



VALUATION METHODS OF A COMPANY AND CREDIT
DEFAULT MODEL APPLYING IN LAIKI BANK

By

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Abstract

This project analyse the main three approaches of valuation, Discounted Cash Flow (DCF) valuation, Relative valuation and the Contingent Claim valuation. It has been discussed in practical part the Merton Model, Structural models, and estimating the Probability of Default of Laiki Bank of Cyprus. Using Merton model and estimating Probability of Default the paper assesses the reliability of the estimates by examining their success in predicting the failure or survival of failed company and survivor. Then the Probability of Default will be compare with the price of the Index of Laiki's Bank.

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Chapter 1

Introduction

The term financial crisis is speeded broadly as a variety of situations in which some financial institutions or assets have lost a large part of their value. During the last two centuries the economy faced many financial crisis, characterized by stock market crashes, currency crisis and sovereign defaults.

From the mid-2007 through the first quarter of 2009 financial markets were shaken by a series of shocks were the global economic crisis began. It is considered by many economists as to be the worst financial crisis since the Great Depression of the 1930's as it was the threat of total collapse of their national governments and downturns in stock markets around the world. Equity markets bottomed out in March 2009, major indices such S&P 500 Index and MSCI Index had lost more than half of their value compared their highs results of 2007, investors had suffered serious losses and many asset management firms were in survival mode while others had gone out of business. The crisis had a significant role in the failure of key business declined in consumer wealth estimated in trillions of US dollars and a downturn in economic activity leading towards the 2008 – 2012 global recession and contributing to the European sovereign – debt crisis.

The European sovereign – debt crisis or as all we know the Eurozone crisis in an ongoing financial crisis that has made difficult or impossible for some countries in the Euro area to repay or event to refinanced their governments debts without the assistance of the third parties. In several countries private debts arising from a property bubble were transferred to the sovereign debt as a result of banking system bailouts and government responses to slowing economies post- bubbles.

In Greece the unsustainable public sector wage and pension commitments drove the debt increase. The structure of the Eurozone leaders in order to respond European banks own significant amount of sovereign debt. This fact raise concerns regarding the solvency of banking systems or sovereigns are negatively reinforcing,

In the turmoil of the Global Financial crisis the focus across all EU member states have been gradually implement austerity measures with the purpose of the lowering the budget deficits to levels below 3% of GDP¹ in order to the debt level would either stay below or start decrease towards to the 60% limit defined by the stability and Growth Pact. In order to restore the confidence in Europe 23 out of 27 EU countries are also agreed on adopting the Euro Plus Pact. This Pact is consisting of political reforms to improve fiscal strength competitiveness. The 25 out 27 EU countries also decided to implement the Fiscal Compact² which includes the commitment of each participating country to introduce a balanced budget amendment as a part of their national constitution.

While sovereign debt has risen tragically in only a few Eurozone countries it has become a perceived problem for the whole area leading to speculation of a possible breakup of the Eurozone. Mid- November of 2011 the Euro was even trading slightly higher against the bloc's major trading partners that at the begging of the crisis before losing ground unfortunately the following months again rebound down. The most affected EU countries are Greece, Portugal and Ireland. Cyprus is a member of European Union since 2004 and a member of the Eurozone since 2008 and has adopted Euro (€) as an official currency as is the common currency in 17 of 27 EU countries in order to serve the common currency. In September of 2011 yields on Cyprus long term bonds have risen at 4.5% and it is valid for 4.5 years. During the second half of 2012, Cyprus and Spain called Troika as to have negotiations about setting up an economic recovery program in return of financial loans of ESM. On 12 of June of 2012 financial media reported that a bailout a request by Cyprus was imminent. Despite the fact that Cyprus has low population and also has a small economy, Cyprus has an off-shore banking industry which is disproportional to its economy. A request was made to the Eurozone Financial Stability Facility or the European Stability Mechanism in June 25, 2012. It is anticipated that a bailout package would include first of all requirements for fiscal reforms. The request follows a downgrade of Cyprus bonds to BB+ by Fitch, also in June 25, 2012 which disqualified bonds issued by Cyprus form being accepted as collateral by European Central Bank. On March of 2012 Moody's has slashed Cyprus' credit rating into Junk status warning that Cyprus government will have to inject fresh capital into its banks to cover losses from incurred Greece's debt swap. Cyprus banks were highly exposed to Greek debts and so are

¹ Gross Domestic Product

² Fiscal Compact is a direct successor of the previous Stability and Growth Pact).

disproportionately hit by the haircut taken by creditors. Cyprus' banks held €22b of the Greek private sector debts.

A way to present the risk that borrowers have is the Credit Risk. Credit Risk refers to the risk that a borrower will default on any type of debt by failing to make payments which it is obligated to do the risk is primarily that of the lender and includes lost principal and interest description to cash flows and increased collection costs. The possible loss may be complete or partial and can arise in a number of circumstances. For example a consumer may fail to make a payment due on a mortgage loan, credit card, line of credit or other loan. A company may be unable to repay amounts secured by a fixed or floating charge over the assets of the company; an insolvent bank won't return funds to depositors a government grants bankruptcy protection to an insolvent consumer or business. More generally there are three main types of credit risk are about three: a) Credit default risk, b) Concentration risk and c) Country risk.

The Structural Models are a way to calculate the credit risk of any company or a firm. In economy the reason of using these models is to identify the conditions under the borrowers are expected to default and after the default, to evaluate the probability that these conditions come about to obtain an estimate of the probability of default. Sometimes we can find them as called option-theoretic or contingent-claim models and sometimes as a Merton model. And these names are for the structural models. <<Structural models of default risk are cause – and - effect models>>. For firm the default occurs when the firm fails to make the promised payments. For the limited liability companies, default comes up when the asset value cannot cover the liabilities of the firm.

This happens when the asset value is smaller than the value of liabilities. Equity holders expected to exercise the walk away option they have and leave the firm to the creditors. If the asset value is not greater than the value of liabilities claims of creditors' are not fully covered and as a result the firm is in default. In these situations we can use option theory. Merton model can be applied here. It has been called Merton model because of Robert (1974) who was the first that applied the option theory in firm's liabilities in default cases.

This study will examine one of the Banks of Cyprus, Laiki Bank that actually has a service problem and efficiently has caused a problem to Cyprus economy. Laiki Bank has mostly been affected from Greece economics problem because of its exposure to Greek debt. The outgoing loans that had been given before now was made to erase million of euro loans because of Greece situation.

Laiki Bank was established in 1901 by four citizens of Limasol named the "Popular Savings Bank of Limasol". Their goal was to encourage the public to save money. First the goal of these four people was the bank to operate from a residence in Limasol but soon with the support of the public the bank grew in power. Over the years the bank has been extended and now is one of the most popular banks in Cyprus. In 2007 directors announced a triple merger of Marfin, Egnatia and Laiki Group which was completed in 30 June, 2007. Now following a shareholder's decision the Official name of the Bank reverts to "Cyprus Popular Bank Public Co Ltd" and the trading name in Cyprus to "Laiki Bank".

In our days Laiki Bank Group (L.B.G) used to be one of the most dynamic and most respected banking groups in the East Mediterranean and one of the biggest banks in Cyprus in terms of customers' base. In 110 years L.B.G based in Cyprus and with history of more than 110 years has developed into a robust organization with presence in 10 countries Cyprus, Greece, United Kingdom, Russia, Ukraine, Romania, Serbia, Malta, Guernsey and representative office in China. It operates 439 branches and employed 8464 people. The bank caters for individuals, small business and large organizations with services in international business banking, foreign exchange and treasury, electronic banking, factoring, finance and leasing insurance investment and fund management.

For the practical part were used the Financial Statements of Laiki Bank Group for the years throughout the periods 2004 till 2011. These periods were chosen because since 2004 the bank's progress was very good and profitable and because of that Cyprus was introduced in Europe and in 2008 adopted Euro as the official currency. Three years later, Cyprus has exposed in worldwide economic crisis. First the paper presents the comments on the Financial Statements: Cash Flow Statement, Income Statement and Balance Sheet. Comments and critics made in the most important sectors which had the biggest price change from the last year. After that using the liabilities and the total equities from Financial Statements have been applied to the Merton Model Formulae. As equity volatility was equal to 12% and the risk free rate was equal to 4.15% according to Euribor. The frequency was three months for each year and using the official page of the Stock Market got the price of the Stock of each period. Using Merton Model formulae, manage to calculate the Probability of Default of Laiki Bank Group and were compared with Stock market price.

Cause of this research is to follow Bank's progress line during the years and analyse the risk that bank has taken. Chapter 2 provides the papers that studied for this research as for a company or a firm defaults there is a wide range of papers to study.

Chapter 3 provides the theoretical part which is regarding the Valuation Methods of a firm. First is been explained what exactly the valuation is and where is been found, then we analysed the three methods of the valuation of a firm and last there is a comparison between the three methods. The three methods are: a) Discounted Cash Flow, b) Relative Valuation Method and c) Contingent Claim Valuation. Discounted Cash Flow methods (DCF) is been used more of the three approaches and is the foundation on which the rest of the other valuation approaches are built. Relative method also named as Multiples, compares a stocks' valuation with those of other stocks or with company's own historical valuation. With Contingent Claim Valuation method we can generate an overall estimate of the future volatility of the business generate an option value for the business. This modelling approach has many refinements but essentially provides both methods and insights into the valuation of all firms that are financed partly be debt and in particular high leveraged, fast growing start-up companies.

In Chapter 4, is the comparison between the methods and the revaluation corrections of accounts before the valuation of a firm. More specific, were compared Relative Valuation and Contingent Claim methods with Discounted Cash Flow method as is the foundation of the two. First is the comparison of the Discounted Cash Flow VS Multiples and second the Discounted Cash Flow VS Contingent Claim. Most analysts in our days use Discounted Cash Flow method and Relative methods. In each of the three methods are presented the benefits and the defects. Then is been describe the procedure that is followed before the valuation of any company or firm. First, in the begging are the pre-valuation corrections of firm's accounts in order to do the correct calculations for the valuation. There is always a checklist which has to be followed.

Chapter 5 named Empirical Part, presents the comments of the Financial Statements and the results of the Merton Model formulae that applied on Laiki bank's data. The conclusions of all the results from each quarter for the probability of default were made a comparison between the stock market prices. Also all the results at the end were presented in charts. Conclusions are presented in Chapter 6.

Appendix 1 presents the Financial Statements of Laiki Bank Group and Appendix 2 presents the Tables of the Probability of Defaults and the Market Prices.

Chapter 2

Literature Review

Sometimes we can find them as called option-theoretic or contingent-claim models and sometimes as a Merton model. All these names are for the structural models. <<Structural models of default risk are cause – and - effect models>>. Generally in economy the reason of uses these models is to identify the conditions under the borrowers are expected to default and after the default, to evaluate the probability that these conditions come about to obtain an estimate of the probability of default. For firm the default occurs when the firm fails to make the promised payments. For the limited liability³ companies, default comes up when the asset value cannot cover the liabilities of the firm.

$$\text{Asset Value} = \text{Value of Equity} + \text{Value of Liabilities}$$

The formula above confirms and shows when the equity value can be negative. This happens when the asset value is smaller than the value of liabilities. Equity holders expected to exercise the walk away option they have and leave the firm to the creditors. If the asset value is not greater than the value of liabilities claims of creditors' are not fully cover and as a result the firm is in default. In these situations we can use option theory.

Merton model can be applied here. Is been called Merton model because of Robert C. Merton in 1974 who was the first that applied the option theory in firm's liabilities in default cases.

Default and Valuation in a structural model:

According to Merton model firm's liabilities has just one zero coupon bond with maturity equals to T and principal equals to L. Until time to maturity T, no payments must be done and equity holders must wait till time to maturity and then decide whether to default or not. In cases that equity holders exercise before time T automatically lose the chance of benefiting from an increase of the asset value. And then according to the default probability theory, the probability at time T, the value of the assets is below the value of the liabilities (L).

³ There are a number of variants of limited company: a) a private limited company, b) a limited company by guarantee and c) a public limited company.

To calculate the probability of default using the Merton model we get from balance sheet of the firm the value of liabilities and then must specify the time to maturity. The formula (2.2 and 2.3) below show how Merton Model works.

$$\ln A_T \sim N(\ln A_t + \left(\mu - \frac{\sigma^2}{2}\right)(T - t), \sigma^2(T - t)) \quad eq\ 2.1$$

An assumption for the value of financial assets is that follows a lognormal distribution such as that the logarithm of the asset value is normally distributed. The σ^2 presents the change of the per annum variance of the log asset, $\mu - \frac{\sigma^2}{2}$ is the expected per annum of the log asset, μ is the drift parameter where drift parameter and t is the time of today.

As we know all the parameters of the formula the next step is just calculation on statistic as to find the probability of default.

The probability that is a normally distributed variable x that falls below z is given by:

$$\Phi[(z - E[x])/\sigma(x)] \quad eq\ 2.2$$

Where Φ is the cumulative standard normal distribution.

$$Prob(Default) = \Phi \left[\frac{\ln L - \ln A_t + \left(\mu - \frac{\sigma^2}{2}\right)(T - t)}{\sigma\sqrt{T - t}} \right] \quad eq\ 2.3$$

$$= \Phi \left[\frac{\ln(L/A_t) + \left(\mu - \frac{\sigma^2}{2}\right)(T - t)}{\sigma\sqrt{T - t}} \right] \quad eq\ 2.4$$

Sometimes in literature often uses the term Distance to Default (DD) (eq 2.5), which has the advance to measure the number of standard deviations the expected asset value A_T is away from the default.

$$DD = \left[\frac{\ln A_t + \left(\mu - \frac{\sigma^2}{2}\right)(T - t) - \ln L}{\sigma\sqrt{T - t}} \right] \quad eq\ 2.5$$

$$\Rightarrow Prob(Default) = \Phi[-DD] \quad eq\ 2.6$$

The reason why we use these kinds of models to calculate default probabilities is because is not possible to calculate the market value of its assets. The only thing that we can do is to observe the book values of its assets which can be diverge from market values for many

reasons. If we are not observing the asset's value means we will have as result to don't know the today's value A_t for equation 2.4.

In the case that the firm pays no dividends the formula for calculating the equity value is the standard Black – Scholes call option formula.

$$E_t = A_t \cdot \Phi(d_1) - L e^{-r(T-t)} \Phi(d_2) \quad eq\ 2.7a$$

$$d_1 = \frac{(\ln A_t / L) + (r + \sigma^2 / 2)(T - t)}{\sigma \sqrt{T - t}} \quad eq\ 2.7b$$

$$d_2 = d_1 - \sigma \sqrt{T - t} \quad eq\ 2.7\ c$$

E_t = Equity value, A_t = Asset value, L = Liabilities, r = Risk free rate, σ = Equity volatility

$T - t$ = Time to maturity,

d_1, d_2 = standard normal distribution

$\Phi(d_1), \Phi(d_2)$ = cumulative distribution function of the standard normal distribution.

For a company or a firm defaults there is a wide range of papers to study.

Tudela and Young (2003) show how a Merton model approach can be used to develop measures of the probability of failure of individuals quoted UK companies. They used in used in profit regressions to evaluate the information content of the Merton-based estimates relative to information available in company accounts and in assessing Type I and Type II errors. Results of their study show that combining company account information and the Merton approach if only marginally.

Crosbie and Bohn (2002) based on KMV's default probability model based on Black-Scholes-Merton framework allows default to occur at any point in time and not necessarily at the maturity of debt.

Leland (2002) examines the differences between two different approaches (Structural models) in the probabilities of default. First approach is the "Merton and Black Scholes" and the second approach is the "endogenous default boundary".

Huang and Huang (2002) try to solve of how much of the historically observed corporate Treasury yield spread is to credit risk using a range of structural models.

Schuermann and Hanson (2004) using several analytical approaches from large-sample theory and bootstrapped small-sample confidence intervals. They present a systematic comparison of Confidence Intervals around estimated probabilities. To predict this they do so for two different PD methods-cohort and duration.

Chapter 3

Valuation

Financial and real asset has a value. Any asset can be valued but some assets are easier to value than others, and the details of valuation will differ from case to case. So the valuation of a real estate property will require different information and follow a different format than the valuation of publicly traded stock. There are many areas in valuation where there is a room for disagreement, including how to estimate true value and how long it will take for prices to adjust to true value. The one point in which there can be so disagreement is on asset prices which cannot be justified by merely using the argument that there will be other investors⁴ around willing to pay a higher price in the future.

The role of valuation is useful in a wide range of tasks and it plays in different arenas. We usually meet valuation in portfolio management, in mergers and acquisition analysis and in corporate finance.

Valuation in Acquisition Analysis:

Aswath (2002), Valuation in acquisition⁵ analysis should play central part. The target firm before bidding has to determine a reasonable value for itself and the bidding firm or individual has to decide on a fair value for the target firm before making a bid. Factors those must be consider in valuation are: **i)** the effects of synergy⁶ of both firms on their combined value where, target and bidding firm must be consider before the decision is made on the bid, **ii)** the effects on value of changing management and restructuring the target firm must to be taken into account in deciding on a fair price, **iii)** the last factor is when there is problem with bias in takeover valuations. Sometimes the target firms may be overly optimistic in estimating value, especially when the takeovers are hostile and they are trying to convince their stockholders that the offer prices are too low. Similarly when

⁴ Investor is a natural or legal person who buys assets with the expectation of profit. Generally is trying to make the investments to minimize risk, maximizing returns as opposed to a speculator who is willing to accept higher risk for higher profits.

⁵ Is the capital that is obtained for the purpose of buying another business. Acquisition financing allows the user to meet their current acquisition aspirations by providing immediate resources that can be applied toward the transaction

⁶ Synergy refers to a financial benefit that a corporation expects to realize when it merges with or acquires another corporation.

the bidding firm has decided as a strategy to do an acquisition there may be strong pressure in the analyst to come up with an estimate of value that backs up the acquisition.

Valuation in Corporate Finance:

The objective in the part of corporate finance is the maximization of firm value where the relationship between financial decisions in corporate strategy and firm value has to be delineated. The value of the firm can be directly related to decisions that the project makes, on how it finances them, and on its dividend policy.

Valuation Portfolio Management:

In this area valuation is determined in large part by investor's investment philosophy. For example a passive investor valuation plays minimal role in portfolio management. For active investors the nature and the role of valuation are different for different types of active investment. Market timers use valuation much less than investors who pick stocks for the long term, and their focus is on the market valuation rather than on firm-specific valuation. For security selectors valuation plays a central role in portfolio management for fundamental analysts and a peripheral role for technical analysis.

In the question why we want to value a company answers are many. The management of the firm may be, is considering the acquisition of other company and needs to value their target in order to decide upon an appropriate bid price, if we can build a generally valid mode of a firm valuation then, we may also gain an understanding of the principal "driver of the firm value" in the market and gain a deeper understanding of how the market itself operates. Also investors we are, may simply think as might be strike lucky and find a firm which is systematically undervalued or a manager believe has the market simply got it wrong.

Valuation is an inexact science at best and all of the methods have different advantages in different situations and some capture important aspects in valuing a business which are not recognized by others. Each method of valuation of a firm will be analysed and define the advantages and disadvantages, to define the situation under which method is likely to be useful.

3.1 Discounted Cash Flow Valuation Method

As Aswath (2002) and Tom, Tim and Jack (2000) ,the main three approaches of valuation a firm are: **a) Discounted Cash Flow b) Relative Valuation c) Contingent Claim Valuation.** All of the three approaches use different cash flows and discount rates.

The first approach is the discounted cash flow (DCF) which relates the value of an asset to the present value (PV) of expected future cash flows on that asset. DCF is been used more of the three approaches and also is the foundation on which the rest of the other valuation approaches are built. As to do relative valuation correctly we need first to understand the fundamentals of discounted cash flow valuation. To apply option pricing models to value assets, we often need to start with a discounted cash flow valuation. Anyone who understands the fundamentals on discounted cash flow will be able to use any of the other approaches as all approaches depend on DCF.

Discounted Cash Flow valuation is based on expected future cash flows and discount rates. This approach is easiest to use for firms whose cash flows are currently positive and can be estimated with some reliability for future periods, and where a proxy for risk that can be used to obtain discount rates is available.

a) Basis for Discounted Cash Flow Valuation:

The foundation of this approach is the present value rule, where the value of any asset is the present value of expected future cash flow on it. Cash flow will vary from asset to asset, for example dividends for stocks, coupons and the face value for bonds and after-tax cash flows for real project. The discount rate will be a function of the riskiness of the estimated cash flows, with higher rates for riskier assets and lower rates for safer projects.

$$Value = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t} \quad eq \ 3.1$$

where, n =life of the asset, CF_t = Cash Flow in period t , r = Discount rate reflecting the riskiness of the estimated cash flow

b) Purpose of using Discounted Cash Flow:

The purpose of using Discounted Cash Flow valuation is to estimate the intrinsic value of the asset based on its fundamentals. Intrinsic value is the value that it would be attached to the firm by an all-knowing analyst, who not only estimates the expected cash flows for the

firm correctly but also attaches the right discount rate to these cash flows and values them with absolute precision. Through the task of estimating intrinsic value may seem to be especially when valuing young companies with substantial uncertainty about the future, where this estimates may be is different from markets prices attached to these companies.

Types of Discounted Cash Flow:

There are thousands of Discounted Cash Flow models in existence. Consulting firms and investment banks often say that their valuation models are better than those used by their contemporaries.

Paths to Discounted Cash Flow

- Value the equity stake in the business
- Value the entire firm
- Value the firm pieces

i. Value the equity stake in the business

In the first path the value of equity is obtained by discounting expected cash flows to equity at the cost of the equity. Cash flows are the residual cash flows after meeting the expenses, reinvestment needs, tax obligations and interest and principal payments. The cost of equity is the rate of return required by equity investors in the firm.

$$Value\ of\ equity = \sum_{t=1}^{t=n} \frac{CF\ to\ equity_t}{(1+k_e)^t} \quad eq\ 3.2$$

where n = life of the asset, $CF\ to\ equity_t$ = expected cash flow to equity in period t , k_e = cost of equity. Dividend discount model is a case of equity valuation, where the value of equity is the present value of expected future dividends.

ii. Value the entire firm

In this part, we can find the value of the firm by discounting the expected cash flows of the firm, taxes reinvestment needs, at the weighted average cost (WACC), the cost of the different components of financing used by the firm.

$$\text{Value of firm} = \sum_{t=1}^{t=n} \frac{CF \text{ to firm}_t}{(1+WACC)^t} \quad \text{eq. 3.3}$$

where, n = life of the asset, CF to firm_t = expected cash flow to firm in period t, WACC = weighted average cost of capital.

iii. Value the firm in pieces (APV)

This path starts with its operations and adding the effects on value of debt and other non equity claims. The value the firm can be obtained by valuing each claim on the firm separately. This approach is called Adjusted Present Value (APV). First, we begin by valuing equity in the firm, only if it was financed only with equity and then consider the taken or added value by debt by considering the present value (PV) of the tax benefits that flow from the debt and the expected bankruptcy costs. This approach can allow different cash flows to the firm to be discounted at the different rates which gives their riskiness.

$$\begin{aligned} \text{Value of firm} = & \text{Value of all - equity - financed firm} + \\ & \text{PV of tax benefits} + \text{Expected bankruptcy costs} \end{aligned} \quad \text{eq 3.4}$$

3.1.1 The negative aspects of DCF

Instead of the challenge in valuation is to extend the valuation framework to cover firms that varies to some extent or the other from idealized framework DCF has some problems. As more the discount rates are as more are the problems we get. Problems when a firm has a trouble, when a firm is cyclical, when firm has unutilized assets, when a firm has patents or product options, if the firm is private and when the firm is in the process of restructuring, acquisition. These problems come up because DCF valuation is simple for firms with well-defined assets that generate cash flows which can be easily forecasted.

a) Firm in trouble:

Firm in trouble means a firm which is distressed and has negative earnings and cash flows for sure it expects to lose some of its money in the future. For this firm is difficult to estimate cash flows since probably will bankrupt. This approach doesn't work very well as Discounted Cash Flow valuation values the firm as going concern providing positive cash flows to its investors. Even though for firm that is distressed but will survive, this method will must be estimate cash flow until they turn positive because if it obtain the present value of negative cash flows will have as result a negative value of equity or for the firm.

b) Cyclical firm:

Cyclical firm's stock is sensitive to business cycles and whose performance is strongly tied to the overall economy. This kind of firm tends to make products or provide services that are in lower demand during downturns in the economy and higher demand during upswings. The stock price of a cyclical firm will often rise just before an economic upturn begins, and fall just before a downturn begins. Investors in cyclical stocks try to make the largest gains by buying the stock at the bottom of a business cycle, just before a turnaround begins.

If the approach of Discounted Cash Flow valuation is been used in cyclical firm, expected Cash Flows are usually smoothed out, unless the analyst wants to undertake the onerous task of predicting the timing and duration of economic recessions and recoveries. In the category of recessions cyclical firm is like troubled firm, which has negative cash flows and earnings. In cyclical firm using Discounted Cash Flow valuation, the estimation of cash flows becomes entangled with analyst predictions about when the economy will turn and how strong the upturn will be, with more optimistic analysts arriving at higher estimates of value.

c) Firms with Unutilized Assets:

Unutilized assets are the assets of a firm that are not producing any cash flows and so the value of these assets will not be reflected in the value obtained from discounting expected future cash flows. The values of unutilized assets always are obtained externally and added to the value obtained from Discounted Cash Flow valuation.

d) Restructuring process of the firm:

When a firm is in restructuring process usually sell some of its assets, change its capital structure and dividend policy, and acquire other assets. In some cases except from the above, some restructuring firms also change their ownership structure and management compensation. All of these changes make estimating future cash flows more difficult and affects the riskiness of the firm. Using its historical data can give wrong information and misleading picture of the restructuring firm. This kind of firm can be estimate using Discounting Cash Flow valuation if the discount rate is adjusted to reflect the new business and financial risk in the firm and if the future cash flows reflect the expected effects of these above changes.

e) Acquisition of a firm:

When using the approach of Discounted Cash Flow valuation there are two issues relating to acquisition models to value target firms. First is whether there is a synergy in the merger and if its value can be estimated is the first and the second is the effect of changing management on cash flows and risk. In the first issue it can be done but it requires assumptions about the form of the synergy that will take and its effects on cash flows. Also in the second issue the effect of the change can and must be incorporated into the estimates of future cash flows and discount rates and hence into value.

f) Private firms:

The measure of risk is the biggest problem in using Discounted Cash Flow valuation models to value the private firms because of the most risk/return models require risk parameters to be estimated from historical prices on the assets being analyzed. Solutions in this is first to relate the measure of the risk to accounting variables which are available and second is to look at the riskiness of comparable.

3.2 Relative Valuation Method (multiples)

Relative Valuation method is a term that refers to the notion of comparing the price of an asset to the market value of similar assets and industries. The asset's value of Relative Valuation method is derived from the pricing of comparable assets and standardized using variables like, earnings revenues, cash flows or book value. Relative valuation compares a stock's valuation with those of other stocks or with the company's own historical valuations.

Categories - approaches of relative valuation are a) the use of an industry average price - earnings ratio to value firm, b) the price - book value ratio where firm selling at a discount on book value relative to comparable firms being considered undervalued and c) market to net worth (Tobin's Q).

Price/earnings ratio (multiples)

“Price / Earnings ratio (P/E) is the valuation ratio of a company's current share price compared to its per-share earnings. Also sometimes known as "price multiple" or "earnings multiple".” Bob (2007)

The calculation of P/E ratio can be done as:

$$\frac{P}{E} \text{ ratio} = \frac{\text{Market Value per share}}{\text{Earnings per share}} \quad \text{eq 3.5}$$

Earnings per share can be written as EPS and usually is from the last four quarters, which is called trailing P/E. Sometimes, EPS can be taken from the estimates of earnings expected in the next four quarters which is called projected or forward P/E. Except of these two valuations also a third variation can be used. The third variation is the sum of the last two actual quarters and the estimates of the next two quarters. P/E ratio is also called as the "multiple" and this is because it shows how much the investors are willing to pay per dollar of earnings. Also the multiple of price to sales is used too, as to value the firm value with the average price-sales ratios of firms using similar characteristics as for comparison.

The general picture of P/E ratio is that ratio suggests to investors, when to expect higher earnings growth in the future compared to companies with a lower P/E. The P/E ratio can also help to determine whether a company is overvalued or undervalued, which the main and more important of it uses. To figure out this we should compare the P/E ratios of one company to other companies which belong in the same industry, to the market in general or against the company's own historical P/E. When the average of P/E ratio of all of the companies always in the industry climbs far above the historical average, then the sector is overpriced.

For investors P/E ratio is the base for their investment to compare the P/ E of a technology company to a utility company as each industry it would not be useful as they have much different growth prospects. The denominator⁷ is based on an accounting measure of earnings that is susceptible to forms of manipulation, making the quality of the P/E only as good as the quality of the underlying earnings number.

So far we see that if P/E ratio works correct, can help us determine whether a company is overvalued or undervalued, where and when it helps the investor of the firm. But P/E analysis is only valid in certain sectors and it has its dangers. Some factors that can undermine the usefulness of the multiples include accounting, inflation and interpretations.

i) Accounting

As we see in equation 3.5 the role of earnings plays a huge role in P/E ratio. Earnings, is an accounting figure that includes non-cash items. Moreover, the procedure for determining earnings are governed by accounting rules, where is called Generally Accepted Accounting Principles (GAAP)⁸. These rules are different in each country and change over time. To complicate matters, EPS can be twisted, prodded and squeezed into various numbers depending on how you do the books.

⁷ earnings

⁸ is a codification of how CPA firms and corporations prepare and present their business income and expense, assets and liabilities on their financial statements. GAAP is not a single accounting rule, but rather the aggregate of many rules on how to account for various transactions.

ii) Inflation

When we have high inflation⁹, inventory and depreciation¹⁰ costs tend to be understated because of the replacement costs of equipment and goods rise with the general level of prices. Therefore, P/E ratio during times of high inflation tends to be lower because the market sees earnings as artificially distorted upwards. When inflation and interest rates are low, there is a greater opportunity and chance for higher and real earnings growth, which increasing the amount that people will pay for a company's earnings. The more people are willing to pay, the higher the P/E.

As we know what happens with the rest ratios, it's more important to look at the P/E over time in order to determine the trend. This is the difficult that we face because of inflation, as past information is less useful today.

iii) Many Interpretations

When a company has a low P/E ratio does not necessarily mean that company is undervalued. Fairly, it could mean that the market believes that the company is headed for trouble in the near future and as result will be undervalued. For stocks that their ratio goes down usually do for a reason. It may be that a company has warned that earnings will come in lower than expected. This wouldn't be reflected in a trailing P/E ratio until earnings are actually released, during which time the company might look undervalued.

a) The price (market) - book value ratio (P/B ratio)

“A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share. Also is been known as the “price - equity ratio”.

The book value of equity, in turn, is the value of a company's assets expressed on the balance sheet. This ratio shows that there is a consistent relationship between the net book value and market value of the firm, or to put it another way that the market prices one pound (dollar) of book value is one firm, the same as in another.

Also the same as the P/E ratio as a lower P/B ratio is, could mean that the stock market is undervalued. Also, it could mean that sometimes is fundamentally wrong with the company. As with most ratios, be aware that this varies by industry. This ratio also gives

⁹ is a rise in the general level of prices of goods and services in an economy over a period of time.

¹⁰ the decrease in value of assets

some ideas if whether you are playing too much for what would be left if the company went bankrupt.

For value investors, the use of P/B ratio remains a tried and tested method for finding stocks with low-priced that the market has ignored. If a company is trading for less than its book value or its P/B ratio is less than one, it normally tells: a) either the market believes the asset value is overstated, or b) the company is earning a very poor return, even negative, on its assets. If the former is true, then investors are well advised to steer clear of the company's shares because there is a chance that asset value will face a downward correction by the market, leaving investors with negative returns. If the latter is true, there is a chance that new management or new business conditions will prompt a turnaround in prospects and give strong positive returns. Even if this doesn't happen, a company trading at less than book value can be broken up for its asset value, earning shareholders a profit.

A company with a very high share price relative to its asset value, on the other hand, is likely to be one that has been earning a very high return on its assets. Any additional good news may already be accounted for in the price.

Best of all, P/B provides a valuable reality check for investors seeking growth at a reasonable price. Large discrepancies between ROE¹¹ and P/B can sometimes send up a red flag on companies. Overvalued growth stocks frequently show a combination of low ROE and high P/B ratios. If a company's ROE is growing, its P/B ratio should be doing the same.

Despite of the positive results of the correct uses and simplicity, P/B doesn't do magic. First of all, this type of ratio is really only useful when you are looking at capital-intensive businesses or financial businesses with plenty of assets on the books. Thanks to conservative accounting rules, book value completely ignores intangible¹² assets and other intellectual property created by a company. Book value doesn't carry much meaning for service-based firms with few tangible assets.

The book value of a firm usually doesn't really offer insight into companies that carry high debt levels or sustained losses. Debt levels by creating artificially high P/B values can increase company's liabilities to the point where they wipe out much of the book value of its hard assets. For example the highly leveraged companies, like those involved in, say, cable and wireless telecommunications, the P/B ratios they have are understate their assets.

¹¹ The amount of net income returned as a percentage of shareholders equity.

¹² like brand name, goodwill, patents

For companies with a sequence of losses, their book value can be negative and hence meaningless. For non operating issues sometimes can impact book value so much that it no longer as a result to reflects the real value of assets. The book value for starters of an asset reflects its original cost, which doesn't really help when assets are aging. Secondly, if the earnings power of the assets has increased or declined since they were acquired their value might deviate significantly from market value. Inflation alone may well ensure that book value of assets is less than the current market value.

At the same time, companies can boost or lower their cash reserves, which in effect changes book value, but with no change in operations. For example, if a company chooses to take cash off the balance sheet, placing it in reserves to fund a pension plan, its book value will drop. Share buybacks also distort the ratio by reducing the capital on a company's balance sheet.

Investors of a firm must recognize the shortcomings of R/B ratio even though it offers is an easy tool for identifying clearly undervalued or overvalued companies. For this reason, the relationship between share price and book value will always attract the attention of investors.

b) Market to net worth (Tobin's Q)

This particular ratio has an impeccable academic pedigree. Since it was proposed for the Nobel Prize winning economist James Tobin in 1969 has developed a small but influential followings. Its principal advantage as a metric also as the two above approaches is that it would appear to allow investors to determine whether a market is overvalued or undervalued. Although its use to individual stock level is more questionable. Tobin defined Q as the ratio of total capital¹³ value to the reproduction cost or the replacement of all capital market assets. The long run equilibrium for this ratio is one. Taking this ratio to the firm level:

$$Q = \frac{\text{market capitalization of the firm}}{\text{replacement cost of the firm's assets}} \quad \text{eq 3.6}$$

Following Modigliani and Miller's proposition 1 that total market capitalization is the sum of the value of equity and the value of debt then an 'equity version of Q' can be defined as:

$$Q = \frac{\text{market capitalization of the firm} - \text{market value of debt}}{\text{replacement cost of the firm's assets} - \text{assets total debt}} \quad \text{eq 3.7}$$

¹³ equity plus debt

$$Q = \frac{\text{market value of equity}}{\text{net worth of the firm}} \quad \text{eq 3.8}$$

Viewing all that Tobin's Q is saying that the rate of return the firm generates on the replacement cost of its net assets is equal to the rate of the return required by equity investors.

To what extent can Tobin's Q and implied relationship between equity value and a firm's net worth be used for prediction purposes? Smithers and Wright (2000) have conducted studies into the properties of their equity version of Q. This is what we would expect if at the market level the Internal Rate of Return on return. Firms that earned greater than the market rate would attract investors and hence their equity prices would rise and firms earnings a lower than the market would find their share price falling.

There are some evidence that Q ratio is also a superior leading indicator for share price changes than either the P/E ratio, where earnings is the fundamental lead indicator, or dividend yield, where dividends are the fundamental lead indicator. In causality tests Smithers and Wright report that the net worth which is the fundamental in the Q ratio, has only a 1.4 per cent probability of no predictor power, while dividends and earnings have 43.8 per cent and 88.6 per cent probability respectively. They also found that the net worth only really works as a predictor when used as a ratio with equity value rather than on its own. There is a theoretical support for Q ratio and at the aggregate market level it does have a strong mean reversion bias, this unfortunately does not mean that we can record the sum of the replacement costs of a firm's assets and these would equal the total market value of the firm. But how we would expect it do as a relative measure? The answer is just badly. Only if twp firms were shown to have comparable yields on their internal investment would we expect to be able to translate the rate of return on equity from one to the other and hence obtain a valuation on that firm's equity. In practise, the application of Tobin's Q ratio invariability relies upon the use of accounting information as a proxy for replacement cost. This leads to the more measurable market to book ratio.

Relative valuation methods are popular with market analysts. Computationally they are straightforward but the problem comes in identifying an appropriate benchmark¹⁴ for a specific company. Underpinning these methods is the idea that similar companies of

¹⁴ The performance of a predetermined set of securities, used for comparison purposes.

similar business and with similar exposure to financial and other risk should carry the same value scaled by the size of their earnings, book value or net worth. This is a straightforward arbitrage argument but one that because of the problems making appropriate comparisons does not lead to methods that have the reliability necessary for practical application. However, the relative valuation measures arguably have value in their time series. As companies or indeed the markets move through their cycles these ratios can help indicate exactly where on the cycle they are. This not the same saying that the companies or the market are overvalued or undervalued when the ratios are higher than the average or the long run trend or vice versa when the ratios are lower than the average or the trend. There may be very good reasons why firms and markets are more or less valuable than the average at different points in time or indeed why one firm is more or less valuable than its business neighbour. It is towards providing answers to these issues that we now turn our attention.

The problem with relative valuations is that not all companies are made alike not even all chemicals makers. There could be very good reasons why Dow has a lower P/E than its average peer. Maybe the company doesn't have the growth prospects of other chemicals companies. Maybe the possible liability from breast-implant litigation rightly puts a damper on the stock's price. After all, a Hyundai has a lower sticker price than a Mercedes, but for very good reasons. The key is to research your stocks well and be aware of the factors that might justifiably make them cheaper or more expensive than similar stocks.

3.3 Contingent Claim Valuation

A Contingent Claim Valuation or an option pricing approach discussed in the last two chapters offers a clue as to how the equity in the firm may be valued, Bob (2007). If we recognize that an equity investors in a geared firm with limited liability has a call option on the underlying assets of the firm then we have, potentially, a method for valuing a business. Although conceptually a powerful approach, the use of option pricing methodology does present difficulties in estimating the necessary input parameters into the model. Using the real option methodology, one approach is to simulate the future cash flows of a firm give realistic current conditions and estimates of the volatility of key input variables. With this we can generate an overall estimate of the future volatility of the business generate an option value for the business. This modelling approach has many refinements but essentially provides both methods and insights into the valuation of all firms that are financed partly by debt and, in particular high leveraged, fast growing start-up companies.

Probably the most significant and revolutionary development in the valuation is the acceptance, at least in some cases, that the value of an asset may be greater than the present value of expected cash flows if the cash flows are contingent on the occurrence or non-occurrence of an event. This acceptance has largely come about because of the development of option pricing models. When these models were initially used to value traded options, there has been an attempt in recent years to extend the reach of these models into more traditional valuation. An option pricing approach is a claim that pays off only under certain contingencies, if the value of the underlying asset exceeds a pre-specified value for a call option or is less than a pre-specified value for a put option. Much work has been done in the past 20 years in developing models that value options, and these option pricing models can be used to value any assets that have option like features. An option can be valued as an option if the payoffs are a function of the value of an underlying asset. It can be valued as a call option if when that value exceeds a pre-specified level the asset is worth the difference. It can be valued as a put if it gains value as the value of the underlying asset drops below a pre-specified level, and if it is worth nothing when the underlying asset's value exceeds that specified level.

Traditional, the value of the firm in the hand of its investors will have a lower limit equal to the breakup value of the firm less all external claims on the business (the sum of its short

and long term liabilities). Generally it was argued that once the present value of the firm's future cash flows (when discounted at the equity investors' rate of return) fell below this value then it would be rational for the investors to cut their losses liquidate the firm and salvage what value could. However, this rather simple analysis is tempered in the light of options theory. From an options perspective the equity investors in a geared firm have a call option on the value of the firm's assets over and above the value of the debt. If the value of the assets should fall below the value of the debt then given limited liability the equity investors could put the firm into members' voluntary liquidation and walk away leaving the debt holders to bear the loss. Thus in a geared firm the equity value of the business is the value does not exist and thus the value of the firm to the equity investors is simply the present value of the net cash flows anticipated over the lifetime of the business.

This analysis suggests that valuing a firm depends upon the existence of gearing and that the value of the firm is not simply the present value of its assets in use less the value of its outstanding debt.

Following chapters explore Merton's approach to the valuation of debt and by implication the valuation of equity. However in the model we presumed that the firm was traded on the equity market and that, as a result, the asset value and the volatility of future cash flows could be imputed from the observed volatility of the security's returns. In the more general valuation context, the firm's equity may not be traded or we may have reason to believe that the true valuation is considerably different from that revealed by the share price. Schwartz and Moon (2000) developed a procedure for the contingent valuation of equities using option pricing and simulation methods. They used as their case study Amazon.com which at the time had been in business for just over three years. The company was still not profitable in the conventional sense but was growing its market and its revenues at the rapid rate. In March 1996 the quarterly sales of Amazon.com was 0.875\$ million. By September 1999 its sales had risen to 355.8\$ million. As a final value they used as ten times EBITDA. As a result the technique does offer a potential route for valuing companies that are in their early stages of growth and which rely upon substantial investment in intangible assets.

Chapter 4

Methods Comparison and Pre-valuation correction of accounts

4.1 Methods Comparison

4.1.1 Discounting Cash Flows VS Relative Valuation

Any valuation method aims at estimating an asset's value as precisely as possible. Yet, savvy analysts and investors know that estimating accurate asset values is highly unlikely due to market inefficiency that leads to wrong value assessments. Because markets are inefficient, assets are not priced correctly. However, as soon as new information becomes available about any asset, markets have the ability to correct themselves (efficient market hypothesis). Therefore, market volatility makes accurate forecasting complicated, the projection of the expected cash flows in terms of growth rate or profit margin is facilitated as soon as new information becomes available for the asset. In efficient markets, the market price is the basis for estimating an asset's value and any valuation method aims at justifying this value.

Today, most analysts use the Discounted Cash Flow (DCF) valuation method and the Relative valuation method as are the most popular valuation approaches. Both approaches are broadly applied tools for effective investment decision making, they differ in the way they estimate the value of an asset.

In particular:

a) Discounted Cash Flow (DCF) Valuation:

In particular Discounted Cash Flow (DCF) valuation is based on the assumption that the value of an asset equals the present value of the expected cash flows on the asset. To do DCF valuation, analysts calculate the present value of the expected future cash flows and discount it by the cost of risk incurred by the cash flows and the life of the asset.

Discounted cash flow (DCF) valuation is based on two fundamental principles. Every asset has an intrinsic value that can be projected if cash flows, growth and risk are known. Markets are inefficient and assets are not priced perfectly, but they can correct themselves when new information about the asset becomes available.

The inputs for DCF valuation are the discount rate, the cash flows and the growth rate. Because DCF valuation can be used both for valuing equities and firms, when valuing equity, analysts use the cost of equity as a discount rate, cash flows to equity and growth in equity earnings; when valuing a firm, analysts use the cost of capital as a discount rate, cash flows to firm and growth in operating income. In both cases, growth is used to calculate the expected cash flows. Also, the discount rate can be in nominal or real terms.

One of the main advantages of DCF valuation is that by taking into consideration the intrinsic value of the asset, investors are aware of the underlying characteristics of the company and the unique characteristics of the asset. Hence, their investment decision making is conscious and they can make safer investments as they can check the fair value prices and the discount rate provided by analysts and portfolio managers.

On the other hand, because DCF valuation focuses on the intrinsic value it requires a lot of inputs and this facilitates the manipulation of the model to the best interest of portfolio managers, who would like to make some investments look more attractive.

b) Relative Valuation (multiples)

Relative valuation is based on the assumption that the value of an asset equals its market value. To do relative valuation, analysts use the prices of similar or comparable assets as variables to estimate the value of an asset and to control possible differences.

Relative valuation is based on two fundamental principles. The intrinsic value of an asset cannot be estimated by any valuation method. It is always equal to what the market is willing to pay for the asset depending on its unique characteristics. Markets are inefficient and assets are not priced perfectly, but because assets are comparable, errors in pricing can be identified and corrected more easily. Because absolute market prices cannot be compared, they need to be converted into standardized values so that price multiples are created. Then, the multiples of the asset are compared to the multiples of the comparable asset to decide whether the asset is overvalued or undervalued. The most common variables used to standardize market prices are earnings, book value, revenues and industry-specific variables. In particular, the multiples used are price to earnings ratio

(P/E), price to book value (P/BV), and price to sales per share (P/S), but also value to EBIT, value to EBITDA and value to cash flow (earnings), and value to sales (revenues).

The main advantage of relative valuation is that it reflects market volatility, enabling investors to realize at any given moment if it is to their best interest to sell a stock or to invest building momentum. Besides, relative valuation provides portfolio managers with a variety of securities that are overvalued or undervalued, thus enabling them to build more diversified portfolios.

On the other hand, relative valuation leaves room for wrong judgment between overvalued and undervalued securities. Even if a security is found overvalued with relative valuation, it may still be undervalued compared to the market. This happens because relative valuation assumes that although markets are inefficient, errors in pricing can be identified and corrected more easily. However, this applies for the markets in the aggregate and not for individual securities. Also, the fact that relative valuation requires fewer inputs than DCF valuation implies that for any other variable the model makes implicit assumptions, which if proved wrong, the entire model is wrong. In conclusion, there is no better or worse valuation model. Both DCF valuation and relative valuation serve their purposes effectively. The choice between the two is subject to the investment philosophy, the time horizon and the individual beliefs about the market.

4.1.2 Discounting Cash Flows VS Multiples

Discounting cash flows (DCF) is the preferred way to valuating a firm's worth but is a lengthy process which requires skill and expertise. Using multiples for valuations is convenient and straightforward but it can also be very misleading. And that is an understatement. In DCF a firm's future cash flows are used to determine its current value by adjusting for risk and time. Multiples such as profit, capital, assets and sales are used to determine values of companies by comparing similar companies to one another and by direct multiplying. Multiples are also used to compare various companies in terms of profitability, effectiveness and more. The most common use of profit multiples, for example, is in comparing valuations of similar companies in the same industry. For a better understanding of valuation techniques and the appropriate use them a look into the pros

and cons of each valuation technique is required. Obviously the shortfalls of one technique are the other's advantages. Here are the main points of reference between the two techniques:

- i) **Simplicity:** Using multiples is simple. Extrapolating data is easy and multiplying is very basic math. DCF requires skill and expertise and is much more complicated technically.
- ii) **Informative:** Using multiples often yield significant data in a very short time. DCF is also very informative but requires time to be invested. Using multiples also help in quickly comparing two companies and might yield more relevant information.
- iii) **Forecasting:** Unlike DCF multiples use existing data which is, of course, their Achilles heel. Using DCF requires forecasting future cash flows which are, at times, quite difficult.
- iv) **Sensitivity to various accounting choices and alternatives:** Using multiples is very sensitive to various accounting choices and alternatives. Different methods of revenue recognition adopted by a company might distort a profit multiplier quite badly. DCF does not suffer this shortfall as a company's cash flows are not affected by accounting for revenue for the long term.
- v) **Sensitivity to unique events:** Using multiples is also sensitive to unique events such as unique revenues or expenses which should be corrected, valuation wise.

These onetime occurrences will affect multiples and could have very significant implications. In DCF these onetime occurrences are cleaned out as only cash flows matter.

- vi) **Unique future circumstances:** Multiples rely on past data. A company just might have significant potential or benefiting circumstances which should be taken into account in a valuation. In DCF future circumstances are accounted for through cash flow forecasts. A potential for market expansion would be reflected in future cash flows.

A direr problem with using multiples is that the search for similar companies often leads us to compare different companies entirely. In order to really identify similar companies we need to carefully examine growth, dividend pay-out ratio, discount rate and beta.

To conclude, using multiples is appropriate when "quick and dirty" analysis and benchmarking is required. When a thorough diligent valuation is needed using DCF is the only way to receive more reliable results.

4.2 Pre-valuation correction of accounts

Bob (2007), before begin a valuation to a company or a firm, first we might look the above checklist of some points which may need to be considered and corrected for before using the accounts for valuation. These following corrections are necessary as to predict more reliable results.

Here in this section must be implied also the COP¹⁵ ratio. The COP ratio gives an indication of the direction of any bias in the presentation of the operating profit of the business. If the COP ratio, bias is neutral then nothing more need be done above the operating profit line apart from ensuring that there has been no change in depreciation¹⁶ and amortization¹⁷ policy.

The list must be followed is:

- Has the depreciation or amortization policy been charged or additional impairments been made which are likely to distort the reported performance in the current year, if so these should be reversed and the bottom line earnings figure been corrected.
- Consider whether the amortization of intangibles is appropriate given their longevity and whether the amortization charge should be corrected. The traditional position was that purchased goodwill and other intangibles should be written off as quickly as possible. It is now recognized under FRS10 and IAS 38 that goodwill may have an indefinite life and that amortization of its value might not be appropriate.
- Check to see if any increase in the bad debt provision has been included and remove.

¹⁵ Coefficient of performance

¹⁶ For accounting purposes, depreciation indicates how much of an asset's value has been used up. For tax purposes, businesses can deduct the cost of the tangible assets they purchase as business expenses; however, businesses must depreciate these assets in accordance with IRS rules about how and when the deduction may be taken based on what the asset is and how long it will last.

¹⁷ a) the paying off of debt in regular instalments over a period of time. b) The deduction of capital expenses over a specific period of time. More specifically, this method measures the consumption of the value of intangible assets, such as a patent or a copyright.

- Consider whether any R&D expenditures should be capitalized. R&D is expenditure designed to produce cash flows in the future which is not reflected in the GAAP requirement to write it off in the year it is incurred. This expenditure should be capitalized over its useful life which depends on the expected life cycle of the business. A useful guide is the length of time which the company uses to depreciate its fixed plant.
- Check the operating leases and hire purchase agreements. Consider capitalizing the annual payments at the company's current cost of debt capital (before tax) over the expected life of the asset (again the company's current depreciation policy for similar owned plant and equipment can be used to estimate the expected life). Then charge an implied interest charge to the profit and loss account on the capitalized sum at the firm's cost of debt capital (gross).
- Check for any exceptional items and remove (including any profits on the sale of fixed assets or other disposals). Similarly remove any exceptional restructuring charges and pension fund deficits or surpluses debited or credited to the profit and loss account.
- Check for any exceptional severance payments to directors or other employees not included in restructuring.

Now with a well scrubbed profit and loss account, you are in a position to calculate the revised earnings per share and the level of retained earnings for the current year. Finally having added any revised capitalized values to the balance sheet, the firm's return on equity capital employed can be recalculated (note that the capitalized values of any leases will be added to the debt balance and not to the owner's equity account. The accounts should also easily reveal the Net Operating Profit after Tax (NOPAT) which forms the basis of the Economic Value Added method discussed earlier in this chapter.

Chapter 5

Empirical Part

The quantitative modelling of credit risk initiated by Merton shows how the probability of company default can be inferred from the market valuation companies under specific assumptions on how assets and liabilities evolve. This paper employs a Merton Style approach based on version of Black Scholes Merton framework in the sense that default occurs at the point that a company cannot pay or fails to make the promised payments. There are essentially three steps in the determination of the default probability. The first step is to estimate the asset value and volatility from the market value and volatility equity and the book value of liabilities. Second was calculated the Probability of survival and third was estimated the Probability of Default.

For the first step the data was from the Financial Statements of ‘Laiki Bank of Cyprus’ and applied in the modified Merton Model formula. The data was for all annual reports of the bank from 2006 till 2012.

The frequency for the analysis of the data was three months, for example the first period at the end of March, the second period is at the end of June, the third period is at the end of September and the last period is for the end of each year for December. For the year 2012 only two periods are been done because the reports were not available. Total liabilities (L) and total equities (E), was taken from the balance sheet of each period. The equity volatility is equal to 12% and the risk free rate is equal to 4.15% and is the same for all periods. The risk free rate is equal to 4.15% according to the Euribor¹⁸ rates.

¹⁸ **Euribor** is short for Euro Interbank Offered Rate. The Euribor rates are based on the average interest rates at which a large panel of European banks borrow funds from one another. There are different maturities, ranging from one week to one year.

The Euribor rates are considered to be the most important reference rates in the European money market. The interest rates do provide the basis for the price and interest rates of all kinds of financial products like interest rate swaps, interest rate futures, saving accounts and mortgages. That's the exact reason why many professionals as well as individuals do monitor the development of the Euribor rates intensively.

The results we get for the probability of default have been compared with Closed Price of the Stock. Closed Prices are from the Stock Watch of Cyprus. As to check if the probability of default assesses the reliability must the price of the index should be inverse proportion between the prices.

To present the results and the relation between the prices of probability of default and closed price are be done some graphs.

Comments on Financial Statements of 2004:

a) Cash generated from operations: 118.673 48.613

The due to other banks was increase. In 2004 the price is (£44.501) and in 2004 was (£13.617). Also the customers' deposit increase is two times higher the price of 2004 than 2003. A quite big difference in the price is for the due from other banks where in 2004 the price is (£23.882) and in 2003 the price was £3.279 and last the advances to customers cost more money in 2004.

b) Proceeds from issue of senior debt: 173.836 -

Senior debt form 2004/07 during the year the Bank set up a Euro Medium Term Note Programme for a total amount of euro 750 m. Pursuant to the Programme the Bank has the ability to issue senior and/or subordinated debt in accordance to its needs. In July 2004 the Bank issued euro 300 m of senior debt from the above Programme. The bonds are repayable three years from their issue and pay interest every three months. The interest rate is set at the three-month rate of euro (Euribor) plus 0,5%. The bonds are listed on the Luxembourg Stock Exchange and their market value at 31 December, 2004 was euro 299,6 m.

c) Due to other banks: 69.722 114.223

We notice a decrease between the two years and this is because of due to Cyprus bank in 2004 is 28.340 and 2003 was 41.438 and also in UK in 2004 the value is 8.981 and in 2003 was 18.974 .

d) Customer deposits: 4.665.037 4.148.064

As we notice the values of the two years, we see that the value of 2004 increased and this is because of Cyprus customers' deposits in 2004 the value is £3.163.145 and in 2003 the

value was £2.931.095. For UK's customers' deposit the amount didn't have a lot of difference in the prices, in 2004 is £248.786 and 2003 was £233.470. In Greece and Australia also we have an increase between the two years. In 2004 in Greece the customer's deposits are equal to £1.129.080 and in 2003 were £873.325 and in Australia in 2004 are £133.026 and in 2003 were £110.170.

e) Interest Income: 297.450 262.371

The differences of the two prices are cause of: the advances of customers, due to other banks, customers' deposits and these are already being commented above.

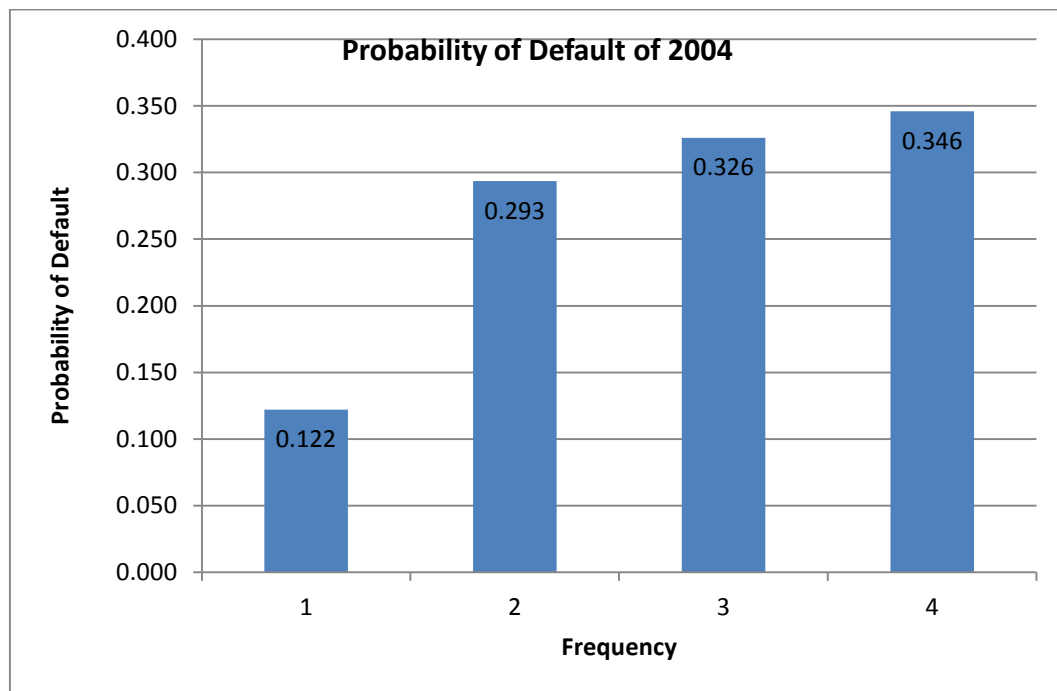


Figure1: Probability of Default of 2004

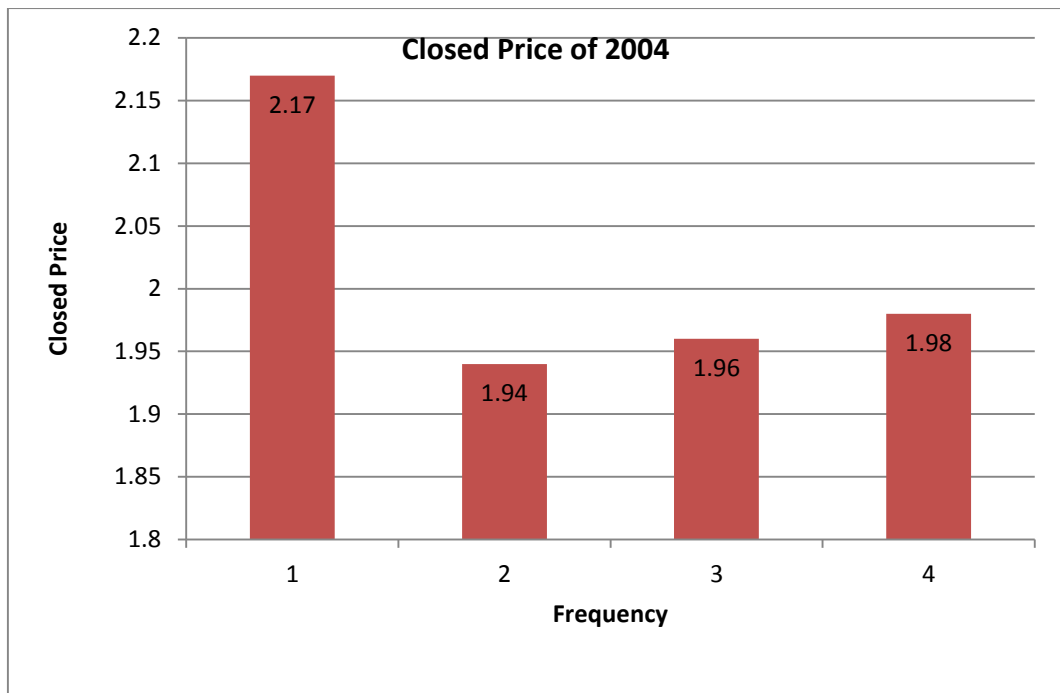


Figure 2: Closed Price of 2004

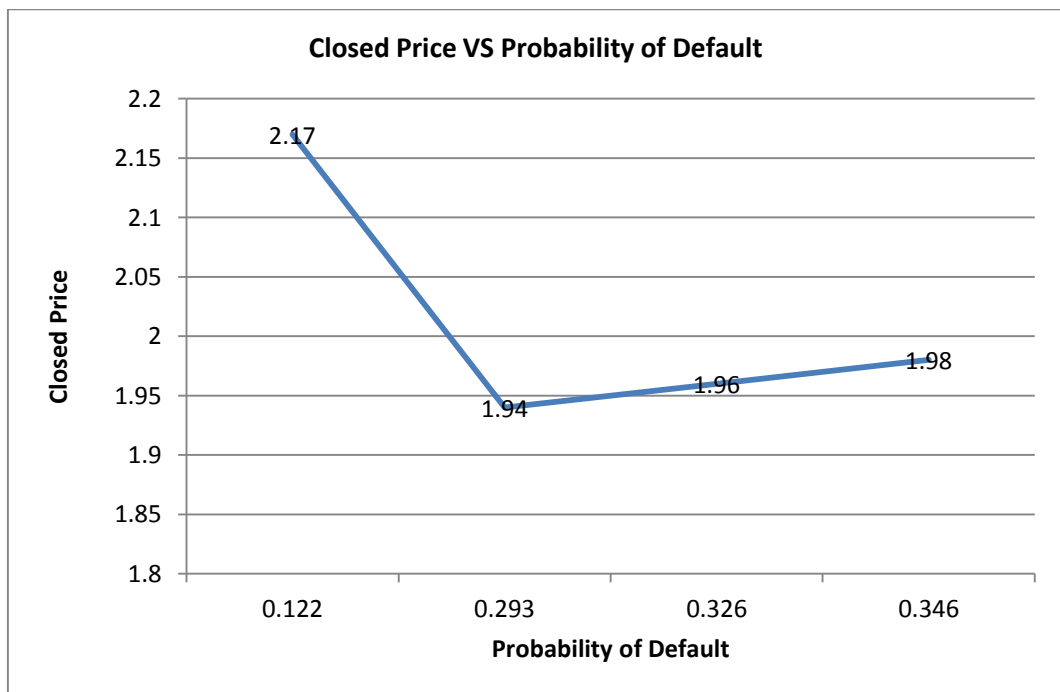


Figure 3: Closed Price VS Probability of Default

Comments on Financial Statements of 2005:

a) Due from other banks:	1.365.173	945.680
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The main factor for this change which is equal to £500.000 in the placement with other banks where in 2004 the price was £917.035 and now in 2005 is £1.327.207.

b) Advance to customers:	3.995.698	3.490.148
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One reason for the change on the price is from the price of provision for impairment of advances was increase in 2005 since 2004. In 2004 was (£272.858) and in 2005 (£319.625). Also the advances to customers cost more money than 2004, in 2004 was £3.387.838 and in 2005 is £3.939.572.

c) Financial assets at fair value through profit/(loss):	172.890	124.214
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Equities securities value was increase, in 2004 was £76.120 and now in 2005 is £85.182.

d) Due to other banks:	122.538	69.722
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Cyprus	64.201	28.340
United Kingdom	11.135	8.981
Greece	47.202	32.401

We notice for all the three countries an increasing in the prices, with the higher difference is for Cyprus where in 2004 was £28.340 and now for 2005 is £ 64.201.

e) Customer deposits:	5.726.421	4.636.846
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Cyprus	3.875.406	3.134.954
United Kingdom and Guernsey	290.685	248.786
Greece	1.382.377	1.120.080
Australia	177.953	133.026

For all countries the customer deposits has been increase and also here for Cyprus we have the higher difference between the two years.

f) Interest income:	358.868	302.153
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The difference of the two years is about £50.000 and this is because of the interest from advances to customers, the interest from other banks, and the interest from bonds and other interest.

g) Interest expenses: (185.600) (147.694)

This difference is most cost by the interest on customer deposits where in 2004 the value was £115.235 and in 2005 the value is £150.342.

h) Staff costs: (94.128) (85.955)

We notice an increase in the price of 2005. In this part the salaries and employer's contribution belongs. The difference of the two years is about £6.000. Also the other staff costs has about £1.300 difference.

i) Cash generated from operations: 534.110 189.118

The difference of the two prices is huge. This difference is equals to £349.992 and this is cost by the minority interest, impairment of goodwill. Exchange differences. Profit on disposal of property and equipment, due to other banks, customer deposits, due from other banks, government bonds and treasury bills, advances to customers. These all are main reasons that cost the difference of the two years.

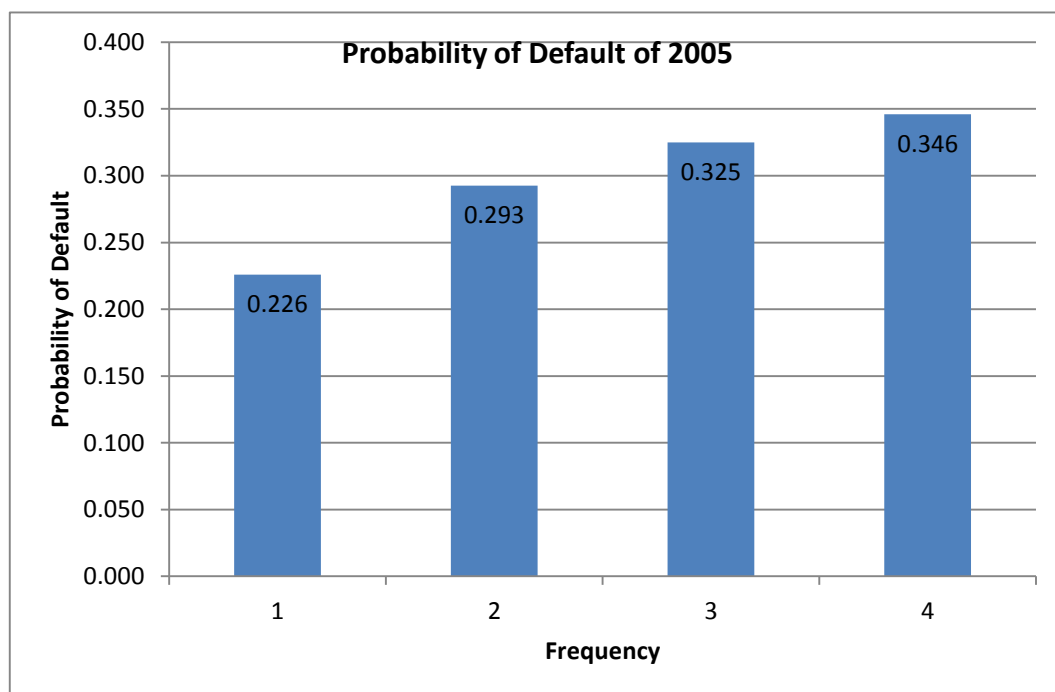


Figure 4: Probability of Default 2005

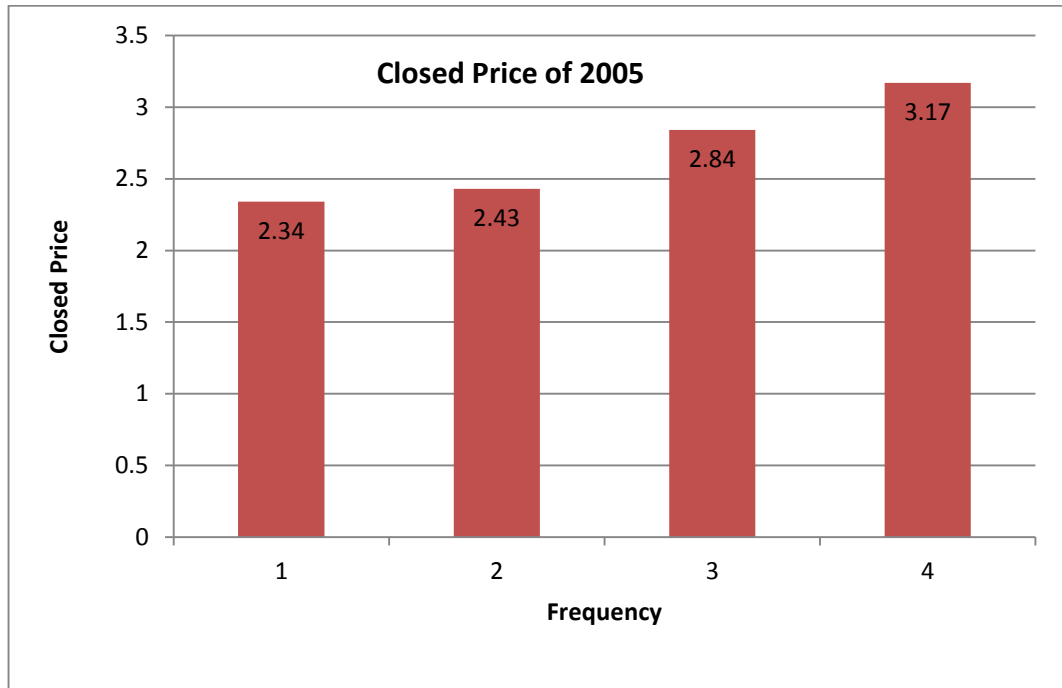


Figure 5: Closed Price of 2005

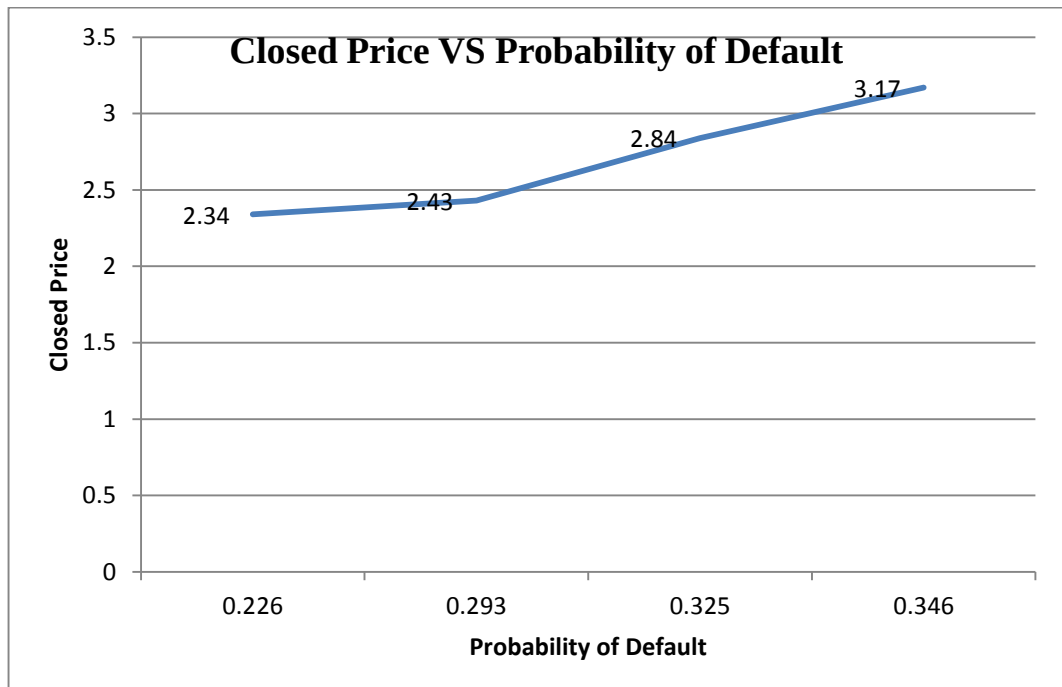


Figure 6: Closed Price VS Probability of Default of 2005

Comments on Financial Statements of 2006:

a) Cash and Balances: 611.916 423.091

The price for balances with Central Bank s other than obligatory reserves for liquidity purposes for 2006 is €348.658 and for 2005 was €221.577 and the obligatory reserves value for 2005 was €221.557 and for 2006 is €66.693.

b) Due from other banks: 2.403.761 1.365.173

The difference in price is about to €1.000.000 and this because of the items in course of collection from bank where in 2006 the price is €66.693 and for 2005 was €37.966. Also the placements with other banks in 2005 the price was €1.327.207 and for 2006 is €2.337.068.

c) Financial assets at fair value through profit or loss: 479.684 172.890

The value for this part in 2006 is almost three times higher than the price in 2005. This is because of the debt securities which the value in 2006 is €230.923 and in 2005 the price was €83.144. The equity securities' price is almost three times higher too. The price for equity securities in 2005 was €85.182 and in 2006 is €235.786.

d) Advances to customers: 6.948.350 3.995.698

The instalment finance and leasing in 2005 cost €378.741 and in 2006 cost €472.275. The provision for impairment of advances for 2005 the price was (€319.615) and for 2006 is (€368.195).

e) Available for sale financial assets: 944.718 544.546

The difference here is €400.000. This is cost by the debt securities and equity securities where the cost for debt securities in 2005 was €519.611 and for 2006 is €855.731 and the cost for equity securities in 2005 was €24.953 and in 2006 the price is three times higher than 2005 and is equal to €88.987.

f) Investments in associates: 12.366 5.880

The main factor for the change in the price is the investments in associates from the acquisition of subsidiaries where cost was only for 2006 and is equal to€ 5.486.

g) Intangible assets: 779.262 46.246

Goodwill, computer software and the value of policies in force are the factors for this change in the price. The main factor for this is the goodwill where the price in 2006 is €742.333 and in 2005 the price is only €16.295. For the others the difference is not so important.

h) Property and equipment: 136.496 89.832

Property for 2006 is cost €112.019 and the equipment price is €24.477. For 2005 the price for the property is €74.166 and equipment's price is €15.666. These prices include also the cost of valuation and the accumulated depreciation.

i) Due to other banks: 440.095 122.538

Due to Cyprus banks for 2006 the price is €130.179 and for 2005 was €64.201, the amount for due to Greece's banks for 2006 is €259.550 and for 2005 was €47.202. Last for the other countries due price, the difference is two times higher for 2005 where the price was €122.538 and for 2006 the price is €50.095.

j) Customers deposits: 9.373.738 5.726.421

There is an increase of customers' deposits in all countries. In Cyprus' deposits increase about €1.000.000, in Greece increase about €2.500.000 and for the rest countries increase about €100.000.

k) Interest expenses: (248.731) (185.600)

The main factor for this is the interest on customers' deposits where in 2006 the value is €297.601 and for 2005 the price is €260.497.

l) Profit on disposal and revaluation of securities: 7.800 738

The profit on revaluation of financial assets at fair value through profit or loss is the main factor for this part. The value for 2006 is €6.562 and for 2005 was €1.582.

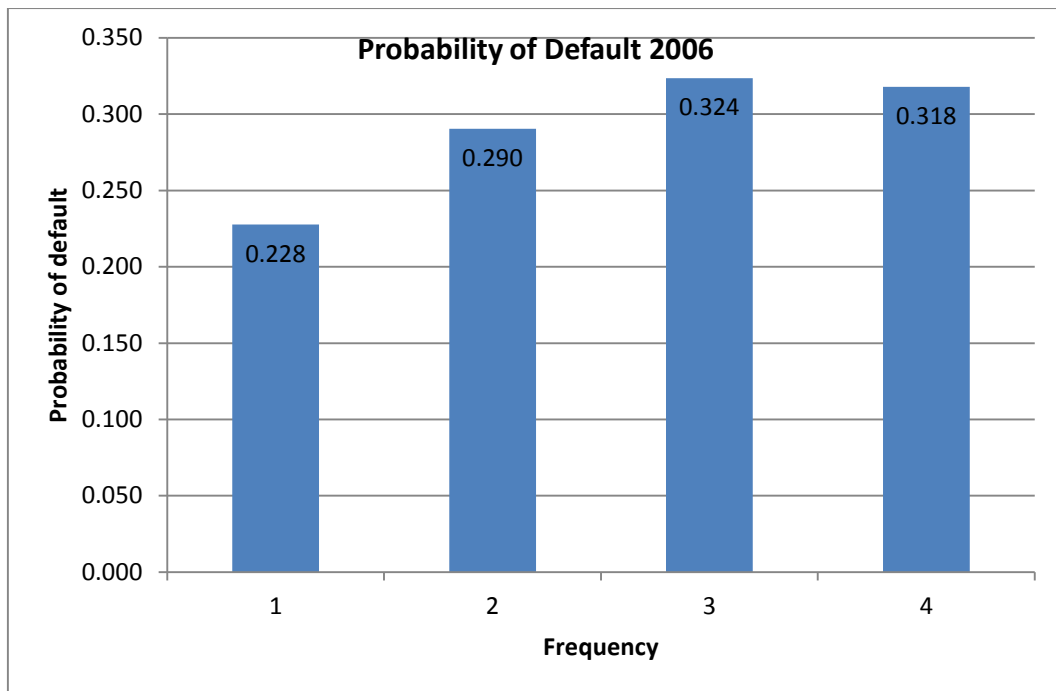


Figure 7: Probability of Default of 2006

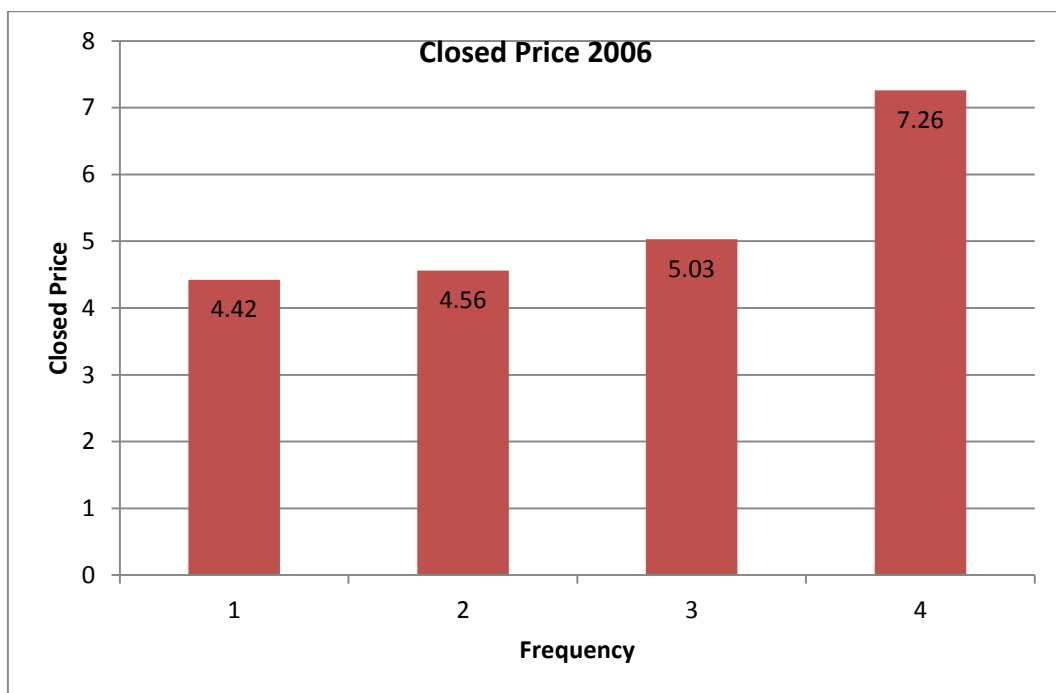


Figure 8: Closed Price of 2006

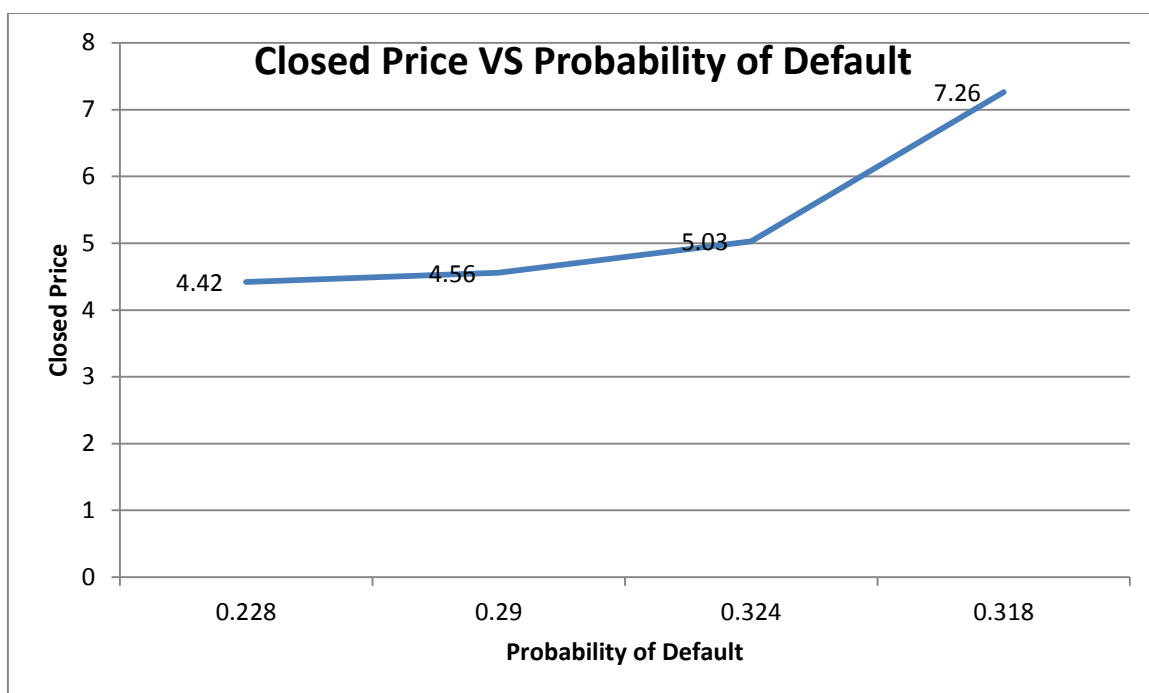


Figure 9: Closed Price VS Probability of Default of 2006

Comments on Financial Statements of 2007:

a) Due to other banks: 4.978.832 4.107.571

The difference of about €900.000 is because of the loans and advances to other banks and the items in course of collection from other banks. The loans and advances to other banks is cost €39.608 for 2007 and for 2006 was €13.000 and the items in course of collection from the other banks is €443.747 for 2008 and €113.966 for 2007.

b) Advances to customers: 17.617.259 11.880.01

Advances to individuals and to corporate entities were the main aim of this difference in the price. The price for the advances to individuals in 2007 is €6.317.599 and in 2006 the price was €4.239.875 and the advances to corporate entities for example in large corporate customers and in small and medium size enterprises (SMEs) in 2007 is €11.972.218 and in 2006 was €8.262.180.

c) Available for sale financial assets: 2.737.791 1.904.863

For this part the debt securities in 2006 was €1.462.288 and in 2007 is €1.786.081, the government bonds and treasury bills with Central Bank of Cyprus the difference between

the two years is great; in 2007 is €496.956 and a year before in 2006 was €286.187. Also the price of equity securities has many difference while in 2007 is €436.809 and in 2006 €138.026.

d) Due to other banks: 2.709.704 752.039

As in the following year as here the due to other banks has a lot of difference than the year before. In 2007 is €2.709.704 and in 2006 was €752.039, this is caused by Cyprus, Greece and from the rest of countries that bank has branches. In Cyprus for the year 2006 was €222.452 and in 2007 is €429.998, for Greece in 2006 was €443.523 and now in 2007 is €1.932.187 and for the other countries was €86.066 in 2006 and in 2007 is €347.530.

e) Customer deposits: 20.697.444 16.017.937

Here for Cyprus customers the difference in the two years is not huge, in 2007 is €10.165.844 and in 2006 was €8.274.441, for Greece we notice a quite big difference in two years' prices. In 2006 was €6.792.137 and in 2007 €9.165.128 and in other countries customers' deposit in 2006 was €951.428 and now in 2007 is €1.366.561.

f) Interest income: 1.634.347 784.098

In 2007 the interest from advances to customers, from other banks and from the bonds are increase comparing to 2006. For the advances to customers in 2006 was €508.545 and in 2007 is €1.077.136, the interest from the other banks is €363.834 in 2007 and in 2006 was €200.792. Last the interest from the bonds and the other interest is €193.383 in 2007 and in 2006 was €74.762.

g) Interest expense: 964.973 425.034

The price here in 2007 is more than the double price of 2006 and this is because the interest on customers' deposits where in 2007 is €722.703 and in 2006 was €331.953. Also the interest in other bank has a lot of difference than 2006.

h) Net fee and commission income: 309.957 105.915

The prices for the fee and commission income and expense are having a huge difference. For income the price is €377.234 in 2007 and was €105.915 for the year before. For expense in 2006 was €6.053 and in 2007 is €67.277. The changes in the prices are because of the fees and commissions that bank related, from portfolio and management fees.

i) Staff costs:	339.163	182.496
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According to the notes of the financial statements the salaries and the employer's contributions were increase from €147.517 and now in 2007 is €262.079. Also a huge difference in price we notice in other staff cost while in 2006 was €5.774 and now in 2007 is €40.772.

j) Administrative expenses:	166.339	182.496
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An obviously difference in price we notice in auditor's remuneration. In 2006 was €30.632 and now in 2007 is €78.026.

k) Dividend paid:	245.047	36.650
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In 2007 the dividend payment of €245.047 was made 0,307 per share while in 2006 was €36.650 and was made 0,1023 per share.

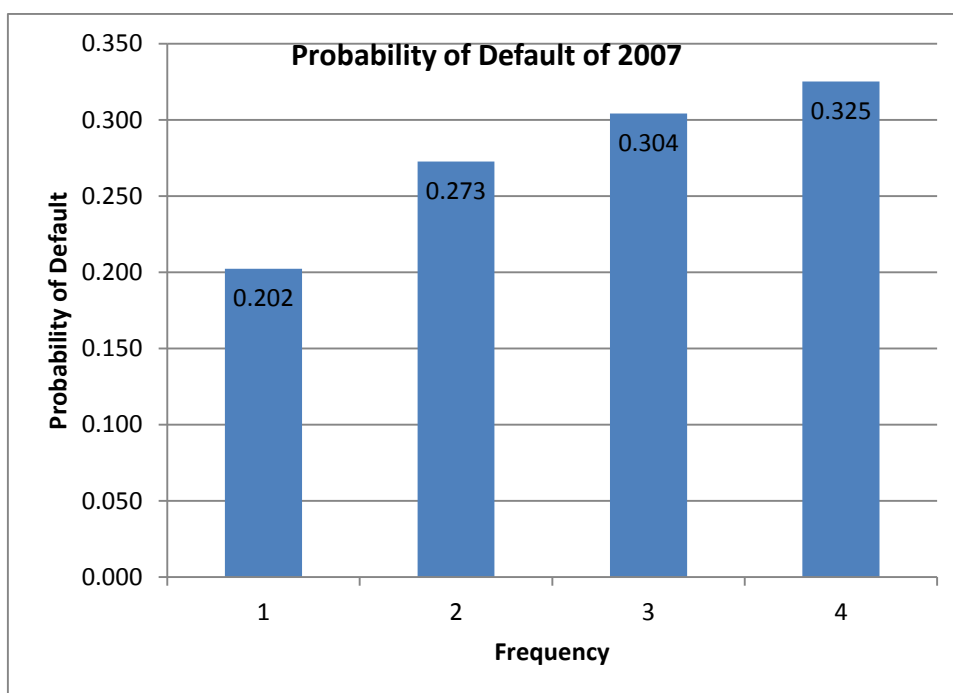


Figure 10: Probability of Default of 2007



Figure 11: Closed Price of 2007

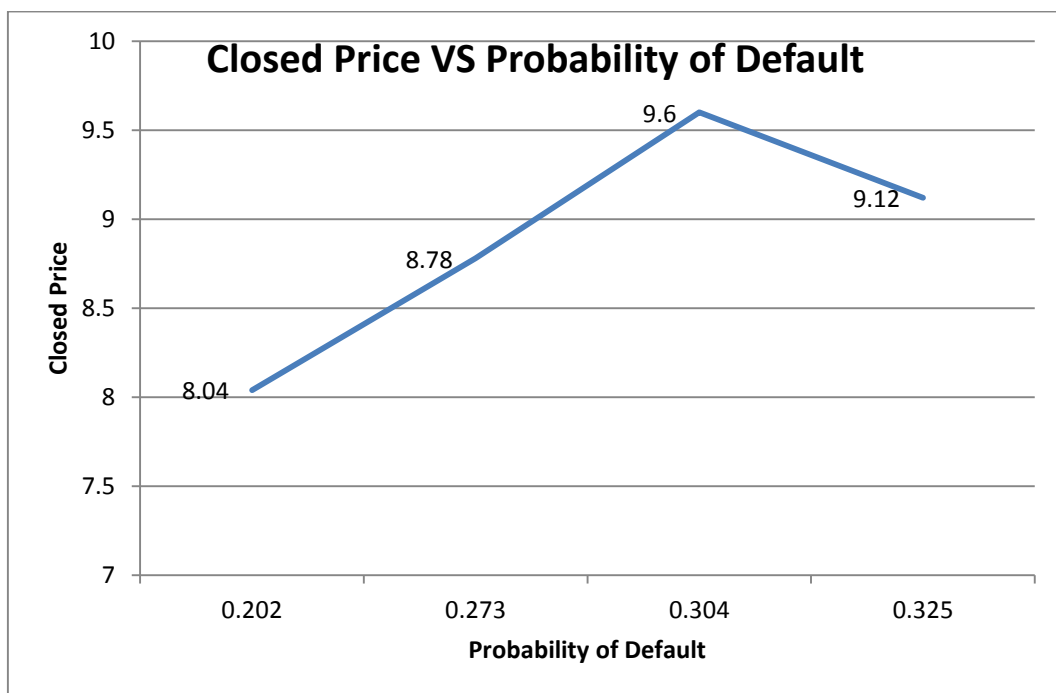


Figure 12: Closed Price VS Probability of Default of 2007

Comments on Financial Statements for 2008:

a) Debt lending securities lending: 938.295 -

For 2007 the value of debt lending securities lending was nothing and for 2008 the value is €938. 295.

b) Investments in associates: 99.473 14.798

The huge difference between the two years is because of transfer to disposal of insurances companies, the price for 2007 was nothing and for 2008 is €84.056.

c) Due to other banks: 6.863.205 2.709.374

The difference is because of the banks of Cyprus and most of Greece banks'. More analytically the amount for Cyprus in 2007 was €429.944 and in 2008 is €1.433.850, for Greece in 2007 was €1.931.942 and in 2008 is €5.006.971.

d) Reserves: €580.073 €691.274

All this difference in the prices is because of the difference between the profits for the year attributable to equity holders of the bank in the two years. For 2007 the price was €563.338 and for 2008 is been €394.563. Also the effect of change in minority interest from group restructuring changes in shareholdings in subsidiaries and other movements is a reason for the difference in the price, for 2007 was €9.775 and for 2008 is -€275. The deferred tax on revaluation has a lot of difference, in 2007 was €3.470 and for 2008 is €151.

e) Interest income: 2.028.151 1.629.040

For this part is been noticed a difference in interest from advances to customers while the price for 2007 was €1.076.803 and for 2008 is €1.482.056.

f) Interest expense: 1.283.747 964.268

The price of 2008 is higher than 2007 price. Here the interest on customer deposits in 2007 was €722.612 and in 2008 is €886.472 and the interest in other banks for 2007 is less than 2008. For 2007 was €133.277 and for 2008 is €299.065.

g) Administrative expenses:	190.957	160.583
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The price for 2008 is higher than 2007 because of the occupancy costs, marketing and sales expenses and other administrative expenses. The occupancy for 2007 was €12.762 and for 2008 is €24.579, the marketing and sales expenses in 2007 were €21.521 and for 2008 are €26.224 and last for the other administrative expenses the price for 2007 was €75.000 and for 2008 is €79.363.

h) Cash generated from operations:	2.643.149	1.004.843
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The prices have much difference. This is because of the impairment of goodwill where the given price is only for 2008 and is equals €400, the fair value gain on investment property where the value of 2007 was (€2.798) and for 2008 is €20.854. The fair value adjustment on property for 2007 was (1.720) and for 2008 is €184. The impairment of available for sale financial assets in 2008 is greater than 2007, for 2008 is €21.618 and for 2007 was €1.491. The income received from financial assets is (€258.070) in 2008 and (€72.003) for 2007. The profit on disposal of property and equipment the value for 2007 was €72.003 and for 2008 is €258.070. A huge difference in prices is also for the restricted balances with Central Banks where in 2007 was (€519.105) and in 2008 is €331.660.

i) Proceeds from disposal of property and equipment:	33.305	7.615
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The net book value has obvious increase in 2008 in this part. For 2007 the price was €7.367 and 2008 is €25.8

j) Disposal of subsidiaries net of cash and cash equivalents disposed:	67.877	-
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The given price is only for 2008. For this part the due from other banks is €261.027, the financial assets at fair value through profit or loss is 162.156, the amount for insurance contract liabilities is -€505.541.

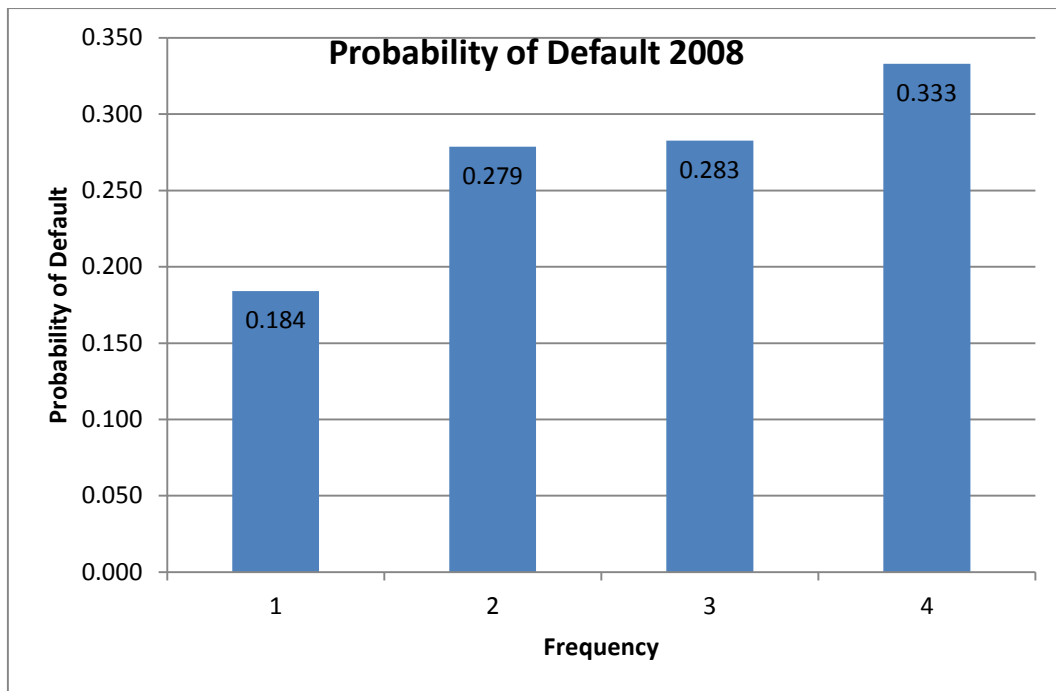


Figure 13: Probability of Default of 2008



Figure 14: Closed Price of 2008

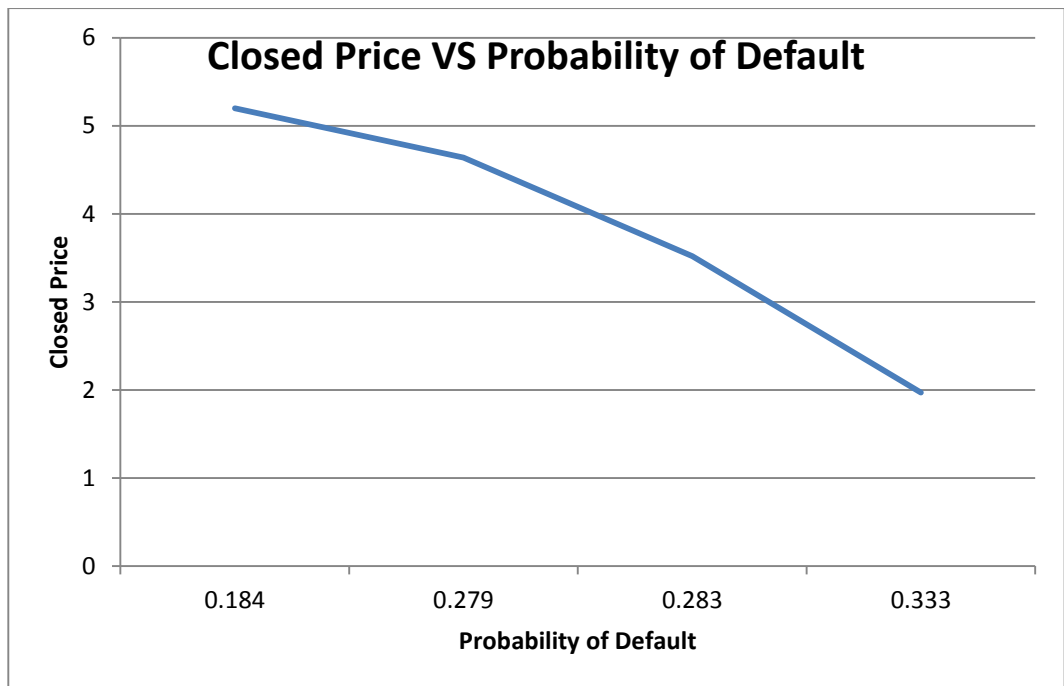


Figure 15: Closed Price VS Probability of Default of 2008

Comments on Financial Statements of 2009:

a) Due from other banks: 3.447.128 4.354.181

We notice a decrease in the amount of 2009 since 2008. This is because of the advances to other banks and the placements with other banks. Both of them in 2009 were less. The price of the advances to other banks in 2008 was €9.273 and now in 2009 is €7.768 and the price of placements with other banks was €3.841.407 and now is €2.961.917.

b) Debt securities lending: 3.395.068 938.295

The big difference between the prices of the two years is because of the debt securities and to the government bonds and treasury bills. The increase is about to €1.200.000. The government bonds and treasury bills in 2008 was €87.775 and in 2009 is €2.238.695. and the debt securities is €1.156.373 in 2009 and 2008 was €850.520.

c) Investment Property: 57.626 42.819

In this category the increase is about €15.000. The difference for this part is cost from the investment property from business acquisitions where in 2008 was €745 and in 2009 is €3.246 and also the disposals in 2008 was €4.391 and in 2009 is €8.219.

d) Due to other banks: 10.470.876 6.863.205

The due to Cyprus banks' in 2009 is €3.006.243 and for 2008 the price was €1.433.850, for Greece banks' the due is now €7.145.093 and in 2008 was €5.006.971 and for the other countries' the due for 2008 was €422.384 and for 2009 is €319.540.

e) Interest income: 1.573.434 2.028.151

The value of 2009 has been fall down and this is because of the interest from advances to customers, the interest from other banks and from the interest of bonds and other interests. The interest from the advances to customers was €1.482.056 and in 2009 is €1.258.915, the interest of bonds and other interests in 2009 is €190.659 and in 2008 was €250.316. Last the interest from the banks in 2009 is €123.860 and in 2008 was €295.779.

f) Interest expense: (937.646) (1.283.747)

The interest on customers' deposit value, the interest on loan capital senior debt and other interest and last the interest to other banks have fallen. The highest difference in the price is for the interest on customers' deposit where in 2008 was €886.472 and in 2009 is €701.846. The interest on other banks is also high, in 2008 was €299.065 and a year after is €165.933. Last the difference for the interest on loan capital, senior debt and other interest is about €30.000, where in 2009 is €69.876 and in 2008 was €98.210.

g) Profit/(loss) on disposal and revaluation of securities: 132.655 (67.696)

This high difference in the two years is most cost from the Profit on disposal of available-for-sale financial assets where in 2009 is €103.783 and in 2008 were €7.209. Also the impairment of available-for-sale financial assets in 2009 is (€4.373) and in 2008 was (€21.618). Last the Held-for-trading in 2008 was (€48.799) and in 2009 is €14.518 which the difference is too high.

h) Provision for impairment of advances: (250.567) (129.414)

For this part the provision for impairment and the release of provision and recoveries belong. Provision for impairment of advances for the year of 2009 the value is €327.466 and for 2008 the value was €194.688. The release of provision and recoveries in 2009 is (€76.899) and in 2008 was (€65.274).

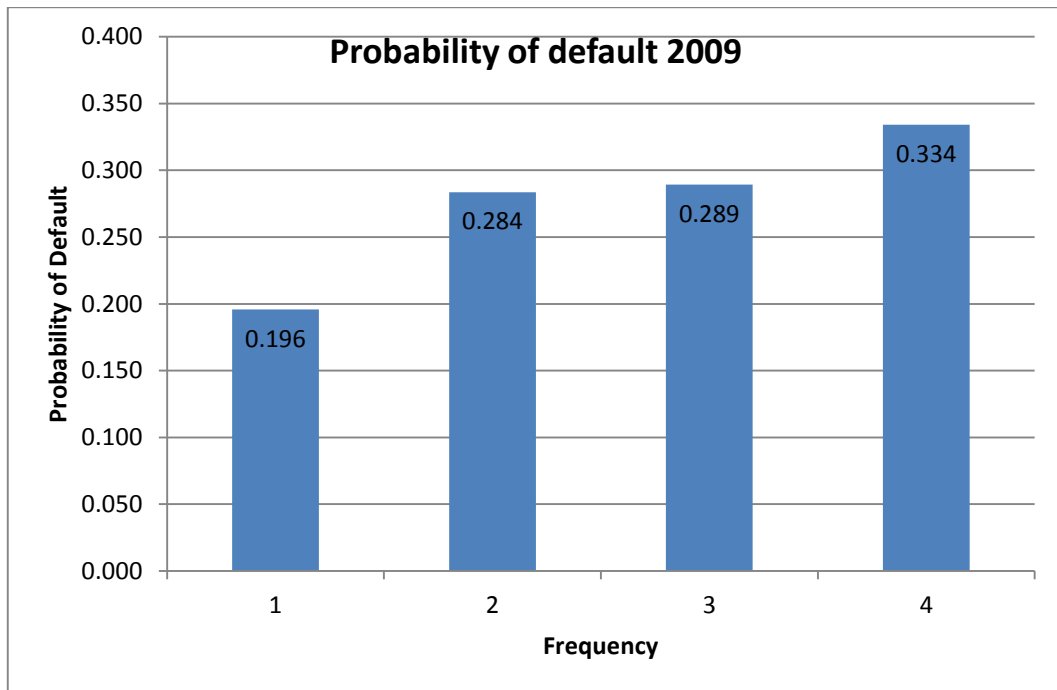


Figure 16: Probability of Default of 2009

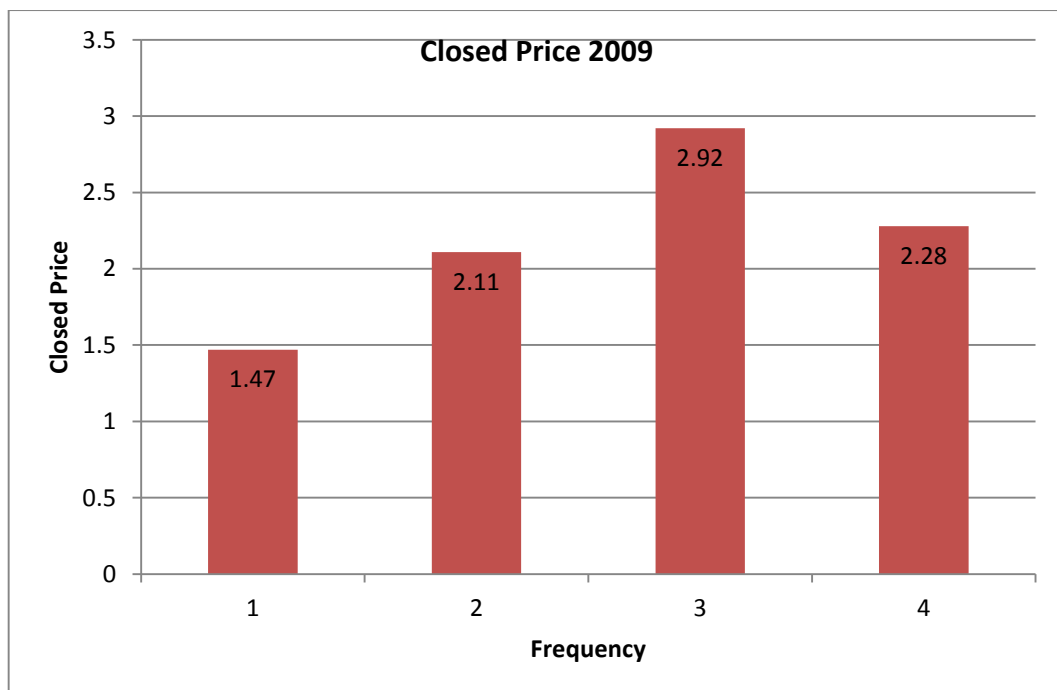


Figure 17: Closed Price of 2009

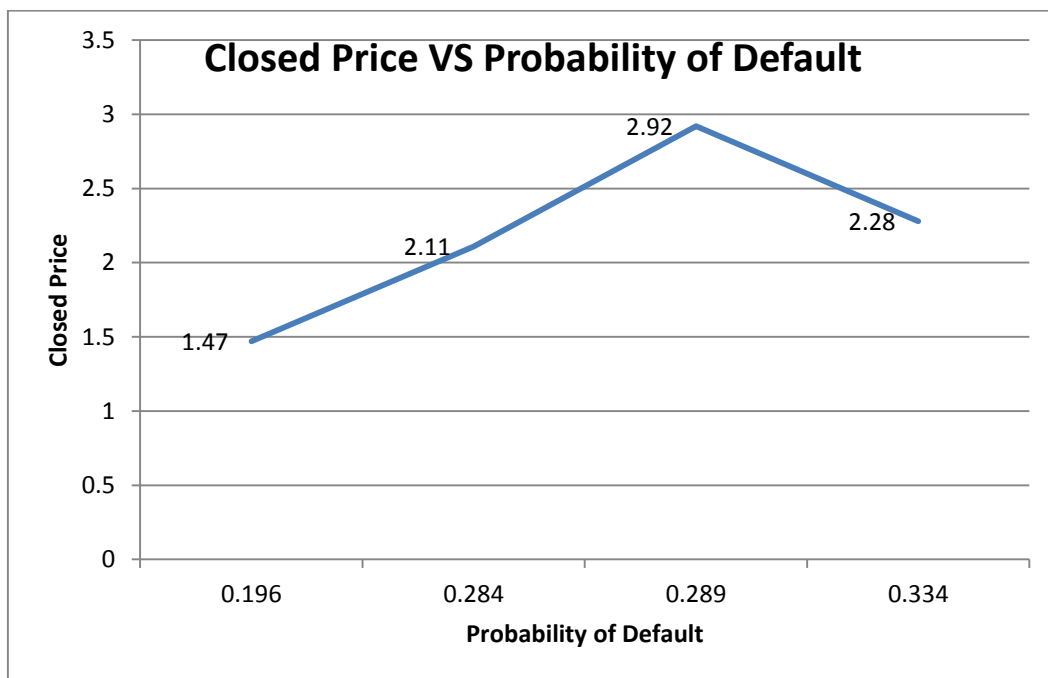


Figure 18: Closed Price VS Probability if Default of 2009

Comments on financial Statements of 2010:

a) Cash and balances with Central Bank: 713.579 1.964.834

The total amount for 2010 is less than the total amount of 2009. The difference is quite big which is about €1.000.000. This is because of the balances with Central Bank other then obligatory reserves for liquidity purposes in 2009 was €1.364.047 and in 2010 is €91.819.

b) Due from other banks: 4.696.112 3.447.128

The difference is also big. The advances to other banks cost in 2009 €7.768 and in 2010 cost €27.852, the placements with other banks in 2009 was €2.961.917 and in 2010 is €4.263.102 and last the reverses repurchase agreements also cost more money in 2010 since 2009. In 2009 the cost was €19.349 and in 2010 is €66.568.

c) Available for sale financial assets: 2.278.411 3.564.893

We notice a decrease between the amounts of the two years. Mostly is because of the amount of debt securities where in 2009 was €2.055.279 and in 2010 is €1.047.517. The government bonds and treasury bills the total cost in 2009 was €1.216.482 and in 2010 is

€925.369. Also the equity securities and fund is important, the price of 2009 was €293.132 and now in 2010 the price is €305.525.

d) Profit on disposal and revaluation of securities: 39.991 32.655

The amount for profit on disposal of financial assets at fair value through profit or loss – held-for-trading for 2010 is €6.336 and for 2009 the value is €17.954. The amount of profit on disposal of available for sale financial assets in 2010 is €29.170 and for 2009 the value was €103.783. Also a quite big difference in the value has the Profit/(loss) on disposal of debt security lending in 2010 is €17.016 and in 2009 was (€585).

e) Other income: 28.304 41.170

Other income is been consisted from Dividend from available-for-sale financial assets, Dividend from financial assets at fair value through profit or loss, Fair value (loss)/gain on investment property, Profit/(loss) on disposal of investment property and equipment. The amount from available for sale financial assets in 2010 is €3.642 and in 2009 was €7.116. Dividend from financial assets at fair value through profit or loss price in 2010 is €561 and 2009 was €717. Big differences in the prices have the fair value (loss)/gain on investment property where in 2009 was €121 and now in 2010 is (€1.669). Also a big difference in values for the two years have the profit/ (loss) on disposal property and of property and equipment. The profit/ (loss) on disposal of investment property has the price of €193 in 2010 and in 2009 had the price of (€129) and last the loss and profit of property and equipment in 2010 is equal to (€415) and in 2009 was equal to €1.048.

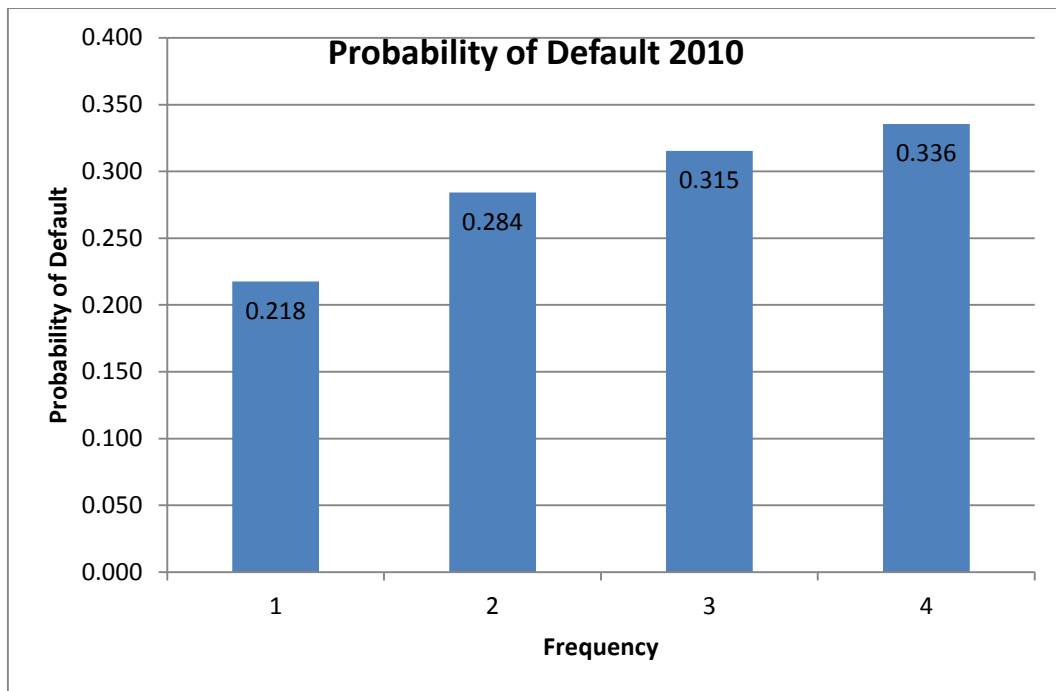


Figure 19: Probability of Default of 2010

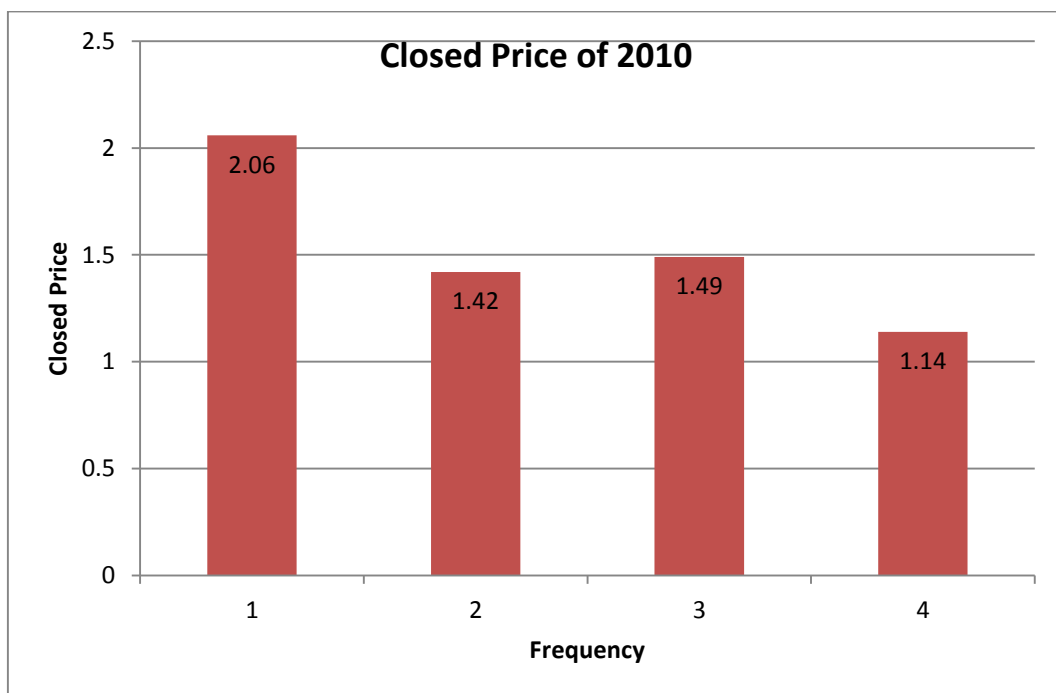


Figure 20: Closed Price of 2010

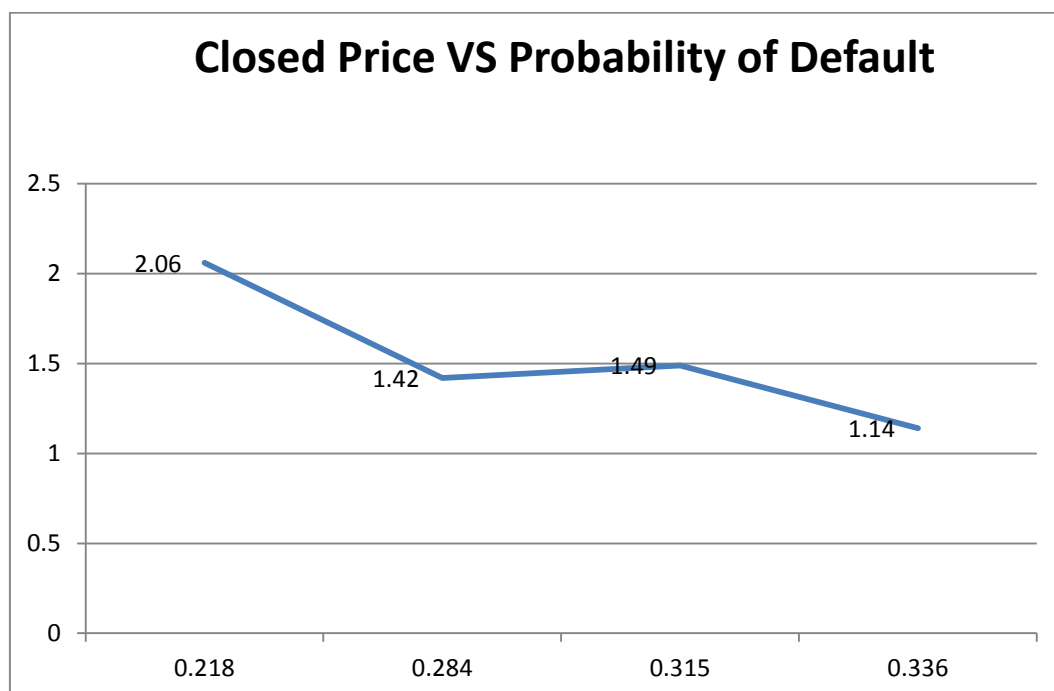


Figure 21: Closed Price VS Probability of Default of 2010

Comments on Financial Statements of 2011:

a) Cash and balances from Central Banks: 1.034.086 713.579

This change in price of the two years is because of the balances with Central Banks other than obligatory reserves for liquidity purposes where in 2009 the price was €91.819 and in 2010 is €159.729.

b) Due from other banks: 689.569 4.696.112

We see a huge change in the price which is equals to €4.000.000. This large difference is for 2011 and more is because of the placements with other banks which the price for 2010 was €4.263.102 and for 2011 the price is €364.237. Also in 2010 the reverses repurchase agreements price was €66.568 and in 2011 the price is nothing for this.

c) Debt securities lending: 1.796.185 3.960.788

This large change between the two periods is noticeable since the difference is equal to €2.000.000. Debt securities price in 2010 was €1.172.391 and in 2011 the price is €964.895. Also the government bonds and treasury bills in 2010 was €2.788.397 and in 2011 the price is €804.290.

d) Intangible assets: 797.780 1.634.734

Goodwill is the main factor for this change in the price between 2010 and 2011. The price for goodwill in 2010 was €1.284.632 and now in 2011 the price is €527.587. For the computer software and others the changes the changes are not so great as to constitute a major factor in the price change.

e) Customer deposits: 20.160.804 25.508.361

For the change of €5.000.000 in price is due to the demand, to the savings and to the time or notice according to the analysis. The demand's and savings' changes are not as important as the time or notice where the price of this in 2010 was €18.938.734 and in 2011 is €14.315.303.

f) Profit on disposal and revaluation of securities: 23.670 49.335

The difference was due more to fair value loss in repossessed property for sale where in 2011 the price is (€28.021).

g) Provision for impairment of advances: (1.151.112) (266.146)

For this part most cost the provision of advances for the next year where in 2010 the price is €368.839 and for 2011 the price is €1.264.388.

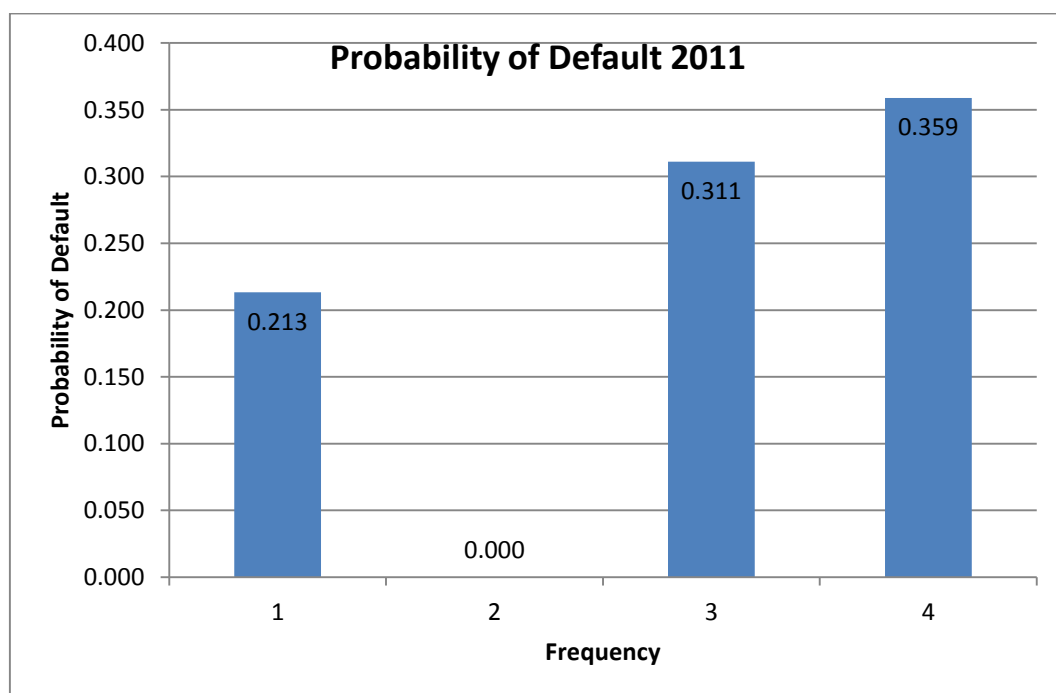


Figure 22: Probability of Default of 2011

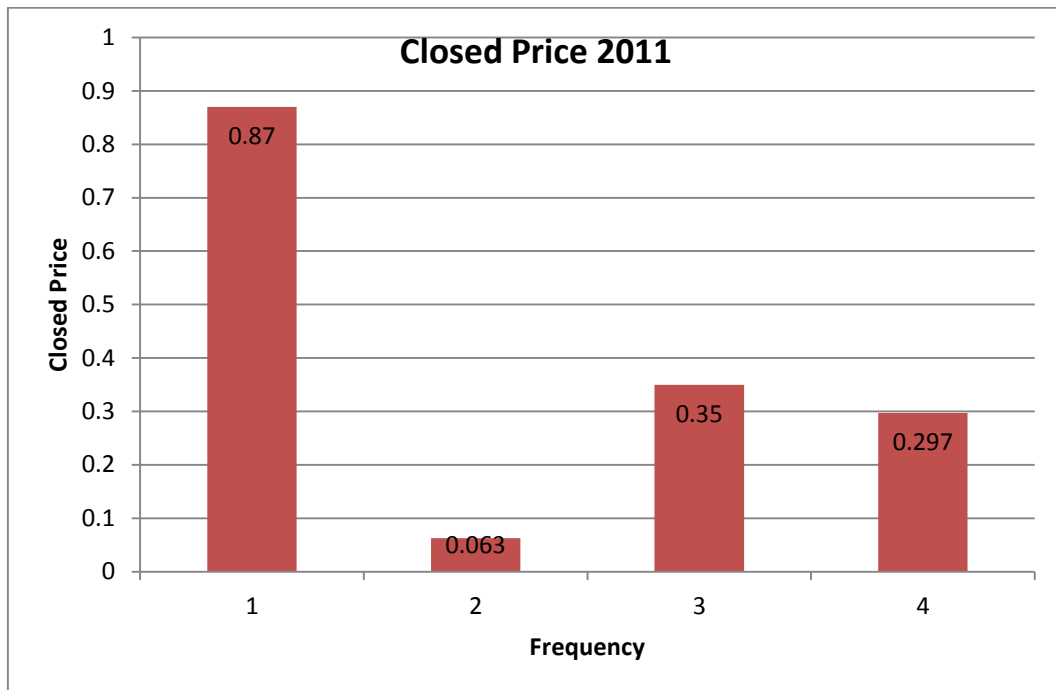


Figure 23: Closed Price of 2011

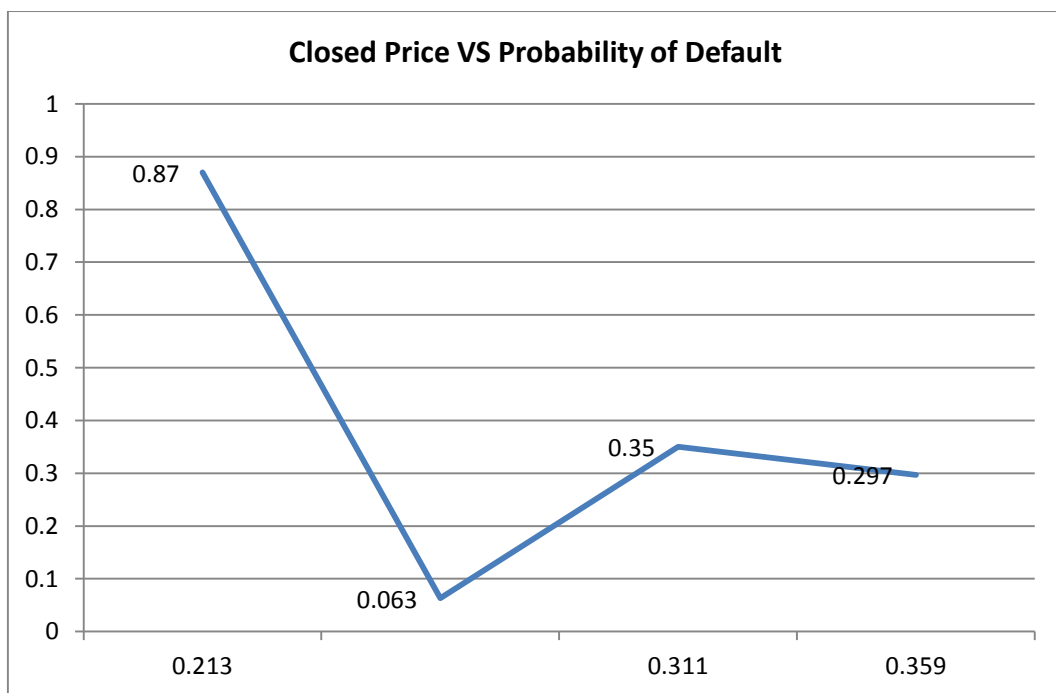


Figure 24: Closed Price VS Probability of Default of 2011

Chapter 6

Conclusions

Laiki Bank Group as one of the biggest banks in Cyprus is among the largest holder of the Greek bonds in Europe and has a substantial presence in Greece through bank branches and subsidiaries. A liquidity squeeze is choking the financial sector and the real economy as many global investors doubt Cypriot borrowing cost have risen steadily because of its exposure to Greek debt. The budget deficit is on the rise and reached 7.4% of GDP in 2011, a violation of EU's budget deficit criteria – no more than 3% of GDP.

The effects of exposure of the bank are also obvious in the results shown in financial statements of the bank at the end of each year. The financial statements have been showed that Laiki Bank is weaker in 2011 to the former years. This period is the worst for almost all the world in economy and most in banks. Customers' deposits as been showed in Balance sheet, presents time to time a decrease. Probably customers have been affected by all that heard them for the economic crisis and the bankruptcy of any bank in any country not only for Greece and for Cyprus and in their attempt to save their money they took it. More generally its been noticed in the period till 2006 an increase and positive results in almost all factors in Financial Statements as the Cash Generated from operation, cash and balances with Central Bank. The Equity Value in the period of 2004 to 2007 is greater than the rest years.

Using Merton Model with Laiki's Bank data for the last seven years we notice an increase in the probability of Default as the time passes. In the beginning of 2004 as you can see in Table 3, in the first quarter of the year the probability of Default was equal to 0.122% and now at the end of 2011 is equal to 0.359%.

As we know probability of Default had been increase and as a result the price of the index is decrease. In 2004 in the first quarter the price was 2.17 and now at the end of 2011 the price is equal to 0.3. The different is huge. In the meantime of the seven years, in 2007-08 we notice an increase in the price of the index which is the period that Cyprus been a member of European Union and a year later the price failed down.

All parts show Laiki Bank Group stronger in 2004 till 2008, in Financial Statements, in Laiki's Index price and in the results of Merton Model. The main reason of Laiki Bank problems is the Global economy crisis. Crisis started from some European countries and now is in Cyprus. Laiki Bank now is facing problems and the main reason is because of the bond market from Greece. Greece now in 2012 is one of the European countries that have serious problems with their economy and facing a bankruptcy problem. Laiki Bank Group also is now facing liquidity problems as its customers afraid for their deposits and using other banks for their savings. Problems in administration also a problem for Laiki Bank as is a government organisation since the industry now depends on government decisions. According to KPMG decisions Laiki Bank Group can faith all these problems. Problems can be faith if the administration picked drastic decisions. Also the equity and probably some private investors can invest their money and as a result of this is to have a new capital. Also employees already have been reduced in their salaries and some branches are already merged with some other branches as to decrease rents and expenses. Purpose of the administration is to reduce the expenses as much as possible.

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[18]<https://www.laiki.com/web/w3uk.nsf/WebContentDocsByID/ID-5B40245B09D76A4DC2256D6C0022BA10>

[19] <http://www.euribor-rates.eu/>

Appendix 1

CONSOLIDATED CASH FLOW STATEMENT 31 December 2004

	2004 (£'000)	2003 (£'000)
Cash generated from operation	118.673	48.613
Tax paid	(5.466)	(8.845)
Net cash from operating activities	113.207	39.768
Cash flows from investing activities		
Purchase of property and equipment	(6.782)	(8.095)
Purchase of computer software	(4.013)	(1.625)
Proceeds from disposal of property and equipment	1.656	634
Income received from held to maturity investments	7.809	5.937
Dividend received from available for sale investments	135	80
Dividend received from investments in associates	798	-
Net cash used in investing activities	(397)	(3.069)
Cash flows from financial activities		
Proceeds from issue of loan capital	-	65.000
Interest paid on loan capital	(9.936)	(8.194)
Proceeds from issue of senior debt	173.836	-
Repayment of loan from syndication of banks	(69.597)	-
Net cash from financial activities	94.303	56.806
Effects of exchange rate changes on cash and cash equivalents	-	(3.999)
Net increase in cash and cash equivalents	207.113	89.506
Cash and cash equivalents at begging of year	1.170.946	1.081.440
Cash and cash equivalents at end of year	1.378.059	1.170.946

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2004

	2004 (£'000)	2003 (£'000)
Assets		
Cash and balance with Central Bank	471.569	328.713
Due from the other banks	840.989	724.126
Trading investment	38.241	22.466
Advances to customers	3.459.375	3.123.582
Corporate bonds and debentures	10.467	4.462
Government bonds and treasury bills	266.058	261.100
Available-for-sale investment	19.481	23.194
Held-to-maturity investment	360.447	323.241
Other assets	94.137	115.876
Tax refundable	9.747	17.874
Investments in associates	4.935	9.434
Intangible assets	32.057	35.776
Property and equipment	85.143	85.630
Total assets	5.692.646	5.075
Liabilities		
Due to other banks	69.722	114.223
Customer deposits	4.665.037	4.148.060
Senior debt	173.836	69.597
Other liabilities	130.881	129.437
Tax payable	9.483	11.958
Deferred tax liabilities	6.878	5.448
Retirement benefit obligations	82.858	71.878
Total liabilities	5.138.695	4.550.601
Loan capital	214.124	215.068
Minority interest	34.904	29.393
Share capital and reserves		
Share capital	152.450	152.450
Share premium	2.949	2.949
Reserves	149.524	125.013
	304.923	280.412
Total shareholder's equity and liabilities	5.692.646	5.075.474

CONSOLIDATED INCOME STATEMENT 31 December 2004

	2004 (£'000)	2003 (£'000)
Interest income	297.450	262.371
Interest expense	(148.236)	(132.231)
Net interest income	149.214	130.140
Fee and commission income	50.857	47.344
Fee and commission expense	(2.131)	(2.417)
Net fee and commission income	48.726	44.927
Loss on disposal and revaluation of securities	(2.692)	(2.071)
Foreign exchange income	12.146	11.034
Other income	14.263	12.162
Operating income	221.657	196.192
Staff costs	(85.955)	(81.038)
Depreciation, amortisation	(16.705)	(15.338)
Other administrative expenses	(35.528)	(38.865)
Profit before provision for impairment of advances	83.469	65.951
Provision for impairment of advances	(46.949)	(49.588)
Profit before impairment of available for sale investments	36.520	16.363
Impairment of available for sale investments	(4.942)	(2.500)
Share of profit from associates	1.514	1.233
Profit before tax	33.092	15.096
Tax	(11.641)	(5.764)
Profit after tax	21.451	9.332
Attributable to:		
Minority interest	(351)	179
Net profit attributable to the shareholders of the Bank	21.100	9.511
Earnings per share-profit after tax from continuing operations attributable to the equity holders of the Bank		
Earnings per share- cent	6,9	3,1

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2005

	2005 (£'000)	2004 (£'000)
Assets		
Cash and balance with Central Bank	432.091	471.569
Due from the other banks	1.365.173	945.680
Financial assets at fair value through profit or loss	172.890	124.214
Advances to customers	3.995.698	3.490.148
Reinsurance assets	15.817	13.702
Government bonds and treasury bills	339.005	202.151
Available-for-sale investment	544.546	385.248
Other assets	77.874	67.102
Tax refundable	10.490	9.747
Deferred tax assets	1.776	1.314
Investments in associates	5.880	4.935
Intangible assets	46.246	54.128
Investment property	15.110	-
Property and equipment	89.832	101.224
Total assets	7.118.731	5.878.129
Liabilities		
Due to other banks	122.538	69.722
Customer deposits	5.726.421	4.636.846
Senior debt	171.833	173.836
Insurance contract liabilities	256.367	231.498
Other liabilities	126.857	110.456
Tax payable	15.063	9.438
Deferred tax liabilities	7.290	8.192
Retirement benefit obligations	96.634	83.887
Total liabilities	6.523.003	5.323.920
Loan capital	213.154	214.124
Share capital and reserves attributable to the Bank's equity holders		
Share capital	153.648	152.450
Share premium	4.843	2.949
Reserves	188.348	149.782
	346.839	305.181
Minority interest	35.735	34.904
Total equity	382.574	340.085
Total equity and liabilities	7.118.731	5.878.129

CONSOLIDATED INCOME STATEMENT 31 December 2005

	2005 (£'000)	2004 (£'000)
Interest income	358.868	302.153
Interest expense	(185.600)	(147.694)
Net interest income	173.268	154.459
Fee and commission income	53.689	51.333
Fee and commission expense	(2.984)	(2.949)
Net fee and commission income	50.705	48.384
Loss on disposal and revaluation of securities	738	(6.014)
Foreign exchange income	12.234	12.146
Other income	20.564	14.148
Operating income	257.509	223.123
Staff costs	(94.128)	(85.955)
Depreciation, amortisation	(19.653)	(16.843)
Other administrative expenses	(37.545)	(36.856)
Profit before provision for impairment of advances	106.183	83.469
Provision for impairment of advances	(46.398)	(49.949)
Profit before impairment of available for sale financial assets	59.785	36.520
Impairment of available for sale investments	-	(4.942)
Share of profit from associates	1.420	1.313
Profit before tax	61.205	32.891
Tax	(17.305)	(11.440)
Profit after tax	43.900	21.451
Attributable to:		
Minority interest	1.139	351
Equity holders of the Bank	42.761	21.100
	43.900	21.451
Earnings per share-profit after tax from continuing operations attributable to the equity holders of the Bank		
Earnings per share- cent	14,0	6,9

CONSOLIDATED CASH FLOW STATEMENT 31 December 2005

	2005 (£'000)	2004 (£'000)
Cash generated from operation	534.110	189.118
Tax paid	(13.779)	(5.466)
Net cash from operating activities	520.331	183.652
Cash flows from investing activities		
Purchase of property and equipment	(11.316)	(6.862)
Purchase of computer software	(2.215)	(4.013)
Proceeds from disposal of property and equipment	443	1.846
Proceeds from disposal of computer software	30	-
Additions less proceeds from redemption and sale of available-for-sale financial assets	(137.576)	(48.967)
Income received from available for sale financial assets	15.634	7.944
Dividend received from investment in associates	475	798
Net cash used in investing activities	(134.525)	(49.254)
Cash flows from financial activities		
Dividend paid	(6.029)	-
Interest paid on loan capital	(10.197)	(9.936)
Proceeds from issue of senior debt	-	173.836
Repayment of loan from syndication of banks	-	(69.597)
Net cash(used in)/from financial activities	(16.226)	94.303
Effects of exchange rate changes on cash and cash equivalents	-	911
Net increase in cash and cash equivalents	369.580	229.612
Cash and cash equivalents at begging of year	1.400.558	1.170.946
Cash and cash equivalents at end of year	1.770.138	1.400.558

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2006

	2006 (€'000)	2005(€'000)
Assets		
Cash and balance with Central Bank	1.058.308	747.302
Due from the other banks	4.157.305	2.361.066
Financial assets at fair value through profit or loss	829.615	299.014
Advances to customers	12.017.171	6.910.559
Reinsurance assets	21.411	27.356
Corporate bonds and debentures	8.808	10.901
Government bonds and treasury bills	815.645	586.310
Available-for-sale financial assets	1.633.889	941.791
Held-to-maturity financial assets	47.560	-
Other assets	252.889	134.684
Tax refundable	42.441	18.142
Deferred tax assets	36.121	3.071
Investments in associates	21.388	10.170
Intangible assets	1.347.733	79.982
Investment property	66.071	26.133
Property and equipment	236.069	155.364
Total assets	22.592.424	12.311.845
Liabilities		
Due to other banks	761.144	211.930
Customer deposits	16.211.880	9.903.845
Senior debt	525.801	297.186
Loan capital	631.655	368.650
Insurance contract liabilities	525.340	443.387
Other liabilities	496.719	219.397
Current tax liabilities	160.174	26.052
Deferred tax liabilities	29.124	12.608
Retirement benefit obligations	198.824	167.129
Total liabilities	19.540.661	11.650.184
Share capital and		
Share capital	683.428	265.734
Share premium	1.925.029	8.376
Treasury shares	(183.253)	-
Reserves	485.498	325.748
	2.910.702	599.858
Minority interest	141.061	61.803
Total equity	3.051.763	61.803
Total equity and liabilities	30.253.800	22.513.833

CONSOLIDATED INCOME STATEMENT 31 December 2006

	2006 (€'000)	2005(€'000)
Interest income	793.592	620.663
Interest expense	(430.181)	(320.995)
Net interest income	363.411	299.668
Fee and commission income	113.323	92.856
Fee and commission expense	(6.125)	(5.162)
Net fee and commission income	107.198	87.694
Profit on disposal and revaluation of securities	13.490	1.275
Foreign exchange income	23.651	21.159
Other income	37.319	35.565
Operating income	545.069	445.361
Staff costs	(184.706)	(162.794)
Depreciation, amortisation and impairment	(20.606)	(33.989)
Administrative expenses	(77.536)	(64.935)
Profit before provision for impairment of advances	262.221	183.643
Provision for impairment of advances	(81.973)	(80.245)
Profit before share of profit from associates	180.248	103.398
Share of profit from associates	2.551	2.457
Profit before tax	182.799	105.855
Tax	(30.726)	(29.929)
Profit for the year	152.073	75.926
Attributable to:		
Minority interest	3.211	1.970
Equity holders of the Bank	148.862	73.956
	152.073	75.926
Earnings per share- for profit attributable to the equity holders of the Bank		
Earnings per share – cent	44,6	24,2

CONSOLIDATED CASH FLOW STATEMENT 31 December 2006

Cash generated from operation	985.663	823.743
Tax paid	(26.823)	(23.831)
Net cash from operating activities	958.840	899.912
Cash flows from investing activities		
Purchase of property and equipment	(11.643)	(19.571)
Purchase of computer software	(4.490)	(3.831)
Purchase of investment property	(5)	-
Proceeds from disposal of property and equipment	3.686	766
Proceeds from disposal of computer software	24	53
Additions less proceeds from redemption and sale of available-for-sale financial assets and redemption of held-to-maturity financial assets	(434.307)	(237.937)
Income received from financial assets	52.525	27.039
Dividend received from investment in associates	821	821
Acquisition of subsidiaries net of cash and cash equivalents acquired	1.158.433	-
Net cash used in investing activities	765.044	(232.660)
Cash flows from financial activities		
Dividend paid	(37.094)	(10.427)
Interest paid on loan capital	(15.638)	(17.636)
Share issue costs	(16.710)	-
Net proceeds from the exercise of rights	105.963	-
Proceeds from the issue of loan capital	449.998	-
Repayment of loan capital	(267.433)	-
Net cash(used in)/from financial activities	219.086	(28.063)
Effects of exchange rate changes	-	7.641
Net increase in cash and cash equivalents	1.942.970	646.830
Cash and cash equivalents at begging of year	3.069.095	2.422.265
Cash and cash equivalents at end of year	5.012.065	3.069.095

CONSOLIDATED CASH FLOW STATEMENT 31 December 2007

	2007 (€'000)	2006 (€'000)
	1.003.324	874.270
Cash generated from operation		
Tax paid	(155.071)	(26.502)
Net cash from operating activities	848.253	847.768
Cash flows from investing activities		
Purchase of property and equipment	(32.652)	(11.504)
Purchase of computer software	(9.909)	(4.436)
Purchase of investment property	(6.514)	(5)
Proceeds from disposal of property and equipment	7.616	3.641
Proceeds from disposal of computer software	-	24
Proceeds from disposal of investment property	20.147	-
Additions less proceeds from redemption and sale of available-for-sale financial assets and redemption of held-to-maturity financial assets	(796.170)	(429.111)
Income received from financial assets	72.013	51.897
Dividend received from investment in associates	1.697	812
Acquisition of subsidiaries net of cash and cash equivalents acquired	(55.960)	1.144.576
Changes in shareholding in subsidiaries	(16.500)	-
Net cash used in investing activities	(791.241)	755.893
Cash flows from financial activities		
Proceeds from sale treasury shares	273.284	-
Dividend and capital return by subsidiaries to minority holders	(24.923)	-
Dividend paid	(245.047)	(36.650)
Interest paid on senior debt and loan capital	(70.668)	(15.451)
Share issue costs	(3.543)	(16.511)
Proceeds from the exercise of warrants	92	104.695
Proceeds from the issue of senior debt and loan capital	715.390	444.615
Repayment of senior debt and loan capital	(315.325)	(264.233)
Net cash(used in)/from financial activities	329.259	216.465
Effects of exchange rate changes	-	20.403
Net increase in cash and cash equivalents	386.271	1.840.529
Cash and cash equivalents at beginning of year	4.632.408	2.791.879
Cash and cash equivalents at end of year	5.018.679	4.632.408

CONSOLIDATED INCOME STATEMENT 31 December 2007

	2007 (€'000)	2006(€'000)
Interest income	<u>1.634.347</u>	784.096
Interest expense	<u>(964.373)</u>	(425.034)
Net interest income	<u>669.374</u>	359.064
Fee and commission income	<u>377.234</u>	111.968
Fee and commission expense	<u>(67.277)</u>	(6.053)
Net fee and commission income	<u>309.957</u>	105.915
(Loss)/profit on disposal and revaluation of securities	<u>160.103</u>	13.329
Foreign exchange income	<u>31.492</u>	23.368
Other income	<u>71.405</u>	36.873
Operating income	<u>1.242.331</u>	538.549
Staff costs	<u>(46.032)</u>	(20.359)
Depreciation, amortisation and impairment	<u>(50.519)</u>	(45.354)
Administrative expenses	<u>(166.339)</u>	(76.609)
Profit before provision for impairment of advances	<u>690.797</u>	259.085
Provision for impairment of advances	<u>(97.923)</u>	(80.992)
Profit before share of profit from associates	<u>592.874</u>	178.093
Share of profit from associates	<u>2.946</u>	2.520
Profit before tax	<u>595.820</u>	180.613
Tax	<u>(88.812)</u>	(30.359)
Profit after tax from continuing operations	<u>507.008</u>	150.254
Profit after tax from discontinued operations	<u>86.197</u>	-
Profit for the year	<u>593.205</u>	150.254
Attributable to:		
Minority interest	<u>29.798</u>	3.173
Equity holders of the Bank	<u>563.407</u>	147.081
	<u>593.205</u>	160.254
Earnings per share- for profit attributable to the equity holders of the Bank		
Earnings per share – cent	<u>72,1</u>	44,1
Earnings per share-profit after tax from continuing operations attributable to the equity holders of the Bank		
Earnings per share- cent	<u>63,0</u>	-

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2007

	2007 (€'000)	2006(€'000)
Assets		
Cash and balance with Central Bank	1.347.284	1.045.848
Due from the other banks	4.978.832	1.107.571
Financial assets at fair value through profit or loss	716.167	752.350
Advances to customers	17.617.259	11.880.018
Reinsurance assets	27.886	21.155
Available-for-sale financial assets	2.737.791	1.904.863
Held-to-maturity financial assets	375.835	438.182
Other assets	391.467	248.346
Tax refundable	23.787	29.046
Deferred tax assets	36.267	15.116
Investments in associates	14.800	15.133
Intangible assets	1.641.765	1.540.614
Investment property	57.875	65.280
Property and equipment	286.794	233.184
Total assets	30.253.809	22.296.505
Liabilities		
Due to other banks	2.709.704	752.039
Customer deposits	20.697.444	16.017.937
Senior debt	793.134	519.509
Loan capital	604.123	624.099
Insurance contract liabilities	557.959	519.054
Other liabilities	826.600	473.774
Current tax liabilities	57.999	56.032
Deferred tax liabilities	124.442	107.448
Retirement benefit obligations	219.853	196.447
Liabilities directly related to assets held for sale	-	209.731
Total liabilities	26.771.258	19.476.070
Share capital and reserves attributable to equity holders of the Bank		
Share capital	680.697	675.252
Share premium	2.017.954	1.901.999
Treasury shares	-	(181.060)
Reserves	691.359	419.690
	3.390.010	2.875.881
Minority interest	92.541	161.882
Total equity	3.482.551	3.037.763
Total equity and liabilities	30.253.800	22.513.833

CONSOLIDATED INCOME STATEMENT 31 December 2008

	2008 (€'000)	2007(€'000)
Interest income	2.028.151	1.629.040
Interest expense	(1.238.747)	(964.268)
Net interest income	744.404	664.772
	339.548	373.600
Fee and commission income		
Fee and commission expense	(52.809)	(64.708)
Net fee and commission income	286.739	308.892
(Loss)/profit on disposal and revaluation of securities	(67.696)	147.679
Foreign exchange income	64.964	31.488
Other income	56.875	23.022
Operating income	1.085.286	1.175.853
Staff costs	(349.749)	(325.221)
Depreciation, amortisation and impairment	(50.519)	(45.354)
Administrative expenses	(190.957)	(160.583)
Profit before provision for impairment of advances	494.061	644.695
Provision for impairment of advances	(129.414)	(97.938)
Profit before share of profit from associates	364.647	546.757
Share of profit from associates	2.528	2.946
Profit before tax	367.175	549.703
Tax	(56.024)	(84.481)
Profit after tax from continuing operations	311.151	465.222
Profit after tax from discontinued operations	92.194	127.911
Profit for the year	403.345	593.133
Attributable to:		
Minority interest	8.782	29.795
Equity holders of the Bank	394.563	563.338
	403.345	593.133
Earnings per share- for profit attributable to the equity holders of the Bank		
Earnings per share – cent	48,3	72,1
Earnings per share-profit after tax from continuing operations attributable to the equity holders of the Bank		
Earnings per share- cent	37,1	57,7

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2008

	2008 (€'000)	2007(€'000)
Assets		
Cash and balance with Central Bank	1.839.670	1.347.119
Due from the other banks	4.354.181	4.978.224
Financial assets at fair value through profit or loss	356.919	716.080
Advances to customers	23.427.226	17.615.108
Debt securities	938.295	-
Reinsurance assets	-	27.883
Available-for-sale financial assets	3.606.173	2.737.456
Held-to-maturity financial assets	1.164.036	375.789
Other assets	496.138	391.419
Tax refundable	39.006	23.785
Deferred tax assets	85.375	36.263
Investments in associates	99.473	14.798
Intangible assets	1.629.069	1.649.021
Investment property	42.819	57.868
Property and equipment	274.858	286.760
Total assets	38.353.238	30.257.573
Liabilities		
Due to other banks	6.863.205	2.709.374
Customer deposits	24.828.269	20.694.917
Senior debt	1.079.042	973.014
Loan capital	725.907	604.049
Insurance contract liabilities	-	557.892
Other liabilities	900.089	829.480
Current tax liabilities	45.626	57.993
Deferred tax liabilities	120.931	128.809
Retirement benefit obligations	228.717	219.827
Total liabilities	34.791.786	26.775.355
Share capital and reserves attributable to equity holders of the Bank		
Share capital	705.607	680.613
Share premium	2.144.141	2.017.708
Reserves	580.073	691.274
	3.429.821	3.389.595
Minority interest	131.631	92.623
Total equity	3.561.452	3.482.218
Total equity and liabilities	38.353.238	30.257.573

CONSOLIDATED CASH FLOW STATEMENT 31 December 2008

	2008 (€'000)	2007(€'000)
Cash generated from operation	2.643.149	1.004.843
Tax paid	(110.250)	(155.053)
Net cash from operating activities	2.532.899	849.790
Cash flows from investing activities		
Purchase of property and equipment	(47.897)	(32.647)
Purchase of computer software	(11.902)	(9.909)
Purchase of investment property	(4.391)	(6.514)
Proceeds from disposal of property and equipment	33.305	7.615
Proceeds from disposal of investment property	33.746	20.146
Additions less proceeds from redemption and sale of available-for-sale financial assets and redemption of held-to-maturity financial assets	(2.499.707)	(769.074)
Income received from financial assets	194.599	72.003
Dividend received from investment in associates	1.853	1.698
Acquisition of subsidiaries net of cash and cash equivalents acquired	47.043	(57.596)
Disposal of subsidiaries net of cash and cash equivalents disposed	67.877	-
Changes in shareholding in subsidiaries	(28.500)	(18.507)
Net cash used in investing activities	(2.213.974)	(792.785)
Cash flows from financial activities		
Proceeds from sale treasury shares	-	273.252
Dividend and capital return by subsidiaries to minority holders	(1.175)	(24.921)
Dividend paid	(123.705)	(245.018)
Interest paid on senior debt and loan capital	(93.895)	(70.660)
Share issue costs	(284)	(3.543)
Proceeds from the exercise of warrants	-	92
Proceeds from the issue of senior debt and loan capital	647.534	715.303
Repayment of senior debt and loan capital	442.029	(315.287)
Net cash(used in)/from financial activities	(13.554)	329.218
Effects of exchange rate changes	-	(39.665)
Net increase in cash and cash equivalents	305.371	346.558
Cash and cash equivalents at beginning of year	4.978.401	4.631.843
Cash and cash equivalents at end of year	5.283.772	4.978.401

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2009

	2009 (€'000)	2008(€'000)
Assets		
Cash and balance with Central Bank	1.964.834	1.839.670
Due from the other banks	3.447.128	4.354.181
Financial assets at fair value through profit or loss	238.435	356.919
Advances to customers	25.082.163	23.427.226
Debt securities	3.395.068	938.295
Available-for-sale financial assets	3.564.893	3.606.173
Held-to-maturity financial assets	1.381.330	1.164.036
Other assets	511.898	496.138
Current income tax assets	38.662	39.006
Deferred tax assets	91.958	85.375
Investments in associates	113.071	99.473
Intangible assets	1.646.842	1.642.938
Investment property	57.626	42.819
Property and equipment	294.455	274.858
Total assets	41.828.363	38.367.152
Liabilities		
Due to other banks	10.470.876	6.863.205
Customer deposits	23.885.776	24.828.269
Senior debt	1.398.502	1.079.042
Other liabilities	840.858	900.089
Current income tax liabilities	33.707	45.626
Deferred tax liabilities	133.881	126.721
Retirement benefit obligations	255.019	228.717
Total liabilities	38.069.120	34.797.576
Share capital and reserves attributable to equity holders of the Bank		
Share capital	720.930	705.607
Share premium	2.179.146	2.144.141
Reserves	735.846	580.073
	3.635.922	3.429.821
Non-controlling interests	123.321	139.755
Total equity	3.759.243	3.569.576
Total equity and liabilities	41.828.363	38.367.152

CONSOLIDATED INCOME STATEMENT 31 December 2009

	2009 (€'000)	2008(€'000)
Interest income	1.573.434	2.028.151
Interest expense	(937.646)	(1.238.747)
Net interest income	635.788	744.404
Fee and commission income	269.589	339.548
Fee and commission expense	(41.676)	(52.809)
Net fee and commission income	227.913	286.739
(Loss)/profit on disposal and revaluation of securities	132.655	(67.696)
Foreign exchange income	37.327	64.964
Other income	41.170	56.875
Operating income	1.074.853	1.085.286
Staff costs	(368.749)	(349.749)
Depreciation, amortisation and impairment	(57.222)	(50.519)
Administrative expenses	(198.532)	(190.957)
Profit before provision for impairment of advances	450.350	494.061
Provision for impairment of advances	(250.567)	(129.414)
Profit before share of profit from associates	199.783	364.647
Share of profit from associates	18.014	2.528
Profit before tax	217.797	367.175
Tax	(47.418)	(56.024)
Profit after tax from continuing operations	170.379	311.151
Profit after tax from discontinued operations	-	92.194
Profit for the year	170.379	403.345
Attributable to:		
Owners of the Bank	173.872	394.563
Non- controlling interests	(3.493)	8.782
	170.379	403.345
Earnings per share- for profit attributable to the equity holders of the Bank		
Earnings per share – cent	20,8	48,3
Earnings per share-profit after tax from continuing operations attributable to the equity holders of the Bank		
Earnings per share- cent	20,8	37,1

CONSOLIDATED CASH FLOW STATEMENT 31 December 2009

	2009 (€'000)	2008 (€'000)
Cash generated from operation	(328.757)	2.643.149
Tax paid	(79.776)	(110.250)
Net cash from operating activities	(408.533)	2.532.899
Cash flows from investing activities		
Purchase of property and equipment	(42.657)	(47.897)
Purchase of computer software	(11.750)	(11.902)
Purchase of investment property	(8.219)	(4.391)
Proceeds from disposal of property and equipment	6.495	33.305
Proceeds from disposal of investment property	580	33.746
Additions less proceeds from redemption and sale of available-for-sale financial assets and redemption of held-to-maturity financial assets	(1.368.193)	(2.499.707)
Income received from financial assets	168.117	194.599
Dividend received from investment in associates	4.739	1.853
Acquisition of subsidiaries net of cash and cash equivalents acquired	4.452	47.043
Disposal of subsidiaries net of cash and cash equivalents disposed	-	67.877
Changes in shareholding in subsidiaries	(4.637)	(28.500)
Net cash used in investing activities	(1.251.073)	(2.213.974)
Cash flows from financial activities		
Dividend and capital return by subsidiaries to minority holders	(1.270)	(1.175)
Dividend paid	(96.966)	(123.705)
Interest paid on senior debt and loan capital	(65.493)	(93.895)
Share issue costs	(834)	(284)
Proceeds from the issue of senior debt and loan capital	953.858	647.534
Repayment of senior debt and loan capital	(144.726)	(442.029)
Net cash(used in)/from financial activities	(644.569)	(13.554)
Effects of exchange rate changes	-	1.578
Net increase in cash and cash equivalents	(1.015.037)	306.949
Cash and cash equivalents at beginning of year	5.285.350	4.978.401
Cash and cash equivalents at end of year	4.270.313	5.283.772

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2010

	2010 (€'000)	2009(€'000)
Assets		
Cash and balance with Central Bank	713.579	1.964.834
Due from the other banks	4.696.112	3.447.128
Financial assets at fair value through profit or loss	229.336	238.435
Advances to customers	26.417.333	25.082.163
Debt securities lending	3.960.788	3.395.068
Available-for-sale financial assets	2.278.411	3.564.893
Held-to-maturity financial assets	1.480.046	1.381.330
Other assets	535.782	511.898
Current income tax assets	34.056	38.662
Deferred tax assets	127.185	91.958
Investments in associates	113.600	113.071
Intangible assets	1.634.734	1.646.842
Investment property	68.322	57.626
Property and equipment	291.202	294.455
Total assets	42.580.486	41.828.363
Liabilities		
Due to other banks	10.649.850	10.470.876
Customer deposits	25.508.361	23.885.776
Senior debt	477.637	1.398.502
Loan capital	1.267.931	1.050.501
Other liabilities	592.516	840.858
Current income tax liabilities	23.203	33.707
Deferred tax liabilities	134.634	133.881
Retirement benefit obligations	284.980	255.019
Total liabilities	38.939.112	38.069.120
Share capital and reserves attributable to equity holders of the Bank		
Share capital	834.799	720.930
Share premium	2.252.897	2.179.146
Reserves	447.815	735.846
	3.535.511	3.635.922
Non-controlling interests	105.863	123.321
Total equity	3.641.374	3.759.243
Total equity and liabilities	42.580.486	41.828.363

CONSOLIDATED INCOME STATEMENT 31 December R 2010

	2010 (€'000)	2009(€'000)
Interest income	1.553.320	1.573.434
Interest expense	(843.777)	(937.646)
Net interest income	709.543	635.788
Fee and commission income	243.091	269.589
Fee and commission expense	(42.610)	(41.676)
Net fee and commission income	200.481	227.913
(Loss)/profit on disposal and revaluation of securities	39.991	132.655
Foreign exchange income	34.091	37.327
Other income	28.304	41.170
Operating income	1.012.410	1.074.853
Staff costs	(386.202)	(368.749)
Depreciation, amortisation and impairment	(56.162)	(57.222)
Administrative expenses	(203.403)	(198.532)
Profit before provision for impairment of advances	366.643	450.350
Provision for impairment of advances	(266.146)	(250.567)
Profit before share of profit from associates	100.497	199.783
Share of profit from associates	14.177	18.014
Profit before tax	114.674	217.797
Tax	(25.446)	(47.418)
Profit for the year	89.228	170.379
Attributable to:		
Owners of the bank	87.080	173.872
Non controlling interests	2.148	(3.493)
	489.228	170.379
Earnings per share- for profit attributable to the equity holders of the Bank		
Earnings per share – cent	10,2	20,8
Earnings per share-profit after tax from continuing operations attributable to the equity holders of the Bank		
Earnings per share- cent	37,1	57,7

CONSOLIDATED STATEMENT OF CASH FLOWS 31 December 2010

	2010 (€'000)	2009 (€'000)
Cash generated from operation	(305.664)	(328.757)
Tax paid	(49.802)	(79.776)
Net cash from operating activities	(355.466)	(408.533)
Cash flows from investing activities		
Purchase of property and equipment	(31.818)	(42.657)
Purchase of computer software	(10.232)	(11.750)
Purchase of investment property	(13.257)	(8.219)
Proceeds from disposal of property and equipment	692	6.495
Proceeds from disposal of investment property	1.121	580
Purchase of available for sale financial assets	(1.118.474)	(4.236.776)
Purchase of held-to-maturity financial assets	(1.358.538)	(1.140.813)
Proceeds from disposals and redemption of available-for-sale financial assets	2.101.641	3.083.274
Proceeds from redemption of held to maturity financial assets	1.287.861	926.122
Interest received from financial assets	183.612	160.854
Dividend received from financial assets	3.819	7.263
Dividend received from investments in associates	12.829	4.739
Business acquisitions net of cash and cash equivalents acquired	-	4.452
Business disposal net of cash and cash equivalents disposed	246	-
Changes in shareholding in subsidiary companies	(14.937)	(4.637)
Net cash used in investing activities	1.044.565	(1.251.073)
Cash flows from financial activities		
Dividend and capital return by subsidiaries to holders of non controlling interests	(1.317)	(1.270)
Dividend paid	(62.155)	(96.966)
Interest paid on senior debt and loan capital	(68.981)	(65.493)
Share issue costs	(5.166)	(834)
Proceeds from the issue of senior debt and loan capital	318.022	953.858
Repayment of senior debt and loan capital	(1.022.870)	(144.726)
Net cash(used in)/from financial activities	(842.467)	644.569
Effects of exchange rate changes	10.513	1.578
Net decrease in cash and cash equivalents	(142.855)	(1.013.459)
Cash and cash equivalents at begging of year	4.270.313	5.285.772
Cash and cash equivalents at end of year	4.127.458	4.270.313

CONSOLIDATED BALANCE SHEET STATEMENT 31 December 2011

	2011(€'000)	2010(€'000)
Assets		
Cash and balance with Central Bank	1.034.086	713.579
Due from the other banks	689.569	4.696.112
Financial assets at fair value through profit or loss	234.505	229.336
Advances to customers	24.778.623	26.417.333
Debt securities lending	1.769.185	3.960.788
Available-for-sale financial assets	1.791.205	2.278.411
Held-to-maturity financial assets	889.455	1.480.046
Other assets	693.234	535.782
Current income tax assets	59.061	34.056
Deferred tax assets	580.246	127.185
Investments in associates	115.741	113.600
Intangible assets	797.780	1.634.734
Investment property	38.056	68.322
Property and equipment	291.232	291.202
Total assets	33.761.978	42.580.486
Liabilities		
Due to other banks	10.301.370	10.649.850
Customer deposits	20.160.804	25.508.361
Senior debt	376.107	477.637
Loan capital	1.333.727	1.267.931
Other liabilities	557.136	592.516
Current income tax liabilities	14.673	23.203
Deferred tax liabilities	120.621	134.634
Retirement benefit obligations	296.982	284.980
Total liabilities	33.161.420	38.939.112
Share capital and reserves attributable to equity holders of the Bank		
Share capital	1.369.444	834.799
Share premium	2.334.583	2.252.897
Reserves	(3.209.867)	447.815
	494.160	3.535.511
Non-controlling interests	106.398	105.863
Total equity	600.558	3.641.374
Total equity and liabilities	33.761.978	42.580.486

CONSOLIDATED INCOME STATEMENT 31 December 2011

	2010 (€'000)	2010(€'000)
Interest income	1.704.553	1.553.320
Interest expense	(905.867)	(843.777)
Net interest income	798.686	709.543
Fee and commission income	218.660	243.091
Fee and commission expense	(38.959)	(42.610)
Net fee and commission income	179.701	200.481
(Loss)/profit on disposal and revaluation of securities	23.670	49.335
Foreign exchange income	29.927	34.091
Other income	5.314	28.304
Operating income	1.037.298	1.012.410
Staff costs	(390.714)	(386.202)
Depreciation, amortisation and impairment	(56.225)	(56.162)
Administrative expenses	(202.266)	(203.403)
Profit before provision for impairment of advances	388.093	375.987
Provision for impairment of advances	(1.151.112)	(266.146)
IMPRAIRMENTS OF DEBT AND EQUITY HOLDINGS	(2.527.082)	(9.344)
Impairments of goodwill and other intangibles	(820.457)	-
(loss)/Profit before tax	4.100.784	114.674
Tax	454.482	(25.446)
(Loss)/Profit for the year	(3.646.302)	89.228
Attributable to:		
Owners of the bank	(3.650.380)	87.080
Non controlling interests	4.078	2.148
	(3.646.302)	89.228
(Loss)/Earnings per share- for (loss)/profit attributable to the owners of the Bank		
Earnings per share – cent	(246,0)	10,0

CONSOLIDATED CASH FLOWS STATEMENT 31 December 2011

	2011 (€'000)	2010 (€'000)
Cash generated from operation	(4.452.046)	(305.664)
Tax paid	(59.427)	(49.802)
Net cash from operating activities	(4.511.473)	(355.466)
Cash flows from investing activities		
Purchase of property and equipment	(30.486)	(31.818)
Purchase of computer software	(10.514)	(10.232)
Purchase of investment property	(20.879)	(13.257)
Proceeds from disposal of property and equipment	835	692
Proceeds from disposal of investment property	447	1.121
Purchase of available for sale financial assets	(1.102.945)	(1.118.474)
Purchase of held-to-maturity financial assets	(376.799)	(1.358.538)
Proceeds from disposals and redemption of available-for-sale financial assets	1.377.583	2.101.641
Proceeds from redemption of held to maturity financial assets	716.989	1.287.861
Interest received from financial assets	234.922	183.612
Dividend received from financial assets	-	3.819
Dividend received from investments in associates	6.736	12.829
Business disposal net of cash and cash equivalents	36.772	246
Net cash used in investing activities	839.661	1.059.502
Cash flows from financial activities		
Dividend and capital return by subsidiaries to holders of non controlling interests	(1.317)	(1.317)
Dividend paid	-	(62.155)
Interest paid on senior debt and loan capital	(82.698)	(68.981)
Share issue costs	(12.664)	(5.166)
Proceeds from the issue of senior debt and loan capital	68.108	318.022
Repayment of senior debt and loan capital	(117.298)	(1.022.870)
Proceeds from rights issue	488.168	-
Changes in shareholding in subsidiary companies	-	(14.937)
Net cash(used in)/from financial activities	(335.203)	(857.404)
Effects of exchange rate changes	(282)	10.513
Net decrease in cash and cash equivalents	(3.343.891)	(142.855)
Cash and cash equivalents at begging of year	4.127.458	4.270.313
Cash and cash equivalents at end of year	783.567	4.127.458

Appendix 2

Table 1: Probability of Default Results VS Closed Price of Index.

Frequency	2004		2005		2006		2007		2008	
	Probability	close price	Probability	close price	Probability	close price	Probability	close price	Probability	close price
Q1	0.122	€ 2.17	0.226	€ 2.34	0.228	€ 4.42	0.202	€ 8.04	0.184	€ 5.2
Q2	0.293	€ 1.94	0.293	€ 2.43	0.290	€ 4.56	0.273	€ 8.78	0.279	€ 4.64
Q3	0.326	€ 1.96	0.325	€ 2.84	0.34	€ 5.03	0.304	€ 9.6	0.283	€ 3.52
Q4	0.346	€ 1.98	0.346	€ 3.17	0.318	€ 7.26	0.325	€ 9.12	0.333	€ 1.97

Table 2: Probability of Default Results VS Closed Price of Index

Frequency	2009		2010		2011		2012	
	Probability	close price	Probability	close price	Probability	close price	Probability	close price
Q1	0.196	€ 1.47	0.218	€ 2.34	0.213	€ 0.87	0.238	€ 0.238
Q2	0.284	€ 2.11	0.284	€ 2.43	-	-	0.299	€ 0.09
Q3	0.289	€ 2.92	0.315	€ 2.84	0.311	€ 0.35		
Q4	0.334	€ 2.28	0.336	€ 3.17	0.359	€0.297		

Table 3: Results of Probability of Default

Frequency	2004	2005	2006	2007	2008	2009	2010	2011	2012
Q1	0.122	0.226	0.228	0.202	0.184	0.196	0.218	0.213	0.238
Q2	0.293	0.293	0.290	0.273	0.279	0.284	0.284	-	0.299
Q3	0.326	0.325	0.34	0.304	0.283	0.289	0.315	0.311	
Q4	0.346	0.346	0.318	0.325	0.333	0.334	0.336	0.359	

