

**EFFECT OF TREASURY BILLS RATE ON COMMERCIAL PAPER
YIELD FOR COMPANIES LISTED AT THE NAIROBI SECURITIES
EXCHANGE**

BY

LOLCHIKE SPENCER SANKALE

D61/66940/2011

**A RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF
THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION,
UNIVERSITY OF NAIROBI**

NOVEMBER, 2013

DECLARATION

This research project is my own original work and has never been submitted for a degree in any other university.

Signed: _____ Date: _____

Ololchike Spencer Sankale

D61/66940/2011

This research project has been submitted for examination with my approval as a University supervisor.

Signed: _____ Date: _____

Dr. Aduda .O. Josiah

Chairman Department of Finance and Accounting

University of Nairobi

DEDICATION

I dedicate this project to my parents Mr. & Mrs. Ololchike F. Ntiogo, wife Stella, siblings Sironka, Ipato, Sempeo, Kantet and all my friends whose prayers and encouragement helped me through the difficult moments as I undertook this research project.

ACKNOWLEDGEMENT

I thank the almighty and ever living God for having granted me life and strength to accomplish this work. Special thanks also go to my Supervisor, Dr. Aduda. O. Josiah, the chairman of finance and accounting department at University of Nairobi, for invaluable guidance and patience throughout the period of this Research project.

I also acknowledge the Central Bank of Kenya, Capital Markets Authority and the Nairobi Securities Exchange for providing data on Treasury bill rates and commercial paper yields which were the key pillars of my research.

I sincerely appreciate the entire teaching fraternity at the University of Nairobi for their belief, dedication and commitment to learning. I would also like to thank my employer, and my many friends for their material and moral support during the completion of the project.

I am grateful to my beloved parents Mr & Mrs. Ololchike, wife Stella and my siblings Sironka, Ipato, Sempeo and Kantet for their extraordinary patience, material and moral support during my study.

Finally I am thankful to my MBA colleagues for their companionship, networking and socializing that made learning enjoyable.

ABSTRACT

The main purpose of this research was to determine the effect of Treasury bills rate on commercial paper (CP) yield for firms quoted on the Nairobi Securities Exchange. The study used causal research design to meet the objectives of the study. The population of this study was listed companies at the NSE that had issued CP between January 2007 and December 2011. Convenience sampling was used while data collected for this research was quantitative and secondary in nature which was sourced from CMA, NSE database and Annual Audited Financial Statements of selected companies. Regression and correlation analysis were used to determine the nature and strength between commercial paper yield (dependent) and Treasury bills (independent variables).

Descriptive and inferential analysis was used in data analysis and presentation. Data analysis using SPSS version 19 resulted in a Pearson coefficient of 0.780 and p-value of 0.000 which were indicators of a strong, significant, positive relationship between Treasury bills rate and commercial paper yield. These results vindicate the existence of a relationship between Treasury bill rates and commercial paper yield for NSE listed companies. The study also found that 14 firms had a significant performance index as shown by the overall evaluation index closest to 5 in the Likert rating scale and that yearly performance improved significantly from 2007- 2011 progressively.

The study recommended that companies should consider issuing commercial paper to finance their short term obligations since customers were willing to hold the instruments because of their high rate of return. The study also recommended that regulations governing commercial paper market should be more publicized to enable more companies embrace commercial paper in meeting their short term obligations as opposed to bank loans. The research was limited to a few listed companies which was the most obvious limitation.

Further studies are needed for longer duration than five years while at the same time, similar studies are required to establish the effect of other instruments like corporate bonds on commercial paper yield.

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ABBREVIATIONS

BIR	Benchmark Interest Rate
CBK	Central Bank of Kenya
CBR	Central Bank Rate
CMA	Capital Markets Authority
CP	Commercial Paper
CPY	Commercial Paper Yield
IOU	I Owe You
LIBOR	London Interbank Offered Rate
MPC	Monetary Policy Committee
NSE	Nairobi Securities Exchange
O/D	Bank Overdraft
SEC	Securities Exchange Commission
SPSS	Statistical Package for Social Sciences
TB	Treasury Bills
USA	United States of America
VIF	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Commercial Paper (CP) is a short term unsecured promissory note issued by corporations which consider it a low-cost alternative to bank loans and Overdrafts (O/D) (Fischer & Jordan, 2001). It is an I owe you (IOU) from a large, well- known and credit-worthy company to an investor to pay back the principal amount borrowed plus accrued interest. Major issuers are normally corporations' of high net worth and market leaders. It is not for small companies. Investors must be willing to buy them unsecured based on the company's reputation and review of the company's credit risk rating.

Calomiris Himmelberg & Wachtel (1995) in their examination of characteristics of firms that issue the paper found that "access to the market was restricted to firms with high credit quality. And that indicators of short-term credit quality (access to CP market) were closely related to but not identical to determinants of long-term credit quality." Gorton and Pennacchi (1990) suggest that firms may issue CP to provide liquid assets that can be used by uninformed agents for transaction purposes. For this to happen, only the highest quality credit risks will issue CP.

Mathias, Shivdasani, & Wang (2008) state that paper issuers tend to be very large firms who play a particularly important role in the economy. For example, in their sample, CP issuers represented about one-third of the market capitalization and about a quarter of the revenues and investment expenditures of all Compustat firms. Without a very strong reputation, the dealers ("placement agents") would not be able to successfully sell this product. Placement agents sell CP to investors. Borrowers who issue commercial paper have already established their creditworthiness in the public credit markets. Almost all CP is rated by at least one credit rating agency. (Diamond, 1991).

CP traces its origins in the United States of America (USA) in the early 19th century; Corporations that found themselves in "deficient" states could not borrow from commercial banks competitively and resorted to borrowing from the open market so as to

meet their financial needs. Investors in the paper earn competitive, market determined yields in notes whose maturity and amounts can be tailored to their specific needs. (Wells, 1994). CP offer businesses a cheaper source of financing their current expenditures. Many companies have been put into receivership and many more wound up because of their inability to service their loans. An opportunity for such companies to source cheaper funds by issuing the paper can be explored. Businesses need money in order to grow, expand to new locations, up-grade equipment or any of thousand uses of capital. (Fidelity Investment Guidelines, 2000). According to Pedro and Pedro (2007) CP is a working capital instrument representing a firm's resources with maturities less than one year which constitute a significant share of items in the balance sheet used to finance short-term company needs. Further evidence by Calomiris et al. (1995) suggests that it can be used to finance working capital.

The Kenyan CP programs have a combination of European and American features. For example, they are authorized by Capital Markets Authority (CMA) for working capital purposes just like in the USA. However, they are sold to investors through dealers who must be registered with CMA as investment advisors which is similar to European markets. The CBK's role is currently limited to issuance of letters of no objection to dealers after assessing their financial status with CMA as the regulatory body. The CMA reason that regulation is necessary to avoid information asymmetry in the CP market and as a protective mechanism to investors.

In order to issue the paper, firms establish a program that authorizes borrowing up to a pre-specified maximum. Once the program is established, a firm can borrow under it without any regulatory approval or disclosure. Establishing these programs typically entails meaningful costs. These include fees to credit rating agencies for obtaining and maintaining a short-term credit rating, fees to banks for backup credit facilities, and fees paid to dealers, all of which play a critical role in commercial paper yield (CPY) determination by the issuing firm or placement agents. One implication of the low default risk is that the issuers are able to borrow in this market at very low rates (Post, 1992).

CP offers investors short-term investment opportunities at yields above the Treasury Bills (TB) rates. The interest rate paid on CP must be set above the TB rate of the same maturity because government debt is inherently safer than private sector debt. Further, CP interest rates are set below the prevailing bank overdraft rates because the funds are raised directly from investors avoiding the high cost of intermediation. In other words, the issuer of CP wants to sell it at an interest which is less than the rate a bank would charge for overdraft funds. Thus, TB rates set the floor for the pricing of CP, while the prevailing overdraft rates are the ceiling. There are, of course, drawbacks to any particular financial instrument being tied to Treasury bills and fluctuating market can be one such drawback for the paper. (Ou, Hamilton & Cantor, 2004).

Cook & Hahn (1989) indicate that changes in the federal funds rate target in the 1970s caused large movements in interest rates. This evidence supports the expectation theory and is consistent with evidence from other studies on the effect of monetary policy on Treasury bill rates. These lend further credence to the standard view among financial market participants that the Federal Reserve has a strong influence on market interest rates through its control of the funds rate. The evidence from their study indicates that expectations of the future level of the funds rate strongly influence other money market rates such as CPY. This research specifically sought to explain the effect of TB rates on the yield of commercial paper.

1.1.1 Commercial Paper Yield

Commercial paper is usually issued at a discount to a predetermined face value, which means that investors acquire CP at a price below the face value and receive the face value at maturity. The difference between the purchase price and the face value is the discount—that is, the interest received on CP. In practice, the interest rate on CP is a bit higher than interest rate on TB of the same maturity and a bit lower than the interest on loans of the same maturity such as London Interbank Offered Rate (LIBOR), the benchmark interest rate paid on short-term lending among large banks. (Stigum & Crescenzi, 2007).

Yield on commercial paper are quoted on a discount basis. The discount return to commercial paper holders is the annualized percentage difference between the price paid for the paper and the par value. The yields on commercial paper are usually 10 to 20 basis points above Treasury bills of the same maturity, primarily because the interest earned from commercial paper, unlike T-bills, is not exempt from taxes. Commercial paper also has lower liquidity than T-bills, where trading in the secondary market is more active and bid/ask spreads, narrower. (Madura, 2008).

At a given point in time, the Commercial Paper Yield (CPY) is slightly higher than the yield on TB with the same maturity because CP carries some credit risk and is less liquid. When a firm plans to issue the paper, the yield to investors is uncertain. Thus, the cost of borrowing funds is uncertain until the paper is issued. CPY is sensitive to many factors both internal and external to the firm which have the capability to influence its behavior. Key among them is the monetary policy, general level of interest rates, level of inflation, TB rates, and demand and supply of the paper. In Kenya, CPY is primarily dictated by how the CBK prices TB.

1.1.2 Treasury Bills Interest Rate

Treasury bills are short-term borrowing instruments issued by the governments through their Central Banks to raise money on short term basis. They are sold at a discounted price to reflect investor's return and redeemed at face (par) value. In Kenya, the 91-day Treasury rate was the official interest rate up to August 2005 when it was replaced by the Central Bank Rate (CBR). The CBR is the average Kenya Interest Rate and has been historically recorded from 1991 by the CBK. Decisions regarding interest rates are taken by The Monetary Policy Committee (MPC) of the CBK. (Central Bank of Kenya, 2012).

Keynes (1935) points out that, "Economic conditions are the most important factor in determining TB rate. The rates are lowest during slow economic times when there is no much demand for money implying that depositors aren't rewarded for handing it over to the bank. There's not a line of customers beating on the bank's door asking for loans because banks can't do much with it so they pay a low rate."

Many factors may affect Treasury bills interest rates in general, as well as rates for specific issues of Treasury securities, in particular. The main components that influence Treasury interest rate include economic conditions, monetary policies, demand and supply of TB.

1.1.3 Theoretical Expected Relationship between TB rate and CPY

The TB rate change generally causes a corresponding change in commercial paper yields. At the same time also, investors' perception has a strong correlation with commercial paper yields. A shift in portfolio demand could explain the countercyclical movement of interest rate spread between CP and TB. Because TB are more liquid and less risky than CP, a flight to quality causes CP rates to fall by less than TB rates, thus explaining the spread. (Friedman and Kutter, 1993).

There are two interest rate risks associated with commercial paper borrowing. First, the firm faces market interest rate risk: the risk that the rate it pays on commercial paper will rise because the level of market interest rates increases. A change in the risk-free rate (TB) rate, will cause a corresponding change in all commercial paper and borrowing rates. Second, the firm faces idiosyncratic interest rate risk: the risk that commercial paper investors will demand a higher rate because they perceive the firm's credit risk to have increased. With idiosyncratic risk, the rate on commercial paper can rise without an increase in the risk-free rate or in other commercial paper rates. A commercial paper issuer can eliminate market interest rate risk by entering into a swap and agreeing to exchange a fixed interest rate payment for a variable interest rate. (Hahn, 1993).

According to Calomiris et al. (1995) commercial paper issuance is restricted to firms with strong balance sheets and high cash flows in order to finance the extension of trade credit to lesser-quality firms. Firms with a strong financial position issue commercial paper more so during downturns in order for them to be able to extend credit to other firms. They act as financial intermediaries to other firms indicating that CPY is strongly correlated with fluctuations in TB rates. Thus, CPY depends on the investor's tolerance for risk and willingness to participate in the market. A general reduction in investor's

tolerance for risk means that for any given yield, investors will be willing to supply fewer funds. Investors in the CP market appear to be “near –riskless.”

1.1.4 The Kenyan Commercial Paper Market

Commercial Paper in Kenya is at its infancy compared to major and developed economies like the United States of America (USA) and European countries. The first issue was in 1994 and it was not until 1997 that activity increased. Prior to this, the Central Bank of Kenya (CBK) limited the issuance to companies listed in the Nairobi Securities Exchange (NSE). In the absence of credit rating agencies in Kenya, the CBK undoubtedly reasoned that investors could access the creditworthiness of the issuers themselves as those listed published their financial statements periodically.

CMA issued revised rules in 1997 that allowed a wider range of companies to issue commercial paper irrespective of their listing status subject to meeting rules and regulations laid out in the CMA guidelines. As a regulator, CMA prescribes the minimum conditions that are considered protective to investors in the paper market. Issuers in Kenya use dealers who are called placement agents or arrangers. There is no organized secondary market that has been developed for CP in Kenya. Since 1994, the numbers of companies that have issued CP have grown to 29. Many firms have voluntarily exited the market within this period due to various reasons. (Nairobi Securities Exchange, 2013).

As in the case of international markets, the Kenyan CP is normally issued on discounted basis where the investors buy the notes at less than their face value with the difference representing the value of the effective interest rate. The investor receives the full face value amount on maturity. The principle advantage of CP as source of short-term financing is that it is generally cheaper than short-term business loans from commercial banks as it is several percentage points lower than the prime rate of bank loan to a high quality borrower. (Van & Wachowicz, 1997).

As a short-term money market instrument, CP is primarily used for financing short term needs — paying quarterly tax assessments, and funding inventory and accounts receivable. In recent years many firms have also used CP to finance major construction undertakings. In Kenya, it can be issued for periods from 1-364 days, although it's most popular maturities are 30 and 91 days. Since CP is an unsecured promissory note, any company in Kenya issuing the paper must represent a good credit risk. Every issuer of commercial paper has to apply for renewal at least three months before the expiry of the approved period of twelve months from the date of approval. (CBK, 2013)

1.2 Statement of the Problem

Calomiris et al. (1995) state that there has been virtually no econometric analysis of the characteristics of CP issuers or circumstances under which CPY rises or falls which is an omission given that it is the only form of publicly traded short-term debt placed by corporations. Further, the researchers call for more studies to disassociate short-term creditworthiness from long-term credit worthiness as the latter uses bond ratings as an indicator of access to capital markets.

A change in the risk-free rate (TB rate) causes a corresponding change in all commercial paper and borrowing rates. Using Vector Auto-regression (VAR) Edelberg and Marshall (1996) found a large, significant response of bill rates to policy shocks, but only a small, marginally significant response for bond rates. In an effort to model the discrete nature of target rate changes, Demiralp and Jorda (1999) examined the relationship between policy actions and interest rates using an autoregressive conditional hazard (ACH) model to forecast the timing of changes in the Fed funds target, and an ordered probit to estimate the size of the change.

Karimi (2012) carried out an inquiry on impacts of CP uptake on the NSE and concluded that CP is affected by the share volumes traded, equity turnover as well as the market capitalization and that most investors hold the paper until maturity. While Kinyua (2006) looked at factors hindering CP market development in Kenya and recommended that further detailed research should be conducted on specific sectors of the economy.

Njogu (2003) also did a research on Price impacts of CP issue announcements and concluded that companies that have taken the bold step of substituting bank loans with CP experience significant interest savings of an average of 5.85%. However, the research recommended studies be done to determine other factors that could impact on the price of CP. Munywoki (2000) also conducted a research on the factors affecting demand for CP as a short term source of finance for publicly quoted companies and found that TB and O/D are negatively related to demand for CP.

Despite the importance of CP as a financing mechanism, only scant data is available about how they are priced in the Kenyan market and how Treasury bill rates affect the firms' pricing decisions. This study therefore seeks to bridge the knowledge gap by answering the question, what is the effect of Treasury bills rate on commercial paper yield for companies listed at the NSE?

1.3 Objective of the Study.

The objective of this study was to establish the effect of Treasury bills rate on commercial paper yield for companies listed at the NSE.

1.4 Significance of the Study

This study was of paramount importance to the following;

a) Investors

The study was to help investors understand the behaviour of CP in relation to TB rate changes and have better information to base their investment decisions. Further, it would enable investors who engage in arbitrage trading to make better choices and timing of buying CP.

b) Academicians/Scholars

The findings of this study were intended to add to the wide academia knowledge in finance especially behavioral finance and market efficiency. Researchers and academicians would find this study useful for further discussion and research so that they can explore and further develop their studies on CP pricing decisions.

c) Investment advisors

The findings would be useful to investment players in advising their clients about future prospects of holding CP. In addition, they would be in a better position to predict the likely behavior of CPY following changes in TB rates.

d) Policy Makers and Regulators

For policy makers and regulators at NSE, CMA and CBK, stock market inefficiency is a matter of concern because it implies less-than-optimal allocation of investment resources within the economy. Outcome of the study would shed more light on how monetary policies affect firms' CP pricing decisions.

e) Researcher

The study was to assist the researcher qualify for an award of MBA Finance while at the same time being on a competitive edge in the business world. The study was also to excite more interest in the study of the subject and expose areas that need more research and exploration. Future research studies may fill up the gap in the areas not covered and thereby contribute to the frontier of knowledge in this still developing area especially in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature that formed the basis of this study. It highlights the theoretical framework where theories/hypothesis and models relating to the study were discussed. This is followed by review of empirical literature where past studies by various scholars locally and globally on Treasury bills and commercial paper are discussed. The review of other literature on commercial paper then follows. Lastly a summary of literature wraps up the chapter by pointing out the gap in literature that the present study seeks to bridge.

2.2. Review of Theories Guiding This Study

2.2.1 Expectation Hypothesis

This hypothesis holds that bonds of different maturities are perfect substitutes which suggest that buyers of bonds do not prefer bonds of one maturity over another, thus, the yield curve reflects investor's expectations about future interest rates. Periods of relatively high (low) rates of inflation are usually associated with relatively high (low) interest rates on T-bills. While "flight to safety" caused by concerns about default or liquidity risk in other financial markets may cause investors to shift to Treasury bills to avoid risk. TB rates typically rise during periods of business expansion and fall during recessions. Monetary policy actions concerning general interest rate also influence TB rates as well as other close substitutes such as CP rates. (Rose 1994).

2.2.2 Liquidity Preference Theory

This theory suggest that for any issuer, long term interest rates tend to be higher than short term rates due to the lower liquidity and higher responsiveness to general interest rate movement of longer term securities. This is because investors perceive less risk in short term securities than in longer term securities because short term securities are more liquid.

Keynes (1935) argues that, “interest rates cannot be a reward for saving as such because, if a person hoards his savings in cash, keeping it under his mattress for example, he will receive no interest, although he has nevertheless refrained from consuming all his current income. Instead of a reward for saving, interest in the Keynesian analysis is a reward for parting with liquidity.”

According to Keynes people demand liquidity or prefer liquidity because they have three different motives. The speculative motive is the need to hold marketable securities in order to be able to take advantage of bargain purchase at favorable exchange rate fluctuations. For most firms, the borrowing ability from the market like issuing CP and other marketable securities can be used to satisfy speculative motives. The demand for money for speculative motive is interest elastic. The precautionary motive is the need by firms to safeguard their future. This need of holding safety stocks of marketable securities arise because these instruments are very liquid. The demand for money for precautionary motive is completely interest inelastic. Transaction motive arises because firms need to settle bills and any other recurrent expenditure as and when they occur. These disbursements include salaries, trade debts, taxes and dividends. The demand for money for this purpose is also completely interest inelastic.

Keynes further suggested that for any issuer, long term interest rates tend to be higher than short term rates due to the lower liquidity and higher responsiveness to general interest rate movement of longer term securities. This happens because investors perceive less risk in short term securities than in longer term securities because short term securities are more liquid. Borrowers are generally willing to pay higher rate for long term funds because they are saved the need to arrange rollover of short term debt – may be at a higher interest rate. In general therefore, longer maturities tend to call for higher interest rates than shorter maturities.

2.2.3 Market Segmentation Theory

The theory suggests that the market for loans is segmented on the basis of maturity and that the supply of, and demand for loans within each segment determine the prevailing

interest rate. The scope of the yield curve will be determined by the general relationship between the rates prevailing in each segment. Thus, the bonds of different maturities are not substitutes at all, so the expected returns from a bond of one maturity has no effect on the demand for a bond of another maturity. This is because bonds of shorter holding periods have lower inflation and interest rate risks, segmented market theory predicts that yield on longer bonds will generally be higher, which explains why yield curve is usually upward sloping.

Modigliani and Sutch (1966) argue that there is relatively little substitution between assets of different maturities because investors have preferred “habitats”. The equilibrium between suppliers and demanders of short term funds (seasonal business loans) would determine prevailing short term rates and the equilibrium suppliers and demanders of long term funds (real estate loans) would determine prevailing long term rates. Therefore, low rates in the short term segment and high rates in the long term segment should cause the yield curve to be upward sloping, vice versa.

2.2.4 Efficient Market Hypothesis

The essence of the efficient market hypothesis is that current interest rates reflect all available information. This implies that if capital markets are efficient and interest rates essentially perform a random walk, then, market expectations contain neither regressive nor extrapolative elements which is in conflict with Modigliani-Sutch postulation.

Fama (1970), states that in an efficient market, on average, competition will cause the full effects of new information on intrinsic values to be reflected instantaneously in actual prices. Many investors try to identify securities that are undervalued, and are expected to increase in value in the future, and particularly those that will increase more than others. Many investors believe they can select securities that will outperform the market and use a variety of forecasting and valuation techniques to aid them in their investment decisions. Fama also distinguishes among three versions of efficient market hypothesis i.e. the weak form, semi-strong form and the strong form.

2.3 General Literature Review.

2.3.1 Macaulay Duration and Modified Duration

Macaulay Duration is used to measure how sensitive a market security or a portfolio's price is to changes in interest rates. It is the weighted average term to maturity of the cash flows from a marketable security. The weight of each cash flow is determined by dividing the present value of the cash flow by the price, and is a measure of price volatility with respect to interest rates of a marketable security.

Modified duration is a price sensitivity measure, defined as the percentage derivative of price with respect to yield. It expresses the measurable change in the value of a security in response to a change in interest rates. Modified duration follows the concept that interest rates and bond prices move in opposite directions. This formula is used to determine the effect that a 100-basis-point (1%) change in interest rates will have on the price.

2.3.2 Term Structure of Interest Rates

The term structure of interest rates is also known as a yield curve and it plays a central role in an economy. The term structure reflects expectations of market participants about future changes in interest rates and their assessment of monetary policy conditions.

In general terms, yields increase in line with maturity, giving rise to an upward sloping yield curve or a "normal yield curve." One basic explanation for this phenomenon is that lenders demand higher interest rates for longer-term loans as compensation for the greater risk associated with them, in comparison to short-term loans. Occasionally, long-term yields may fall below short-term yields, creating an "inverted yield curve" that is generally regarded as a harbinger of recession.

2.3.3 Three-Factor Model of Level, Slope and Curvature.

This model distinguishes three factors that explain variations in government bonds and related securities. It uses duration analysis to estimate how a change in the general level of interest rates affect prices of fixed income securities. The analysis suggest that most variations in returns on all fixed-income securities can be explained in terms of three factors or attributes of the yield curve i.e. level, steepness and curvature. The three factor approach is especially useful in hedging because the factors explain almost all return variability across the maturity spectrum.

2.4 Online Based Commercial Paper Issues.

Trauten and Langer (2007) did a survey of 54 corporate CP issuers from 11 European countries in order to analyze the perceived benefits and obstacles of online platforms for issuing CP in Europe.

The researchers found that lack of a joint initiative of large issuers, close relations to banks and the fact that liquidity is scattered over separate domestic paper markets were felt to be the main obstacles to the establishment of an integrated European online CP platform. Responses revealed consensus that an internet platform would increase flexibility but show divergent opinions about the effect on other criteria. Corporate issuers expected their own issuance activity as well as the overall market volume to increase within the next five years. The establishment of an online based issuance platform was considered to be likely.

2.5 Review of Empirical Studies Related to the Study.

Standard economic theory would suggest an increase in the target Fed funds rate leads to an increase in commercial paper rates and a fall in paper prices. Evidence for this view is elusive as there are very few studies about commercial paper markets. Research on the effects of monetary policy on interest rates outside of the commercial paper market is suggestive of the possible effects on the commercial paper market.

Kuttner (2001) uses Fed funds futures rates to distinguish between anticipated and unanticipated changes and finds that while the changes of marketable rates are essentially zero to anticipated changes; their response to unanticipated movements is large and highly significant. The model used to undertake the regressions was commercial paper response rate as the dependent variable against anticipated and unanticipated changes components of target Fed funds i.e.

$$\Delta R_t^t = \alpha^t + \beta_1^t \Delta r_t^e + \beta_2^t \Delta r_t^u + \varepsilon_t^t$$

Where R_t^t is the rate on overnight, one-week and monthly CP

r_t^e is the anticipated change

r_t^u is the unanticipated change

ε_t^t is the error term

The model used AA rated non-financial firms for the intervals of overnight to one month. The mean change in the overnight rate was found to be much larger, at twice the size, of the other commercial paper rates, reflecting in part the greater volume of activity in the USA market.

Two main conclusions were obtained from the results. First, the coefficients on anticipated and unanticipated portion of the target Fed funds changes were relatively large and significant for overnight. This result indicated that overnight CP rates responded to both new and old information equally. Which was deemed inconsistent with efficient market hypothesis as information in the anticipated changes should already be incorporated. The second result showed that longer rates show small and insignificant responses to both expected and unexpected changes which violated the expectation hypothesis as well as efficient market hypothesis.

Kuttner concludes by stating that surprise policy actions have little effect on near-term expectations of future actions, and this is taken as an explanation of “finding that the expectations hypothesis fails to explain rate structure at the short end of the yield curve”. Radecki and Reinhart (1994) obtain similar results for the period 1989–1992. (as cited in Gregory & Boghozian, 2010).

Gregory & Boghuzian, (2010) point out that corporations and government that have access to the CP market or have better credit ratings than their peers, may be able to earn arbitrage profits by borrowing cheaply in the market and then use the funds to purchase higher yield short-term investments in other markets. The yields out to one month were found to be dependent upon lagged innovation in the overnight market which they concluded could be as a result of relative size of the markets since most US CP market takes place in the overnight market.

Kacperczyk & Schnabl (2010) state that even though CP market had experienced disruptions in the past, the financial crisis of 2007-2009 was by far the largest decline in the market and contrary to previous episodes, it mostly affected paper issued by financial institutions. The crisis proved that the Federal Reserve is likely to respond aggressively to such decline in the CP market. In fact, the scale of response was unprecedented and included a blanket guarantee of money market investment worth \$3 trillion and direct purchases of commercial paper of up to \$370 billion. Such large-scale market interventions raise concerns about future moral hazard of paper issuers, independent of whether these guarantees will remain implicit or not. The amount of CP outstanding is still low and interest rate spreads high, but issuers will remember for some time that CP was much riskier than they had originally believed. And investors now know the paper can be riskier than they thought. They conclude that, the high levels of skepticism on both sides of the market suggest it will probably diminish relative to its size before the financial crisis.

Matthias et al. (2008) proposed a new explanation for why firms issue CP and argued that firms use it to enhance their financial flexibility. They provide a flexible source of financing because they allow firms to borrow only if there are good investment opportunities or shortages of internal cash flow arise. This, they argue allows firms to observe the realization of investment opportunities and raise capital quickly to capture these opportunities. They tested this proposition by constructing a comprehensive panel data set of all USA issuers from the inception of CP ratings in 1971 to 2005. They showed that firms enter the paper market when they face increased uncertainty about their

operating cash flow or investment. Moreover, after the exit from the market, investment and performance variability decline. They also show that CP borrowings are positively correlated with investment expenditures and negatively correlated with cash holdings, but similar relations do not hold for other corporate debt.

Further, Matthias et al. (2008) tested several alternative hypotheses that could explain why firms use CP. They found mixed evidence for the seasonality hypothesis and little evidence for the certification and market-timing hypothesis. Their results indicated that firms chose to access CP market in anticipation of changes in investment opportunities and that CP market access affects investment behavior. They also show that, while CP issuance had remained fairly stable during the credit crisis, a shutdown in the market would have important real effects on investment. They suggest further research on macroeconomic effects of CP as a credit channel.

Downing & Oliner (2007) show that the term premia built into commercial paper yields rise dramatically at year-end, causing the expectation hypothesis to be rejected. However, once predictable year-end effects were controlled, they found the reverse that commercial paper yields largely conform with the expectations hypothesis. Commercial paper rates are strongly influenced by monetary policy. Hence, their results have implications for the transmission of monetary policy to private interest rates. Their data consisting of daily indexes constructed from the actual market yields on nearly all commercial paper issued by U.S. firms, beginning in January 1998.

Using these transactions-based data, they show that term premia for commercial paper jump up at year-end, causing the expectations hypothesis to be rejected. The year-end jump probably reflects a combination of factors. One contributing factor appears to be "window dressing" on the part of some large institutional investors. Just prior to releasing their year-end financial statements, these investors evidently have an incentive to temporarily substitute Treasury bills and other safe instruments for their holdings of commercial paper especially lower-grade paper to present a strong balance sheet to investors. Another likely factor is the desire of commercial paper issuers to lock-in

longer-term funding over year-end when conditions in overnight markets tend to be volatile. Their willingness to pay a premium for this insurance boosts the yield on longer-term commercial paper at year-end.

Gregory & Word (2006) examine evidence for the expectations hypothesis amongst commercial paper rates and find results that are generally supportive of the hypothesis in both domestic and international commercial paper markets. This means that information on inflation is generally transmitted throughout the maturity structure, a result supportive of monetary policy effecting rates, but there are no direct measurements, and no published work on measuring the effects of anticipated and unanticipated changes of policy on rates. They concluded from their research that commercial paper markets did not conform to the hypothesis of market efficiency and the expectations hypothesis over sampled period. Only the overnight commercial paper market yields indicated a significant response to changes in Federal Reserve policies, and then they showed nearly equivalent responses to both anticipated and unanticipated changes.

A possible explanation for this they argued could have been the time span considered. As during this time span, there was considerable intervention in the commercial paper market by the Federal Reserve, in an attempt to provide liquidity for the market in the wake of the default of Lehman Brothers, an investment bank that had played a considerable role as a market maker in the commercial paper market. The yields up to one month were found to be dependent upon lagged innovation in the overnight market. This was most likely due to the relative size of the markets, as it is well-known that most of the volume activity in the US commercial paper market takes place in the overnight market.

Ou et al (2004) found that a marked increase in "fallen angels" and investment-grade defaults between 2000 and 2002 heightened investor concern about the credit quality of commercial paper issuers. Since Moody's last report on commercial paper defaults in the year 2000, four Moody's-rated issuers defaulted on over \$1.4 billion of CP, the highest level of defaults since 1989 when five issuers defaulted on \$285 million of CP. The

increase in credit risk, even among high credit-quality issuers, also contributed to decline in the total dollar volume outstanding of corporate commercial paper since 2001.

The results of their study indicated that Moody's short-term ratings effectively differentiate the default risk of commercial paper issuers: default rates increased monotonically as ratings fell and increased as time horizon lengthen. They also found that, conditional on a credit rating downgrade, rating withdrawal rates and default rates increased significantly for all rating categories. Finally, commercial paper was found to experience very high recovery rates in the event of default, with a median recovery rate of 100%.

Shen (2003) found that the decline in total volume of non-financial CP outstanding depend on the factors driving it- supply and demand factors. This arose from both the magnitude and timing of the decline in early 2000's which were found to be unusual relative to historical patterns. On the supply side, the researcher found that an unusually widespread deterioration of credit quality and investor's decreased tolerance for risk reduced the supply of credit to the market. On the demand side, it was found that aggressive inventory reduction and widespread practice of replacing CP with long-term corporate bonds reduced demand for credit in the CP market. The researcher wraps up the by illuminating that in the near term, the market was likely to remain at current low levels or shrink even further, but the pace of shrinkage would be fairly moderate.

Duffee (1998) points out that, regardless of credit quality, bond yield spreads are all strongly negatively related to Treasury yields and the relationship is somewhat stronger for lower quality bond. Further, the researcher states that yield spreads on investment grade non-callable bonds fall when the three month Treasury bill yield rises and this decline depends on the initial credit quality of the bond. These changes in yield spreads appear to persist for more than a year, although there was much uncertainty in the estimates of persistence. The inverse relationship between Treasury yields and corporate bond yield spreads was much stronger for callable bonds. However, the scholar argues that variations in yield spread based on such indexes should not be viewed simply as

proxies for variations in investor's perception of credit quality. The researcher concludes by stating that, although yield spreads on both callable and non-callable corporate bonds fall when Treasury yields rise, this relation is much stronger for callable bonds.

McKenzie (1996) while investigating some of microeconomic and macroeconomic properties of commercial paper market in Japan states that the commercial paper-treasury bill spread provides a good predictor of future economic activity at the macroeconomic level while at the microeconomic level, the research focused on providing evidence on the issuing behavior of firms. The study uses monthly outstanding CP data over the period 1988-90 when commercial paper market was just developing in Japan and exhibited some anomalies. The study found that attempted replication of some of the American macroeconomic results using Japanese data ran into several problems since there was no publicly available continuous time series data on interest rates on CP. Again, CP market was relatively new in 1987 and there appear to exist unexploited arbitrage opportunities between the CP market and other markets. Limited evidence is provided in the study on the cyclical nature of the Japanese CP market at firm and aggregate level.

At the microeconomic level, even after account is taken of the regulatory framework determining which firms are eligible to issue CPs, the issuing decision of a firm in the Japanese manufacturing sector in 1988-89 appears to have been significantly influenced by the firm's size, its sales to capital ratio, its net accounts payable to sales ratio and the variability of its earnings. There is some indirect evidence to suggest that the regulatory framework does prevent some firms who wish to issue CPs from doing so.

Nayar & Rozeff (1994) begin by stating that, if credit rating changes convey information to investors and influence stock prices, then, by the same token, so should initial ratings and they present evidence that initial ratings of CP influence common stock returns. They point out that highly-rated industrial issues of commercial paper, unaccompanied by bank letters of credit, are associated with significantly positive abnormal returns; lower-rated issues are not. The stock price effects of changes in CP ratings also demonstrate the

relevance of ratings to the financing of firms. Ratings downgrades, especially those that imply an exit from the CP market, produce significantly negative abnormal returns; upgrades have no effects. Initial CP ratings and subsequent re-ratings appear to help investors sort firms by their future prospects. The study concluded that CP rating downgrades have negative information content while upgrades have no equity price effects, which is similar to effects of rating changes of long-term debt. This they argue suggest that CP downgrades lead the market to re-assess the probability of bankruptcy.

Post (1992) while writing on evolution of the USA CP market states that the composition of firms issuing commercial paper continued to change in the 1990s, in large part because events fostered a sharp decline in the issuance of medium-grade paper (mostly 2-rated), some of which was from the ranks of traditional borrowers. The primary engine of growth for the paper market in the mid-to-late 1980s was the long economic expansion which came to an end with the close of the decade. Recession set in during the early 1990s, and the economy since has been in an extraordinarily slow recovery. Consumers and firms cut back on borrowing, investors and banks became more wary of extending credit and downgrades became more frequent.

In a pattern typical of recessions, the interest rate premium required by investors to hold medium-grade paper rose. The slowdown in economic activity and the increased risk premium curbed the growth of CP; but in addition, defaults of several paper issuers and new Security Exchange Commission (SEC) policy that restricted money market fund investments in medium-grade exacerbated the market's normal response to recession. In spite of the market's setbacks, the commercial paper market continued to be a major source of short-term funds for corporations. New issuers that entered the market were highly rated foreign firms attracted by the liquidity and low cost of the market among other programs carefully structured to obtain high ratings at low cost.

Chandy & Duett (1990) conducted a study on commercial paper rating models using data for the years 1985 and 1986 and the ratings of commercial paper by Moody as well as Standard and Poor. They used three statistical tests; MDA, LOGIT and CART, the

models had a prediction rate of 85%. They found that in some rating categories, the quality component (judgment by analysts) played a greater role than in other categories. Variables such as sales, earning power, return on assets, and amount of equity were identified as most important in explaining ratings of commercial paper. They concluded that, although it is essential that CP be highly liquid and low risk, it is the overall set of financial statements, not just the short-term assets that is important in determining the quality of commercial paper rating.

Cook & Hahn, (1989) did a test on the influence of monetary policy on interest rates so as to identify Fed actions or statements that signal changes in the funds rate target and then examine the reaction of interest rates to these signals. An increase in interest rates at a given maturity following a perceived increase in the funds rate target was taken as evidence that the Fed influences interest rates at that maturity.

They estimated the reaction of interest rates to changes in the funds rate target in the period from September 1974 through September 1979. They found that changes in the Fed's funds rate target were followed by large movements in the same direction in short-term interest rates, moderate movements in intermediate-term rates and small but significant movements in long-term rates. Further, they found that reactions of three-month, six-month and twelve-month Treasury bill rates to changes in the federal funds rate target were very similar. This result indicates that new information influencing funds rate expectations has little effect on the slope of the Treasury bills yield curve from three to twelve months. This result could explain the lack of support for the expectations theory from a number of studies that have tested the theory using short-term interest rates. Cook & Hahn documented a strong response in the 1970s, but regressions using data from the 1980s and 1990s show little, if any, impact of Fed policy. Roley and Sellon (1995) conclude that the empirical relationship is quite variable and time dependent.

Selden (1963) carried out a study on trends and cycles in the commercial paper market and found that there was marked difference between behavior of direct paper and dealer paper during business cycles, while direct paper outstanding increase and decrease with

business expansion and contraction, dealer paper tended to move in a countercyclical fashion. The researcher concludes that these movements could be explained by the general direction of supply of funds to the money market and to both divisions of the commercial paper market or the relatively greater easing of supply in the dealer paper market. A decline in the demand for funds in the direct paper market and a relatively stable demand for funds in the dealer market or the high elasticity of demand for paper funds by some business finance companies and smaller sales finance companies than by the large direct borrowers could also explain these movements.

Musyoka (2012) sought to establish the relationship between commercial paper financing and working capital components in Kenya. Causal research design was adopted and findings indicated that majority of companies had a strong positive correlation between CP borrowings and working capital components. From a population of 27 companies that had issued commercial paper in Kenya, 22 companies showed negative relationship between CP borrowings and cash holding. This means that as levels of cash holding decrease, CP borrowing increase. On the other hand, CP borrowings had a positive relationship with inventory accumulation and accounts receivable. In this respect the researcher drew a conclusion from the foregoing evidence that firms issue CP in Kenya to finance increases in inventories and accounts receivable.

Karimi (2012) carried out an inquiry on impacts of CP uptake on the NSE and found out that the number of commercial paper issued, the approved amount of commercial paper and the outstanding amount of commercial paper are affected by the share volumes traded, equity turnover as well as the market capitalization. The study also found that most investors in the commercial paper market purchase the paper at issuance and hold it until maturity. Hence, there is little trading of commercial paper in secondary markets. As a result, issuers usually finance the repayment of maturing commercial paper with newly issued commercial paper. However, the need to roll over maturing commercial paper generates the risk that investors may not be willing to finance maturing commercial paper.

Kinyua (2006) conducted a study on factors hindering CP market development in Kenya. A sample of 100 companies quoted and unquoted were picked. Included here were 24 companies that have issued CP as they were deemed to have more information given that they had experienced the issuing process. The results showed that factors hindering development of CP market in Kenya include:-Approval time by CMA and NSE, lack of information, Competition from lenders, Costs of issuance and Management lack of enthusiasm. The researcher concluded that concerted efforts by the policy makers, NSE, CMA, stock broker's investment advisors and commercial banks will be the only solution to realize a vibrant commercial paper market in Kenya. The researcher recommended that further studies should be done to determine other critical factors impeding development of the paper market in Kenya.

Njogu (2003) conducted a study on Price impacts of CP issue announcements: A case of quoted companies which have issued CP in Kenya. The main objective being to determine whether stock prices adjust to commercial paper issues announcements and the direction of stock price adjustment. The study was justified because of the slow development of the market in Kenya, there was need to assess investors reactions to the market so that any company considering issuing the paper can predict the reaction of investors and its impact on its share prices.

The population of the study consisted of all quoted companies that have issued commercial paper from 1994 to 2001. The findings of the study concluded that companies that have taken the bold step of substituting the commercial short-term bank loans with CP experienced some significant interest savings of between 2.85% and 13.85% with an average of 5.85%. The study also confirmed the expectation of the study that abnormal returns surrounding the commercial paper issue announcements should be significantly positive. Companies in the NSE that substituted bank overdraft with a commercial paper experienced positive abnormal returns due to interest savings. Hence CP issue announcement is interpreted as good news by investors. The researcher suggested further research be done to establish other factors impacting on CPY apart from issue announcement.

Munywoki (2000) conducted a research on the factors affecting demand for CP as a short term source of finance for publicly quoted companies. This study was aimed at the identification of the factors critical to the development of the CP market and whether the companies issuing CP achieved the cost minimization strategy. Study results indicated that company's cash flow, interest on Bank Overdraft (O/D) and the TB significantly affect the demand for CP. while on the other hand, TB demand and O/D rate were found to have a negative relationship with the Demand of CP. The researcher also indicates that the cost of borrowing of all companies studied decreased after engaging TB rate was found to affect the CP interest rate.

2.6 Summary of Literature Review

Among the many academic publications and articles, there is still a notable gap in this research area that no study has been undertaken to date in the context of effect of TB rates on CPY. This study therefore serves as a springboard for future researchers to investigate and widen their scope on TB rate effect on pricing decisions of CP.

The study provides managers with useful information on how to price their paper and also how policy makers manage the risk associated with TB fluctuations. This study has found mixed results regarding significance of TB impacts on paper yield. The study contends that the TB rates are likely to have significant impact on CPY. Given the many contrary arguments, the effect of TB rates on CP pricing is an important empirical question.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design, population, sampling design, the data collection method, data analysis methods and data validity and reliability that was used in the course of the research. This section also indicates the research tools that were employed to collect data and carrying out the data analysis.

3.2 Research Design

According to Kerlinger (1986), “research design is the plan and structure of investigation so conceived so as to obtain answers to research questions.” It is a detailed outline of how a research will take place. It is the process of making decisions before a situation arises in which the decision has to be carried out. It is actually a process of deliberate anticipation directed towards bringing an unexpected situation under control. The main purpose of this research was to determine the effect of treasury bills rate on commercial paper yield for firms quoted on the Nairobi Securities Exchange. The study therefore used causal research design since it enabled the researcher meet the objectives of the study.

Causal research involves demonstrating co-variation, eliminating spurious relations and establishing the time order of occurrences. It is conducted to identify the cause and effect relationships among variables when the research problem has been narrowly defined. It explains the effect of one variable on another and has the potential to illustrate how a change in one variable causes some predictable change in another variable. It explains how various independent variables are manipulated in order to check how a dependent variable is affected within a relatively controlled environment. Indeed, at the heart of all scientific explanations is the idea of causality that is an independent variable is expected to produce a change in the direction and magnitude specified by the theory. (Frankfort & Nachmias, 1996).

3.3 Population of the Study

According to Cooper and Schindler (2003) a population is the subject such as a person, organization, customer database or amount of quantitative data on which measurement is being taken. The population of this study was taken to be listed companies at the NSE that had issued CP. According to the CMA annual reports and CBK statistics, there were 29 companies that had issued CP since inception in 1994 however, out of this only 11 were listed at the bourse as at December 2011. (Appendix I).

3.4 Sample Selection

Trochim & Donnelly (2006), define sampling as the process of selecting units from a population of interest so that by studying the sample, fair generalization of results can be made regarding the population from which they were chosen. In this research, convenience sampling was used and the entire population of listed companies was used to conduct the study. Since eleven out of the fourteen firms were still listed at the NSE, their financial statements were readily available and reliable. (Appendix I).

3.5 Data Collection

The data collected for this research was quantitative and secondary in nature. Secondary data which involves the collection and analysis of published material and information was obtained from CMA, NSE database and Annual Audited Financial Statements of selected companies as well as other published data. Saunders, Lewis & Thornhill (2009) point out a major advantage of using secondary data as the enormous savings in resources to researchers' such as time and money.

Quarterly commercial paper yield outstanding was extracted from the audited financial statements of the selected firms. While quarterly TB rates were obtained from CBK and NSE reports for the five year period, between January 2007 and December 2011. The period of data collection was five years since not all firms had renewed their paper consistently from inception date while others had exited the market permanently after a few renewals. Further, others exited for some years and came back into the market in

subsequent years. The 5-year period was chosen in order to capture the influence of major factors in the economy that could have affected the CPY and TB rates.

The five-year period was comparable to Cook & Hahn, (1989) who used a similar period to determine the effect of changes in federal funds rate on Commercial paper yield. A second justification for use of 5-year period was that a much longer period would have increased the stochastic of betas (Sharpe and Cooper (1972). It was also the estimated time that investors require to assess the risk of a certain stock. The specific data collected in each quarter for the five years for the analysis of independent firm variable was data on different TB maturity rates and inflation levels.

3.6 Data Analysis

To determine the relationship between CPY and TB rates, the data was analyzed through the use of regression and correlation analysis to assess the strength of the relationship between the dependent and independent variables. The required variables were obtained as follows; the CPY outstanding and TB rates for different maturity periods at the end of each third month from Jan 2007 to Dec 2011. The independent variables were the Treasury bills with the maturity period of 30 days (TB30), 91 days (TB91), 182 days (TB182) and 364 days (TB364). CPY was taken as the dependent/ respondent variable in the model.

Regression method of quantitative analysis was used in the study. Specifically, Pearson's Multiple Regression was used to estimate the causal relationships between CPY and the selected variables. While Auto-correlation, Multi-co linearity and Causality test supported the regression results. The Statistical Package for Social Sciences (SPSS) version 19 software was used for analysis of the different variables in the study. The package helps in organizing and summarizing data by use of descriptive statistics like tables. Data presentation was done through; percentages and matrix tables to ensure that gathered information was clearly understood. The multivariate regression between CPY and TB was as follows:

$$CPY_{it} = \alpha + \beta_1 TB_{30} + \beta_2 TB_{91} + \beta_3 TB_{182} + \beta_4 TB_{364} + \varepsilon$$

CPY_{it} Commercial paper yield outstanding at time t for $i=1, 2, \dots, 11$ firms

α the intercepts of equation. Estimated value of CPY when all the other variables are zero.

$\beta_1, \beta_2, \beta_3,$ and β_4 : coefficients of variables. Change in estimated value of CP.

t : time = 1, 2, ..., 5 years.

ε : the error term. This was used to capture firm as well as industry specific factors that influence CPY_{it} .

Coefficients of the equation were found using the method of Ordinary Least Squares (OLS); while results of the regression were analyzed by coefficient of correlation (r), coefficient of multiple determination (r^2) and adjusted coefficient of determination (r^2_{adj}).

The regression model was based on a similar model adopted by Cook & Hahn (1989) in determining the effect of federal funds rate on commercial paper yield. Similarly, Musyoka (2012) espoused this model while establishing the relationship between commercial paper financing and working capital components in Kenya. This model was also used by Njogu (2003) in the study of impacts of CP issue announcements.

3.7 Data Validity and Reliability

Multi-collinearity test was used to check whether explanatory variables were correlated to ensure the validity of multiple regression model in predicting CPY. In addition, variance inflation factor (VIF: $1/1 - r_j^2$) was used as a precise measure for multi-collinearity which was obtained directly as an output of SPSS. Relevant explanatory variables with a VIF higher than ten were excluded from the regression model.

Reliability analysis provided information about the relationship between individual variables. Auto-correlation was tested using Durbin-Watson test statistic to indicate the extent of reliability of the regression model given the time lag between the explanatory variables. The Durbin-Watson test statistic for autocorrelation generated directly by SPSS and with a value near two is indicative of non-existence of no serial correlation meaning the model was reliable.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 Introduction

This chapter presented the results and findings of the study based on the research objectives. The study provided two types of data analysis namely; descriptive analysis and inferential analysis. The descriptive analysis helps the study to describe the relevant aspects of the phenomena under consideration and provide detailed information about each relevant variable.

For the inferential analysis, the study used the Pearson correlation, the panel data regression analysis and the t-test statistics. While the Pearson correlation measured the degree of association between variables under consideration, the regression estimated the relationship between treasury bills rate and commercial paper yield for companies listed at the Nairobi Securities Exchange. Furthermore, in examining if the treasury bills rate was significantly different from that of commercial paper yield, the Chi-Square Test statistic was used.

4.2 Data Presentation

4.2.1 Evaluation of Commercial paper yield

The study evaluated commercial paper yield for listed companies yearly for a period of 5 years. The researcher evaluated the commercial paper yield in a five point Likert scale. The range was ‘very great extent (5)’ Not at all/applicable; ‘(1). The scores of ‘to Not at all ‘and’ to a less extent; have been taken to present a company which had commercial paper yield to a small extent (S.E) (equivalent to mean score of 0 to 2.5 on the continuous Likert scale ;($0 \leq S.E < 2.4$).

The scores of ‘To a moderate extent;’ had been taken to represent a company that had commercial paper yield to a moderate extent (M.E.) (equivalent to a mean score of 2.5 to 3.4 on the continuous Likert scale: $2.5 \leq M.E. < 3.4$). The score of ‘great extent; and very great extent’ had been taken to represent a company which had commercial paper yield to

a large extent (L.E.) (equivalent to a mean score of 3.5 to 5.0 on a continuous Likert scale; $3.5 \leq \text{L.E.} < 5.0$). A standard deviation of >1.5 implied a significant difference on the commercial paper yield among companies considered. The results were as indicated in Table 4.1.

Table 4.1 Commercial paper yield (2007-2011)

	2007	2008	2009	2010	2011	Average
East African Industries	2.39	3.28	3.38	4.11	1.354	3.98
Athi River Mining Co. Ltd	3.99	4.08	4.45	4.66	1.146	4.63
BAT Ltd	2.66	3.42	3.58	4.22	4.22	4.16
Kenya Power	1.99	3.08	3.45	4.08	3.08	3.02
Crown Burger Ltd	4.522	4.344	3.96	4.399	4.11	5.647
Total Kenya Ltd	4.7466	3.354	3.67	4.388	3.08	5.974
Brook Bond	4.663	4.146	3.93	4.398	2.13	5.687
General Motors Kenya	4.553	4.22	3.99	0.922	4.11	3.767
Industrial Promotion Services	4.99	3.08	4.45	5.08	3.08	4.63
Lonrho Motors	2.81	2.13	2.75	3.36	2.13	4.89
Mabati Rolling Mills	3.66	4.11	3.58	4.22	4.11	3.16
Kenya Shell	4.99	3.08	4.45	5.08	4.22	3.63
TPS Serena	2.81	2.13	2.75	3.36	1.344	3.84
Kenya Oil Company	3.66	4.11	3.58	4.22	1.354	5.33
Caltex Oil	4.553	4.22	3.22	0.922	1.146	2.653
Bidco Oil Company	4.522	4.344	4.96	3.399	4.22	5.622
CMC Holdings	3.66	4.11	3.58	4.22	4.99	4.16
Cooper Kenya Ltd	4.553	4.22	3.22	0.922	2.81	1.677
Motor Mart Kenya	1.522	1.344	0.96	1.399	3.66	4.678
Kenya Kazi Ltd	4.99	3.08	4.45	5.08	4.553	4.634
K-rep Bank	2.81	2.13	2.75	3.36	1.522	3.89
Davis & Shirliff Ltd	3.66	4.11	3.58	4.22	1.7466	5.16
KK Securities Ltd	4.553	4.22	3.22	0.922	1.663	5.633
Kenya Hotel Properties	4.99	3.08	4.45	5.08	4.553	4.644

Express Kenya	3.66	4.11	3.58	4.22	2.81	4.33
Agip Kenya Ltd	4.99	3.08	4.45	5.08	3.66	2.52
Ecta Kenya	2.81	2.13	2.75	3.36	4.99	2.84
Pan Africa Paper Mills	3.66	4.11	3.58	4.22	2.81	3.14
Yearly Performance of Commercial Paper Yields	5%	16%	24%	25%	30%	100%

Source: computed by researcher using data extracted from annual reports of companies (2007-2011)

The findings in Table 4.1 indicated that out of a total of 29 listed companies that issued commercial paper, 14 had a significant performance index as shown by the overall evaluation index closest to a 5 in a rating scale. However other companies that issued commercial paper did not show much significance in their performance index. The findings further showed that yearly performance improved significantly from 2007- 2011 as shown by 5% (2007), 16% (2008), 24 % (2009), 25 % (2010) and 30% (2011) respectively. This implied that commercial paper yield was continuously improving due to increased short term obligations of the companies and enhanced number of customers due to high rate of return associated with holding the commercial paper.

4.2.2 Relationship between Treasury bill rates and commercial paper yield

Under the advance analysis, correlation analysis was first used to measure the degree of association between different variables under consideration. While regression analysis was used to determine the effect of the treasury bills rate on commercial paper yield for companies listed at the Nairobi Securities Exchange, the Chi-square test statistics was used to ascertain whether there was a significant difference in the Treasury bill rates and commercial paper yield. Finally, the t-test statistic was also used to find out if a significant difference occurred in the performance of companies that issued commercial paper and those that did not issue commercial paper.

4.2.2.1 Pearson's Correlation Coefficient Analysis for Treasury bill rates and commercial paper yield

In this section, the study measured the degree of association between treasury bill rates and commercial paper yield i.e. if the treasury bills with the maturity period of 30days (TB30), 91 days (TB91), 182 days (TB182) and 364 days (TB364) had an impact on CPY in the model. Also measured was the likely serial correlation of the explanatory variables. From the priori stated in the previous chapter, a positive relationship was expected between treasury bill rates and commercial paper yield. Table 4.2, 4.3 and 4.4 presented the correlation coefficients for all the variables considered in this study.

Table 4.2: Pearson's Correlation Coefficients Matrix for the Model (CP Yield)

		(TB30)	(TB91)	(TB182)	(TB364)	Commercial paper yield
(TB30)	Pearson Correlation	1	-.681(**)	-.486(**)	.528(**)	.539(**)
	Sig. (2-tailed)		.000	.000	.000	.000
	N	53,677	53,677	53,677	63	53,677
(TB91)	Pearson Correlation	.681(**)	1	.609(**)	-.496(**)	.596(**)
	Sig. (2-tailed)	.000		.001	.000	.000
	N	53,677	53,677	53,677	63	53,677
(TB182)	Pearson Correlation	.486(**)	.609(**)	1	-.225	.625
(TB364)	Pearson Correlation	.528(**)	-.496(**)	-.225	1	.353(**)
	Sig. (2-tailed)	.000	.001		.63	.076
	N	53,677	53,677	53,677	1	53,677
Commercial paper yield	Pearson Correlation	.539(**)	.596(**)	.625	.353	1
	Sig. (2-tailed)	.000	.000	.076	.63	
	N	53,677	53,677	53,677		53,677

** Correlation is significant at the 0.01 level (2-tailed).

Source: computed by researcher using data extracted from annual reports of companies (2007-2011)

From the correlation results for model, Treasury bills with maturity period of 30, 91 and 182 days had a strong correlation with commercial paper yield which was significant at 1% and 5%. This implied that Treasury bills with these maturity periods had a positive effect on the level of commercial paper yield due to their associated high rate of return as opposed to holding Treasury bills. Treasury bills of maturity period of 364 days also showed a significant contribution to commercial paper yield.

Table 4.3 Pearson’s Correlation Matrix and VIF

Variables	TB30	TB91	TB182	TB361	Co-linearity Statistics (VIF)
TB30	1	-.681	-.486	.528	1.865
TB91	.681	1	.609	-.496	1.590
TB182	.486	.609	1	-.225	1.053
TB364	.528	-.496	-.225	1	1.387

At 90 percent level of significance, Pearson correlation matrix among explanatory variables satisfied the rule of thumb for multi colinearity as all the VIF values for explanatory variables were less than the upper limit of 10. This indicated that there was no multi-colinearity problem among the independent variables and therefore all the explanatory variables were used in regression model.

Table 4.4: Chi-Square Test: two-sample with equal variances for Treasury bills and commercial paper

	(Treasury bills)	(Commercial paper yield)
Mean	0.062177643	0.023739
Variance	0.00233563	1.38085E-05
Observations	8	4
Hypothesized Mean Difference	0	
Df	7	
t Stat	2.958540189	
P(T<=t) one-tail	0.00554419	
t Critical one-tail	1.770933383	
P(T<=t) two-tail	0.01108838	
t Critical two-tail	2.160368652	
Mean	0.062177643	0.023739
Durbin Watson	1.632	2.002

Source: Computed by the researcher from annual reports of companies (2007-2011)

From the Chi-square results, Treasury bills recorded a mean of 0.0621 while commercial paper yield recorded a mean of 0.0237. However, the variance for the Treasury bills and the commercial paper were 0.0023 and 1.3808 respectively. Furthermore, at two-tailed, the t-calculated of 2.9585 was seen to be greater than the t-tabulated of 2.1603. This implied that Treasury bill rates had a great effect on commercial paper yield since Treasury bills carry higher returns to customers holding them compared to commercial paper resulting to low commercial paper yield. The Durbin Watson values of 1.632 and 2.02 implied that there was no serial correlation and therefore the model could be relied upon to make conclusions for the study

4.2.3 Hypothesis Testing

The study carried out correlation analysis for the null hypothesis (H0) that there is no relationship between Treasury bill rates and commercial paper yield for the companies listed on Nairobi securities exchange i.e.

H0: There is no relationship between Treasury bill rates and commercial paper yield for the companies listed on Nairobi securities exchange.

The findings were as indicated in Table 4.4.

Table 4.5 Treasury bills rate Vs commercial paper yield

	Commercial paper yield
Treasury bills rate Pearson Correlation	0.780
Sig. (2-tailed)	0.000
N	29

A Pearson coefficient of 0.780 and p-value of 0.000 indicated a strong, significant, positive relationship between Treasury bills rate and commercial paper yield by NSE listed companies in Kenya. Therefore based on these findings, the study rejected the null hypothesis that there was no relationship between Treasury bill rates and commercial paper yield for the companies listed on Nairobi securities exchange and accepted the alternative hypothesis that there was a relationship between Treasury bill rates and commercial paper yield for the companies listed on Nairobi securities exchange.

4.3 Summary and interpretation of the findings

The study aimed to establish the effect of Treasury bill rates on the commercial paper yield for companies listed at the Nairobi securities exchange. The study evaluated the commercial paper yield for listed companies for a period of 5 years. The findings indicated that out of a total of 29 listed companies trading with commercial paper, 14 had a significant performance index as shown by the overall evaluation index closest to a 5 in a rating scale. However other companies that issued commercial paper did not show much significance performance index. The findings further showed that yearly performance improved significantly from 2007- 2011 as shown by 5% (2007), 16% (2008), 24 % (2009), 25 % (2010) and 30% (2011) respectively. This implied that commercial paper yield was continuously improving due to increased short term obligations of companies and enhanced number of customers due to high rate of return associated with holding commercial paper.

Under the advance analysis, correlation analysis was first used to measure the degree of association between different variables under consideration. While the regression analysis was used to determine the impact of the Treasury bills rate on commercial paper yield of companies listed on Nairobi Securities Exchange, the Chi-square test statistics was used to ascertain whether there is a significant difference in the Treasury bill rates and commercial paper yield. Finally, the t-test statistics was also used to find out if a significant difference occurred in the performance of companies trading in commercial paper and those without commercial paper.

In this section, the study measured the degree of association between Treasury bill rates and commercial paper yield i.e. if the Treasury bills with the maturity period of 30days (TB30), 91 days (TB91), 182 days (TB182) and 364 days (TB364) have impact on CPY in the model. From the priori stated in the previous chapter, a positive relationship is expected between Treasury bill rates and commercial paper yield. From the correlation results for model, Treasury bills with maturity period of 30, 91 and 182 days had a strong correlation with commercial paper yield which was significant at 1% and 5%. This implied that Treasury bills with these maturity periods had a positive effect on the level

of commercial paper yield due to their associated high rate of return as opposed to holding Treasury bills. Treasury bills of maturity period of 364 days also showed a significant contribution to commercial paper yield.

From the Chi-square results, Treasury bills recorded a mean of 0.0621 while commercial paper recorded a mean of 0.0237. However, the variance for the Treasury bills and the commercial paper are 0.0023 and 1.3808 respectively. Furthermore at two- tailed, the t-calculated of 2.9585 is seen to be greater than the t-tabulated of 2.1603. This implies that Treasury bill rates have a great effect on the commercial paper since Treasury bills carry higher returns to customers holding them as compared to commercial paper resulting to low commercial paper yield. It was also observed that towards the end of companies financial years, commercial paper holding fell as Treasury bills and other government debt instruments holding increased pointing to a flight-to-quality by risk-averse investors who wanted to hold high quality assets.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of Findings

The main purpose of this research was to determine the effect of Treasury bills rate on commercial paper yield for firms quoted on the Nairobi Securities Exchange. The study used a causal research design to meet the objectives of the study. The population of this study was listed companies at the NSE that have issued CP. According to the CMA annual reports and CBK statistics, there are 29 companies that have issued CP since its inception in 1994 however, out of this only 14 are listed at the bourse. Secondary data which involves the collection and analysis of published material and information was obtained from annual reports and published data. Quarterly commercial paper yield outstanding was extracted from the audited financial statements of the selected firms. While quarterly TB rates were obtained from CBK and NSE reports for the five year period, between January 2007 and December 2011.

To determine the relationship between CPY and TB rates, the data was analyzed through the use of regression and correlation analysis to assess the strength of the relationship between the dependent and independent variables. The required variables were obtained as follows; the CPY outstanding and TB rates for different maturity periods at the end of each third month from Jan 2007 to Dec 2011. The independent variables were the Treasury bills with the maturity period of 30days (TB30), 91 days (TB91), 182 days (TB182) and 364 days (TB364). CPY was taken as the dependent/ respondent variable in the model. From the study findings it was found that out of a total of 29 listed companies which have issued CP, 14 had a significant performance index as shown by the overall evaluation index closest to a 5 in a rating scale. However other companies that had issued CP did not show much significance on the performance index. The study further found that yearly performance improved significantly from 2007- 2011 progressively.

5.2 Conclusion

The findings of this study show that out of a total of 29 listed companies which had already issued CP, 14 had a significant performance index as shown by the overall evaluation index closest to a 5 in a rating scale. However other companies did not show much significance in their performance index. The study further concludes that yearly performance improved significantly from 2007- 2011 progressively.

From correlation results of the model, it is clear that Treasury bills with maturity period of 30, 91 and 182 days had a strong correlation with commercial paper and that Treasury bills with a maturity period of 364 days also had significant contribution to commercial paper yield. Additionally, the study shows that Treasury bill rates have a great effect on the commercial paper yield since Treasury bills carry an assured return to customers holding them compared to commercial paper resulting to low commercial paper yield.

From the Chi-square results, Treasury bills had a mean of 0.0621 while commercial paper yield mean was 0.0237 and the variance for the Treasury bills and the commercial paper were 0.0023 and 1.3808 respectively. Furthermore at two- tailed, the t- calculated of 2.9585 was seen to be greater than the t-tabulated of 2.1603. It can therefore be concluded that Treasury bill rates have a great effect on the commercial paper yield since Treasury bills carry higher returns to customers holding them as compared to commercial paper resulting in low commercial paper yield.

5.3 Policy recommendations

The study recommended that companies should consider issuing commercial paper to finance their short term obligations since customers were willing to hold the instruments because of their high rate of return. The study also recommended that regulations governing commercial paper market should be more publicized to enable more companies embrace commercial paper in meeting their short term obligations as opposed to bank loans.

The Nairobi Securities Exchange should support the CP program more and reduce the high costs, bureaucracy in the transaction process. Further, the study recommends that companies should actively seek to issue CP as another avenue to raising cheap short-term finance to meet their immediate needs while their shareholding/ ownership remain the same.

Other areas that the study recommend for improvement include the government's intervention through fiscal and monetary policies to reduce inflation in order to curb price volatility of CP while providing an opportunity for companies to acquire finances from the instruments to meet their short term obligations. The study also recommends that regulations be efficient and more publicized to enable more companies embrace Treasury bills and commercial paper in meeting their short term obligations as opposed to bank loans. Efforts to improve commercial paper yield should focus on the value of the Treasury bills on the market, since it is positively related to both future operating performance and the probability of commercial paper turnover in poorly performing firms.

Furthermore there should be proper monitoring by independent directors while regulatory bodies should require additional disclosure of financial or personal ties between Treasury bill rates and commercial paper yield. By so doing, they would be more completely related.

5.4 Limitations of the study

Since the main purpose of this study was to identify the effect of Treasury bill rates on commercial paper yield in companies, NSE considered some information sensitive and confidential and thus the researcher had to convince them that the purpose of information was for academic research only and not for any other intentions.

The findings of this study may not be generalized to all listed firms but can be used as a reference to listed firms in developing countries since they face almost the same

challenges due to similar prevailing economic situations as opposed to listed firms in developed countries.

The small number of the sample in this study was the most obvious limitation. The research was limited to a few listed companies and a shorter period, thus results cannot be generalized to all companies listed or those intending to list at the NSE. This is because different companies may have different strategies for managing Treasury bill rates and commercial paper yield.

Treasury bill rates and commercial paper yield keep on changing from period to period depending on prevailing economic situations and demand on the capital market. The findings therefore may not reflect the true effect of Treasury bill rates on commercial paper yield across the companies listed for a period of 5 years since some companies are delisted and listed again depending on their performance on NSE.

5.5 Suggestions for further study

There is need for further studies to carry out similar study for a longer time period. This would allow better generalizations across the board for similar CP issues. A similar study should also be carried out on relationship between firms' performance and Treasury bills and commercial paper performance in Kenya.

Comparable studies should also be carried-out to establish the effect on commercial paper yield by other short term debt instruments like bank overdrafts or even long term debt instruments like corporate bonds in Kenya.

Equivalently, studies on how other key factors bear effect on commercial paper should be conducted to establish their extent, for instance there is need to establish how Central Bank Rate, bank interest rates and inflation levels influence commercial paper yield.

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Appendices

Appendix I: Companies which have issued CP from 1994-2011

	Issuing Company	Issue Value Kshs Million	Year of Initial Issue	Number and Year of Subsequent Renewal								
				1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th
1	Agip Kenya	350	1998	1999								
2	Athi River Mining Limited	100	1998	2000	2003	2005	2006	2007	2008 (expired)			
3	Bidco Oil Company	300	1999	2001								
4	BAT Limited	550	1996									
5	Brook Bond	1000	1994									
6	Caltex Oil	500	1995	2000	2001							
7	CMC Holdings	250	1999	1999	2000	2001	2002	2007	2008	2009	2011	
8	Cooper Kenya Limited	100	2004	2005	2007	2008	2009					
9	Crown Berger Limited	200	2000	2001	2002	2004	2005	2006	2007	2009		
10	Davis & Shirliff Limited	100	2008	2011								
11	EastAfrica Industries (Unilever)	500	1999	2000	2001	2002						

12	Ecta Kenya	50	2000	2001	2002	2004	2005	2007	2008	2009		
13	Express Kenya	150	1999	2000								
14	General Motors Kenya	500	1999	2000	2001							
15	IndustrialPromotionServices	100	1999	2000								
16	Kenya Hotel Properties	150	2000	2001	2002	2004	2005	2006	2007	2009		
17	Kenya Kazi Limited	250	2011									
18	Kenya Oil Company (KenolKobil)	500	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
19	Kenya Power	1500	1999	2000								
20	Kenya Shell	1000	1999	2000	2001							
21	KK Securities Limited	250	2011									
22	K-Rep Bank	500	2007									
23	Lonrho Motors	1500	1999									
24	Mabati Rolling Mills	500	1997	1999	1999	1999	2001	2002				
25	Motor Mart Kenya	1500	1995									
26	Nation Media Group	500	1999	2001								
27	Pan Africa Paper Mills	500	2000	2001	2002							

28	Synergy Industrial	100	2006	2007	2008 (expired)	2009						
29	Total Kenya Limited	1200	1999	2000	2001							
30	TPS Serena	100	1999	2000	2001	2002	2006					