

**MARMARA UNIVERSITY  
FACULTY OF ECONOMIC AND ADMINISTRATIVE  
SCIENCES  
ACCOUNTING AND FINANCE**

**FORECASTING AND VALUATION FOR  
FINANCIAL INSTITUTIONS**

**Master Thesis**

**METE YÜKSEL**

**ISTANBUL, 2010**

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**Supervisor: JALE ORAN, Associate Professor of Finance**

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Marmara Üniversitesi  
Sosyal Bilimler Enstitüsü Müdürlüğü

Tez Onay Belgesi

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## ABSTRACT

The study aims to guide the way to value a bank starting from the forecasting of key balance sheet and income statement items to boil them down to valuations. Forecasting of the key determinant, the loans, is explained in an SPSS regression model having GDP as the independent variable. Important determinants of bank financials such as structure of funding, impact of duration gap on spread and margin calculations are also analyzed. The data shows how profitability and margins of Turkish banks tend to widen during the easing cycle on the back of a wide difference between the short term duration of liabilities and longer term duration of interest earning assets. There is also empirical forecasting and valuation of major banks listed on the Istanbul Stock exchange integrated with the necessary steps for bank valuation.

As well as analyzing the general concept of valuation, this study emphasises four different methodologies for the banks. The Gordon growth model, dividend discount model, economic value added -- discounted excess return over the cost of equity-- and comparison with peer group multiples. All in all, if the assumptions are well build, forecasts should be close enough to the potential outcome, and if valuation factors in different methodologies are consistent, the results of all valuation methodologies should end up to be more or less parallel to each other. This is also the main argument of the thesis.

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## ABBREVIATIONS

BRSA	Banking Regulatory and Supervisory Agency
C/I	Cost to Income Ratio
CAPM	Capital Asset Pricing Model
CBT	Central Bank of Turkey
CF	Cash Flow
CPI	Consumer Price Index
DCF	Discounted Cash Flows
DDM	Dividend Discount Model
EOP	End of Period
EVA	Economic Value Added
FCFE	Free Cash Flow to Equity
FX	Foreign Exchange
GDP	Gross Domestic Product
IBL	Interest Bearing Liabilities
IEA	Interest Earning Assets
LIBOR	London interbank offered rate.
MCAP	Market Capitalization
NIM	Net Interest Margin
NIS	Net Interest Spread
NOPAT	Net Operating Profit After Tax
NPL	Non Performing Loans
P/B	Price to Book Ratio
P/E	Price to Earnings Ratio
P/L	Profit and Loss Account
PV	Present Value
ROA	Return on Assets
ROE	Return on Equity
SME	Small and Medium Sized Enterprises
YOY	Year-on-Year

## 1. INTRODUCTION

In the past couple of years many foreign banks that wanted to have a foothold in the Turkish market established strategic partnerships, joint ventures and controlling stake acquisitions. The valuations started at the book values and increased up to four times the shareholders equities over time as the number of acquisition targets diminish as well as due to the increasing income generation potentials of the banks. Other than direct investments, portfolio investments of foreign institutions also picked up. As close to half of the Turkish Istanbul Stock Exchange's free float market capitalisation is made up of banks, it is crucial to understand the forecasting and valuation of the banks to figure out where the stock market is heading to. In this study, we will be showing how profitability and growth makes a difference in setting a price for a bank. The valuation and forecasting techniques presented hereby are valid both from a controlling shareholder and from a minority point of view. After providing the details on forecasting we will be analyzing the fundamentals of valuation and key factors affecting the value of a bank. We will also be analysing the whole process relying on the official financial statements of a bank.

In the forecasting section we will be starting from the macro variables to build a model to estimate the key balance sheet figure of a bank, the loans. Using the SPSS program we have run a regression analysis with GDP as the independent variable and the loans as the dependent variable. After testing the model for F values and normality we became confident that 86% of the variation in loans can be explained by quarterly GDP. After having done with balance sheet constituents through linking them to estimated yields on different asset classes and cost of funding we have built the model for the profit and loss accounts.

In the valuation section we have worked through three main valuation models for the banks and also used the relative valuation or the market multiples as a sanity check. The key models we have emphasised are the Dividend Discount Model, Economic Value Added and the Gordon Growth Approach. We have shown in this study that if projections are done profoundly, assumptions in the valuation models are well built and consistent, the results of all valuation models end up to be confirmative of each other.

## 2. FORECASTING THE KEY DETERMINANTS OF A BANK

### 2.1 Operations of a Financial Intermediary

Banks are financial firms and depend on economies of size and gains arising from internalising certain activities rather than relying on market transactions. Banks provide packages of financial services which individuals find too costly to search out, produce and monitor by themselves. Banks are also special as they not only accept and deploy large amounts of uncollateralized public funds in a fiduciary capacity, but also leverage such funds through credit creation. Capital represents a very small fraction of total assets of banks especially when compared to non-financial institutions. A minimum percentage of capital of 8% of assets is equivalent to a leverage ratio (debt/equity ratio) of  $92/8 = 11.5$  which is unsustainable with non-financial institutions. Borrowers would consider it as impairing too much the repayment ability and causing an increase in the bankruptcy risk beyond acceptable levels. The high leverage of banking institutions does not interfere with their functioning because the discipline imposed by borrowers does not apply to depositors who are protected by deposit insurance. Banks require easy and immediate access to financial markets for raising funds as long as the perceived risk by potential lenders remains acceptable. The risks are however made visible and explicit by bank ratings (Machiraju, H.R. 2008).

Commercial banks are institutions which combine various types of transactions services with financial intermediation. Banks provide three types of transactions services. Banks, first, stand ready to convert deposits into notes and coins to enable holders of deposits to undertake transactions in cash. Secondly, bank deposits are used as a means of settling debts. Thirdly, where exchange controls do not exist, banks exchange cash and deposits from one currency into cash and deposits of another currency.

Benefits provided by financial intermediaries consist of reduction of information and transaction costs, grant long-term loans, provide liquid claims and pool risks. Financial intermediaries economize costs of borrowers and lenders. Banks are set up to mobilize savings of many small depositors which are insured. While lending the bank makes a single expert

investigation of the credit standing of the borrower saving on several department investigations of amateur. Financial intermediaries make it possible for borrowers to obtain long term loans even though the ultimate lenders are making only short-term loans. Borrowers who wish to acquire fixed assets do not want to finance them with short-term loans. Although the bank has used depositor's funds to make long-term loans it still promises its depositors that they can withdraw their deposits at any time on the assumption that the law of large numbers will hold. Bank deposits are highly liquid and one can withdraw the deposit any time, though on some kinds of deposits the interest previously earned on it has to be foregone. Finally, banks by pooling the funds of depositors reduce the riskiness of lending. Indirect finance in sum reduces the information and transaction costs of lenders and borrowers, renders deposits liquid and reduces the risk of lending. (Machiraju, H.R. 2008)

## **2.2 Forecasting of Key Variables**

Valuation starts with forecasting the future performance of a bank rather than concentrating on past profitability, past book values or past dividend payout policies. Obviously these items open up the way to judge the future trends but inadequate on their own. Starting by forecasting the performance of each bank to arrive at a conclusion for the whole system, which is the bottom-up approach, may lead to inconsistencies especially on the market share front. That is why it is recommended to apply a top-down approach to the valuation. That requires the analyst to start with macro variables, estimate the overall sector data and ultimately arrive at the performance of the bank subject to analysis.

Virtually all of stock valuation boils down to understanding growth. In particular, we seek to understand how our expectations of growth differ from the expectations embedded in market prices. We are essentially trying to get to the sustainable growth rate because it represents the growth rate the company can sustain if its core efficiencies do not change and if it uses only internal capital (along with a small amount of additional debt to maintain capital structure) to generate the growth. The company may actually grow at a faster rate (which forces the company to raise additional capital and perhaps dilute the company's shares) or at a slower rate (Hoover, S. 2005. p 205).

To estimate future growth, we might rely on historical growth, industry forecasts, and any of a number of other pieces of information that help us to understand where the company is headed. The accuracy and reliability of each of these depend heavily on the company under consideration. Using historical growth to estimate future growth is simple, yet will only provide meaningful results if we believe the company is likely to remain fundamentally unchanged over the next few years (Hoover, S. 2005. pp 206-207).

In our forecasting process graphs should also be used as a sanity check.. It acts to reduce bias. When people make judgmental forecasts from time series, they can study the data in graphical form (as a set of points on a two-dimensional plot of the forecast variable against time) or in tabular form (as a row or column of numbers). Evidence has been accumulating that forecasts from most types of series show less overall error when based on data presented in graphical form. Judgmental forecasts based on trended series presented graphically are much less biased (but no more consistent) than forecasts based on the same data presented tabularly. For example, our publishing editor makes her forecasts from previous sales that are recorded as lists of numbers. Sales of one journal have dropped considerably. Her forecasts for the next few periods are likely to show a fairly consistent continuing decrease but to underestimate its rate. Had the extent of her underestimation been less, she and her publishing manager might have realized that they needed to take more drastic action than they did (e.g., cease to publish the journal rather than try to rescue it). Had the editor forecast from a graphical display of previous sales, she probably would have forecast sales closer to the true underlying trend in the series. She and her manager would then have been likely to act more appropriately (Armstrong, J. Scott 2001, p64).

### **2.3 Growth's Link to Macro Variables**

The growth figures of every sector or industry are somehow related to GDP growth but not as much as it is in the banking sector. Banking sector finances the economy growth. It would be very easy just to derive the loan growth of the year ahead just by plugging in the independent GDP growth forecast to the equation and get to the dependent variable loan/asset growth. The

overall size of the system could be ascertained by the value of financial assets, both in absolute dollar terms and as a ratio of gross domestic product (GDP). Although identifying the absolute dollar amount of financial assets is informative, normalizing financial assets on GDP facilitates benchmarking of the state of financial development and allows comparison across countries at different stages of development (World Bank . 2005).

There is also a qualitative touch which cannot be simply derived from a regression equation but requires the analyst to communicate with the top managements on their future plans. This is particularly important for outlier years such as 2009. Therefore pure reliance on macro variables might be misleading and it is vital to know the strategies of top players in the system not to end up with material mistakes.

## **2.4 Forecasting the Balance Sheet Figures**

There are a variety of ways in which we might forecast the financial statements of the company, but the most common technique involves first forecasting sales (loan growth in the case of a bank) and then forecasting the other variables based on the expected relationship between them and sales (Hoover, S. 2005. p 212). However in banks before estimating the top-line as suggested by Hoover (2005), we need to forecast the underlying macro variable's growth.

Balance sheet and particularly loan growth is the key parameter we need to estimate to ultimately arrive at margins and profitability. Taking into account the macro variables, considering the strategic plans of the top players and taking into account sensitivities of the dependent variables to the independent factor, which is essentially the GDP in our study, analyst arrives at loan growth forecasts for the periods ahead.

The next step after setting aside the forecasts of the key balance sheet figures, it is time to distribute this aggregate figure to the bank/banks we are making the analysis for. Existing market share level is a good starting point which can be shaped taking into account short term and long term lines of attack of the individual banks. These are generally derived through

qualitative guidance such as Akbank's decision of following a conservative stance in lending to small and medium sized enterprises in 2009. Therefore a slight market share loss was inevitable for Akbank, though as it maintains its long term plan of being the market leader, it is inevitable for the Bank to become aggressive in the longer run. Therefore any market share loss in the near future are set to be compensated going forward. These are the qualitative data inflows that should be converted into intuitive market share decisions to be used in our model after completing the study on the estimated balance sheet and P/L for the aggregate banking system. The forecasting process can be divided into a number of stages (Armstrong 1985) comprising formulation of the forecasting problem, choice of method, application of method, comparison and combination of forecasts, assessment of uncertainty in forecasts, adjustment of forecasts, and evaluation of forecasts. Each of these stages may be carried out sub-optimally, and each involves judgment to some extent. All of them could benefit from improved judgment. (Armstrong, J. Scott 2001. p 59)

#### **2.4.1 Regression Analysis of GDP and Lending**

By far the leading indicator in estimating lending expansion is the sequence of the GDP as a flow figure. As the general loan level of the system is indicated in local currency that tends to soar at times of high inflation/high rates and depresses when the inflation/interest rates are low, rather than using multiple independent variables such as real GDP and inflation rate, running a regression model based on nominal GDP should be preferred. Another choice would be adjusting the loans for the inflation rate to arrive at the real (inflation adjusted) numbers, which would be time consuming. In the rational-actor model underlying mainstream principles texts, buyers and sellers of financial assets, such as bank loans and shares of stock, follow unambiguous and rational decision rules in making economic choices. The "correct decision" is knowable and grounded in stable fundamentals from the real sector. Mainstream texts acknowledge that the "real world" is more uncertain and complex than suggested by perfect information models (Cohn, Steven Mark. 2006. p.170). In other words there can be many unexpected events that may lead to lending expansion to a state that cannot be estimated by the expected macro variables. Assessing financial stability is a complex process. In practice, the assessment requires several iterations. For example, the effects of the financial system on

macroeconomic conditions may produce feedback effects on the financial system. The profile of risks and vulnerabilities (ascertained through macro-prudential surveillance) could feed into qualitative assessments of effectiveness of supervision, and those effects, in turn, might influence the analysis of vulnerabilities and overall assessment of financial stability (World Bank. 2005. p 62).

Fast GDP growth without some degree of balanced asset augmentation may also be difficult to sustain (Thomas, Vinod. 2000 p.65). When we talk about the asset augmentation, the financing is done through two ways, through capital or borrowing from the financial intermediaries, which brings us to the relationship between loans and GDP. These are nominal GDP figures showing goods and services produced in a three month term, which includes the impact of inflation. Loans is the stock lending figure of the banking system also in nominal terms.

<b>TRLmn</b>	<b>Quarterly Nominal GDP</b>	<b>Loans</b>
2002/12	100,054	47,334
2003/03	98,040	55,569
2003/06	105,709	54,032
2003/09	128,512	58,519
2003/12	122,519	66,743
2004/03	119,502	73,063
2004/06	130,999	87,406
2004/09	157,690	93,725
2004/12	150,842	101,578
2005/03	141,086	106,690
2005/09	181,572	142,088
2005/12	172,510	159,553
2006/03	160,073	174,961
2006/06	183,652	207,403
2006/09	213,295	212,515
2006/12	201,371	224,239
2007/03	187,951	235,471
2007/06	203,280	251,290
2007/09	232,257	264,591
2007/12	219,691	286,634
2008/03	215,562	318,398
2008/06	239,436	343,439
2008/09	262,384	365,487
2008/12	232,717	371,075
2009/03	209,781	369,225
2009/06	228,948	373,964
2009/09	262,229	374,091



TRLmn	Quarterly Nominal GDP	Loans
2009/12	253,015	400,510
2010/03	274,855	420,222
2010/06	280,516	455,039
2010/09	286,177	473,026

**Table 1:** Quarterly Nominal GDP and Loans

**Source:** CBT, BRSA

When we plug in this data to the SPSS regression model setting GDP as the independent variable and loans as the dependent variable, we attain the following results. Correlation between the two series is a strong 96%. In other words, a hefty 92% of the variation in loans can be explained by the variation in GDP.

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,958 <sup>a</sup>	,919	,916	40563,49998

a. Predictors: (Constant), GDPQuarterly

b. Dependent Variable: Loans

**Table 2:** Correlation Between Loans and GDP

We are testing the accuracy of our regression model with an F test.

**H<sub>0</sub>**=The independent variable is statistically irrelevant in explaining the dependent variable.

**H<sub>1</sub>**=The independent variable is statistically relevant in explaining the dependent variable.

As the F value is a high 371,939 and significant p is 0,000 that is below the 0.05 threshold we reject the H<sub>0</sub> hypothesis and conclude that the independent variable has a positive contribution in explaining the dependent variable.

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,120E11	1	6,120E11	371,939	,000 <sup>a</sup>
	Residual	5,430E10	33	1,645E9		
	Total	6,663E11	34			

a. Predictors: (Constant), GDPQ

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,120E11	1	6,120E11	371,939	,000 <sup>a</sup>
	Residual	5,430E10	33	1,645E9		
	Total	6,663E11	34			

a. Predictors: (Constant), GDPQ

b. Dependent Variable: Loans

**Table 3: ANOVA for Loans and GDP**

To built the model to estimate loans through estimated quarterly nominal GDP figures we need a constant and a dependent multiplier from the unstandardized coefficients table. Our equation for this data set is:

$$Y = -182,765 + x * 2.37$$

or

$$\text{Dependent Variable} = -182,765 + \text{Independent Variable} * 1.2.37$$

or

$$\text{Loans} = -182,765 + \text{Quarterly Nominal GDP} * 2.37$$

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-182765,391	21589,161		-8,466	,000
	GDPQuarterly	2,373	,113	,958	19,286	,000

a. Dependent Variable: Loans

**Table 4: Generating the Regression Formula**

**Residuals Statistics<sup>a</sup>**

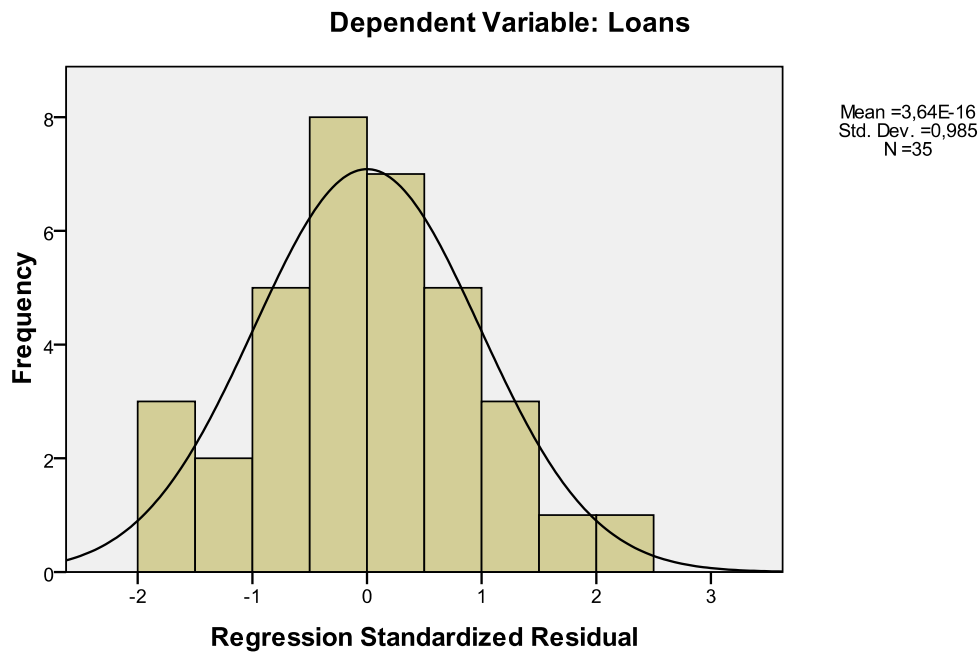
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-31858,7813	438964,8125	212041,1143	1,34163E5	35
Residual	-69618,54688	96233,35156	,00000	39962,52602	35
Std. Predicted Value	-1,818	1,691	,000	1,000	35
Std. Residual	-1,716	2,372	,000	,985	35

a. Dependent Variable: Loans

**Table 5: Residuals Statistics**

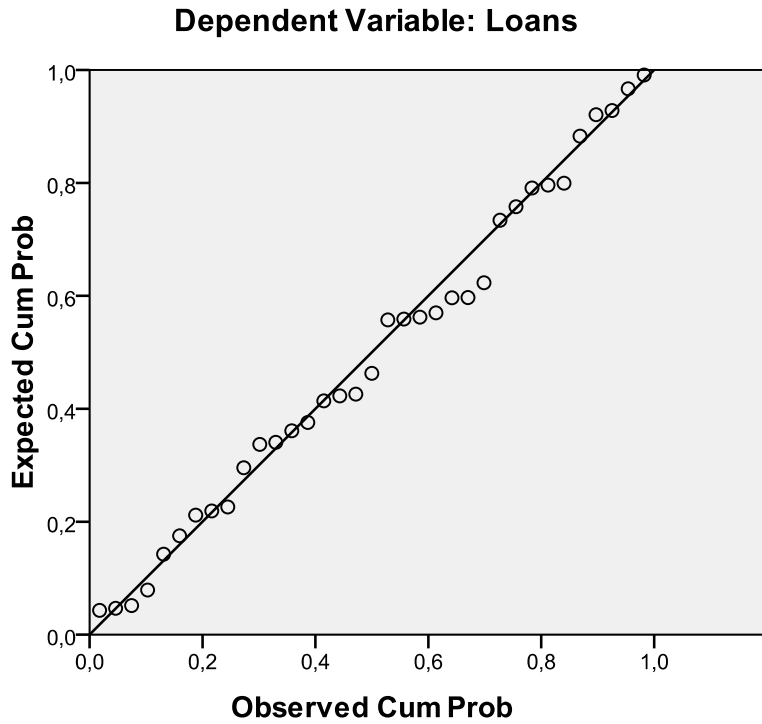
While the histogram shows that the dependent variable loans is normally distributed, we also double check the issue through a Normal P-P plot. This method consists of plotting the points  $(\Phi(z_{(k)}), p_k)$ , where  $z_{(k)} = \frac{(x_{(k)} - \hat{\mu})}{\hat{\sigma}}$ . For normally distributed data this plot should lie on a 45° line between (0,0) and (1,1). As seen on the chart below points are plotted more or less on the line.

**Histogram**



**Figure 1: Histogram of Regression Standardized Residual**

## Normal P-P Plot of Regression Standardized Residual



**Figure 2:** Normal P-P Plot of Regression Standardized Residual

We will continue our forecasts by starting from the macro assumptions, which will be used in estimating the key variables on the balance sheet. We have taken the macro assumptions from EFG Istanbul Securities. The major points in the macro estimations are; the GDP is expected to increase by 6.3% in 2010 parallel to his normalised sustainable level of 5%. Inflation rate is estimated to be 7.3% in 2010 and then normalise to 5% levels in the long run. The year-end USD exchange rate is assumed to be TRL1.55 and strengthen a tad in the year ahead.

	2007	2008	2009F	2010F	2011F
GDP (TRL bn)	843.2	950.5	954.0	1099.1	1238.2
GDP (US\$ bn)	648.4	732.0	616.7	723.1	809.2
GDP Growth (yoy)	4.7%	0.7%	-4.7%	6.3%	5.0%
TRL/US\$ (level, eop)	1.1593	1.5218	1.4873	1.5500	1.5000
TRL/US\$ (yoy change, eop)	-17.5%	31.3%	-2.3%	4.2%	-3.2%
TRL/US\$ (level, ave)	1.3004	1.2985	1.5469	1.5200	1.5300
TRL/US\$ (yoy change, ave)	-9.0%	-0.1%	19.1%	-1.7%	0.7%
CPI Inflation (eop)	8.4%	10.1%	6.5%	7.3%	6.8%
CPI Inflation (ave.)	8.8%	10.4%	6.3%	8.4%	6.8%
PPI Inflation (eop)	5.9%	8.1%	5.9%	8.5%	7.8%
PPI Inflation (ave)	6.3%	12.7%	1.2%	8.4%	7.3%
CBT Policy Rate, O/N (eop)	15.8%	15.0%	6.5%	7.0%	8.5%
CBT Policy Rate, O/N (ave)	17.2%	16.0%	8.8%	6.8%	7.8%
Yield on Benchmark Bond (eop)	16.6%	16.5%	9.1%	9.0%	10.0%
Yield on Benchmark Bond (ave)	18.3%	19.3%	11.6%	8.8%	9.8%

**Table 6: Macroeconomic Forecasts**

**Source:** TURKSTAT, CBT, Turkish Treasury

Under the light of above mentioned macroeconomic variables we have estimated the below mentioned interest rates for key interest earning assets and interest bearing liabilities. These numbers will be linked to our balance sheet forecasts to end up with profound income statement forecasts. The future performance of the banks and their net interest margins and spreads are very much related to the accuracy of these estimates.

TRLmn	Quarterly Nominal GDP	Loans	YoY Loan Growth
4Q10	291,839	508,893	27%
1Q11	297,500	522,310	24%
2Q11	308,068	547,355	20%
3Q11	318,635	572,400	21%
4Q11	329,203	597,446	17%
1Q12	339,770	622,491	19%
2Q12	348,923	644,183	18%
3Q12	358,076	665,874	16%
4Q12	367,228	687,566	15%
1Q13	376,381	709,257	14%
2Q13	385,531	730,945	13%
3Q13	394,682	752,632	13%
4Q13	403,833	774,319	13%

TRLmn	Quarterly Nominal GDP	Loans	YoY Loan Growth
1Q14	412,984	796,006	12%
2Q14	422,482	818,518	12%
3Q14	431,981	841,030	12%
4Q14	441,480	863,542	12%
1Q15	450,978	886,053	11%
2Q15	461,351	910,636	11%
3Q15	471,723	935,219	11%
4Q15	482,096	959,802	11%

**Table 7: Loan Growth Estimates Based on Regression Equation**

**Source:** GDP figures are estimates of EFG Istanbul Securities.

## 2.4.2 Funding Structure

One of the key items that determine the profitability and eventually the value of a bank is its funding structure. There are three types of key sources to finance assets. These are deposits, borrowings and shareholders' equity. In Turkey, deposits make up 65% of the balance sheet, which climbs up to 70% if we are to include repo funding. Wholesale funding makes up a mere 12% of the total. This funding structure points to a well diversified and a robust setting as in some emerging market countries such as the ones in the CIS or in the Eastern Europe, the share of wholesale funding (most of which are in the form of syndicated loans and securitizations) makes up a third of the balance sheet.

At times of global crisis such as the one we have experienced in 2009, the banks of these countries run into liquidity crisis as the availability of funding or rolling over the existing syndicated loan becomes totally impossible. That is why the Turkish financial system is much healthier than the peer countries. The sector is simply benefiting from relatively less globalization. Obviously the Turkish banks are not operating in a totally closed economy. They are interacting with their correspondent bank networks especially on the export financing front.

The third largest contributor to funding is the shareholders' equity. In this tight liquidity environment, the last favour a bank can ask to the owners should be fresh cash capital. Roughly 10% of the balance sheets are being funded through capital equity. The capital

adequacy ratio of the system is currently 17% as government bonds and obviously the cash has zero risk weighting. If it was not deferred perpetually the Basel II practice was going to start at the beginning of 2009 and with the change in the risk weighting of FX government securities from 0% up to 100% due to low sovereign risk weighting of the Country together with other risk weighting increases on lending to other banks, the capital adequacy ratios were going to come down by up to 5 percentage points under the standard approach. As the Basel I practice is going to be in place for now but the banks raised some cash capital in the first half of 2008 assuming that Basel II will start on time, Turkish banks entered the crisis as the most strongly capitalized banks globally. Although normally in our dividend discount model valuation we were suggesting the highest dividend amount possible should be distributed, while keeping the capital adequacy ratio above 12%, unique regulatory changes should also be kept in minds while constructing our models. Specifically for 2009, the banking watchdog BRSA (Banking Regulatory and Supervisory Agency) has suggested the banks not to distribute any dividends out of their 2008 earnings and put some caps to dividends from 2009 profits. Although such precautions do not prevent them from paying out any dividends at all it pulls down the amounts that will be paid out.

Net-net on the funding front as might have recalled from the capital asset pricing model (CAPM), financing through equity has the highest cost. The lowest cost and the most profitable financing methodology is through syndicated loans. The banks that generate short FX positions via borrowing in FX at low real interest rates and grant TRY loans can generate even higher net interest margins but obviously that would create severe short position risk which may erode the book values when the local currency loses a bulk of its value, just like the case we are running through nowadays. Thanks to their experience from the 2001 crisis, all banks that generated the short FX positions on their balance sheets totally covered them mostly with off-balance sheet swap contracts as well as forwards done with credible on-shore banks to end up to almost zero short FX position in net terms. In other words Turkish Banks are not directly exposed to short FX position risk, but they are exposed to risk of credit quality worsening through companies they are lending FX loans to.

## 2.5 Yields on Different Asset Classes

### 2.5.1 Net Interest Margin

Net interest income which is the difference between interest income and interest expense is the principal determinant of the profitability of banks. Net interest income is determined by interest rates on assets and paid for funds, volume of funds and mix of funds (portfolio composition). Changes in interest rate affect the net interest income. Whenever rate of interest conditions attaching to assets and liabilities diverge, then changes in market interest rates will affect bank earning. If a bank attempts to structure its assets and liabilities to eliminate interest rate risk, the profitability of the bank would be impaired.

A bank may borrow short and lend long. The mismatch of assets and liabilities gives rise to interest rate risk. In such a case a rise in interest rates can result in losses for the bank. A bank has also to take into account the preferences of its constituents. They may want long-term deposits when the bank wants to issue short-term deposits; and loan customers may want fixed interest loans when the bank wants to increase the amount of interest sensitive assets. Each bank through its choice from different types of assets and liabilities can alter the structure of its balance sheet in order to increase or decrease interest rate exposure. In order to limit interest rate risk banks in US and Eurodollar market have substituted during the last three decades variable interest rates for fixed interest rates across much of their lending. Lending at variable rates such as LIBOR which varies in line with short-term market rate helped in aligning them closely with rates paid by the bank on the bulk of liabilities (Machiraju, H.R. 2008. p190).

The most important interest earning asset class of a bank is the loans that make up around 55% of the assets followed by securities constituting 30% of the total. Not all loan types have similar yields. One bank can be aggressive in credit cards, which are by far the highest yielding loan segment while one may prefer sticking to long term hard currency denominated low yielding project financing deals to preserve asset quality. These decisions are the outcomes of a bank's aggressiveness. The banks taking a higher risk are expecting to deliver a



higher net interest margin that surpasses the cost of risk, which are the provisions set aside for problematic loans as a percentage of average loans. This is consistent with the findings of Petersen and Rajan (1994), who posit that adverse selection and moral hazard have more influence on small and young corporate borrowers. Similarly, Sufi (2006) finds that when the borrower is more informationally opaque, syndicates are more concentrated and reports weak evidence that spreads are higher (Chen, Andrew H. 2008. p92).

Loan size is viewed as an important determinant of loan yield spreads. Larger loans are more likely to be associated with large borrowers, for whom more information is available. This strategy of a bank can be followed from past trends but communication with the management is again very crucial as some banks, which used to be the banks of large borrowers in the past, switched rapidly to high yielding retail banking over time. All in all, it is crucial to correctly figure out which loan types or asset classes such as securities or cash the bank will lay a greater emphasis in the years ahead. It should also be taken into consideration that the banks with a more aggressive line of attack are the candidates that will end up setting aside the highest amount of loan loss provisions as well. Also, the highest yielding asset class, the credit card business, needs so much of an operating expense outflow and higher specific provisions. Therefore higher net interest margin does not necessitate a higher profitability on the bottom-line. In theory, the potential for credit risk diversification for banks can be considerable. Insofar as different industries or sectors are more or less procyclical, banks can alter their lending policy and capital allocation across those sectors. Similarly, internationally active banks are able to apply analogous changes across countries. In addition to such passive credit portfolio management, financial engineering— using instruments such as credit derivatives— enables banks (and other financial institutions) to engage in active credit portfolio management by buying and selling credit risk (or credit protection) across sectors and countries (Carey, Mark. 2007. p431).

As seen in the chart below, large corporates (bluechips) manage to borrow at rates way below the SMEs, unsecured credit card loans on the other hand traditionally yield the highest rates in the market due to their high cost of risk. If risk is managed well, as banks depart from government bond holdings and lending to bluechip companies has the potential to maximise

their returns. During times of downturns, the banks that prefer safer asset allocation strategies end up to be the winners, but they end up to be the major market share losers during bull markets.

	TL Deposits	FX Deposits	TL Bond	Eurobond 2030	Mortgage Loans	Car Loans	Cons. Loans	Credit Cards	SME Loans	Blue- chips	Commercial
1Q04	23%	2.5%	22%	8.0%	28%	28%	33%	113%	33%	22%	27%
2Q04	23%	2.5%	28%	10.1%	31%	31%	34%	113%	34%	28%	31%
3Q04	22%	2.5%	24%	8.4%	27%	28%	34%	113%	34%	24%	29%
4Q04	21%	2.5%	20%	7.9%	22%	24%	30%	107%	30%	20%	25%
1Q05	19%	2.5%	17%	8.7%	20%	21%	29%	104%	29%	17%	23%
2Q05	20%	3.0%	17%	8.0%	17%	19%	27%	101%	27%	17%	22%
3Q05	20%	3.0%	15%	7.7%	16%	17%	24%	97%	24%	15%	19%
4Q05	19%	3.0%	14%	7.6%	14%	15%	20%	93%	20%	14%	17%
1Q06	18%	3.0%	14%	7.2%	14%	14%	20%	80%	20%	14%	17%
2Q06	19%	3.0%	21%	8.4%	21%	21%	25%	76%	25%	21%	23%
3Q06	21%	3.0%	22%	7.5%	25%	25%	28%	75%	28%	24%	26%
4Q06	20%	3.1%	21%	7.3%	24%	24%	27%	71%	25%	22%	24%
1Q07	19%	4.4%	20%	7.2%	22%	23%	25%	68%	24%	21%	23%
2Q07	18%	4.4%	18%	7.3%	17%	20%	25%	66%	23%	19%	21%
3Q07	18%	4.3%	17%	7.4%	17%	19%	25%	65%	25%	18%	21%
4Q07	18%	4.2%	17%	7.5%	17%	19%	24%	64%	24%	18%	21%
1Q08	16%	3.3%	18%	7.4%	19%	21%	27%	59%	27%	20%	23%
2Q08	17%	3.1%	22%	7.9%	24%	27%	34%	59%	27%	25%	26%
3Q08	18%	3.4%	19%	7.6%	21%	23%	29%	59%	27%	21%	24%
4Q08	18%	4.2%	17%	7.7%	18%	22%	25%	52%	27%	19%	23%
1Q09	13%	2.9%	14%	8.4%	18%	22%	25%	52%	27%	18%	23%
2Q09	11%	2.7%	13%	7.0%	17%	21%	24%	47%	27%	17%	22%
3Q09	10%	2.1%	9%	6.4%	14%	18%	21%	42%	24%	13%	19%
4Q09	8%	2.0%	9%	6.2%	12%	15%	18%	39%	21%	12%	16%
1Q10	8%	2.0%	9%	6.1%	12%	14%	17%	35%	20%	12%	16%
2Q10	8%	2.3%	8%	6.0%	11%	14%	16%	34%	18%	11%	15%
3Q10	8%	2.3%	8%	6.0%	11%	13%	15%	32%	16%	11%	15%

**Table 8:** Interest Rates on Key Balance Sheet Items

**Source:** CBT, BRSA, The Banks Association of Turkey

To have a simple set of assumptions regarding future yields of these key balance sheet items and cost of deposits initial estimation that should be made is estimating the benchmark bond yield. As we are the end users of this data we will not be going into the details to assess these numbers through macroeconomic models but rather rely on the estimations of a leading economist instead. It is then a straightforward process to link the estimated bond yields to different interest rate classes to end up with interest rate estimations from deposits to loans.

## Interest Rate Forecasts on Key Balance Sheet Items

	TL Deposits	FX Deposits	TL Bond	Eurobond 2030	Mortgage	Car Loans	Cons. Loans	Credit Cards	SME Loans	Blue- chips	Commercial
4Q10	9%	2.3%	9%	6.0%	11%	14%	16%	31%	20%	11%	15%
1Q11	9%	2.5%	10%	6.0%	12%	15%	17%	32%	21%	12%	16%
2Q11	10%	2.5%	10%	6.0%	13%	15%	18%	34%	22%	13%	17%
3Q11	10%	2.5%	10%	6.0%	13%	15%	18%	34%	22%	13%	17%
4Q11	10%	2.5%	10%	6.0%	13%	15%	18%	34%	22%	13%	17%
1Q12	10%	2.5%	10%	6.0%	12%	15%	18%	34%	22%	13%	17%
2Q12	10%	2.5%	10%	6.0%	12%	15%	18%	33%	21%	12%	17%
3Q12	9%	2.5%	10%	6.0%	12%	15%	18%	33%	21%	12%	17%
4Q12	9%	2.5%	10%	6.0%	12%	15%	17%	33%	21%	12%	17%
1Q13	9%	2.5%	10%	6.0%	12%	15%	17%	32%	21%	12%	16%
2Q13	9%	2.5%	9%	6.0%	12%	14%	17%	32%	21%	12%	16%
3Q13	9%	2.5%	9%	6.0%	12%	14%	17%	32%	20%	12%	16%
4Q13	9%	2.5%	9%	6.0%	12%	14%	17%	31%	20%	12%	16%
1Q14	9%	2.5%	9%	6.0%	11%	14%	16%	31%	20%	12%	16%
2Q14	9%	2.5%	9%	6.0%	11%	14%	16%	31%	20%	11%	15%
3Q14	9%	2.5%	9%	6.0%	11%	14%	16%	30%	19%	11%	15%
4Q14	9%	2.5%	9%	6.0%	11%	13%	16%	30%	19%	11%	15%
1Q15	8%	2.5%	9%	6.0%	11%	13%	16%	30%	19%	11%	15%
2Q15	8%	2.5%	9%	6.0%	11%	13%	16%	29%	19%	11%	15%
3Q15	8%	2.5%	9%	6.0%	11%	13%	15%	29%	18%	11%	15%
4Q15	8%	2.5%	8%	6.0%	10%	13%	15%	29%	18%	11%	14%

**Table 9:** Interest Rate Forecasts on Key Balance Sheet Items

**Source:** Benchmark bond yield projections are taken from EFG Istanbul Securities.

### 2.5.2 Interest Rate Sensitivity

Yield curve plays an important role in interest rate risk management. Banks accept interest rate risk and maintain a slight liability sensitive position (rate sensitive assets less than rate sensitive liabilities). The interest sensitivity position of a bank is usually measured by its gap, which is defined as the difference between the volume of interest sensitive assets and liabilities. Interest sensitive assets and liabilities are those whose earnings or costs change with the general movement of interest rates within a predetermined period. The analysis emphasizes profitability and costs of assets and liabilities rather than the value of those assets and liabilities. It analysis measures the difference between bank's assets and liabilities and off balance sheet positions which will be repriced or will mature within some planning horizon. To manage interest rate risk through the maturity or funding gap the direction of future interest rates has to be forecast and assets and liabilities have to be shifted. A defensive strategy would balance the amount of interest rate sensitive assets with interest rate sensitive liabilities.

Interest income and interest expense are expected to rise and fall together with changing interest rates. When maturity of assets is one day, liabilities 30 days and planning horizon 30 days an increase in interest rates would lead to repricing of assets but liabilities would reprice only after 30 days. Conversely, a decrease in interest rate would result in an immediate decrease in earnings on assets but the cost of funds would decrease only after a time lag (Machiraju, H.R. 2008. p191).

A bank's margins which is the leading factor generating the profitability is directly linked to its asset and liability structure. Higher the risk a bank takes, higher the margins. The difference between spread and margin is that margin takes the net interest income as the nominator and simply divides it to interest earning assets, without caring about the size of the interest bearing liabilities. It is a simple method that shows return on interest earning assets but certainly not a profound methodology. Net interest spread on the other hand takes into account the gross yield on interest earning asset and gross cost of interest bearing liabilities and calculate the difference between the costs and yields accordingly. If we are to put what we have said up until now into numbers;

Net Interest Margin: NIM

Net Interest Spread: NIS

IEA: Interest Earning Assets (Loans, bond investments, receivables from other banks)

IBL: Interest Bearing Liabilities (Deposits, repos, borrowings)

$NIM = (\text{Interest Income} - \text{Interest Expenses}) / \text{IEA}$

$NIS = (1 + \text{Interest Income} / \text{IEA}) / (1 + \text{Interest Expenses} / \text{IBL}) - 1$

### **2.5.3 Duration Gap Influence on the Margins**

In estimating the margins and spreads the analyst should also take into account the time to repricing of the assets and the liabilities. The banks that are running wide duration mismatches benefit from the easing cycle like the one we had been through in 2009. The Banks that funded themselves through the shortest duration possible and allocated these funds into the longest duration loans and fixed rate securities had their NIMs increasing faster than the rest. Duration

measures the interest rate risk of a financial instrument. It shows the relationship between the change in value of a financial instrument and change in the general level of interest rates. The average amount of time required by an asset holder for recovering the discounted value or present value of all cash flows (principal and interest) can be estimated with the help of duration analysis. Duration gap analysis emphasises the balance between the duration of assets and liabilities with a view to avoid the effect of interest rate changes on the value of the firm. Duration of an asset is the weighted value of all of the cash flows that it will produce with each cash flow weighted by the time at which it occurs. It is weighted average maturity of an instrument's cash flows where the present value of the cash flow serves as the weight.

	<b>Adjusted* Time to Repricing of Assets &amp; Liabilities (months)</b>			<b>% More than 1 Year**</b>	
	<b>Assets</b>	<b>Liabilities</b>	<b>Net Mismatch</b>	<b>Assets</b>	<b>Liabilities</b>
ISCTR	7.3	2.9	4.4	39%	25%
HALKB	4.7	1.7	2.9	30%	22%
YKBNK	7.9	5.0	2.8	47%	32%
GARAN	5.0	3.0	2.0	33%	29%
VAKBN	3.7	1.9	1.8	27%	25%
AKBNK	4.9	3.1	1.7	27%	26%
TEBNK	6.0	4.7	1.3	38%	32%
TSKB	3.3	2.5	0.8	17%	19%
<b>Weighted Avg.</b>	<b>5.7</b>	<b>3.0</b>	<b>2.7</b>	<b>33%</b>	<b>27%</b>

Source: Bank Financials, EFGI Estimates

\* Post off-balance adjustments. Long term IEAs are reduced by the amount of free funds (free capital & demand deposits & other free funds).

\*\* Percentage of assets and liabilities with more than 1 year to repricing including non-interest earning/bearing part.

**Table 10:** Adjusted Time to Repricing of Assets and Liabilities

**Source:** The BRSA

The Banks with wider duration gaps managed to increase their margins relatively faster than the rest during the easing cycle. However, on the other way around if we are to expect the hiking cycle, bulk of these margins can be eroded. We have adjusted the repricing of assets and liabilities chart below for free capital. In other words we have pulled down the long end of the interest earning assets by the amount of capital net of fixed assets and subsidiaries. The banks with a higher free capital like Akbank has a tighter 1.7 months of duration gap, meaning that during a general rise in the interest rates it will take 1.7 months for the interest earning assets to catch up with the already increased funding costs. However Isbank with a lower free capital and longer term interest earning assets has a wide 4.4 months of gap. That is why the Bank had its NIM increasing by the highest margin during the period of rate cuts in 2009.

## 2.6. Non-Interest P/L Items

### 2.6.1 Cost of Risk

Credit quality, which is followed through the ratio of problematic loans to total lending (NPL ratio), and the provisions set aside for these loans under follow up is the leading indicator showing the prudence of a bank especially during times of crisis. Banks assume credit risk when they act as intermediaries of funds and credit risk management lies at the heart of commercial banking. The business of banking is credit and credit is the primary basis on which a bank's quality and performance are judged. Studies of banking crises show that the most frequent factor in the failure of banks has been poor loan quality. The credit risk management process of a bank is believed to be a good indicator of the quality of the bank's loan portfolio. Among the transactions risk the most important are liquidity risk and credit risk. Banks are successful when the risks they take are reasonable, controlled and within their financial resources and competence. C R Credit risk covers all risks related to a borrower not fulfilling his obligations on time. Even where assets are exactly matched by liabilities of same maturity, the same interest rate conditions and the same currency, the only on balance sheet risk remaining would be credit risk. Credit risk exposure is measured by the current mark to market value. The magnitude of credit risk depends on the likelihood of default by the counter party, the potential value of outstanding contracts, the extent to which legally enforceable netting arrangements allow the value of offsetting contracts with that counter party to be netted against each other or the value of the collateral held against the contracts (Machiraju, H.R. 2008. P216).

Even the most risky and high yielding loans do not happen to be a cause for concern at times of robust macro growth. The banks that are strongly capitalised and prefer conservative booking set aside 100% provision coverage for the loans under follow-up immediately when a loan is not collected for more than 90 days, while some of the banks prefer the set aside provisions only for the portion required by the banking regulator. The banks in this second group first deduct the collateral taking into account the ease of cash conversion, and set aside provision for the rest. For example, if a bank has cash collateral (demand deposit of a company) against a certain loan, it does not have to set aside any provision for that loan at all

if it becomes problematic. Obviously this is an arbitrary case. On the other extreme a loan with no collateral at all should be totally provisioned for when it becomes problematic. The risk to the erosion of the book values is higher for the banks that are under-provisioned.

As we have analysed in the funding structure section the banks are exposed to foreign currency risk indirectly through the companies that are using these funds. Banks lend foreign currency indexed loans to companies with foreign currency revenues and the exporting companies. These companies do not use financial hedge contracts claiming that they are naturally hedged against the sharp movements of the currency because of the structure of their business. However when the 30% decline in the value of the TRY took place concurrently with the global slowdown, the lack of demand for the export products virtually came to a hold in the final quarter of 2009. This unexpected negative development ended up to be an increased demand from such companies for their loans being restructured by the banks. Banks are positive to such restructurings as when a loan is being restructured and followed under a problematic loan account for 6 months with 15% of the total collected, these loans are being transferred to the active loans account and the provisions set aside for them are being released. These released provisions help banks to solidify their capital adequacies and also the shareholder value via supporting the equities. The book value is the top determinant in bank valuation.

In the forecasting of provisioning needs, past practices and risk level of asset allocation are the starting points. The banks with a higher emphasis in credit card business has a lower asset quality than a bank that prefers lending to corporates to finance their investments as the NPL ratio of credit cards is 11%, while it is less than 1% for FX loans. Changing provisioning policies also matter in projecting the impact of asset quality on financials. Some banks that used to set aside full provisions for problematic loans start cutting down the provisioning level just to maintain a capital adequacy level above the legal threshold. We are following the provision expenses through the ratio of provision expenses (specific+general) to average loans, which we call the cost of risk.

## Cost of Risk Calculations – Akbank Sample

Quarterly Provision Expenses	3Q08	4Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10
<b>Specific Provisions for Loans and Other Receivables</b>	<b>254</b>	<b>316</b>	<b>430</b>	<b>248</b>	<b>213</b>	<b>102</b>	<b>131</b>	<b>91</b>
Tier I NPL	261	257	421	230	191	84	117	82
Tier II NPL	-9	54	9	16	18	12	10	6
Tier III NPL	2	5	1	2	4	6	3	4
<b>General Provisions</b>	<b>7</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>37</b>
<b>Discretionary Reserves</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>110</b>	<b>60</b>	<b>0</b>
<b>Impairment Losses on Securities</b>	<b>2</b>	<b>-4</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>-2</b>	<b>3</b>	<b>-3</b>
Trading Securities	-1	-3	0	0	1	-1	0	0
AFS	3	-1	0	0	1	-1	3	-3
<b>Impairment Losses on Associates, Subsidiaries and</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>-1</b>	<b>12</b>	<b>1</b>	<b>21</b>	<b>-3</b>
Associates	0	0	0	0	0	0	0	0
Subsidiaries	0	0	0	0	0	0	0	0
Joint Ventures	0	0	0	0	0	0	0	0
HTM	0	4	1	-1	12	1	21	-3
<b>Others</b>	<b>7</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>-5</b>	<b>1</b>	<b>1</b>	<b>0</b>
<b>Total</b>	<b>275</b>	<b>353</b>	<b>436</b>	<b>253</b>	<b>223</b>	<b>212</b>	<b>255</b>	<b>122</b>
Cost of Risk (Specific+General Provisions/Avg. Loans)	2.1%	2.8%	3.6%	2.2%	1.9%	0.9%	1.5%	1.0%

**Table 11:** Sequence of Akbank's Cost of Risk

### 2.6.2 Fee Generation

Following net interest income, the second top contributor to P/L is the fee generation that is very much related with lending and especially with the credit card business. For the top banks around 40% of gross fees stem from the credit card business, while the other top contributors are asset management (15%), cash & non-cash lending (15%), asset management (15%) and bankassurance (5%). The total share of money transfer and account management fees is a mere 10% in total fee generation. We prefer linking the fee generation to average loans all else being equal and this gives a very close estimate of what this figure can end up to be in the years ahead. Trying to figure out the contribution of each loan segment to the overall fee generation is much too time consuming with an immaterial difference as compared to using average loans as the denominator.

### 2.6.3 Operating Expenses

Operating expense increase is very much linked to loan growth with the exception of years of crisis. In such periods, even if the loans do not bestow a single percentage point of growth, the operating expenses tend to increase at least at the level of inflation as the salaries and rents of branch premises are somewhat linked to the inflation rate. Credit card loyalty programs and advertisement expenses are the other contributors that are not inflation related and hence can



be cut down at times of downturns or can be increased dramatically at times of boom. The cut in advertising budgets is not an outcome of a crisis only on banks but it is done by all the economic actors. That is why the ad market and media related companies face the downturn before other participants of the services sector. Close to half of the operating expenses stem from personnel costs, while the other half is made up of SDIF (Savings Deposits Insurance Fund premiums, custody expenses, branch levies, rent and other general and administrative costs).

### Operating Expense Breakdown

Period	2008/09	2008/12	2009/03	2009/06	2009/09	2009/12	2010/03	2010/06
<b>AKBNK</b>								
Total	100%	100%	100%	100%	100%	100%	100%	100%
Personnel Expenses	39%	39%	37%	37%	37%	40%	39%	40%
D&A	5%	4%	6%	6%	5%	5%	5%	5%
Others	56%	57%	58%	57%	57%	55%	56%	55%
<b>GARAN</b>								
Total	100%	100%	100%	100%	100%	100%	100%	100%
Personnel Expenses	38%	50%	42%	33%	40%	45%	40%	39%
D&A	7%	8%	7%	6%	7%	6%	5%	6%
Others	56%	42%	50%	61%	53%	49%	55%	55%
<b>ISCTR</b>								
Total	100%	100%	100%	100%	100%	100%	100%	100%
Personnel Expenses	46%	43%	51%	57%	54%	46%	50%	56%
D&A	5%	7%	7%	6%	7%	7%	7%	6%
Others	48%	49%	42%	36%	40%	47%	42%	38%
<b>YKBNK</b>								
Total	100%	100%	100%	100%	100%	100%	100%	100%
Personnel Expenses	44%	40%	43%	40%	42%	37%	39%	45%
D&A	7%	6%	8%	7%	8%	7%	7%	8%
Others	48%	54%	49%	53%	51%	56%	54%	47%
<b>HALKB</b>								
Total	100%	100%	100%	100%	100%	100%	100%	100%
Personnel Expenses	50%	50%	53%	51%	49%	48%	47%	47%
D&A	5%	5%	5%	5%	5%	5%	5%	6%
Others	45%	46%	42%	45%	46%	47%	48%	48%
<b>VAKBN</b>								
Total	100%	100%	100%	100%	100%	100%	100%	100%
Personnel Expenses	39%	40%	39%	44%	43%	36%	41%	42%
D&A	5%	9%	7%	8%	6%	8%	7%	7%
Others	56%	51%	54%	48%	51%	56%	51%	51%

**Table 12: Operating Expense Breakdown (D&A: Non-cash costs)**

## 2.7 Final Steps to Start Valuation

After estimating the overall sector balance sheet the most important step is to estimate the figures of particular bank. When we are done with estimating the figures for the sector, the individual figures can be attained by linking the overall figure to the assumed market shares of the individual banks.

### 2.7.1 Projecting Key Parameters of a Particular Bank

Under the light of forecasts for the sector, it is time to derive the numbers for individual banks. We picked Akbank in this study as our sample bank. While the past market shares are indicators of the future aggressiveness of a bank, bank specific factors such as the strategy of emphasising asset quality rather than growth in some areas should be taken into consideration. There is no way to link this qualitative information to the model but relying on the company guidance and also considering the line of attacks of the peers help.

AKBNK	Loans	Securities	Deposits	Assets	Mortgages	Car Loans	General Purpose CL	Credit C. Loans
2006/12	13.90%	12.60%	11.49%	12.44%	13.9%	16.7%	12.9%	14.5%
2007/03	14.30%	14.17%	12.04%	12.99%	13.6%	16.3%	12.8%	15.0%
2007/06	14.61%	15.40%	12.75%	13.52%	13.5%	16.1%	13.4%	14.4%
2007/9	13.99%	14.59%	12.43%	12.92%	13.3%	16.2%	12.8%	14.1%
2007/12	14.22%	14.72%	12.22%	12.85%	13.3%	17.3%	12.8%	14.4%
2008/3	14.03%	15.23%	12.69%	13.27%	12.9%	16.6%	12.1%	14.0%
2008/6	14.59%	12.63%	12.54%	13.45%	13.2%	16.7%	11.7%	13.9%
2008/9	13.89%	13.33%	12.51%	13.46%	12.6%	15.8%	10.6%	14.0%
2008/12	13.37%	13.70%	12.70%	13.19%	11.7%	11.1%	9.5%	14.2%
2009/3	12.85%	13.95%	11.87%	12.67%	11.7%	14.1%	9.2%	14.0%
2009/6	12.25%	14.16%	11.88%	12.45%	10.9%	12.3%	8.3%	14.4%
2009/9	11.74%	15.25%	11.98%	12.54%	10.7%	11.2%	8.2%	15.4%
2009/12	11.71%	16.73%	12.02%	12.88%	10.4%	10.0%	8.2%	15.6%
2010/3	11.72%	16.44%	12.14%	12.95%	10.2%	9.5%	8.6%	15.8%
2010/6	11.84%	16.06%	12.61%	12.63%	10.4%	9.3%	8.7%	15.6%
2010/9	11.83%	16.06%	12.61%	12.63%	10.4%	9.3%	8.7%	15.7%
2010/12	11.82%	16.06%	12.61%	12.63%	10.5%	9.4%	8.7%	15.7%
2011/3	11.87%	16.06%	12.61%	12.63%	10.6%	9.4%	8.7%	15.7%
2011/6	11.89%	16.06%	12.61%	12.63%	10.6%	9.5%	8.7%	15.7%
2011/9	11.91%	16.06%	12.61%	12.63%	10.7%	9.5%	8.7%	15.7%
2011/12	11.94%	16.06%	12.61%	12.63%	10.7%	9.6%	8.7%	15.7%
2012/3	11.97%	16.06%	12.61%	12.63%	10.8%	9.6%	8.7%	15.7%
2012/6	11.94%	16.06%	12.61%	12.63%	10.8%	9.7%	8.7%	15.7%
2012/9	11.91%	16.06%	12.61%	12.63%	10.9%	9.7%	8.7%	15.7%

AKBNK	Loans	Securities	Deposits	Assets	Mortgages	Car Loans	General Purpose CL	Credit C. Loans
2012/12	11.88%	16.06%	12.61%	12.63%	10.9%	9.8%	8.7%	15.7%
2013/3	11.88%	16.06%	12.61%	12.63%	11.0%	9.8%	8.7%	15.7%
2013/6	11.88%	16.06%	12.61%	12.63%	11.0%	9.9%	8.7%	15.7%
2013/9	11.88%	16.06%	12.61%	12.63%	11.1%	9.9%	8.7%	15.7%
2013/12	11.88%	16.06%	12.61%	12.63%	11.1%	10.0%	8.7%	15.7%
2014/3	11.88%	16.06%	12.61%	12.63%	11.2%	10.0%	8.7%	15.7%
2014/6	11.88%	16.06%	12.61%	12.63%	11.3%	10.1%	8.7%	15.7%
2014/9	11.88%	16.06%	12.61%	12.63%	11.3%	10.1%	8.7%	15.7%
2014/12	11.88%	16.06%	12.61%	12.63%	11.4%	10.2%	8.7%	15.7%
2015/3	11.88%	16.06%	12.61%	12.63%	11.4%	10.2%	8.7%	15.7%
2015/6	11.88%	16.06%	12.61%	12.63%	11.5%	10.3%	8.7%	15.7%
2015/9	11.88%	16.06%	12.61%	12.63%	11.5%	10.3%	8.7%	15.7%
2015/12	11.88%	16.06%	12.61%	12.63%	11.6%	10.4%	8.7%	15.7%

**Table 13: Market Shares**

**Source:** The BRSA

When we plug-in the data to our model we get to the multiple year financial forecasts of any bank. Up until now we went through the process how we can briefly estimate the basis for our valuation; the financial statements. The aim here is to get to an estimate for the net-profit, which is the top contributor to the shareholders' equity. As return on equity and the book value are the roots of all valuation models, these steps are the prerequisites to start valuing a bank (See Appendix).

### 2.7.2 Financial Ratios

Having a quick look at the financial ratios tell more than trying to arrive at a conclusion by looking at plain absolute figures. The table below tells us that following a slight drop in this year, the net interest margin is set to stabilise. Loan growth will almost come to a hold in the current year and then recover up to levels exceeding 20%. The bank will continue switching from government bonds to the core business activity of granting loans. The bank will try to enhance profitability by becoming more efficient and via increasing its fee generation that is the core reason why the return on equity recovers despite stable margins. Asset quality will follow a deteriorating path as the non performing loan (NPL) ratio increases doublefold in the upcoming two years. On the funding side, the share of deposits in total balance sheet is set to come down slightly as foreign wholesale borrowing capabilities improve.

Without analysing the ratios, sometimes it becomes very hard to point out any inconsistencies by just looking at the basic financial statements. Therefore, as a sanity check, the analyst should go over the ratios before concluding the forecasts that are going to be the basis of the valuation models.

<b>RATIOS</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
<b>Profitability</b>									
IEA	70,741	91,457	101,008	119,287	139,874	160,181	181,085	204,848	227,082
IBL	60,612	80,750	87,224	103,322	121,784	138,893	156,228	175,924	193,738
Yield on IEA	13.5%	12.5%	9.9%	8.4%	8.3%	8.5%	8.2%	7.9%	7.6%
Cost of IBL	9.6%	9.2%	5.7%	5.0%	5.3%	5.2%	5.2%	5.1%	4.9%
Net Int. Spread	3.6%	3.0%	4.0%	3.2%	2.8%	3.1%	2.8%	2.7%	2.6%
NIM	5.2%	4.5%	4.9%	4.1%	3.7%	3.9%	3.7%	3.5%	3.4%
ROE	22.9%	16.2%	21.1%	19.8%	18.1%	20.8%	19.7%	19.0%	17.8%
ROA	3.1%	2.2%	2.8%	2.8%	2.5%	2.8%	2.8%	2.7%	2.6%
<b>Efficiency</b>									
C/I	39%	47%	37%	40%	40%	35%	34%	32%	33%
Fees/Costs	56%	50%	59%	59%	67%	73%	80%	88%	89%
Costs/IEA	2.5%	2.5%	2.2%	2.0%	1.9%	1.8%	1.7%	1.5%	1.6%
<b>Asset Quality</b>									
NPL Ratio	2.5%	2.3%	3.8%	2.4%	2.1%	1.8%	1.8%	1.7%	1.7%
NPL Coverage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Growth YoY</b>									
Loans	32%	23%	-9%	27%	18%	15%	15%	15%	13%
Securities	22%	10%	66%	12%	16%	12%	9%	8%	5%
Deposits	21%	32%	6%	24%	15%	16%	14%	11%	14%
Sh. Equity	48%	7%	28%	16%	14%	18%	16%	16%	15%
Assets	20%	29%	10%	18%	17%	15%	13%	13%	11%
Net Profit	29%	-13%	53%	14%	5%	33%	11%	12%	8%
<b>Asset Breakdown</b>									
Loans	56%	54%	44%	48%	48%	48%	49%	50%	51%
Securities	36%	30%	46%	43%	43%	42%	40%	38%	36%
Deposits	67%	71%	73%	72%	71%	72%	72%	71%	73%
Borrowings	13%	13%	9%	10%	11%	10%	9%	10%	8%
Sh. Equity	15%	12%	14%	14%	13%	14%	14%	15%	15%
Loans/Deposits	83%	75%	61%	66%	67%	67%	68%	70%	70%
FX Loans/Loans	36%	47%	47%	44%	42%	41%	42%	43%	45%
FX Deposits/Deposit	39%	44%	37%	37%	39%	40%	40%	41%	41%
<i>Source: The Bank, EFGI.</i>									
<b>Profit (Gross Int. Inc. + Net Fee) Breakdown</b>									
Loans	54%	55%	46%	40%	41%	41%	42%	42%	43%
Securities	31%	30%	39%	44%	42%	42%	41%	40%	38%
Fees	10%	10%	12%	14%	14%	14%	15%	15%	16%

**Table 14: Financial Ratios**

**Source:** The BRSA, Bank Financials

## 3. VALUATION

### 3.1 The Concept of Valuation

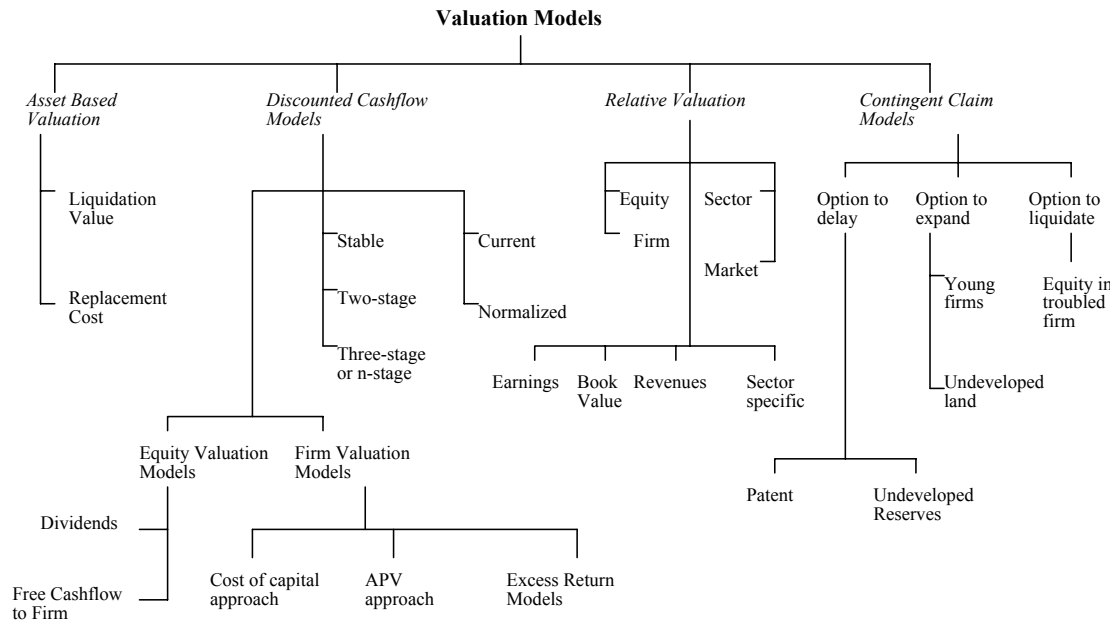
The value of an asset is the present value of its expected returns. Specifically, you expect an asset to provide a stream of returns during the period of time you own it. To convert this estimated stream of returns to a value for the security, you must discount this stream at your required rate of return. This process of valuation requires estimates of (1) the stream of expected returns and (2) the required rate of return on the investment. 1 Value today always equals future cash flow discounted at the opportunity cost of capital (Pratt, Shannon P. 2007 p174).

The selection of appropriate valuation methods has been the subject of extended debate over the last few years and will probably continue to be for many years to come. The use of valuation models in investment decisions (i.e., in decisions on which assets are under valued and which are over valued) are based upon

- a perception that markets are inefficient and make mistakes in assessing value
- an assumption about how and when these inefficiencies will get corrected

In an efficient market, the market price is the best estimate of value. The purpose of any valuation model is then the justification of this value. (Aswath Damodaran, Valuation Model p2)

According to Damodaran (2006) in general terms, there are four approaches to valuation.

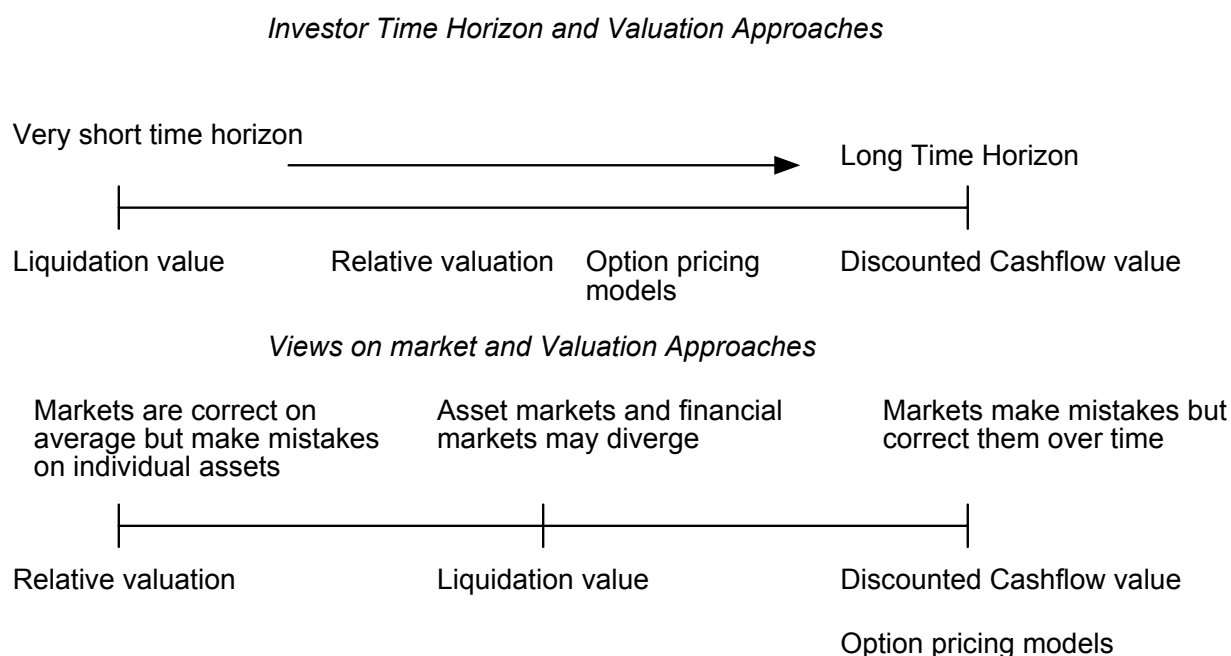


**Figure 3: Valuation Models**

**Source:** Aswath Damodaran, Valuation Model, 2006

As seen in table, the first, discounted cash-flow valuation, relates the value of an asset to the present value of expected future cash-flows on that asset (DCF). The second, relative valuation, estimates the value of an asset by looking at the pricing of 'comparable' assets relative to a common variable like earnings, cash-flows, book value or sales (ratio analysis). The third, liquidation and accounting valuation is built around valuing the existing assets of a firm, with accounting estimates of value or book value often used as a starting point. The final approach, contingent claim valuation, uses option pricing models to measure the value of assets that share option characteristics. This is what generally falls under the rubric of real options. We will be analyzing the first two valuation approaches in this part. The most commonly used standalone valuation model is the discounted cash flow model. On the other hand, DCF model has some drawbacks which are covered by mostly relative valuation model.

As seen in the table below, time horizon is important factor that the analyst chooses one of the valuation models.



**Figure 4:** Investor Time Horizon and Valuation Approach

**Source:** Valuation Model: Aswath Damodoran P.44

If we are to summarise the concept in general terms, there are four approaches to valuation. The first, discounted cash-flow valuation, relates the value of an asset to the present value of expected future cash-flows on that asset. The second, liquidation and accounting valuation is built around valuing the existing assets of a firm, with accounting estimates of value or book value often used as a starting point. The third, relative valuation, estimates the value of an asset by looking at the pricing of 'comparable' assets relative to a common variable like earnings, cash-flows, book value or sales. The final approach, contingent claim valuation, uses option pricing models to measure the value of assets that share option characteristics. This is what generally falls under the rubric of real options. We will only be analysing the first three equity related valuation approaches in this study.

### 3.2 Valuing a Bank

In this section after proving that the methodologies we will be implementing the studies on a Turkish Bank and try to arrive at valuations through the methods mentioned earlier in the report. Banks borrow money (whether in the form of deposits or of loans from other financial institutions or markets) and then lend it out. It follows that when we are valuing or analyzing a bank, we should distinguish between the bank's borrowing for the purpose of making loans and the bank's permanent debt. (This is not to say that this distinction can always be made in practice.) Once we have made this conceptual distinction, we can apply the enterprise valuation model to banks. The distinction between funds used for the bank's lending activities and funds used as part of the bank's longer-term financing means that there are some important differences between banks and nonfinancial companies: On the asset side: For a nonfinancial company, cash and marketable securities are usually a store of value. For a bank, however, most marketable securities (and some of the cash) constitute an operating current asset. On the liability side: For a nonfinancial company, we put all debt items together, even if— from an accounting point of view— they are current liabilities. For a bank, most or all of the short-term debt items are operating current liabilities and are therefore part of the bank's working capital (Benninga, Simon. 2008).

Prerequisites of determining the value of a bank are an in-depth understanding of the underlying business, the assets allocation trends, outlook for local and international operating environment, competitive position, financial history and knowing the management. Although these key bullets have the utmost importance, they are insufficient to explain the value as it is more important to judge the future trends and their impact on profitability than having a thorough understanding of the past or the current situation. Establishing the value based on a bank's book value by taking the average Price/Book multiple of the peer group is handy shorthand, but a lacking technique of establishing actual value as first of all it does not take into account the profitability function.

Gordon Growth Approach takes its roots from the excess return model, which we have went through in the valuation section of this thesis. In a very simple setting in which we have one



bank with no debt and allocating all of its shareholders' equity to assets that yield at par with its cost of equity, it is convenient to assume that this bank should deserve a value equal to its tangible book value, which is simply its shareholders' equity in our case. In other words it should have a Price/Book multiple of 1.0x. The factor that creates value to the shareholders is the excess return over the cost of equity, that is the additional value the bank can generate over what the capital asset pricing model suggests or the present value of the annual economic added values. In this study we will be concentrated on the Gordon Growth Approach. Gordon Growth Approach is basically a modified and a simplified approach to economic value added model. Under a no-growth assumption, the sustainable return on equity over the sustainable cost of equity of a bank provides the benchmark Price/Book multiple a bank deserves. By applying the outcome of this equation to one-year forward looking tangible book value we arrive at a value of a bank one year from now. This methodology is more convenient to judge the value of a bank from a minority investor point of view and easy to compare with the yields on other instruments such as the government bonds. To arrive at a current value for a bank, it is a simple dividing practice by (1+Cost of Equity).

Now let us simplify what we have talked about up until now by also taking into account the growth factor.

Cost of Equity: CoE

Return on Equity: ROE

g: Growth

BV: Book Value

Present Value of a Bank=  $\frac{((ROE-g)/(CoE-g)) \times (\text{forward looking BV})}{(1+CoE)}$

Turkish Banks no longer operate in a hyperinflationary environment. Also, we no longer use the crawling exchange rate regime but a floating one. Therefore there is no logic in making our valuations and forecasts in hard currencies. The banks are doing almost their entire business both on the asset side and on the liability side with locals and roughly 65% of both

loans and deposits are in Turkish Lira. That is why we will be sticking to Turkish Lira accounts in all of our figures in this analysis unless otherwise stated.

Both for the Return on Equity and for the Cost of Equity, rather than relying on one year's data, which is most probably not indicative of the bank's true potential it is more reliable to take the average of the forecasts of several few years ahead. As a very simple example of this we can work on the 2009 profitability and cost of equities of the Turkish Banks. Given the global liquidity and credit crunch backed unfavourable operating environment' weak loan growth and soaring problematic loans, the Return on Equity of the sector will most probably slump to 10% levels on the average, while the Cost of Equity is set to be over 20%. Obviously the growth will be value destroying in such a case, therefore assuming no growth the banks should trade half of their book values, which does not make a lot of sense as most probably the ratios will be totally switched in the long run which ends up to at least 2.0x benchmark Price/Book multiples in the long run.

Coming back to Growth which is one of the most crucial assumptions we have to make not only for the Gordon Growth Model but for all other valuation models as well. If we are working through the Turkish Lira models, the growth is definitely not 2% or 3% as many rule-of-thumb lecturers suggest. Turkish banking sector is deeply underdeveloped relative to global peers with loans corresponding to 35% of the GDP versus over 100% level of the global peers. Loans/Deposits ratio is 85% versus 150% of the peer countries. Therefore under the most conservative scenario, the real growth rate of the banking system should be at par with the sustainable GDP growth, which we can assume as 5% looking at the past performance. Over this figure there is the long-run inflation rate, which again can be assumed as 5%. All in all these two figures bring us to  $(1+5\%) \times (1+5\%) - 1 = 10.25\%$ . This is even a conservative number as just to preserve its state as a percentage of GDP 5% real growth is needed, to catch up with the developed peers, under an aggressive case it can even be convenient to assume a multiple stage model with an initial 5-year real CAGR of a low two-digit number. Damodaran (1996) states that the growth rate of a stable firm should not exceed the total of expected inflation and expected real growth rate.

The basic model for valuing equity is the dividend discount model—the value of a stock is the present value of expected dividends on it (Damodaran, A. 1996, p.191). The value of any asset is the present value of expected future cash flows, discounted at the rate appropriate to the riskiness of the cash flows being discounted.

When investors buy stock in publicly traded companies, they generally expect to get two types of cash flows - dividends during the holding period and an expected price at the end of the holding period. Since this expected price is itself determined by future dividends, the value of a stock is the present value of dividends through infinity.

The rationale for the model lies in the present value rule - the value of any asset is the present value of expected future cash flows discounted at a rate appropriate to the riskiness of the cash flows. There are two basic inputs to the model - expected dividends and the cost on equity. To obtain the expected dividends, we make assumptions about expected future growth rates in earnings and payout ratios. The required rate of return on a stock is determined by its riskiness, measured differently in different models – the market beta in the CAPM, and the factor betas in the arbitrage and multi-factor models. The model is flexible enough to allow for time-varying discount rates, where the time variation is caused by expected changes in interest rates or risk across time.

If we are to use the Gordon Growth Model:

Value per share of Stock = Dividend per share / (CoE - g)

In a multiple year forecasting horizon we will be using this formula in the final year of our forecasts to get a perpetual value for the company. For the earliest couple of years ahead, for which we have more sound forecasts we simply discount the dividends for every year to date or to a point a year from now to get a target per share price (Damodaran, A. 2006).

Due to the extensive number of needed underlying assumptions, this model has some credibility problems and sometimes it is quite easy to manipulate by just modifying the dividend payout ratio assumption of a year far in the future. To overcome this issue to some extent on top of discounting the future dividends to date, we are also discounting the

economic added value generated every year that exceeds the dividends distributed. If there has been a shift in corporate finance and valuation in recent years, it has been towards giving “excess returns” a more central role in determining the value of a business (Damodaran, A. 2007, p.2).

The top two assumptions we make for this model to go through are that a bank should be distributing dividends or it should have the track record of doing it for some-time in the past, if not this year due to the banking watchdog’s preventions or global liquidity issues though. Second assumption is that the bank will preserve a capital adequacy ratio of at least 12% under Basel I guidelines. Clearly an excess appetite of dividend payout would end up to a need for a rights issue via pulling down the capital adequacy ratio below the legal threshold. Details of this methodology can be found in individual bank valuation section.

### **3.3 Valuation Methodologies**

#### **3.3.1 Discounted Cash Flows**

The basic idea behind the DCF Model is that the value of the company is the present value of the expected unlevered free cash flows of the company. Intuitively, the free cash flow equation is based on the idea that the income statement does not adequately capture the actual cash flows of the company. The equation can therefore be viewed as a series of adjustments to the income statement. The free cash flow equation is built on NOPAT, which is the company’s net operating profit after taxes (i.e., the company’s earnings before interest and taxes less the taxes that would be paid if the company had no debt). We adjust NOPAT by subtracting the change in the company’s net working capital and the company’s capital expenditures, both of which reflect cash flows that do not appear on the company’s income statement. In the case of net working capital, we capture cash flows related to short-term assets and liabilities that do not appear on the income statement, and we correct for short-term items that appear on the income statement even though there was no actual cash flow during the period (Hoover, S. 2005. p 334). Most financial analysts consider it presumptuous to project an infinite number of free

cash flows; therefore, the projected cash-flow stream is often cut off at some arbitrary date, and a terminal value is substituted for the cash flows beyond this date (Benninga, 2008).

However, banks have some peculiarities that warrant a separate discussion. The primary distinction has to do with the definition of the FCFs for a bank. Whereas the FCF for a nonfinancial company excludes all financial items, the FCF for a bank has to take explicit account of the financing of the bank's lending activities. To the extent that a bank borrows to finance its lending, this lending should be part of the bank's net working capital. The FCF for a bank therefore includes many of the financial items that we have excluded in the case of a nonfinancial company (Benninga, Simon. 2008. p210) .

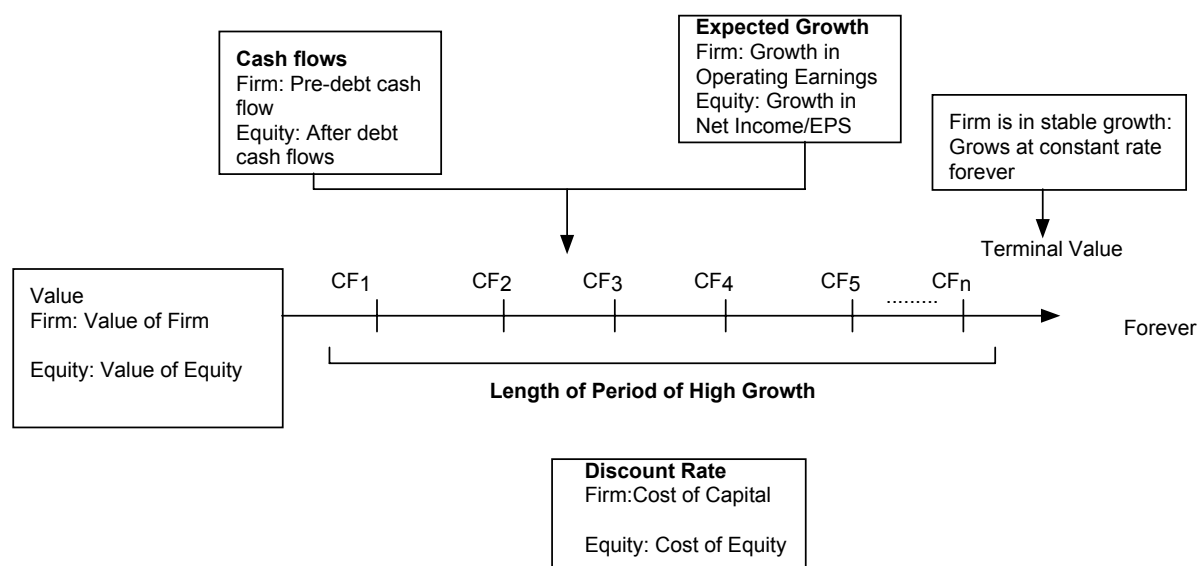
In a survey article on the use of discounted cash flow in history, Parker (1968) notes that the earliest interest rate tables date back to 1340 and were prepared by Francesco Balducci Pegolotti (Damodaran, A. 2006). We use higher discount rates to discount expected cash flows when valuing riskier assets, and lower discount rates when valuing safer assets. Building on the theme that the equity risk premium is the price for taking risk, it is a key component into the expected return that we demand for a risky investment. This expected return, is a determinant of both the cost of equity and the cost of capital, essential inputs into corporate financial analysis and valuation. While there are several competing risk and return models in finance, they all share some common views about risk. First, they all define risk in terms of variance in actual returns around an expected return; thus, an investment is riskless when actual returns are always equal to the expected return. Second, they argue that risk has to be measured from the perspective of the marginal investor in an asset, and that this marginal investor is well diversified. Therefore, the argument goes, it is only the risk that an investment adds on to a diversified portfolio that should be measured and compensated. In fact, it is this view of risk that leads us to break the risk in any investment into two components.

Discounted cash flow (DCF) analysis uses future free cash flow projections and discounts them (most often using the weighted average cost of capital) to arrive at a present value, which is used to evaluate the potential for investment. If the value arrived at through DCF analysis is

higher than the current cost of the investment, the opportunity may be a good one.  
 Calculated as:

Also known as the Discounted Cash Flows Model.

### DISCOUNTED CASHFLOW VALUATION



**Figure 5:** Discounted Cash Flow Valuation

**Source:** Valuation Model: Aswath Damodoran. 2006

There are many variations when it comes to what you can use for your cash flows and discount rate in a DCF analysis. Despite the complexity of the calculations involved, the purpose of DCF analysis is just to estimate the money you'd receive from an investment and to adjust for the time value of money.

Discounted cash flow models are powerful, but they do have shortcomings. DCF is merely a mechanical valuation tool, which makes it subject to the axiom "garbage in, garbage out". Small changes in inputs can result in large changes in the value of a company. Instead of trying to project the cash flows to infinity, terminal value techniques are often used. A simple

annuity is used to estimate the terminal value past 10 years, for example. This is done because it is harder to come to a realistic estimate of the cash flows as time goes on.

The basic idea behind the DCF Model is that the value of the company is the present value of the expected unlevered free cash flows of the company. Intuitively, the free cash flow equation is based on the idea that the income statement does not adequately capture the actual cash flows of the company. The equation can therefore be viewed as a series of adjustments to the income statement. The free cash flow equation is built on NOPAT, which is the company's net operating profit after taxes (i.e., the company's earnings before interest and taxes less the taxes that would be paid if the company had no debt). We adjust NOPAT by subtracting the change in the company's net working capital and the company's capital expenditures, both of which reflect cash flows that do not appear on the company's income statement. In the case of net working capital, we capture cash flows related to short-term assets and liabilities that do not appear on the income statement, and we correct for short-term items that appear on the income statement even though there was no actual cash flow during the period (Hoover, S. 2005. p 334).

In simple terms, discounted cash flow tries to work out the value of a company today, based on projections of how much money it's going to make in the future. DCF analysis says that a company is worth all of the cash that it could make available to investors in the future. There are several tried and true approaches to discounted cash flow analysis, including the dividend discount model (DDM) approach and the cash flow to firm approach. In this part, we will use the free cash flow to equity approach commonly used by equity analysts to determine the "fair value" of companies. (This is a measure of how much cash can be paid to the equity shareholders of the company after all expenses, reinvestment and debt repayment. Calculated as:  $FCFE = \text{Net Income} - \text{Net Capital Expenditure} - \text{Change in Net Working Capital} + \text{New Debt} - \text{Debt Repayment}$ )

For starters, DCF analysis can serve as a reality check to the fair value prices found in brokers' reports. DCF analysis requires you to think through the factors that affect a company, such as future sales growth and profit margins. It also makes you consider the discount rate, which

depends on a risk-free interest rate, the company's costs of capital and the risk its stock faces. All of this will give you an appreciation for what drives share value, and that means you can put a more realistic price tag on the company's stock. (Ben McClure, 2006).

More recently, Glaum and Friedrich (2006) examine the valuation preferences of European telecommunication analysts and find that the popularity of the DCF model has increased significantly since the end of the 1990s, when valuations were primarily driven by earnings multiples. Consistent with the predictions of valuation theory, analysts prefer DCF over PE when they face more challenging valuation cases. The empirical results of Efthimios G. Demirakos (Athens University of Economics and Business), Norman C. Strong (Manchester Business School) and Martin Walker (Manchester Business School 90's) show that analysts use DCF more frequently than PE to value small firms, high-risk firms, loss-making firms, and firms with a limited number of industry peers.

Common stock represents an ownership interest in a business. A business in its operations generates a stream of cash flows, and as owners of the business, common stockholders have an equity ownership claim on those future cash flows. Beginning with John Burr Williams (1938), analysts have developed this insight into a group of valuation models known as discounted cash flow (DCF) valuation models. DCF models-which view the intrinsic value of common stock as the present value of its expected future cash flows-are a fundamental tool in both investment management and investment research. Although the principles behind discounted cash flow valuation are simple, applying the theory to equity valuation can be challenging. Four broad steps in applying DCF analysis to equity valuation are choosing the class of DCF model-equivalently, selecting a specific definition of cash flow; forecasting the cash flows; choosing a discount rate methodology; and estimating the discount rate. (Analysis of Equity Investment: John D. Stowe, CFA, 2008)

All of the models other than proxy models require three inputs. The first is the risk free rate, simple to estimate in currencies where a default free entity exists, but more complicated in markets where there are no default free entities. The second is the beta (in the CAPM) or betas (in the APM or multi-factor models) of the investment being analyzed, and the third is the



appropriate risk premium for the portfolio of all risky assets (in the CAPM) and the factor risk premiums for the market risk factors in the APM and multi-factor models.

Note that the equity risk premium in all of these models is a market-wide number, in the sense that it is not company specific or asset specific but affects expected returns on all risky investments. Using a larger equity risk premium will increase the expected returns for all risky investments, and by extension, reduce their value. Consequently, the choice of an equity risk premium may have much larger consequences for value than firm-specific inputs such as cash flows, growth and even firm-specific risk measures (Damodaran A, 2008).

There is a firm-specific component that measures risk that relates only to that investment or to a few investments like it, and a market component that contains risk that affects a large subset or all investments. It is the latter risk that is not diversifiable and should be rewarded. All risk and return models agree on this fairly crucial distinction, but they part ways when it comes to how to measure this market risk. In the capital asset pricing model (CAPM), the market risk is measured with a beta, which when multiplied by the equity risk premium yields the total risk premium for a risky asset. In the competing models, such as the arbitrage pricing and multi-factor models, betas are estimated against individual market risk factors, and each factor has its own price (risk premium).

### **3.3.2 Capital Asset Pricing Model**

The CAPM, originated by Sharpe (1964) and Lintner (1965), has played an important role in finance and has been a focal point in the empirical finance literature. The CAPM is a single-period specialization of the fundamental valuation equation. At the end of the period,  $t = 1$ , firms pay a liquidating dividend, and consumption equals aggregate wealth (Bhattacharya, S. 2005).

All of the models other than proxy models require three inputs. The first is the riskfree rate, simple to estimate in currencies where a default free entity exists, but more complicated in markets where there are no default free entities. The second is the beta (in the CAPM) or betas

(in the APM or multi-factor models) of the investment being analyzed, and the third is the appropriate risk premium for the portfolio of all risky assets (in the CAPM) and the factor risk premiums for the market risk factors in the APM and multi-factor models.

Note that the equity risk premium in all of these models is a market-wide number, in the sense that it is not company specific or asset specific but affects expected returns on all risky investments. Using a larger equity risk premium will increase the expected returns for all risky investments, and by extension, reduce their value. Consequently, the choice of an equity risk premium may have much larger consequences for value than firm-specific inputs such as cashflows, growth and even firm-specific risk measures (Damodaran A, 2008). Model can be summarised as  $CoE=Rf+B*(Rm-Rf)$ .

### 3.3.3 Economic Value Added Approach

In the excess return valuation approach, we separate the cash flows into excess return cash flows and normal return cash flows. Earning the risk-adjusted required return (cost of capital or equity) is considered a normal return cash flow but any cash flows above or below this number are categorized as excess returns; excess returns can therefore be either positive or negative. With the excess return valuation framework, the value of a business can be written as the sum of two components:

Value of business = Capital Invested in firm today + Present value of  
excess return cash flows from both existing and future projects

If we make the assumption that the accounting measure of capital invested (book value of capital) is a good measure of capital invested in assets today, this approach implies that firms that earn positive excess return cash flows will trade at market values higher than their book values and that the reverse will be true for firms that earn negative excess return cash flows (Damodaran, A. 2006).

Economic Profit = Net Income – Cost of Equity \* Book Value of Equity

Economic value added (EVA) model aims to derive the valuation of a bank via discounting a bank's profits exceeding its cost of equity (discounted excess return over the cost of equity). Due to adverse operating environment we expect the bank to deliver profits below the cost of equity in 2009 and 2010. As the profitability recovers over time it starts adding value. When we add up the net present value of this incremental amount on top of the current book value we get to a total value for the bank.

### AKBNK

#### Economic Value Added

TRLmn	2010	2011	2012	2013	2014	2015
Book Value	16,804.7	19,138.1	22,537.9	26,229.6	30,412.4	34,887.6
Cost of Equity	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Theoretical Return on BV (a)	3,043.4	3,330.8	3,472.2	3,755.4	4,023.2	4,615.2
Net Income (b)	3,100.5	3,251.1	4,332.8	4,815.4	5,385.0	5,819.9
Economic Profit (b-a)	57.0	-79.6	860.5	1,060.0	1,361.8	1,204.7
Discount Factor		1.11	1.28	1.46	1.66	1.87
PV of Economic Profit		-71.82	672.68	724.81	822.42	642.55
Aggregate PV of Economic Profit (c)	19,353.1					
Terminal Value of Economic Profit (PV)	16,562.5					
PV of Economic Profit (10-15)	2,790.6					
Book Value (d)	15,571.6					
<b>Fair Value of Bank (c+d)</b>	<b>34,924.7</b>					
Mcap	34,600					
Upside	1%					
Number of Shares	4,000					
Current Price/Share	8.65					
<b>Fair Price/Share</b>	<b>8.73</b>					

### GARAN

#### Economic Value Added

TRLmn	2010	2011	2012	2013	2014	2015
Book Value	16,545.6	18,351.9	20,875.1	23,905.6	27,192.8	30,611.0
Cost of Equity	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Theoretical Return on BV (a)	2,996.5	3,193.9	3,216.1	3,422.7	3,597.3	4,049.4
Net Income (b)	3,769.1	3,879.0	4,499.1	4,922.7	5,231.4	5,487.2
Economic Profit (b-a)	772.6	685.1	1,283.1	1,500.0	1,634.2	1,437.7
Discount Factor	0.95	1.12	1.29	1.47	1.67	1.89
PV of Economic Profit	812.19	613.38	995.44	1018.02	979.48	761.07
Aggregate PV of Economic Profit (c)	33,348.5					
Terminal Value of Economic Profit (PV)	28,168.9					
PV of Economic Profit (10-15)	5,179.6					
Book Value (d)	15,046.2					
<b>Fair Value of Bank (c+d)</b>	<b>48,394.7</b>					
Mcap	34,020					
Upside	42%					
Number of Shares	4,200					
Current Price/Share	8.10					
<b>Fair Price/Share</b>	<b>11.52</b>					

## ISCTR

### Economic Value Added

TRLmn	2010	2011	2012	2013	2014	2015
Book Value	15,850.7	18,118.2	20,608.8	23,477.8	26,470.3	29,649.4
Core Business Book	10,813.0	13,080.5	15,571.1	18,440.1	21,432.6	24,611.7
Cost of Equity	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Theoretical Return on core BV (a)	1,958.3	2,276.5	2,398.9	2,640.2	2,835.3	3,255.8
Net Income	3,330.9	3,261.4	3,463.7	3,902.5	4,157.1	4,421.1
Core business net income (b)	2,942.8	2,850.0	3,038.6	3,464.2	3,705.1	3,955.2
Economic Profit (b-a)	984.5	573.5	639.6	824.0	869.9	699.3
Discount Factor		1.14	1.32	1.51	1.71	1.93
PV of Economic Profit		502.39	485.53	547.13	510.12	362.20
Aggregate PV of Economic Profit (c)	14,533.6					
Terminal Value of Economic Profit (PV)	12,998.6					
PV of Economic Profit (10-15)	1,535.1					
Book Value (d)	14,315.2					
<b>Fair Value of Bank (c+d)</b>	<b>28,848.8</b>					
Mcap	27,675					
Upside	4%					
Number of Shares	4,500					
Current Price/Share	5.50					
<b>Fair Price/Share</b>	<b>6.41</b>					

## HALKB

### Economic Value Added

TRLmn	2,010	2011	2012	2013	2014	2015
Book Value	7,421.5	9,105.7	11,104.5	13,340.3	15,709.0	18,248.4
Cost of Equity	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Theoretical Return on BV (a)	1,344.1	1,584.7	1,710.8	1,910.0	2,078.1	2,414.0
Net Income (b)	2,019.4	2,175.4	2,529.6	2,853.3	3,064.7	3,288.5
Economic Profit (b-a)	675.3	590.7	818.8	943.3	986.6	874.4
Discount Factor		1.14	1.32	1.51	1.71	1.93
PV of Economic Profit		517.47	621.51	626.37	578.59	452.88
Aggregate PV of Economic Profit (c)	10,849.8					
Terminal Value of Economic Profit (PV)	8,053.0					
PV of Economic Profit (10-15)	2,796.8					
Book Value (d)	6,432.0					
<b>Fair Value of Bank (c+d)</b>	<b>17,281.8</b>					
Mcap	16,375					
Upside	6%					
Number of Shares	1,250					
Current Price/Share	6.35					
<b>Fair Price/Share</b>	<b>13.83</b>					

## VAKBN

### Economic Value Added

TRLmn	2010	2011	2012	2013	2014	2015
Book Value	8,453.8	9,646.8	11,157.9	12,821.5	14,733.9	16,984.9
Cost of Equity	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Theoretical Return on BV (a)	1,531.0	1,678.9	1,719.0	1,835.7	1,949.1	2,246.9
Net Income (b)	1,200.3	1,402.9	1,759.4	1,979.1	2,266.5	2,664.3
Economic Profit (b-a)	-330.7	-276.0	40.4	143.4	317.4	417.4
Discount Factor		1.14	1.32	1.51	1.71	1.93
PV of Economic Profit		-241.79	30.66	95.22	186.14	216.20
Aggregate PV of Economic Profit (c)	3,366.7					
Terminal Value of Economic Profit (PV)	3,482.6					
PV of Economic Profit (10-15)	-115.9					
Book Value (d)	7,777.2					
<b>Fair Value of Bank (c+d)</b>	<b>11,143.9</b>					
Mcap	10,800					
Upside	3%					
Number of Shares	2,500					
Current Price/Share	3.94					
<b>Fair Price/Share</b>	<b>4.46</b>					

Table 15: Economic Value Added

### 3.3.4 Dividend Discount Model

The dividend discount model is simply the net present value of all dividends a company will payout. The process is not that easy when analysing a bank as the banking watchdog BRSA can ban or limit a bank's dividend distribution in an adverse year. The enactment of Basel II may pull down the capital adequacy ratio of some banks below the legally allowed minimum level of 12% and some banks may end up not paying out any dividends at all. A bank with a specified 25% dividend payout ratio in its articles of association may prefer cancelling it in next year.

We start our dividend discount model with the items making up the capital adequacy ratio just to assure that it is comfortably above the legal threshold even after cash dividend payments. Then, taking into consideration past dividend payout rates, talking with the management and following the BRSA's rulings dividend payout ratios for every year are attached. However, some of these dividends are generated with the excess capital meaning the capital that is over the 12% capital adequacy ratio threshold. However we eliminate this artificial dividend contribution and ultimately add up the excess capital to the present value of the bank's dividend payments. In this model all the numbers are in nominal Turkish lira terms as majority

of the risk taken by Turkish banks are in local currency, the parties they lend to and the depositors are carrying the exposure of local currency. Costs and majority of the income are in local currency.

<b>AKBNK</b>						
<b>DDM TRL MN</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Credit risk	72,861	85,821	98,954	113,637	130,773	147,839
Market risk	4,217	4,947	5,667	6,405	7,244	8,026
Operational risk	9,256	9,969	12,094	13,253	14,642	16,146
Total Risk	86,334	100,737	116,715	133,295	152,659	172,011
Capital Base	16,927	19,261	22,660	26,352	30,535	35,010
CAR	20%	19%	19%	20%	20%	20%
Required CAR	12%	12%	12%	12%	12%	12%
Required Capital	10,360	12,088	14,006	15,995	18,319	20,641
Excess Capital	6,567	7,172	8,655	10,357	12,216	14,369
Implied Post-Tax Yield on Excess Capital	8%	8%	8%	8%	8%	8%
Post Tax Return on Excess Capital	442	474	587	681	771	874
<b>Net Profit</b>	<b>3,100</b>	<b>3,251</b>	<b>4,333</b>	<b>4,815</b>	<b>5,385</b>	<b>5,820</b>
Dividend to Common Shares	775	813	1,083	1,204	1,346	1,455
Div. Payout Ratio (Common shares)	25%	25%	25%	25%	25%	25%
Implied Contribution of Excess Cap. on Div.	110	118	147	170	193	218
Core Dividends (Common shares)	665	694	937	1,034	1,153	1,236
Global Rf (US 2027 bond)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Turkish Rf (2036 Eurobond)	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Turkish Equity Risk Premium	5.87%	5.87%	5.87%	5.87%	5.87%	5.87%
Cost of Equity (Real)	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
Inflation	8.5%	7.8%	6.0%	5.0%	4.0%	4.0%
Cost of Equity (Nominal)	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Discount Factor		1.11	1.28	1.46	1.66	1.87
PV of Core Div. from prev. year profit		600	543	640	624	615
Total PV of Core Dividends	3,605					
Terminal g (Nominal)	10%					
Terminal Value	45,765					
PV of Terminal Value	21,557					
Average Excess Capital	7,052					
Current Fair value of Bank	32,214					
1y FL Target value of Bank	34,125					
Number of Shares	4,000					
Target Price/Share	8.53					

<b>GARAN</b>						
<b>DDM TRL MN</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Credit risk	75,683	88,119	100,732	115,745	133,303	150,872
Market risk	4,921	5,689	6,434	7,281	8,248	9,162
Operational risk	8,128	8,540	9,962	10,941	11,992	13,066
Total Risk	88,732	102,348	117,127	133,966	153,543	173,099
Capital Base	16,986	18,792	21,315	24,346	27,633	31,051
CAR	19%	18%	18%	18%	18%	18%
Required CAR	12%	12%	12%	12%	12%	12%
Required Capital	10,648	12,282	14,055	16,076	18,425	20,772
Excess Capital	6,338	6,510	7,260	8,270	9,208	10,279
Implied Post-Tax Yield on Excess Capital	9%	9%	9%	9%	8%	8%
Post Tax Return on Excess Capital	436	450	513	570	610	654
<b>Net Profit</b>	<b>3,769</b>	<b>3,879</b>	<b>4,499</b>	<b>4,923</b>	<b>5,231</b>	<b>5,487</b>

<b>GARAN – Cont'd</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Dividend to Common Shares	1,508	1,552	1,800	1,969	2,093	2,195
Div. Payout Ratio (Common shares)	40%	40%	40%	40%	40%	40%
Implied Contribution of Excess Cap. on Div.	174	180	205	228	244	262
Core Dividends (Common shares)	1,333	1,372	1,595	1,741	1,849	1,933
Global Rf (US 2027 bond)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Turkish Rf (2036 Eurobond)	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Turkish Equity Risk Premium	5.87%	5.87%	5.87%	5.87%	5.87%	5.87%
Cost of Equity (Real)	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
Inflation	8.5%	7.8%	6.0%	5.0%	4.0%	4.0%
Cost of Equity (Nominal)	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Discount Factor		1.12	1.29	1.47	1.67	1.89
PV of Core Div. from prev. year profit		1,194	1,064	1,082	1,044	979
Total PV of Core Dividends	6,266					
Terminal g (Nominal)	10%					
Terminal Value	71,553					
PV of Terminal Value	33,451					
Average Excess Capital	4,337					
Current Fair value of Bank	44,055					
1y FL Target value of Bank	46,668					
Number of Shares	4,200					
Target Price/Share	11.11					

<b>ISCTR</b>						
<b>DDM TRL MN</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Credit risk	85,463	98,990	113,419	129,527	147,907	165,298
Market risk	7,177	7,986	8,792	9,652	10,597	11,389
Operational risk	9,505	10,340	11,143	12,267	13,437	14,661
Total Risk	102,145	117,316	133,354	151,446	171,941	191,348
Capital Base	16,320	18,588	21,078	23,947	26,940	30,119
CAR	16%	16%	16%	16%	16%	16%
Required CAR	12%	12%	12%	12%	12%	12%
Required Capital	12,257	14,078	15,336	17,416	19,773	22,005
Excess Capital	4,063	4,510	5,743	6,531	7,167	8,114
Implied Post-Tax Yield on Excess Capital	9%	9%	9%	9%	9%	8%
Post Tax Return on Excess Capital	281	324	417	462	493	545
<b>Net Profit</b>	<b>3,331</b>	<b>3,261</b>	<b>3,464</b>	<b>3,903</b>	<b>4,157</b>	<b>4,421</b>
Dividend to Common Shares	999	978	1,039	1,171	1,247	1,326
Div. Payout Ratio (Common shares)	30%	30%	30%	30%	30%	30%
Implied Contribution of Excess Cap. on Div.	84	97	125	139	148	164
Core Dividends (Common shares)	915	881	914	1,032	1,099	1,163
Global Rf (US 2027 bond)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Turkish Rf (2036 Eurobond)	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Turkish Equity Risk Premium	5.87%	5.87%	5.87%	5.87%	5.87%	5.87%
Cost of Equity (Real)	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
Inflation	8.5%	7.8%	6.0%	5.0%	4.0%	4.0%
Cost of Equity (Nominal)	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Discount Factor		1.14	1.32	1.51	1.71	1.93
PV of Core Div. from prev. year profit		801	669	607	605	569
Total PV of Core Dividends	3,784					
Terminal g (Nominal)	10%					
Terminal Value	43,037					
PV of Terminal Value	19,685					
Average Excess Capital	3,884					
Current Fair value of Bank	27,353					
1y FL Target value of Bank	28,975					
Number of Shares	4,500					
Target Price/Share	6.44					

<b>HALKB</b>						
<b>DDM TRL MN</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Credit risk	39,111	47,367	55,364	64,505	75,150	85,691
Market risk	1,026	1,243	1,453	1,692	1,970	2,243
Operational risk	5,160	5,654	6,653	7,503	8,390	9,361
Total Risk	45,296	54,264	63,470	73,700	85,509	97,294
Capital Base	7,368	9,052	11,051	13,287	15,656	18,195
CAR	16%	17%	17%	18%	18%	19%
Required CAR	12%	12%	12%	12%	12%	12%
Required Capital	5,436	6,512	7,616	8,844	10,261	11,325
Excess Capital	1,932	2,540	3,435	4,443	5,394	6,870
Implied Post-Tax Yield on Excess Capital	10%	10%	10%	9%	9%	9%
Post Tax Return on Excess Capital	152	199	268	335	390	478
<b>Net Profit</b>	<b>2,019</b>	<b>2,175</b>	<b>2,530</b>	<b>2,853</b>	<b>3,065</b>	<b>3,288</b>
Dividend to Common Shares	505	544	632	713	766	822
Div. Payout Ratio (Common shares)	25%	25%	25%	25%	25%	25%
Implied Contribution of Excess Cap. on Div.	38	50	67	84	98	119
Core Dividends (Common shares)	467	494	565	629	669	703
Global Rf (US 2027 bond)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Turkish Rf (2030 Eurobond)	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Turkish Equity Risk Premium	5.87%	5.87%	5.87%	5.87%	5.87%	5.87%
Cost of Equity (Real)	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
Inflation	8.5%	7.8%	6.0%	5.0%	4.0%	4.0%
Cost of Equity (Nominal)	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Discount Factor		1.14	1.32	1.51	1.71	1.93
PV of Core Div. from prev. year profit		409	375	375	369	346
Total PV of Core Dividends	2,196					
Terminal g (Nominal)	10%					
Terminal Value	26,009					
PV of Terminal Value	11,896					
Average Excess Capital	2,605					
Current Fair value of Bank	16,697					
1y FL Target value of Bank	17,688					
Number of Shares	1,250					
Target Price/Share	14.15					

<b>VAKBN</b>						
<b>DDM TRL MN</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Credit risk	47,131	54,737	62,936	72,259	83,000	93,394
Market risk	2,276	2,646	3,043	3,490	4,002	4,493
Operational risk	4,795	5,226	6,071	6,714	7,500	8,459
Total Risk	54,202	62,609	72,050	82,463	94,502	106,346
Capital Base	7,911	9,104	10,615	12,279	14,191	16,442
CAR	14.6%	14.5%	14.7%	14.9%	15.0%	15.5%
Required CAR	12%	12%	12%	12%	12%	12%
Required Capital	6,504	7,513	8,646	9,896	11,340	12,762
Excess Capital	1,407	1,591	1,969	2,383	2,851	3,680
Implied Post-Tax Yield on Excess Capital	9%	9%	9%	8%	8%	8%
Post Tax Return on Excess Capital	100	112	139	162	185	229
<b>Net Profit</b>	<b>1,200</b>	<b>1,403</b>	<b>1,759</b>	<b>1,979</b>	<b>2,267</b>	<b>2,664</b>
Dividend to Common Shares	240	281	352	396	453	533
Div. Payout Ratio (Common shares)	20%	20%	20%	20%	20%	20%
Implied Contribution of Excess Cap. on Div.	20	22	28	32	37	46
Core Dividends (Common shares)	220	258	324	364	416	487
Global Rf (US 2027 bond)	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Turkish Rf (2036 Eurobond)	5.8%	5.8%	5.8%	5.8%	5.8%	5.8%
Turkish Equity Risk Premium	5.87%	5.87%	5.87%	5.87%	5.87%	5.87%



<b>VAKBN – Cont'd</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Cost of Equity (Real)	8.9%	8.9%	8.9%	8.9%	8.9%	8.9%
Inflation	8.5%	7.8%	6.0%	5.0%	4.0%	4.0%
Cost of Equity (Nominal)	18.1%	17.4%	15.4%	14.3%	13.2%	13.2%
Discount Factor		1.14	1.32	1.51	1.71	1.93
PV of Core Div. from prev. year profit		193	196	215	213	216
Total PV of Core Dividends	1,256					
Terminal g (Nominal)	10%					
Terminal Value	18,030					
PV of Terminal Value	8,247					
Average Excess Capital	1,619					
Current Fair value of Bank	11,122					
1y FL Target value of Bank	11,782					
Number of Shares	2,500					
Target Price/Share	4.71					

**Table 16: Dividend Discount Model**

The inflation in Turkey is at single digits and no longer called hyper. Therefore there is no logic behind valuing a bank in hard currencies and put another item to estimate; the exchange rate. Consequently, the dividend discount model yields the below stated target market capitalisation and per share price for Akbank.

Dividend Discount Model

Many of the excess return models are built on this theme (Ohlson, J. 1995). The Gordon Growth approach, which values the bank on excess ROE over the cost of equity is also influenced by this excess return model. Economic profit or excess return model system is designed primarily to make sense to management, not to its accountants. The economic value added, with its myriad potential adjustments, is generally tailored to individual company needs, not to standard rules like GAAP (English, J. 2001. p 200).

### 3.3.5 Liquidation and Accounting Valuation

The value of a business is the sum of the values of the individual assets owned by the business. While this may be technically right, there is a key difference between valuing a collection of assets and a business. A business or a company is an on-going entity with assets that it already owns and assets it expects to invest in the future. For companies with lucrative growth opportunities, asset-based valuations will yield lower values than going concern valuations.

There are some who contend that the accounting estimate of the value of a business, as embodied by the book value of the assets and equity on a balance sheet, represents a more reliable estimate of value than valuation models based on shaky assumptions about the future.

(Damodaran, A. 2006). That is one of the core reasons why we were taking into account the Gordon Growth approach that stems from the one year forward looking book value as our base valuation technique in bank valuation.

While it may seem naïve to assume that liquidation value is equal or close to book value, a number of liquidation rules of thumb are structured around book value. In summary, liquidation valuation is likely to yield more realistic estimates of value for firms that are distressed, where the going concern assumption underlying conventional discounted cash flow valuation is clearly violated. For healthy firms with significant growth opportunities, it will provide estimates of value that are far too conservative.

### 3.3.6 Gordon Growth Model

Gordon Growth approach is the most straightforward and the commonly used methodology in bank valuation. The method, as explained earlier is built on the formula that Price/Book multiple that a bank deserves is equal to how many times the return on equity exceeds the cost of equity.

<b>AKBNK - TRLmn - Consolidated</b>	
<b>Gordon Growth Model (TRLmn - nominal)</b>	
Benchmark RoE	19%
g (nominal)	10%
CoE	15.0%
Benchmark P/B (a)	2.0
1y FL adj. P/B	1.97
1yFL Sh. Eq. (Excl. Minority Int.) (b)	17,591
Dividend (c)	775
Dividend Yield	2.2%
Target Market Cap. (a*b+c)	35,100
Number of Shares (mn)	4,000
Price Target	8.8
Current Per Share Price	8.65
<b>Upside Potential</b>	<b>1%</b>

**GARAN - TRLmn - Consolidated****Gordon Growth Model (TRLmn - nominal)**

Benchmark RoE	24%
g (nominal)	10%
CoE	15.0%
Benchmark P/B (a)	2.9
1y FL adj. P/B	2.20
1yFL Sh. Eq. (Excl. Minority Int.) (b)	15,468
Dividend (c)	1,508
Dividend Yield	4.4%
Target Market Cap. (a*b+c)	46,478
Number of Shares (mn)	4,200
Per Share Price Target	11.1

**ISCTR - TRLmn - Bank-Only****Gordon Growth Model (TRLmn - nominal)**

Benchmark Core RoE	19%
g (nominal)	10%
CoE	15.0%
Benchmark P/B (a)	1.9
1y FL adj. P/B	2.41
1yFL Sh. Eq. (Excl. Subs) (b)	11,490
Dividend (c)	999
Dividend Yield	3.6%
Value of Subsidiaries (d)	6,260
Target Market Cap. (a*b+c+d)	29,290
Number of Shares (mn)	4,500
Price Target	6.5
Current Per Share Price	6.15
<b>Upside Potential</b>	<b>6%</b>

**HALKB - TRLmn - Bank-Only****Gordon Growth Model (TRLmn - nominal)**

Benchmark RoE	20%
g (nominal)	10%
CoE	15.0%
Benchmark P/B (a)	2.1
1y FL adj. P/B	2.06
1yFL Sh. Eq. (b)	7,934
Dividend (c)	505
Dividend Yield	3.1%
Target Market Cap. (a*b+c)	16,779
Number of Shares (mn)	1,250
Price Target	13.4
Current Per Share Price	13.10
<b>Upside Potential</b>	<b>2%</b>

**VAKBN - TRLmn - Bank-Only****Gordon Growth Model (TRLmn - nominal)**

Benchmark RoE	16%
g (nominal)	10%
CoE	15.0%
Benchmark P/B (a)	1.29
1y FL adj. P/B	1.22
1yFL Sh. Eq. (b)	8,851
Dividend (c)	121
Dividend Yield	1.1%
Target Market Cap. (a*b+c)	11,501
Number of Shares (mn)	2,500
Price Target	4.60
Current Per Share Price	4.32
<b>Upside Potential</b>	<b>6%</b>

**Table 17: Gordon Growth Model**

When necessary simplifications are made, this formula simply states the net present value of earnings with no growth. If we are to adjust both the nominator and the denominator for the growth  $(ROE-g)/(CoE-g)$  we end up with the benchmark P/B. When this multiple is being related with the one year forward looking shareholders' equity estimation, a target value for the bank is attained. As one year forward looking book value excludes the dividends to be paid, the dividend for the year should be added on top of this figure to arrive at an overall valuation for a bank. In this valuation methodology, both the return on equity and the cost of equity should be normalised, meaning that they should be sustainable figures that the bank is capable of operating with. There can be one-off years with soaring cost of equities or plunging profits, but they will not be representative for the bank's potential. That is why this model uses the average return on equity and the average cost of equity of our forecasting horizon that includes the years from 2010 to end with 2015.

Main drawback of this methodology is that it rewards the banks using a higher leverage. If we are to compare Akbank with Halkbank, it is clear that Akbank is using a substantially less leverage than Halk. Akbank prefers higher CAR to higher ROE. Akbank's CAR is a huge 20% as of end-2Q109 versus Halk's 15%. If we plug-in Halk's higher 10.3% leverage to Akbank, Akbank's ROE leaps from 21% up to 30%, which is even above that of Halkbank.

### Dupont Analysis (1H10)

	GARAN	AKBNK	YKBNK	ISCTR	HALKB
NIM (NII/ Avg. Assets)	4.5%	4.1%	4.2%	3.7%	5.0%
Fee Inc. / Avg. Assets	1.5%	1.3%	2.2%	1.0%	0.8%
Other Inc. / Avg. Assets	1.0%	0.9%	1.6%	2.4%	0.8%
<b>Banking Income / Avg. Assets</b>	<b>7.0%</b>	<b>6.2%</b>	<b>8.0%</b>	<b>7.2%</b>	<b>6.7%</b>
Cost / Banking Income	36.3%	34.4%	39.8%	39.4%	32.7%
<b>Operating ROA</b>	<b>4.4%</b>	<b>4.1%</b>	<b>4.8%</b>	<b>4.4%</b>	<b>4.5%</b>
Provisions / Avg. Assets	0.4%	0.4%	0.9%	0.9%	0.6%
Inc. From Associates / Avg. Assets	0.0%	0.0%	0.0%	0.0%	0.0%
Extraordinary Income / Avg. Assets	0.0%	0.0%	0.0%	0.0%	0.0%
<b>ROA before taxes</b>	<b>4.1%</b>	<b>3.6%</b>	<b>3.9%</b>	<b>3.5%</b>	<b>3.9%</b>
Tax Rate	19.5%	19.7%	19.9%	15.1%	18.7%
<b>ROA</b>	<b>3.3%</b>	<b>2.9%</b>	<b>3.1%</b>	<b>2.9%</b>	<b>3.2%</b>
<b>Leverage Ratio</b>	7.8	7.2	8.4	8.6	10.3
<b>ROE</b>	<b>25.7%</b>	<b>21.0%</b>	<b>26.2%</b>	<b>25.2%</b>	<b>32.7%</b>
Average Leverage -Big 6	8.6				
<b>Implied ROE @ Avg. Lev.</b>	<b>28.2%</b>	<b>25.1%</b>	<b>26.7%</b>	<b>25.2%</b>	<b>27.1%</b>

Source: Company Data

**Table 18:** ROE Decomposition - Dupont Analysis (9M09)

**Source:** The BRSA, Bank Financials

If we are to analyse the outcomes of all three different valuation techniques of the five banks we end up with a maximum of 3pp standard deviation to the mean. This outcome assures that with consistent assumptions backed by sound estimations all valuation methodologies should lead to similar valuation outcomes.

<b>AKBNK 1YFL Target Value TRL/Share (Avg. GGM &amp; DDM &amp; EVA)</b>		<b>Δ Mean</b>
Gordon Growth Model	8.77	1.1%
Dividend Discount Model	8.53	-1.7%
Economic Value Added	8.73	0.6%
<b>Avg. GGM &amp; DDM &amp; EVA</b>	<b>8.68</b>	<b>0.0%</b>
Current Price	8.7	
<b>Upside</b>	<b>0%</b>	

<b>GARANTI 1YFL Target Value TRL/Share (Avg. GGM &amp; DDM &amp; EVA)</b>		<b>Δ Mean</b>
Gordon Growth Model	11.07	-1.5%
Dividend Discount Model	11.11	-1.1%
Economic Value Added	11.52	2.6%
<b>Avg. GGM &amp; DDM &amp; EVA</b>	<b>11.23</b>	<b>0.0%</b>
Current Price	8.10	
<b>Upside</b>	<b>39%</b>	

<b>ISCTR 1YFL Target Value TRL/Share (Avg. GGM &amp; DDM &amp; EVA)</b>		<b>Δ Mean</b>
Gordon Growth Model	6.51	0.9%
Dividend Discount Model	6.44	-0.2%
Economic Value Added	6.41	-0.7%
<b>Avg. GGM &amp; DDM &amp; EVA</b>	<b>6.45</b>	<b>0.0%</b>
Current Price	6.15	
<b>Upside</b>	<b>5%</b>	

<b>HALKB 1YFL Target Value TRL/Share (Avg. GGM &amp; DDM &amp; EVA)</b>		<b>Δ Mean</b>
Gordon Growth Model	13.42	-2.7%
Dividend Discount Model	14.15	2.5%
Economic Value Added	13.83	0.2%
<b>Avg. GGM &amp; DDM &amp; EVA</b>	<b>13.80</b>	<b>0.0%</b>
Current Price	13.10	
<b>Upside</b>	<b>5%</b>	

<b>VAKBN 1YFL Target Value TRL/Share (Avg. GGM &amp; DDM &amp; EVA)</b>		<b>Δ Mean</b>
Gordon Growth Model	4.60	0.2%
Dividend Discount Model	4.71	2.7%
Economic Value Added	4.46	-2.9%
<b>Avg. GGM &amp; DDM &amp; EVA</b>	<b>4.59</b>	<b>0.0%</b>
Current Price	4.32	
<b>Upside</b>	<b>3%</b>	

**Table 19: Valuation Summary**

### 3.3.7 Relative Valuation

In relative valuation, we value an asset based upon how similar assets are priced in the market, in other words, a potential investor in a stock tries to estimate its value by looking at the market pricing of similar stocks. If the market is correct, on average, in the way it prices assets, discounted cash flow and relative valuations may converge. If, however, the market is systematically over pricing or under pricing a group of assets or an entire sector, discounted cash flow valuations can deviate from relative valuations (Damodaran, A. 2006).

One of the more intuitive ways to think of the value of any asset is as a multiple of the earnings that asset generates. When buying a stock, it is common to look at the price paid as a multiple of the earnings per share generated by the company. This price/earnings ratio can be estimated using current earnings per share, yielding a current PE, earnings over the last 4 quarters, resulting in a trailing PE, or expected earnings per share in the next year, providing a forward PE.

To do a relative valuation, the analyst needs:

- an identical asset, or a group of comparable or similar assets
- a standardized measure of value (in equity, this is obtained by dividing the price by a common variable, such as earnings or book value)
- and if the assets are not perfectly comparable, variables to control for the differences

Variation on Multiples:

Equity versus Firm Value

- Equity multiples (Price per share or Market value of equity)
- Firm value multiples (Firm value or Enterprise value)

Scaling variable

- Earnings (EPS, Net Income, EBIT, EBITDA)
- Book value (Book value of equity, Book value of assets, Book value of capital)
- Revenues
- Sector specific variables

Base year

- Most recent financial year (Current)
- Last four quarters (Trailing)
- Average over last few years (Normalized)
- Expected future year (Forward)

Comparables

- Sector
- Market

PE is analyzed when a company achieves a rate of return of equity different from the cost of capital and when the value is created or destroyed. Earnings are profits attributable to shareholders. They are the main output of a company's accounting system and they are designed to be a bottom line measure of performance. It is not surprising therefore those investors seek to establish a direct relationship between earnings and share prices, in the form of the PE ratio. In effect, PE ratio summarizes in a single number the relationship between the

financial performance of the company and the stock market valuation of expected performance (share price) (Richard Barker, Determining Value, 2001)

Due to differences in accounting systems comparing the value of a bank with the peer group may sometimes end up with unreasonable results. As countries are more and more trying to implement IFRS guidelines and Basel practices are enforcing banks of different countries to use similar accounting techniques, the differences are getting less gradually. Figures below are taken from Bloomberg and done by credible equity analysts that have access to this system. Prerequisite of peer group market multiple comparison is to have a good set of competitors from similar countries. In other words, comparing Turkish Bank with a developed country would provide a misleading guideline. In the below set, we have taken into account the emerging market banks.

As seen at the bottom of the chart the average 11F Price/Book multiple of emerging competitors is 1.5x that is below that of Turkish banks' 1.8. While this might mean that Turkey is over valued at the first glance, this is a naïve conclusion if the analyst interprets this figure without taking into account the ROE. Turkish banks' expected 2011 ROE is 20%, which is 4pp above the average ROE of emerging competitors. In the ROE vs P/B graph below Turkey looks a tad more expensive than the emerging peers. Throughout the local bank, compared to the Turkish banks' average 11F Price/Book multiple of 1.8x, Akbank is 8% overvalued despite its ROE being close to the domestic banks' average. This means that Akbank is fully valued as indicated by the average of the three fundamental valuation methods. Comparing with the multiples of the competition should be used just to double-check the fundamental valuation outcome.

Company	Country	P/E			P/B			ROE		
		2009	2010E	2011E	2009	2010E	2011E	2009	2010E	2011E
BM&FBOVESPA SA	BRAZIL	29.31	20.40	17.45	1.50	1.44	1.43	5.27	7.14	7.71
REDECARD SA	BRAZIL	14.02	11.62	11.17	20.48	22.34	19.53	159.94	188.47	184.02
MRV ENGENHARIA	BRAZIL	25.44	13.84	9.95	3.36	2.88	2.43	16.72	20.55	24.94
PDG REALTY SA	BRAZIL	34.99	15.39	10.32	3.02	2.14	1.88	15.55	16.90	20.53
PORTO SEGURO SA	BRAZIL	24.61	12.85	10.18	2.22	2.02	1.92	13.71	16.18	17.80
MULTIPLAN EMPREENDIMENTOS	BRAZIL	29.58	26.21	22.06	2.38	2.07	2.00	9.36	7.71	8.35
SUL AMERICA SA - UNITS	BRAZIL	16.03	12.06	10.61	1.11	2.02	1.88	15.14	16.71	16.11
BR MALLS PARTICIPACOES SA	BRAZIL	27.47	22.56	19.17	1.26	1.10	1.07	9.95	4.95	5.81
BROOKFIELD INCORPORACOES SA	BRAZIL	21.36	12.26	8.33	1.68	1.48	1.30	10.05	12.57	17.30
IGUATEMI EMP DE SHOPPING	BRAZIL	35.37	25.45	21.85	2.10	2.13	2.06	8.11	8.68	9.40
BANCO DAYCOVAL SA	BRAZIL	14.95	9.42	7.98	1.68	1.36	1.30	10.36	14.37	16.25

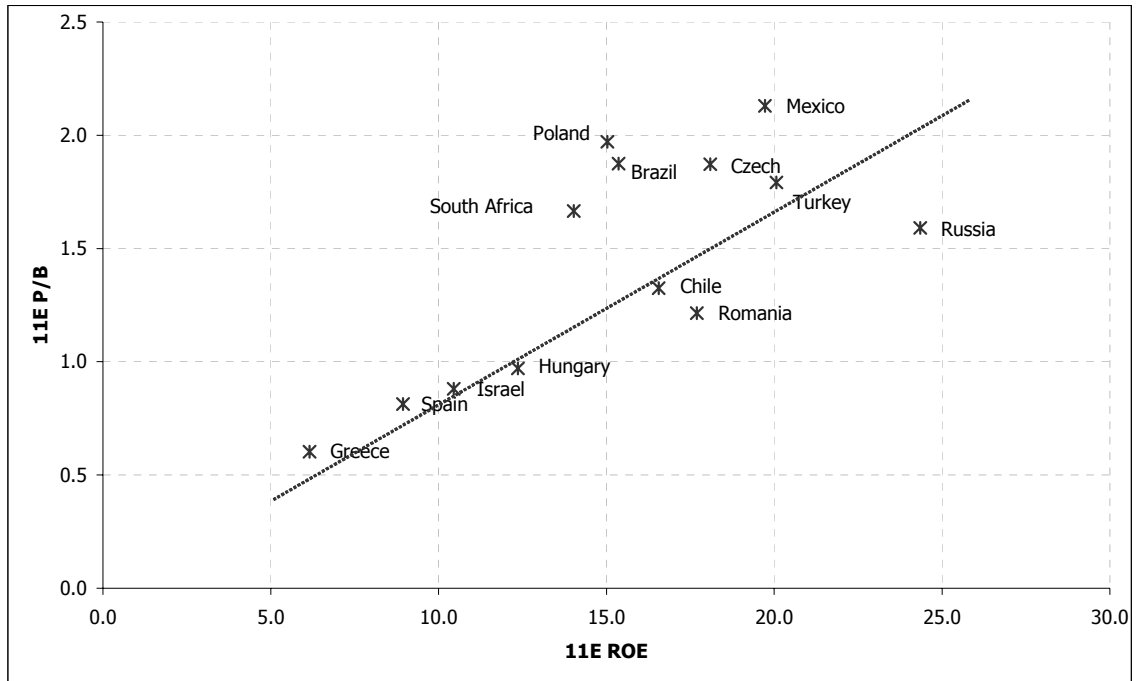


Cont'd	Country	P/E			P/B			ROE		
		2009	2010E	2011E	2009	2010E	2011E	2009	2010E	2011E
BANCO ABC BRASIL SA	BRAZIL	17.29	10.77	8.52	1.89	1.32	1.22	11.16	15.74	16.75
KROTON EDUCACIONAL SA	BRAZIL	21.80	53.98	15.04	1.21	1.26	1.21	4.89	1.63	5.73
BANCO PINE SA - PREF SHARES	BRAZIL	14.68	8.14	7.51	1.58	1.36	1.26	10.65	15.22	-
	<b>BRAZIL</b>	<b>22.64</b>	<b>15.34</b>	<b>12.53</b>	<b>2.10</b>	<b>1.98</b>	<b>1.87</b>	<b>10.69</b>	<b>13.29</b>	<b>15.36</b>
BANCO BILBAO VIZCAYA ARGENTA	CHILE	7.00	7.98	7.11	1.16	1.18	1.07	18.24	16.32	16.66
BANCO SANTANDER CHILE	CHILE	22.01	19.90	17.78	5.19	4.91	4.24	25.80	27.83	26.93
BANCO DE CHILE	CHILE									
	<b>CHILE</b>	<b>8.49</b>	<b>9.43</b>	<b>8.41</b>	<b>1.45</b>	<b>1.47</b>	<b>1.32</b>	<b>19.01</b>	<b>15.48</b>	<b>16.56</b>
GRUPO FINANCIERO BANORTE-O	MEXICO	17.46	13.84	10.70	2.46	2.07	1.78	14.30	15.18	17.67
BANCO COMPARTAMOS SA	MEXICO	26.11	18.85	15.69	8.81	6.20	4.76	40.65	39.00	34.90
	<b>MEXICO</b>	<b>19.13</b>	<b>14.89</b>	<b>11.68</b>	<b>3.04</b>	<b>2.51</b>	<b>2.13</b>	<b>17.34</b>	<b>18.45</b>	<b>19.72</b>
KOMERCNI BANKA AS	CZECH	13.96	11.92	10.73	2.36	2.02	1.87	17.43	17.50	18.09
	<b>CZECH</b>	<b>13.96</b>	<b>11.92</b>	<b>10.73</b>	<b>2.36</b>	<b>2.02</b>	<b>1.87</b>	<b>19.69</b>	<b>18.26</b>	<b>18.09</b>
NATIONAL BANK OF GREECE	GREECE	6.13	13.77	7.72	0.52	0.65	0.61	15.94	6.63	10.30
ALPHA BANK A.E.	GREECE	6.99	29.48	11.25	0.52	0.54	0.52	9.38	1.81	4.75
EFG EUROBANK ERGASIAS	GREECE	8.14	43.73	11.14	0.51	0.57	0.55	6.35	0.84	5.07
PIRAEUS BANK S.A.	GREECE	5.40	107.13	10.94	0.37	0.41	0.40	7.10	0.47	3.42
AGRICULTURAL BANK OF GREECE	GREECE	16.24	-7.75	-166.76	0.68	1.58	1.48	2.94	-15.60	-3.21
TT HELLENIC POSTBANK S.A.	GREECE	12.60	-38.14	23.07	0.94	1.56	1.41	9.68	-3.54	5.75
	<b>GREECE</b>	<b>7.00</b>	<b>29.31</b>	<b>10.09</b>	<b>0.53</b>	<b>0.64</b>	<b>0.60</b>	<b>7.64</b>	<b>1.97</b>	<b>6.16</b>
OTP BANK PLC	HUNGARY	9.65	11.69	8.22	1.13	1.07	0.97	12.96	10.02	13.15
	<b>HUNGARY</b>	<b>9.65</b>	<b>11.69</b>	<b>8.22</b>	<b>1.13</b>	<b>1.07</b>	<b>0.97</b>	<b>12.89</b>	<b>9.41</b>	<b>12.37</b>
PKO BANK POLSKI SA	POLAND	22.98	17.63	13.48	2.60	2.56	2.30	13.41	14.53	17.19
BANK PEKAO SA	POLAND	17.81	17.62	14.79	2.37	2.33	2.19	14.22	13.78	15.23
BANK ZACHODNI WBK SA	POLAND	19.64	17.04	13.57	2.76	2.51	2.23	14.89	15.11	16.85
BANK HANDLOWY W WARSZAWIE SA	POLAND	20.45	17.59	14.21	1.77	1.79	1.71	9.18	10.04	12.50
ING BANK SLASKI SA	POLAND	16.46	14.52	12.31	2.09	1.87	1.67	14.06	14.54	14.51
BRE BANK SA	POLAND	67.36	21.79	13.54	1.87	1.71	1.54	4.35	8.99	12.09
GETIN HOLDING SA	POLAND	27.70	19.67	12.28	1.98	1.70	1.47	7.15	9.29	13.14
BANK MILLENNIUM SA	POLAND	-198.23	23.95	14.21	1.64	1.46	1.32	-1.18	7.97	10.04
KREDYT BANK SA	POLAND	75.52	25.13	12.58	1.56	1.47	1.32	2.37	6.76	9.73
	<b>POLAND</b>	<b>22.54</b>	<b>17.93</b>	<b>13.73</b>	<b>2.27</b>	<b>2.17</b>	<b>1.97</b>	<b>11.84</b>	<b>12.36</b>	<b>15.03</b>
BRD-GROUPE SOCIETE GENERALE	ROMANIA	8.03	8.00	7.28	1.72	1.55	1.32	22.29	20.20	18.81
BANCA TRANSILVANIA	ROMANIA	16.89	12.03	7.97	0.86	0.94	0.85	3.72	6.68	9.05
	<b>ROMANIA</b>	<b>8.72</b>	<b>8.43</b>	<b>7.38</b>	<b>1.49</b>	<b>1.41</b>	<b>1.21</b>	<b>17.84</b>	<b>17.21</b>	<b>17.70</b>
SBERBANK	RUSSIA	95.20	13.78	7.29	2.41	2.02	1.60	2.64	14.71	24.41
BANK MOSKVY-CLS	RUSSIA									
BANK ST PETERSBURG-CLS	RUSSIA	85.13	13.89	5.79	1.84	1.63	1.33	0.96	10.12	21.33
BANK VOZROZHDENIE-CLS	RUSSIA	24.46	33.15	9.56	1.62	1.56	1.31	6.64	5.05	14.55
MDM BANK OJSC-CLS	RUSSIA									
	<b>RUSSIA</b>	<b>91.30</b>	<b>13.90</b>	<b>7.28</b>	<b>2.38</b>	<b>2.00</b>	<b>1.59</b>	<b>2.66</b>	<b>15.63</b>	<b>24.36</b>
STANDARD BANK GROUP LTD	S. AFRICA	15.63	13.18	10.41	2.08	1.78	1.62	13.68	14.34	16.29
FIRSTRAND LTD	S. AFRICA	17.76	12.71	10.78	2.59	0.76	1.97	14.08	19.87	19.40
ABSA GROUP LTD	S. AFRICA	14.54	11.64	9.36	2.04	1.79	1.60	14.71	15.80	17.73
NEDBANK GROUP LTD	S. AFRICA	19.56	16.15	11.78	1.94	1.63	1.49	11.37	12.29	15.40
	<b>S. AFRICA</b>	<b>16.42</b>	<b>13.09</b>	<b>10.46</b>	<b>2.15</b>	<b>1.31</b>	<b>1.67</b>	<b>14.75</b>	<b>12.45</b>	<b>14.03</b>
AKBANK T.A.S.	TURKEY	13.75	11.57	10.69	1.96	2.15	1.93	20.75	19.72	18.57
TURKIYE GARANTI BANKASI	TURKEY	13.43	10.37	9.58	2.98	2.35	1.98	24.30	24.00	21.24
TURKIYE IS BANKASI-C	TURKEY	12.41	10.07	9.40	2.32	1.78	1.57	20.73	20.79	19.07
YAPI VE KREDI BANKASI	TURKEY	14.72	11.10	9.84	2.61	2.18	1.80	19.75	21.23	19.58
TURKIYE HALK BANKASI	TURKEY	11.47	9.49	8.81	3.24	2.58	2.17	30.61	28.38	25.29
TURKIYE VAKIFLAR BANKASI T-D	TURKEY	9.30	9.15	8.05	1.73	1.40	1.21	18.68	15.41	15.45
	<b>TURKEY</b>	<b>12.79</b>	<b>10.45</b>	<b>9.58</b>	<b>2.40</b>	<b>2.07</b>	<b>1.79</b>	<b>20.33</b>	<b>21.32</b>	<b>20.06</b>
<b>EM Average</b>		<b>14.93</b>	<b>12.63</b>	<b>9.76</b>	<b>1.80</b>	<b>1.62</b>	<b>1.52</b>	<b>13.16</b>	<b>13.49</b>	<b>16.05</b>

Source: Bloomberg

Table 20: Market Multiples of Emerging Countries

Source: Bloomberg



**Table 21:** ROE versus P/B Multiple

Source: Bloomberg

## 4. CONCLUSION

The thesis guides the way to value a bank starting from the forecasting of key balance sheet and income statement items to boil them down to valuations. In every step of the forecasting we have tried to bestow the key parameters that are critical to forecast the line. In the normal distribution tests, hypothesis testing and regression model we have run our numbers on SPSS. Our study bestows that a hefty 92% of the variation in loans, which is the key determinant in bank models, can be explained by the variation in GDP. Taking into account duration gaps and their impact on net interest margins we have shown how profitability of the banks soar during the easing cycle and how they should come down when the Central Bank starts increasing the rates.

On the valuation side this study emphasises four methodologies for the banks. The Gordon Growth Approach, dividend discount model, economic value added -- discounted excess return over the cost of equity-- and comparison with peer group multiples as a sanity check.

Gordon growth model is based on return on equity generating capability of a bank over its cost of equity and relates the outcome with the bank's shareholders' equity to arrive at a valuation for the whole entity. This simple methodology takes into account a normalised return on equity and a normalised cost of equity but does not analyse each year's contribution to value separately. Dividend discount model discounts the future dividends of a bank while taking into account the excess capital retained as hidden value. The bank should have a track record of distributing dividends and a sustainable dividend policy for this method to work. Economic value added discounts the difference between the bank's forecasted future earnings and implied return if the capital was returning a yield at par with cost of equity. This is the economic profit a bank generated on the back of well built banking organisation. The banks that are unable to generate a positive economic return are value destroyers and they deserve to be traded below the book values.

As well as the analysis of the necessary steps for bank valuation, the study also has empirical forecasting and valuation of 5 banks listed on the Istanbul Stock exchange to show that the

fundamental valuation techniques should lead to similar valuation outcomes. In the empirical analysis the Dividend Discount Model, Gordon Growth, Economic Value Added and the sanity check international peer group multiples led to a mere 3pp standard deviation from the mean in the most extreme case. All four valuation methodologies range in +/- 3% interval. All in all, if the assumptions are well build, forecasts are based on sound numbers, valuation inputs are consistent the results of all valuation methodologies should end up to be reasonably close to each other as we have seen in the approaches we have gone through above.

## APPENDIX

### AKBNK

<b>Balance Sheet</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
<b>Loans</b>	<b>49,054</b>	<b>44,604</b>	<b>56,962</b>	<b>67,094</b>	<b>77,361</b>	<b>88,841</b>	<b>102,237</b>	<b>115,579</b>
Trading Securities	243	405	669	778	886	1,006	1,144	1,278
AFS Securities	7,557	30,704	42,281	48,909	54,406	58,474	62,231	64,484
HTM Investments	20,561	15,840	9,558	11,173	12,769	14,457	16,388	18,224
<b>Deposits</b>	<b>57,575</b>	<b>60,954</b>	<b>75,636</b>	<b>87,225</b>	<b>101,313</b>	<b>115,437</b>	<b>127,742</b>	<b>145,130</b>
Funds Borrowed	12,311	9,209	11,803	15,926	16,235	16,665	20,900	18,379
Shareholders' Equity	11,331	14,447	16,805	19,138	22,538	26,230	30,412	34,888
<b>TOTAL ASSETS</b>	<b>93,093</b>	<b>102,833</b>	<b>121,511</b>	<b>142,547</b>	<b>163,292</b>	<b>184,561</b>	<b>208,715</b>	<b>231,262</b>
<b>P/L</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Interest Income	10,133	9,550	9,256	10,699	12,713	14,030	15,232	16,420
Interest Expense	6,486	4,825	4,767	5,940	6,806	7,712	8,406	9,047
Net Fees	1,142	1,323	1,450	1,786	2,094	2,407	2,783	3,196
Dividend Income	4	1	5	0	0	0	0	0
Net Trading Income	65	113	175	144	162	170	177	181
Other Op. Income	749	512	1,047	1,029	1,201	1,365	1,551	1,751
Operating Income	5,608	6,675	7,166	7,718	9,364	10,260	11,336	12,501
Provisions	1,194	1,124	828	981	1,079	1,241	1,434	1,648
Opex	2,262	2,261	2,441	2,673	2,868	3,000	3,171	3,578
Tax	369	566	797	813	1,083	1,204	1,346	1,455
<b>Net Profit</b>	<b>1,782</b>	<b>2,723</b>	<b>3,100</b>	<b>3,251</b>	<b>4,333</b>	<b>4,815</b>	<b>5,385</b>	<b>5,820</b>

### GARAN

<b>Balance Sheet</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
<b>Loans</b>	<b>52,750</b>	<b>53,477</b>	<b>66,281</b>	<b>77,172</b>	<b>88,218</b>	<b>101,366</b>	<b>116,743</b>	<b>132,130</b>
Trading Securities	1,274	1,241	2,338	2,733	3,099	3,481	3,902	4,267
AFS Securities	18,328	29,770	31,027	34,895	38,028	40,882	41,593	40,156
HTM Investments	7,784	7,468	7,331	8,554	9,696	10,905	12,246	13,428
<b>Deposits</b>	<b>57,960</b>	<b>68,782</b>	<b>78,007</b>	<b>90,571</b>	<b>106,874</b>	<b>123,399</b>	<b>138,375</b>	<b>159,105</b>
Funds Borrowed	13,473	15,466	19,060	22,418	20,785	20,783	24,844	21,803
Shareholders' Equity	9,743	13,686	16,546	18,352	20,875	23,906	27,193	30,611
<b>TOTAL ASSETS</b>	<b>99,038</b>	<b>116,334</b>	<b>128,719</b>	<b>148,805</b>	<b>168,285</b>	<b>190,438</b>	<b>215,731</b>	<b>239,645</b>
<b>P/L</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Interest Income	10,066	11,139	10,052	11,391	13,298	14,675	15,982	17,236
Interest Expense	6,635	5,733	4,895	6,079	6,875	7,647	8,406	9,177
Net Fees	1,578	1,725	1,857	2,233	2,577	2,955	3,419	3,931
Dividend Income	29	3	3	3	3	3	3	3
Net Trading Income	254	898	494	585	443	466	471	465
Other Op. Income	438	437	870	674	827	830	897	1,015
Operating Income	5,730	8,469	8,382	8,807	10,273	11,282	12,367	13,474
Provisions	618	1,716	666	809	1,024	1,175	1,360	1,563
Opex	2,776	2,823	3,106	3,125	3,595	3,922	4,434	5,016
Tax	456	840	930	975	1,131	1,237	1,315	1,379
<b>Net Profit</b>	<b>1,879</b>	<b>3,086</b>	<b>3,769</b>	<b>3,879</b>	<b>4,499</b>	<b>4,923</b>	<b>5,231</b>	<b>5,487</b>

**ISCTR**

<b>Balance Sheet</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
<b>Loans</b>	<b>47,610</b>	<b>48,334</b>	<b>67,070</b>	<b>77,686</b>	<b>89,010</b>	<b>101,651</b>	<b>116,075</b>	<b>129,724</b>
Trading Securities	452	499	828	919	1,011	1,113	1,226	1,324
AFS Securities	21,250	25,980	33,021	32,463	31,615	30,790	30,012	28,678
HTM Investments	3,462	12,929	17,099	19,188	21,193	23,066	25,015	26,390
<b>Deposits</b>	<b>63,539</b>	<b>72,177</b>	<b>94,893</b>	<b>108,829</b>	<b>125,697</b>	<b>142,950</b>	<b>157,886</b>	<b>179,377</b>
Funds Borrowed	11,033	9,744	9,567	6,924	1,075	-4,628	-6,722	-18,116
Shareholders' Equity	9,449	13,493	15,851	18,118	20,609	23,478	26,470	29,649
<b>TOTAL ASSETS</b>	<b>97,551</b>	<b>113,223</b>	<b>142,765</b>	<b>158,856</b>	<b>174,887</b>	<b>191,997</b>	<b>210,787</b>	<b>226,541</b>
<b>P/L</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Interest Income	10,596	10,200	10,307	12,660	14,229	15,281	16,350	17,380
Interest Expense	6,978	5,333	5,680	7,547	8,213	8,652	9,124	9,532
Net Fees	1,204	1,253	1,429	1,606	1,647	1,887	2,164	2,465
Dividend Income	285	325	388	411	425	438	452	466
Net Trading Income	473	408	471	445	453	445	437	426
Other Op. Income	652	1,073	1,471	1,547	1,289	1,424	1,575	1,729
Operating Income	6,231	7,927	8,386	9,122	9,831	10,823	11,855	12,935
Provisions	1,614	2,286	1,357	1,548	1,792	2,053	2,355	2,682
Opex	2,820	2,695	3,094	3,498	3,709	3,892	4,304	4,726
Tax	289	573	714	815	866	976	1,039	1,105
<b>Net Profit</b>	<b>1,509</b>	<b>2,372</b>	<b>3,331</b>	<b>3,261</b>	<b>3,464</b>	<b>3,903</b>	<b>4,157</b>	<b>4,421</b>

**HALKB**

<b>Balance Sheet</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
<b>Loans</b>	<b>25,836</b>	<b>32,458</b>	<b>41,768</b>	<b>50,585</b>	<b>59,125</b>	<b>68,887</b>	<b>80,255</b>	<b>91,512</b>
Trading Securities	115	56	89	107	124	147	174	203
AFS Securities	2,360	4,760	6,317	7,433	8,350	9,287	10,171	10,878
HTM Investments	15,859	16,557	15,507	18,063	21,153	24,518	28,356	31,978
<b>Deposits</b>	<b>40,271</b>	<b>43,950</b>	<b>54,953</b>	<b>65,400</b>	<b>78,116</b>	<b>91,846</b>	<b>103,477</b>	<b>119,931</b>
Funds Borrowed	1,522	2,032	3,179	4,939	3,660	2,957	6,683	5,140
Shareholders' Equity	4,289	5,760	7,422	9,106	11,105	13,340	15,709	18,248
<b>TOTAL ASSETS</b>	<b>51,096</b>	<b>60,650</b>	<b>74,358</b>	<b>90,115</b>	<b>105,355</b>	<b>122,668</b>	<b>142,774</b>	<b>162,569</b>
<b>P/L</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Interest Income	6,793	6,817	6,396	7,760	9,177	10,351	11,555	12,779
Interest Expense	4,667	3,708	3,011	4,063	4,741	5,351	5,984	6,579
Net Fees	370	461	568	683	774	860	956	1,055
Dividend Income	39	11	47	50	53	56	60	63
Net Trading Income	-194	16	151	71	83	92	101	109
Other Op. Income	363	261	404	488	526	615	719	835
Operating Income	2,705	3,857	4,554	4,990	5,872	6,623	7,405	8,262
Provisions	436	646	567	668	797	931	1,090	1,266
Opex	1,002	1,194	1,468	1,603	1,914	2,125	2,485	2,886
Tax	248	386	500	544	632	713	766	822
<b>Net Profit</b>	<b>1,018</b>	<b>1,631</b>	<b>2,019</b>	<b>2,175</b>	<b>2,530</b>	<b>2,853</b>	<b>3,065</b>	<b>3,288</b>

<b>VAKBN</b>								
<b>Balance Sheet</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
<b>Loans</b>	<b>30,502</b>	<b>34,573</b>	<b>43,215</b>	<b>50,189</b>	<b>57,705</b>	<b>66,254</b>	<b>76,102</b>	<b>85,633</b>
Trading Securities	47	39	34	39	44	52	62	74
AFS Securities	7,982	14,966	14,953	15,454	15,761	15,936	16,086	15,846
HTM Investments	3,471	3,498	5,312	6,176	7,103	8,147	9,344	10,491
<b>Deposits</b>	<b>37,120</b>	<b>44,652</b>	<b>50,173</b>	<b>58,047</b>	<b>68,310</b>	<b>79,218</b>	<b>89,220</b>	<b>103,407</b>
Funds Borrowed	5,770	4,366	10,001	12,099	12,315	13,220	16,757	15,112
Shareholders' Equity	5,671	7,381	8,454	9,647	11,158	12,822	14,734	16,985
<b>TOTAL ASSETS</b>	<b>52,193</b>	<b>64,798</b>	<b>78,035</b>	<b>90,730</b>	<b>104,363</b>	<b>119,687</b>	<b>137,257</b>	<b>154,077</b>
<b>P/L</b>	<b>2008</b>	<b>2009</b>	<b>2010F</b>	<b>2011F</b>	<b>2012F</b>	<b>2013F</b>	<b>2014F</b>	<b>2015F</b>
Interest Income	6,414	6,403	6,081	7,142	8,295	9,174	10,067	10,956
Interest Expense	4,439	3,326	3,289	4,018	4,638	5,164	5,614	5,932
Net Fees	466	466	455	543	630	725	837	959
Dividend Income	25	24	56	56	59	62	65	69
Net Trading Income	90	178	217	202	213	216	219	220
Other Op. Income	313	311	570	532	619	713	822	942
Operating Income	2,869	4,056	4,090	4,457	5,177	5,726	6,396	7,214
Provisions	624	981	929	858	996	1,146	1,323	1,516
Opex	1,319	1,533	1,656	1,839	1,974	2,097	2,230	2,356
Tax	172	291	304	357	448	504	577	678
<b>Net Profit</b>	<b>753</b>	<b>1,251</b>	<b>1,200</b>	<b>1,403</b>	<b>1,759</b>	<b>1,979</b>	<b>2,267</b>	<b>2,664</b>

**Table 22: Financials and Projections**

**Source:** The BRSA

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