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<u>THESIS</u>

TESTNG OF CAPM FORPAKISTAN'S LONG-TERM CORPORATE BOND PRICING

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Abstract

Government bond markets serve as a stepping-stone on the path to developing a corporate bond market. A government bond market, if functioning satisfactorily, can significantly increase investors' confidence in the overall bond market, and in the whole capital market.

One of the intra-market relationships between two sub-markets of the bond market is dependency of corporate bond market (from now on referred to as CBM) on government bond market (from now on referred to as GBM) for benchmark interest rates i.e. risk free interest rate. The study closely scrutinizes the bond markets of Pakistan to determine the interest rate structure of long term government bonds, if any, and long term corporate bonds. The research question is whether CAPM can be used to determine the prices of long-term corporate bonds? In form of an equation, CAPM is as below

$$Rj = Rf + \beta(Rm\text{-}Rf)$$

Where

R_j = Required return on security j

R_f = Risk free rate

β = Beta for security j

R_m = return on market portfolio

The corporate bond market consists of Term Finance Certificate (TFC). Paramount leasing is selected, as Subject Company for which required rate of return is determined using CAPM and Yield To Maturity (YTM). Regression analysis was used to determine the relation ship between $(R_m\text{-} R_f)$ and R_i using ex-post values. So Return on Paramount stock is a dependent variable (Y), Excess of market return over risk free rate or Market risk premium (Rm-Rf) is the independent

variable (X), coefficient b that explains the relation between dependent and independent variable is β and the vertical intercept is risk free rate. Market portfolio was taken as a portfolio comprising of shares of all the listed companies such as KSE 100 that is highly diversified. The return for a specific period is calculated by calculating percentage change in the returns on market portfolio from a base year.

The YTC is 6.76% while the required return via CAPM is 27.71%. Themajor reason for this discrepancy is that the rate of return on stock market is higher because the total return component of stocks consist of dividend + capital gains on the sale of stock in the secondary market. In comparison, TFCs however do not have the availability of a strong and developed secondary market like stocks. Their total return comprises of coupon payments + principle redeemed. If our aim is to enhance the breadth and depth of our TFC market then development of secondary market for TFCs is highly crucial.

The limitations in applying CAPM in Pakistan include absence of Beta values, absence of bond index, Lack of sufficient similar companies to determine proxy betas, difficulty in estimating the value of independent variable, excess return on market portfolio (Rm-Rf), Floating Rate TFCs Vs. Fixed rate TFCs

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ANNEXURE

Annex: 1   Listed TFCs

	Issue Size (Rs in mln)
Gatron Industries	250
FIB (Inter Bank) 1	300
Dewan Salman Fibres Ltd 1	700
NDLC	330
Pak Ind. Leasing Corp 1	250
Paramount Leasing	250
Atlas Lease I	200
Network Leasing	100
Al-Noor Sugar Mills	200
Pak Ind. Leasing Corp II	325
ORIX Leasing	700
Shakarganj Mills	250
Sui Souther Gas Corp.ll	1000
Engro Asahi	500
Dewan Salman Fibres Ltd II	1800
ICI Pakistan Limited	1600
Atlas Lease II	100
Packages Limited II	700
Gulistan Textlie	300
Dawood Leasing	250
First Int. Inv Bank II	100
Nishat Mills Limited	600
Engro Chemicais	500
CresLease	250
Security Leasing Corp.	200
Reliance Weaving Mills Ltd.	150
Union Leasing Limited	250
Pak Arab Refinery Limited	2500
Shah Murad Sugar Mills	200

Saudi Pak Leasing-II	400
SSGC-III	1250
Sitara Chemicals'	360
Engro Chemicals -II	1000
Maple Leaf Cement	225
Dawood Leasing -II	250
Orix Leasing - II	710
Muslim Commercial Bank	1600
Cres Lease - II	250
Shakarganj Mills	200
World Call Communications	350
Quetta Textile Mills	750
Bank Alfalah	650
Union Bank	750
Security Leasing Corp. II	299
KASB Leasing	200
Gulistan Textile II	400
Gulshan Spinning	400
Paramount Spinning	200
Paramount Leasing II	325
Securetel	840
Total	**26,264**

Source: Pakistan Economist

Annex: 2   SBP discount rates

SBP Discount Rate

20%	19%	18%	17%	16%	14%	13%	11%	12%	13%	14%	13%	12%	10%	9%
Oct96	Jun97	Jul97	Jul98	Mar99	Apr99	May99	Jan00	Sep00	Oct00	Jun01	Jul01	Aug01	Oct01	Jan02
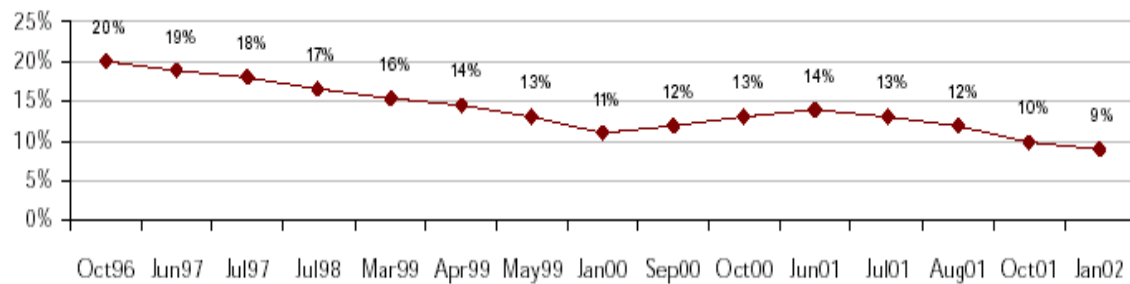
Source: SBP

Annex: 3   Rating Comparison by PACRA & JCR-VIS

Credit Risk	PACRA	JCR-VIS
Investment Grade		
Highest Quality	AAA	AAA
Very High Quality	AA	
High Quality	A	AA+, AA, AA-
Good Quality	BBB	A+, A, A-
Adequate Quality	-	BBB+, BBB, BBB-
Not Investment Grade		
Somewhat Speculative		BB+, BB, BB-
Speculative	BB	B+, B, B-
Highly Speculative	B	CCC
High Default risk	CCC	CC
Very high Default Risk	CC	C
Imminent Default	C	
Default	D	D

Source: SBP

PROPECTUS PARAMOUNT LEASING COMPANY

Chapter: 1

INTRODUCTION

Developing countries like Pakistan need to diversify their sources of industrial financing through capital markets. They need to modernize the method of corporate financing, which has traditionally been overwhelmingly bank-based. Effective capital markets can help deepen the financial base, lead to greater diversification of financing sources, and screen financial risks more promptly than bank credit departments.

Government bond markets serve as a stepping-stone on the path to developing a corporate bond market. They can offer pricing benchmarks for private debt issues and financial derivatives and hence play a catalytic role in developing a nascent bond market. A government bond market, if functioning satisfactorily, can significantly increase investors' confidence in the overall bond market, and in the whole capital market. And a well-developed government bond market can help government to finance expenditure and conduct monetary policy efficiently.

Pakistan's capital market like most developing countries lacks a reliable benchmark yield curve of longer maturity and this is the primary impediment to the development of corporate bond and other securities markets. As a result, the industrial sectors in Pakistan have relied excessively for their long-term development resources on short-term borrowings from commercial banks. The overwhelming bank-based short-term financing behavior has caused two critical financial mismatches:

- A maturity mismatch and
- A currency mismatch.

The maturity mismatch was the consequence of unhealthy financing practices, which were characterized by large long-term investments under the financing of short-term borrowings. The practice involved a serious currency mismatch without a proper currency hedging arrangement. In fact, the currency mismatch was implicitly protected by overvalued exchange rates, which were the result of foreign exchange misalignments in these countries.

As a benchmark, nothing is better than long-term government bonds given their low or negligible risks. Hong Kong, China is a good example. Since the early 1990s, it has been making significant efforts to develop the Exchange Fund paper market, the local version of a treasury paper market. Although its fiscal position has generally been comfortable, the government has continued to issue Exchange Fund paper in order to create a reliable benchmark yield curve for local debt instruments and to increase the supply of high quality bonds to strengthen the capital market.

The potential for developing domestic bond market in Pakistan is considerable given its high saving rates. In developing a sovereign bond market, there must be close coordination with the central bank so that monetary policy is not weakened. The prices of government bonds should be freely determined. An enabling environment must be provided to encourage participation by issuers, intermediaries and investors. The regulatory, legal, tax and accounting framework must effectively protect and guide government bond markets without restricting the activities of participants.

1.1 Research Question

One of the intra-market relationships between two sub-markets of the bond market is dependency of corporate bond market (from now on referred to as CBM) on government bond market (from now on referred to as GBM) for benchmark interest rates i.e. risk free interest rate. The CBM borrows the base rate or risk free rate from the GBM and adds relevant risk premium to it to determine the price of its debt instruments. In the absence of base rate for longer-term CBM securities, some price determining mechanism, more evolved than simple supply and demand should be in use. This mechanism can be such that it determines bond returns on the basis of risk involved. The higher the risk, higher will be the return (Sharpe, 1964 & Lintner, 1965).

This research study will put forth the question that *can CAPM be used in Pakistan to determine prices of its longer-term corporate debt market instruments?* I believe that if the linear relationship between risk and return holds for the Pakistani market, then CAPM can be effective in determining prices of CBM longer term instruments.

To answer the research question, first of all the assumptions of CAPM have to be applied to Pakistani CBM. Secondly, different input side variables have to be arranged for the research work. These include identification of efficient market portfolio, risk free rate of lending, selecting a sample market portfolio and identifying beta or proxy for beta for the selected portfolio. The research techniques will give an idea as to how I plan to arrange for the above data.

1.2 Objectives of Research

The study will closely scrutinize the bond markets of Pakistan to determine the interest rate structure of long term government bonds, if any, and long term corporate bonds. My hypothesis is that the Capital Asset Pricing Model (CAPM)

can be applied to obtain required rate of return for long-term corporate bond taken as TFCs in this thesis. The desired outcome of this research study is to provide a model for pricing longer-term corporate bonds. This research study will be aiming at answering following questions:

- Can CAPM be used to determine the prices of long-term corporate bonds?
- What are the limitations in using CAPM in Pakistani market?

1.3 Research Techniques used

- Regression analysis will be used to determine the relation ship between $(R_m - R_f)$ and R_i. Here ex-post values will be used since ex-ante values are quite subjective in nature and differ from one estimator to another.
- Market portfolio will be taken as a portfolio comprising of shares of all the listed companies such as KSE 100 that is highly diversified. The return for a specific period is calculated by calculating percentage change in the returns on market portfolio from a base year.
- Calculating the periodic returns on selected TFCs and then regressing them on return on market portfolio can determine beta.
- Information for the research study will be gathered via:
  - o Interviews with relevant officers in financial institutions
  - o Research case studies on CAPM tests.
  - o Publications of SBP & SECP

The major limitation that I foresee is the non-availability of authentic documented statistical and other market data required during the study. Pakistani bond market is a young market and much of the historical data is not yet been properly documented. The alternative will be to use proxies in place of certain variables.

1.4 Scope of study

This research project will focus basically on use of CAPM for long-term bonds defined for the purposes of the thesis as those bonds with lives greater than 1 year. The sample selected for calculations will consist of those instruments issued during the last five years.

1.5 Sequence

A brief description of the contents of each chapter is given as below:

❑ **Chapter – 2** Literature Review

This chapter focuses on the related research work by economists, analysts and experts already available in journals and publications. The literature review will show how much work has already been done on the selected thesis topic and how will this thesis contribute to the existing knowledge

❑ **Chapter – 3** Findings

This chapter and the next one are basically the heart of the project. The chapter entails details about the debt market of Pakistan, an overview of the instruments in the market, covering certain instruments in gray areas, and finally this chapter presents the use of CAPM and discounted cash flow method to determine the required rate of return of a TFC holder of a subject company through use of sample companies ex-post data

❑ **Chapter – 4** Analysis

The analysis portion of the project tries to answer the questions presented as objectives in the earlier part of this chapter. In this chapter, a comparison of the required rates of return calculated in chapter 3 by application of CAPM and discounted cash flow method will be discussed

❑ **Chapter – 5** Conclusions

This last chapter entails the essence of this thesis, highlighting the main learning points for further research by interested people.

1.6 Introduction to Sample & Subject companies

1.6.1 Saudi Pak Leasing – Sample Company

Saudi Pak Leasing Company Limited (formerly Standard Chartered Merchantile Leasing Company Limited) was incorporated in January 1991. In October 1997, Saudi Pak Industrial & Agricultural Investment Company (SAPICO) acquired the entire 30% shareholding of Standard Chartered Bank. SAPICO is the second largest of the three investment companies set up by the Government of Pakistan as joint venture with other sovereigns. The Saudi Arabian government holds 50% equity stake in SAPICO with the other 50% held by Pakistan. The Company has a seven member board of which three, including the CEO, represent SAPICO, two, the Piracha Group, and one each, the Premier Merchantile Services and NIT. SPLC is the fifth largest leasing company in Pakistan in terms of asset size. SPLC has offices in three cities with its head office based in Karachi. The company is listed on all the three stock exchanges in Pakistan.

- **Mission**

Saudi Pak Leasing shall maximize the net wealth of shareholders by operating in the Financial Services sector. The Company would seek market leadership in its core business of leasing by providing superior quality

service, developing innovative customer oriented solutions, and valuing

people as the greatest resource

The organizational objectives of SPLC are listed as below:

- Extend lease finance to businesses which are expected to contribute positively to economic development;
- Support enterprises that create value; and
- Provide lease finance in areas that offer compatible risk and returns

1.6.2 Sigma Leasing Company – Sample Company

Sigma is a professional and progressive leasing company operating in Pakistan. It is approved by the Securities and Exchange Commission of Pakistan, the then Corporate Law Authority, (CLA)and commenced it operations on January 28, 1997. Sigma Leasing Corporation Limited is a public limited company listed on the Karachi Stock Exchange, with a paid up capital of Rs.100million, with its head offices at Karachi. The company is now increased to Rs.200 million with equity base of Rs. 260 million.

- **Objectives**

The broader objective of the company is to make Sigma Leasing Corporation Limited a known professional leasing company providing assistance to the industrial and commercial sector of Pakistan. Efforts are being made to establish the company as one of the top ranking companies in the leasing sector. Sigma Leasing Corporation Limited participates in facilitating the

lessee by providing cash flow benefits, a sound hedge against inflation, an alternate source of funding, avoidance of dilution of share ownership and time   efficiency.

Sigma Leasing actively seeks to play a positive and constructive role in expanding the capital and fund markets in Pakistan and actively invites offshore funding both from private sources and multinational agencies with the objective of expanding the fund base, available for Pakistan's industrial and economic growth. It particularly aims to assist the private sector in Pakistan to meet its medium term capital needs for expansion and Balancing, Modernizing and Replacement (BMR).

- **Credit rating**

The company has already undergone rating process by JCR-VIS. Credit Rating Company. The company has been assigned medium to long-term entity rating BBB+ and short-term entity rating A 2 an investment grade.

Medium to Long Term Entity Rating of BBB+ (Triple B Plus) means that adequate credit quality indicating that protection factors are reasonable and sufficient.

Short Term Entity Rating of A 2 means that there is good certainty of timely payment. Liquidity factors and company fundamentals are sound. Although on-going funding needs may enlarge total financing requirements, access to capital markets in good. Risk factors are small.

TFC Rating of A

The TFCs of Sigma leasing is given A rating. This means that good credit quality and protection factors are adequate however risk factor may vary with the possible changes in the economy.

In a nutshell, the basic objective of Sigma Leasing Corporation Limited is to provide full payout financial leases against plant and machinery, office equipment and vehicles. However, along with providing this facility, Sigma Leasing also intends to embark on other services that include consumer lease finance and micro leasing.

1.6.3 Paramount Leasing Company – Subject Company

Paramount Leasing Limited (PLL) was incorporated on 30th December 1992 as a public Limited company under the Companies Ordinance 1984 with the paid-up capital of Rs. 250 Million. The company is listed on all the stock exchanges of Pakistan. In terms of net investment in lease finance, PLL stands among the top five leasing companies in Pakistan. The company commenced its commercial operations on June 7 1995. The founding sponsors of the company were Union International limited, Pak-Libya holding company (Pvt.) Ltd., and The Bank of Khyber with a total equity stake of 70.39%. Currently the major share holder is First Standard Investment Bank Limited (45%), then Crescent Business Management (Pvt.) Limited (27%) and the rest of the shares are held by diverse group of share holders.

PLL's primary objective is to provide full payout leases to productive private and public sector enterprises, for all types of assets including plant and machinery, office equipment, computer hardware, vehicles etc., thus helping in the capital formation in the country.

The principal activity of the company is leasing of machinery, equipment, and vehicles to individual and corporate clients. The company is presently focusing on small and medium sized manufacturing industries with emphasis on BMR (Balancing, Modernization, and Replacement) and expansion projects. Besides the manufacturing sector, PLL also focuses on the social sector projects such as schools and hospitals. PLL believes in consistent growth through developing a well diversified and quality lease portfolio.

PLL also provides other leasing services including Vendor Programs, Lease Syndications, and Lease underwriting. The activities of PLL can be categorized as follows:

Fund based activities

Lease Financing

❑ Full payout leasing

❑ Operating Leasing

❑ Hire purchase

❑ Syndicated Leasing

❑ Leveraged Leasing

Treasury/ Capital market operations

❑ Investment in government/Corporate Bonds through primary and secondary market

❑ Investment in listed securities through stock market operations

❑ Investment in listed securities through primary market operations and Pre-IPOs

❑ Treasury operations

Financing under Islamic modes

❑ Financing through Musharaka Arrangement

❑ Financing through Morabaha Arrangement

Non Fund-Based activities

❑ Issuance of gurantees

❑ Corporate finance and advisory

Credit Rating

The company has received an instrument rating for (TFC 2) of 'A' (Single A) by JCR-VIS credit rating Company Limited. The rating denotes good credit quality. The rating rationales are as following:

❑ Paramount Leasing Limited (PLL) enjoys the support of one of the leading and well-established local groups, The Crescent Group that has interests in various sectors of the local economy.

❑ Prudent credit appraisal and monitoring techniques have enabled the company to maintain strong quality of its lease portfolio.

❑ The structures of two TFC issues provide additional credit comfort

Chapter: 2

LITERATURE REVIEW

According to expectations theory of the term structure of interest rates, the long-term interest rate is equal to an average of the short-term rates that are expected to prevail over the long-term period. Therefore, in equation form

$$(1+_t R_3) = [(1+_t R_1)\ (1+_{t+1} r_1)\ (1+_{t+2} r_1)]^{1/3} - 1.0$$

Where,

$(1+_t R_3)$ – The interest rate on a three year government bond

$(1+_t R_1)$ – The current known rate on a one year government bond

$(1+_{t+1} r_1)$ – The expected rate on bond with one year to maturity beginning one year from now

$(1+_{t+2} r_1)$ - The expected rate on bond with one year to maturity beginning two year from now

Apart from expectations theory there may be other alternatives and theories to determining long-term interest rate. But why do we need to have long-term interest rates for government bonds? The answer has already been given in the

research question i.e. to determine the price of any long-term financial instrument.

CAPM uses risk free rate as the basis for pricing securities and then adds premium for systematic risk to the risk free rate to determine the required return or price of the security (Sharpe, 1964). While testing the CAPM, a close adherence to the assumptions of CAPM has to be observed to obtain meaningful results. The basic assumptions of CAPM are following:

- Investors are assumed to be holding a well-diversified portfolio that is the market portfolio.
- All investors are characterized by the same investment horizon
- All investors are one period expected utility maximizers
- There exists homogenous expectations
- The market is perfect with riskless borrowing rate equal to lending rate, there is no transaction cost.
- Market is in equilibrium
- Every investor makes decision solely on the basis of risk and return

On the basis of following assumptions, the following relationship was formulated by Sharpe and later tested by many others.

$$Er_i = R_f + B_i (E_{rm} - R_f) \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Er_i – The expected rate of return on security i

R_f – is the risk free interest rate

B_i – is the ith asset systematic risk

E_{rm} – is the expected rate of return on market portfolio

Equation (1) is an equilibrium equation in terms of ex-ante parameters. However in order to examine the validity of the CAPM it is common to use ex-post data as a proxy.

Many financial gurus and economists have tested the validity of CAPM over the past decades. Various contararians have simply rejected the CAPM on the grounds of existence of market imperfections (Seong.N.La, Christopher.J.Green, Paolo Magionni, 1995). (Douglas, 1969) (Levy, 1978) & (Friend, 1978) empirical studies state that beta is not a suitable measure of security's risk since most investors hold highly undiversified portfolios. Rather variance of each security is a more appropriate risk index. These experts have come up with modified and less restrictive versions of CAPM. (Levy, 1983) based on contrarians empirical results came up with a reformulated version of CAPM. Under the reformulated model (1) The market portfolio plays no role, (2) No expectation of linear relationship between average return and beta for portfolio (3) Use of variance of each security in place of beta.

However, according to Charles.P.Jones the conclusions of CAPM are entirely sensible:

1. Return and risk are positively related
2. The relevant risk for a security is a measure of its effect on portfolio risk

If the CAPM is valid and the market tends to balance out so that realized security returns average out to equal expected returns, equation of following type can be estimated

Estimated beta for security i

Avg. return on security i over some # of periods

$R_i = a_1 + a_2\beta_i$

When the above equation is estimated, a_1 should approximate the average risk-free rate during the periods studied and a_2 should approximate the average market risk premium during the periods studied. A representation of reasonable consensus of various empirical studies to test CAPM is given as below:

- The Security market line appears to be linear i.e. the trade off between expected return and risk is an upward sloping straight line
- The intercept term, a_1, is generally found to be higher than RF
- The slope of CAPM, a_2, is generally is found to be less steep than posited by the theory.
- Although the evidence is mixed, no persuasive case has been made that unsystematic risk commands a risk premium. In other words, investors are rewarded only for assuming systematic risk.

The major problem in testing the model is that it is formulated on an ex ante basis but can be tested only on an ex post basis since investor expectations can never be known with certainty. Therefore, the tests of the model have produced conflicting results in some cases and that the empirical results diverge from the predictions of the model. (Roll, 1977) has argued that the CAPM is untestable because the market portfolio, which consists of all risky assets, is unobservable. Infact, Roll argues that tests of CAPM are actually tests of the mean-variance efficiency of the market portfolio. Nevertheless, many researchers hold the view that CAPM remains a logical way to view the expected return-risk trade-off.

Haim Levy in 1980 carried out a research study on CAPM's explanatory power in Israeli market based on a similar study on American markets. The Pakistani securities market, especially the bond market has some close resemblances with the Israeli bond market. The market is small and thus, relatively insignificant

excess supply and demand will induce large fluctuations on bond prices (Levy, 1980). The Israeli market is found to be consistent with CAPM. The consistency depends on efficiency of market portfolio. If the market portfolio or the proxy chosen for market portfolio is mean variance inefficient then the resulting empirical results will contradict the CAPM, since it is based on the assumption that investors are expected to hold a market portfolio that is efficient. (Levy, 1980). This means that a test of CAPM for any market is infact a test of market portfolio efficiency. The efficiency of market portfolio and CAPM are equivalent (Ross, 1977, 1978).

There is an exact linear relationship between expected returns and true betas when the market portfolio is on the ex ante mean variance efficient frontier, but empirical research has found little relation between sample mean returns and estimated betas. One possible explanation is those market portfolios proxies are mean variance inefficient (Roll & Ross, 1994)

Haim, during his research, found that increasing the time period of sample data enhances the explanatory power of CAPM. The assumed investment horizon plays a central role and that the regression coefficients of CAPM, coefficient of determination and the on parameter performance index are all functions of investment horizon. According to him

"The results obtained, however, were startling. The explanatory power of CAPM increased dramatically; we obtained the right direction for all coefficients; and overall we would not hesitate to say that the empirical results were much stronger than in any empirical study which had been done on American data"

The effect of investment horizon on estimates of systematic risk was first investigated by Jensen (1969). According to him the basic specification of CAPM is a Cobb-Douglas type functional form.

C. F. Lee, Chunchi Wu & K. C. John Wei (1990) examined the effect of heterogeneous investment horizons on the functional form of CAPM and proposed a translog model for estimating the risk return relationship. Their study suggests that some empirical anomalies that are inconsistent with traditional CAPM have resulted from misspecification of CAPM by ignoring the discrepancy between the observed data periods and the actual investment horizons.

Engel & Rodrigues (1989) tested CAPM with time varying covariances and testing the restrictions imposed by CAPM against a more general pricing model. The betas in their research work vary overtime as the supplies of assets change and as the conditional covariance or returns on those assets change. They stated that estimated CAPM performs much better when variances are not constant over time.

Chapter: 3

FINDINGS

3.1 FIXED INCOME SECURITY

A bond is defined by its characteristics of as below:

- A debt investment whereby the investor loans money to an entity (company or government) that needs funds,

- For a defined period of time

- At a specified interest rate.

- In exchange for the loan, the entity will issues a certificate, or bond, that states the interest rate (coupon rate) to be paid and when loaned funds are to be returned (maturity date).

- Interest on bonds is usually paid every six months (semiannually).

The size of bond and equity markets at year-end 2003 is shown in Table below

Bank Loans, Corporate Bonds, and Equities in Pakistan, End-2003

	Outstanding	Aggregate

	corporate bonds (Rs. In Mn)[1]	Market Capitalization (KSE) (Rs. in Bn)[2]
1998-99	15,446	289.20
1999-00	15,150	391.86
2000-01	15,259	339.25
2001-02	24,125	407.64
2002-03	28,784	746.02

[1] Source: *Global securities Limited Pakistan*

[2] *Source: State Bank of Pakistan, capital market indicators*

This table shows that although the corporate bond market is expanding yet its size is very small relative to the equity market.

3.2 PAKISTAN'S BOND MARKET

3.2.1 Long Term Government Bonds

The long-term government bond market consists of

- 3 year, five year and 10 year Pakistan Investment Bonds (PIBs)
- 5 year and 10 year Federal Investment Bonds (FIBs),

Pakistan launched long-term three, five- and 10-year government bonds, in December 2000. Ministry of Finance is considering the possible issuance of bonds with maturities longer than the 10-year period as informed by Shaukat Aziz, Finance Minister.

FIBs are less liquid than T-Bills since the SBP has capped FIB holding to 15% of total DTL. FIBs have been discontinued and replaced by PIBs. The details about FIBs are given as below:

	Primary Market	**Secondary Market**
Maturity:	3, 5 & 10 years	Up to 10 years
Coupon/Return:	13%, 14% and 15%	Based on yield to maturity for the respective maturities
Available:	Are no longer issued by SBP	Any time through the secondary market
Price:	NA	Determined through trading in the money market & available liquidity
Tax:	Deducted at source on coupon (20%)	None, if sold before coupon or maturity
Zakat:	No compulsory deduction	No compulsory deduction

Source: Global securities Limited Pakistan

Individuals, institutions and corporate bodies including banks, irrespective of their residential status, may hold the Pakistan Investment Bonds. These bonds can also be used as security for maintaining Statutory Liquidity Reserve (SLR). The details about PIBs is given as below

	Primary Market	**Secondary Market**
Maturity:	3, 5 & 10 years	Up to 10 years
Coupon/Return:	To be announced by the State Bank on each auction	Based on yield to maturity for the respective maturities
Available:	Through auctions to the Primary dealers	Anytime through the Primary Dealers or the secondary market
Price:	Governed through auction	Determined through trading in the money market and the system's liquidity profile
Tax:	Deducted at source on coupon (10%)	None, if sold before coupon or maturity
Zakat:	No compulsory deduction	No compulsory deduction

Source: Global securities Limited Pakistan

3.2.2 Corporate bond market & Term Finance Certificates (TFCs)

The issuing and trading of corporate debt securities is not a new phenomenon in Pakistan. During the 1960s and early 1970s, before the nationalization of financial institutions in 1972, corporate debentures issued by Pakistani companies were listed on one or more of Pakistan's three stock exchanges (Islamabad, Karachi, and Lahore), and there was some secondary market trading in these securities. In the early 1980s bonds were floated by utility agencies in the public sector to meet their requirements for financing infrastructural investments. Initially, these floatation's were backed by government guarantees. However, these bonds were replaced by a new debt instrument that the corporate and commercial banking sectors (including both public and privately controlled enterprises) have been using to raise funds, Term Finance Certificates.

A Term Finance Certificate (TFC) is a corporate debt instrument issued by companies. This instrument arose from legislation enacted in 1984, which authorized the issue of redeemable capital securities. As a debt instrument, the TFC is slightly different from the traditional corporate bond because it was specifically created to accord with the Sharia principles of Islamic law. The key difference is that the TFC substitutes the words "expected profit rate" for "interest rate." In line with Islamic financing principles, the corporate bond was packaged as TFCs with maturities of more than three years.

The TFCs issued to date include both fixed and floating rate instruments, although issuers have lately tended to favor the floating rate variant (see annex 1 for listed TFCs). The coupon rate on floating rate TFCs is set at a risk-free benchmark rate plus a risk spread to reflect the relative risk of the instrument. The risk-free benchmark is typically the SBP's discount rate, or the auction yield on the Pakistan Investment Bond (PIB) of equivalent maturity. Floating rate TFCs may impose caps and floors on the coupon payments.

Some TFCs may have embedded call and put options. The paper can only be floated after prior consent from the Securities and Exchange Commission of Pakistan (SECP), which is granted provided the following criteria have been met:

(a) The issue must be rated by a credit rating company;

(b) The instrument is listed on any one of the stock exchanges; and

(c) The issue has been under-written. Underwriters to TFC issues have generally been investment banks and major broking firms dealing in debt securities

(d) A trustee must be appointed to look after the interests of investors. Trustees have generally been investment banks (which have also participated in issues as underwriters or investors). The trustees do not appear to have the power to take independent action to look after the interests of investors; rather, they act only after the receipt of instructions from investors.

(e) The proposed security for the issue must be specified. This is often a charge over specific property.

(f) A redemption reserve must be established to cover the repayment of principal. The SECP's stance on this requirement appears to vary. The SECP agreed to waive the need for a redemption reserve in the Dewan Salman Fibre Limited prospectus, whereas there was no specific reference to this matter in the Gatron (Industries) Limited prospectus.

(g) SECP's sanction is not required if the issue is placed privately.

Private sector Pakistani companies issued no TFCs in the 1984–1995 period. However, major government-owned corporations, most notably, the Water and Power Development Authority (WAPDA), the national power utility

company, issued some in this period. From 1988 to 1994, WAPDA issued Rs 22.25 billion of bonds to the public. However, it was not until February 1995 that the first public TFC issue by Packages Ltd. was listed on the stock exchange. The listing signaled the birth of a corporate debt market and was swiftly followed by three others, with yields of between 17.8 and 19 percent, bringing the stock of listed TFCs to a little more than PRs2 billion. While listed TFCs are not approved securities for commercial banks' SLR, nonbank financial institutions (NBFIs) were allowed to invest in TFCs as SLR from May 1997 onward.

At present 50 TFCs are listed at local stock exchanges. These have been issued by public limited companies. Only one private limited company, Engro Asahi, has issued TFCs so far. Among the listed TFCs, leasing companies have the largest shares. Lately some commercial banks have also issued TFCs to improve upon their capital adequacy ratio. Only one state-owned enterprise, Sui Southern Gas Company, has issued TFCs to finance its capital expenditure programme.

Among the listed TFCs, the issues amounting to one billion rupee and above are by Sui Southern Gas Company (Rs 2.250 billion), Dewan Salman Fibre (Rs 1.8 billion), ICI Pakistan (Rs 1.6 billion), Pak Arab Refinery (Rs 2.5 billion), Engro Chemical Pakistan (Rs 1.0 billion) and Muslim Commercial Bank (Rs 1.6 billion). The seven TFCs issues issued in the past have been redeemed completely. Four more issues are in the pipeline.

Certain financial institutions, such as investment banks, DFIs, and leasing companies, are allowed to issue an alternative form of corporate debt— Certificates of Investment (COIs), introduced ten years ago. Given that COIs

are unsecured debt papers, company rating is mandatory. Issuance is only approved for qualified institutions and can vary from three months to five years, with both principal and profit (interest) encashable upon maturity.

3.2.3 Market Infrastructure

Central Market Infrastructure

Some TFCs are traded on-line on the stock exchanges. However, there are no publications of indicative bid/offer rates for corporate debt securities on the Reuters' pages of market participants. Transactions in listed securities, done by members of the three stock exchanges, are settled through the settlement systems of the exchanges. Other corporate debt traded over the counter is settled privately, through physical delivery in exchange for cheques. Pakistan's depository, the Central Depository Company of Pakistan Limited, was established in 1993 to provide efficient delivery, settlement, and transfer of securities transactions through a computerized book-entry system. The company has declared all listed equity securities eligible for its depository system.

Institutional Infrastructure of corporate debt market

Two types of organizations were set up specifically to facilitate the development of corporate debt market—discount houses and rating agencies. There are three discount houses and two rating agencies in Pakistan. The first discount house was set up in 1989 to discount WAPDA bonds. Since then, discount houses have broadened into FIBs, T-bills, and TFCs (mostly those of International Chemical Industries [ICI]-Pakistan). Pakistan has two credit-rating agencies: the Pakistan Credit Rating Agency (PACRA) and DCR-VIS. PACRA was established in 1994 and is the largest operator; its major shareholder is

Fitch IBCA, while IFC and the Lahore Stock Exchange are minor shareholders. DCR-VIS, is associated with Duff & Phelps.

Pricing Long-Term Securities

It is expected that long-term securities would be priced relative to government bonds, in reality; TFCs' pricing (coupon and price) was based on NSS. The reason is twofold:

- First, secondary FIB trading and pricing are yet to evolve to the stage where FIB yields are long-term benchmark rates; and

- Second, NSS constitutes more than a quarter of all domestic government debt and is aimed mostly at the public, which the TFCs, through listing at the stock exchanges, are also targeting.

3.3 APPLICATION OF CAPM

In form of an equation, CAPM is as below

$$R_j = R_f + \beta(R_m - R_f)$$

Where

R_j = Required return on security j

R_f = Risk free rate

β = Beta for security j

R_m = return on market portfolio

Most of the TFCs are being launched by Leasing Companies. This is because of the fact that leasing companies need long-term funds to match their lease portfolios. Paramount leasing is selected, as Subject Company for which we will determine required rate of return using CAPM and Yield To Maturity (YTM)

formulas (Prospectus attached as annex). Paramount leasing company has issued second tranche of its authorized TFCs in February 2003. The details are as below

Paramount Leasing

Amount (Rs. million)	325
Amount with Green Shoe (Rs. million)	400
Tenor	4 years
Issue Date	6-7 February
Rating	"A" JCR-VIS
Coupon Rate	SBP discount rate+2.5% with a floor of 11.50% p.a. and a ceiling of 14.50% p.a.
Principal Repayment	On semiannual basis in last seven installments commencing 24 months from the issue date with a call option carrying a premium of 0.25% and exercisable from the third coupon till the eighth coupon.
Placement Type	Private/Public
Face value	Rs. 5000
Private-Public Placement (Rs. million)	250-150
Security	Specific charge on leased assets and related rental receivables.

The values of key variables in CAPM are estimated as below.

3.3.1 Risk free rate (R_f)

The risk free rate is taken as the SBP discount rate on February 2003 i.e. 7%.

3.3.2 Return on market portfolio (R_m)

The return on market portfolio is taken as the annualized compound return on KSE 100 for last for years i.e. 1999-2003 calculated as below

Period	KSE Index*	% Change (R$_m$)
July 1998-Jan 1999	1054.7[1]	na
Jan 1999-June 1999	1520.7[2]	44.18
July 1999 – Jan 2000	1247.08	(17.99)
Jan 2000 – June 2000	1743.6	39.814
July 2000 – Jan 2001	1485.45	(14.806)
Jan 2001 – June 2001	1626.4	9.489
July 2001 – Jan 2002	1276.35	(21.522)
Jan 2002 – June 2002	1764.45	38.241
July 2002 – Jan 2003	2174.47	23.238
Jan 2003 – May 2003	2735.2	25.79

Source: Economic Survey of Pakistan (relevant pages

attached in annexure)

* Six monthly averages
[1,2] 12 month index
[3] Averages rates

3.3.3 Beta (β)

We will determine a proxy beta for paramount leasing company using a sample of two leasing companies of similar risk. The two sample companies selected are Saudi Pak Leasing (SPL) and Sigma Leasing Company (SLC). The reason for selecting these two companies is that they are of comparable risk (the comparison key of ratings by PACRA and JCR-VIS is given in annexure 3) and belong to the same industry. The TFCs issued by the sample companies

have completed their tenor. However, if we take such a TFC in our sample that has few coupon payments left then we will not be able to use it for regression[1], as we will not be having the corresponding returns on market portfolio for the future returns on sample TFC. The process for determining proxy beta will be as below:

❖ The CAPM variables are arranged corresponding to the variables in the regression equation as below:

$$Y_i = a + bX_i$$

$$R_j = R_f + \beta(R_m - R_f)$$

So Return on Paramount stock is a dependent variable (Y), Excess of market return over risk free rate or Market risk premium $(R_m - R_f)$ is the independent variable (X), coefficient b that explains the relation between dependent and independent variable is β and the vertical intercept is risk free rate.

❖ The returns of each of these two companies are separately regressed over the excess returns on market portfolio measured by KSE 100.

❖ Variable b for each sample company is found by the following formula

$$b = \Sigma (X - X\ mean)(Y - Y\ mean) / \Sigma (X - X\ mean)^2$$

as below

---

[1]   Regression Analysis or least-squares regression analysis is a technique for determining relationship between two variables such as price and quantity demanded of a good. The first step is to formulate a model based on general correlation of the variables. Then time series data consisting of observations from a single market over a period o time is determined. Cross-sectional data can also be used based on information from a number of markets.

a) Saudi Pak leasing

Saudi Pak Leasing is the first leasing company to float its TFCs in January 1999 amounting to Rs 250 million with a coupon rate of 18.25 per cent. The TFCs were rated AA-. Out of the total amount, TFCs worth Rs 50 million were offered to general public. Details are given in the following table

TFC Issuer	SPLC
Issue date	Jan 28, 1999
Amount (PKR):	250mn
Pre-IPO (PKR)	200mn
IPO (PKR):	50mn
Coupon rate(%):	18.25 p.a. 9.125 semi annually
Maturity:	4 yrs
Price	Rs. 100, 000
YTM (%):	16.22
Principle redemption:	3.125 Mn semiannually
Credit Rating:	AA- (PACRA)

Source: Pakistan economist

- **Calculating return on SPLC TFCs (Y)**

Period	Interest payment (1)	Principle Redemption (2)	Principle Outstanding (3)	Total Return (1) + (2)
Jan 99-June 99	9125	12500	87500	21625
July 99 – Jan 00	7984.38	12500	75000	20484.38
Jan 00 –June 00	6843.8	12500	62500	19343.75
July 00 – Jan 01	5703.12	12500	50000	18203.12
Jan 01–June 01	4562.5	12500	37500	17062.5
July 01–Jan 02	3421.9	12500	25000	15921.9
Jan 02–June 02	2281.25	12500	12500	14781.25
July 02–Jan 03	1140.62	12500	0	13640.62

- **Calculating the value of variable X i.e. Rm – Rf**

In order to determine the value of variable X, we need data about the risk free rate from Jan 1999 to Jan 2003 that is taken from the following graph
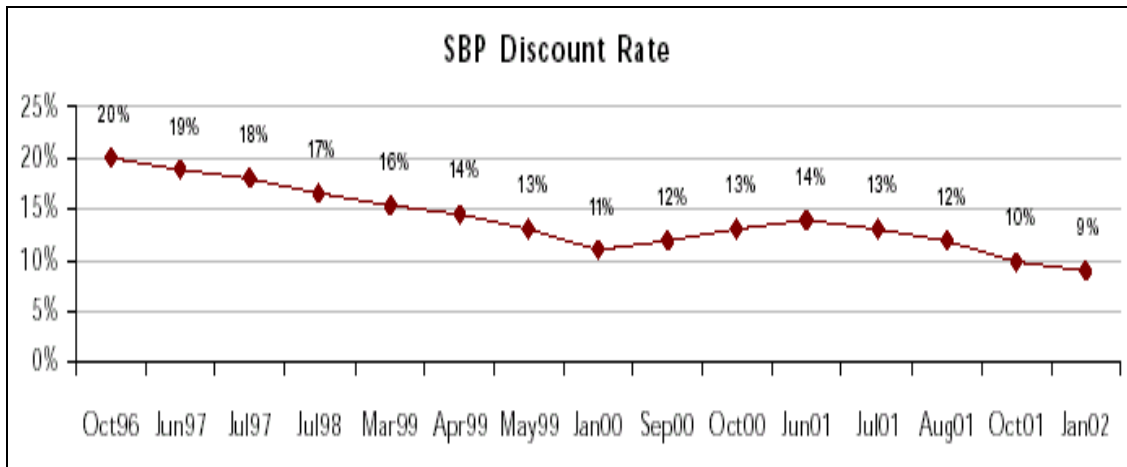
Source: SBP

On the basis of above graphical illustration of risk free rates, the average Rf on six monthly basis is calculated as below to determine value of variable X

Period	% Change (R_m)	R_f^3	R_m - R_f
Jan 1999-June 1999	44.18	14.33%	29.85%
July 1999 – Jan 2000	(17.99)	13%	-30.99%
Jan 2000 – June 2000	39.814	11%	28.81%
July 2000 – Jan 2001	(14.806)	12%	-26.81%
Jan 2001 – June 2001	9.489	13.5%	-4.01%
July 2001 – Jan 2002	(21.522)	11%	-32.52%
Jan 2002 – June 2002	38.241	11%	27.24%
July 2002 – Jan 2003	23.238	7.5%	15.74%

- **Regressing returns on SPLC TFCs on Returns on KSE 100**

Year	Y	X	X-X mean	Y – Y mean
Jan 99-June 99	21625	29.85%	28.94%	3992.19
July 99 – Jan 00	20484.38	-30.99%	-31.90%	2851.57

Jan 00 –June 00	19343.75	28.81%	27.90%	1710.94
July 00–Jan 01	18203.12	-26.81%	-27.72%	570.31
Jan 01–June 01	17062.5	-4.01%	-4.92%	-570.31
July 01–Jan 02	15921.9	-32.52%	-33.43%	-1710.91
Jan 02–June 02	14781.25	27.24%	26.33%	-2851.56
July 02–Jan 03	13640.62	15.74%	14.83%	-3992.19
			Σ = 0.03	Σ = 0.04

Y mean = 141062.52 / 8 = 17632.81

X mean = 7.31/ 8 = 0.91

$b = \Sigma (X - X \text{ mean}) (Y - Y \text{ mean}) / \Sigma (X - X \text{ mean})^2$

b = 0.03 x 0.04 / .0009 = 1.333

b) Sigma leasing

Prospectus is attached in annexure.

TFC Issuer	SLC
Issue date	Jan 17-18, 2000
Amount (PKR):	100mn
Pre-IPO (PKR)	80mn
IPO (PKR):	20mn
Coupon rate (%):	17% p.a. 8.5% semi annually
Maturity:	3 yrs
Price	5000(individual investor) 100,000 (Institutional investor)
Principle	Individual:

redemption:	After 6 month – 250
	After 12 month – 250
	After 18 month – 500
	After 24 month – 500
	After 30 month – 1750
	After 36 month – 1750
	Institutional:
	After 6 month – 5000
	After 12 month – 5000
	After 18 month – 10,000
	After 24 month – 10,000
	After 30 month – 35000
	After 36 month – 35000
Credit Rating:	A- (DCR-VIS)

- **Calculating Return on Sigma TFCs**

Return on Sigma TFC is calculated by using the data only for individual or small investors

TR for Individual investors

Period	Interest payment (1)	Principle Redemption (2)	Principle Outstanding (3)	Total Return (1) + (2)
Jan 00 –June 00 After 6 months	425	250	4750	675
July 00 – Jan 01 After 12 months	403.75	250	4500	653.75
Jan 01–June 01 After 18 months	382.5	500	4000	882.5
July 01–Jan 02	340	500	3500	840

After 24 months				
Jan 02–June 02 After 30 months	297.5	1750	1750	2047.5
July 02–Jan 03 After 36 months	148.75	1750	0	1898.75

TR for Institutional investors

Period	Interest payment (1)	Principle Redemption (2)	Principle Outstanding (3)	Total Return (1) + (2)
Jan 00 –June 00	8500	5000	95,000	13500
July 00 – Jan 01	8075	5000	90,000	13075
Jan 01–June 01	7650	10,000	80,000	17650
July 01–Jan 02	6800	10,000	70,000	16800
Jan 02–June 02	5950	35,000	35,000	40950
July 02–Jan 03	2975	35,000	0	37975

The total return comes out to be the sum of returns for individual and institutional investor calculated as below

Period	Total Return for Institutional investor	Total Return for Individual investor	TR
Jan 00 –June 00	13500	675	14175
July 00 – Jan 01	13075	653.75	13728.75
Jan 01–June 01	17650	882.5	18532.5
July 01–Jan 02	16800	840	17640

Jan 02–June 02	40950	2047.5	42997.5
July 02–Jan 03	37975	1898.75	39873.75

- **Regressing returns on SLC TFCs on Returns on KSE 100**

Year	Y	X	X-X mean	Y – Y mean
Jan 00 –June 00	14175	28.81%	27.484%	-10316
July 00 – Jan 01	13728.75	-26.81%	-28.136%	-10762.3
Jan 01–June 01	18532.5	-4.01%	-5.341%	-5958.5
July 01–Jan 02	17640	-32.52%	-33.852%	-6851
Jan 02–June 02	42997.5	27.24%	25.911%	18506.5
July 02–Jan 03	39873.75	15.74%	14.408%	15382.75
			Σ = 0.474	Σ = 1.5

Y mean = 146947.5/ 6 = 24491

X mean = 8 / 6 = 1.333

b = Σ (X - X mean) (Y – Y mean) / Σ (X – X mean)^2

= 0.474 x 1.5 / (0.474) ^{2} = 3.164

❖ The b value for the subject company is the weighted average of b values for the companies in the sample, the weights being the market capitalization of each company in the sample.

	Market Capitalization	Weights	b	β (Weight x b)
Saudi Pak Leasing	22000000	52.38%	1.33	0.698[2]

---

[2] b of SPLC = 1.333 so weighted average = 1.333 x .5238 = 0.698

Sigma Leasing	20000000	47.62%	3.164	1.507[3]
Total	42000000	100%		1.1025

Market capitalization for selected leasing companies is given in annex 4

$Rp = 0.07 + 1.1025(0.2579 - 0.07)$

$= 27.71\%$

3.4 REQUIRED RETURN ON PARAMOUNT TFC VIA CASH FLOW METHOD

The formula for finding the required rate of return uses cash inflows associated with the bond. The rate that equates the cash inflows with the outflows is the cost of debt or the required rate of return. The formula is as below:

$$P = \sum_{t=1}^{n} I / (1+kd)^t + MV / (1+kd)^n$$

If the investor till maturity holds the bond then the resultant required rate of return is called Yield to Maturity (YTM). Since the TFC of Paramount has embedded call option so instead of calculating Yield to maturity we will calculate yield to call (YTC) by the following formula

$$P = \sum_{t=1}^{n} C / (1+YTC)^t + CP / (1+YTC)^n$$

where

C = The number of years until the first call date

YTC = The yield to first call

CP = The call price to be paid if the bond is called

---

[3] b of SLC = 3.164 so weighted average = 3.164 x .4762 = 1.507

The details of the issue are given in the following table

Paramount Leasing

Amount (Rs. million)	325
Amount with Green Shoe (Rs. million)	400
Tenor	4 years
Issue Date	6-7 Feb 2003
Coupon Rate	SBP discount rate+2.5% with a floor of 11.50% p.a. and a ceiling of 14.50% p.a.
Principal Repayment	On semiannual basis in last seven installments commencing 24 months from the issue date with a call option carrying a premium of 0.25% and exercisable from the third coupon till the eighth coupon.
Placement Type	Private/Public
Face value	Rs. 5000 (individual) Rs.100,000 (Institutional)
Private-Public Placement (Rs. million)	250-150
Security	Specific charge on leased assets and related rental receivables.

3.4.1 Yield to Call

a) Coupon rate determination

In order to determine the coupon rate for future TFC interest payments we have to forecast the future SBP discount rates. This forecasting will be done by determining the compound annual growth rate of SBP discount rates from 2000 till 2003. The SBP discount rates in different periods is given in graphical form as below
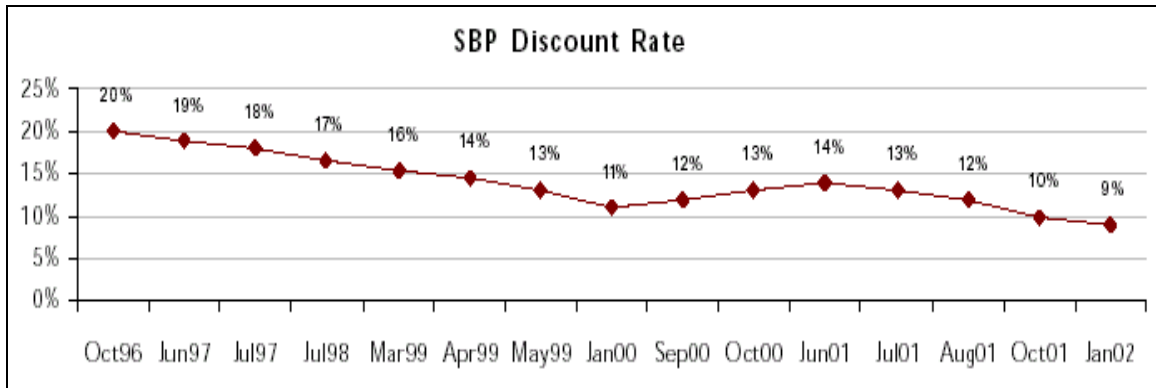
Auction month	WA t-bill yield 6-month	WA PIB yield 10-year	Call money overnight	SBP repo rate
Jun-99	10.60	-	2.48	13.00
Jun-00	7.22	-	10.95	13.00
Jun-01	12.88	14.00	2.69	11.00
Jun-02	6.28	10.86	7.19	9.00
Jun-03	1.66	5.61	7.33	7.50

The compound annual growth rate is calculated as below

Period	SBP Discount Rate
June 00	13%
June 03	7.5%

CAGR = 7.5 / 13 = 0.577

By looking at the table for future value interest factor (FVIF) of one rupee at the end of 4 periods, we find that the FVIF of 0.6818 corresponds to a compound annual growth rate of less than 1%. By interpolating (0.577/1.020[4]) we find that the CAGR is 0.566%. So the future SBP discount rates will be determined by increasing the current discount rate by 0.566% for the future SBP discount rate estimation.

---

[4] FVIF for 4 periods and interest rate of 1%

	SBP discount rate	+ 2.5%	Annual Coupon
7 Aug 2003	7.50%	10.00%	11.5
7 Feb 2004	7.54%	10.04%	11.5
7 Aug 2004	7.58%	10.08%	11.5
7 Feb 2005	7.62%	10.12%	11.5
7 Aug 2005	7.66%	10.16%	11.5
7 Feb 2006	7.70%	10.20%	11.5
7 Aug 2006	7.74%	10.24%	11.5
7 Feb 2007	7.78%	10.28%	11.5

b) YTC calculation

- **For Individual Investors**

The redemption schedule of the TFCs at the floor rate of 11.5%p.a. is as follows:

Month	Principal Outstanding	Profit payment	Principle Redemption	Total Redemption
0	5000	-	-	-
6	4999	287.5	1.00	288.5
12	4998	287.44	1.00	288.44
18	4165	287.39	4165 + 1041[5]	5493.39

YTC is the rate that will equate inflows with outflows and is calculated as below:

Period	Cash inflow	Cash Outflow

---

[5] Call premium on outstanding principle

7 Feb 2003	-	5000
7 Aug 2003	288.5	-
7 Feb 2004	288.4	-
7 Aug 2004	5493.39	-

Using excel the YTC comes out to be 7%

- **For Institutional Investors**

The redemption schedule of the TFCs at the floor rate of 11.5%p.a. is as

follows:

Month	Principal Outstanding	Profit payment	Principle Redemption	Total Redemption
0	100,000	-	-	-
6	99999	5750	1.00	5751
12	99998	5749.9	1.00	5750.9
18	99998	5749.8	$99998 + 250^6$	105997.8

YTC is the rate that will equate inflows with outflows and is calculated as

below:

Period	Cash inflow	Cash Outflow
7 Feb 2003	-	100,000
7 Aug 2003	5751	-
7 Feb 2004	5750.9	-
7 Aug 2004	105997.8	-

---

[6] Call premium

Using excel the YTC comes out to be 6%

The weighted average of yield to call for individual and institutional investors
is as below

Issue	Amount	Weight	YTC	Weighted average
Public	250,000,000	76.92%	7%	5.38%
Private	75,000,000	23.08%	6%	1.38%
Total	325,000,000	100%		**6.76%**

So the YTC is 6.76%

3.4.2 Yield To Maturity

- **For Individual Investors**

The redemption schedule of the TFCs at the floor rate of 11.5%p.a. is as
follows

Month	Principal Outstanding	Profit payment	Principle Redemption	Total Redemption
0	5000	-	-	-
6	4999	287.5	1.00	288.5
12	4998	287.44	1.00	288.44
18	4165	287.39	833	1120.39
24	3332	239.49	833	1072.49
30	2499	191.59	833	1024.59
36	1666	143.69	833	976.69
42	833	95.80	833	928.80
48	0	47.90	833	880.90

Source: Prospectus Paramount Leasing Limited

The yield will be the rate that equates inflows with outflows. It is calculated as
below

Period	Cash inflow	Cash Outflow
7 Feb 03		5000
7 Aug 03	288.5	-
7 Feb 04	288.44	-
7 Aug 04	1120.39	-
7 Feb 05	1072.49	-
7 Aug 05	1024.59	-
7 Feb 06	976.69	-
7 Aug 06	928.80	-
7 Feb 07	880.90	-

Using excel, the yield to Maturity is found to be 6%.

- **For Institutional Investors**

The redemption schedule of the TFCs at the floor rate of 11.5%p.a. is as follows

Month	Principal Outstanding	Profit payment	Principle Redemption	Total Redemption
0	100,000	-	-	-
6	99999	5750	1.00	5751
12	99998	5749.9	1.00	5750.9
18	83331.67	5749.8	16666.33	22416.13
24	66665.34	4791.57	16666.33	21457.9
30	49999.01	3833.25	16666.33	20499.58
36	33332.68	2874.94	16666.33	19541.27
42	16666.35	1916.62	16666.33	18582.95
48	0	958.31	16666.33	17624.64

Source: Prospectus Paramount Leasing Limited

The yield will be the rate that equates inflows with outflows. It is calculated as below

Period	Cash	Cash

	inflow	Outflow
7 Feb 03		100,000
7 Aug 03	5751	-
7 Feb 04	5750.9	-
7 Aug 04	22416.13	-
7 Feb 05	21457.9	-
7 Aug 05	20499.58	-
7 Feb 06	19541.27	-
7 Aug 06	18582.95	-
7 Feb 07	17624.64	-

Using excel, the yield to Maturity is found to be 6%.

The weighted average of yield to maturity for individual and institutional

investors is as below

Issue	Amount	Weight	YTM	Weighted average
Public	250,000,000	76.92%	6%	4.61%
Private	75,000,000	23.08%	6%	1.38%
Total	325,000,000	100%		**5.99%**

Chapter: 4

ANALYSIS

The corporate debt market in Pakistan is developing at a precautionary pace. A strong corporate debt market is highly desirable for the rapid growth of any economy as it provides an alternative for efficient mobilization of resources for long-term investment. Raising debt through capital market is a more efficient way of securing funds because the company does not have to go through the cumbersome process of obtaining funds from financial institutions or in different installments. It provides the investors with the opportunity of earning certain returns and a new and better way to diversify their portfolio. Companies can lock into interest rates for a long period of time and a known cost of capital helps them in planning and budgeting process. Investors always have the other advantages of equity market instruments such as ready liquidity and capital gains. In short, corporate bonds have advantages both for investors and borrowers (issuers) that add to the attractiveness of this market.

4.1 CAN CAPM BE USED TO DETERMINE RETURNS OF LONG TERM CORPORATE BONDS IN PAKISTAN

It is the joint view of some analysts in Pakistan that CAPM cannot be used to determine the required rate of return for a debt instrument like TFC but it is a model to be used exclusively to determine the returns for equities. Well there are several arguments against this view stated as below:

- The TFC is not a perfect example of fixed income security. Since 2001, TFCs returns are based on SBP discount rates or repo rates, thus making them more of debt instruments with floating rate or non-fixed rate of return similar to equity issues.

- The value of the variable Rf (risk free rate) in CAPM is taken as the rate on Treasury bill which itself is a debt instrument. So if we can use the return on a debt instrument as the basis for determining the required return on stocks in CAPM, we can also use it to do the same for TFCs.

Comparison of returns on Paramount Leasing TFC by CAPM & Cash Flow techniques

The YTC is 6.76% while the required return via CAPM is 27.71%. There is a huge difference in the required rates of return on the same security obtained by using same data in two different calculation techniques. The Possible reasons for this discrepancy can be following:

- The assumption of CAPM about low or negligible transaction costs is not true for Pakistan.

- For discounted cash flow techniques, the future cash inflows depend upon market expectations about the interest rates while for CAPM the beta value is determined by using the historical returns of securities and market portfolio based on past interest rates. So this difference may be because of the reason that investors in the past jointly felt a

higher interest rate risk that is evident from the discount rate fluctuations shown in annex 2. While the investor outlook about future interest rates (3-4 yrs in future) is that they will be relatively stable as compared to historical fluctuations. So the required return by discounted cash flow is lower than that for CAPM.

- The return on market portfolio R_m is increasing since Jan 2002 while the risk free rate taken as SBP discount rate is decreasing since 2000. So the value of variable X i.e. $R_m - R_f$ is increasing. This means that the market risk premium and the resultant risk premium is increasing, raising the required rate of return through CAPM. On the other hand in determining required rate of return via discounted Cash Flow (DCF) technique, interest payments are crucial and the future interest payments for TFCs are based on predictions about future risk free rate (which is used as base rate for determining the coupon on floating rate TFCs). So as the trend is decrease in R_f, the future cash inflows in form of coupon payments are reduced since investor hold the view that either this trend will continue or will maintain for some time in future. So the resultant yield is lower.

- The difference between required rate of return via discounted cash flow method and CAPM is 20%. If we look at this difference it becomes clear that the stock market is offering a return many times greater than the return on TFCs. The stock market is in boom and this combined with the fact that the interest rates have been reduced (reduced saving rates, more investment in alternatives), has boosted investment in the stock market. The returns in stock market are much higher than that of TFCs, people who accept the level of risk associated with stocks, are investing more in the stock market and this is one of the main reasons

for the slow developmental pace of our corporate bond market. The rate of return on stock market is higher because the total return component of stocks consist of dividend + capital gains on the sale of stock in the secondary market. In comparison, TFCs however do not have the availability of a strong and developed secondary market like stocks. Their total return comprises of coupon payments + principle redeemed. If our aim is to enhance the breadth and depth of our TFC market then development of secondary market for TFCs is highly crucial.

- The YTC and YTM is less than the risk free rate indicating that the TFCs are having higher risk than T-bills but are giving return lower than that of T-bills which in reality is impossible since according to CAPM, the higher the risk the higher will be the return.

- In the face of declining interest rate environment, there is a strong possibility that companies may once again revert back to traditional mode of resource mobilization, borrowing from financial institutions and solicit funds from banks at rates lower than the return paid to TFC holders.

4.2 LIMITATIONS IN USE OF CAPM IN PAKISTAN

- **Absence of Beta values**

Up to date there is no publicly available information regarding betas of securities. The companies who are responsible for underwriting TFC issues in Pakistan have their own analysts calculate the variation in excess returns of the security to the excess returns on market portfolio. However, it is very difficult to determine betas for securities due to lack of required information

- **Absence of bond index**

The portfolio used to determine required return on market portfolio is KSE 100. There is no separate bond index. Since required return on stocks is greater than the required return on debt/TFCs, KSE 100 may not be as suitable a market index as an index based on TFCs.

- **Lack of sufficient similar companies to determine proxy betas**

In order to determine the proxy beta for any security, a sample of companies with similar degree of risk, having issued TFCs that have matured (their tenor has been completed) is selected. It is important that all the companies in the sample

  o Have issued TFCs that have expired i.e. they have completed their tenor. Otherwise if we take such a TFC in our sample that has few coupon payment left then we will not be able to use it for regression, as we will not be having the corresponding returns on market portfolio for the future returns on sample TFC.

  o Are of comparable risk to the subject company for which beta is being calculated

The returns of these companies are regressed over the returns on market portfolio to determine coefficient b or beta in the following equation

$$Y_i = a + bX_i$$

$$Rj = Rf + \beta(Rm-Rf)$$

The b value for the subject company is the weighted average of b values for the companies in the sample, the weights being the market capitalization of each company in the sample.

However, since the first TFC was issued in 1995, less than a decade ago, there is not sufficient suitable number of companies available to form the sample.

- **Difficulty in estimating the value of independent variable, excess return on market portfolio (Rm-Rf)**

The historical values for risk free rate and the retuns on KSE-100 are very difficult to obtain and differ slightly from one source to another.

- **Floating Rate TFCs Vs. Fixed rate TFCs**

We have used fixed rate bonds (TFCs of sample companies) to determine proxy beta for the subject company who has issued floating rate bond. From 1995 till Oct 2000, all the TFCs issued were fixed rate bonds. The TFC market is only nine year old and it is only since 2001 that floating rate TFCs were introduced in the market. So a perfect sample for determination of proxy beta means that all the samples TFC are floating rate TFCs. However due to relatively younger age of the TFC market, such sample TFCs were unavailable.

Chapter: 5

CONCLUSIONS

Over-reliance on bank lending for debt financing exposes an economy to the risk of a failure in the banking system. A banking crisis can therefore affect economic activity suddenly and adversely because companies would find themselves credit-constrained and be forced to abandon investment spending. When looking at options for raising capital in low interest environment, the business does not want equity investments. There is no retail investment. Firms avoid cumbersome procedures for listing at stock exchanges prescribed by SECP. A business executive says, "*Cost of debt is cheap. So, it is wise to avoid a plethora of legal and other formalities for listing.*" This has placed disproportionate burden on the banks. Industry and other businesses have borrowed heavily to replace costly debts by cheaper borrowing.

The presence of an active and efficient domestic capital market, in particular, the bond market, would give corporations an alternative means of raising debt capital in the event that banks were unable to do so, thus ameliorating any potential adverse effect that a bank-credit crunch may have on the economy.

However, this does not mean that bond markets are a panacea for debt financing. For instance bank loan financing is arguably more appropriate for the effective financing of small and medium enterprises (SMEs) because credit information on SMEs is highly idiosyncratic, the non-negotiable, standardized and inflexible terms common to most bond contracts may be inadequate to finance such ventures.

TFCs make up the corporate bond market in Pakistan and are facing rapid growth as According to Iffat Zehra Mankani of IP Securities, *during the first quarter of current financial year seven corporates issued TFCs amounting to over Rs 2.6 billion. Almost all the issues were oversubscribed. There seems to be a huge gap in demand and supply. As far as the size of the bonds market in Pakistan is concerned, it is much smaller than those of many developed countries. However, the way it has registered growth in a short span of time depicts the potential of this market.*

Pakistan's interest rates have traditionally remained on the higher side, with the prime lending rate fluctuating between 18 per cent and 23 per cent. The biggest paradigm shift in the financial sector has been the sharp reduction in the interest rate structure in the country, whereby the government bonds and National Savings Schemes rates have fallen by more than 6 per cent since April 1998. At present the one-year T-Bill rate is only 7 per cent, as compared to 14 per cent two years ago, while they had touched a peak of 17 per cent at one time. There should be market-oriented interest rate in the country, so that each and every bank can handle the emerging trends at its own. It is our national tragedy that we always try to follow the other western concepts. Common people of the country are not ready to reinvest in the banking industry due to its low dividends and Interest rates on National Savings Schemes have been constantly declining.

In face of this present situation of the capital market, the need for a developed corporate bond market becomes a pressing need. One of the reasons for small corporate bond market is weak secondary market and another one can be the preference of investors to hold the certificate till maturity. Another reason is the lack of depth in the wholesale market for longer-term government securities. To develop the market for long-term instruments, the SBP needs to introduce a new series of longer-term government securities, sold via auctions. These securities should carry coupons in line with prevailing trends in government securities markets. There is no denial in the fact that our TFC market has come a long way since its inception in 1995. In order to make issues more flexible and affordable issuers have with time added features like shelf registration, green shoe option to TFC structure. Use of shelf registration implies that the issuer can split the TFC issue into tranches, which is useful for periodic financing requirements of the issuer and also allows optimal pricing of the individual tranches. Similarly, the green shoe option allows the issuer the right to retain the over subscribed portion of the initial public offer (IPO). However, the issuer has to specify the amount it would retain under this option in advance. We still have a long way to go in terms of development of a strong secondary market. Ways have to be found to encourage bond-market funding of urban infrastructure, one of which would be an efficient and vibrant secondary debt market. Such a market would introduce much-needed liquidity in the paper. This liquidity would help not only in providing incentive to the market for debt instruments like TFCs, as it would satisfy the motive for portfolio balancing and asset-liability management, but, over time, also reduce the cost of borrowing. After the listing of the bonds on the stock exchanges and growing expertise in the trading of such bonds, it is now necessary to create a long-term active secondary market, thereby ensuring the market sustainability of such instruments. An active secondary market while

adding value to the TFCs would also facilitate the diversification of risks, with the computerization of the trading system for securities strengthening the market for such instruments. Moreover, direct measures would also be required to strengthen the domestic capital market. This would involve the establishment of a legal framework for trading and supervision, supplemented by self-regulatory structures for implementing standards and conventions for bond trading, an environment for fair and secure trading and dissemination of information on the secondary bond market.

This thesis aimed at applying CAPM to determine required rate of return and determine its applicability by comparing it with the required return calculated through Discounted Cash Flow (DCF) techniques. A large difference is found between the required returns calculated through the two methods. The possible reasons are explained in detail in the preceding chapter.

This thesis has also brought forth the limitations faced during application of CAPM. The major limitation is the availability of authentic required data to determine regressional variables and lack of sufficient number of sample TFCs. However, the required rate of return calculated through CAPM(27%) is much closer to the return on market portfolio (25%) and therefore, represents a much realistic estimate of required rate of return.

Glossary

CALL OPTION

This option gives the *issuer* the right to redeem the outstanding bond issue at specified dates, and at a specified price, prior to maturity.

CAPS/FLOORS

These are applicable on floating rate securities. Caps and floors impose limits on the maximum and minimum coupon rate respectively.

FIXED RATE BOND

This bond carries a fixed coupon rate (as a percentage of par value).

FLOATING RATE BOND

Carries a *floating,* i.e. variable, coupon rate, based on a benchmark rate (usually the SBP discount rate in Pakistan) plus/minus a premium/discount that reflects the risks of the bond. The coupon rate is reset on specified dates.

YEILD TO MATURITY

The YTM is an *expected* return, which means that it will only be *realized* under certain conditions. The investor will only realize the YTM if:

- The bond is held to maturity.

- Coupon payments can be reinvested at the YTM.

If *either* of these conditions is not met, the *actual* return to the investor may be different (higher or lower) from the YTM.

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