capital rich advanced countries.

According to Levine (2001), the integration with international financial markets would enhance the country's growth potential and increase the efficiency gains in the domestic financial system though increased competition amongst domestic banks and increased liquidity in the stock market.

Conversely financial market frictions such as capital gains taxes and transaction costs could lower financial integration thereby hindering growth. Historically, Bernanke and Getler (1989) showed that financial frictions interfered with trade causing a market participant to be more or less exposed to risk than preferred, while Obstfeld (1994) reiterated that financial integration could lead to higher growth rates in the absence of market frictions. Blanchard and Fisher (1989) further showed that the most straight-forward benefit of capital market integration is the possibility of separating the savings and investment decisions. Thus, countries could achieve a higher utility by borrowing from abroad to finance domestic investments.

More recent theoretical literature however highlights the negative effects of foreign flows. Mckinnon and Pill (1997) stress that increased borrowing by domestic banks from foreign funds may induce bank runs consequently leading to asset liquidations and reduced income and welfare. Due to the contagion effects of bank runs, a financial crisis may result affecting the national economy and financial system. Kaminsky and Reinhart (1999) and Sachs and Woo (2000), argue that domestic banks amplify a financial crisis as during the boom cycle bank debts increase more than domestic investment and output then credit market inefficiencies occur consequently increasing nonperforming loans thereby creating a liquidity crisis. During the boom episodes, there is an influx of large capital inflows that cause an appreciation of the real exchange rate and the deterioration of the current account balance. More importantly, GDP growth also increases, fueling the stock and property boom. This stimulates excessive credit extension and asset price bubbles which may create excessive demand for imports (Calvo *et al.* 2003).

Monetary policymakers are hence advised to intervene as a widening current account deficit and appreciation of the exchange rate could turn the boom into burst (Robini, 2006) removing the stability that initially caused the flows. Neoclassical theories explain international capital inflows with differentiated rates of return across countries mainly for trade. Fundamentally, the trade in assets allows countries to trade consumption today for consumption in the future thus providing substantial economic benefits (Eichengreen, *et al.* 1999). Cockcroft and Riddell (1991) claim that the future investment flows are directly related to the package of incentives, which influence the expected rate of return such as the security of the investment, the scope and speed with which companies are able to disinvest, the tax regime, investment code or guidelines, and overall macroeconomic policies. According to Meier (1994), the determinant of foreign capital inflows into developing countries is the expectation of higher returns or higher profits by firms especially in the case of foreign direct investment. However, Albuquerque (2002), Bekaert *et al.* (2002), Bernanke and Gertler (2009) argue that there are factors that inhibit investment, which include lack of formal legislation, lack of legal infrastructure such as patents, price controls, labour legislation, taxation policies, foreign exchange controls and a weak financial system.

The independence of the flows in raising investment is still unclear despite the relationship being evident. Alfaro *et al.* (2004) and Durham (2004) claim that the extent of integration of domestic economies into global capital markets influences this relationship and so does the nature of the flows and the domestic investment climate. However, Carkovic and Levine (2005) and Basu *et al.* (2003) report that the relationship between capital flows and domestic investment weakened in the 1990s, which is the same period in which most countries liberalized their capital accounts. The authors note that this was attributed to the increase in portfolio flows which had an insignificant impact on domestic investment. The trend was also attributed to the growing need of offsetting as countries become more integrated into international

financial markets, domestic savings and investment decisions are less correlated and as a consequence the relationship between capital flows and domestic investment weakens.

In addition, the relationship between capital inflows and productivity could also have a negative correlation in the presence of international financial frictions and sovereign risk. Standard economic theory predicts that capital should flow into countries experiencing a sustained increase in total factor productivity (TFP). Feldstein (1994) argues that in theory the effect of foreign capital inflows on domestic investment is ambiguous. He states that inbound capital may raise domestic investment but may dampen domestic production through increased imports.

Theoretical literature concludes that countries participate in capital mobility to allow residents to engage in welfare improvement by allocating capital to the most productive areas (Dooley, 1995). Consequently increased productivity leads to a higher expected future income hence consumption increases and savings decrease. These macro-economic outcomes are determined by the interaction of capital flows and government policies such as monetary, exchange rate and fiscal policy (Gourinchas and Jeanne, 2007). The policies affect the composition of flows and the attractiveness of the climate.

### **3.2. Empirical studies**

The analyses of the flows and ebbs of international financial transactions for the past four decades show that uneven capital account liberalization have brought upon mixed blessings to different countries (Obstfeld and Taylor, 2004). Prasad *et al.*, (2006) concludes that there is no robust relationship between capital account liberalization and economic growth as the costs are greater than the benefits.

Klein and Olivei (1999) and Edwards (2001) find that countries with open capital accounts have experienced greater financial deepening but only in OECD countries, and that the strong domestic financial institutions must first be in place for financial deepening to occur. The benefits seem to dominate with strong domestic financial institutions and the costs dominate with weak institutes making the economy vulnerable to shocks. Aoki *et al.* (2009) attempted to explain why the economy with an underdeveloped financial system is vulnerable to shocks found that shocks cause an unanticipated increase in foreign interest rates and decrease future output generating a fall in asset prices, contraction of domestic and foreign credit and a fall in total factor productivity. These frictions or shocks may hinder the borrowing ability of developing countries to borrow in order to smooth consumption and may thus reduce the amount of capital flows to these countries (Gourinchas and Jeanne, 2007).

Contrary, Eichengreen *et al.* (2001) finds that the effects of financial openness are dependent on the income level and the rule of law. Edwards, (2001) uses the interaction term between Quinn's index of capital account openness and the GDP per capita and finds that financial opening has a positive effect on growth only in advanced economies. Laureti (2005) studies the

relationship between economic growth and capital inflow for 11 countries using data for the period 1990 to 2000. The results find a positive relationship between foreign capital and growth only for those countries which followed openness oriented policies to attract foreign capital.

Bailliu, (2000) adopts an endogenous-growth model (earlier developed by Greenwood and Jovanovich, 1990) to explore the relationship between capital flows and growth and find that financial intermediaries foster growth by improving capital allocation. Earlier studies that examined cross country capital inflows experiences found that the key determinants of capital flows were global factors such as international interest rates and commodity prices (Calvo *et al.* 1996, Fernández-Arias and Montiel, 1996 and Glick, 1998). Soto (2000) further finds that bank flows benefit developed countries more than developing countries and that national income is positively affected by foreign direct investment, portfolio debt investment and bank flows, while portfolio equity flows have a negative effect on national income. In contrast to neo-classical models, Gourinchas *et al.*, (2007) finds that capital tends to flow towards countries with lower productivity growth and lower investments as low developing countries were eager to welcome any type of foreign capital inflows making them an attractive option for portfolio diversification. Sethi (2006) observes that capital flows affected the macro-economic variables such as exchange rate, interest rates money stock, and inflation more negatively with increased volatility and positively with decreased volatility. If capital inflows were large and sudden they could lead to an appreciation of the real exchange rate impacting the financial market negatively. Fernandez-Arias and Montiel (2002) argue that large surges of capital flows imposed macro-economic distortions in the domestic financial sector and the real economy in the absence of adequate policies. Only, countries with sound macro-economic policies and well-functioning financial institutions were able to reap the benefits of capital flows.

Khanna (2002) in his examination of the Indian Stock Market found that international capital flows increase the depth of the domestic capital market and reduce the systemic risk of the economy. Kohli, (2003) investigates the impact of capital flows on a range of economic variables such as interest rates on foreign exchange reserves, domestic monetary condition, and the financial system and finds that they induced real exchange rate appreciation, stock market and real estate boom, real accumulation and monetary accumulation. She concluded that capital inflows had a significant impact on the domestic money supply, stock market growth, liquidity, and volatility. Kim and Yang (2008) report that the increased liquidity and money supply influenced asset prices which were also affected by the flows through three main mechanisms. Firstly, the demand for domestic currency assets is affected as the inflows tend to appreciate nominal and real exchange rates. Secondly as capital flows into the stock market, stock market prices increase putting upward pressure on real estate and bond prices. Thirdly as asset prices increase an economic boom is created due to increased consumption and investment.

World Bank (2006) study examining the effectiveness of macroeconomic policies on capital inflows reports that large inflows are associated with the acceleration of GDP and that GDP fluctuations affect aggregate demand and real currency appreciation. The report concludes that capital flows financed investments, increased financial integration and stimulated economic growth though they created challenges for policy makers due to their increased vulnerability to crisis and loss of competitiveness.

### **3.3. Capital Flow Composition and its Key Determinants:**

Kenya makes a good case study as it is the largest non-resource economy in Sub Sahara Africa after Ethiopia (UNECA 2013). Mining activities make up for less than 1% of the country's GDP. However, this is bound to change with the recent discovery of oil, gold, coal, iron, and rare earth resources. With the discovery of these resources it is possible that within the time horizon of Vision 2030 the sector could contribute up to 10% of GDP and over US\$1 billion annually in export earnings.

Kenya also has the 3<sup>rd</sup> largest stock exchange in Sub Sahara Africa after South Africa and Nigeria and one of the eight countries in SSA with the most liberal capital account despite retaining a range of controls on the amount of assets and liabilities held by non-resident investors (IMF, 2007). A separate study done by UN on capital flows in SSA, showed that Kenya was amongst the top five countries with the highest rates of reserve accumulation due to the liberalization of the capital account and external financial vulnerability. Moreover, the country has one of the most vibrant bond and fixed income securities market in Africa causing the economy to benefit from large short term flows. However less controls with increased global financial integration has also increased capital outflows facilitating the acquisition of assets abroad by residents. In addition, the country's economic reforms and increased growth and investment prospects under 'Vision 2030' has also contributed to the confluence of foreign flows.

In spite of the availability of literature on the effects of capital flows on economic growth, studies that focus on Kenya specifically are scanty and limited in scope. The few credible studies focus on private capital inflows in particular FDI and the determinants of capital mobility in the country. Ndungu, (2001) investigated the impact of interest rates on private flows and found that the private flows responded to interest rate differentials creating a policy dilemma for authorities by conflicting the goals and objectives for exchange management. This dilemma relates to the targeting of a low inflation rate and a competitive exchange rate in a floating exchange rate regime. A related study by, O'Connell *et al.* (2010) noted that private flows were a source of macroeconomic instability as they exposed domestic markets to external volatility influencing policies to facilitate private markets for foreign exchange risk, and to monitor and limit macroeconomic vulnerabilities. The suitable combination of regulations and policies on private capital movements still remains a topic of vigorous debate among economists (Edwards 2007, Obstfeld 2008).

Ndungu and Ngugi, (1999) also find that the composition of foreign flows in Kenya influences the monetary policy with short-term flows constraining monetary policy more than long term flows. Njuguna (2010) finds that this is because short-term non-equity flows were the dominant form of flows mainly due to the dollarization of domestic bank liabilities, circulation of foreign currencies in the informal and tourism economies and accumulation of offshore deposits by residents. Kinuthia, (2010) reports that though the country has a liberal capital account, other factors in addition to a liberal capital account affect the flow of capital i.e. the exchange rate expectations, interest rate differentials, and political stability. The main goal in having an open capital account is to attract foreign capital to facilitate an increase in portfolio opportunities for domestic residents and to spur financial sector development. According to Mishkin, (2009) financial development is fostered indirectly by financial globalization through reduced financial repression. This is because the presence of foreign banks increases competition with local banks by increasing efficiency through institutional reforms such as accounting standards and disclosure requirements.

Nonetheless, studies done on the SSA region report that the financial flows in the 1990s and early 2000s have been inadequate and volatile due to frequent terms of trade and natural shocks that cause growth to be too slow. An econometric study by UNCTAD on capital inflows amongst 16 countries in the region including Kenya showed that capital inflows were channeled towards offsetting financial transactions not towards economic growth. Mwau (2002) used OLS on data from 1970 to 1999 and found insignificant impact of inflows on growth due to underdevelopment of domestic financial institutes, human capital, and entrepreneurship. Nyamwange (2009) used the Multiple Linear Regression Model for the period 1974-75 to 2003-04 and found the same results. Kiptoo, (2007) recommends that the region needs a sustained injection of external financing to accelerate and maintain growth in combination with the right policies to permit both an increase in standards of living and domestic savings.

On the other hand, the low saving rates in Kenya, (13 to 14% of GDP) show that the country relies heavily on capital flows to finance its current account deficit which is in excess of 5% of GDP. O'Connell *et al.*(2010), investigates the net capital flows in Kenya and finds that short term non-equity flows are the most dominant and the balance of payments data suggests that the country's external debt maturity period is significantly short, increasing the effect of sudden stops. The study also found that capital flows exert significant influence on the country's monetary policy as the central bank pursues price and exchange rate stability to counter short term volatility. A comprehensive study on national competitiveness done by KIPPRA (2009) also noted that political instability plays a role especially during national elections affecting capital account transactions and remittances. This increases the volatility of the country's balance of payments to which the CBK responds either by smoothing the exchange rate or by allowing the interest rates to be determined by international arbitrage.

Furthermore, World Bank, (2012) reports that the country experiences high influx of short term flows which make it more vulnerable to market sentiments. In addition the country also experiences illicit financial flows arising from money illegally earned, transferred, or spent which is not revealed in national accounts or figures that typically include trade mispricing, bulk cash movements, hawala transactions, and smuggling. According to Ndikumana and Boyce (2011) illicit flows out of the country are a major hindrance to the mobilization of domestic resources for development as they significantly reduce the resources available for investment. As a result hard currency reserves are drained, inflation is increased, tax collection decreases and free trade and investment are undermined (OECD 2011).

On the other hand, statistics published by the central bank of Kenya in 2010 showed USD 2.1 billion inflows to Kenya fuelling concerns that the country may be turning into a money laundering destination for drug cartels and Somali pirates. In 2009 the figure for errors and omissions in the country's balance of payments accounts was a massive USD 1.1 billion whose sources the Central Bank of Kenya cannot explain. The unexplained cash stood at a staggering USD 1.5 billion by mid-2011 and rose to about USD 2 billion at the beginning of 2012, falling to US\$ 79 million (KSh6.5 billion) in June (KNBS 2012).

The strange inflows were artificially driving the country's balance of payments surplus leading to higher liquidity and inflation. The property bubble in the country and the excessive demand for imported goods is believed to be linked to the illicit flows (KIPPRA, 2011).

The funds however, did provide the much needed foreign currency to defend the weak shilling as well as funds required to import goods which were more than double the amount of exports in August 2012 (CBK 2012). In comparison to neighboring Uganda and Tanzania, the errors and omissions on Kenya's total national income are way above the rest. For instance 2010 data shows that Uganda and Tanzania had only USD 84.5 million and USD 28.8 million consecutively as net errors and omissions compared to Kenya which recorded USD 847 million eight times the combined flow of the two neighboring countries.

The challenge for policy makers in Kenya is in managing the short term surges of capital inflows and the associated vulnerabilities as strong short term capital inflows have contributed to the appreciation of the real exchange rate. Despite the mobility of private short term capital flows, the CBK manages inflation through residual capital controls, prudential regulations and by influencing the nominal exchange rate and in the long run, the real exchange rate. It also intervenes to curb short term volatility that may lead to exchange rate risks, excessive instability in aggregate demand and severe liquidity problems if credit markets are weak (Maina, 2008).

## **Conclusion**

The preceding theoretical and empirical studies show that the relationship between capital inflows and economic growth is partly non causal as the effects of capital flows depend on the macro-economic environment of the host country. The need of foreign capital generally arises with the lack of capital in a host country and low saving and investment ratios. Foreign capital does provide important support to the host economies, though reliance on foreign capital is cautioned as it is associated with high levels of exposure to global crisis and policies of home countries. Volatility of capital flows especially short-term capital flows increase the dangers of capital flight especially in countries characterized by weak financial sectors and macro-economic policies. The nature, type, and composition of capital inflows determine their impact on economic growth.

Policies are a key issue for capital flows, the domestic policy environment plays a significant role in determining the type, and composition of capital flows. A reduction in flows causes an increase in domestic interest rates and reduction in asset prices consequently leading to a depreciation of the real exchange rate and adverse inflation. Hence governments need to formulate appropriate policy responses to the increase and decrease of foreign capital to minimize the economy's vulnerability to fluctuations in capital flows. It seems the most serious concern is not the inflows but the possibility of abrupt stops or reversals that could lead to a financial crisis.

The magnitude of capital flows are influenced by both external and internal shocks. Internal shocks include abrupt policy changes that disrupt the balance between domestic savings and investments or political changes that alter domestic and foreign confidence. On the other hand external factors include changes in interest rates that influence the prices of domestic assets and changes in the regulatory environment which could alter portfolio preferences of investors.

## 4. Research Methodology

### 4.1. Research Approach

This study uses a deductive and quantitative research approach to investigate the impact of capital flows on macro-economic variables of inflation, exchange rate, and interest rates in Kenya.

A quantitative research approach emphasizes the use of quantification in data collection and analysis for ease of deductions and objectivity (Bryman and Bell, 2011). Leedy and Omrod (2010) define quantitative research as an approach focusing on making predictions and explanations with the objective of investigative, checking, and validating presence of relationships. *This study seeks to investigate the impact of capital flows on four macroeconomic indicators; interest rates, inflation, exchange rates, and consumer price index.*

Time series analysis is used in this study to explore the relationship between independent (interest, exchange rates, inflation rates, asset prices, and GDP account balance) and dependent variables (FDI, OVR and foreign borrowing). Vandaele (1983) advocates for the use of time series analysis as it provides a platform for; the description of time series attributes; development of a model to explain patterns in the time series; to forecast future trends in the time series<sup>3</sup>; and to control outliers and abnormal deviations in the time series.

This study utilizes a single equation regression model to investigate the relationship between capital flows and macro-economic variables. This model estimates the long run steady state relation by considering the first equation to estimate the parameters by regression analysis.

### 4.2. Data Analysis and Software

This study uses empirical analysis of quantitative data to investigate the impact of capital flows on various macro-economic variables. The data is on a monthly frequency covering the period January 2005 and December 2012 representing 96 data points. The time series analyses for this study are: capital remittances, foreign direct investment, and external debt.<sup>4</sup> These capital flow statistics represent the biggest proportion of the total capital inflows into Kenya.

#### 4.2.1. Capital Flow Variables

##### Foreign Direct Investment (FDI)

According to the IMF, (2008), FDI is defined as an *investment made to acquire lasting or long-term interest in enterprises operating outside of the economy of the investor.*

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<sup>3</sup> This study does not present a forecasting model

<sup>4</sup> Time series charts for Capital flows are shown in Appendix I.

This refers to capital injections into a country for investment purposes such as development projects, individual investments, business expansion, and startups.

Foreign direct investment has been widely included in studies that examine the relationship between financial development and economic growth, such as Markusen (1995), Caves (1996), Borensztein *et al.* (1998), Berthelemy and Demurger (2000), Obwona, (2001), Alfaro (2003), Zhang and Ram (2002) and Choong *et al.* (2010).

It is anticipated that foreign direct investment will have a positive impact on gross domestic product due to increased output in the economy. On the other hand, foreign currency inflows into the country are expected to have a negative effect on interest rates. Data for these variables was collected from the Central Bank of Kenya statistics.

#### **Foreign Government Borrowing**

Foreign government borrowing represents the total debt of the government from external sources i.e. the cumulative debt of the government from foreign governments, institutions, and individuals. This variable has been included in accordance with Loko *et al.* (2003), and Bordo *et al.* (2010).

It is anticipated that foreign government borrowing would have a negative impact on interest rates due to decreased internal borrowing. On the other hand, government borrowing is anticipated to have a positive impact on the gross domestic product due to increased output. Data for the variables was collected from Central Bank of Kenya Statistics.

#### **Overseas Worker Remittances**

OWR into Kenya represent the total funds sent into Kenya by its citizens working in foreign countries for investment and consumption. According to CBK (2012), remittances into Kenya have been the biggest capital inflow into the country over the last 5 years. Capital remittances are used in this study to investigate their impact on inflation, exchange rates, interest rates and as discussed by Brown (1994), Mesnard (2004) Gyltsos (2005) and Gupta *et al.* (2007).

It is anticipated that capital remittances into Kenya would have a impact on the inflation rates. Capital remittances are bound to increase the disposable income of citizens leading to higher prices for goods and services. Data for these variables was collected from the Central Bank of Kenya Statistics.

#### **4.2.2. Macro-Economic Variables**

This study utilized five macro-economic variables. The choice of the macro economic variables was informed by literature of other scholars, availability of data and challenges in accessing the data from Kenya.

##### **Gross Domestic Product (GDP)**

Gross Domestic product refers to the total output of a country measured in terms of total goods and services produced, total incomes or total expenditure. In this study, GDP represents the difference between the capital and current accounts in Kenya and is included as a measure of economic growth. Due to scarcity and access restrictions on the data available (especially monthly Real GDP) this study utilized the difference between the capital and current accounts. This data for this variable was collected from the Central Bank of Kenya statistics.

It is anticipated the gross domestic product will have a positive relationship with the foreign direct investment, capital remittances, and foreign borrowing.

##### **Interest Rates**

Interest rates refer to the cost of acquiring funds for investment. Interest rates refer to the cost of acquiring funds for investment. In this study, the average commercial bank lending rate was used as a proxy to capture the effect of asset market prices in influencing capital flows in the country. The data for this variable was collected from the Central Bank of Kenya Statistics.

It is anticipated that a positive relationship exists between interest rates, foreign direct investment, and OWR implying increased competitiveness in the country. However, a negative relationship is anticipated between interest rates and foreign borrowing as when interest rates increase it becomes more expensive for the government to service its debt.

##### **Exchange Rates**

Exchange rates refer to the cost of acquiring one unit of a currency using another currency. It is the value between two sets of currencies. In this study, exchange rates refer to the value of the Kenya shilling against the United States Dollar. The data was sourced from the Central Bank of Kenya statistics.

It is anticipated that exchange rates will have a positive relationship with foreign direct investment, foreign borrowing, and OWR and thus are expected to be a contributing factor to liquid short term liquidity flows.

### **Inflation Rates**

Inflation rates refer to the general rise in the prices of goods and services over a period of time. Inflation rates statistics in Kenya are computed and compiled by the Kenya National Bureau of Statistics.

It is anticipated that OWR will have an inflationary impact on the inflation rates due to increased consumer purchasing power and thus increase consumption.

### **Asset Prices:**

Asset prices refer to the total value of assets purchased by investors (IMF, 2008). It refers to the market prices of assets and liabilities in a country (IMF, 2008). In this study, the asset prices refer to the total value of securities listed in the Nairobi Securities Exchange as measured using the NSE20SI. Asset prices were used in line with the study by Schularick (2006), Obstfeld and Taylor (2004) and Mauro, Sussman and Yafeh (2006).

### **4.3. Data Limitations and Assumptions**

The statistics were sourced from different sources due to scarcity of data hence the accuracy of each data set may therefore vary in consistency. The time period was initially set for ten years but due to limited availability of monthly forecasts the forecast period was set for 8 years. Accessing data from Central Bank of Kenya and the Kenya Bureau of Statistics was very cumbersome and in most cases data provided did not cover the entire period of the study. This limited the variables used in the study and frequency of data to monthly. On the other hand, monthly data is considered to contain excessive noise which inhibits the identification of relationships (Brooks *et al.*, 2004). The methodology assumes that there is no interaction between capital flow variables and thus they can be modeled as separate dependent variables in a univariate rather than multivariate model. Software restrictions did not allow for added lags in the data which could be useful to inference relationships (Castren, 2005)

Statistical Package *EViews* was used for data analysis.

### **4.4. Descriptive Statistics of Data Set**

A summary of the descriptive statistics are set out in Table 4.1 below. The average monthly remittances into Kenya were US\$ 55,080.78 million for the period 2005 - 2012. However, there were significant variances in the levels of remittances as indicated by the standard deviation (21,140.008). The variances to the remittances were higher than the mean as implied by the skewedness statistics (0.882) indicating that in most months, remittances into the country were higher than the mean.

On average the government borrowed US\$ 6.813 million from external (foreign) sources. The standard deviation of government borrowing was 1.1055 with a skewedness statistic of 0.870.

The mean FDI into Kenya was US\$ 113.719 million per month with variances of 190.065. The FDI was however skewed to the right with a skewedness of 1.807 indicating that in most months the monthly FDI surpassed the mean FDI.

The mean exchange rate (US\$/Kshs) for the period was 76.760 with a standard deviation of 7.653. The skewedness statistic was 0.499 indicating that most of the months experienced higher exchange rates than 76.76.

The mean Inflation rate in the country of the period 2005 - 2012 was 12.823% and a standard deviation of 7.630. This implies that on average the prices of goods and services in the country increased by 12.823%. However, the skewedness statistics of 0.674 implies that in most months the inflation rate was higher than the average inflation rate i.e. there was a high probability of the country having a higher than average inflation rate. Further, the inflation rates were very volatile as depicted by the high standard deviation.

The mean commercial bank lending rates for the period 2005 – 2008 were 14.717% with a standard deviation of 2.148. The skewedness statistic of 1.755 indicates that most months in the period had interest rates higher than 14.717%.

**Table 2: Summary of Descriptive Statistics**

	ASSET_PRICE	EXCHANGE	GDP	INFLATION	INTEREST	REMMITANCES	FOREIGN DEBT	FDI
Mean	54.845	76.760	4.465	12.823	6.552	55080.781	6.813	113.719
Maximum	86.047	101.270	7.390	31.540	18.300	106198.000	9.600	636.150
Minimum	31.858	61.900	0.570	3.180	1.570	26056.000	5.360	-55.310
Std. Dev.	14.779	7.653	1.553	7.630	2.954	21140.008	1.106	190.065
Skewedness	0.604	0.442	-0.465	0.664	0.693	0.882	0.870	1.807

## 5. Methodology

### 5.1. Introduction

This study seeks to investigate the impact of capital flows on various macro-economic variables. The analysis consists of a three step procedure: (i) the variables are tested for unit roots using the Augmented Dickey Fuller (ADF) and Phillip Perron (PP) tests, (ii) the empirical model are produced, and (iii) the resulting model is tested for misspecification using various stability tests.

### 5.2. Step 1: Unit Root Testing

Before proceeding with the analysis, it is necessary to understand the degree of integration of the variables in order to avoid spurious regression (Engel and Granger, 1987). Hence augmented Dickey-Fuller (ADF) (1979, 1981) and Phillips-Perron (PP) (1988) unit root tests are performed on all of the variables.

#### Augmented Dickey Fuller Tests (Dickey & Fuller, 1979, 1981)

The ADF tests is an autoregressive based equation for unit root testing (Glynn, Perera and Verman, 2007). The unit root tests are an adequate test for stationarity. Tests for stationarity are undertaken to ensure that the results and findings of the data are valid. The ADF tests are premised on the null hypothesis ( $\alpha_j = 0$ ) against the alternate hypothesis that  $\alpha_j < 1$ . The ADF is expressed using the following equation:

$$\Delta y_t = \mu + \beta t + \alpha_j y_{t-1} - \sum_{j=1}^p C \Delta y_{t-j} + \varepsilon_t \quad (1)$$

Where

$\alpha_j$	=	0 (null hypothesis)
Y	=	Time series
T	=	Trend
$\Delta$	=	First difference

Because the ADF test fails to account for existing breaks in time series data, it lowers its ability to reject a null hypothesis (Glynn *et al.*, 2007). Therefore the Phillip Perron test is used when diagnostics reveal significant values for normality, autocorrelation, and heterogeneity. (Khozan, 2010)

#### Phillips-Perron Tests (Phillips and Perron, 1980)

The PP tests are an alternative test to the ADF unit root test. However, as opposed to the ADF, the PP tests for serial correlation and heteroskedacity using the error terms (Glynn *et al.*, 2007). The PP tests are premised on the null hypothesis  $\pi = 0$  and the alternate hypothesis  $\pi < 1$ . The equation for PP tests is expressed as follows:

$$\Delta Y_t = \beta + \pi Y_{t-1} + \mu t \quad (2)$$

Where  $\pi = 0$  (null hypothesis)

The test addresses the question that generating data for  $y_t$  might have a higher order of autocorrelation than is admitted in the test equation - making  $y_{t-1}$  endogenous and thus invalidating the Dickey–Fuller  $t$ -test. Whilst the ADF test addresses this issue by introducing lags of  $\Delta y_t$  as regressors in the test equation, the Phillips–Perron test makes a non-parametric correction to the  $t$ -test statistic (Davidson and MacKinnon, 2004).

### 5.3. Step 2: Model Estimation

This study utilizes a single-equation regression model to investigate the relationship between the capital flows (FDI, remittances, and foreign borrowing) and the explanatory variables (interest rates, exchange rates, inflation rates, GDP, asset prices). This empirical approach has been chosen in accordance with the literature that examines the relationship between FDI and macroeconomic variables, including Frankel and Rose (1994), Sjaastad and Scacciavillani (1996), Sarno and Taylor (1999), Rime (2001), Cady and Gonzalez-Garcia (2007), Gay (2008), and Novitzky (2010).

The model used to conduct the empirical analysis can be summarized using the following single equation:

$$V = \alpha + \beta \text{ inf}(t) + \beta \text{ gdp}(t) + \beta \text{ exchange}(t) + \beta \text{ int}(t) + \beta \text{ (ass-price)} \quad (3)$$

Where  $\text{Ln}V$  = Dependent variables i.e. remittances, FDI and foreign borrowing

$\alpha$	=	Constant
$\beta$	=	Coefficients
$\text{inf}(t)$	=	Inflation at time $t$
$\text{gdp}(t)$	=	Gross Domestic Product balance at time $t$
$\text{exchange}(t)$	=	Exchange rate at time $t$
$\text{int}(t)$	=	Interest rates at time $t$
$\text{ass\_price}$	=	Asset Price

#### 5.4. Step 3: Stability Testing

Stability of the empirical model is established using the following five techniques: Q-statistic test for autocorrelation, Jarque-Bera test for normality, Breusch-Godfrey LM test for serial correlation, Breusch-Pagan-Godfrey test for heteroskedasticity, and the Durban-Watson statistic.

##### 5.4.1. Q-statistic Autocorrelation Test

The Q statistic is a measure of high order serial correlation in the variables. The Ljung-Box Q statistic identifies any correlation in the residuals. If no correlation exists then the Q statistic is not significant at the 0.05 significance level while significance below 0.05 indicates presence of autocorrelation. The Q-statistic is provided by the following equation:

$$\delta = n(n+2) \sum_{k=1}^h \frac{\hat{\rho}^2_k}{n-k} \quad (4)$$

Where  $n$  = sample size

$\hat{\rho}^2_k$  = sample autocorrelation at lag  $k$

##### 5.4.2. Jarque-Bera Normality Test

The Jarque Bera Normality test measures the difference in the distribution of the variables to that of a normal distribution. Thus the test indicates whether the distribution of the data is similar to the Gaussian distribution which has a kurtosis statistic of 0 (Graphpad, 2007) using the following equation:

$$JB = \frac{n}{6} \left( S^2 + \frac{(K-3)^2}{4} \right) \sim \chi^2_2 \quad (5)$$

Where  $n$  = Sample Size

$S$  = Skewness

$K$  = Kurtosis

##### 5.4.3. Breusch-Godfrey LM Serial Correlation Test

The Breusch – Godfrey Serial Correlation tests measures non stationarity, serial correlation and lagged dependence in the variables in the model (Macrodados, 2006 and Lott, 2010). The Breusch Godfrey Test uses the sample residuals in the regression model. The Breusch Godfrey Correlation tests consist of the following equation (Lott, 2010):

$$\hat{u}_t = \delta_1 + \delta_2 X_{2t} + \dots + \delta_k X_{kt} + \lambda_1 \mu_{t-1} + \dots + \lambda_p \mu_{t-1} + \omega_t \quad (6)$$

#### 5.4.4. Breusch-Pagan-Godfrey Heteroskedasticity Test

The Breusch Pagan Godfrey test measures heteroskedasticity in the regression model by assessing the squared residuals of the initial regression model (Khozan, 2010). Heteroskedasticity is a problem encountered in cross sectional data when the variance of the disturbance is not constant (Gujarati and Porter 2009).

Though it does not affect the parameter estimates it makes the variance of the estimated parameters biased hence the t-statistic cannot be trusted.

#### 5.4.5. Durban-Watson Statistic

Durban Watson (DW) statistic establishes the linear relationship between residuals in the model using the hypothesis that the error values in the regression have a first order auto regression component (Sherrod, 2010 and Johnson, 2000). The DW statistic is determined from the following equation:

$$DW = \frac{\sum_{t=2}^n (\hat{u}_t - \hat{u}_{t-1})^2}{\sum_{t=1}^n \hat{u}_t^2} \quad (7)$$

Where  $\hat{u}$  = the estimated residuals

$n$  = number of observations

A DW statistic close to 2 indicates no correlation in the residuals, while if the DW falls outside of the DW bands then the residuals are correlated and thus not white noise (Novitzky, 2010).

## 6. Research Findings & Discussions

### 6.1. Discussion and Empirical Results

This section presents and discusses the results of the empirical analysis used to investigate the impact of capital flows on a selection of macro-economic variables. First, the results of the unit root tests are presented. Next, the results of the various misspecification stability tests are presented. Finally, the results of the empirical models are discussed.

### 6.2. Unit Root Test Results

The results of the ADF and PP unit root tests are presented in Table 3 below, and show real values of foreign direct investment, capital remittances and foreign debt had unit roots. However, the logged values of capital remittances did not have any unit root and are therefore non-stationary. Values for Public debt and remittances were differenced to make them non-stationary.

**Table 6.1: Summary of Unit Root Tests**

Variable	ADF test with intercept		PP test with intercept	
	Prob.	Test Statistic	Prob.	Test Statistic
FDI	0.3152	-2.526	0.4754	-2.215
Remittances	0.1195	-0.203	0.2027	-0.203
Public Debt	0.1301	-3.029	0.1421	-0.189
Ln Remittances	0.003	-4.478***	0.005	-4.285***
Ln Public Debt	0.014	-3.942**	0.0149	-3.919**
LNFDI	0.6217	-1.948	0.4589	-2.246
LNAssetprice	0.301	-2.557	0.308	-2.541
DLNpublic Debt	0	-9.567	0	-14.840
DLNremittances	0	-13.629	0	-20.440

\*\*\*\* indicates rejection of null hypothesis at 10%, 5% and 1%

\*\* indicates rejection of null hypothesis at 10% and 5%

### 6.3. Stability Tests:

Having examined the stationarity conditions of the variables, the empirical models are then produced using the following equations:

$$\begin{aligned}\text{FDI} &= 4.562 - 0.0891\text{inf} + 0.0507 \text{gdp} - 0.949\text{exch} - 0.0167\text{int} \\ \text{Remittances} &= 0.443 + 0.090 \text{inf} + 0.011 \text{gdp} + 3.477 \text{exch} + 0.199 \text{int} + 0.0418\text{ass\_pr} \\ \text{Debt} &= 15.852 + 0.01 \text{inf} + 0.029 \text{gdp} + 1.440\text{exch.} + 0.083 \text{int.} + 0.080 \text{ass\_pr}\end{aligned}$$

Where *int* = interest rates  
*Inf* = Inflation rates  
*Exch* = Exchange rates  
*Ass\_pr* = Asset Prices

Before considering the implications of the resulting models it is necessary to first determine that the models are correctly specified and stable. Hence, the next step is to conduct the stability tests. The results of the stability tests are summarized in Table 4 below.

The Jarque Bera normality tests show that the residuals are normally distributed, while the Breusch-Pagan-Godfrey and Breusch-Godfrey tests show that there is no heteroskedasticity or serial correlation. In addition, the Durban Watson statistics are close to 2 and thus indicate the absence of autocorrelation (Public debt model Durban Watson statistic = 1.816, FDI model = 1.812 and the Durban Watson Statistic for Remittances model was = 1.940). Thus, having determined that the empirical models are correctly specified and stable, the next step of the analysis is to discuss the results.

**Table 6.2: Summary of Stability Tests**

Test	FDI	REMITTANCES	PUBLIC DEBT
<b>Jarque Bera Test</b>			
JB statistic	0.443	0.636	0.553
Prob.	0.801	0.728	0.758
<b>Breusch -Godfrey Serial Correlation LM test</b>			
F statistic	115.229	121.194	115.223
Obs R. Squared	64.471	70.43	69.471
Prob. F (2,88)	0	0	0
Prob Chi Square	0	0	0
<b>Breusch Pagan Godfrey Heteroskedasticity Test</b>			
F- Statistic	7.957	10.072	10.07241
Obs R-Squared	24.876	29.46	29.46011
Prob. F	0	0	0
Prob Chi Square	0	0.002	0.001
<b>Durban Watson Statistic</b>	1.816	1.94	1.816

#### **6.4. Empirical Results**

The results of the three empirical models are discussed in Tables 5-7 below.

##### **Model I: Foreign Direct Investment**

The results show that FDI is significantly impacted by interest rates at 5% significance levels and exchange rates at 10% significance levels as shown in Table 5. Nevertheless, the impact of exchange rates and interest rates on FDI was negative. This implies that as the interest rates and exchange rates in the country increased, the foreign direct investment into the country decreased.

Despite common expectations of increase in FDI as a result of increases in interest rates (Choong *et al.* 2010; Osoro, 2013) this study found that increases in interest rates led to decreases in FDI. Plausible explanations could be the losses in value of exchange rates (depreciation of the local currency) which also led to decreases in FDI. Therefore, gains on interest rates were eroded on exchange rate losses therefore setting off any gains. The results show that GDP did not have any significant effect on FDI in Kenya.

This findings are in accordance with the findings of Markusen (1995), Caves (1996), Borensztein *et al.* (1998), Berthelemy and Demurger (2000), Obwona, (2001), Zhang and Ram (2002) and Choong *et al.* (2010). Kinaro (2006) found that other variables such as trade openness, human capital, real exchange rate, and inflation affected FDI flows and not macro-economic variables. Opolot *et al.*, (2008) using panel data for SSA, also found that terms of trade, quality of institutions, infrastructure, and the rate of return influenced the amount of FDI flows. Additional variables such as government consumption, financial development, natural resources, wages and political rights were found to be insignificant.

**Table 6.3: FDI Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.5621	2.2814	1.9997	0.0486
LNEXCHANGE	-0.9486	0.4870	-1.9481	0.0546
LNGDP	0.0507	0.0581	0.8734	0.3848
LNINFLATION	-0.0891	0.0714	-1.2471	0.2157
LNINTEREST	-0.1672	0.0889	-1.8816	0.0432
R-squared	0.10805	Mean dependent var		0.017692
Adjusted R-squared	0.057371	S.D. dependent var		0.367709
S.E. of regression	0.357005	Akaike info criterion		0.839568
Sum squared resid	11.21582	Schwarz criterion		1.001905
Log likelihood	-33.45967	Hannan-Quinn criter.		0.90514
F-statistic	2.132052	Durbin-Watson stat		1.978429
Prob(F-statistic)	0.068944			

**Model II: OWR Model**

The results show that remittances are significantly impacted by asset prices and inflation rates at 10% significance levels and exchange rates and interest rates at 1% significance levels. This is shown in Table 6.

This results show that as the exchange rates, inflation rates, asset prices, and interest rates increased in the country, the levels of remittances into the country also increased. This is in accordance with the findings of Osoro (2013) who noted that the biggest proportion of remittances into the country were used for consumption purposes while a very small proportion was used for investment. In this study, the increase in positive impact of inflation rates on remittances can be explained by an increase in the capital inflows as citizens abroad seek to

support their families in Kenya. Therefore as the prices of goods rise more funds must be remitted to support the higher cost of living standards. Further, increases in exchange rates led to increase in remittances into the country due to increase in the value of the remittances in the local currency i.e. as the exchange rate increased, the value of remittances in local currency also increased leading to higher purchasing power. Increases in interest rates also led to increases in the level of remittances into the country. Whilst most remittances are used by for consumption some diaspora working abroad did seek to exploit profitable opportunities in the country.

However, GDP did not have any significant impact on remittances in Kenya. This could be attributed to the use of remittances for consumption rather than production and investment purposes. This is in line with the findings of Mensard (2004), Gupta *et al.* (2007), IMF (2008), and Osoro (2013), who noted that the impact of capital remittances on economic growth is dependent on the use of remittances for consumption or investment purposes.

**Table 6.4: Remittances Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.44318	3.219563	0.137652	0.891
LNASSETPRICE	0.4179	0.2282	1.8315	0.070
LNEXCHANGE	3.4770	0.5637	6.1686	0.000
LNGDP	0.0111	0.0811	0.1373	0.891
LNINFLATION	0.0907	0.0551	1.6468	0.103
LNINTEREST	0.1993	0.0607	3.2840	0.002
R-squared	0.418082	Mean dependent var		17.75623
Adjusted R-squared	0.385753	S.D. dependent var		0.36722
S.E. of regression	0.287805	Akaike info criterion		0.407393
Sum squared resid	7.454843	Schwarz criterion		0.567665
Log likelihood	-13.55485	Hannan-Quinn criter.		0.472177
F-statistic	12.93221	Durbin-Watson stat		0.28556
Prob(F-statistic)	0			

### **Model III: Foreign Debt**

Public foreign debt is significantly impacted by exchange rates and interest rates at 1% significance levels. This is as shown in Table 7 below. Increases in exchange rates and interest rates in the country led to increases in public foreign debt. The increase in foreign debt as a result of increase in exchange rates could be explained by the higher value of foreign debts when converted into local currency i.e. as the exchange rate increases, one unit of the foreign

currency is worth more in Kenyan shillings, therefore higher exchange rates denote more funds in terms of local currency but lower value in terms of the foreign currency. On the other hand, increases in the interest rates in the country led to an increase in the demand for foreign debt as it was cheaper to the government.

The results of this study show that GDP did not have any significant impact on foreign debts. This is in line with the literature of Lin and Sosin (2001), Pattilo et al. (2002), Loko et al. (2003), Reinhart and Reinhart (2008), and Bordo et al. (2010). The findings of this study are also in accordance with those of Pattilo *et al.* (2002) who noted that in countries with high levels of corruption and a lack of transparency, foreign debt is usually misappropriated or embezzled by government officials<sup>5</sup> rather than being used for production thus has not effect on economic growth.

**Table 6.5: Public Debt Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.85166	1.264604	12.53488	0.00
LNASSETPRICE	0.0807	0.0896	0.9007	0.37
LNEXCHANGE	1.4400	0.2214	6.5042	0.00
LNGDP	0.0295	0.0319	-0.9266	0.36
LNINFLATION	0.0100	0.0216	0.4612	0.65
LNINTEREST	0.0834	0.0238	3.5011	0.00
R-squared	0.523341	Mean dependent var		22.62696
Adjusted R-squared	0.49686	S.D. dependent var		0.159372
S.E. of regression	0.113046	Akaike info criterion		-1.461581
Sum squared resid	1.150148	Schwarz criterion		-1.301309
Log likelihood	76.15588	Hannan-Quinn criter.		-1.396796
F-statistic	19.76284	Durbin-Watson stat		0.323939

<sup>5</sup> Latest Transparency international statistics place Kenya at position 163 in the list of most corrupt countries (Transparency, 2013).

## 7. Conclusions and Recommendations

### 7.1. Conclusions

This study examined the impact of three capital flows these being foreign direct investment, OWR, and foreign debt on exploratory variables of interest rates, exchange rates, inflation rates, asset prices and gross domestic product using a single-equation regression modeling approach.

The findings of the study are used to answer the research questions of the study:

#### 7.1.1. *What is the Impact of FDI, Remittances and Foreign Debt on Economic Growth?*

This study sought to identify the impact of FDI, remittances and foreign debt on economic growth as measured by GDP balances on the capital and current account. The results of this study found that GDP does not significantly impact any of the capital flows. As result this study concludes that capital flows into Kenya do not have any significant effect on economic growth.

The conclusion of this study is informed by similar conclusions by Kiragu (2001) and Choong *et al.*, (2010) who noted that capital flows do not have any effect on economic growth. Reasons presented for the absence of the impact are: lack of support structures especially financial structures (CBK, 2012: Kiragu, 2010 and Osoro, 2013), use of remittances predominantly for consumption rather than investment (Osoro, 2013: IMF, 2008: Mesard, 2004), misuse of public funds in Kenya and high corruption levels in the government (Kiragu 2010: Nyawira 2011: Musau, 2011: Mwenda, 2013).

#### 7.1.2. *What is the impact of Macro-economic Variables on Capital Flows?*

The results of this study show that foreign direct investment was negatively impacted by exchange rates and interest rates. This indicates that as the levels of exchange rates and interest rates increase in the country, the foreign direct investments into the country reduce. This pattern was explained by the impact of loss in value of investments as the exchange rates led to depreciation in the value of foreign investments in the country. In addition, increases in interest in the country led to lower levels of FDI due to depreciation in the value i.e. despite increase in returns on assets, the capital losses due to foreign exchange were higher and thus overall negative returns on investment. This led to decrease in FDI in the country.

Remittances were positively impacted by asset prices, exchange rates, inflation rates, and interest rates. This results show that as the asset prices, exchange rates, inflation rates, and interest rates in the country rose, the level of remittances also rose. This is attributed to the exploitation of profitable opportunities (interest rates and asset prices) by citizens working abroad, increase in the value of remittances in the local currency

(exchange rates), and demand for higher remittances due to increased cost of living (inflation).

Foreign debt was positively impacted by exchange rates and interest rates. This implies that as the interest rates and exchange rates rose, the levels of foreign debt in the country rose. This shows that as the cost of locally borrowed funds rose (interest rates) the government sought cheaper funds from external sources. In addition, as the exchange rate rose, the foreign debt levels increased partly due to two reasons: the value of the current foreign debt increases as the exchange rate increases (CBK, 2012: Nyawira 2011: Musau, 2011 ) and the government borrows externally as the value of the local debt is higher in Kenyan shillings.

## **7.2. Policy Recommendations**

Based on the findings of this study, the following policy recommendations are applicable:

The government should refocus its efforts on establishing stronger financial institutions and reduce corruption for capital flows to have a significant impact on economic growth. Capital inflows present various qualitative benefits such as: knowledge and technology transfer and increase in market linkages (De Mello, 1999: Durham, 2004). It is expected that as the levels of technology improves, the productivity and market demand will eventually lead to economic growth.

This study attributed the lack of impact of GDP on foreign debt to high levels of corruption, funds misuse, and misallocation of resources (Kiragu, 2010). This study recommends that the government undertakes urgent measures to reform the public service, financial management practices and resource allocation in the country. The government must develop structures to detect, protect, and punish corruption and resource misuse within the government. This is especially with the revelations that over Kshs.300 billion (US\$ 3.6 billion) could not be accounted for in the financial Year 2012/2012 while at the same time the foreign debt in the country rose by over Kshs. 100 billion (US\$ 1.2 billion) (GOK, 2012).

This study recommends that the government must be proactive in the management and stability of exchange rates and interest rates in the country. This is in line with the findings that interest rates and exchange rates had significant impacts on FDI, Remittances and foreign debt in the country. As a policy development institution, the Central Bank of Kenya must ensure that the exchange rate and interest rates are maintained at rates that are beneficial to the economy.

As noted by Mensard (2004), capital remittances into any country have an impact on economic growth if used for investment rather than consumption uses. The government must therefore take administrative measures to ensure that adequate measures to monitor capital remittances into the country and provide incentives for the use of capital remittances for investment purposes. This could be achieved with the provision of government initiated investment

platforms for Kenyans in diaspora and provision of tax holidays/exemptions for capital remittances used for investment purposes.

### **7.3. Recommendations for future Research**

The following issues were identified in the course of the research and could form potential topics for research:

Firstly, the effect of capital flows on asset prices especially listed shares, bonds, and securities in the Nairobi Securities Exchange. This study will identify any causal linkages between capital flows specifically equity and bond flows on asset prices.

Secondly, the effect of capital flows on the transmission mechanisms of household expenditure and credit extension. This study identified that capital remittances had a negative impact on economic growth with the plausible reason that Kenya is consumption led economy rather than investment or savings focused. Therefore, the investigation on the effect of capital flows on these transmission mechanisms could identify if indeed capital flows have an effect on household consumption and credit card expenditure.

Lastly, the factors that determine the composition of capital flow in Kenya. This study found that capital flows are not significantly impacted by certain macro-economic variables giving plausible causes for the same. Research should be focused on the country specific factors influencing the composition of capital flows.

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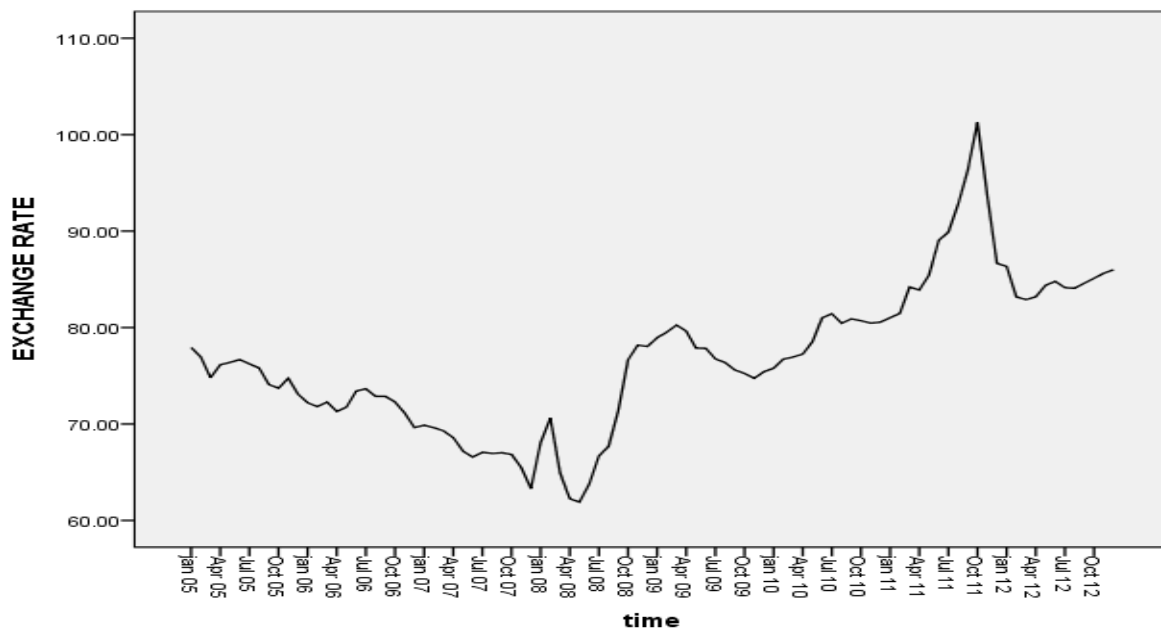
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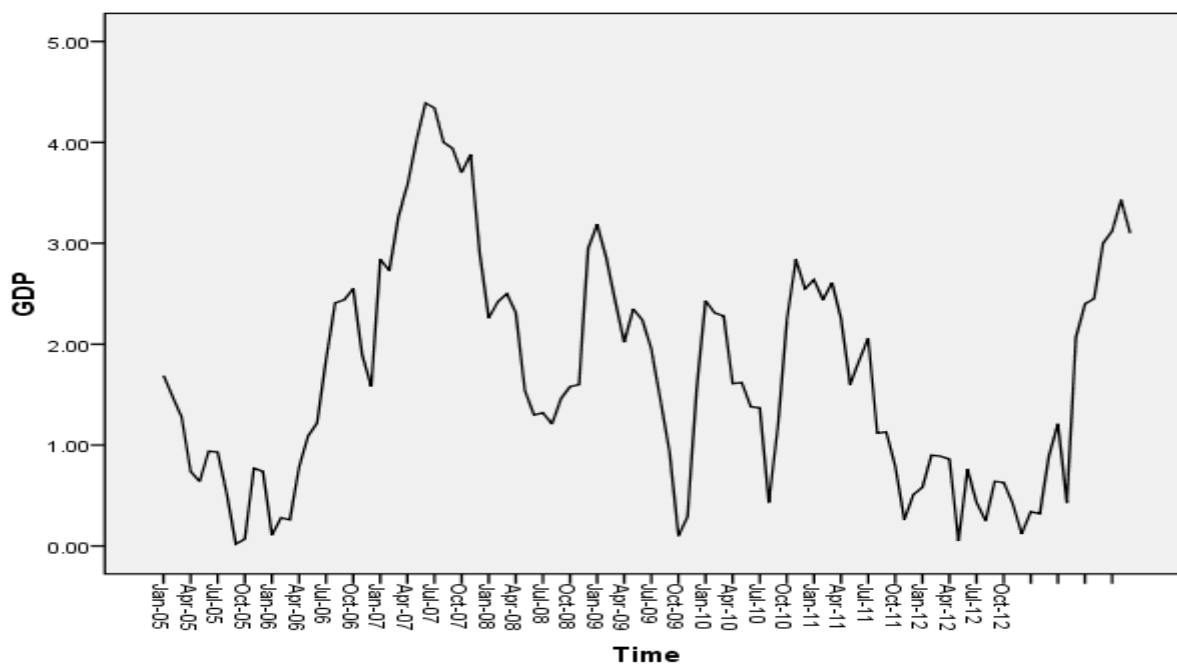
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## Appendix A: Time Series Charts for Variables

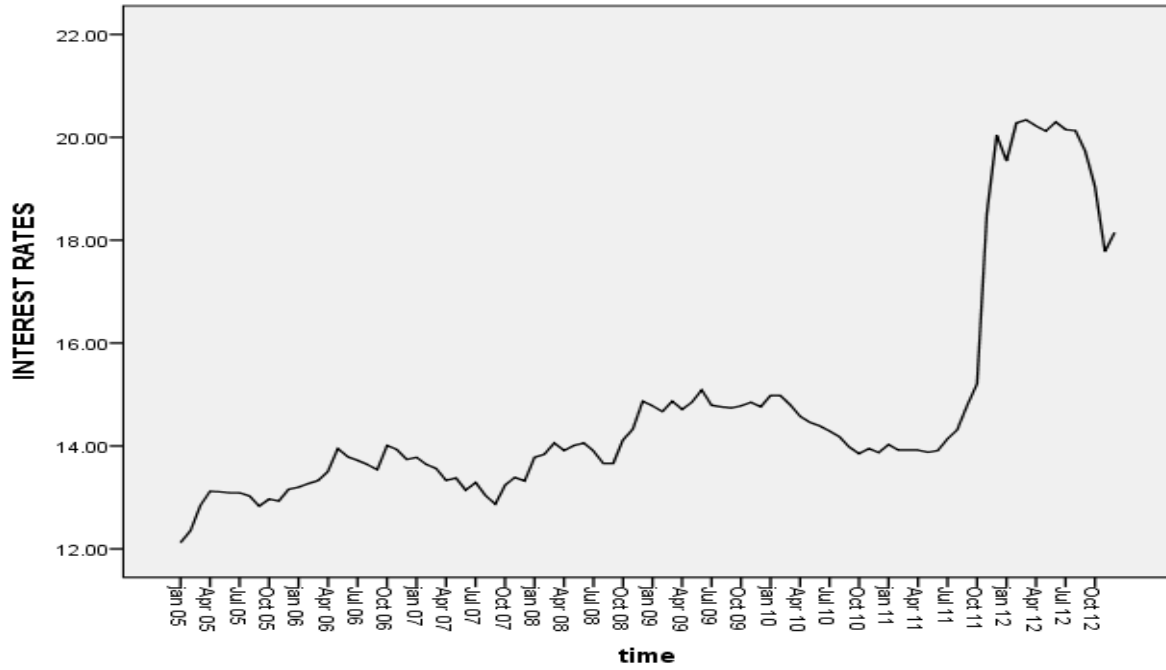
### A.1: Exchange Rates



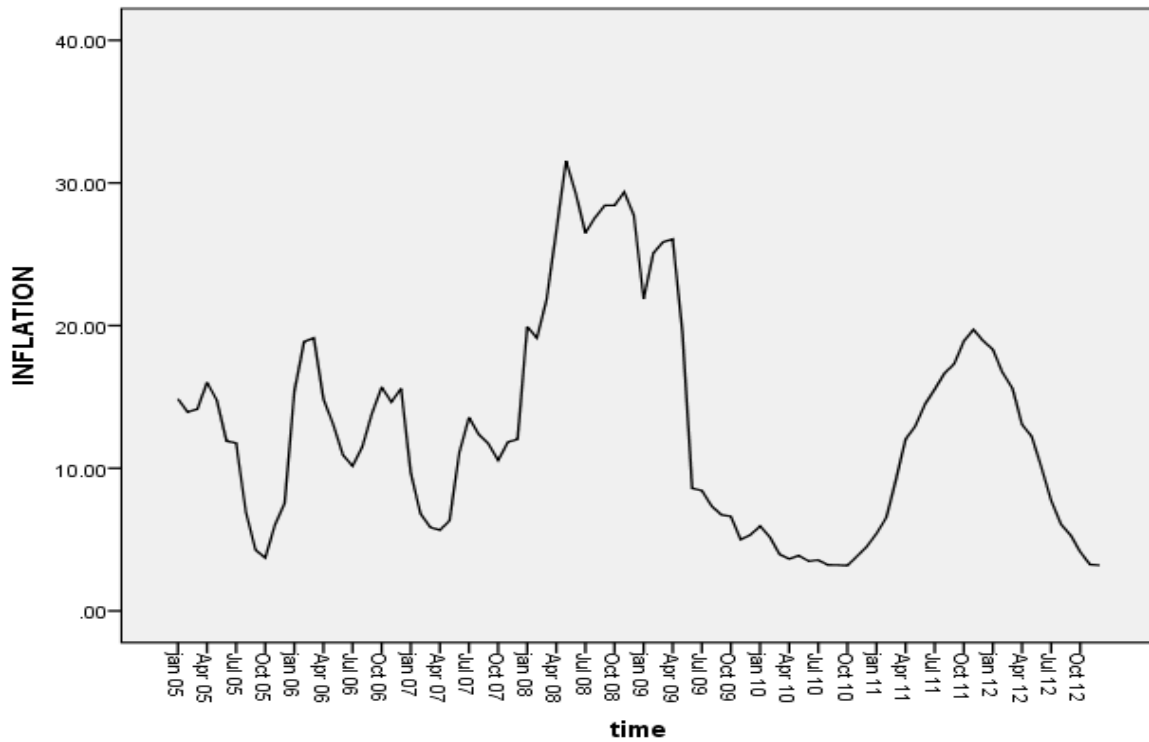
### A.2 GDP



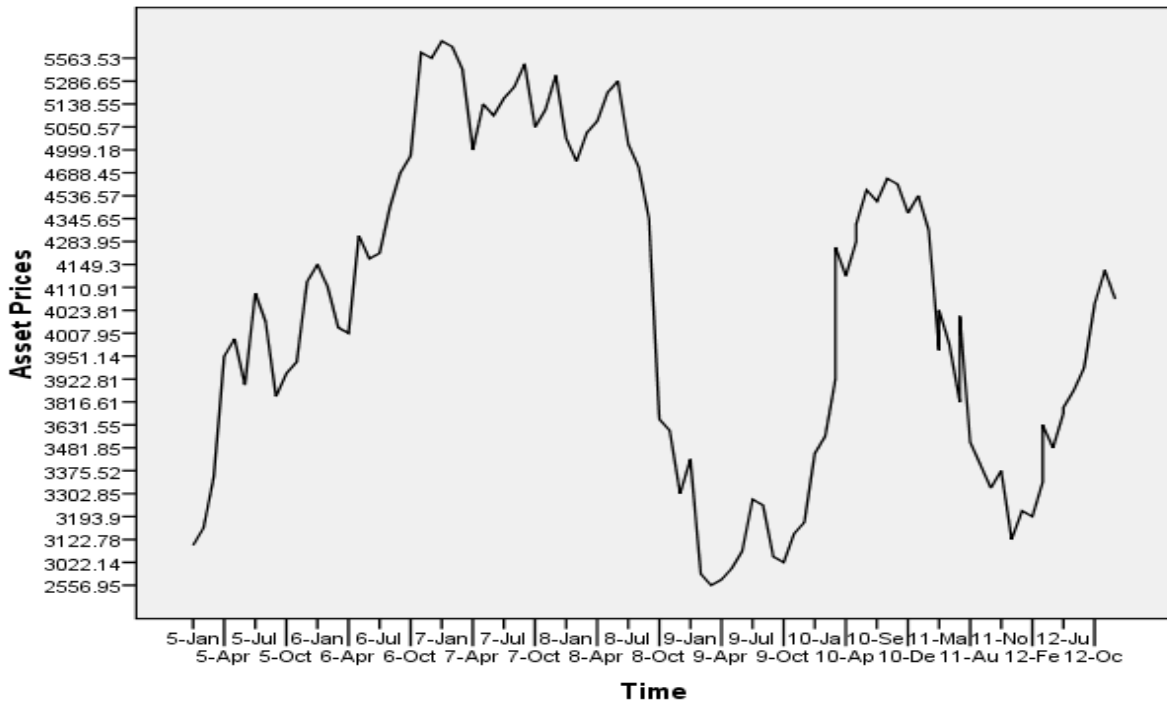
### A.3 Interest Rates



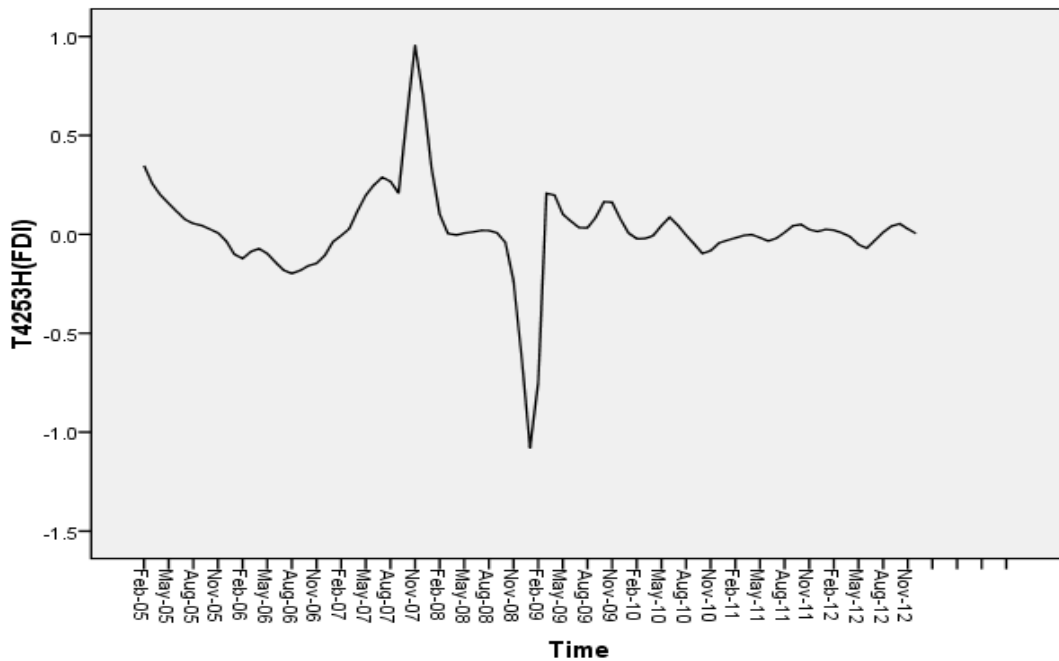
### A.4 Inflation Rates



### A.5 Asset Prices

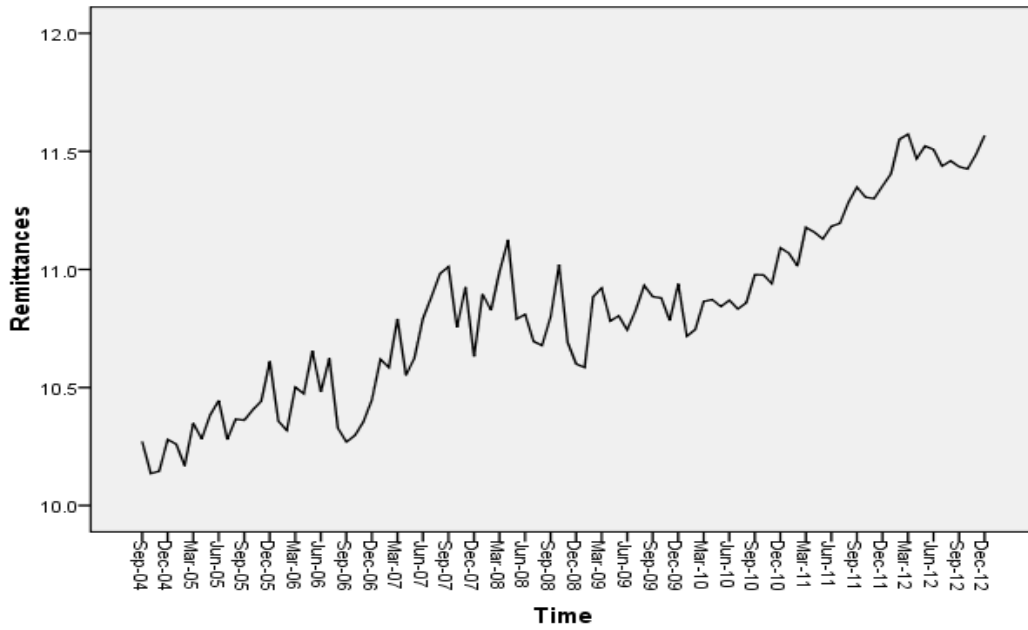


### A.6 FDI



Transforms: natural log, difference(1)

### A.7 Remittances



**A.8 Public Debt**

