# NEAR EAST UNIVERSITY <br> FACULTY OF ECONOMICS AND ADMINISTRATIVE SCIENCES 

## DEPARTMENT OF BANKING AND FINANCE



BANK 410

## SEMINAR ON BANKING GRADUATION PROJECT

FIRM VALUATION<br>''Bank Application'’

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#### Abstract

Nowadays technological and economical developments have reached the top level and related to this factors, finance area is also affected and changed related to this variable conditions. One of the this changes and developments is notice of the importance of "creating value" this valuing concept helped to appear the value based management understanding


Value based management understanding aims to create shareholder value and adopting this understanding by the firms all discipline. There is a great competition in the business world and the profit, output perfection, customer satisfaction and the other factors send away the firms to value based management understanding. It never forgot that no aim cannot waylay the aim of creating the shareholder value.

First of all in this study we give information about the value and valuation concept. We observed the valuation with the discounted cash value method and free cash flow to the firm method and apply this method to the banks

The finance sector in the world and TRNC we can see that banks merges, purchases and the offerings to public are increasing rapidly. I observed that there is no study in this valuing financial institution especially banks in the TRNC and this encouraged me to work on this study

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## ABBREVIATIONS

CTCCB Cyprus Turkish Central Cooperative Bank
TRNC Turkish Republic of Northern Cyprus
CB Central Bank
ROA Return on Asset
ROE Return on Equity
FED Federal Reserve Bank of America
EPS Earnings per Share
U.S United States
U.S.C.A United States Capital Asset

NAV Net Asset Value
UIT Unit Investment Trusts
SV Share Value
CEO Chief Executive Officer
USD United States Dollar
CAPM Capital Asset Pricing Model
SML Security Market Line
WACC Weighted Average Cost Of Capital
FCFF Free Cash Flow Firm
FCFE Free Cash Flow Equity
EBIT Earning Before Income Tax
DCF Discounted Cash Flow
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## CHAPTER 1

## INTRODUCTION

### 1.1. AIM OF THIS STUDY

The aim of this study is valuing the financial institutions by the method of discounted cash flow and help to the investors and the managers how the institution operates its activities according to data and results. In this study we provide ab overview of valuing financial institutions, banks.

These are some of the most complex companies to value, especially from the outside in .Outside analysts always lack some critical information about these companies' economics(such as asset liability mismatch and credit losses for banks) so that we must rely on rough estimates and judgment about the accuracy of management's accounting decisions. Moreover, due to the nature or their operating model, these companies are highly levered that makes valuations extremely sensitive. To even small changes in key drivers.

In this study we will highlight some of the primary issues you may encounter when valuing financial institution. Our basis approach is to valuing industrial companies and we will serve as a foundation from which we can focus on the areas where the valuation process for financial companies differs. First we describe why you should use the equity cash flow approach for valuing these companies. Then we provide details on how to put this approach into practice.

Finally we discuss in turn specific issues relating to banks and insurance companies including some of the methods and metrics that internal analysts use to better assess their performance and value.

### 1.2. BROAD PROBLEM AREA

The bank mergers and acquisitions in near times rises the importance of the firm valuation concept. The role of the firm valuation increased especially nowadays. In this study the method of FCFF and FCFE used and the value of the Cyprus Turkish Central Cooperative Bank

Calculation the firm value with each method will help the financial managers in the firms and also the investors who want to merge or acquire a commercial bank

This study is prepared at the end of a broad and harder work and it will be the main source of in valuation concept studies

### 1.3. METHODOLOGY

In the application of this study first of all the bank's historical balance sheets and the income statements are consolidated to the convenient position and the all items in the balance sheets and income statements are observed necessarily

And after the growth rates of the historical balance sheets and income statements are calculated to see the whole percentage changes and the historical performance of the banks. And also we calculated the average rates of historical performances and the standard deviation of the data to forecast healthy

According to the economical and financial conditions of the TRNC the general view and the past performances calculated and the banks forecasted balance sheets and income statements arranged based on the nominal GDP of the TRNC. And the discount rate $10 \%$ is taken from the Central Bank

In this study to determine the relative changes in the bank's assets and liabilities the important factor is calculating the cash flows to the firm. From the data on statements
the cash flows to the firm is prepared to see the increases or decreases in the banks holdings

In addition to the cash flow tables the equity cash flow tables are prepared and after the check of the equity cash flow table calculated to evaluate the banks efficiently There are lots of ratios that express the current situation of the firms such as ROA ROE DEBT/EQUITY, LOAN/ASSETS, DEPOSİTS / LIABILTIES EQUİTY / TOTAL ASSETS and etc. All this ratios are calculated for evaluation process

And lastly t all the data are evaluated together and the banks total values are calculated and the banks condition is showed on graphics

### 1.4. STRUCTRE OF THE STUDY

The first chapter shows the aim of this study, broad problem statement, methodology and the structures of the study.

The second chapter starts with defining the valuation and the main valuation terms shareholders value and the usage of the valuation

In the third chapter cost of debt, cost of equity and weighted average cost of capital topics are concentrated and the related examples are given to identify the concept

The fourth chapter consist the free cash flows to the firm and the equity cash flows to the firms and the methods are expressed with lots of examples

In the fifth chapter valuing banks with the discounted cash flow method is observed. In this part the banks probable value is calculated with the method of free cash flows to the firm.

Sixth chapter consists with conclusion and gives some recommendation about valuing the financial institutions and others

## CHAPTER 2

## VALUATION AND THE CONTENTS OF THE FIRM VALUE

### 2.1. INTRODUCTION

There are lots of identifications in the literature besides the valuation refers to "total utility provided from an asset, the amount against an asset" (Ercan,Öztürk and Demirgüneș,2003:1)

Every asset has a value besides its price .the price determined by the supply and demand on the market because of this price does not always reflect the asset's value. A general rule that if the demand exceeds the supply prices increase, if the supply exceeds the demand the price of an asset decreases (Ercan,Öztürk and Demirgüneş,2003:1)

Determining the real value of an asset is a very important case and it varies the type of an asset. There is an internal relationship between the valued assets and and the value creation components (Ercan, Öztürk and Demirgüneş, 2003:1)

The identification of the maximum valuation of shareholder value emphasizes the measuring the financial performance of the firms. The aim of the firm was identified ''maximization of the firm profit' in the earlier of 1900's but this belief began to negotiate in the 1960's and the finance theory relationship become more importance

In the December of 1960 Robert Anthony published an article named 'The Trouble With Profit Maximization' and he defended that the aim of the firm cannot be profit maximization and profit concept is an subjective and is not a meaning with using single meaning(Ercan, Öztürk and Demirgüneş, 2003:1)

In there the desired profit concept is short term or long term? or profitability rate or the profitability amount? This thesis are began to discussed in the finance areas

To understand the concept of valuation firstly we can explain the related terms about the valuation and identify:

### 2.2. THE MAIN VALUATION TERMS

### 2.2.1. Par Value

Banking A check collection system where depository institutions exchange checks at face value, without charging a fee (called an exchange charge) for accepting checks drawn on other banks. Non-par banking was prevalent during the nineteenth and early twentieth century's. Banks that are member banks in the Federal Reserve System are required by the Fed to honor checks at face value, and in fact, most banks, even nonmember state banks, honor checks at par exchange. The Federal Reserve maintains a list, called the par list, of banks that pay checks at par. (http://www.answers.com/topic/par-value)

Securities. The face value of a security or financial instrument. The par value of a common stock is the nominal value assigned by a corporate charter, and has no specific financial relevance after the issue date. The par value of a debt security, for example a bond, is very relevant, as that is the price that will be paid the bondholder at maturity. The bond coupon interest payable semi-annually is a percentage of a bond's par value. Preferred stock dividends normally are stated as a percentage of the assigned par value, but also may be determined by auction bidding at periodic intervals. Par value is unrelated to market value, which is influenced more by market pricing, yield on the securities offered for sale, Net, and prices of comparable issues in the secondary market(http://www.answers.com/topic/par-value)

### 2.2.2. Book Value

Book Value is the shareholders' equity of a business (assets - liabilities) as measured by the accounting 'books'. The term is also used to distinguish between the
accounting value (usually historical cost) and the market price of any asset, such as capital equipment, and may be referred to as carrying value. While it can be used to refer to the business' total equity, it is most often used:

As a 'per share' value': The balance sheet Equity value is divided by the number of shares outstanding at the date of the balance sheet (not the average $\mathrm{o} / \mathrm{s}$ in the period). as a 'diluted per share value': The Equity is bumped up by the exercise price of the options, warrants or preferred shares. Then it is divided by the number of shares that has been increased by those added. (/http://en.wikipedia.org/wiki/Book_valueshare, end of year)

Book value is used in the financial ratio price/book. It is a valuation metric that sets the floor for stock prices under a worst-case scenario. When a business is liquidated, the book value is what may be left over for the owners after all the debts are paid. Paying only a price/book $=1$ means the investor will get all his investment back. Shares of capital intensive industries trade at lower price/book ratios because they generate lower earnings per dollar of assets. Business depending on human capital will generate higher earnings per dollar of assets, so will trade at higher price/book ratios. Book value per share can be used to generate a measure of comprehensive earnings, when the opening and closing values are reconciled. Book value/share, beginning of year - Dividends +Sh issue Premium + Comprehensive EPS $=$ Book value (/http://en.wikipedia.org/wiki/Book_valueshare, end of year)

### 2.2.3. Liquidation Value

The liquidation value of a company is the value of its individual assets, valued as if the company will not continue to carry on business. There are actually two "flavors" of liquidation value, depending on the time available for the liquidation process:

The explanation of "market value" in this article applies to single family houses only. Different methods apply to apartments and other commercial real estate.

The meaning of "market value" confuses many people. As consumers, most people shop at retail stores and pay the price printed on the price tag. A sweater is worth $\$ 24.95$ because the price tag says so. A hammer is worth $\$ 10.95$ because the price tag says so.

When stores have sales on certain items, it is because the store did not sell all of these items for the listed price within a certain period of time. The sweater was not worth $\$ 24.95$ to enough people. Therefore, the store must now lower the price to persuade people to buy the remaining sweaters. At the beginning of the fall clothing season, the market value of the sweater was $\$ 24.95$. In March, when we have more interest in spring clothes, the market value may dropto $\$ 9.95$ (j.p vaugh han).

Market value is simply the price at which something will sell within a reasonable period of time. In a normal or average real estate market, "reasonable" means one to three months (j.p vaugh han).

Here is our definition:

Market value is the price at which a particular house, in its current condition, will sell within 30 to 90 days.

3elements:

1. Particular house
2. Current condition
3. 30to 90 days

The only real measure of market value is what a particular house sells for. Period. However, unless you have a crystal ball, you might think you cannot predict how much someone will pay for the house in the future. Not true. You can learn to come
very close to predicting the true market value of any house even without a crystal ball. Real estate appraisers do it every day. Even so, the appraisal of real estate is more art than science. An appraisal is only an opinion, an educated guess (j.p vaugh han).

Orderly liquidation value This assumes that the enterprise can afford to sell its assets to the highest bidder. It assumes an orderly sale process. It assumes that the seller can take a reasonable amount of time to sell each asset in its appropriate season and through channels of sale and distribution that fetch the highest price reasonably available.

Distress liquidation value This is a "fire sale" price. This assumes that the enterprise must sell all its assets at or near the same time, to one or more purchasers. The assumption is that the typical purchaser for the assets is a dealer who specializes in the liquidation of the entire assets of a company. (info.com/businessvalue.htm).

Value will always be lower than the Orderly Liquidation Value. Depending on the enterprise and the nature of its assets, the difference between the two values can be dramatic (http://www.divorceinfo.com/businessvalue.htm)

### 2.2.4. Going Concern Value

The value inherent in an active established company as opposed to a firm that is not yet established. The value of the assets of a business considered as an operating whole.

As a component of business value, going concern value recognizes the many advantages that an existing business has over a new business, such as avoidance of start up costs and improved operating efficiency. In this sense, the going concern value of a firm represents the difference between the value of an established firm and the value of a start-up firm. (http://www.divorceinfo.com/businessvalue.htm)

Going concern value also indicates the value of a firm as an operating, active whole, rather than merely as distinct items of property. U.S. bankruptcy law, for example, has recognized the need to preserve going concern value when reorganizing businesses in order to maximize recoveries by creditors and shareholders (11 U.S.C.A. § 1101 et seq.). Bankruptcy laws seek to preserve going concern value whenever possible by promoting the reorganization, as opposed to the liquidation, of businesses.

Going concern value also implies a firm's ability to generate income without interruption, even when ownership has changed (Butler v. Butler, 541 Pa. 364, 663 A.2d 148 [Pa. 1995]).

Going concern value is distinguished from the concept of good will, which refers to the excess value of a business that arises from the favorable disposition of its customers. Good will may include the value of such business elements as trade names, trade brands, and established location (http://www.answers.com/topic/going-concern-value)

### 2.2.5. Intrinsic Value

The actual value of a security, as opposed to its market price or book value. The intrinsic value includes other variables such as brand name, trademarks, and copyrights that are often difficult to calculate and sometimes not accurately reflected in the market price.

The amount by which a call option is in the money, calculated by taking the difference between the strike price and the market price of underlie. For example, if a call option for 100 shares has a strike price of $\$ 35$ and the stock is trading at $\$ 50$ a share than the call option has an intrinsic value of $\$ 15$ per share, or $\$ 1500$. If the stock price is less than the strike price the call option has no intrinsic value. (http://www.investorwords.com/2587/intrinsic_value.html)

### 2.2.6. Fair Market Value

Fair Market Value is a term in both law and accounting to describe an appraisal based on an estimate of what a buyer would pay a seller for any piece of property. It is a common way of evaluating the value of property when assessing damages to be awarded for the loss of or damage to the property, generally in a claim under tort or a contract of insurance

Relativity of Fair Market Value: It is important to remember that any vision about value is usually subjective to a number of circumstances i.e. place (local habits), time (moment), the existence of comparable precedents, and the evaluation principles of each involved person.

A Fair Market Value (and any Value)is valid if it is applied, and worthless if not (applied). By example: The opinion of 1,000 people about their intention to buy a product has no meaning if nobody buys the product.

On the other hand, if there is one single person interested in a product, it is a oneperson market. In this case, any price would be a Fair Market Price.

It should not be forgotten that appraising is always guesswork. Opinions are based upon subjective interpretation of checked (or/and unchecked) information.

Elements that are considered relevant by one party in a discussion may be considered totally irrelevant by another party.

Fair Market Value vs. Imposed Value: In a free market system only a legal office (law, tax regulation, court, etc.) can set a absolute value upon a product or a service, and such decision is at least limited in place (territoriality/jurisdiction). [[In this case it is not a Fair Market Value but an imposed value.]]

### 2.2.7. Net Asset Value

Net asset value," or "NAV," of an investment company is the company's total assets minus its total liabilities. For example, if an investment company has securities and other assets worth $\$ 100$ million and has liabilities of $\$ 10$ million, the investment company's NAV will be $\$ 90$ million. Because an investment company's assets and liabilities change daily, NAV will also change daily. NAV might be $\$ 90$ million one day, $\$ 100$ million the next, and $\$ 80$ million the day after.
(http://www.investorwords.com/2587/netassetvalue.html).

Mutual funds and Unit Investment Trusts (UITs) generally must calculate their NAV at least once every business day, typically after the major U.S. exchanges close. A closed-end fund, whose shares generally are not "redeemable"-that is, not required to be repurchased by the fund-is not subject to this requirement.

An investment company calculates the NAV of a single share (or the "per share NAV") by dividing its NAV by the number of shares that are outstanding.

For example, if a mutual fund has an NAV of $\$ 100$ million, and investors own $10,000,000$ of the fund's shares, the fund's per share NAV will be $\$ 10$. Because per share NAV is based on NAV, which changes daily, and on the number of shares held by investors, which also changes daily, per share NAV also will change daily. Most mutual funds publish their per share NAVs in the daily newspapers. (http://www.investorwords.com/2587/netassetvalue.html).

The share price of mutual funds and traditional UITs is based on their NAV. That is, the price that investors pay to purchase mutual fund and most UIT shares is the approximate per share NAV, plus any fees that the fund imposes at purchase (such as sales loads or purchase fees). The price that investors receive on redemptions is the approximate per share NAV at redemption, minus any fees that the fund deducts at that time (such as deferred sales loads or redemption fees).

For the statutory and regulatory provisions relating to NAV, refer to the Investment Company Act of 1940 and the rules adopted under that Act, in particular Section 2(a)(41), and Rules 2a-4 and 22c-1
(http://www.investorwords.com/2587/netassetvalue.html).

Shareholder value is a term used in many ways:

To refer to the market capitalization of a company (rarely used)

To refer to the concept that the primary goal for a company is to enrich its

Shareholders (owners) by paying dividends and/or causing the stock price to increase

To refer to the more specific concept that planned actions by management and the returns to shareholders should outperform certain bench-marks such as the

Cost of capital concept.

## Definition

For a publicly traded company, SV is the part of its capitalization that is equity as opposed to long-term debt. In the case of only one type of stock, this would roughly be the number of outstanding shares times' current share price. Things like dividends augment shareholder value while issuing of shares (stock options) lower it. This Shareholder value added should be compared to average/required increase in value, aka cost of capital. (ERCAN Kamil Literatür, 2006)

For a privately held company, the value of the firm after debt must be estimated using one of several valuation methods, such discounted cash flow or others.

### 2.3. SHAREHOLDER VALUE MAXIMIZATION

This management principle, also known under value based management, states that management should first and foremost consider the interests of shareholders in its business decisions. Although this is built into the legal premise of a publicly traded company, this concept is usually highlighted in opposition to alleged examples of CEO's and other management actions which enrich themselves at the expense of shareholders. (ERCAN Kamil Literatür, 2006)

Examples of this include acquisitions which are dilutive to shareholders, that is, they may cause the combined company to have twice the profits for example but these might have to be split amongst three times the shareholders.

The sole concentration on SV has been widely criticized. While SV might be best for the owners of a corporation, for society other aspects like employment, environmental/ethical issues or business practices (monopoly) play a higher role. (SERİN Reyhan Gül,www.makalem.com)

A management decision can maximize SV while lowering global welfare. It can also threaten the long-term health of a company, for example by emphasizing dividends and returning cash to shareholders rather than investment.

## Alternative Definition based upon Criticism: Stakeholder Analysis

The intrinsic or extrinsic worth of a business measured by a combination of financial success, usefulness to society, and satisfaction of employees, the priorities determined by the makeup of the individuals and corporations that together own the shares an direct the company. This is sometimes referred to as stakeholder analysis.(http://www.sec.gov/answers/nav.htm)

## CHAPTER 3

## THE COST OF CAPITAL

### 3.1. INTRODUCTION

The cost of capital for a firm is a weighted sum of the cost of equity and the cost of debt (see the financing decision). Firms finance their operations by three mechanisms:

## Issuing stock (equity)

Issuing debt (borrowing from a bank is equivalent for this purpose) (those two are external financing), and reinvesting prior earnings (internal financing).

Capital (money) used to fund a business should earn returns for the capital owner who risked their saved money. (VELEV-PAREJA, Ignacio January 2001)

For an investment to be worthwhile the estimated return on capital must be greater than the cost of capital. Otherwise stated, the risk-adjusted return on capital (incorporating not just the projected returns, but the probabilities of those projections) must be higher than the cost of capital. (VELEV-PAREJA, Ignacio January 2001)

The cost of debt is relatively simple to calculate, as it is composed of the interest paid (Interest rate), including the cost of risk (the risk of default on the debt). In practice, the

Interest paid by the company will include the risk-free rate plus a risk component, which

Itself incorporates a probable rate of default (and amount of recovery given default).For

Companies with similar risk or credit ratings, the interest rate is largely exogenous. (VISWANATH, P.V 2002)

### 3.2. COST OF DEBT

Calculating the cost of debt:

Example: expected return of the coupon bond

Nominal value: 1.000 USD

10 year maturity, market price of a bond: 850

Coupon interest: $15 \%$

Time to maturity: 5 year

What is the expected return of a bond?
$850=\sum_{1}^{4} \frac{150}{\left(1+k_{d}\right) t}+\frac{1.150}{\left(1+k_{d}\right)^{5}}$

$$
k_{d}=20 \%
$$

After the calculation for the customer who wants to buy the firms bond today is an advantage of $20 \%$ return on this bond. And also when the firm use to calculate the weighted average cost of capital it uses this $20 \%$ ratio as a long term debt's cost Determining the debts ratio in the firms weighted average cost of capital today current ratio 850 usd should be considered3.3 Cost of Equity

Cost of equity is more challenging to calculate as equity does not pay a set return to its investors. Similar to the cost of debt, the cost of equity is broadly defined as the risk-weighted projected return required by investors, where the return is largely unknown. The cost of equity is therefore inferred by comparing the investment to other investments with similar risk profiles to determine the "market" cost of equity. (ERCAN Kamil Literatür, 2006)

The cost of equity is also known as the discount rate, the rate at which projected earnings will be discounted to give a present value.

## Expected return

The expected return can be calculated as the "dividend capitalization model" which is:
(Dividend per share / price per share) + Growth rate of dividends.
Which is the dividend yield + growth rate of dividends*dividend..

### 3.3. CALCULATING EQUITY WITH CAPITAL ASSET PRICING MODEL (CAPM)

CAPM is used in finance to determine a theoretically appropriate required rate of return (and thus the price if expected cash flows can be estimated) of an asset, if that asset is to be added to an already well-diversified portfolio, given that asset's nondiversifiable risk. The CAPM formula takes into account the asset's sensitivity to non-diversifiable risk (also known as systematic risk or market risk), in a number often referred to as beta $(\beta)$ in the financial industry, as well as the expected return of the market and the expected return of a theoretical risk-free asset. (DAMODARAN, Aswath, march 2000)

The model was introduced by Jack Treynor, William Sharpe, John Lintner and Jan Mossin independently, building on the earlier work of Harry Markowitz on diversification and modern portfolio theory. Sharpe received The Nobel Memorial Prize To Economics (jointly with Harry Markowitz and Merton Miller) for this contribution to the field of financial economics. (ERCAN Kamil Literatür,2006)

## The Formula:

The CAPM is a model for pricing an individual security (asset) or a portfolio. For individual security perspective, we made use of the security market line (SML) and its relation to expected return and systematic risk (beta) to show how the market must price individual securities in relation to their security risk class. The SML enables us to calculate the reward-to-risk ratio for any security in relation to that of the overall market. Therefore, when the expected rate of return for any security is deflated by its beta coefficient, the reward-to-risk ratio for any individual security in the market is equal to the market reward-to-risk ratio, thus:

Individual security's $/$ beta $=$ Market's securities (portfolio)

Reward-to-risk ratio Reward-to-risk ratio

$$
\frac{E\left(R_{i}\right)-R_{f}}{\beta_{i m}}=E\left(R_{m}\right)-R_{f}
$$

The market reward-to-risk ratio is effectively the market risk premium and by rearranging the above equation and solving for $E(R i)$, we obtain the Capital Asset Pricing Model (CAPM).

$$
\left.E\left(R_{i}\right)=R_{i}+\beta_{i n}\left(E R_{n}\right)-R_{j}\right) .
$$

Where:
$E\left(R_{i}\right)$ is the expected return on the capital asset
$R_{f}$ is the risk-free rate of interest
$\beta_{i m}$ (the beta coefficient) the sensitivity of the asset returns to market returns, or also
$\beta_{i m}=\frac{\operatorname{Cov}\left(R_{i}, R_{m}\right)}{\operatorname{Var}\left(R_{m}\right)}$,
$E\left(R_{m}\right)$ is the expected return of the market
$E\left(R_{m}\right)-R_{f}$ is sometimes known as the market premium or risk premium (the

Figure : 3.1. Capm


The Security Market Line, seen here in a graph, describes a relation between the beta and the asset's expected rate of return.

Figure 3.2. Security Market Line


## Asset pricing

Once the expected return, $E\left(R_{i}\right)$, is calculated using CAPM, the future cash flows of the asset can be discounted to their present value using this rate $\left(E\left(R_{i}\right)\right)$, to establish the correct price for the asset.

In theory, therefore, an asset is correctly priced when its observed price is the same as its value calculated using the CAPM derived discount rate. If the observed price is higher than the valuation, then the asset is overvalued (and undervalued when the observed price is below the CAPM valuation. Alternatively, one can "solve for the discount rate" for the observed price given a particular valuation model and compare that discount rate with the CAPM rate. (VISWANATH, P.V 2002)

If the discount rate in the model is lower than the CAPM rate then the asset is overvalued (and undervalued for a too high discount rate).

## Asset-specific required return

The CAPM returns the asset-appropriate required return or discount rate - i.e. the rate at which future cash flows produced by the asset should be discounted given that asset's relative riskiness. Betas exceeding one signify more than average "riskiness";
betas below one indicate lower than average. Thus a more risky stock will have a higher beta and will be discounted at a higher rate; less sensitive stocks will have lower betas and be discounted at a lower rate. The CAPM is consistent with intuition - investors (should) require a higher return for holding a more risky asset. (ERCAN Kamil Literatür,2006)

Since beta reflects asset-specific sensitivity to non-diversifiable, i.e. market risk, the market as a whole, by definition, has a beta of one. Stock market indices are frequently used as local proxies for the market - and in that case (by definition) have a beta of one.

An investor in a large, diversified portfolio (such as a mutual fund) therefore expects performance in line with the market.

The risk of a portfolio comprises systemic risk and specific risk which is also known as idiosyncratic risk. Systemic risk refers to the risk common to all securities - i.e. market risk. Specific risk is the risk associated with individual assets. Specific risk can be diversified away to smaller levels by including a greater number of assets in the portfolio. (Specific risks "average out"); systematic risk (within one market) cannot. . (ERCAN Kamil Literatür, 2006)

Depending on the market, a portfolio of approximately 30-40 securities in developed markets such as UK or US (more in case of developing markets because of higher asset volatilities) will render the portfolio sufficiently diversified to limit exposure to systemic risk only.

A rational investor should not take on any diversifiable risk, as only nondiversifiable risks are rewarded within the scope of this model. Therefore, the required return on an asset, that is, the return that compensates for risk taken, must be linked to its riskiness in a portfolio context - i.e. its contribution to overall portfolio riskiness - as opposed to its "stand alone riskiness." In the CAPM context, portfolio risk is represented by higher variance i.e. less predictability. In other words the beta
of the portfolio is the defining factor in rewarding the systemic exposure taken by an investor. (BENINGA, S, Z ODED,1997)
The efficient frontier

Figure 3.3. Efficient Frontier


The CAPM assumes that the risk-return profile of a portfolio can be optimized an optimal portfolio displays the lowest possible level of risk for its level of return.

Additionally, since each additional asset introduced into a portfolio further diversifies the portfolio, the optimal portfolio must comprise every asset, (assuming no trading costs) with each asset value-weighted to achieve the above (assuming that any asset is infinitely divisible). All such optimal portfolios, i.e., one for each level of return, comprise the efficient frontier. (BENINGA,S,Z ODED,1997)

Because the unsystemic risk is diversifiable, the total risk of a portfolio can be viewed as beta.

## Example: CAPM problem

Beta coefficient of the firm is 1.2 ; market return $26 \%$,risk free rate $17 \%$ and inflation
rate is $9 \%$.Calculate the cost of equity

Real interest $=\frac{1+\text { interest rats }}{1+\text { inflation raze }}-1$


Real risk free interest rate $=\frac{1+17 \%}{1+9 \%}-1$
risk free rate is calculated $=7.3 \%$
with the same formula;

Real market return $=\frac{1+26 \%}{1+9 \%}-1$

Real market return $=15.6$ \%

When we replace the values into the capital asset pricing method the equity's real Expected return ;

$$
\begin{aligned}
& k_{e=}=k k_{r f}+\beta\left(k_{m}+k_{r f}\right) \\
& k_{e=}=7,3 \% 1,2(15,6 \%-7,3) \\
& k_{e=1}=17,2
\end{aligned}
$$

### 3.3.1. Calculating The Cost Of Equity With Dividend Model

This approach related to calculation of the cost of equity and developed by Myron J.Gordonand. This model expresses the current value of the future dividend. The main point in there is the dividends will be equal payments until infinite. The paid dividends are expressed as $D_{1} D_{2} \ldots \ldots D_{\infty}$ and all these payments regarded equal so the current value of the common stock is $\left(P_{0}\right)$;

$$
P_{0}=\frac{D_{1}}{\left(1+k_{e}\right)^{2}}+\frac{D_{2}}{\left(1+k_{e}\right)^{2}}+\ldots \ldots+\frac{D_{3}}{\left(1+k_{e}\right)^{\infty}}+\frac{P_{\infty}}{\left(1+k_{e}\right)^{00}}
$$

Here the $k_{s}$ is the expected return, the another saying cost of equity capital .If the dividents not increases and the payment for each $\mathrm{C} / \mathrm{S}$ is not equal the growth rate will be zero.therefore $P_{\infty}$ 'S current value is regarded zeroand the equation will be the following:
$P_{0}=\frac{D}{k_{e}}$

Let see the derivation of the formula:

$$
\begin{aligned}
& A=\sum_{t=1}^{n} D * \frac{(1+g)^{t}}{(1+k)^{t}}=D *\left[\frac{(1+g)}{(1+k)}+\ldots+\frac{(1+g)^{n}}{(1+k)^{n}}\right] \\
& A * \frac{(1+k)}{(1+g)}=D *\left[\frac{(1+g)^{0}}{(1+k)^{0}}+\frac{(1+g)}{(1+k)}+\ldots+\frac{(1+g)^{n-1}}{(1+k)^{n-1}}+\left(\frac{(1+g)^{n}}{(1+k)^{n}}-\frac{(1+g)^{n}}{(1+k)^{n}}\right)\right] \\
& A *(1+k)=D *(1+g) *\left(1-\frac{(1+g)^{n}}{(1+k)^{n}}\right)+(1+g) A
\end{aligned}
$$

$$
A k=D *(1+g) *\left(1-\frac{(1+g)^{n}}{(1+k)^{n}}\right)+(1+g) A-A
$$

$$
A(k-g)=D *(1+g) *\left(1-\frac{(1+g)^{n}}{(1+k)^{n}}\right)
$$

$$
A=D * \frac{(1+g)}{(k-g)} *\left(1-\frac{(1+g)^{n}}{(1+k)^{n}}\right)
$$

As,

$$
\begin{aligned}
& n-->\infty \text { And } g<k \\
& A=D * \frac{(1+g)}{(k-g)}
\end{aligned}
$$

### 3.3.2. Problems with the model

a) The model requires one perpetual growth rate greater than (negative 1) and less than the cost of capital. But for many growth stocks, the current growth rate can vary with the cost of capital significantly year by year. In this case this model should not be used.
b) If the stock does not currently pay a dividend, like many growth stocks, more general versions of the discounted dividend model must be used to value the stock. One common technique is to assume that the Miller-Modigliani hypothesis of dividend irrelevance is true, and therefore replace the stock's dividend $D$ with $E$ earnings per share. (FERNANDEZ, Pablo 2001)

But this has the effect of double counting the earnings. The model's equation recognizes the tradeoff between paying dividends and the growth realized by reinvested earnings. It incorporates both factors. By replacing the (lack of) dividend with earnings, and multiplying by the growth from those earnings, you double count. (FERNANDEZ, Pablo 2001)
c) Gordon's model is sensitive if k is close to g .

For example, if dividend $=\$ 1.00$

Cost of capital $=8 \%$

Say the

Growth rate $=1 \%-2 \%$

So the price of the stock

Assuming 1\% growth $=\$ 14.43=1.00(1.01 / .07)$

Assuming $2 \%$ growth $=\$ 17.00=1.00(1.02 / .06)$

The difference determined in valuation is relatively small.

Now say the

Growth rate $=6 \%-7 \%$

So the price of the stock

Assuming 6\% growth $=\$ 53=1.00(1.06 / .02)$

Assuming 7\% growth $=\$ 107=1.00(1.07 / .01)$

The difference determined in valuation is large. (Myron J. Gordon (1962).

### 3.4. THE WEIGHTED AVERAGE COST OF CAPITAL INTRODUCTION

In the following all variables and parameters are stochastic variables, either in themselves or by being derived as functions of other stochastic parameters or variables (This even holds for the tax rate and tax regime). As such WACC is a stochastic variable defined by the variables and parameters below, but more important by the capital structure of the company and is value - which themselves
are stochastic variables determined by the distributions for sale, prices, costs and investments. (ERCAN Kamil Literatür, 2006

We will use the mean values for all variables/parameters in the discussion and tables, but give the estimated probability distribution for WACC in the case used as example at the end. WACC The Value Sim model puts emphasis on correct estimation of the weighted average cost of capital (WACC).The WACC is probably the single most important factor beside the return on invested capital (ROIC), when estimating company value - the basis for most strategy and performance evaluation methods.

It is also the discount rate (time value of money) used to convert expected future cash flow into present value for all investors. (ERCAN Kamil Literatür,2006)

## An Example for Calculating WACC and the Firm Value

In this example it is assumed that d is the correct discount rate for tax savings.

Assume a firm with the following information:

The cost of the unlevered equity $r$ 15.1 $\%$

Debt's beta 0.2

Risk free rate $10 \%$

Market risk premium 6\%

Tax rate 35\%

Using CAPM the cost of debt is $10 \%+0.2 \times 6 \%=11.2 \%$ before taxes. Ifthe debt is not traded, the cost is the one stipulated in the contract. The information about the investment, free cash flows, debt balances and initial equity is:

Table 3.1. Free cash flow and initial investment

| Year | $\mathbf{0}$ | $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| FCF |  | 170,625 | $195,750.00$ | $220,875.00$ | $253,399.45$ |
| Debt at end of <br> period, | 375,000 | $243,750.00$ | 75,000 | $37,500$. |  |
| Initial equity <br> investment | $125,000.00$ |  |  |  |  |
| Total initial <br> investment | $500,000.00$ |  |  |  |  |

Source: (VELEV-PAREJA, Ignacio, January 2001)

The WACC calculations are made estimating the debt and equity participation in the total value of the firm for each period and calculating the contribution of each to the WACC after taxes.

Table 3.2 WACC calculation. Contribution of debt to WACC.

| Year | $\mathbf{0}$ | $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Debt |  |  |  |  |  |
| Relative weight of <br> debt D\% (Debt <br> balance | $61.37 \%$ | $47.04 \%$ | $19.33 \%$ | $16.91 \%$ |  |
| Cost of debt after <br> taxes d(1-T) |  | $7.28 \%$ | $7.28 \%$ | $7.28 \%$ | $7.28 \%$ |
| Contribution of <br> debt WACC d(1- <br> T)D\% |  | $4.47 \%$ | $3.42 \%$ | $1.41 \%$ | $1.23 \%$ |

Source: (VELEV-PAREJA, Ignacio, January 2001)
The same procedure is used to estimate the contribution of equity to WACC.

Table 3.3. WACC Calculation Contribution Of Equity

| YEAR |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Relative weight of <br> debt D\% (Debt <br> balance | $38.63 \%$ | $52.96 \%$ |  |  |  |
| Cost of debt after <br> taxes d(1-T) |  | $21.38 \%$ | $17.40 \%$ | $15.75 \%$ | $15.65 \%$ |
| Contribution of <br> debt WACC d(1- <br> T)D\% |  | $8.26 \%$ | $9.22 \%$ | $12.70 \%$ | $13.01 \%$ |

Source: (VELEV-PAREJA, Ignacio, January 2001)

Note that the cost of equity -e- is larger than r as expected, because r is the cost of the stockholder, as if the firm were unlevered15. When there is debt ee calculationnecessarily e ends up being greater than $r$, because of leverage.

With these values it is possible to calculate the firm value for each period. If el is known, as it was said above, $r$ is found with (6). Excel solves the circularity that is found and the same values result.

Table 3.4. WACC Calculations

| Year | $\mathbf{0}$ | $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ |
| :--- | :--- | :--- | :--- | :--- | :--- |
| WACC after <br> taxes |  | $12.7 \%$ | $12.6 \%$ | $14.1 \%$ | $14.2 \%$ |
| Firm value a end <br> of $\mathbf{t}$ | $611,056.56$ | $518,200.45$ | $387,957.75$ | $221,818.63$ |  |

Source: (VELEV-PAREJA, Ignacio, January 2001)

Notice that WACC results in a lower value than r. WACC is after taxes.

Example: Firm value at end of year 3 is
$253,399.45 /(1+$ WACC 4$)=253,399 \cdot 45 /(1+14.2 \%)=221,818.63$.

For year 2 it will be
$(221,818.63+220,875.00) /(1+\mathrm{WACC} 3)=(221,818.63+220,875.00) /(1+14.1 \%)=$ 387,957.75
and so on for the other years.

The reader has to remember that the values $14,2 \%$ and $14,1 \%$, etc.Are not calculated from the beginning because they depend on the firm value that is going to be calculated with the WACC. In this case circularity is generated. This is solved allowing the spreadsheet to make enough iteration until it finds the final numbers. It is recommended that the last15 As MM say that r is constant and independent from the capital structure; it will be equal to when debt is zero. This is WACC before taxes. And this is the condition for the validity of the first proposition of MM.28arithmetic operation be WACC calculation as the sum of the debt and equity contribution to the cost of capital.

## CHAPTER 4

## CALCULATION OF THE FİRM VALUE WITH DISCOUNTED CASH FLOW METHOD

### 4.1. FREE CASH FLOW TO THE FİRM METHOD (FCFF)

In the process of looking at firm valuation, we also look at how leverage may or may not affect firm value. We note that in the presence of default risk, taxes and agency costs, increasing leverage can sometimes increase firm value and sometimes decrease it. In fact, we argue that the optimal financing mix for a firm is the one that maximizes firm value. (COTNER JOHN S. AND HAROLD D. FLETCHER, 2000)

## The Free Cash flow to the Firm

The free cash flow to the firm is the sum of the cash flows to all claim holders in the firm, including stockholders, bondholders and preferred stockholders. There are two ways of measuring the free cash flow to the firm (FCFF).One is to add up the cash flows to the claim holders, which would include cash flows to equity (defined either as free cash flow to equity or dividends), cash flows to lenders (which would include principal payments, interest expenses and new debt issues) and cash flows to preferred stockholders (usually preferred dividends). (ERCAN Kamil Literatür, 2006)

The calculation of free cash flows to the firm is below:

## EBIT (1-T)

## + Depreciation

-capital expenditures

## - $\Delta$ Working capital

## Firm value $=$ FCFF/ $($ Kwacc-g)

If the growth of the firm is a variable n year and after n year grows constantly infinite in this situation the value of the firm calculated as follow


FCFF $\mathrm{t}=$ represents the cash flow to the firm in each t term until n year
.gn=represents the constant growth rate year n to infinite

Kwacc hg =represents the weighted average cost of capital in the high growth term

Kwacc st =represents the weighted average cost of capital in the constant growth term

If the amount of FCFE is known we can calculate the each free cash flows belongs to firm

## FCFE

## +interest expenses

## +capital repayments

## -new debts

## +preferred dividends

Example: The calculation of the firm value with FCFF method:

The financial data of an any firm is the following .

Sales revenue: 40.000 .000 usd

EBIT: 10.000.000 usd

The cost expenditure of the term: 2.000 .000 usd

Depreciation: 3.000.000

The portion of the debts in capital structure: $40 \%$

The interest rate of the firm's long term debts: $20 \%$

Tax rate: $40 \%$

Expected constant growth of the firm: $5 \%$

Risk free rate: 7, 3\%

The return rate of the market portfolio: $15,6 \%$

The beta of the shares: 1,25

We use the CAPM to calculate the capital assets of the firm

The formulation of the CAPM is:
$\boldsymbol{k}_{\boldsymbol{e}=\mathrm{k}} \boldsymbol{k}_{r f}+\boldsymbol{\beta}\left(\boldsymbol{k}_{m}+\boldsymbol{k}_{r f}\right)$

$$
\begin{aligned}
& k_{e=}=7,3 \% 1,25(15,6 \%-7,3) \\
& k_{e=1}=17,67
\end{aligned}
$$

When the weighted average cost of capital is calculated in the firms debt and total capital:

$$
\begin{aligned}
& \mathbf{k}_{\text {WACC }}=W_{\mathrm{dx}} \mathbf{k}_{\mathrm{dx}}(1+\mathrm{T})+W_{\mathrm{e}} \mathbf{k}_{\mathrm{e}} \\
& \mathbf{k}_{\mathrm{WaCC}}=(40 \% * 10 \% *(1-0,40 \%)+(60 \% * 17,76), \\
& \mathbf{k}_{\text {WACC }}=13 \%
\end{aligned}
$$

Calculation of the free cash flow to the firm (FCFF):

Free cash flow is calculated using this format,

## FCFF=EBIT (1-T)

## + Depreciation

-capital expenditures

## -4 Working Capital

FCFF: $1=\operatorname{EBIT}(1-\mathrm{T})=10.000 .000$ usd $*(1-40 \%)=6.000 .000$ usd

The constant growth rate is $5 \%$ so,
6.000 .000 usd $^{*} 1.05=6.300 .000$ usd

Depreciation expense for first year,
$3.000 .000 * 1.05=3.150 .000$ usd

Cost expenditures for first year,
2.000.000 usd * $1.05=2.100 .000$ usd

Firms change in capital in first year (2005) is 500.000 usd

The business capital for first year,
500.000 usd $* 1.05=525.000$ usd

So firm's 2004 position and future term (2005) free cash flows is as follows :

Table 4.1. Free Cash Flow Position

FCFE (2004) FCFF12005)

EBIT $(1-\mathrm{T}) \quad$ 6.000.000 USD 6.300 .000

USD
+depreciation 3.000.000 USD 3.150.000 USD
-capital expenditures 2.000 .000 USD
2.100.000 USD

When we replace the upon free cash flows to the firm in the constant growth formula,

Firm value $=\frac{F C F F}{\left(K_{\text {wact }}-g\right)}$

Firm value $=\frac{6.825 .000 \text { usd }}{(13 \%-5 \%)}$

Firm value $=85.312 .500$ USD

If the firm's debt's current value 34.125 .00 usd, firms capital must be ;
85.312.000 USD - 34.150.000 USD $=51.187 .500$ USD

If the firm operates in the stock exchange market we can calculate the value per share

With dividing the 51.187 .500 to the total share outstanding

If we develop a new example based on the 3 year rapid growth the calculations

About the firm will be following:
$\beta$ : 1

The constant growth after growth is predicted:

Firm's expected growth rate: \%3

The interest rate of long term debts: $20 \%$

Table 4.2. Calculating Fcff


Rapid growth term s free cash flows discounted with the rate of $13 \%$ the value of the firm is 16.866 .000 USD

Calculations for crossing the term of the constant growth 4. Rd year:

The constant growth for the first 3 year is $3 \%$ so

EBIT $=11.576 .000 * 3 \%=11.923 .000$ USD. The change in the firm's business capital in

Related term is the $10 \%$ of the growth of the sales revenue.
3. Rd year sales revenue $=40.000 .000 \mathrm{USD} *(1.05)^{3}=46.305 .000 \mathrm{USD}$

4 th year sales revenue $=46.305$ usd $*(1.03)=47.694 .150$ usd

The distinction is 1.389 .150 . And the $10 \%$ ( of this amount $\Delta$ business capital) 138.915

USD. According to this data the free cash flow of 4. Year is calculated like this :

Table 4.3. Calculating Fcff With Ebit
4.year(1.000 USD)

crossing term

## EBIT

11.923
$-\operatorname{tax}(40 \%)$
4.769

+ EBIT $^{*}(1-$ T $)$
7.154
+depreciation
0
-capital spending
$-\Delta$ business capital 139

FCFF $_{4}$
7.015

Calculation of the cost of capital in the growth term,

When the values are replaced in the CAPM model

$$
\begin{aligned}
& k_{e=} \mathrm{k} k_{r f}+\beta\left(k_{m}+k_{r f}\right) \\
& k_{e=} \% 7,3+1 *(15,6 \%-7,3) \\
& k_{e=}=15.6 \%
\end{aligned}
$$

The weighted average cost of capital is:

$$
\begin{aligned}
& k_{W A C C}=W_{d} \times k_{d} \times(1+\mathrm{T})+W_{e} \times k_{e} \\
& k_{W A C C}=(40 \% * 10 \% *(1-0.40)+(\% 60 * 15,6 \\
& k_{W A C C}=11,76
\end{aligned}
$$

Calculation of the firm value :

Firms continuing value in 3.rd year

Continuing value $=\frac{\mathrm{FCFF}_{4}}{\left(k_{\text {WACC }}-\mathrm{g}\right)}$

Continuing value $=\frac{7.015 .000}{(1.76 \%-10 \%)}$

Continuing value $=398.579 .545$ USD

The current value of amount in 3 .rd year 398.579 .545 with the weighted average cost of capital is :
(398.579.545 USD) *(3 year,13 \%)
276.235.618 USD

So the sum of free cash flows in the rapid growth term 16.866.000 USD and the

Current value of the constant growth term 276.235.618 USD gives us the total value of

The firm:

Firm value $=16.866 .000+276.235 .618=293.101 .618$ USD

### 4.2. FREE CASH FLOW FROM EQUITY METHOD (FCFE )

In this method we only evaluate the expected future cash flows of the equity holders.

# This method is usually used in valuing banks, insurance firms and other financial 

 institutions. (COTNER JOHN S. AND HAROLD D. FLETCHER, 2000)The formulation of the FCFE is following:

FCFE $=$ Net Income
+depreciation
-capital spending

- $\triangle$ business capital
-principal repaid
+new debts

Here, $\lambda$ represents the ratio of:

Long term debt/(long term debt + shareholders equity) this is the arranged form of the free cash flow equity :

## FCFE=Net income

-(1- $\lambda$ )( capital spending-depreciation )
$-(1-\lambda)(\Delta$ business capital

Example: the valuation of the firm with the FCFE method :

Profit per share $=6$ USD

Dividend per share $=2$ USD

Invested amount per share $=4$ USD

Depreciation per share $=2$ USD

Change in the business capital per share $=1$ USD

Firms target capital structure (debt ratio) $\lambda=40 \%$

The beta of the firms common stocks $=1.1$

Risk free rate $=7.3 \%$

Return rate of market portfolio $=15.6 \%$

If the firm's constant growth regarded $3 \%$ we can calculate the value of common

Stock like this:

FCFE=Net income
$-(1-\lambda)($ capital spending-depreciation )
$-(1-\lambda)(\Delta$ business capital $)$

We replace the data:

6 USD
-(1-0.40) (4USD-2USD)

## -(1-0.40)(1USD)

## $F C F E_{0}=4.2 \mathrm{USD}$

When we calculate the firms cost of equity using CAPM :

$$
\begin{aligned}
& k_{e=} \mathrm{k} \boldsymbol{k}_{r f}+\beta\left(k_{m}+k_{r f}\right) \\
& k_{e=7.3 \%+1.1(15.6 \%-7.3 \%)} \\
& k_{e=16.4 \%}
\end{aligned}
$$

We know the firms FCFF, FCEE and the constant growth rate. So we use the Myron Gordon's dividend model to calculate:
$P_{o}=\frac{F C F E_{1}}{\left(k_{e}-g\right)}$
$P_{0}=$ represents the price of the common stock
$F C F E_{1}=$ represents the expected future equity cash flow

Future terms equity cash flow will be more the current cash flow growth rate(g).the upon expression,
$P_{0}=\frac{F C F E_{0}(1+g)}{\left(k_{e}-g\right)}$

Like this and when we replace the data the common stocks value

$$
\begin{aligned}
& P_{o}=\frac{4.2(1+0.03)}{(16.4-3 \%)} \\
& P_{o}=32.28 \mathrm{USD}
\end{aligned}
$$

After doing these calculations we can say if the firms common stocks in the stock

Exchange is highly valued or undervalued

## Example: FCFE-valuing the firm with two phase's method

It is assumed that the firm which following data in year 2004 given did not
pay the dividend and the rapid growth of the firm will be continue 3 year

The sales revenue per share $=25$ USD

Profit per share: 6 USD

Dividend payment per share :0 USD

Capital Spending per share (investment amount) $=4$ USD

Depreciation per share $=2$ USD

Rapid growth term time $=3$ year

The beta of the common stocks in the rapid growth term $=1.5$

The beta of the common stocks in the constant growth term=1.1

Firm's target capital structure $=30 \%$

Risk free rate=7.3 \%

The return rate of the market portfolio: $15.6 \%$

Firms expected rapid growth rate $=5 \%$

## Firm's expected constant growth rate $=2 \%$

It s assumed that the capital spending and the depreciation in the constant growth term will be equal, firms debt ratio will be continue ( $\lambda$ ) $30 \%$ and the business capital level will be the $20 \%$ of the sales revenue.

The firm's 3 year rapid growth equity ratio will be calculated with using the capital asset pricing model CAPM

$$
\begin{aligned}
& k_{e=}=k_{r f}+\beta\left(k_{s m}+k_{r f}\right) \\
& k_{e=7.3 \%+1.5(15.6 \%-7.3 \%)} \\
& k_{e=1}=19.75 \%
\end{aligned}
$$

When we recalculate the equity cost of capital after the 3 year growth we change the coefficient of the beta;

$$
\begin{gathered}
k_{e=} k_{r f}+\beta\left(k_{m}+k_{r f}\right) \\
k_{e=7.3 \%+1.1(15.6 \%-7.3 \%)} \\
k_{e=}=16.43 \%
\end{gathered}
$$

Calculation of the profit per share:

Firm's profit per share in the 3 year rapid growth term wills increase $5 \%$ each year.

So ;

6 USD in term $t_{0}$
$6(1+0.05)^{2}=6.3 \mathrm{USD}$ in term $t_{1}$
$6(1+0.05)^{2}=6.6$ USD in term $t_{2}$
$6(1+0.05)^{3}=6.9$ usd in term $t_{3}$

Dividend per share for fourth year will be $2 \%$ constant growth. So;
$6.9(1+2 \%)=7.03 \mathrm{USD}$
(1- $\lambda$ ) (Capital spending-depreciation)

The initial year will be based and the capital spending and depreciation rate increased Increased;

We calculated this amount $((1-0.30)(4-2))=1.40$ USD in the term of $t_{0}$

And this amount will be :
$(1-0.30)(4 * 1.05)^{1}-(2 * 1.05)^{1}=1.47$ USD in the term of $t_{1}$
$(1-0.30)(4 * 1.05)^{2}-(2 * 1.05)^{2}=1.54$ USD in the term of $t_{2}$
$(1-0.30)(4 * 1.05)^{3}-(2 * 1.05)^{3}=1.62$ USD in the term of $t_{3}$

It is assumed that the amount of capital spending and the depreciation are equal after The term of $t_{4}$. And the capital spending-depreciaton will be zero.
(1- $\lambda$ ) ( $\Delta$ Business capital)

To calculate the occurred change in the business capital, the business capital in the term of $\left(t_{0}\right)$ is the $20 \%$ of the amount of sales revenue and its considered to see the annual changes .

The level of per share for the term of $t_{0}$ :

## $25 * 20 \%=5$ USD

The level of per share for the term of $t_{1}$ :
$5 * 1.05=5.25$ USD

The increase in business capital in the term of $\varepsilon_{1}$ is described as the difference
$(5.25-5)=0.25$. And $30 \%$ of this amount financed with debt.

For the term of $t_{0}(1-0.30)^{*} 0.25=0.175$ USD the increase rate of this amount is the base
of the following years and it's calculated :
$0.175^{*} 1.05=0.183$ USD for the term of $t_{1}$
$0.183 * 1.05=0.192$ USD for the term of $t_{2}$
$0.192 * 1.05=0.202$ USD for the term of $t_{3}$

For the calculation of the $t_{4}$ term, the sales revenue of $t_{3}$ and $t_{4}$ should be calculated

And the $10 \%$ (business capital) of this amount should be known.

The firm's growth rate will be $2 \%$ after the third year so ;

The revenue of $t_{3}$ will be: $25^{*}(1.05)=28.94$ USD

The revenue of $t_{4}$ will be: $28.94^{*}(1.02)=29.52$ USD

The business capital of the $t_{3}$ and $t_{4}$ term are the following:

Business capital level for the term $t_{3}$,
$28.94 * 20 \%=5.79$ USD

Business capital level for the term $t_{4}$,
$29.52 * 20 \%=5.90$ USD

The change in the business capital is the distinction between $(5.90-5.79)=0.11$ USD

Except the portion financed with debt;

We can calculate the change in business capital in $t_{4}$ term:
$(1-0.30)^{*}(0.11)=0.077$. This " 0.077 " is financed with the shareholders equit

The expected free cash flows in the rapid growth term is the following :

Table 4.4. Expected Free Cash Flows In The Rapid Growth

| YEARS | 1 | 2 | 3 | 4 |
| :--- | :--- | :--- | :--- | :--- |
| Dividend per share | 6.3 | 6.6 | 6.9 | 7.03 |
| - (1-え)(cap. Sp.) | 1.4 | 1.54 | 1.62 | 0 |
| -(1-ג)( $\Delta$ buss. Cap.) | 0.113 | 0.192 | 0.202 | 0.077 |
| FCFE | $\mathbf{4 . 7 8 7}$ | $\mathbf{4 . 8 6 8}$ | $\mathbf{5 . 0 7 8}$ | $\mathbf{6 . 9 5 3}$ |
| Current value $\left(k_{e}=\mathbf{2 0 \%}\right)$ | $\mathbf{3 . 9 9}$ | $\mathbf{3 . 3 8}$ | $\mathbf{2 . 9 4}$ |  |

The total of the current value the free cash flows to equity in the rapid growth term is: $3.99+3.38+2.94=10.31$ USD. After the third year the constant growth will begin the Price of the $P_{3}$ will be:

$$
\begin{aligned}
& P_{3}=\frac{F C F E_{4}}{\left(k_{z}-g\right)} \\
& P_{3}=\frac{6.953}{(16.43-2 \%)}
\end{aligned}
$$

$$
P_{3}=48.18 \mathrm{USD}
$$

We find the continuing value of the current value of the firm with discounting This amount to $20 \%$ ( cost of equity) and find :27.88 USD

The total of this calculated two amount among the free cash flow method gives us The required value of the common stock.

$$
\begin{aligned}
& P_{0}=10.31+27.88 \\
& P_{0}=38.19 \text { USD }
\end{aligned}
$$

## CHAPTER 5

## APPLICATION OF THE DISCOUNTED CASH FLOW METHOD TO THE BANKS

### 5.1. INTRODUCTION

All the firms presents goods and services are in the financial service firm category We can classify the financial service firms to their earning types like below: These are; Banks, Insurance companies and the other investment institutions

Banks are a trade- off money with a simple approach .In this study the intended bank concept is a commercial banks. The main costs of the banks are the interest paid to the source providers and in contrast the interests on the given loans are the main income source of the banks. The difference between them forms the bank's main revenue. (ERCAN Kamil Literatür, 2006

Insurance firms provide revenue mainly from two sources. These are the premiums from the insurers and the revenues come from the investment portfolios.An investment institution provides their revenues from investment counseling and the management of the customer portfolios. (ERCAN Kamil Literatür, 2006)

In the finance sector generally the funds suppliers with financial institutions and fund demanders face to faces. TRNC has an important place in the finance sector.

### 5.2. GENERAL VIEW TO TRNC BANKING SECTOR DATAS SOME DATAS ABOUT TRNC BANKS

Table 5.1. Some Data's About Trnc Banking

| Billion ntl | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Bank amount | 36 | 37 | 32 | 26 | 25 | 24 | 25 | 24 |
| Total debit | 408,265 | 847,998 | 954,381 | $1,733,214$ | $2,197,518$ | $2,895,046$ | $3,631,717$ | $3,894,968$ |
| Deposits | 225,350 | 468,701 | 560,012 | $1,119,315$ | $1,828,850$ | $2,453,697$ | $3,184,534$ | $3,332,684$ |
| Loans | 178,299 | 437,573 | 358,011 | 337,587 | 485,863 | 659,533 | $1,052,308$ | $1,221,240$ |
| Frozen <br> receivables | 4,935 | 12,106 | 25,179 | 203,243 | 74,440 | 58,615 | 55,117 | 47.728 |

Source TRNC Central Bank

Table 5.2. Various Data's About Trnc Banking

| D4FE |  | Forfice TRRFNC | Torat |
| :---: | :---: | :---: | :---: |
| 31 JAN. 2007 | 1.350.997.962,07 |  | 2.299.723.075,26 |
| 28 TEB. 2007 | 1337.810578 .89 | $950-899756$ | $2.288 .600 .506,45$ |
| 31 MAR 2007 | 1.370 351.454,06 | 95496719210 | 2325.318.647,18 |

Table 5.3. Credit Volume of the TRNC Banking

| JUNE 2005 | AMOUNT |
| :--- | :---: |
| BANK NUMBER | 24 |
| PUBLIC BANKS | 2 |
| PRIVATE BANKS | 16 |
| BRANCH BANKS | 6 |
| OFF-SHORE <br> BANKS | 18 |

Source: TRNC Central Bank

## ON- SHORE BANKS ON-LİNE

Table 5.4. On Shore Banks On Line

| BRANCH NR. | 132 |
| :--- | :--- |
| ATM | 102 |
| BRANCH | 137 |
| PERSONAL | 2,321 |

### 5.3. STRUCTRE OF THE BANK BALANCE SHEETS AND INCOME STATEMENTS

It's important that performing of the balance sheets and the income statement analysis foe determining the cash flows to the banks. In modern economy there are kinds of institutions such as Banking Arrangement and Supervision Committee, Capital Market Committee another Banking Unions. These differences is detail based And don't harms the structure. We can classify the bank balance sheet with main items like below (Banks of America www.boa.org):

### 5.3.1. Bank Balance Sheet

## Assets:

Cash and cash equivalents

Time deposits placed and other short-term investments

Federal funds sold and securities purchased under agreements to resell

Trading account assets

Derivative assets

Securities:

Loans and leases

Allowance for loan and lease losses

Loans and leases, net of allowance

# Premises and equipment, net 

Mortgage servicing rights

Goodwill

Core deposit intangibles and other intangibles, other assets

## Liabilities:

Deposits in domestic offices:

Noninterest-bearing Interest-bearing

Deposits in foreign offices: Noninterest-bearing

Interest-bearing

Total deposits

Federal funds purchased and securities sold under agreements to repurchase

Trading account liabilities

Derivative liabilities

Commercial paper and other short-term borrowings

Accrued expenses and other liabilities Long-term debt

Total liabilities

# Commitments and Shareholders' equity 

Preferred stock

Retained earnings

Accumulated other comprehensive income (loss)

Other Total shareholders' equity

Total liabilities and shareholders' equity

### 5.3.2. Bank Income Statement

Interest and discount income

Interest expense

## Net interest income

Fee and commission income

Fee and commission expense

## Net fee and commission income

Dividend income

Net trading income

Gains less losses from investment securities

Other operating income

Operating income

Operating expenses

Bad and doubtful debts expense

Profit before tax

Income tax expense

Net profit for the period
5.4. ARRANGEMENT OF THE FREE CASH FLOW TO EQUITY CALCULATION IN BANK

It's possible to calculate the free cash flow to equity such a this format:

FCFE $=$ Net Income

+ depreciation
-capital spending
-change in net business capital
-capital back payments
+new debts

We can easily apply this calculation method to the commercial banks:

## NET INCOME

Net income is the first item used to calculate FCFE. The 'Net term profit/loss' of the Income statement took and the main factor that effects this calculation is 'Net interest revenue" So "'Net interest Margin" (ERCAN Kamil Literatür, 2006)

## DEPRECIATION

This is the expenses of the fix assets and it varies according to businesses when the fix asset rate of the total asset rate is low depreciation expense is also low

## CAPITAL SPENDING

The calculated capital spending for banks is below:

## Capital Spending $=$ Fix assets

+participations
+related partnerships
+credits
+Stocks and bond to maturity
+personal expenditures

## CHANGE IN NET BUSINESS CAPITAL

Net business capital is regarded '' 0 '" for banks

## CAPITAL BACK PAYMENTS

This payments is also regarded zero for this calculations but the end of term and the beginning of the term amounts is take in consideration. when we want to say with numbers the end term amount of the various debts account is assumed 1000 NTL and beginning term amount is 750 NTL. The subtraction is 250 and this amount is regarded new debt. In reality the in-term new debt rate is 800 NTL and debt Capital back payment is 550 NTL. (ERCAN Kamil Literatür, 2006)

## NEW DEBTS

Calculated shape of the new debts for banks is formulated like this :

## New Debts = Deposit

+received credits

+ Exported stocks and bonds
+various debts
+other foreign values


## +leasing debts

## +capital like credits

When we replace the upon items in to the formula and formulate them we can reach The amount of term's free cash flow to the equity :

```
FCFE =Net income
+depreciation
-capital spending
-change in net business capital
-capital back payments
+new debts
```


### 5.5. VALUATION OF THE CYPRUS CENTRAL COOPERATIVE BANK

### 5.5.1. Valuing Bank From Outside In

In building a cash flow model of a bank from outside in, we must make several simplifications. We cannot truly understand the contribution of the mismatch profits to overall net interest income, the quality of the loan portfolio, or whether the company has excess equity. However given these shortcomings we can still use an equity cash flow model to understand the company's economic prospects.(VALUATION BOOK,Mc-Grew)

I created a disguised example based on one of the major banks in TRNC ;CYPRUS TURKISH COOPERATIVE CENTRAL BANK. Our goal is to illustrate the various steps in the estimation of the bank's value

I have created a full income statement and balance sheet, along with an abbreviated schedule of changes in shareholder equity, which then lead to the equity cash flow. I have also used Publicity available TRNC CENTRAL BANK's information to evaluate the bank. So that 1 can corporate some estimates of capital adequacy

Looking the CTCCB's historical performance we can see that over the past several years it has generally done very well.Net income of the bank grew $50,61 \%$ with a standard deviation of 5,36 \% per year from 2003 to 2006 (Table 5.8)

Its return on equity in 2006 reach $\mathbf{5 3 , 6 9 \%}$ (Table 5.18 ))

For income statement items (see Table 5.12, $5.13,5.14$ )) I estimate interest income and expense by forecasting margins on future amounts of loans and deposits. I also forecast future levels of loans.

On the balance sheet (see tables $5.9,5.10,5.11$ ) 1 use my 3 different possible projections on deposit growth as a driver; than 1 forecasted the ratio of loans to deposits based on historical performance. I then relate other accounts on the asset side of the balance sheet

To check on how plausible my forecasts are 1 calculate a number of output ratios. (Table 5.18 ) These include growth in revenues and net income, ratios between different balance sheet items and returns on an asset and equity .For example from the output ratios we can see that growth in net incomes are $\mathbf{4 4 , 8 6} \% \mathbf{4 1}, \mathbf{5 0} \% \mathbf{3 0}, 9$ $\% \mathbf{3 3 , 3 4} \%$ for the years of $\mathbf{2 0 0 3}, 2004,2005$ and $\mathbf{2 0 0 6}$. According to this ratios we can observe that the CTCCB grew more and more and exceeds the Average real GDP rate( past10 year average) for this term is which is $6,16 \%$

Finally to check our overall valuation 1 also calculate an annual economic profit forecast and economic profit continuing value. Discounting this item to the present and adding the initial level of equity, 1 reach the same value as my equity cash flow model

My main finding from this analysis is that forecast that all estimates top line revenue growing at more than the nominal GDP and banks in TRNC is growing rapidly and this growth rate is much more the general RGDP and other indicators

### 5.5.2. Equity Cash Flow Approach

Throughout most of this study 1 will detail the enterprise DCF (see table 5.16) approach to valuation which we use for nonfinancial companies in cases where operating decisions and financing decisions are separate. For financial companies, however, we cannot value operations separately from interest income and expense, since these are important components of their income. Another distinction involves our concept of investments capital which focuses on company's operating assets and is indifferent, within bounds to how those assets are financed. However financing decisions (the choice of leverage, for example)are at the core of how banks and insurers generate earnings. Therefore to value financial institutions you should use the equity cash flow method rather than the enterprise DCF method. .(VALUATION BOOK,Mc-Grew)

### 5.5.3. Calculating Equity Cash Flow

I can derive equity cash flow from two starting points. First equity cash flow is driven by net income minus the earnings retained in the business:

## Equity Cash Flow =Net Income -Increase in Equity + Other Comprehensive Income

I start with net income because it represents the earnings theoretically available to shareholders after the company has paid all expenses, including those to debt holders. However net income by, itself is not cash flow. As a financial institution grows, it will need to increase its equity; otherwise its debt/equity ratio would rise, which might cause regulators and customers to worry about the company's solvency. Increases in equity reduce equity cash flow.(VALUATION BOOK,Mc-Grew)

In addition to these two relatively simple approaches you can calculate equity cash flow from changes in all the balance sheet accounts. For example equity cash flow(see table 5.15 and 5.16 )for a bank equals net income plus the increase in
deposits and reserves, less the increase in loans and investments and so on. The result will be identical to the two simpler approaches, and it highlights changes in the company's asset or liability composition. .(VALUATION BOOK,Mc-Grew)

People often equate the equity cash flow method with discounting dividends. In a simplified world, dividends are indeed the same as equity cash flow. However real world companies are generally more complex. But other items, such as share as buybacks and issuances, still have a material impact. . (VALUATION BOOK,McGrew)

## Understanding a Company's Equity Needs

Forecasting future equity cash flows is more complex than the historical calculation discussed. Earlier the reason is that a financial institution grows and increases its net income; it will need to increase its equity. But how much equity will it need? In this area our perspective depending on weather you are doing evaluation inside or outside the institution. (DAMODARAN, Aswath, march 2000)

The crux of the issue is this: Financial institution are highly levered because of the nature of their business -taking money from depositors or policy holders, then lending it out and /or pressing it into investments. Fundamentally, much of this institutions business involves risking other people's money. Regulators (and prudent managers)will want to make sure that the company also puts some of its owners money at risk by financing some of its activities with equity, and that companies do not achieve high returns simply by operating at unsustainable high levels of leverage.

Risk capital versus book equity: From the perspective of regulators and risk management, the amount of equity a financial institution should have depends on the risk in its portfolio. The 1988 Basel 1 accord established rules for banks regarding how much capital they must hold based on their level of risk -weighted assets(RWAs).These RWAs where defined as a banks' loan portfolio weighted by the riskiness of different classes of borrowers. (BENINGA, S,Z ODED, 1997)

However, Basel 2 maintains the general principal that capital should be related to risk (and may lead to measure revisions of capital needs per product type). Similarly insurers operate under national regulations regarding solvency that seek to make sure they have enough capital to meet their risk. . (VALUATION BOOK,Mc-Grew)

Banks and insurers make internal calculation of the risk capital required to operate prudently.(not that the amount of risk capital a financial institutions believes it needs to hold may be less than the required by regulators and ,indeed, less than the total equity on its books.) In this context, when you analyze financial institutions, you will often hear term like RAROC(risk-adjusted return on capital) or RORAC(return on risk adjusted capital).These concepts are used in most modern performance management systems to evaluate the economic performance of business units within a bank or insurance company. .(VALUATION BOOK,Mc-Grew)

From an external perspective, we are unlikely to know a financial institution's risk Capital per business unit. Indeed, we may not know whether a bank or-insurer overall has excess (or insufficient) risk capital. Therefore, when valuing an entire bank or
insurance company from the outside in, we make the assumption that the amount of risk capital employed by the companies essentially equal to the book value of its equity. .(VALUATION BOOK,Mc-Grew)

## CHAPTER 6 CONCLUSION AND RECOMENDATION

After the lots of calculations and evaluations lastly we calculated the NET FREE CASH FLOW TO EQUITY tables and we reached the results

I calculate the value of the CTCCB's according to the 3 different economical scenarios

From the first scenario we forecasted the bank will grow $8 \%$ in each ten years. This forecast was the worse scenario and we take the growth rate (8\%) below the average real gdp results because we want to see if the firm faces such kind of problems and this result gives us the minimum values of the bank. (See table 5.23)

From the worse scenario the value of the CTCCB is $\mathbf{2 , 6 3 5 , 9 2 8 , 0 0 0}$ NTL

The second scenario depends on the ten year $10 \%$ growth in all financial sheets of the bank. We select this rate at a near to real GDP rate of the country. This result gives us the optimum level of the bank performances and the values. If the conditions in the economy remains same it means that the calculations we made are healthy and we can match the market rate of the bank according to market value (see table 5.24)

From the normal growth scenario the value of the CTCCB is $2,909,790,000 \mathrm{NTL}$

The last forecasting scenario is the $12 \%$ growth best scenario and we grew all the financial statements of the CTCCB is $12 \%$.This is an optimistic model shows us the probable value of the bank if the historical economical performance and the targets of the general economy related with the macroeconomic policies continues this forecast can be truly and our observations may realize but we always have to consider and prepare our financial position according to the worse scenarios(See table 5.25)

From the best scenario the value of the CTCCB is $3,215,066,000$ NTL

## CALCULATED STATEMENTS OF CTCCB

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