Asset/Liability Glossary

The Baker Group

Asset/Liability Glossary

EARNING POWER MEASURES

Break-Even Yield
The break-even yield for a bank can be defined as the rate on earning assets that produces no net income, or the yield an institution needs to earn on its average earning assets in order to pay all of its expenses. Break-Even Yield is calculated by:

Break-Even Yield =((Interest Expense + Non-Interest Expense - Non-Interest Income)/Average Earning Assets) X (365/DM) X 100

DM = Days in the particular month.

Break-Even Yield = (($153,000+$141,000-$60,000)/$47,432,000)(365/31) = 5.81%

Cost of Paying Liabilities
The cost of paying liabilities is the weighted average rate paid on paying liabilities. The cost of paying liabilities is extremely useful because it tracks the cost of funds an institution is forced to employ. The projected cost of paying liabilities is calculated by monitoring the dynamic structure of the balance sheet as it evolves over time. The roll between accounts is utilized to monitor the projected shift in the balance sheet.

Earning Assets
Earning assets include all assets that generate explicit interest income or lease receipts. It is typically measured by subtracting all non-earning assets, such as cash and due from banks, premises, equipment, and other assets from total assets. Earning Assets is calculated by:

Earning Assets = Total Assets - Non Earning Assets

Earning Assets = $50,368,000 - $2,936,000 = $47,432,000

Earning Assets/Paying Liabilities
Earning Assets/Paying Liabilities is an earning power measure that displays the amount of earning assets an institution possesses for every dollar of paying liabilities. Equilibrium is achieved when a measure of 100 is achieved, however for an institution to profit from business a spread should exist. In historical terms banks have been able to maintain a level of $1.17 of earning assets for every $1.00 in paying liabilities.

Earning Assets/Paying Liabilities is calculated by:

(Earning Assets/Paying Liabilities) x 100

($47,432,000/$39,362,000) x 100 = 120.50

Earning Interest Spread
The earning interest spread is simply the arithmetic difference between the weighted average rate on earning assets and the weighted average cost of paying liabilities. The earning interest spread simply shows the relative interest rate difference, or spread, between earning assets and paying liabilities. The usefulness of the earning interest spread is that it easily tracks and displays the variability of cost of funds relative to the yield earned on assets. The earning interest spread is calculated by:

Earning Interest Spread = (Wt. Avg. Yield on Earning Assets - Wt. Avg. Cost of Paying Liabilities)

Earning Interest Spread = 8.27% - 4.63% = 3.64%

Efficiency Ratio
The efficiency ratio displays how well bank managers are utilizing the bank's resources to produce healthy returns for the shareholders. The efficiency ratio can be thought of as total overhead expense (i.e. non-interest expense) divided by total operating income less interest expense. The efficiency ratio is calculated by:

Total Overhead Expense/(Total Operating Income - Interest Expense)

Efficiency Ratio = ($141,000/$300,000+$60,000-$153,000) = 68.12%

Equity/Total Assets
Equity/Total Assets reveals to bank managers the percentage of shareholders' equity that supports an institution's assets. Bank managers find the equity/total assets ratio extremely useful in maintaining adequate levels of capitalization. Equity/total assets can be calculated by:

(Equity/Total Assets) x 100

($5,238,000/$50,368,000) x 100 = 10.40%

Paying Liability
Paying liabilities include all liabilities that generate explicit interest expense. It is generally measured by subtracting all non-paying liabilities, such as demand deposits, TT&L, and other liabilities, from total liabilities.

Paying Liabilities = Total Liabilities - Non-Paying Liabilities

Paying Liabilities = $50,368,000 - $11,006,000 = $39,362,000

Target Yield
Target Yield is the yield an institution needs to earn on its average earning assets in order to reach its desired return on equity. The desired return on equity display management's goal for return on shareholders' equity. This method simply requires that owners and managers specify a desirable return to shareholders in terms of return on equity. This return is then converted to a pretax equivalent

yield and added to the break even yield. Target Yield is calculated by:

(Desired Return on Equity x Capital)/(Average Earning Assets x (1 - MTR)) x 100 + Break-Even Yield

MTR = Marginal Tax Rate

(16.00% x $5,283,000)/$47,432,000 (1-.34) x 100 + 5.81% = 8.51%

Yield on Earning Assets

The yield on earning assets represents the percentage of return that an institution is receiving on its earning assets. The projected yield on earning assets is similar to the projected cost of paying liabilities in that it is a forward projection of the current balance sheet.

GAP MEASURES

In considering the mismatch between rate sensitive assets and liabilities it is important to keep in mind that the gap is a crude indicator of the possible direction in which net income might change. Thus, it is imperative to keep in mind that a gap measure is not necessarily a total risk measure.

Fixed Rate Asset or Liability

The dollar amount of interest earning assets or paying liabilities that will not mature or reprice within a predefined time period.

Gap

Gap is simply the dollar difference between rate sensitive assets and rate sensitive liabilities for a particular time period. If more assets reprice than liabilities the number will be positive which shows that an institution is asset sensitive, or positively gapped. An asset sensitive institution will generally realize an increase in income if interest rates rise due to the fact that more assets will be reinvested at higher market rates than liabilities. If more liabilities have an opportunity to reprice than assets the measure will be negative which shows that an institution is liability sensitive, or negatively gapped. A liability sensitive institution will generally realize an increase in income if rates fall due to the fact that more liabilities will be repricing at lower market rates than assets. Repricing gap is defined as a gap analysis that utilizes contractual repricing dates in the allocation of assets and liabilities across predefined time periods. A repricing gap analysis does not consider how core deposits affect the balance sheet. It reports non-maturing deposits according to repricing frequency. An effective gap is useful in displaying how core deposits affect a bank's actual gap position. An effective gap analysis allows bank managers to utilize the flexibility of non-maturing deposits to analyze their current interest rate position. The major difference between the two, is that the repricing gap is calculated from the repricing frequency, instead of utilizing analyst assumptions on repricing characteristics for effective gap.

Gap/Equity

Gap/Equity displays the degree to which an institution is leveraging shareholders equity in favor of interest rates. Experience suggest that a Gap/Equity ratio in the one year time period that is either greater than +200% or less than -200% tests the limits of prudence and exposes shareholders and bank management to significant risk in the event of an incorrect interest rate forecast. A positive reading suggests the bank will benefit if interest rates increase because the gap is positive. A negative reading suggests the bank will benefit if interest rates decrease because the gap is negative.

Gap/Total Assets

Gap/Total Assets expresses the percent of an institution's total assets that are exposed to changing interest rates. A prudent Gap/Total Assets measurement should be between the range of +15 and -15% throughout the one year time period.

Rate Sensitive Assets (RSA)

The dollar amount of interest earning assets that will have a rate change due to maturity, repricing or principal paydown within a predefined time period.

Rate Sensitive Assets/Rate Sensitive Liabilities Rate Sensitive Assets/Rate Sensitive Liabilities reveals the mismatch between earning assets and paying liabilities within a particular time frame. An equilibrium will be achieved when the ratio equals 100, which implies that rate sensitive assets are equal to rate sensitive liabilities. History has shown that a prudent RSA/RSL ratio within the one year time frame will fall between the range of 70% to 130%. A ratio below 100 displays a liability sensitive institution and a ratio above 100 displays an asset sensitive position.

Rate Sensitive Assets/Total Assets

Rate Sensitive Assets/Total Assets displays the cumulative amount of assets that an institution possesses that will have a rate change within a given time period. A ratio of 100 would mean that all of an institution's assets will have an opportunity to reprice within a predefined time period. Experience has shown that a ratio between the range of 40 to 60 percent is an adequate measure for the one year time frame.

Rate Sensitive Liabilities (RSL)

The dollar amount of interest paying liabilities that will have a rate change due to maturity, repricing, principal decay, or early withdrawals within a predefined time period.

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Rate Sensitive Liabilities/Total Assets

Rate Sensitive Liabilities/Total Assets displays the amount of liabilities that an institution possesses that will have an opportunity to reprice within a given time period. A ratio of 100 would mean that all of an institution's liabilities will reprice within a predefined time period. Experience has shown that a ratio between the range of 40 to 60 percent is an adequate measure for the one year time frame.

LIQUIDITY MEASURES

Asset Mix

Asset Mix is basically the internal structure of the asset side of the balance sheet. The asset mix displays the percentage of a particular asset to total assets.

Dependency Ratio

The Dependency Ratio displays the amount to which an institution's long term assets are dependent on short term (volatile) liabilities for funding. The dependency ratio is calculated by:

Dependency Ratio = ((Non-Core Liabilities - Short Term Investments)/(Long Term Assets * 100))

Investments/Deposits

The investment to deposit ratio displays the percentage of deposits used to fund investments. Since there is an actively traded investment market, a high percentage of investments to deposits could display a very liquid balance sheet if these securities book value was equal or close to market value.

Investments/Deposits = Total Securities/Total Deposits

Investments/Deposits = $14,059,000/$43,544,000 = 32.28%

Liability Mix

Liability Mix is basically the internal structure of the liability side of the balance sheet. The liability mix displays the percentage of a particular liability to total assets.

Liquid Assets/Total Assets

Asset liquidity refers to the ease of converting an asset to cash with a minimum amount of loss. The most liquid assets typically mature in the near term and are highly marketable. The liquidity ratio is expressed as a percentage of total assets. The Liquidity Ratio is calculated by:

(Cash & Due + ST Investments - Pledged Investments + Funds Sold + Trading Account)/Total Assets

ST Investments = all investments that mature or paydown within a one year time frame.

Loan/Deposit

Many banks and bank analysts monitor loan/deposit ratios as a measure of liquidity. Loans are presumably the least liquid of assets, while deposits are the primary source of funds. A high ratio indicates illiquidity because a bank is fully loaned up relative to its stable funding. Implicitly, new loans or other asset purchases must be financed with large purchased liabilities, which can be very expensive. A low ratio suggests that a bank has additional liquidity because it can grant new loans financed with stable, low cost deposits.

Loans Category/(Non-Maturing Demand + CD > $100,000 + CD < $100,000) 100

Loans/Capital

Loans/capital displays the amount of loans versus the amount of primary capital for a particular institution. History has shown that institutions with loan amounts equivalent to eight times tier 1 capital are testing the limits of prudence. Ratios much lower than eight times capital could be considered the norm for most institutions. Loans/capital is derived by:

Total Loans/Net Tier 1 Capital

Net Funds Borrowed/Loans

Net funds borrowed/loans is monitored by analysts and bank managers to display how well bank managers are able to utilize their natural deposit base to fund growth. A high ratio of net funds borrowed/loans portrays an institution that has outgrown its natural client base, and is having to find alternative sources of funds to continue to grow. A low ratio of net funds purchased/loans portrays an institution that is able to fund nearly all of their loans through their natural deposit base.

((Borrowed Funds - Funds Sold)/Loans) 100

Net Funds Borrowed/Capital

Net funds borrowed/capital is monitored by analysts and bank managers to display the extent to which bank managers are forced to utilize purchased funds to maintain steady growth.

((Borrowed Funds - Funds Sold)/Capital) 100

Over $100m Dep./Total Assets

Jumbo CD's, or time deposits over $100,000, typically tend to be highly volatile in that purchasers of CD's that size tend to pay close attention to interest rates. This close monitoring of the term structure of interest rates allows purchasers to shop around for the highest rate. This shopping around causes this type of liability to be highly volatile money, hot money. It is vital to banks to keep large percentages of deposits from leaving the bank at one time. Therefore, managers and analysts use

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this ratio to protect against runs on the bank. Over $100m Dep./Total Assets is calculated by:

> (Certificates of deposits of $100m or more + Open Account Time Deposits of $100m)/Total Assets

Reliance on Wholesale Funding
Reliance on Wholesale Funding = (Total Borrowings + Brokered Deposits)/(Total Borrowings + Total Deposits)

PRICE VOLATILITY

Average Life
The weighted average time (in years) the principal of an instrument is outstanding. An increase in prepayments of the underlying mortgage loans shortens the average life of a mortgage security since more principal has been repaid and a smaller amount of principal will be paid in the future. Callable securities also exhibit extension risk. For example, if an investor purchases a fixed income security in anticipation of the instrument being called and prevailing interest rates suddenly increase, the issuer can forgo the call forcing the instrument to go to the next call date or maturity.

Effective Margin
The effective margin is the average spread of an adjustable rate instrument's book yield over the underlying index for the life of the instrument. The effective margin assumes that the index remains constant over the life of the instrument. The adjusted book yield is calculated assuming that the coupon fully resets to the index plus the margin over time, taking into account all caps, collars and floors. The effective margin reflects that an instrument is being held on the books at a premium or a discount. An instrument held at par will generally have an effective margin equal to its margin. The effective margin is primarily used for reporting floating rate securities, due to the fact that loans are carried on the books at par.

Convexity
Duration estimates the price change of an instrument for a hypothetical shift in market rates. The ability of duration to measure a price change accurately depends upon the magnitude of the change in interest rates. Convexity measures the change in duration of an instrument for a shift in interest rates. Combined, the two provide an accurate measure of price volatility for a shift in market rates. Effective Convexity measures the difference in price sensitivity for increasing versus decreasing rates. Convexity is the difference between an instrument's appreciation and its depreciation for a 100 basis point move in interest rates.

To determine the convexity of an institution's assets and liabilities an analyst must first find the sum of the weighted average convexities of the institution's assets and liabilities. The sum of the weighted average convexities on the asset side of the balance sheet can be viewed as the convexity of assets. Similarly, the convexity of an institution's liabilities can be displayed as the sum of the weighted average convexities on the liability side of the balance sheet. Positive convexity on assets indicates that for the same +/- change in interest rates, the potential appreciation is greater than is the potential depreciation. Negative convexity indicates that for the same +/- change in interest rates, the potential depreciation is greater than is the potential appreciation. It is important to keep in mind that the convexity of a liability is inverse to the convexity of an asset.

The convexity of equity is defined as the difference between the convexity of assets and the convexity of liabilities weighted by liabilities/total assets. To display how an institution's equity will react to changes in interest rates the convexity of equity is calculated by:

> Convexity of Equity = Convexity of Assets - (Convexity of Liabilities X Total Liabilities/TA)

Duration
Duration simply conveys the interest rate sensitivity, or price elasticity of a financial instrument. Macaulay duration was the first step in defining price elasticity. Macaulay Duration was formulated in 1938 by Frederick Macaulay. Macaulay wanted to measure the approximate timing of cash flows from bonds. Macaulay duration involves three simple calculations:

1. Determine the time remaining until the payment of receipt of each cash flow from an instrument is determined.
2. Weight those time periods by multiplying each by the ratio of the present value of that cash flow to the instrument's total present value.
3. Calculate the sum of the weighted time periods.

Although, Macaulay duration was a significant break-through, a more indicative measure of interest rate sensitivity was needed, and modified duration was the answer. Modified duration becomes a price elasticity measure by incorporating the current market yield with Macaulay duration for each one percent change in prevailing interest rates. Instruments that are more sensitive to changes in prevailing interest rates will have a higher modified duration than instruments that are less sensitive. Modified Duration can be calculated by:

> Modified Duration = Macaulay Duration (1 + Market Yield)

Modified duration was a significant step towards

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developing measurement of price elasticity; however, it fails to incorporate all embedded options so a new tool was needed. Effective Duration measures the price sensitivity due to changes in interest rates, as well as captures changing prepayments, cash flows, and all other embedded options. Effective Duration is calculated by projecting theoretical interest rate scenarios to determine how the cash flow will respond to changing interest rates due to embedded options. The price change of an instrument is then calculated and the duration is quantified. One of duration's main advantages is that it is additive, which makes it easy to determine the interest rate sensitivity of an entire balance sheet through simply adding the sums of the weighted average duration. To determine the duration of assets or liabilities, an analyst must first find the sum of the weighted average durations of an institution's individual instruments. The sum of the weighted average durations can be viewed as the duration of assets or liabilities. A financial institution can calculate its interest rate sensitivity by finding out how a particular change in interest rates will affect the institution's capital position, duration of equity. A large difference between the duration of a bank's assets and the duration of a bank's liabilities displays a great deal of interest rate risk. Likewise, a bank with a small difference between the duration of assets and liabilities exhibits a small degree of interest rate risk. To display how an institution's equity will react to changes in interest rates the duration of equity is calculated by:

Duration of Equity = Duration of Assets - (Duration of Liabilities X Total Liabilities/Total Assets)

Fair Value
SFAS 107 requires institutions to disclose the fair value of financial instruments on both assets and liabilities. Fair value can be defined as the amount at which the instrument could be exchanged in a current transaction between willing parties, other than in a liquidation sale. For commercial banks SFAS 107 affects virtually the entire balance sheet as well as off balance sheet instruments: debt and equity securities, loan receivables, deposits, loan commitments, loan guarantees, letters of credit and all derivative products. Balance sheet items that are not affected by SFAS 107 include fixed tangible and intangible assets, deferred tax assets and liabilities, and insubstance foreclosed assets.

SFAS 107 consists of two specific disclosures. First, the estimated fair value of all financial instruments for which it is possible to estimate the value. Second, the methods and assumptions used to make the estimate.

- If a quoted market value exists, fair value must be based on that price.

- If a quoted market price does not exist, management can determine its best estimate of fair value using a variety of techniques such as: based on quoted price of a similar instrument, or based on the present value of estimated future cash flows using a discount rate commensurate to the risks taken.

- The fair value of non-maturing deposits should be measured by the amount repayable on demand, at the reporting date.

Fair Value of Investments
The fair value of investment is simply the current quoted market value for the particular investment or similar investments.

Fair Value of Loans
Market quotations are generally not available for loan portfolios; therefore the present value of future cash flows must be calculated for the different loan portfolio types. The present value of future cash flows can be calculated by:

Present Value = SUM $(P_t + 1_t)/(1+i)_t$

P_t = Principal cash flow in period t
1_t = Interest cash flow in period t
i = Discount Rate (The discount rate should be determined by comparing similar loans in the same geographic area.)

Fair Value of Non-Maturing and Time Deposits
SFAS 107 defines core deposits as demand deposits and savings deposits as liabilities of financial institutions that bear a low rate or no rate of interest and do not fluctuate in response to changes in interest rates. The statement specifically requires the value of certain deposits attributable to no-cost or low cost funds be viewed as intangible and be excluded from the fair value of the deposits. It states that "for deposit liabilities with no deposit intangibles, consider forecasting the future values using statistical methods or other models with the appropriate factors." The present value is calculated using the Federal Home Loan Bank's current offered rate for like maturities as a discount rate. It is important to keep in mind that when calculating the present value for time deposits the bank's current offered rate for like maturities should be used as a discount rate.

Present Value
The present value of a financial instrument is the amount of money that needs to be invested today to receive a certain amount in the future. The present value theory is based on the belief that a dollar today is worth more than the same dollar in the future, i.e. time value of money. Present value can be calculated by:

A (Present Value) = Future Value/$(1+r)_n$

A = Sum of Money
r = Interest Rate
n = Number of periods

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ECONOMIC CHANGE

Net Interest Change (NIC)
Net interest change displays how interest income and expense will change over time, as assets and liabilities have an opportunity to reprice. Net interest change is extremely useful in displaying how changes in interest rates as well as changes in an institution's balance sheet will affect the institution's net interest income. The power of net interest change comes through the analysis of several different rate scenarios at one time as well as the ability to adjust prepayment speeds of cash flows and monitor reinvestment assumptions for different interest rate scenarios. Net interest change is also a beneficial tool in distinguishing between the profitable and non-profitable sectors of the balance sheet. Through projected balances and yields, analysts are able to predict how an institution will perform in future horizons given the dynamic shift in the balance sheet over time. The reinvestment term is the time period for which maturing and repricing cashflow will be invested. The repricing assumption is the yield at which managers choose to reprice their adjustable rate cash flow. Reinvestment assumptions can be defined as the rates at which principal repricing, and maturing will be reinvested in the market. Net interest change is calculated by:

Net Interest Change = (Balance X Rate Change) (Days in Period)/365

Rate Change = Prevailing Market Rates - The Current Book Yield of an Instrument

Days in Period = Days in predefined time period/2

Net Interest Change as a Percentage of Net Interest Income
Net interest change as a percentage of net interest income displays the amount of net interest income that is exposed to interest rate risk. Net interest change as a percentage of net interest income is calculated by:

Net Interest Change/Net Interest Income

Net Interest Income
Net interest income is the sum of interest and fees earned on all bank assets, including loans, deposits held at other institutions, municipal and taxable securities, minus the gross interest expense. This figure is important because its variability over time indicates how well management is controlling interest rate risk. Net Interest Income is calculated by:

Net Interest Income = (Interest Income - Interest Expense) x 100

Net Interest Margin
The net interest margin is the dollar difference between interest income and interest expense often expressed as a percentage of average earning assets. For comparative purposes, the net interest margin is usually expressed as a percentage of earning assets. Net Interest Margin is calculated by:

Net Interest Margin = (Interest Income - Interest Expense)/Average Earning Assets

The projected net interest margin is simply the current net interest margin adjusted for the appropriate net interest change position. The projected net interest margin is calculated by:

[((Interest Income X 12) + 365 Day Change in II)/ Earning Assets] - [((Interest Expense X 12) + 365 Day Change in IE)/Earning Assets]

Net Operating Income (NOI)
Net operating income is the income earned by a bank in the course of its normal business activities. Net Operating Income is calculated by:

Net Operating Income = ((II + NII) - (IE + NIE)) x 12