EFFECTS OF MACROECONOMIC DETERMINANTS ON FOREIGN EQUITY FLOWS AMONG THE LISTED FIRMS IN KENYA

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Abstract

Due to the growing concern about the Kenyan economy among others being exposed to various kinds of risks especially of portfolio flows reversal, this study was motivated by the need to find out the macroeconomic determinants of portfolio equity flows among the listed firms in Kenya. This study focused on investigating these causative agents influencing foreign equity investors to invest in a developing economy such as Kenya and specifically those agents that are macroeconomic in nature such as inflation, exchange rates and interest rates. The study applied a descriptive research designs to organise, analyse and present data in a manner that produced adequate evidence to draw conclusion. It also utilised the various agreeable estimation techniques and tests such as Autoregressive Distributed Lag model, and Vector Error correction model. This study found that the net portfolio inflows to the Kenyan economy are influenced by exchange rate, inflation and interest rate differential, Inflation being the only endogenous factor with a negative impact. The results also indicate that there is significant Granger causality all the endogenous variables and the net portfolio inflows.

Keywords: Foreign Equity Flows, exchange rate, interest rate deferential, inflation

INTRODUCTION

In the recent past, there has been growing concern about the possibility of capital flight among most developing countries mostly across Sub-Saharan Africa. This means that developing most developing country have mostly attracted short term financial flows like Foreign portfolio flows which are highly volatile and exposes the recipient economies to various risks other than of the long term capital flows such as FDI, ODA etc. all these movements have been brought about by liberalization and globalization which has increased the international capital mobility. The Foreign portfolio flows is categorized into foreign equity and bond flows and are the main are the most of concern all the types of financial flows because of its high potentiality of reversal. (Razin & Sadka, 2001) (Razin, Sadka, & Yuen, 1996)

Foreign Portfolio investment occur when foreign investors acquire non-controlling stake of companies in the home country or when they buy corporate or government bonds, or short-term securities (Obiechina & Ukeje, 2013). Unlike foreign direct investors, Portfolio investors typically have less of a role in the decision making of the enterprises with potentially important implications for future flows and for the volatility of the price and volume of positions. In other words the market for these assets is usually more liquid compared to that for direct investments since it's usually easier to sell a stock or bond than a whole company or factory. This means that, investors can easily reshuffle portfolio investments if they lose confidence in their market and hence more volatile compared foreign direct investment. However, on the other side Countries that receive foreign portfolio inflows can find a rapid reversal of these inflows usually the economic or political developments informs the investors to re-evaluate the expected return on their financial assets.

Portfolio investment differs from other forms of foreign investments in several ways. Most important of all is that it provides a direct way to access local financial markets, and thus it can provide liquidity and flexibility. The second distinguishing feature is the fact that it lacks the element of lasting interest and control.

Economic and financial conditions in both the recipient and investor countries are important determinants of foreign investment flows. These FPI reversals have been mostly attributed to the concern that private-sector and government borrowers in emerging market economies could be unable to meet their financial obligations (Beghebo & Apere, 2014). Such destabilizing reversals of foreign investment have been in countries such as Brazil, Argentina, Korea, Mexico and Russia during the late of the 1990s and early 2000s. Bank investment and foreign reserves are also form a major category of capital flows. These include to only the deposit holdings by foreigners also loans to foreign individuals, businesses, and governments.

The equity flows allude to the net inflows specifically from equity securities excluding those recorded as foreign direct investments. They include stocks, shares and depository receipts from abroad and direct purchase of shares by foreign investors in local stock markets.

Trends in global equity flows

Investment policymaking is more complex, divergent and even uncertain. Sustainable development objectives of many countries make investment policies more challenging and multifaceted for investment. Policymaking is also becoming more divergent, considering the variety of approaches with which societies and governments respond to the effects of globalization. This, together with more government interventions, has also reduced the predictability of investment policies by investors. Most investment policy measures introduced in 2016 and 2017 by most economies aimed at investment promotion, facilitation and liberalization. Entry conditions for foreign investors were liberalized in a variety of industries, and numerous countries streamlined registration procedures, provided new investment incentives or continued privatization (Ethridge, 2004).

The world is experiencing rapid growth of capital-market-related policies and instruments designed to promote investment in sustainable businesses and to support the achievement of the Sustainable Development Goals (SDGs). These policies and instruments are emanating primarily from stock exchanges and their regulators, but with strong involvement from other capital market stakeholders such as institutional investors. Stock exchanges are positioned to influence investors and companies in a way few other actors can (through new products and services, as well as through support for regulators in promoting the adoption of market standards).

The digitalization of many capital markets is a key determinant of growth and development of an economy. It increases competitiveness between sectors, better opportunities for trade and entrepreneurship, and capital for assessing international markets. It also gives new way for dealing with some growth development problems. Yet, it comes with a host of policy challenges, including the needs to bridge the digital divide, minimize potential negative social and development impacts, and deal with complex internet-specific regulatory issues. The opportunities and challenges associated with the digital economy are particularly important for developing countries (Ethridge, 2004).

A digitalized market economy has important implications on investment, and investment is crucial for digital development. The adoption of digital technologies has the potential to transform the international capital markets as well as also impact on host countries. And digital development in all countries, especially developing countries in the global digital economy, calls

for targeted investment policies. Foreign portfolio flows that declined dramatically in the second and third quarter of 2013.

Figure 1 Different Forms of Financial Flows All Over the World.
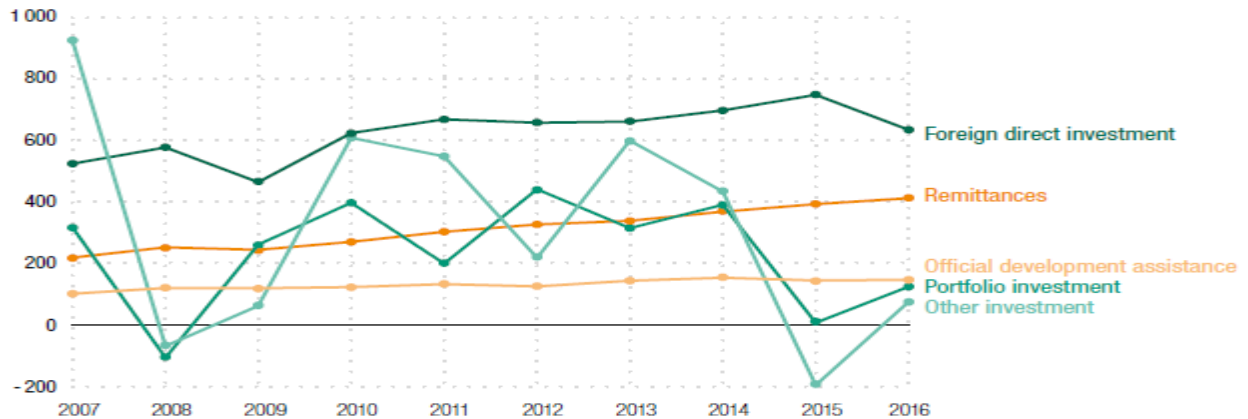
Source: UNCTAD, based on data from IMF

Portfolio flows in sub-Sahara Africa

Portfolio flows on the direction of developing countries generally has transformed through different phases since the start of global liberalisation during the 1980's and early 1990s. African continent was not left out of these changes. In fact has been the propelling factor to this transformation to the world. Sub-Saharan Africa from the late 1990's and early 2000's, experienced a constant increase in Portfolio flows until the come up of the Asian crisis in 2001. The Asian crisis, made Africa record a huge decline in PI by 441 percent between 1995 and 2008 (from USD$11 billion to USD$3.2 billion) (Klugman, 2011).

However, since 2003 PI have considerably grown; as much as USD 22.5 b in 2006, even though there has been a moderate dropping from USD 22.5 billion in 2006 to USD 14.4 billion in 2007 then continued to worsen in 2008 to as a negative flow of USD 24.6 billion. However, since 2011, they have been steadily rising mainly due to global financial liberalization as well as improved security situations in most Africa (IMF 2013).

Likewise, to equity flows, bond flows has been volatile over the period following the global financial crisis especially in the late 2007. Bond flows rose to over USD 7 billion in 2007 to the highest amount of flow before the global financial crisis. This could be attributed to the Nigerian and Ghanaian economy, which issued bonds internationally for the first time. However, in 2008 there was a drastic drop in flows as bonds issues were withheld due to the global financial crises in 2007- 2008. A slight recovery was seen from 2009 through 2011 where bond

flows grew to about US$2 billion in 2009 and US$6 billion in 2011. (Massa et al., 2012) (Wang et al., 2013).

Equity flows in Kenya

Kenya's economy is a market-based economy. It functions as a commercial, economic, technological and logistical leader in East Africa. It's also considered a regional financial centre; because of it is strong industrial base with a young, educated and English speaking population. Foreign investors have same treatment as national investors from administrative and judicial authorities. Among the factors that may discourage investment in the country are: corruption, a slow judicial system, high unemployment and poverty, recent security issues related to terrorism and crime, Inter-ethnic tensions, costly skilled labour, the high cost of energy and the instability of the electricity distribution system, poor infrastructure, recent uncertainty concerning the capital constitution of foreign companies and administrative difficulties in obtaining work permits for instance Foreigners are not permitted to own land in Kenya (they can rent land for 99 years).

Net financial inflows in Kenya increased by 9.5 per cent to KSh 420.0 billion in 2016. Other investment inflows increased to KSh 415.4 billion (a surplus of 1.1 per cent) in 2016. However, foreign direct investment inflows declined by 34.4 % to a Decrement of KSh 39.9 billion in 2016. These developments led to the improvement in the overall BOP position from a deficit of KSh 24.9 billion in 2015 to a surplus of KSh 13.1 billion in 2016. (KNBS 2018)

Foreign Investor's Participation at the Nairobi Securities Exchange (NSE)

The history of Participation of foreign investors at the Nairobi Securities Exchange (NSE) previously Nairobi stock exchange, has been traced back to 1950s, when trade in stock was limited only to the European community. Africans were permitted to trade in shares only after the country gained independence in 1963 (Ngugi 2003).

Until the establishment of NSE, shares were traded informally (Ngugi 2003). The presence of foreign investors in the NSE reduced after independence due to the adoption of the Kenyanisation movement. Nevertheless, the Government still purposed to protect the interest of foreign investors, by adopting several parliamentary acts such as Foreign Investment Protection Act establishment of the Capital Markets Authority (CMA); the removal of the Exchange Control Act; the implementation of Central Depository System (CDS); and Automation of Trading System, among other things. Opening of the NSE to foreign portfolio investment might have led to improvement in trading volumes, enhanced levels of service by stockbrokers and increased volume of capital raised from trade. The capital market is however, still small in size with less listings, relatively low liquidity and is faced with significant structural and regulatory weaknesses

(Ngugi et al., 2010). The volume of shares traded increased due to these reforms (Figure 2). Trade shocks were however experienced in 2009 and 2010 mainly arising from low foreign turnover resulting in net outflow, attributed to the 2008 and global financial crisis.

Figure 2 Market Statistics
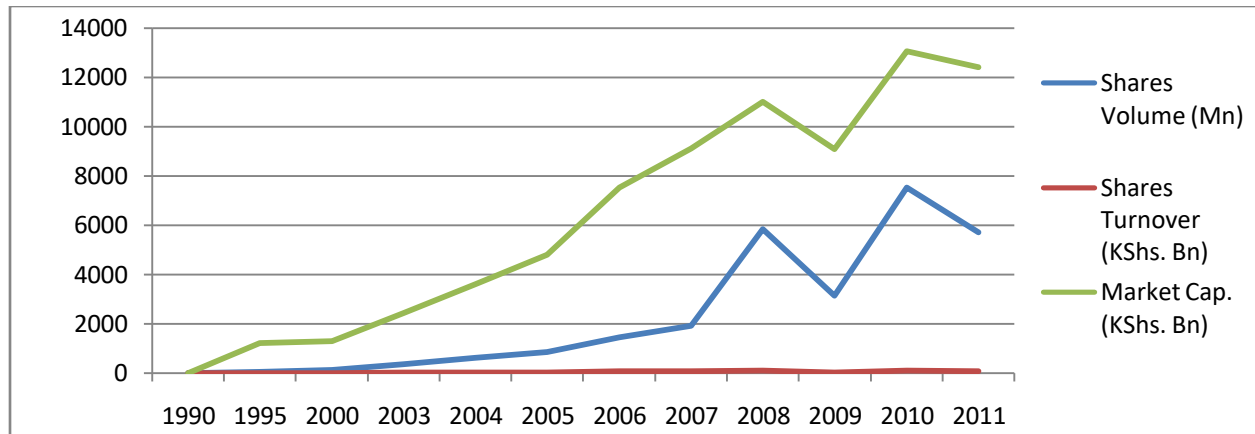
Source: Capital Markets Authority Reports.

Figure 2 presents the foreign to market turnover and the stock market index. In the initial period, the proportion of foreign turnover in the market was low though volatile. The general trend, however, shows that foreign flows and stock market index moved almost in the same pattern up to the end of 2002. Movement of the stock index, however, was less volatile during this period. This trend changed with the stock market index rising at a faster rate in 2007, while the influence of the foreign investors in the market fell to almost less than 1 per cent of the market turnover.

Determinants of portfolio equity flows

All foreign exchange transactions in Kenya were controlled and managed by the Central Bank of Kenya (CBK) until 1993. Afterwards, many countries decided to increase trade liberalization including using a floating exchange rate system. The liberalization of the economies has led to large value of inflows and outflows of both public and private capital into and out of the country (KNBS, 2013). These flows of capital have significant proved to have effect on growth and development of Kenyan economy. Therefore, many research studies have endeavoured on bring out economic conditions necessary to promote the inflows of capital.

Economic effects of inflation are generally diverse and are both positive and negative. However, the negative effects of inflation are more pronounced mainly because with time, it compromises on the real value of money and also other monetary variables. Kasidi and Mwakanemela (2013) and Aubery (2015) mention some of the effects of inflation in Tanzania's

and South Africa's economies. A rise in inflation levels, causes shortages of consumer products and consumers will begin to hoard out due anxiety in pricing. In addition, investment and savings are most likely to be discouraged by uncertainty over future inflation.

The Keynesian theories and other neoclassical economists share the argument that higher interest rates attract more equity flows into a country, other things being constant. This pushes the capital account in the balance of payments towards the direction of surplus and hence the current account in the direction of deficit. Still the argument can also be explained that the cause and effect that a country with a rising current account deficit will need progressively higher interest rates to fund that deficit and that the higher interest rates across the economy will eventually slow down the growth in aggregate demand and thus correct the tendency towards deficit on the current account.

Statement of the problem

The net financial inflow has been identified by many functional economies as one of the main drivers of economic growth. Some macroeconomic variables have been seen to have a major impact on these financial flows (Kirabaeva & Razin, 2010). Most researchers who have done some studies in the moments of these financial flows have mostly focused on foreign direct investment and given less attention to the other forms of capital such as the portfolio investment and even the debt flows yet they still have a major impact on the economy. These portfolio and debt flows have both positive and negative impact in an economy. For instance a high positive net inflow of equity may accelerate economic growth in terms of resource mobilization, market growth and investor confidence as well as reinforcing cooperate control. However, at the same time it poses many financial risks such as sudden depreciation of the local currency which also affects import prices and overall inflation.

Since 2005, the overall trend in the net foreign equity flow declines over the years in relation to the total turnover both as figures and as percentages. The volume of shares traded at the NSE on daily basis has been growing on average with the highest total turnover growth recorded in the starting in 2008 and constantly increasing though to 2015. However, the net foreign inflows inflow remained at a near zero until 2007 then started fluctuating starting with a decrease below zero in 2008. It picked up in 2009 and in 2010 and yet again declined in 2011 to a near zero of 0.28%. a sharp recovery was then realized in 2012 and the highest of the period was in 2013 which recorded 20.6% rise in turnover. However 2014 and 2015 recorded a decline in the percentage turnover with the lower of 2.57% in 2015 (Nyaga, 2014).

Calvo and Reinhart, 1998) introduced the concept of pull factors of capital flows to the literature. They unanimously included factors such as fiscal and monetary policies, the country

risk conditions among other domestic economic conditions such as interest rate and the price earnings ratio most of which were macroeconomic and country- specific in nature (Atobrah, 2015). Also most recent studies such as Ilias and Ulloa (2014), Froot and Ramadorai (2008) and Portes & rey (2005) find significant support to some of these macroeconomic determinants. However, on inflation as a factor there are some conflicting finds as most finding it a significant (cooper and Kaplanis) while others such as Portes & rey (2005).

According to International Monetary Fund (2017), Kenya is among the top countries with large portfolio flows that expose them to various kinds of risks due to its nature of high volatility such as changes in global investor risk appetites. The report categorises Kenya with Ghana, Mongolia and Serbia as facing the risk of the portfolio flows reversing. It uses the period 2007– 2014, where the ten countries had average net portfolio inflows exceeding two per cent of GDP.However, it is also conspicuous in the literature that there has not been enough empirical information that can inform the decisions of any policy maker. It is also important to note that the past studies on the equity flows phenomenon are first of all scarce and secondly use relatively out-dated econometric methodology. This study intends to contribute largely to the debate by analysing the dependence of the equity inflows on macroeconomic variables using the Granger causality, the ARDL cointergration and the Vector Error Correction techniques. This motivates the study to investigate the main reasons for these economise to have such high foreign equity flows exposing them to capital reversal and country risks.

By bringing out the main determinants (specifically the macro-economic determinants) of the different kinds of portfolio flows in Kenya, this study will to a large extend provide information to the policy makers of the adjustments to make on macroeconomic variables. It is therefore necessary to study the trends of these investment flows in and out of Kenyan economy and the specific causative agents this financial and investment flow in and out of the Kenyan economy. This will help deduce scientifically the main macroeconomic determinants of investment flows by checking the trends in the flows for the past 20 years.

Research objectives
The broad objective of this study was to bring out the specific macroeconomic determinants of foreign equity flows among the listed firms in Kenya.
The specific objectives are:
To investigate the effect of Exchange rates on foreign equity flows in Kenya.
To investigate the effect of Inflation on foreign equity flows in Kenya.
To investigate the effect of interest rates on foreign equity flows in Kenya.

Justification of the Study

Understanding the drivers of international portfolio flows has important policy implications for countries wishing to input some control policies on their size, direction and volatility of these flows. The study seeks to bring out clearly the existing relationship between the four variables (exchange rate, interest rate, inflation rate and the portfolio equity flows). The three variables are considered to be the major macroeconomic factors of economic growth. The same variables are also attributed to influence the decisions of investors.

This paper empirically assessed the relative contribution of the three variables which have been considered in literature to be the common country- specific (pull) factors to the variation of bond and equity flows to Kenya and other emerging economies. By satisfying this, the study has contributed much to understanding the dynamics and determinants of portfolio equity flows that can help policy makers in different countries design an effective policy that may consist of structural reforms, targeted macroeconomic policies or capital controls in order to influence these flows.

This study also benefits many academicians/researchers who may access current literature relating to portfolio equity movements or even the whole concept of financial flows in their academic works.

There are many factors in literature that influence these equity flows together with other forms of capital flows. It was for this reason; that the study narrowed itself to macroeconomic factors determine the foreign equity flows. The study focused on the Kenyan economy since Kenya is typical example of a developing economy so that the results from this study can be replicated to other developing country especially in Sub-Saharan Africa.

Scope of the Study

The domestic interest rates dynamics is contributed by many factors both form domestic and foreign factors. Interest rate differential has often been used more frequently in recent times as a better and more accurate measure in meaning interest rate (Ulloa, 2014). The main reason for this is high and increasing interdependence between financial variables such as interest rates exchange rate and others that make studies in the discipline more challenging. This study shares this idea not only on the same grounds but also on the basis that it is more accurate as it considers the dynamics in interest rate parity between home and foreign countries. The theory of portfolio investment by Hymer (1976) postulated that foreign portfolio investors are attracted by the high interest rates since it reduces

Exchange rate is a macroeconomic variable that has been used commonly in many studies in the financial sector. It is also been found to be a major determinant of capital market

performance Makori, N. G. (2017) and Alam, M. M., & Uddin, G. S. (2009). The two and other studies prompts this its usage in study are they are related to some extent.

Inflation is a risk factor not only financial markets but almost all markets. Inflation risk is the risk that inflation will undermine the performance of an investment. Inflation affects the volatility of most FPI. Agarwal (1997) postulates that home country low return and high inflation motivates foreign investors to invest on other countries is compared the rates of returns. Mody, Taylor and Kim, (2001) supported it by arguing that decline in foreign portfolio could be as a result of increase in inflation.

For this study Kenya has been chosen among the many other developing countries since it is a typical example of most developing countries and can be used as a representative of the other Sub-Saharan African countries carrying the same characteristics in macroeconomic aspects. The study seeks to determine whether the macro-economic factors as given in the literature have real effect on the portfolio equity flows for a typical emerging economy such us Kenya. These factors include inflation, interest rates and exchange rates. In order to derive reliable significant parameters and this study will collect data for the period of 2000 to 2018 on monthly basis. The study will source its data from various relevant sources such as the Nairobi securities exchange the Kenya National Bureau of Statistics and any other relevant source including the IMF.

LITERATURE REVIEW

Theoretical literature

The standard neoclassical theory

Janicka (2016) reviews the Lucas Paradox and the Standard Neoclassical theory. He traces The Neoclassical theory back to the years 1870- 1914 during the period of the gold standards, where free flows of capital between countries were more or less natural. It's also universally agreeable the theory mostly consistent with the economic norms of those times confirming benefits resulting from international free mobility of capital. The standard neoclassical theory believes in the argument that Investments always flows from low return markets to high return markets or to where capital is relatively scarce. In other words, it believes in the basic economics argument that investment flows from low return avenues to high returns. In this case the developing countries are the ones which normally have shortage of capital. The theory however assumes no cross border restrictions and Investment flows freely between countries. This movement allows countries to adjust their consumption patterns by either borrowing more cheaply for investment or lending the money to finance more promising investment abroad. This theory has an essential identity. It implies that in the national accounting, the current account

equals to the difference between national saving and investment. This means by definition the current account must the capital account which also implies that savings and investment decision contribute largely to the capital flow analysis (Janicka, 2016) (Lucas, 1990).

However, what is found in the literature, is opposite as capital flows from emerging markets (where returns are high) to developed (where returns are low). Most controversies related to capital-flows in international macroeconomics have gone unnoticed by research. However, some more or less adequately analysed these bases. They include, Feldstein and Feldstein, M. c. Horioka.(1980), (the Feldstein-Horioka puzzle), (Lucas, 1990) (the Lucas' paradox) and Bernanke, (2005); Blanchard and Milesi-Ferretti, (2009) debate on global imbalances and the "global savings glut"

Brunnermeier, (2012) viewed capital flows as financial counterpart to investment and savings decisions. This is in line with the theory of capital flowing from "capital rich" economies that have lower rates of return to "capital poor" economies having higher returns. This perspective focuses on the net capital flows, because that it is the net capital flows that counts when funding a country's borrowing requirements.

The usage of this theory has been adequately wide to be considered relevant by this study. It has been recently used by studies such as Ashford, (2011), Bonizzi, (2013) in try to explain the cross-border movements if capital flows of all the types. The standard neoclassical theory could is also useful in helping this study to predict well on the aggregate directions of equity flows as part of the financial flow. That is, it will help this study predict the kind of relationship that exist between the macroeconomic conditions and these equity flows. This neoclassical theory is also important as it will relent guidance based on the results in developing the policy recommendation as was done by artoba (2015) and Bonizzi, (2013) and some others.

The Marxist theory of international Investment flows

Cogoy (1987) promotes the Marxist theory and connects it to the capital accumulation. It asserts that Marx was proposing a development of productive forces as the main driver of social transformation and also tried to reconcile the idea with an anthropocentric perspective with that of positive humanism. The Marxist's theory provides two contrary positions on the question of whether the direction of capital flow under capitalist is from the developed economies to underdeveloped capitalist economies (Cavalieri, 2014). In explaining the two contrasting position in the Marxist literature, Marxist's argument tends to advocate that developed capitalist economies export capital to less developed countries due to some motivating factors such as the tendency of profit to decline (because of high organic consumption of capital) and /or due to

lower wages abroad or due to inadequate opportunities for profitable investments at home (I.e. underconsumption).

In contrast to that the NeoMarxist position maintains that due to the international structure of international commerce and investment, the developed countries exploit the less developed countries by one-side economic arrangements and by exporting profits from third world countries and investing in them. The process of real extraction of resources from less develop economies by developed capitalist economies is one of the principle causes of backwardness as well as widening gap between the two sets.

The most reasonable interpretation of this Marxist's view is on the question on the direction of flow would appear that the relationship between the two sets of the economies goes through three stages; i.e. the stage of plunder, exploitation through trade, and investment in industry. During the first two stages the direction of flow is from the technologically backward countries to the industrialised ones. However, during the last stage that of mature capitalism the flow is from the more advanced countries to less developed countries.

Cavalieri (2014) explains the relevance the Marxist theory to the capital theory. He provided a logically realistic reformulation of Marx's theories of value and capital. Equity flow forms part of the greater financial the capital flows concept together with debt flow, international remittances and on other flows. Since the NeoMarxist talks about capital accumulation, and growth of economies, it gives a better explanation on the state of affairs concerning the macroeconomic conditions and policy formulation about flow of equity.

Portfolio theory of International Investment flows

Devereux and Saito (2006) and Devereux and Saito (1997)developed a well elaborate explanation of how the portfolio theory can explain the amount and direction of financial flows. He together with Obstfeld (2004) suggested that the financial globalisation and flow, phenomenon, calls for a standard intertemporal view of the current account. Devereux and Saito (2006) specifically argued that an appropriate concept of external balance adjustment must be defined with reference to the structure of the national portfolios situations.

Financial flows (Sometimes referred to as intertemporal trade) occur when the changes in a country's gross bond and equity holdings do not sum to zero. The sum of wealth in the two countries is equal to the world capital stock, since capital is the only outside asset in the world economy. If portfolio diversification could sustain the complete markets allocation, then there would be no change in relative wealth across the two countries, and each country would maintain a constant share of the world capital stock. But because nominal bond trade cannot achieve the complete markets equilibrium, productivity shocks in one country will have a larger

impact on that country's wealth than on the wealth of the other country. These changes in relative wealth levels give rise to net capital flows across countries.

A rise in foreign relative wealth will be followed by a rise in home gross borrowing in home currency bonds, and a rise in gross lending in foreign currency bonds. Such gross borrowing dominates gross lending, because we have. In addition, there are changes in the holdings of real bonds. This is always negative, so that as the home country becomes an overall net debtor, it will issue sell real risk-free bonds to the foreign country (Devereux & Saito, 2006).

If the home country has a diversified portfolio but a zero net external balance, as the foreign country becomes larger in terms of world wealth, the home country becomes a recipient of foreign capital inflows. With trade in real bonds alone, there are no international capital flows at all. The key feature is the interaction between changes in nominal bond returns and gross bond holdings. Thus, a rise in the share of world wealth for the foreign country drives down the return on home currency bonds, while pushing up the return on foreign currency bonds. Intuitively, as the foreign country increases its wealth, its portfolio preferences dominate the global bond markets. It increases its demand for home currency bonds, while increasing its supply of foreign currency bonds. This is reflected in the movements in the returns on nominal bonds.

The gross portfolio position, when combined with the evolution of returns that are driven by relative wealth dynamics, allows for gains from intertemporal trade in the economy with nominal bonds, even though there are no gains when only real bonds can be traded. Where the two countries have exactly equal net wealth, and given the symmetric model, the current account in each country becomes null. Say that there is a rise in, driven for instance by a positive technology shock in the foreign country. If there were trade only in a real risk-free bond, this would simply permanently increase the foreign country's expected consumption, and have no impact at all on the home country. This affects the cost of borrowing for the recipient country, leading it to a higher net foreign debt, higher investment in the domestic technology, and a higher level of wealth and consumption. In this manner, the original positive technology shock in the foreign economy is shared by the home economy. Moreover, we see that there is an essential interrelationship between net capital flows and gross portfolio holdings. This levered portfolio ensures that its overall cost of borrowing is lowered, facilitating net capital inflows.

One very influential study by Griffin, Nardari, and Stulz (2004) strived to investigate the conditions under which the intertemporal equilibrium based on investors' portfolio decisions can explain the dynamics of equity flows. It concludes that equity flows toward a country increase with the return of that country's stock market. It also infers that for a small country, equity flows

toward the country increase with stock returns for bigger market together with foreign investors invest more chasing the high returns in a market and that they react quickly to the dynamics.

This portfolio theory has got an increasing popularity in the intertemporal trade since the beginning of globalization due to it adaptive nature in the each and every reality especially concerning international capital and financial phenomenon (Devereux & Saito, 2006). This also improves the relevance of this study in that it provides necessary proof of influence of the macroeconomic state of affairs of an economy and its risks of reversal.

The Push -pull Factor Theory

Artobra (2015), Jeanneau and Micu (2002) and Artobra (2015 proposes the push-pull factor theory as they explained the causes of FPI. The theory simply tries to identify the several macro and socio-economic factors inside and outside the recipient economy that causes these flows. According to this theory low interest rates and slow economic growth rate in the developed countries are considered some of the push factors, (Calvo and Reinhart, 1998). The tendency of investors to invest more international diversification is also another push factor according to the theory, and this is highly seen with the decline in the US interest rate in the 1990s (Fernandez-Arias, 1994).

The other key push factors identified by the theory are; the rise in the tax rate of MNCs. Jeanneau and Micu (2002) comments that, robust economic activities and tax policies in industrialised economies is significant in explaining portfolio inflows of developing economies. In addition, there are considerable studies which explaining capital flows to emerging economies as induced by a recession in industrialised countries.

The contagion effect is another pull factor in the literature. Financial contagion became a major concern in international liberalization since the Asian crises in the late 1990s. There are three transmission mechanisms of contagion, namely the monsoonal effect, the spillover effects and the shift or pure contagion (Masson 1999).

The monsoonal effects are effect of variables real interest rate of major developed countries that are directed to a number of countries simultaneously, especially, countries in one region or with similar economic conditions. The spill-over effects happens as a result of trade and financial channels. These trade channels include market competition and import price changes whiles financial channels are as a result of PI. Therefore, a loss of competitiveness for country say "A" may cause a currency crisis of country "B", given that both countries are linked by commercial operations (Masson, 1999 and Forbes and Rigobon, 2002). For instance, a change in investors' perception may yield reversal of funds and may lead to financial crises. Forbes and Rigobon (2002) and Kleimeier and Sander (2003) provided evidence that the first

two of Masson's factors may be channels where external shocks are usually transmitted and that, only the third factor could be contagion.

This theory comes up with essential policy implications directed sustainability of portfolio inflows to an economy. For instance, if it has been established that lower interest rate causes an increase in PI of developing countries, an increase in such rates may hinder the ability of these countries to sustain such inflows. This raises an important issue for policy makers in host countries as to whether the domestic response is likely to effectively influence the possibility of reversal.

Empirical literature

Portes and Rey (2004) endeavored to explore the trends in bilateral gross cross-border equity flows between 14 countries, using a set panel data 1989–1996. The study reliably managed to show that the gravity model explains international financial asset transactions at least as well as goods trade transactions. It also inferred that gross transactions of asset flows depend on market size in source and destination country as well as cost of trading, which are also influenced by both information and the transaction technology. The study also provided evidence on the hypothesis the distance produces some information costs due to information transmission, and information asymmetry between domestic and foreign investors, due to efficiency of transactions. But geography of information is the main determinant of the patterns of international transactions. Though in the view of this study, there is weak support in their data but the results can be relied upon as the provided evidence linking the equity transactions to equity holdings.

Froot & Ramadorai (2008) also sheds some more light on the relationship between cross border equity flows and domestic and foreign equity. Several findings came as a result of the study. First is that Cross border equity flows predicts the returns on emerging market equity over and above the contemporary relationship between them. Secondly, cross border equity flows also predict both the NAV and price returns of emerging market funds and the forecasts are roughly of the same magnitude. Farther more Cross border equity flows into emerging markets are trend following in response to absolute return shocks and trend reversing in response to relative return shocks. Lastly, flows into closed end funds forecast price returns.

Lane and Milesi-Ferretti (2008) also included international trade in its model while investigating the international investment patterns. Motivated by their aim to providing an understanding the geography of international investment providing insights of the globalisation process, it uses the data for the period of 1997 to 2000 from 27 source countries to derive the bilateral equity holdings patterns.

Hau and Rey (2002) also investigate the relationship between exchange Rate, Equity Prices and Capital Flows. Their study endeavoured to lay emphasis on equity flows relative to the new open macroeconomics literature, the financial market incompleteness assumption relative to the real business cycle literature, the endogeneity of the order flows relative to the FOREX microstructure literature and the explicit modelling of the exchange rate relative to the finance literature. Although the study could be criticised not take account of asymmetric information that is differences in opinion concerning the international equity returns between the home and foreign investors it could still be relied upon on its many contributions to the literature. It provides evidence on three main issues. First, is that relationship between exchange Rate, Equity Prices and Capital Flows.; secondly, higher returns in the home equity market relative to the foreign equity market are associated with a home currency depreciation; and finally the net equity flows into the foreign market are positively correlated with a foreign currency appreciation.

Hau and Rey (2006) also examined the volatility ratio of exchange rate returns to stock index returns. They did this by calculating the standard deviation of the log returns of the dollar exchange rate and the stock index returns in local currency they managed to show the ratios of the standard deviations for their entire data sample since 1980 to 1995. They only sample 17 OCED countries by excluding those for which daily data on exchange rate were not readily available over a sufficiently time period. The volatility ratio for the full sample varied between 0.369 for Finland and 0.845 for Switzerland with a mean for all countries of 0.6215. By also comparing volatility ratios they found a declining trend the ratios for most countries. They associated this to decrease exchange rate volatility. This study was mainly empirical in nature and managed to develop a model concerning the volatility of the exchange rate returns with respect to equity return, the correlation of exchange rate and equity returns, and most importantly the correlation of exchange rate return and equity flows. On equity flows the study highlights a positive correlation between equity investment into the foreign market and the foreign currency return. Evidence on the correlation of net U.S. flows into the 17 OECD countries before and the corresponding forex rate returns was also showed by the study. Only France and Portugal show positive correlation for the entire period. However, in general, the evidence produced is support the linkage between net equity portfolio flows and exchange rate returns. Net equity flows into foreign market are positively correlated when the foreign currency is appreciating.

Agarwal (1997) also investigated the determinants and macro-economic impacts of portfolio investments. The study tested the influence several variable in the study including domestic interest rates. The study contributes two inferences about the relationship between the

real exchange rates and portfolio equity flows. First is that the coefficient of the effect of real exchange rate on portfolio equity flows is 0.6832 Significant at 5% confidence level. However, because of time lapse these inferences need to be reviewed. The Results also showed that inflation rate, real exchange rate, index of economic activity and the share of domestic capital market in the world stock market capitalization are four statistically significant determinants of FPI. The first variable has a negative coefficient while the last three variables possess positive coefficients. Foreign direct investment, total foreign trade and current account deficit variables are found to be statistically insignificant. Regarding the impact of FPI on the national economies, it is found that the index of economic activities and inflation rate show an upward trend. Volatility in portfolio flows has not increased overtime. Ratio of foreign debt and debt-servicing to GDP has declined. But the rule of thumb regarding the issue of sustainability of FPI suggests that India and Indonesia have crossed the upper bounds of permissible debt ratios.

Cooper and Kaplanis (1994) endeavoured to find out whether the home bias in equity portfolios is caused by investors in their quest to hedge inflation risk. The study developed a reliable model of international portfolio choice and equity market equilibrium that integrated PPP deviations and deadweight costs. Using the model, the study was able to estimate the costs required to give the observed home bias portfolio. It was concluded that costs and inflation risk have identical effects on portfolio holdings as well as on equilibrium returns. It was also a notable inference that the home bias cannot be explained by direct observable costs of international investment or either inflation hedging unless the investors have very low levels of risk aversion. This study seeks to improve on these findings by actually determining the actual extent to which inflation effect foreign portfolio holdings in the home country.

Kinda (2010) advances the classical push-pull factors together with Lucas paradox theoretical approaches, by investigating the relationship between components of capital flows and the physical financial structures. This study used a data for the period of 1970-2003 sourced from all the sub-Saharan countries, Latin and Caribbean countries and also all the Asian and Muslim dominated countries. The study applied the Three Stage Least Square (3SLS) estimations method due to its nature of being of the form of simultaneous equation model in nature. The study also highlighted the various macro and socioeconomic determinant and tested their significance effect using the data, among them was inflation. This paper provided evidence that physical infrastructure together with financial development positively affect Foreign Direct Investment (FDI) and portfolio investment in developing countries across the world. The analysis highlights the lax monetary policy and excessive credit provisions weakens the financial system and significantly reduce portfolio investment flows in long run. The results also provide evidence that for Sub-Saharan African countries, better physical

infrastructure tends to attract more FDI. For the case inflation there is a significant influence across all the developing countries but to a very small extend of just 0.1% elasticity. This can be interpreted to mean that a unit increase in inflation has a very small change in portfolio flows which in a very small change. However, this study mainly on the aggregate international flows of investments to SSA which creates doubts on whether or not it is the same case on individual countries.

Scott (2014) considered the question on whether debt based and equity based capital inflows have different macroeconomic effects. He used external instruments in a structural VAR, by identifying the components of capital inflows that is driven not by domestic economic and financial conditions but by conditions in the rest of the world. He then estimated the response to an exogenous shock to debt or equity based capital inflows in a structural VAR model that includes domestic variables like GDP, inflation, the exchange rate, stock prices, credit growth, and interest rates. It was found that an exogenous increase in debt inflows leads to a significant increase in GDP, inflation, stock prices and credit growth and an appreciation of the exchange rate. An exogenous increase in equity-based capital inflows has almost no effect on the same variables. Thus the macroeconomic effects of exogenous capital inflows are almost entirely due to changes in debt, not equity-based.

Also most recently, Amata (2017) investigate the causal relationship between macro-economic variables and stock market volatility in Kenya. The study chose a period of a period of 14 years, from 2001 to 2014 and a descriptive research design to meet the study objectives. the study found that interest rate and inflation granger cause stock market volatility both in the short run and long run in Kenya, while GDP and exchange rate did not have a direct causal relationship with stock market volatility. The study also established that investor herding behaviour has no direct causal relationship with stock market volatility, there was a significant relationship between investor herding behaviour exchange rate and stock market volatility on the Nairobi Securities Exchange. The study findings were limited to selected macro-economic variables and methods used in measuring and analysing the relationship.

Also motivated by the need to analyse the factors behind portfolio inflows of developing countries Artobrah (2015) investigated the determinants of portfolio inflows to Sub-Saharan Africa (SSA). In the study a panel data for the period of 2005 - 2013 from 17 SSA countries were used. Only 17 countries complete the whole SSA but may have only sampled the 17 largest economies to represent the whole of SSA. By employing a panel regression with endogenous factors such as market size, level of financial development, current account balance, trade openness international interest rate and the growth rate industrialised countries, managed to make several conclusions. First is that market size, past portfolio inflows and the

growth rate of industrialised countries positively affects portfolio flows to SSA. Secondly was that there is a long-run negative relationship between from portfolio inflows to economic growth. Though the finding can be used to deduce good policy implications, the study could still be improved by investigating either the socioeconomic or macroeconomic factors the influence the portfolio flows for clearer policy implementation.

The review of literature shows clearly the gives a series of evidence concerning the reasons for the net direction of equity flow. Some of the conclusions the can be drawn from the literature the general reason that influence the flow of portfolio to words developing countries as the distance, inflation, exchange rate, neighbourhood economic conditions, trade opens etc. (Hau and Rey, 2002) (Kinda, 2010). In the literature we can also see some attempt to bring out the specific contributions of each of these factors on the cross-border equity trade. It is also important to note that the effect of the asymmetric information between home and foreign countries has not been well taken care of.

The other good development in the literature is the effect of inflation on the internal equilibrium returns. However, inflation in within that control of macroeconomic policy makers and more has to be done on this variable especially on its effects on cross-border equity or other financial flows. The literature has also focussed mostly on the relationship between the equity flows and the return on equity in stock markets generally and somehow neglected macro-economic variable that are in control of the policy makers which limits its ability to producer policy implication. Lastly some studies such as Atobrah (2015) have also attempted focus their studies determinants of foreign portfolio investment in sub-Saharan Africa but they also do not bring out the exact situation for individual country like Kenya.

The literature review on inflation in Kenya and various developing countries has developed various concepts and explanations on the relationships between the various determinants and equity flows. However, it was also conspicuous in the literature that there has not been enough empirical information that can inform the decisions of any policy maker. It is also important to note that the past studies on the equity flows phenomenon are first of all scarce and secondly use relatively out-dated econometric methodology. This study intends to contribute largely to the debate by analysing the dependence of the equity inflows on macroeconomic variables using the Granger causality, the ARDL cointergration and the Vector Error Correction techniques. The study produces absolutely a dependable macroeconomic model as well as assesses the impact of these macroeconomic pull factors on equity flow phenomenon.

RESEARCH METHODOLOGY

This chapter discusses the methodology that was used to conduct the study. The chapter also details the methods that are to be used to collect the secondary data necessary for the study. The research design that was used, the target population, data collection methods and data analysis methods are also be discussed in this chapter.

Research Design

For this study to obtain high standards of accuracy and reliability, it adopted a descriptive research design. Descriptive research design is a scientific method which entails observation and description of a subject without influencing it in any way (Ethridge, 2004). This design helps the study to provide adequate evidence concerning the trends and movements of portfolio equity flows. Since the study also strived to establish the extent to which the macroeconomic determinants of portfolio equity flows in Kenya the design was of great relevance (Fox & Bayat, 2007).

According to Flick, (2009) descriptive research design has become widely accepted in the field of economics and finance since it is very useful in policy evaluations. Groves, (2004) also asserts that descriptive technique provides accurate information of persons, situations or events. For instance this descriptive design has been applied/ used by almost also the studies that have been relied upon by this study including Portes and Rey (2006), Ashford, (2011), Bonizzi, (2013) (Kirabaeva & Razin, 2010) (Razin & Sadka, 2001) (Razin, Sadka, & Yuen, 1996) among others.

Target population

Kombo & Tromp, (2009) refer population as a group of objects individual or items from which samples are drawn for measurement or an entire group of persons or the sum of the individuals or elements that have at least one thing in common. In this study the population constitutes firms that are listed at the Nairobi securities exchange. The macro economic variables also in the study include the interest rates, exchange rates(exchange rate against the dollar), and inflation

Data Collection

According to Flick, (2009) data collection is the process of gathering and measuring information with an aim of using them to answer able to answer questions that prompted the undertaking of the research. This study requires data for the selected variables. The main reason for using

secondary data was because it not only saves time but also rules out the risk of biasness that may be obtained from primary sources.

The data concerning exchange rate, can always be obtained from the database compiled by the central bank of Kenya or the Kenya National Bureau of Statistics. There are other sources that can the data on exchange rate but it's the two source are more official data. The data on exchange rate can be obtained on daily basis but for the sakes the coherence of the variables in the study, it was best to translated to monthly or obtained in monthly form.

Likewise to exchange rate, interest rates can also be obtain the official sources- the CBK databases or and compared with those from the KNBS for accuracy. To obtain the data on inflation, it was possible to obtain the directly from the same sources as in the case of exchange rate or could also be calculated for the values of consumer price index (CPI) obtained from the same sources or can also be obtained form calculating from the nominal GDP which was possible. Portfolio equity flows figures can easily be obtained from the CMA reports or directly from the NSE database. There was no need for sampling of any nature since this study considered all the listed firm at the NSE

Data Analysis Approach

According to (Mugenda & Mugenda, 2003), and (Mugenda & Mugenda, 2003) data must be cleaned, coded and properly analysed in order to obtain meaningful information. For this reason the data gathered were organized in spreadsheets for the purpose of analysis. The data was then analysed using Statistical Package for Social Sciences (SPSS). The results of the analysis have been organized in tables and graphs and then used to answer the study questions and also to test the hypotheses.

Unit root Test

Most datasets in international finance and economics are known to be non-stationary time series data. Non stationary data cannot be analysed without correction presents a risk of obtaining spurious results (Engel and Grager 1987). This study was also not exceptional from such risks and hence there's a need make limited the effect of such spurious relationships on the could have on the results. Stationarity test was done to establish whether the data was stationary or non stationary, as well as determine the order of intergration of the variables (Granger , 1993) .

Stationarity can be tested by testing the presence or absence of unit root. There are various method to test the presence of unit root in a data set. This study prefers the Augmented Dickey-Fuller (ADF) Test proposed by Dickey and Fuller (1979).

Causality Test

Granger & Ramanathan (1984) proposed an approach to time-series data that has been widely in used by econometricians to determine causality. In the Granger Proposes that; X is a cause of Y if it is useful in forecasting Y (Bosworth, 1975) . In this framework the word 'useful' is used to mean that X is able to increase the accuracy of the prediction of Y with respect to a forecast, considering past values of Y only. This also a concept that that was very much needed in this study to verify that there the causal relationship really exists.

Model Specification

For the purpose of this study, the dependent variable became the net flows of portfolio equity, net foreign reserves and other investments. Other selected macro-economic variables which includes; exchange rate, inflation rate, interest rates.

From economic theory, inflation, interest rates and exchange rates have been known to affect the direction of all the financial Flows including the portfolio equity in any country. The model of this study is as specified below

$$NCF = f(EXR, INFL, IR) \tag{1}$$

EXR = Exchange rate

IR = Interest rates

NFL = Inflation rate, calculated from the monthly increase in consumer price Index or the GDP deflator.

NEPF = Net Portfolio Equity Flows used in the model as the dependent variable.

Cointergration Test

The data that was collected for analysis in this study have high chance of being non stationary. Otherwise OLS estimation could have been more appropriate. Non-stationarity is a property common of many macroeconomic and financial time series variables. If not handled, it can incorporate the spurious correlation error into the econometric methodology. For this reason, the differencing and logarithmic transformation was also needed to stabilize the time series, which are to be used in analysis. The non-stationary data are mostly useful in modeling the long-run equilibrium of the respective time series. Then, each deviation from the equilibrium is assumed to be corrected in the proceeding periods (Engle, Granger, 1987). Before Drawing any conclusion, the study observe this situation and endevour to undertake cointergration test. Up to now there are many econometric methods that have been developed for investigating the long-run equilibrium (cointegration) approach with in time series variables. Engle and Granger (1987), Johansen (1988) and Phillips and Hansen (1990) have been some the most used

acceptable approaches that were developed in the late 20th century. The Johansen's approach allows for more than one cointegrating variable relationship, unlike the Engle–Granger approach, but this condition of asymptotic properties, (i.e. large samples). If the sample size is significantly small then the results would not have been reliable and the only alternative would be the AutoRegressive Distributed Lags (ARDL) (Pesaran, 2001). Since the effect of explanatory variables (x) on portfolio equity flows (y), in which they occur over time and not once, the concept of Autoregressive Distributed Lag (ARDL) Model would be very useful in this case. This study chooses the Autoregressive Distributed Lag (ARDL) model approach that was developed by Pesaran and Pesaran (1997) and Pesaran and Smith (1998).

The Autoregressive Distributed Lag (ARDL) Model

The ARDL model has become more popular compared to the other single equation cointegration procedures, because of several advantages. First of all was the ability to estimate both long and short-run parameters of a model simultaneously without losing the avoidance of the problems posed by non-stationary time series data. Secondly, unlike other approaches, this approach does not require a prior determination of the order of the integration amongst the variables. The other reason why this study preferred the ARDL procedure was that it is statistically much more of an accurate approach to determine the cointegration relationship in small samples, which allows different optimal lags of variables. It is also preferable to use the ARDL model is that it captures dynamic effects from the lagged dependent variable and the lagged explanatory variable(s).The study assumed a simple case of explanatory variables and a linear relationship as follows:

$$y_t = \alpha + \beta(L)x_t + \mu_t \qquad \forall, x = (x_1, x_2, x_3, x_4) \qquad (3.1)$$

$$y_t = \sum_{s=0}^{\infty} \beta_s x_{t-s} + \mu_t \qquad (3.2)$$

Where,

μ_t is a stationary error term and the individual coefficients β_s represents the lag weights which collectively comprise the lag distribution and y_t and x_t have to be stationary variables. This model defines the pattern of how x affects y over time similar to an infinite moving average representation of an ARMA (*pq*) process, except that the lagged polynomial on the right-hand side is applied to the explanatory variable x and not the white-noise process ε. The x_t in this case has been used to represent a matrix of all the explanatory variables (EXR, INF, and IRD).

The Error Correction Model (ECM)

Since the study involves multiple time series models, where the underlying variables uses data which have a long-run stochastic trend, it would be necessary to involve an error correction model. ECMs provides an approach used to estimating both short-term and long-term effects of one-time series on another. The term error-correction was used to represent the fact that the previous period's error term influences its short-run dynamics (Yule, 1926). In other words, these ECMs directly estimate the rate in which the dependent variable returns to the equilibrium after a change in either one of independent variables.

In normalizing the equation with the ARDL and the Error correction model the long run model gives the following equation.

$$\Delta \ln NEITR_t = \alpha_0 + \sum_{i=1}^{p} \beta_{1i} \Delta NEITR_{t-1} + \sum_{i=0}^{q} \beta_{2i} \Delta EXR_{t-i} + \sum_{i=0}^{q} \beta_{3i} \Delta IRD_{t-i} + \sum_{i-0}^{q} \beta_{4i} \Delta INF_{t-i}$$

$$+ \delta_1 LnNEITR_{t-1} + \delta_2 EXR_{t-1} + \delta_3 IRD_{t-1} + \delta_4 INF_{t-1} + \varepsilon_t \qquad (3.3)$$

RESEARCH FINDINGS AND DISCUSSION

The data analysis was carried out with the aim of adequately satisfying the specific objectives and carefully making informed inferences source from the data. As per the research design chosen - that is the descriptive research design- the descriptive analysis was carried out the followed by the test for unit root and the granger causality. After that a careful use ARDL and the ECM techniques were used to estimate the long run relationship together with the model's diagnostic checks.

Descriptive statistics

The data on the net equity inflow and the total turnover were obtaining from the Nairobi securities exchange (NSE), and then divided to obtain their ratio. For simplicity in the analysis this net equity to total turnover ratio was called NEITR (see eqn. 4.1). the data on the Exchange Rate, Consumer Price Index and those of the 91 Day Treasury Bills for Kenya were readily provided by the Kenya National Bureau of statistics (KNBS) while those of the US 91 Day Treasury Bills for the US department of commerce available in their website. The study used the nominal exchange rate data as they were, however, Interest Rate Differential (IRD) data were obtained by determining the difference in the Kenya's 91-day T-Bills and the US 91-day T-Bills (see eqn. 4.2). Lastly, inflation for was determined as the percentage increase in the monthly CPI (see eqn. 4.3).

$$NEITR = \frac{Net\ Equity\ Inflows}{Total\ NSE\ turnover} \quad (4.1)$$

$$Interest\ Rate\ Differential\ (IRD) = (Kenya's\ 91Day\ TBills) - (US\ 91\ Day\ TBills)\ (4.2)$$

$$Inflation = \frac{CPI_x - CPI_{x-1}}{CPI_{x-1}} \quad (4.3)$$

Starting with the graphical representation of the variables in figures 3 and 4 gives the basis information the relationship and the trends in movements over time.

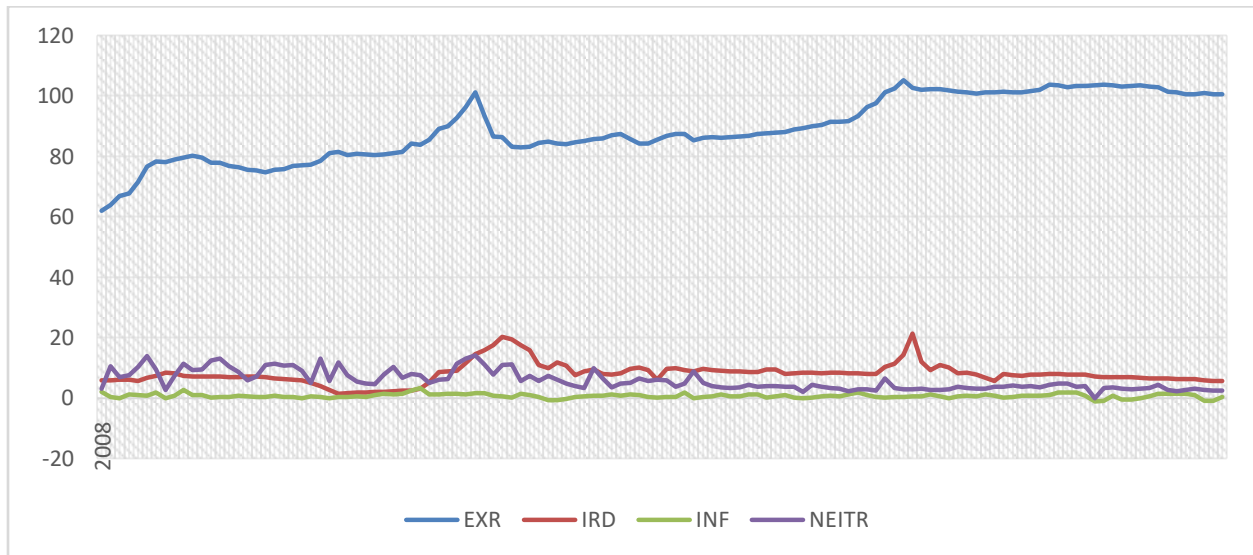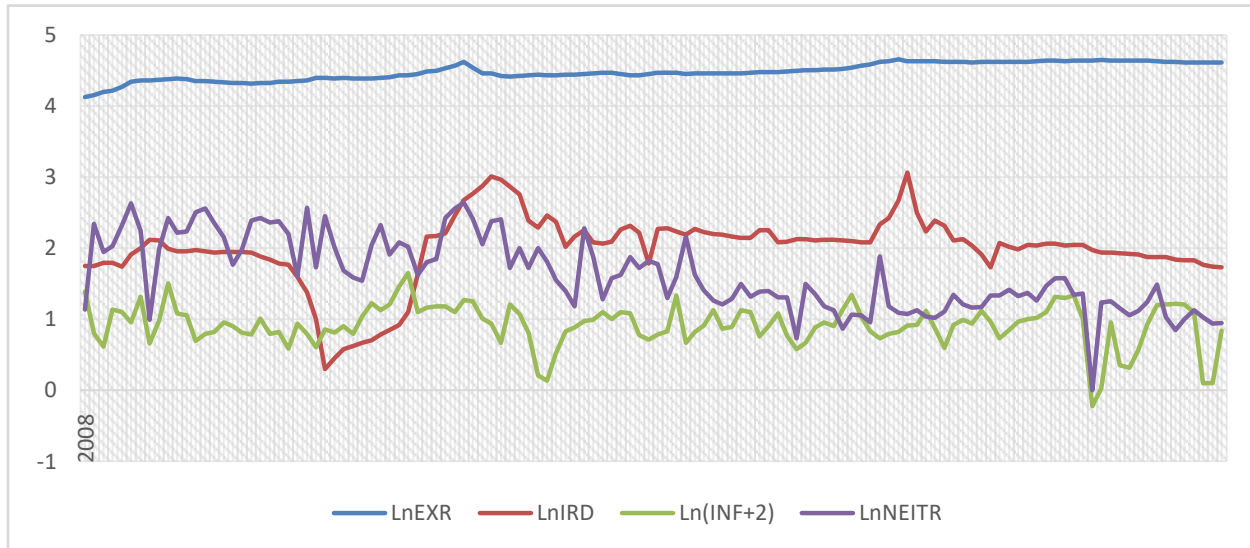## Figure 3 Graphical Representation of the Variables

Figure 4 The Variables in Natural Logs

 As shown in figure 3, though out from the years 2005 to the year 2018 there is a mild long term increasing trend in the Kenya's exchange rate but shows low volatility except in the years 2008, 2011 and in 2015. Interest rates differential portrays a stationary characteristic but a volatility rate. Inflation in Kenya has been constant since 2008 which shows that the Kenya monetary policy has been adequate. The movements in the variable seem to be correlated as seen especially in the log form.

Table 1 Descriptive statistics

	EXR	FPF	INF	IRD
Mean	89.178804659	5.8678362	0.597102	8.06806
Median	86.8795	4.73500003	0.551343	7.81
Maximum	105.275	14.0850692	3.20264	21.4
Minimum	61.899	2.0758886	-1.198174	1.35
Std. Dev.	10.501371018	3.1568682	0.701383	3.487974
Skewness	-0.1165855703	0.9423544	0.3412187	1.253681
Kurtosis	2.1636670531	2.7106650	4.323597	6.316447
Jarque-Bera	3.8947448234	18.3307035	11.365361	89.30938
(Probability)	(0.1426484008)	(0.00010460)	(0.0034044)	(4.04309e-20)
Sum	11058.171778	710.008185	73.4435661	1000.44
Sum Sq. Dev.	13564.291572	1195.89803	60.0164761	1496.413535
Observations	124	121	123	124

Table 1 presents the descriptive statistics for all the variables in real terms. The mean and the median values of exchange rates seem to be very close which portrays a high level of normality Likewise to the mean and media values of inflation rate. The mean and median values of interest rate deferential and the foreign portfolio flows to total turnover in Kenya portrays a high difference which gives doubts on the level of normality of the two variables. The makes it

necessary to confirm the normality characteristics of the variables using the Jarque-Bera statistic. This was done by checking skewness, kurtosis, and Jacque-Bera statistics. The JB test of normality is a test of the joint hypothesis that S and K are 0 and 3, respectively. The Jarque-Bera statistic is compared by using the p-values give in brackets in table 1 above.

Correlation Analysis

Multicollinearity is a problem that arises from the correlation between the independent variables. Therefore, it was necessary check whether this problem was present among the variables in this study. Correlation matrix was obtained which show the correlation each and every variable as shown in the table 2 below. Multicollinearity has the impact of increasing the variances and standard errors of the ordinary least squares (OLS) estimates. High variances imply that the estimates are imprecise, and therefore not very reliable.

Table 2 Independent Variable Correlation

	exchange rates against US dollar	interest rate differential	inflation rate	Net inflows to total turnover ratio
exchange rates against US dollar	1			
interest rate differential	0.218989	1		
inflation Rate	-0.06033	-0.05341	1	
Net inflows to total turnover ratio	-0.75606	0.613368	0.528913	1

The correlation matrix above shows the correlation figures each of the variables. Focusing only on the correlation value of the independent variables we find that none of the independent variables are highly correlated as evident by the correlation values of less than 0.3.

Multicollinearity is normally a problem of the independent variables being correlated. These results indicate that the correlation between the independent variables being less than 0.3 infers that the model to be estimated will is devoid of multicollinearity. Therefore, there was no multicollinearity detected among the independent variables, allowing for the model estimation and therefore there is no reason not to invalidate to estimation results.

Unit Root Test

Time series data is often known to have problems with non-stationarity. It is important to determine whether a series is stationary (do not contain a unit root) or not stationary (contains a unit root) before using it. One can obtain a high R^2 with non-stationary data even though there is no meaningful relation between variables, otherwise known as a spurious regression between

unrelated variables. Therefore, before testing for the existence of cointegration among the variables, unit root tests were carried out using Augmented Dickey-Fuller tests.

Table 3 Unit Root Test at k^{th} order

		EXR		IRD		INF	NEITR
		test statistic at k=0	test statistic at k=1	test statistic at k=0	test statistic at k=1	test statistic at k=0	test statistic at k=0
Augmented Dickey-Fuller (p-value)		-2.2324 (0.196)	-7.476525*** (0.000)	-2.584863 (0.988)	-10.34879*** (0.000)	-6.326748*** (0.000)	-3.326748*** (0.0167)
Test critical values:	1% level	-3.484653	-3.484653	-3.484198	-3.484653	-3.484653	-3.488063
	5% level	-2.885749	-2.885249	-2.885051	-2.885249	-2.885249	-2.886732
	10% level	-2.579491	2.579491	-2.579386	2.579491	-2.579491	-2.580281

Notes: *** rep stationary variable at k^{th} order of difference

The table 3 gives a summarised output of the augmented dickey-fuller tests for each of the variables under study. By comparing the absolute figures of augmented dickey-fuller and corresponding test statistics, it is cleared with 95% confidence level unit root is only present in two variables that is interest rates deferential and exchange rate while the rest (inflation and net equity inflows to turnover ratio) shows no presence of unit root. However, the two variables – interest rates deferential and exchange rate did not show the presence of unit root at fist deference and therefore they were used in the estimation of the equation at the fist difference. This being cleared provided a go-ahead to proceed in performing cointegration tests using the maximum eigenvalue likelihood ratio test statistic.

Causality test

The results of the causality test shown in the table 4 below are given in terms of the F statistic with the corresponding p- values. A causality test between two variables can be done ways that is it can have two null hypotheses. In this study the causality test was carried out for each of the independent variables against the dependent variable using the two possible null hypotheses for each case. The results were as shown below. The causality study has been done for the period 2008m1 to 2018m8.

Table 4 Granger Causality Test Results (2008m1 to 2018m8)

Null hypothesis	F- statistic	p- value	Reject hypothesis?	Direction of causality
NEITR does not cause EXR	6.30413	0.0116	No	

EXR does not cause NEITR	4.63424	0.0025	Yes	EXR ⟶ NEITR (One directional)
NEITR does not cause INF	0.41408	0.5211	Yes	
INF does not cause NEITR	0.87754	0.3508	Yes	INF ⟷ NEITR (Both directions)
NEITR does not cause IRD	1.23841	0.0298	No	
IRD does not cause NEITR	0.63995	0.6351	Yes	IRD ⟶ NEITR (One directional)

There is a causal relationship between all the exogenous variables and the net equity inflows to turnover ratio as evident by the fact that the null hypothesis granger F-statistics were rejected 5% significance level. However, the vice versa is not true for all the variables except for inflation which was found to have the causal relationship in both directions. Fortunately, it is functionally and scenically right to express the NEITR as a function of tall the endogenous variable (i.e. in true) given the result in the Table 4.

Cointergration tests

Given that we have four variables, and after performing stationarity test, the outcome showed that the series are integrated of different orders. That is, they have a combination of I (0) and I (1) series. Since the series are integrated of different orders, performing a cointergration test is necessary to establish a long run relationship. In this case the use of the Johansen cointergration test is invalid, hence the appropriate cointergration test is the bounds test proposed by Pesaran, shin & smith (2001).

ARDL Bound Test Results

The technique gives three advantages to the analysis in the study in comparison with other cointegration methods. first of all is that it does not need the condition that that all the variables must be integrated of the same order while still useful when all the underlying variables are integrated of order zero or one. Secondly the ARDL bound test is more efficient especially if the sample size of the data is small and finite. Lastly, the use of the technique gives the unbiased estimates of the long-run and short run models (Harris and Sollis, 2003). In applying this test, we test the null hypothesis that stated as H0; there is no cointergrating equation. Otherwise the null hypothesis state that Ho is not true.

Table 5 Cointergration test results

Dependent Variable	H_0	F-statistic	Cointregretion	Next course of action
NEITR	No cointergretion in the NEITR equetion	6.530434	Yes	Estimate with the use of ECM

Since the calculated F-statistic (6.530434) is greater than the critical value for the upper bound I(1) we reject the null Hypothesis. This implies that there is no long run relationship in the NEITR equation. Now with the proven existence of long run relationship the most appropriate method of equation estimation is use a combination of Autoregressive Distributed Lag (ARDL) Model and Error Correction (ECM) Modem.

Autoregressive Distributed Lag (ARDL) Model

The use of the ARDL model in estimation was supported by the fact that there is presence of cointergration ant that the variables are integrated of different orders. Before the estimation of the equation, the optimal lag length of each of the variables in order to factor in in the NEITR equation. The optimal lag length the variables NEITR, EXR, IRD, and INF were 1, 0, 0, and 3 respectively.

$$\Delta \ln Y_t = \alpha_0 + \sum_{i=1}^{p} \beta_{1i} \Delta Y_{t-1} + \sum_{i=0}^{q} \beta_{2i} \Delta Inf_{t-i} + \sum_{i=0}^{q} \beta_{3i} \Delta S_{t-i} + \sum_{i-0}^{q} \beta_{4i} \Delta ER_{t-i} + \sum \beta_{5i} R_{t-1} {}_t$$
$$+ \delta_1 Ln Y_{t-1} + \delta_2 Inf_{t-1} + \delta_3 Smp_{t-1} + \delta_4 ER_{t-1} + \delta_5 R_{t-1} + \varepsilon_t \quad (4.5)$$

Error-Correction Model

To obtain the error correction model we obtain the residuals in the above model and use them in a new model as a new variable as follows.

Table 6 Estimation results for ARDL (1, 0, 2, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LN_NEITR(-1)	0.805415	0.057273	14.06269	0.0000
LN_IRD	0.028105	0.054199	0.518559	0.6051
D_LN_IRD	0.184403	0.108050	1.706635	0.0907
D_LN_EXR	-0.149233	0.089999	-1.658171	0.1001
D_LN_EXR(-1)	0.006821	0.099395	0.068627	0.9454
D_LN_EXR(-2)	0.262147	0.093720	2.797142	0.0061
D_LN_INF(-1)	-0.195071	0.095297	-2.046979	0.0430
R-squared	0.593341	Mean dependent var		1.637649
Adjusted R-squared	0.571359	S.D. dependent var		0.503793

S.E. of regression	0.329836	Akaike info criterion	0.677049
Sum squared resid	12.07591	Schwarz criterion	0.841412
Log likelihood	-32.94591	Hannan-Quinn criter.	0.743785
Durbin-Watson stat	2.459422		

Table 7 Error correction Term

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT	0.899866	0.117956	7.628829	0.0000
D_LN_EXR	-0.234778	0.106891	-2.196422	0.0301
D_LN_IRD	0.140150	0.143051	0.879722	0.0329
LN_INF	-0.133770	0.140501	0.552092	0.0431
C	1.618578	0.364283	4.443188	0.0000

R-squared	0.379868	Mean dependent var	1.637649
Adjusted R-squared	0.357916	S.D. dependent var	0.503793
S.E. of regression	0.403690	Akaike info criterion	1.065109
Sum squared resid	18.41509	Schwarz criterion	1.182510
Log likelihood	-57.84140	Hannan-Quinn criter.	1.112777
F-statistic	17.30480	Durbin-Watson stat	0.447027
Prob(F-statistic)	0.000000		

From table 6 the regression coefficient of lagged NEITR was found to be 0.805415. This value shows that holding other variables in the model constant, an increase in lagged economic growth by one percent causes the economic growth to decrease by 0.805415percent. The value of the coefficient is also positive. The coefficient was negative and statistically significant with a t-statistic value of 7.628829 and the standard error was found to be 0.117956 and the p-value was found to be 0.0301. The positive effect shows that there is a positive relationship between lagged economic growth and economic growth.

The regression coefficient of inflation was found to be -0.133770. This value shows that holding other variables in the model constant, an increase in inflation by one percent causes the economic growth to decrease by -0.133770 percent. The value of the coefficient is also negative. The coefficient was negative and statistically significant with a t-statistic value of -2.293945 and the standard error was found to be 0.355871 and the p-value was found to be 0.0264. The negative effect shows that there is a negative relationship between inflation and economic growth Risso and Carrera, (2009), Chowdhury, (2014) who found out that inflation rate can have a significant effect on economic growth.

The regression coefficient of real exchange rate was found to be 13.34065. This value shows that holding other variables in the model constant, an increase in exchange rate by one percent causes the economic growth to increase by 13.34065 percent. The value of the coefficient is also positive. The coefficient was positive and statistically significant with a t-statistic value of 4.230973 and the standard error was found to be 3.153092 and the p-value

was found to be 0.0001. The positive effect shows that there is a positive relationship between exchange rate and economic growth Iyke, (2017), Kandil and Dincer (2008) who found out that real exchange rate can have a significant effect on economic growth.

The regression coefficient of remittance was found to be 1.903984, 6.702407 and -11.52127 respectively. This value shows that holding other variables in the model constant, an increase in remittance by one percent causes the economic growth to increase by 1.903984 and 6.702407 and then decrease by -11.52127 percent respectively. The value of the coefficient is also negative. The coefficient was negative and statistically significant with a t-statistic value of -1.036898, 3.297442 and -6.107461 and the standard error was found to be 1.836231, 2.032608 and 1.886426 and the p-value was found to be 0.3052, 0.0019 and 0.0000. The negative effect shows that there is a negative relationship between remittance and economic growth Awad and Sirag, (2018), Adenutsi (2011) who found out that remittances can have a significant effect on economic growth.

Table 7 presents the results of the regression model after correcting for unit root problem using the co-integration technique. The t-statistic values that test the significant of the coefficient of the explanatory variable had achieved the optimal values as showed by the highly significant values of p. from the results the value of the error correction term was found to be -0.891422 with a t-statistic value of -8.600270 and a p-value of 0.0000. The interpretation here was that the disequilibrium in the economic system in the previous quarter corrected at the speed of 89.14422% in the current quarter.

From the table, it can be clearly concluded that all the model parameters are significant at least at 90 percent confidence level except foe β_{33} which in not significant. The R^2 of the model is 0.60576 which means that 60 percent of the movements have been explained by the model. The other 40% could be as a result of other factor such as the socioeconomic factor, risk factors etc. Any increase in the net portfolio inflows to the Kenyan economy are influenced by exchange rate, inflation and interest rate differential as follows; 17.21% by the exchange rate of the month; 27.4% by the exchange rate of the previous month; interest rates differentials of the three previous months by 9.2%, 4%, and 11.9% respectively, and inflation by -4%. (-)ve in this case mean native influence. The error correction Model is significant at 5% SL.

Diagnostic Tests

Various diagnostic checks were conducted on the estimated the model with the aim of analysing its reliability.

Table 8 Diagnostics

Page 294

Tests	X^2–statistic
Breusch-Godfrey Serial Correlation LM Test	0.7555
White Heteroscedasticity test	0.0833
Jarque-Bera test	32.86330

The estimated parameters of the long run ARDL equation fits well and the model is globally significant at 5% significance level. From table 7, the estimated model passes all diagnostic tests including Breach-Godfrey Serial Correlation LM Test for serial correlation, the White Heteroscedasticity Test for heteroscedasticity, and the residual Jarque-Bera test for normality of errors.

Cumulative Sum test

The cumulative sum of the recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests are use to describe the randomness of the residuals or in other words it checks the stability of the model. The Null hypothesis to be tested is that 'the data is random'. In this study used both the Cumulative Sum Control Charts (CUSUM) and the CUSUM of squares. The CUSUM is a plotted graph of residuals against the model equitation together with the upper and lower limits of 95% confidence level. The CUSUM of squares on the other hand, denotes the limit at which the Beta coefficients deviate from the expected. The results of the tests were as follows:

Figure 5 Cumulative Sum (CUSUM) Control Chart
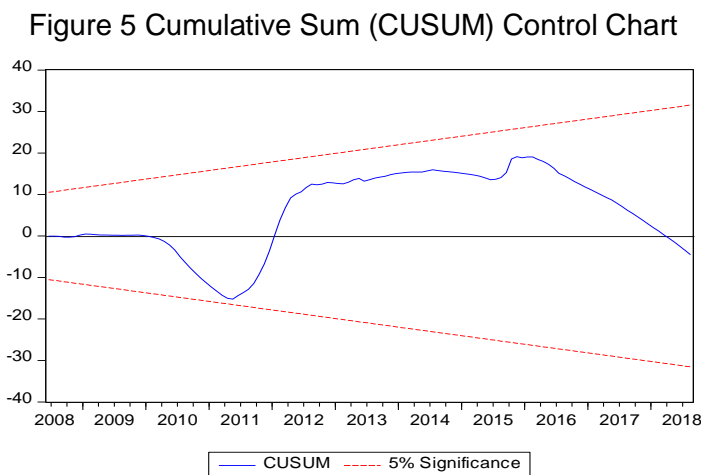
Form figure 5 above, the residual line does not move beyond the 5% Significance control line (demarcated by the red dotted line). The null hypothesis that 'the model is not stable' is rejected. This implies that the model depicted by parameter confidents is stable and reliable at 95 percent confidence level. Likewise, to the case in figure, the red dotted line demarcated the limit at

which the Beta coefficient deviates from the expected. The results depict that the model is largely stable but there exists a random rupture reflecting some level of instability of the coefficients for this date. From these results we can confirm that the model describes the data properly and adequately ant how well the model predicts the response variable.

Discussion of Research Findings

The results as presented in table 4 gave evidence that the equity inflow to turnover ratio is functionally related to the exchange rate, inflation and interest rates differential. Empirically, this results affirm the findings of Portes and Rey (2004), Hau and Rey (2002) and Kinda (2010) who all find the causal relationship between these variable except for interest rate differential which was not used in there studied but which this also to be a significant factor.

The estimated ECM equation is the true representation of the long run relationship of these variables. With this we can therefore make inference that equity inflows are influenced by the current and the previous month exchange rate, the current inflation rate and the current ant two previous mounts interest rate differentials. These findings are closely related the finding of Froot & Ramadorai (2008), Lane and Milesi-Ferretti (2008), Agarwal (1997) and even Artobrah (2015) who all admit that exchange rate, inflation and Interest rates. However, the findings of this study goes further to determine that event the past conditions on the endogenous variables especially exchange rate still influence these equity inflows.

The push- pull factor theory fit well to the findings of this study although cans the side of pull factors. Therefore, the direction of flow of these equity flows can be explained as Calvo and Reinhart, (1998) explained about the monsoonal effect and the split over effect. Therefore, we affirm in this study that the equity inflows and outflows for a country are largely as a result of the competitiveness of such a country's macroeconomic conditions as compared to other.

SUMMARY

Exchange rate and foreign equity trade in NSE

The exchange rate was measured in terms of the nominal exchange rate in Kenya Shillings (home currency) against the US dollar. An increase in the exchange rate for a period of two consecutive months increases the net portfolio inflows according to the findings of this study. These findings replicated the Froot & Ramadorai (2008) second conclusion which said that cross border equity flows predict both the NAV and price returns of emerging market funds and the forecasts are roughly of the same magnitude.

In this study, we also found a high causal relationship between exchange rate and cross border equity flow. This is also in agreement with Hau and Rey (2002) who found that Exchange

Rates, Equity Prices and Capital Flows highly related and that high returns in the domestic equity market relative to the foreign equity market are related with domestic currency depreciation; and finally the net equity flows into the foreign market are correlated with a foreign currency appreciation. Hau and Rey (2006) found that Net equity flows into foreign market are positively correlated with appreciation of foreign currency. About the coefficient of the effect of exchange rate on portfolio equity flows, in this study we found it to be 0.17 which highly deviated with from Agarwal (1997) of 0.6832 but the variance could be as a result the difference in the unit of analysis (that is the difference in the two countries Kenya and Nigeria) and the difference in the measurement variables (that is nominal exchange rate and real exchange rate).

Inflation and Foreign Equity Trade in NSE

Invention as a variable was calculated from the consumer price index that is the percentage increase in the CPI. This study confirms that inflation discourages the equity portfolio inflows. This result could be explained by the findings of Cooper and Kaplanis (1994) who found that the costs and inflation risk have identical effects on portfolio holdings as well as on equilibrium returns. If the equilibrium returns are high inflation risk sensitivity, then the investors are naturally attracted according the capital asset pricing Model (CAPM). Kinda (2010) found that inflation has a very small influence on the portfolio flows. However, the difference between the findings of this study and the findings of Kinda (2010) could be as a result of the difference in their scopes. Kinda (2010) used data 2003 sourced from all the sub-Saharan countries, Latin and Caribbean countries and also all the Asian and Muslim dominated countries

Interest rate differential and Foreign Equity Trade in NSE

Interest rate differential is the difference in interest rates between the home economy and the foreign economy (US interest rate for the case of the study). Like exchange rate, the interest rate differential for the previous four mouths influences the equity portfolio inflows in to an economy such as Kenya. Artobrah (2015) also found a long-run negative relationship between from portfolio inflows to economic growth. Although these two inferences do not mean the same thing we can say that they are related in the sense that the capital accumulation due to portfolio movement increases economic growth.

CONCLUSION

The study examined the empirical influence of the various Macroeconomic variables on the Portfolio equity flows in Kenya. The variables under study included Inflation, Exchange Rate, Interest Rate Differential and the Net Equity Inflow to Turnover Ratio as a measure of equity

portfolio inflows. Due the various factors such the availability of the data the study resorted to limit its study period between 2008 and 2018 on monthly basis. It implemented the ARDL model of cointegration in investigating the existence of the long run relation among the above identified series; the Granger causality and the Vector error correction (VEC) Model to test the direction of causality and the influence of the variables. The topic is of special importance because to the interrelationship among the series with implications for economic growth and policy formulation especially on capital accumulation and build-up. The results show that there is cointegration among the variables specified in the model given the net equity inflow to total turnover ratio as the endogenous variable. The net portfolio inflows to the Kenyan economy are influenced by exchange rate, inflation and interest rate differential, Inflation being the only endogenous factor with a negative impact. The results indicate that there is significant Granger causality all the endogenous variables and the net portfolio inflows. This finding produces important implications and policy recommendations to policy makers in Kenya. The results suggest that for Net Portfolio inflows to generate in the significant positive impacts on economic growth, the Kenyan government should undertake serious reform in consideration of a good combination of the macroeconomic variable to meet it objectives as it strive to develop. Other developing economies too may borrow the finds of the study for as long as they share most of characteristics as those of the Kenyan economy.

RECOMMENDATIONS

Policy Recommendations

Short-term portfolio flows have no doubt been increasing in Kenya over the last decade. Beside the various merits brought about by these flows in terms capital accumulation, there is also a growing concern about the macroeconomic concerns by the policy makers such policy management difficulties. This study confirms that external portfolio investment flows into a developing market are a result of internal factors such as inflation and interest rates as well exchange rate that provides a conducive environment for this flows. This study therefore affirms that for a developing economy to have a stable for inflow of portfolio it oughts' to have a good macroeconomic policy management system that stabilises inflation exchange rate and interest rates. Another concern is the country risk rating of an economy. In this study inflation risk have identical effects on portfolio holdings. It is therefore conclusive that country risk in generals has a huge influence in the equity flows. Lastly, policy makers need to concentrate more on stabilising the monetary system so as to maintain the constant flow if this cross border portfolio flows as well as prevent the so called capital flight.

Managerial Recommendations

In the Kenyan context the financial system is regulated by four different regulators namely The Central Bank of Kenya (CBK), The Capital Markets Authority, The Insurance Regulatory Authority (IRA) and SASRA each of which has different mandates. The Central Bank of Kenya is mandated to implement the monetary policy as per the directions of the Monetary Policy Committee. This means that Inflation exchange rate and interest rate dynamics are solely in the hands on the central bank. The Capital Markets Authority on the other hand regulated the capital markets such as the NSE and in turn the portfolio flows. In this study it is evident that what happens in the money markets affects the capital markets and its dynamics yet they are regulated by different institutions. Coordinating two market regulated by different institutions will is next to impossible yet coordination in clearly necessary tool for stability. Therefore, this study recommends that the two regulators be merged in order to better manage the dynamics in these markets.

Recommendations for Further Studies

This study limited itself to the effects of selected macroeconomic viable on the portfolio equity inflows in to the economy. However, there are other areas that still have to be studied. How the is more to be done in this field of equity flows, the whole concept of portfolio investment flow and the wider discipline of international finance.

For example, to better develop more empirical content in this field there is a need to explore the relationship between these portfolio flows and socioeconomic variable in order to better or full develop an understanding about the movements if these equity flows and its behaviour give the push and pull stimuli. There is also a need to establish whether there is a relationship the macroeconomic variables and the equity flows, bond flows or other forms of international payments.

Adequate studies on the real causes of financial flows have also not yet been done since there could be other underlying causes of financial movements such employment, country risk etc.

REFERENCES

Agarwal, B. (1997). "Bargaining" and gender relations: Within and beyond the household. Feminist economics, 3(1), 1-51.

Alam, M. M., & Uddin, G. S. (2009). „Relationship between Interest Rate and Stock Price.

Amaudou, S., & Fenohasina, M. R. (2015). Private o A Capital Flows, Official Development Assistance, and Remittances to Africa: Who Gets What? Global Economy and Business at booking, Policy paper, 05-06.

Ashford, C. C. (2011). Global Private Capital Flows and development Finance in sub-Saharan Africa; Exemplary performance, Lessons for Others and Strategies for Global competiveness in the Twenty-First Century. Journal of Sustainable Development, 4(5), 2-5.

Atobrah, R. (2015). Determinants of Foreign Portfolio Investment: Evidence From Sub-Saharan Africa (Doctoral dissertation, University of Ghana).

Aubery, F., Marchetta, F., Pélissier, A., Rajemison, H., Rakotomanana, F. & Villa, K. (2015). MADAGASCAR YOUNG ADULT TRANSITIONS SURVEY-Preliminary Descriptive Results. HAL.

Beghebo, M., & Apere, T. O. (2014). Foreign portfolio investment and economic growth in Nigeria. international journal of business and social Science, 5(11(1)), 11-15.

Bénard, G., Massa, F., Puente, N., Lourenço, J., Bellocchio, L., Soria-Gómez, E. ... & Hebert-Chatelain, E. (2012). Mitochondrial CB 1 receptors regulate neuronal energy metabolism. Nature neuroscience, 15(4), 558.

Bernanke, B. S. (2005). The global saving glut and the US current account deficit (No. 77).

Blanchard, O. J., & Milesi-Ferretti, G. M. (2009). Global imbalances: in midstream? (pp. 3-31). Washington, DC: International Monetary Fund.

Bonizzi, B. (2013). Capital Flows to Emerging Markets: An Alternative Theoretical Framework. SAOS Department Working Paper Series No. 186, 2-13.

Bosworth, B. (1975). The Stock Market and the Economy (Vol. 2). Brookings Papers on Economic Activity.

Brunnermeier, M. K., Eisenbach, T. M., & Sannikov, Y. (2012). Macroeconomics with financial frictions: A survey (No. w18102). National Bureau of Economic Research.

Calvo, G. A., & Reinhart, C. M. (1999). When capital inflows come to a sudden stop: consequences and policy options.

Chen, J., Zhu, G., Yang, W., Jing, Q., Bai, P., Yang, Y., & Wang, Z. L. (2013). Harmonic-resonator-based triboelectric nanogenerator as a sustainable power source and a self-powered active vibration sensor. Advanced materials, 25(42), 6094-6099.

Cogoy, M. (1987). The theory of value and state spending. International Journal of Political Economy, 17(2), 75-110.

Cooper, I., & Kaplanis, E. (1994). Home bias in equity portfolios, inflation hedging, and international capital market equilibrium. The Review of Financial Studies, 7(1), 45-60.

Devereux, M. B., & Saito, M. (2006). A Portfolio Theory of International Capital Flows. The Institute for International Integration Studies Discussion Paper Series.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. Journal of the American statistical association, 74(366a), 427-431.

Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. Econometrical: journal of the Econometric Society, 251-276.

Ethridge, D. E. (2004). Research Methodology in Applied Economics. John Wiley & Sons, 24.

Feldstein, M. c. Horioka. (1980). Domestic savings and international capital flows. Economic Journal, 90(314), 29.

Flick, U. (Ed.). (2009). The sage qualitative research kit: Collection. SAGE Publications Limited.

Forbes, K. J., & Rigobon, R. (2002). No contagion, only interdependence: measuring stock market co movements. The journal of Finance, 57(5), 2223-2261.

Fox, w., & Bayat, M. S. (2007). A Guide to Managing Research. Juta Publications.

Froot, K. A., & Ramadorai, T. (2008). Institutional portfolio flows and international investments. The Review of Financial Studies, 21(2), 937-971.

Granger, C. W., & Ramanathan, R. (1984). Improved methods of combining forecasts. Journal of Forecasting, 3(2), 197-204.

Griffin, J. M., Nardari, F., & Stulz, R. M. (2004). Stock market trading and market conditions (No. w10719). National Bureau of Economic Research.

Han, Y. W., & Wang, X. (2013). Mobile microbiome: oral bacteria in extra-oral infections and inflammation. Journal of dental research, 92(6), 485-491.

Hau, H., & Rey, H. (2002, July). Order flows, exchange rates and asset prices. In IFM meetings of the NBER summer institute, Cambridge, MA.

Hau, H., & Rey, H. (2004). Can portfolio rebalancing explain the dynamics of equity returns, equity flows, and exchange rates? American Economic Review, 94(2), 126-133.

Hymer, S. H. (1976). International operations of national firms. MIT press.

Janicka, E., & Żukowski, T. (2016). Przemoc filosemicka?: nowe polskie narracje o Zẏdach po roku 2000. Instytut Badań Literackich PAN. Wydawnictwo.

Jeanneau, S., & Micu, M. (2002). Determinants of international bank lending to emerging market countries.

Jeanneau, S., & Micu, M. (2002). Determinants of international bank lending to emerging market countries.

Johansen, S. (1988). Statistical analysis of cointegration vectors. Journal of economic dynamics and control, 12(2-3), 231-254.

Kasidi, F., & Mwakanemela, K. (2013). Impact of inflation on economic growth: A case study of Tanzania. Asian Journal of empirical research, 3(4), 363-380.

Kinda, T. (2010). Investment climate and FDI in developing countries: firm-level evidence. World development, 38(4), 498-513.

Kirabaeva, K., & Razin, A. (2010). Compsition of International Capital Flows: A Survey. Working Paper, 33.

Klugman, J. (2011). Human development report 2011. sustainability and equity: A better future for all.

Klugman, J., Rodríguez, F., & Choi, H. J. (2011). The HDI 2010: new controversies, old critiques. The Journal of Economic Inequality, 9(2), 249-288.

Lane, P. R., & Milesi-Ferretti, G. M. (2008). International investment patterns. The Review of Economics and Statistics, 90(3), 538-549.

Lee, K., Pesaran, M. H., & Smith, R. (1998). Growth empirics: a panel data approach—a comment. The Quarterly Journal of Economics, 113(1), 319-323.

Lucas, R. E. (1990). Why does not capital Flow from Rich to Poor Countries? The America Review, 73(2), 92-96.

Makori, N. G. (2017). The effect of exchange rate changes on stock market returns at the Nairobi securities exchange(Doctoral dissertation, MS Thesis, University of Nairobi).

Massa, M., Lovati, S., Sudati, D., Franceschina, G., Russo, E., Puglia, R., ... & Augliera, P. (2012). INGV strong-motion data web-portal: a focus on the Emilia seismic sequence of May-June 2012. Annals of Geophysics.

Masson, P. (1999). Contagion:: macroeconomic models with multiple equilibria. Journal of International Money and Finance, 18(4), 587-602.

Mugenda, O. M., & Mugenda, A. G. (2003). Research methods. Quantitative and qualitative approaches.

Mwenga. (2009). Global financial crisis discussion series. Kenya. Overseas Development Institute,, 7.

Ngugi, I. K., Johnsen, R. E., & Erdélyi, P. (2010). Relational capabilities for value co-creation and innovation in SMEs. Journal of small business and enterprise development, 17(2), 260-278.

Ngugi, R. (2003). Development of the Nairobi Stock Exchange: a historical perspective (No. 27). Kenya Institute for Public Policy Research and Analysis.

Nyaga, L. K. (2014). Effects of foreign portfolio flows in Kenya. repository.

Obiechina, M. E., & Ukeje, E. U. (2013). Economic Growth, Capital Flows, Foreign Exchange Rate, Exports and trade openness in Nigeria. International journal of Economics and Management Sciences, 2(9), 01-13.

Obstfeld, M., & Taylor, A. M. (2004). Global capital markets: integration, crisis, and growth. Cambridge University Press.

Ocaya, B., Ruranga, C., & Kaberuka, W. (2013). Foreign direct investment and economic Growth in Rwanda: A time series analysis. Journal of Business, 2(1), 11-18.

Pesaran, M. H., & Pesaran, B. (1997). Working with Microfit 4.0: interactive econometric analysis;[Windows version]. Oxford University Press.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.

Phillips, P. C., & Hansen, B. E. (1990). Statistical inference in instrumental variables regression with I (1) processes. The Review of Economic Studies, 57(1), 99-125.

Pisani-Ferry, J., Sapir, A., & Wolff, G. B. (2013). EU-IMF assistance to euro-area countries: an early assessment (Vol. 16). Brussels: Bruegel.

Portes, R., & Rey, H. (2005). The determinants of cross-border equity flows. Journal of international Economics, 65(2), 269-296.

Prasad, E., Rajan, R., & Subramania, A. (2006). Patterns Of International Capital Flows and Their implication for economic Development. Research Department IMF, 8-9.

Razin , A., & Sadka, E. (2001). Country risk and capital flows reversal. Economics Letters, v72(1,Jul), 73-77.

Razin, A., Sadka, E., & Yuen, C. (1996). A Pecking Order Theory of International Capital Flows. NBER Reprint.

Sander, H., & Kleimeier, S. (2003). Contagion and causality: an empirical investigation of four Asian crisis episodes. Journal of International Financial Markets, Institutions and Money, 13(2), 171-186.

Taylor, R. H., & Kim, Y. Y. (2001). U.S. Patent No. 6,231,526. Washington, DC: U.S. Patent and Trademark Office.

Ulloa, L. Torres-Rosas, R., Yehia, G., Peña, G., Mishra, P., del Rocio Thompson-Bonilla, M., Moreno & Eutimio, M. A., (2014). Dopamine mediates vagal modulation of the immune system by electroacupuncture. Nature medicine, 20(3), 291.

Yule, G. U. (1926). Why do we sometimes get nonsense correlations between time series? A study in sampling and nature of time series. Journal of royal statistics, 89(1), 1-63.