

**THE EFFECT OF REGULATION ON INFRASTRUCTURE BONDS UPTAKE IN  
KENYA**

**BY:**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE AWARD OF THE MASTER OF BUSINESS  
ADMINISTRATION (MBA) DEGREE, SCHOOL OF BUSINESS, UNIVERSITY  
OF NAIROBI**

**OCTOBER 2011**

# DECLARATION

## Student's Declaration

I hereby declare that this research project is my original work; it has not been presented to any other institution of higher learning for the award of a degree.

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## Supervisor's Declaration

This research project has been submitted with my permission as the University Supervisor

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## **DEDICATION**

I dedicate this work to my loving wife, Pauline Mukami and my daughter Megan Wambui who have been my inspiration.

## **ACKNOWLEDGEMENT**

I would like to thank the Almighty God for availing an opportunity and strength to pursue my education. It is through His abundant grace that has brought this research project to a success.

This work would have not been possible without my Supervisor who guided me all along the process. I acknowledgement his support and thank him most sincerely for his tireless efforts.

I also appreciate the most important people who directed and encouraged me in the adventure of academics and have been my anchor. They include my wife, my parents, siblings and child. They relentlessly stood by me even when I barely had time for them in pursuant of this course. Their understanding and moral support went a long way in making this a success.

Last but not the least, special thanks goes to my classmates at the University who provided input and positive criticism hence the accomplishment of this research project. I salute you all.

## **ABSTRACT**

In 2001, the Government of Kenya initiated reforms to restructure domestic debt market to ensure sustainable source of long term financing by both public and private sector through infrastructure bonds. In addition, the move was meant to inter alia reduce exposure to risks associated with short term bonds. These actions have over the time assisted in creating demand for long-term papers. Consequently, the outstanding stock of Treasury bonds rose from Ksh 80bn in June 2001 to Ksh 318bn by end December 2008. For instance in 2003-04, the coupon yield on a 10-year bond was 8.50% while Treasury bills rates averaged below 1.0%. This study focused on the effect of regulation and how it has influenced the investors' subscription to infrastructure bonds.

This study took a causal research design to determine the causal relationship between one variable and another; in this case, the cause and effect relationship between regulation and infrastructure bond uptake.

The study found that regulations regarding the minimum initial subscription amount of the infrastructure bonds was constant at Ksh100,000 with the subsequent units being subscription at Ksh50,000 (par value). The study concludes that tenure period of infrastructure bonds affects their uptake. Investors being rational are skeptical about postponing consumption of money for longer period of time and would rather invest in 'short-term' periods. The study recommends that in order to increase bond subscription, the issuers should address the regulations governing the particular issue.

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## **ABBREVIATIONS**

AICD - Africa Infrastructure Country Diagnostic

CBK – Central Bank of Kenya

CMA - Capital Market Authority

ECA - Export Credit Agencies

FONDAD - Forum on Debt and Development

ICT - Information and Communications Technology

KENGEN – Kenya Electricity Generating Company

LDCs - Least Developed Countries

MDG – Millennium Development Goals

NEPAD - New Partnership for Africa’s Development

NSE - Nairobi Stock Exchange

PFI - Private Finance Initiative

PPI – Private Participation in Infrastructure

PPP - Public-Private Partnership

SROs - Self Regulatory Organizations

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background of the Study**

Any meaningful discussion of financial market regulation first requires a description of the basic regulatory framework. Not so long ago, financial market regulation in Kenya consisted primarily of a set of rules and restrictions that were mostly aimed at ensuring market (and broader macroeconomic) stability (Basel Committee on Banking Supervision, 2001). In the late 1980s and early 1990s, some of these rules and restrictions, especially capital controls, were eased.

One of the key lessons of the Kenyan financial crisis is that financial liberalization should not occur in isolation. Critical for success is the existence of adequate prudential regulation and supervision that protects investors, ensures that markets are fair and transparent and reduces systemic risks (African Development Bank, 2003). Equally important is that the policy regime, especially the exchange rate regime, is sufficiently flexible to cope with increased capital mobility.

According to Central Bank of Kenya (CBK) (2009), in the years since the Kenya financial crisis of the 1990s, there has been sustained effort to improve the prudential regulation and supervision of the financial sector and progress has been made everywhere, although to different degrees. The recognition that local Infrastructure bond market regulation remains underdeveloped has more recently led to several efforts to promote their development, including the Infrastructure bond instrument with a Diaspora component. A number of issues have been identified as hampering the uptake of

infrastructure bonds, including bond tenor; bond issuance period; price and interest rate controls; Minimum subscription; Taxation and Redemption structures. This paper will focus on the regulatory aspects and compare the degree of bond uptake with the relevant prudential regulatory conditions.

The motivation behind economic rules and restrictions often varies, but the end effect is that they undermine the free operation of market forces by prohibiting certain business activities or making them difficult. Good examples are market entry restrictions, capital controls, price controls and certain taxes. Often, economic regulations are used to support macroeconomic policy objectives, like financial market or foreign exchange stability. But while such regulations may help governments achieve their policy objectives, they are typically inefficient and lead to a misallocation of resources (International Organization of Securities Commissions, 2003). Another motive behind economic regulations, especially entry barriers, is to protect domestic financial institutions from foreign competition. However, such protection typically leads to inefficiencies and preserves poor market practices.

The aim of any developing economy should be to gradually reduce economic regulations and open up its markets. The only caveat is that such liberalization should not run ahead of other economic, policy and market reforms, including the establishment of strong prudential regulation. According to report from Organization for Economic Co-operation and Development (2003), when comparing the different degrees of financial liberalization in Kenya, one needs to be mindful of the circumstances and the feasible extent of deregulation against the background of economic, policy and market conditions. Prudential regulation and supervision are meant to protect investors, ensure that financial

markets are fair, transparent and efficient and reduce systemic risks. A strong prudential regulatory environment is the key to a successful Infrastructure bond uptake. Contrary to popular wisdom, most financial institutions do not want lax regulation.

Most financial institutions recognize that good regulation is a valuable asset which attracts investors to invest in Infrastructure bonds. It is no accident that the most successful financial centers, New York, London, Hong Kong and Singapore, all have rigorous supervision (International Monetary Fund, 2003). Even so, detailed mechanical rules and ratios enforced by frequent checking are undoubtedly burdensome. When these rules constrain otherwise desirable transactions, they can contribute to driving business away. Good prudential regulation works with the grain of market forces and should provide incentives to reinforce prudent instincts. This is why the trend of regulation and supervision is towards encouraging high-quality risk management processes, and away from detailed monitoring of balance sheet ratios.

According to PricewaterhouseCoopers (2001), there are many types of economic regulations in Kenya that have some restrictive impact on the uptake of Infrastructure bond investments. This study focuses only on those that are the most common and have the most disruptive impact. In no particular order, these economic regulations are: Bond Tenor; Bond issuance period; Price and Interest rate controls; Minimum subscription; Taxation and Redemption structures.

International Monetary Fund and World Bank (2002) suggested that regulation in this area is usually aimed at increasing transparency and regulatory intervention usually reflects a view that, when left unregulated, a sub-optimal level of transparency is chosen

by Self Regulatory Organizations. The term ‘increased transparency’ can be used to imply that prices and traded quantities are made observable to a wider audience than before. It may also mean that more sensitive details about trades are revealed, or that information is revealed more quickly than before.

Over the past decade Africa has seen growing interest in debt financing mechanisms once used almost exclusively in the developed world. High rates of growth, rising commodity prices, and the emergence of capital market authorities across the region have attracted investors to bond markets (International Monetary Fund and World Bank, 2002). A developed bond market also plays an important role in improving the efficiency of overall economic management through expanding the range of opportunities of available to financing large scale projects, contributing to better allocation of capital, providing a non-inflationary source of finance for government and facilitating public debt management, and contributing to promote sustainable economic growth.

Regulations in bond market are meant to facilitate access to a larger pool of capital for governments and corporate. On infrastructure bonds for instance, regulations increases the amount of bonds outstanding, boosting development projects in a country. According to PricewaterhouseCoopers (2001) effective policy framework defines the path clearly for bonds market development and builds credibility. Through regulation benchmark issue streamlines prices of bonds and other debt instruments accurately. Favourable tax policies and tax incentives; improves participation and in turn liquidity through increased transaction volume; checks excessive speculation; improved savings and investment liquidity; increased market competitiveness from decreased cost of capital.

Infrastructure is the basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function and refers to the technical structures that support a society, such as roads, cables, wires, pipes, bridges, canals, reservoirs, sewers, power grids and telecommunications (Sullivan and Sheffrin, 2003). Stohler (1964) characterized infrastructure as the substructure or the “skeleton” assets of an economy that are essential for the production of goods and services. Later approaches have subdivided infrastructure into social and economic subgroups. Economic infrastructure (including transport, energy/utilities and communication facilities) provides key services to business and industry and enhances productivity and innovation. Social infrastructure, on the other hand, is seen as a medium for supplying basic services to households (healthcare, education and judicial facilities) (ING Real Estate, 2006).

Infrastructure is important in an economy for it facilitates the production of goods and services and impacts on time usage such as travelling time and quality of life (Sullivan and Sheffrin, 2003). According to Varma (2001), investments in infrastructure either produce services directly for household consumption (water, sanitation, social services, telecommunications, electricity) or provide the critical inputs used by enterprises in the production process (transport, port facilities, electricity, and information and communications technology (ICT)).

Kuroda (2006) and Bhattacharyay (2008) identified a number of major roles for infrastructure in socio-economic development and regional integration. First, basic infrastructure promotes economic exchange among various sectors of an economy, both locally and internationally. It provides greater access to key inputs for economic growth,

such as resources, technology, and knowledge. Second, infrastructure improves socio-economic and environmental conditions by providing basic needs and utilities such as roads, water, sanitation, hospitals, clinics, schools, environment-friendly power, and telephone lines all of which are part of the United Nation's Millennium Development Goals (MDGs). It can reduce: (i) non-income poverty by facilitating the poor's access to basic services; and (ii) income poverty by increasing economic opportunities and income generating capacity, particularly for poorer groups and communities in remote areas.

However, failure to provide adequate or affordable infrastructure facilities and services for low income users has often been associated with negative social impacts of inappropriate provision (Masika and Baden, 1997). In the United States, concerns are being expressed about the capacity of the country's aging network of highways, roads and bridges to support future economic expansion. In contrast, in sub-Saharan Africa, the recent work of the Africa Commission, the New Partnership for Africa's Development (NEPAD), the Africa Infrastructure Country Diagnostic (AICD) and the Forum on Debt and Development (FONDAD) have brought into stark relief the extent to which a lack of access to basic infrastructure services is constraining the current welfare and future growth potential of countries in the region.

### **1.1.1 Bond Market**

A bond is a debt security, in which the authorized issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay interest (the coupon) and/or to repay the principal at a later date, termed maturity (Sullivan and Sheffrin, 2003). It is a debt investment in which an investor loans a certain amount of money, for a certain

amount of time, with a certain interest rate, to a company (Daniels & Jayaraman, 2002). Infrastructure bonds are Bonds issued by either the Public sector or the private sector with the purpose of financing infrastructure projects of public interest.

A mature bond market offers a wide range of opportunities for funding the government and the private sector, with the government bond market typically creating opportunities for other issuers. Efficient bond markets are characterized by a competitive market structure, low transaction costs, low levels of fragmentation, a robust and safe market infrastructure, and a high level of heterogeneity among market participants (Bloomfield & O'Hara, 1999). In Latin America, for instance, the sub-sovereign governments sold \$9.1 billion worth of debt in the early 2000s compared to \$3.1 billion in the 1990s, while Issuers in Asia include Japan, Malaysia, and South Korea has also increased (Peterson, 2007).

In developed countries, bond markets are composed of Government, Municipal, Asset-backed, financing and Corporate bond markets (Platz, 2009). The majority of Africa's debt is in foreign currency and is not tradable, and very few countries in Africa have a viable bond market. Particularly, for most African countries the bond market is insignificant or non-existent, even though Africa has some of the most heavily indebted countries in the world (Yeboah, 2007). Sub-Saharan African countries in developing local bond markets include the different debt structures and level of market infrastructure.

Access to the international bond markets by infrastructure projects in emerging economies is a relatively new phenomenon, borne of the economic reforms, market liberalization, and financial innovations in the early 1990s. Brealey, Cooper & Habib



(1996). It also ushered in structural changes in the way in which infrastructure was operated and managed as a pre-requisite for successful private funding or projects.

In Africa countries like: South Africa, Ghana, Botswana and, Nigeria, have used capital markets to finance infrastructure projects. However, infrastructure investments needs remain enormous in the least developed countries (LDCs) in all regions. During the period 1990 – 2001, the private sector invested a total of US \$750 billion in developing and transition economies. Sub-Saharan Africa's share of this investment was a paltry US \$ 23 billion, a mere 3%. There were Only 200+ bond issues worldwide in 2001 by infrastructure entities: Nearly 50% of them in telecom, Only 20% of them in LDCs (mostly in Asia and Eastern Europe), of which about 33% by public companies, Therefore, only about 30 private issues in LDCs, of which about 15 by telecom companies (Schwartz, Hahn and Bannon, 2004).

The regulatory set up in Kenya to some extent resembles that of South Africa, which has a well developed bonds market. In South Africa, the regulation of Bond Exchange of South Africa (BESA) is through Bond Market Association (BMA), a SRO launched in 1987. In turn, the working of the BMA is overseen by the Financial Markets Control Act, which was also promulgated in 1987.

In Kenya, institutions involved in bonds trading include the Central Bank of Kenya (CBK), Capital Market Authority (CMA), the Nairobi Stock Exchange (NSE), stockbrokers, arrangers, commercial banks and guarantors. Besides, there are various organs that make up the regulatory framework. The Capital Markets authority holds the statutory regulatory powers with the overall objective of driving market development and protecting investors' interest. The Authority creates, maintains and regulates the market

where bonds are issued and traded in an orderly, fair, and efficient manner, through the implementation of a system in which market participants regulate themselves to the maximum practicable extent. Capital Market Authority reviews the offer document (information memorandum) to ensure that the issuer makes adequate disclosure. The Central Bank of Kenya ensures a fair equilibrium in the money market; hence ensuring interest rates, inflation and exchange rates are maintained to levels where investors earn real returns on their funds.

The NSE is a self-regulating body that defines the rules of the game in bonds trading with the approval of CMA and within the bounds of prescribed rules. The Capital Markets Authority remains the regulatory authority of capital markets, with the Nairobi Stock Exchange (NSE) only performing delegated roles as a capital markets intermediary. The CMA approves these NSE rules and roles as provided in CMA rules. There is a substantial amount of legal drafting of rules and regulations by the CMA for which, to date, has been able to supplement its resources with private sector resources, especially through the use of committees and taskforces. These have proved useful in developing the regulatory framework, but the more important area in which the CMA needs to develop capacity is that of monitoring and ensuring compliance with the rules and regulations drawn up.

### **1.1.2 Infrastructure Bonds in Kenya**

The bonds market in Kenya trades in both the treasury and corporate bonds. While treasury bonds were introduced as early as mid-1980s, corporate bonds came to the market in 1996 during the reform period. Despite the early initiation of treasury bonds in the market, the market remained almost stagnant, with the government using treasury

bills to finance domestic debt. It was not until 2001 when the government took a deliberate effort to develop the market that activities of the treasury bonds market increased (Mbewa, Ngugi & Kithinji, 2007).

In 2001, the Government of Kenya initiated reforms to restructure domestic debt market to ensure sustainable source of long term financing by both public and private sector. In addition, the move was meant to inter alia reduce exposure to risks associated with short term borrowing. The proportion of short-term to long-term debt in the total domestic debt stock stood at 70:30 then. A number of reforms were introduced, which included; the lowering the cash ratio for commercial banks to release liquidity thereby reducing short term interest rates, streamlined domestic Borrowing Cash Plan in favor of bonds, and liberalized the pension sector (Mbewa, Ngugi & Kithinji, 2007).

Kenya issued its first infrastructure bond of 18.5 billion shillings in February 2009 and was used to build roads, develop a geothermal energy project, and boost water and irrigation systems (Mugwe, 2011). The infrastructure bond was issued at 12.5% coupon rate over 12 years; redeemed in three stages in 2015, 2017 and 2021. its second infrastructure bond, a 12-year security with a 12 percent coupon valued at 18.5 billion shillings (\$249.16 million), on Nov. 12 and plans to use the proceeds in fiscal 2010 (Ombok, 2009).

## **1.2 Problem Statement**

The economic importance of infrastructure has been the subject of extensive research since the late 1980s and is free of controversy. The World Economic Forum (2008) lists infrastructure as one of the most crucial elements to a country's productivity and

competitiveness. In Kenya, the 2030 Vision aspires for the country to be firmly interconnected through a network of roads, railways, ports, airports, and water ways, and telecommunications and provide water and modern sanitation facilities to her people (Denge, 2011). However, according to Iyabo (2010) , if the Government's vision of accelerating economic growth in the medium-term and making Kenya a middle-income country by 2030 is to be kept on target, additional investment in infrastructure is required. Denge states that the country has a fiscal deficit of around 7.5 percent for the second straight year in 2010/11 because of required spending on infrastructure.

Kenya is a developing country in transition from a planned economy to a market economy. Its financial system bears not only the general weakness of other Asian countries, but also the stigma of the planned economy. Furthermore, the strong risk aversion among bond investors has caused the pool of investors to be disproportionately dominated by institutional investors who are under regulation to invest in high grade bonds only. This in turn has put additional pressure on project sponsors that do not meet the minimum investment grade to seek other modes of financing, as there is one less avenue to source funding from even though the project may be viable.

In Kenya, no study, to the knowledge of the researcher, has been carried out on the impact of regulation on infrastructure bonds uptake in Kenya. This study, therefore, seeks to fill-in this knowledge gap by focusing on the following research questions: does coupon rate influence uptake of infrastructure bonds in Kenya? Does the minimal subscription amount influence the uptake of infrastructure bonds? Is redemption structure related with infrastructure bonds?

### **1.3 Objective of the Study**

To determine the effect of regulation on infrastructure bond uptake in Kenya

### **1.4 Significance of the Study**

This study is important to various stakeholders. It is specifically important to the following stakeholders for the following reasons:

The research study is significant to the government and investors as demand for infrastructure services is growing due to the fact that infrastructure financing has gained prominence as a viable and profitable method for raising finance and in the face of the Government pursuing a deliberate policy action to restructure domestic debt, with a view to developing a vibrant bond market for generating long term finance. Hence the Government will be able to understand how regulation impacts on infrastructure bonds uptake as a financing mechanism for Infrastructure development in Kenya.

It is important to policy makers and regulators at Central Bank of Kenya (CBK), Treasury and Capital Market Authority (CBK) as it will help them understand how the regulations they formulate and implement affects facilitate infrastructure financing through bonds. They will thus make the necessary policies that will enhance uptake of infrastructure bonds.

The study seeks to identify regulatory impact on infrastructure bond uptake, thus, the study's findings and recommendations there-to will enhance infrastructure development/improvement in the country. Thus, the study will be of significance to

Kenyan citizens and residents for infrastructure development, as already mentioned, will enhance social and economic development.

The study will also be a source of reference materials for future researchers and academia on related topic. The study will also be an empirical source for future research. Further, academicians will find this study useful in learning the regulatory impact on infrastructure bond uptake. The knowledge thus gained will be useful for pedagogical purposes.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents literatures that have been done on the critical factors in infrastructure bonds investments. The chapter, thus, presents the objectives to be used by the study and how such variables are related with successful infrastructure bonds investments.

#### **2.2 Theoretical Review**

##### **2.2.1 Preferred Habitat Theory**

The Preferred Habitat Theory is one of the many theories that are connected with the yield curves. The Preferred Habitat Theory tries to define the way the maturity period of a debt instrument and its yield is related. As per the Theory the investors want a proper premium to be paid to them when they are purchasing a debt instrument. This is an addition to the interest rate requirements and proper investment options they have (Modigliani and Sutch 1966). It states that different investors have distinct investment horizons and require a premium to buy bonds with maturities outside their “preferred” maturity, or habitat (Campbell and Viceira, 2001). According to Modigliani and Sutch (1967), in the fixed income markets the investors are putting their money more in the short-term debt instruments rather than the long-term debt instruments.

The Preferred Habitat Theory targets investors’ preferences who based on experiences and familiarity have maturity preference, thus, shift from their preferred maturity only for

much higher yield. That is, enhanced investors' confidence reduces liquidity risk premium (Modigliani and Sutch 1967).

As developed by Modigliani and Sutch, the Preferred Habitat model is a combination of three logically independent hypotheses. One is that market participants have a preferred habitat, that is, they tend to match the term structure of their assets and liabilities. The second is that long-term rates depend on expected future short-term rates. The third is that market expectations about future short-term rates contain both regressive and extrapolative elements. Modigliani and Sutch, asserts further that the long-term rate depends on current and past short-term rates and a risk premium that reflects the difference between the premium on long-term and short-term bonds generated by the preferred habitat (Modigliani and Sutch 1967).

### **2.2.2 Liquidity Preference Theory**

This theory explains the difference of interest rates for short term and long term bonds in terms of liquidity preferences. Concerned with risk-aversion investment behaviors, it asserts that lenders anticipate the potential need to liquidate an investment earlier than expected. This is a combination of hypothesis theory and preferred habitat theory. Liquidity preference theory says that the shorter the maturity the lesser the volatility of interest rates and less risky. Because of less involved risk, short term bonds are more liquid compared to long-term bonds (Keynes 1936).

Since for a given change in interest rates, the price volatility of a short-term investment is lower than the price volatility of a long-term investment, investors prefer to lend short term. Therefore, they must be offered a risk premium to induce them to lend long-term.



Borrowers, on the other hand, often prefer long-term bonds because they eliminate the risk of having to refinance at higher interest rates in future periods. Furthermore, the fixed costs of frequent refinancing can be quite high. Therefore, borrowers are willing to pay the premium necessary to attract long-term financing (Van Deventer and Imai, 1996).

### **2.3 Infrastructure Bonds Investments**

Much of the activity has been in corporate and sovereign bonds. But as responsibility for infrastructure development devolves to utilities or local authorities, sub national entities are also turning to bond markets for financing (Fleming M. J. (2000). Although the global financial crisis has reduced liquidity, interest in bond financing continues to grow in anticipation of the recovery and as a stimulus to support economic growth.

Sub national (or subsovereign) bonds provide a mechanism for raising long-term private capital., they are issued by a host of sub national entities, including local authorities, states or provinces, school districts, and utilities. Sub-national bonds generally do not have the explicit backing of the national or federal government (IMF and World Bank, 2001). If the issuer defaults, the national government has no obligation to step in and repay the investors. Sub-national entities most often use bonds to raise financing for infrastructure projects, because their tenor can more closely match the life of the infrastructure being developed.

Bond financing is also an equitable alternative, as it enables all the beneficiaries of the infrastructure to share in the burden of repayment. Jones, Allen (2002) argued that in absence of these long-term instruments, capital expenditures in many emerging markets are financed out of external, hard-currency loans, central government grants or loans, or

recurrent budgets. The price of a certain bond is determined in part by the credit rating it gets from the specialized credit rating companies. The credit rating reflects the risk involved in holding a bond, which have been cooperating respectively at the present time.

## **2.4 Factors Influencing Development of Bonds Market**

For a bonds market to contribute significantly to the development process, it requires that the market caters for a diverse risk preference, is liquid, efficient and has minimal volatility (Jones, Allen, 2002). To achieve this, there must be a sound fiscal and monetary policy, effective legal and regulatory framework, secure and efficient settlement and custodial system, effective information disclosure system, a diversified investor base on favorable tax policies. For treasury bonds especially, there is need for an effective financial system, a sound and prudent debt management and credible and stable government. In addition, the development of a well-functioning money market is essential in enhancing liquidity of the market. An active money market is the precursor to an active secondary bond market.

### **2.4.1 Institutional Framework**

According to Ngugi, (2003b) a sound institutional framework for debt management embodying good governance practices, prudent procedures, and strong capacity for managing operational risks is essential for bonds investment development. A clear legal framework, well specified organizational arrangements, public disclosure and auditing procedures are key elements of an effective governance structure for bonds investment management. The soundness and credibility of a financial system can be supported by assurances that the debt portfolio is being managed prudently and efficiently. The

organizational framework for debt management should be well specified, and must ensure that mandates and roles are well articulated. Sometimes, a risk management office is established to undertake risk analysis, monitor and report on portfolio-related risk, and assess the performance of debt managers against any strategic benchmarks. Debt management activities should be supported by an accurate and comprehensive management information system with proper safeguards.

#### **2.4.2 Regulatory Environment**

The legal and regulatory environment shapes the development of the bond market. Financial markets do not develop without a sound legal, regulatory and supervisory framework (Christensen and Jakob, 2004). The regulatory framework for securities markets is usually seen as having three distinct objectives assurance of fair, efficient and transparent markets; minimization of systemic risk; and, protection for investors and consumers of financial services.

The fundamental parts of the legal framework supporting an efficient domestic securities market usually include an explicit empowerment of the government to borrow budgetary rules for the issuance of government securities, rules for the organization of the primary market, the role of Central Bank as a government agent for debt management framework, rules governing issuance of securities, and rules pertaining to the secondary market (Central Bank of Kenya, 2007). A legal framework is important in defining the exact parameters under which fiscal budgeting process will be linked to securities issuance, limiting issuance through debt ceilings or other devices such as sinking funds and defining the legal properties of securities and their use as collateral in transactions.

The rights and obligations of parties to debt contracts in the primary and secondary markets for issuers, investors, and intermediaries need to be defined (Christensen and Jakob, 2004). Thus, minimum guidelines should exist for disclosure of material information, liability for entities handling third-party investment accounts, and vehicles to allow proper legal recourse against mutual funds, pension funds, and even the government and corporations as issuers.

The regulatory structure of securities markets is, in many cases, built around Self Regulatory Organizations (SROs) such as exchanges and security dealers' associations as a supplement to the government regulatory authorities. SROs typically provide the first layer of regulatory oversight, guiding their members to meet the objectives of regulation. Non-uniformity of capital requirements across different classes of market participants can be an important factor in creating incentives for self-regulation. If members of securities depository and settlement corporations are required to hold higher levels of capital than nonmembers, the members will have greater incentives to monitor those financial institutions with lower capital requirements.

#### **2.4.2.1 Trading and Settlement Systems**

This is the method of matching trades, settlement, surveillance, dispute resolution, failed trades and defaults. In determining the potential efficiency of the bonds market, an important factor is whether bonds are issued as paper or are paperless (dematerialized) securities registered in security accounts (IMF and World Bank (2001). Dematerialization of securities ensures that transactions take place quickly and cheaply and that security accounts protect investors against destruction, loss, theft, or forgery of paper securities, eliminating the problem of tainted script.

Organizing the central depository as a separate agency, even if located within the Central Bank, allows for a clear delimitation of responsibilities, the possibility of independent oversight and, at a later stage, full independence of the system. If custody is fully or in part privately provided, governance arrangements and oversight must be sound. Because of the centralized nature of a securities depository, policy makers might find regulation of the fee structure necessary to prevent monopoly pricing (IMF and World Bank (2001). Efforts to link custody arrangements on a cross border basis should be sought at a later stage to broaden the market base. For an effective secondary market infrastructure, trading and information systems that facilitate an efficient completion of transactions are key. The automated trading systems are increasingly the preferred avenue for most countries; with their costs three to four times lower than those of traditional exchanges using a floor and open outcry method.

#### **2.4.2.2 Favorable Tax Policies**

Fleming (2000) suggested that taxation of capital gains and income from bonds affects consumption, savings and investment decisions, influencing the general level of savings, the demand for financial assets, and investment. An inappropriate tax system hampers the emergence of new financial instruments such as mutual funds and asset-backed securities. Tax authorities in most developing countries often skew the tax regime to take advantage of a relatively well-institutionalized financial sector from which revenue can be raised easily.

As a way of stimulating national savings, many countries have employed various tax incentives for certain financial assets. Tax incentives used with care can be effective in

achieving certain economic goals, such as promoting a long-term bond market. Contributions to pension plans are tax exempt in many countries, and savings through life insurance receive special tax treatment in many countries (Fleming, 2000). Contributions to private pension funds are a major source of national private savings, hence representing an important source for institutional investment in the capital market, including debt securities such as bonds. Policy makers should give careful consideration to designing a tax regime for pensions and other collective investment vehicles that are conducive to bond market development.

## **2.5 Empirical Review**

The opening of local capital markets to international financial flows and rising domestic savings rates, including in the region's growing pension funds, hold out the prospect for greater private financing of infrastructure projects in Africa. Estache's (2006) survey of private sector involvement in the infrastructure sector in Africa found that levels of private participation in the electricity, water and sanitation, telecoms and transport sectors were at or above the levels seen in other low-income countries, though somewhat below those seen in middle-income countries. According to the World Bank's Private Participation in Infrastructure database, between 2000 and 2006, private commitments to infrastructure in Africa increased more than five-fold from around US\$2 billion to over US\$11 billion, though two countries, South Africa and Nigeria, accounted for around two-thirds of those commitments.

Platz (2009) sought to explore the potential of sub-sovereign (infrastructure) bonds in financing infrastructure in developing countries. Taking into account the historical

experience of the US, the study developed a supply and demand side framework for analysis of the market for sub-sovereign bonded debt in developing countries and applied this framework to Mexico, India and South Africa. It also drew lessons for countries seeking to promote markets for sub-sovereign bonds. The study established that the regulatory environment, a diversified financial sector and increased capacity for debt support and management matter most for the development of the sub-sovereign bond market.

Dalla and Khatkhate (1996) studied the emergent bond market in Asia and found that there are regulatory impediments to the development of a vigorous and vibrant secondary bond market in East Asia. The absence of a critical mass of bonds and the relatively small size of issues tend to raise the transaction costs of trading. As fiscal deficits decline or disappear, the number and frequency of government bond issues are declining in the East Asian countries, except in China and the Philippines. Though the gap is being filled by corporate bonds, trading volume in the latter has not reached the threshold necessary for the development of secondary market trading. This reflects several related factors, such as a narrow eligibility criterion for bond issues by corporations, elaborate and long drawn-out issuing procedures, the absence of a streamlined regulatory framework, and discriminatory taxation. Moreover, institutional holders, who form the backbone of the bond market, are “buy and hold” investors whose main objective is to avoid or minimize mismatches in the maturities of their assets and liabilities. There was thus little incentive for secondary market trading in bonds. However, they found the situation to be slowly changing, with greater autonomy being given to the managers of pension, provident, and insurance funds and more flexibility permitted in their operations.

Schur, von Klauy, Dellacha, Sanghi and Pushak (2008) in their studies on developing country firms in infrastructure found that developing country investors have emerged as a major source of investment finance for infrastructure projects with private participation. They found that during 1998–2006 these investors accounted for more of this finance in South Asia and East Asia and Pacific—and for more in transport across developing regions—than did investors from developed countries. Even though the policy implications are not yet fully clear for policy makers, this development suggests a need to rethink the criteria used in selecting investors in schemes for private participation, which have been biased toward large international operators.

Bubnova (2000) conducted a study on the governance impact on private investment in infrastructure bonds. The study used international cross-sectional and time-series infrastructure bond risk premium and credit rating history data from the past decade to examine the factors that influence investor risk perceptions and thus ultimate decision to invest in the same. The study found a substantial degree of variation in the impact of regulatory and political risks on the spread for bond issuers according to their institutional and ownership characteristics. Private sector infrastructure projects were found to be systemically more vulnerable to the effect of political and regulatory risks than were public sector projects, and more so in the emerging market countries. Overall, the study the study provided empirical evidence that governance conditions was a significant factor determining the flow of private finance to and the cost of borrowing for infrastructure.

Mästle and Izaguirre (2008) in their study on trends in private activity in infrastructure stated that in 2006, private participation in infrastructure continued its recovery for the



third consecutive year from the steep downturn of the late 1990s. Activity was more evenly spread across all developing regions. However, it was more concentrated in less risky subsectors, reflecting a lower appetite for risk among private investors. They observed that although greater selectivity had facilitated private sector's renewed interest, it also raise questions about how governments can best tap private operators' abilities in high-need, high-risk areas such as water and electricity distribution. They also found out that the nature of infrastructure project bonds mainly appeals to institutional investors such as the insurance companies, unit trusts and pension funds due to their long-term investment periods that enable these institutions to generate a stream of long-term cash flows consistent with their objectives.

Banerjee, Oetzel and Ranganathan (2006) focused specifically on the role of institutional risk in Private-Public Investment (PPI) and found that the quality of the regulatory environment (effective, market-supporting legal system including property rights protection, contracting ability and contract enforcement) is essential but government commitment to its regulatory and legal roles may be even more important.

Collignon and Plummer (2005) sought to find out the emerging responses to enhancing the role of local private sector providers and argued for tri-sector partnerships (between the public sector, the large and small private sectors, and civil society) as an expanded form of private-public partnership (PPP), which includes actors that can support poor communities and ensure that services meet the needs of all the poor, especially the poorest and marginalized groups. Sansom (2006) identified some positive examples of tripartite water or sanitation contracts and agreements involving government, civil society and the local private sector. Sansom found that this approach offers advantages over the

‘cost sharing’ approach that is commonly used by governments and donors. In particular, the community group and NGO can proceed with their component of the new infrastructure without undue interference from government and vice versa.

## **2.6 Summary**

The chapter looked at the theories on infrastructure bond investments and the regulatory effect on bond uptake. These theories were preferred habitat theory and liquidity preference theory. The chapter also elucidate that regulatory framework affect facilitate access to a larger pool of capital through infrastructure bonds. It also defines the path for bonds market development, enhances credibility, provides necessary oversight of the market ensuring stability, defines parameters linking fiscal budget with security issuance, showing the ceilings and legal properties of bonds among others. These manifests themselves in who issues the bond, amount issued and bought, tenor (in years), price (whether at Par, Discounted or Premium), period of sales (in months), value date, minimum amount, interest rate, taxation, amortization amount and redemption structure. However, no study has been conducted in Kenya to establish how regulatory environment influences the uptake of infrastructure bonds in Kenya. This study will address this gap by looking at how regulations, proxied by the terms of infrastructure bonds have influenced subscription over time.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter outlines the methods, tools and sources of research data, method of data collection which will attain the objective of the study which is to establish the impact of regulation on infrastructure bonds uptake in Kenya. It further discusses how the data will be processed and tools to be used in data analysis and presentation.

#### 3.2 Research Design

This study will take a causal research design. Gay and Airasian (2003) note that causal research designs are used to determine the causal relationship between one variable and another; in this case, the cause and effect relationship between regulation and infrastructure bond uptake. Thus the causal research design is consistent with the study's objective.

#### 3.3 Data Analysis

The data collected will be entered into Statistical Package for Social Sciences (SPSS version 17). The study will adopt the use of regression analysis in achieving its objective. Regression analysis is a statistical tool for the investigation of relationships between variables; to ascertain the causal effect of one variable upon the other (Freedman, 2005). The regression model will be:

$$Y = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4 + \varepsilon$$

Where  $\beta_0$  is the constant or y-intercept,  $\beta_1 - \beta_4$  are the regression coefficients (change in Y, given one unit change in  $\chi$ ). Y is the dependent variable (amount subscribed/amount intended). This will show whether the bonds are oversubscribed or not.  $\chi_1$  is tenure (in years) to proxy the investment period of the bond from investor perspective.  $\chi_2$  is Period of Sale (Days);  $\chi_3$  is interest or Coupon Rate (%);  $\chi_4$  is Redemption Structure (number of amortization periods); and  $\varepsilon$  is the error term.

The study will also use Pearson correlation coefficients between dependent and individual independent variable to establish the relationship between the two. T-test and F-test significances from Analysis of Variance (ANOVA) will be used to establish the independent variable and regression model significance.

## CHAPTER FOUR

### DATA FINDINGS AND ANALYSIS

#### 4.1 Introduction

This chapter presents the findings on how regulations uptake influences infrastructure bond investment or uptake. The study assessed 6 infrastructure bonds that have been issued in Kenya; 5 issued by the Government and 1 by Kenya Electricity Generating Company (Kengen). All the infrastructure bonds have a par value of Ksh50,000 with a minimum subscription value being Ksh100,000. Though the interest rates varied, the rates are paid every half year. To achieve the study's objective, the data obtained was analyzed through multiple linear regression analysis.

#### 4.2 Descriptive Statistics

**Table 4.1: Descriptive Statistics**

Issue No	Value Date	Uptake	Tenure	Period of Sale	Interest Rate	Redemption Structure
IFB 1/2009/12	23/02/09	1.4532	12.5	21	12.5	3
KENGEN FXID 1/2009/10	02/11/09	1.6667	10	21	12.5	16
IFB 2/2009/12	07/12/09	2.385	12	22	12	3
IFB 1/2010/8	01/03/10	2.4326	8	13	9.75	2
IFB 2/2010/9	30/08/10	1.1823	9	19	6	3
IFB 1/2011/12	10/03/11	0.6648	12	12	12	3

Ever since the introduction of infrastructure bonds in 2009, the subscription/issue ratio has ever been on the increase. However, this reduced in the second half of 2010. The

highest infrastructure bond uptake was in March 2010 (IFB 1/2010/8) with subscription more than doubling the issue value. It was established that all the infrastructure bonds were oversubscribed apart from 2011 issue which had a subscription to issue ratio of 0.6648. The low subscription can be blame on the rising inflation during the year occasioned by the depreciating Kenyan shilling.

From the results, the highest coupon rate for the infrastructure bonds were in 2009 (12-12.5%) with the minimal rate being in 2010 (6%). The tenure period ranged from 8 to 12 years with most infrastructure bonds being offered for 12 years. KENGEN had the highest redemption structure of 16 times, though mostly three redemption periods were norms in most infrastructure bnonds issued.

#### 4.3 Correlation Analysis

**Table 4.2: Correlation Matrix**

		<b>Uptake</b>	<b>Tenure</b>	<b>Period of Sale</b>	<b>Interest Rate</b>
Uptake	Pearson Correlation	1			
	Sig. (2-tailed)	.			
Tenure	Pearson Correlation	-0.316	1		
	Sig. (2-tailed)	0.542	.		
Period of Sale	Pearson Correlation	0.260	0.308	1	
	Sig. (2-tailed)	0.619	0.553	.	
Interest Rate	Pearson Correlation	0.092	0.673	0.147	1
	Sig. (2-tailed)	0.862	0.143	0.781	.
Redemption Structure	Pearson Correlation	-0.018	-0.100	0.372	0.336
	Sig. (2-tailed)	0.973	0.851	0.468	0.515
	N	6	6	6	6

The study used correlation analysis to establish the effect of infrastructure bond tenure, period of sale, interest rate and redemption structure on infrastructure bond. Two-tailed Pearson correlation (R) was used to establish the same at 95% confidence level. From

the results, the R-value between tenure and infrastructure bond uptake was -0.316. This signifies moderate but negative linear association between infrastructure bond uptake and the period of time it takes for the bond to fully mature. Thus, investors find infrastructure bonds that take longer period of time to fully mature unattractive.

Period of sales had a correlation value of 0.260 with infrastructure bond uptake. This depicts a low linear relationship between infrastructure bond uptake and period of sales. Therefore, the longer the infrastructure bonds are on offer, the higher the subscription rate. However, there were very low correlation values between infrastructure bond uptake and coupon rate or redemption structure given R-values of 0.092 and -0.018.

#### 4.4 Multicollinearity

**Table 4.3: Collinearity Statistics**

	<b>Tolerance</b>	<b>VIF</b>
Tenure	0.304	3.290
Period of Sale	0.612	1.635
Interest Rate	0.316	3.163
Redemption Structure	0.472	2.120

Multicollinearity test was conducted to establish if the independent variables were correlated. Multicollinearity affect regression model and its lack, thereof, is a key assumption for regression. The study conducted formal detection-tolerance or the variance inflation factor (VIF) for multicollinearity. For tolerance, value less than 0.1 suggest multicollinearity while values of VIF that exceed 10 are often regarded as

indicating multicollinearity. The values of tolerance were greater than 0.1 and those of VIF were less than 10. This shows lack of multicollinearity among independent variables.

#### 4.5 Regression Analysis

The study conducted multiple regression analysis of:

$$Y = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4 + \varepsilon$$

$\beta_0$  is the regression model constant;  $\beta_1 - \beta_4$  are the regression coefficients. Y is the infrastructure bond uptake depicted by the ratio of the amount subscribed/amount issued to the extent oversubscribed.  $\chi_1$  is the time taken by the infrastructure bonds to full maturity (in years);  $\chi_2$  is period of sale denoted by the number of days taken from the opening to closing of bond subscription;  $\chi_3$  is interest or coupon rate per annum (%);  $\chi_4$  is redemption structure, that is, number of times the principle amount gets redeemed; and  $\varepsilon$  is the error term obtained from the F-significance from ANOVA.

**Table 4.4: Model Goodness of Fit**

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>	<b>Durbin-Watson</b>
0.951	0.904	0.518	0.47885	2.550

a. Predictors: (Constant), Redemption Structure, Tenure, Period of Sale, Interest Rate

b. Dependent Variable: Uptake

Table 4.4 above presents the regression model goodness of fit to establish if regression analysis is suited for the data. Pearson Correlation value of 0.951 was established depicting that the independent variables (redemption structure, tenure, period of sale and interest rate) had a very good linear relationship with the dependent variable



(infrastructure bond uptake). An R-square value of 0.904 was established depicting that this relationship was very strong and the infrastructure bond redemption structure, tenure, period of sale and interest rate influences 90.4% of the investors' decision to invest in bonds offered.

A Durbin Watson test for autocorrelation value of 2.550 was established depicting no (serial) autocorrelation within the regression model residuals. Thus, the random (non-stationary) data was used in the regression analysis.

**Table 4.5: Analysis of Variance (ANOVA)**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	2.149	4	0.537	2.343	0.451
Residual	0.229	1	0.229		
Total	2.379	5			

ANOVA analysis was conducted to determine the significance of the regression model.

An F-significance value of 0.451 was established depicting that the regression model had low significance (confidence level) ( $p > 0.05$ ).

**Table 4.6: Regression Coefficient**

	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>	<b>t</b>	<b>Sig.</b>
	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>		
(Constant)	2.032	1.355		1.500	0.374
Tenure	-0.607	0.209	-1.634	-2.901	0.211
Period of Sale	0.146	0.062	0.927	2.335	0.258
Interest Rate	0.374	0.149	1.388	2.514	0.241

Redemption Structure	-0.127	0.058	-0.992	-2.194	0.272
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a. Dependent Variable: Infrastructure Bond Uptake

The study established the following regression model:

$$\text{Uptake} = 2.032 - 0.607\text{Tenure} + 0.146\text{Period of Sale} + 0.374\text{Interest Rate} - 0.127\text{Redemption Structure}$$

The study established that when the redemption structure, tenure, period of sale, interest rate are zero, the infrastructure bond uptake would be 2.032 depicting that subscription would still double the bond offered.

The study also established that holding other factors constant, a unit increase in infrastructure bond tenure would lead to a 0.607 decrease in uptake; a unit increase in period of bonds sale would yield a 0.146 increase in uptake; a unit increase in coupon rate would result in a 0.374 increase in infrastructure bond uptake while a unit increase in redemption structure would yield a 0.127 decrease in infrastructure bond uptake. This depicts that while coupon rate and number of days that one subscribe to the bond increase uptake, redemption structure and tenure period negates the same.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter summarizes the study findings and makes conclusion based on the results. Limitations of the study and areas for further research are also presented.

#### 5.2 Summary of the Findings

The study found that regulations regarding the minimum initial subscription amount of the infrastructure bonds was constant at Ksh100,000 with the subsequent units being subscription at Ksh50,000 (par value). Most of the infrastructure bonds had tenure of 12 years though the minimum tenure that the bond had ever been offered was 8 years. The highest coupon rate of the bonds was 12.5% although the minimum amount was 6% in 2010.

The highest redemption structure was initiated by KENGEN whereby investors redeemed the principal amount every half an year after the second and half year bring about 16 redemption periods. However, most bonds had 3 redemption periods. However, all the infrastructure bonds issued were oversubscribed with exception of 2011 issued which was heavily undersubscribed (0.6648 subscription to offer ratio). Regression equation established was:

$$\text{Uptake} = 2.032 - 0.607\text{Tenure} + 0.146\text{Period of Sale} + 0.374\text{Interest Rate} - 0.127$$

Redemption Structure

This depicts that without the regulations governing the tenure period, period of sale, coupon rate and redemption structure or with all these information being undisclosed, the infrastructure bonds issues would still be oversubscribed. It was also established that

tenure period and redemption structure negatively affects issue subscription. Although period of sales and interest rate would positively influence investors' decision to subscribe to the infrastructure bonds.

### **5.3 Conclusions**

The study concludes that tenure period of infrastructure bonds affects their uptake. Investors being rational are skeptical about postponing consumption of money for longer period of time and would rather invest in 'short-term' periods. Thus, they are hesitant to invest in bonds that take longer time to mature. The study also concludes that the higher the frequency of redemption of the principle reduces the return of the bonds as it affects interest generating ability of the bonds, thus investors don't prefer higher short redemption periods.

It is concluded that long subscription period of infrastructure bonds affect investments in the same. This follows that some investors take longer to decide on whether to invest in the bond and/or others look to financial resources for the same thus short period cut them off. Interest rate is the major revenue centre for infrastructure bonds, thus, the higher the interest, the higher the return. Thus, investors prefer higher interest generating bonds.

### **5.4 Recommendations**

The study recommends that in order to increase bond subscription, the issuers should address the regulations governing the particular issue. Of more importance are the regulations on the tenure period which should be short and principle redemption structure to be reduced as this increases the interest generating ability of the bonds making it more attractive.

### **5.5 Limitations of the Study**

There have been only 6 infrastructure bond issues; thus, the study could be limited by the low number of cases or observations with regards to infrastructure bonds. This could have affected the outcome of the analysis. Infrastructure bond issuance could have been affected by other factors other than those studied such as inflation, GDP performance, exchange rate and other macro-economic aggregates that were hard to isolate from the study.

### **5.6 Areas for Further Research**

The study recommends that further studies can be done on the effect of inflations and exchange rate on the infrastructure bond uptake/investment. Further studies can also be on the factors influencing infrastructure bond investment decisions.

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## APPENDICES

### Appendix I: Data Collection Form

<b>N0</b>	<b>Issue No</b>	<b>Amt Subscribed</b>	<b>Total Bond Value</b>	<b>Competitive Bids</b>	<b>Non-Competitive</b>	<b>Value date</b>	<b>Tenure</b>	<b>Price</b>	<b>Period of Sale</b>	<b>Interest Rate</b>	<b>Redemption Structure</b>	<b>Taxation</b>	<b>Minimum Amount</b>	<b>Minimum Amount</b>
1														
2														
3														
4														
5														
6														

## Appendix II: Dataset

Issue No	Received (bn)	Value (Bn)	Uptake	Competitive Bids	Non-Competitive Bids	N/C	Value date	Tenure	Price	Period of Sale	Interest Rate	Redemption Structure	Taxation	Minimum Amount	Par Value (000)
IFB 1/2009/12	26.884	18.5	1.453	950	593	0.624	23/02/09	12.5	Par, Discounted or Premium	21	12.5	3	Exempt	100	50
IFB 2/2009/12	44.121	18.5	2.385	930	554	0.596	07/12/09	12	Par, Discounted or Premium	22	12	3	Exempt	100	50
IFB 1/2010/8	35.273	14.5	2.433	398	372	0.935	01/03/10	8	Par, Discounted or Premium	13	9.75	2	Exempt	100	50
IFB 2/2010/9	37.362	31.6	1.182	573	238	0.415	30/08/10	9	Par, Discounted or Premium	19	6	3	Exempt	100	50
IFB 1/2011/12	13	20	0.6647	9753.02	1872.73	0.192	10/03/11	12	Par, Discounted or Premium	12	12	3	Exempt	100	50
KENGEN FXID 1/2009/10	25	15	1.667			0.192	02/11/09	10	At Par	21	12.5	16	Exempt	100	50

Source: CBK (2009a, 2009b 2010a, 2010b 2011); KENGEN (2009)

