SECTION 1: PORTFOLIO BASICS

1a. FUNDAMENTAL ANALYSIS

Fundamental Factors

A fundamental analyst makes his investment decisions based on the "fundamentals" of the corporation. The analyst will examine:

The outlook for the industry;

The management of the company;

The product lines of the company;

Anticipated introduction of new products;

Market share of the company.

Financial Statements

These qualitative aspects of the company are generally not measured by numbers; fundamental analysts use quantitative analysis to examine the company's financial results. The analyst will examine the financial statements of the company, including the:

Balance sheet;
Income statement;
Statement of changes to retained earnings.

Balance Sheet Formula

The balance sheet of a company is a "snapshot" of all of the company's assets and liabilities at one point in time.

The formula for the balance sheet is:

Assets - Liabilities = Net Worth

By rearranging the items, the formula becomes:

Assets = Liabilities + Net Worth

The "Assets" side of the balance sheet is arranged in order of "liquidity." Those assets that are quickly convertible to cash are listed first. Going down the sheet, the assets become less and less liquid.

Similarly, the "Liabilities" side of the balance sheet is arranged in order of liquidity - those liabilities that must be paid promptly are listed first. Longer term liabilities are listed below. Finally, after all liabilities, the Stockholder's Equity section is listed, termed "Net Worth."

A way of visualizing the balance sheet is that all "Assets" of the company can be claimed by the creditors and the

shareholders of the company. The amounts claimed by the creditors are listed as liabilities. The amounts claimed by the shareholders are listed under Stockholder's Equity (Net Worth).

Below is a sample balance sheet for ABC corporation:

ABC Corporation Balance Sheet at 12-31-XX

Current Assets	$(000)	Current Liabilities	$(000)
Cash and Marketable Securities	2,000	Accounts Payable	900
Accounts Receivable	1,000	Wages Payable	500
Inventory	1,000	Taxes Payable	500
		Interest Payable	100
Total Current Assets	4,000	Total Current Liabilities	2,000
Notes Receivable due after one year	1,000	Long Term Debt	2,000
Property and Equipment (valued at cost less accumulated depreciation of $3,000)	6,000	Stockholder's Equity Preferred Stock-$100 par	1,000
Intangible Costs	1,000	Common Stock-$1 par	1,000
		Capital in excess of par value	2,000
		Retained Earnings	4,000
Total Long Term Assets	8,000	Total Stockholder's Equity	8,000
Total Assets	12,000	Total Liabilities and Stockholder's Equity	12,000

Notice that the balance sheet "balances" - Total Assets of $12,000,000 equals Total Liabilities and Stockholder's Equity of $12,000,000. The first items listed on both the asset and the liability sides are current, showing they will turn into cash within one year.

Current Asset Due Within 1 Year

Current Liability Due Within 1 Year

The "current" section of the balance sheet is used to evaluate the "liquidity" of a company. From this section, we can determine if the company has enough current funds to meet its bills as well as any excess funds for other business purposes. An item is "current" if it comes due within one year.

The current section of the balance sheet is highlighted following:

ABC Corporation Balance Sheet at 12-31-XX

Current Assets	$(000)	Current Liabilities	$(000)
Cash and Marketable Securities	2,000	Accounts Payable	900
Accounts Receivable	1,000	Wages Payable	500
Inventory	1,000	Taxes Payable	500
		Interest Payable	100
Total Current Assets	4,000	Total Current Liabilities	2,000
Notes Receivable due after one year	1,000	Long Term Debt	2,000
		Stockholder's Equity	
Property and Equipment (valued at cost less accumulated depreciation of $3,000)	6,000	Preferred Stock- $100 par	1,000
		Common Stock- $1 par	1,000
Intangible Costs	1,000	Capital in excess of par value	2,000
		Retained Earnings	4,000
Total Long Term Assets	8,000	Total Stockholder's Equity	8,000
Total Assets	12,000	Total Liabilities and Stockholder's Equity	12,000

Current assets consist of:

Cash And Marketable Securities

Cash and Marketable Securities: These are highly liquid - marketable securities can be turned into cash in 3 business days or less.

Accounts Receivable

Accounts Receivable: These are invoices sent by the company against which payment is not yet received. It is normal for companies to have payment "terms" of 10 to 30 days on invoices. Therefore, if receivables are being well managed, they should not represent more than about 30 days' worth of sales.

Accounts Receivable are considered highly liquid because they can be turned into cash quickly by selling them to a "factor." Factors extend credit to companies using receivables as collateral.

Inventory

Inventory: These are inventories of goods that have not been sold. Inventories should not be too large relative to sales. Of the current assets, inventories are the least liquid, since they can be difficult to dispose of at full value.

Current liabilities are all of the bills coming due within a year. Current liabilities consist of:

Accounts Payable — Accounts Payable: Amounts owed to trade creditors of the company.

Wages Payable — Wages Payable: Monies owed to employees at the date of the balance sheet. These are wages that have accrued between payroll check dates.

Taxes Payable — Taxes Payable: Tax amounts owed to federal, state and city governments which have not been paid.

Interest Payable — Interest Payable: Accrued amounts payable to note and bondholders between interest payment dates.

We will now analyze the "liquidity position" of ABC Corporation. ABC has total current assets of $4,000,000 and total current liabilities of $2,000,000. It appears that ABC has plenty of funds to pay its bills coming due. ABC Corporation has "net working capital" of $2,000,000 - this is the excess of current assets over current liabilities. Thus, ABC has "excess" funds for use as it sees fit after all current bills are paid. The formula for Net Working Capital is:

Current Assets - Current Liabilities =

Net Working Capital

Ratios that are used to measure liquidity include:

Current Ratio

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{\$4{,}000}{\$2{,}000} = 2{:}1$$

ABC Corporation has 2 times the current assets needed to pay its current liabilities

A more stringent test of liquidity is the "Acid Test" or "Quick" ratio. Of the current assets, inventory is not quickly convertible to cash, so it is excluded from the ratio.

Quick Ratio

$$\text{Quick Ratio} = \frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}}$$

$$\frac{\$4{,}000 - \$1{,}000}{\$2{,}000} = 1.5{:}1$$

ABC Corporation has 1.5 times the assets "quickly convertible" to cash that it needs to pay off its bills. If this ratio is less than 1, the company may have problems meeting its current bills.

Capitalization

The sources of long-term capital for a company are

Long-Term Liabilities; and
Stockholder's Equity.

These are the sources of the capital for the company. The company raised funds for its operations by selling bonds, preferred stock, and common stock. Thus, this section analyzes the "capitalization" of the company. This is highlighted following:

ABC Corporation Balance Sheet at 12-31-XX

Current Assets	$(000)	Current Liabilities	$(000)
Cash and Marketable Securities	2,000	Accounts Payable	900
Accounts Receivable	1,000	Wages Payable	500
Inventory	1,000	Taxes Payable	500
		Interest Payable	100
Total Current Assets	4,000	Total Current Liabilities	2,000
Notes Receivable due after one year	1,000	Long Term Debt	2,000
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Total Assets	12,000	Total Liabilities and Stockholder's Equity	12,000

The company has sold $2,000,000 of long term debt and has stockholder's equity of $8,000,000 for a **total capitalization** of $10,000,000.

The items that are included in the capitalization of a company are:

Long-Term Debt

Long-Term Debt: Called "funded debt" because it is a source of long-term funding for the company. For balance sheet purposes, this is debt that must be repaid in more than one year. ABC has raised $2,000,000 by selling long-term bonds.

Preferred Stock

Preferred Stock: ABC has sold $1,000,000 of $100 par preferred stock. Therefore, 10,000 shares have been issued.

Common Stock

Common Stockholder's Equity: Consists of common at par; capital in excess of par; and retained earnings. Examining each separately:

Common At Par

Common at Par: ABC has placed a par value of $1 per share on its stock (this is an arbitrary value, usually kept very low for state tax purposes). Since $1,000,000 was raised at $1 par, 1,000,000 common shares were issued.

Capital In Excess Of Par

Capital In Excess of Par: If shareholders actually paid more than par for each share, this amount shows as "CEP"- Capital in Excess of Par. $2,000,000 of CEP is recorded, or $2 additional per common share. Therefore, the company received $3 per common share from the sale of its stock.

Retained Earnings

Retained Earnings: Theoretically, the company should pay out **all** of its earnings to shareholders as a dividend. However, if the company only pays out part of its earnings as a dividend, and retains the rest of the funds for use in the business, it really has taken an "involuntary capital contribution" from the shareholders. These accumulated retained earnings "belong" to the common shareholders. The $4,000,000 retained is counted as part of common stockholder equity .

Total common stockholder's equity consists of $1,000,000 common at par + $2,000,000 capital in excess of par + $4,000,000 retained earnings = $7,000,000.

Debt / Equity Ratio

A fundamental analyst will examine the "debt to equity ratio" to evaluate the company's capital structure. For example, if the company is highly leveraged (debt is a large proportion of capitalization), covering interest charges may be difficult if income falls.

$$\text{Debt/Equity Ratio} = \frac{\text{Long-Term Debt}}{\text{Stockholder's Equity}} = \frac{\$2{,}000{,}000}{\$8{,}000{,}000} = 25\%$$

Note that Stockholder's Equity includes both Common Equity ($7,000,000) and preferred stock ($1,000,000).

Other measures that must be known for the exam are the dividend payout ratio and the dividend yield.

Dividend Payout Ratio

The dividend payout ratio measures the proportion of a company's earnings that are paid to common shareholders as a dividend.

Dividend Payout Ratio

$$\text{Dividend Payout Ratio} = \frac{\text{Common Dividends Paid}}{\text{Earnings For Common}}$$

For example, if a company has $3.00 of earnings for common and it pays a $1 cash dividend, it has a dividend payout ratio of $1/$3 = 33%. This means that it paid 33% of its earnings as dividends to shareholders and retained the other 66% of earnings.

Companies that pay no dividend or a small dividend tend to be either growth companies or companies in financial distress. Mature companies and utilities tend to have high dividend payout ratios.

The dividend yield shows a common stock's return on money invested, looking at dividends only.

Dividend Yield

$$\text{Dividend Yield} = \frac{\text{Annual Dividend}}{\text{Market Price}}$$

For example, if a customer pays $25 a share for a stock and the stock pays 4 quarterly dividends of $.25, the dividend yield is $1/$25 = 4%.

Claim Priority In Liquidation

In a corporate liquidation, the priority of claim to assets is:

Secured Bondholders;
Unsecured Bondholders;
Preferred Stockholders; and finally
Common Stockholders.

A fundamental analyst can get the corporation's financial statements by examining the corporation's filings with the SEC. These documents are made available to the public. The major financial statement filings are the:

10K - Corporate Annual Audited Financial Statements

10K Report: The company's audited year-end financial statements, filed with the SEC. These are filed anywhere from 60 - 90 days after year end, with larger companies (over $700 million public float) filing within 60 days and smaller companies filing within 90 days.

10Q - Corporate Quarterly Unaudited Financial Statements

10Q: The company's quarterly unaudited financial statements. These are filed with the SEC either 40 days (larger companies) or 45 days (smaller companies) after quarter-end.

Footnotes

An important part of a company's financial statements is the footnotes that accompany them. In the footnotes are

found the company's significant accounting policies (e.g., how the company recognizes revenue, how the company values inventory). In addition, the footnotes contain the details of scheduled debt maturities; pension obligations; lease obligations; unresolved litigation, etc.

1b. PORTFOLIO CONSTRUCTION

The types of equity securities that can be included in a portfolio include:

Blue Chip

Blue Chip: The highest quality companies with proven earnings and dividend records. These are mainly NYSE listed issues.

Growth

Growth: Companies that are in a period of above average growth due to rapid market expansion or unique products. Growth companies normally do not have a proven track record and have very low dividend payout ratios. They also tend to sell at higher P-E (price-earnings) multiples than mature companies (such as blue chips), because of their exceptional growth potential.

Price/Earnings Ratio

Emerging Growth

Emerging Growth: Brand-new ventures of high risk but also high potential reward. These companies have **no** track record and typically can't afford to pay dividends.

Income

Income: Mature companies with high dividend payout ratios such as utilities.

Cyclical

Cyclical: Companies whose fortunes track the business cycle closely. An example of a cyclical stock is a "durable goods" manufacturer. When the business cycle turns down, people feel poorer and don't buy washing machines and cars.

Counter-Cyclical

Counter-Cyclical: Companies whose fortunes operate in reverse to the business cycle. There are very few counter-cyclical stocks. An example is a basic food producer such as a grain company. When people feel poorer, they don't eat out as much; so in-home cooking increases. Another classic counter-cyclical stock is a "gold mining" stock. When the economic cycle turns down, and corporate profits erode, investors sell industrial stocks and "flee to safety" - that is, to gold stocks.

Defensive

Defensive: A company which remains unaffected during business cycle downturns. Drug companies

are a classic defensive stock (at least, until recently!), as are public utilities.

Speculative

Speculative: Companies that fly high during business cycle upturns. Toy companies and airplane manufacturers go through "feast" and "famine" periods that mirror the business cycle and are speculative.

Special Situation

Special Situation: A company going though a takeover, restructuring, bankruptcy, or management change that will greatly change the nature of its operations, and hence its earnings potential.

Top-Down Approach

When constructing a portfolio, the investor can take either a "top-down" approach or a "bottom-up" approach. In a "top-down" approach, the investor starts from the big picture and then goes into greater and greater levels of detail to determine the appropriate investments. For example, the investor would first look at overall economic conditions and trends to identify those industries that are likely to perform better than average. Then the investor would look for the specific companies in those industries that are likely to perform better than their peer group.

Bottom-Up Approach

The "bottom-up" approach to investing is the exact opposite. The idea here is that the investor looks at specific companies first, choosing the best ones, say, based on new products coming to market. These companies should do well, regardless of overall economic conditions or trends.

1c. PORTFOLIO RETURNS

Return On Investment

Return on Investment is a "classic" measure of performance. It looks at positive cash flows that are generated from a given dollar investment, and shows them as a percentage return.

For example, assume that an investment of $10,000 is made with a 5 year life and returns $1,000 per year for 5 years, at which point the $10,000 principal is returned. The "ROI" (Return on Investment) is:

ROI Formula

$$\frac{\text{Sum of All Cash Flows From Investment/\# of Years}}{\text{Investment Amount}} =$$

$$\frac{+ \$1{,}000 + \$1{,}000 + \$1{,}000 + \$1{,}000 + \$1{,}000 \,/\, 5}{\$10{,}000} =$$

$$\frac{\$1{,}000}{\$10{,}000} = 10\%$$

ROI is simply the average annual cash flow divided by the initial investment outlay, without giving consideration to the time value of money, and also ignoring the negative cash flow of the initial investment and the positive offsetting cash flow representing the return of principal.

RRR - Required Rate of Return

As long as the ROI is more than the "RRR" (the Required Rate of Return - the minimum rate of return required to induce a person to make an investment), then the investment would be made. If the ROI is less than the RRR, then the investment would not be made.

When applying the ROI concept to investments, the returns provided by stock investments have 2 components:

Dividends; and

Growth in Stock Price (Capital Gains)

If a company pays a 2% dividend per year; and if the stock price is expected to grow at the rate of 6% per year, then the Total Return provided by the investment is 8%.

Total Return

Thus, Total Return on an investment is:

Total Return = Income (Dividends for Equities; Interest for Debt) + Growth

Mature companies tend to have high dividend rates; and low growth rates. Growth companies tend to have low dividend rates and high growth rates. All other things being equal, the combination of dividends and growth should add to the same amount for both types of companies.

For example, if a growth company pays a 1% dividend and is expected to grow at the rate of 7% per year, then the total return is 8%.

If a mature company pays a 4% dividend and is expected to grow at the rate of 4% per year, then the total return is, again 8%.

Risk Premium

However, there is a greater risk that the return generated by a growth company may vary than is the case for a mature company. Because of this, the market demands a "risk premium" - that is, additional return, from a growth company than for a mature company.

Standard Deviation

The measure of risk of variability of returns is the "standard deviation" of the return. It measures the spread

of the distribution of returns compared to the average return. Before showing how standard deviation is used, there are some other basic statistics that must be known. Consider an investment with following annual returns:

Year 1: 4%
Year 2: 6%
Year 3: 12%
Year 4: 8%
Year 5: 10%
Year 6: 13%
Year 7: 10%

Mean: The "average" return is the "mean." 4% + 6% + 12% + 8% + 10% + 13% + 10% = 63% / 7 = 9% average (mean) return

Median: The 7 returns in ascending order are:

4%, 6%. 8%, **10%**, 10%, 12%, 13%.

The "center" return is 10%. This is the median.

Mode: Arranging the 7 returns in ascending order, they are:

4%, 6%. 8%, **10%**, **10%**, 12%, 13%.

The mode is the return that occurs most often, which is 10% (occurs twice, while the others only occur once).

Now let's show how standard deviation is used to show the variability of investment returns. For example, look at a company that generates the following returns:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
8%	8%	8%	8%	8%	8%

The average (arithmetic mean) rate of return is 8% (8% + 8% + 8% + 8% + 8% + 8% = 48%/6 = 8%). The rate of return has not varied at all from year to year, so the standard deviation of the rate of return is "0."

Now look at a company that generates the following returns:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
12%	6%	8%	10%	4%	8%

The average (arithmetic mean) rate of return is, again, 8% (12% + 6% + 8% + 10% + 4% + 8% = 48% / 6 = 8%). However, for this company, the rate of return has varied anywhere

from 4% to 12% over this time period. Using these numbers, based on the 6 years shown, the rate of return compared to the 8% arithmetic mean has varied from 4% below this figure to 4% above this figure.

Putting this simply, even though the average rate of return is 8%; the rate of return is just as likely to fall to .5 of this amount (to 4%) as it is to increase to 1.5 times this amount (to 12%). Thus, the standard deviation of the rate of return (for this short time horizon of 6 years) is + or - 4%. (Please note that this is a very simplified explanation of standard deviation.)

Let's put Total Return and Standard Deviation in perspective for various types of securities. The chart following shows Average Total Return and Standard Deviation of Return for securities of differing risk classes (over the last 50 years).

	Average Total Return	Standard Deviation
1 Year Treasuries	5%	3%
30 Year Treasury Bonds	7%	8%
30 Year Corporate Bonds	8%	9%
Large Capitalization Stocks	12%	20%
Small Capitalization Stocks	20%	35%

Notice from the chart that the securities types are listed in order of increasing risk. Also notice that both the average total return on that investment and the standard deviation of that return for each type increases. This is just what we would expect.

Risk Free Rate of Return

Treasuries are the safest security. Because of their short maturity and government guarantee, investors will accept a lower total return on these investments - with the average return over this time frame being 5%. This is sometimes called the "Risk-Free" Rate of Return. Notice that the variability of the return is minimal, being within +/-3% (normalized). The rate of return is not likely to be less than 2% (5% - 3% Standard Deviation) over time; nor is it likely to be more than 8% (5% + 3% Standard Deviation).

Risk Premium

On the other hand, small capitalization stocks are the most risky security. Investors demand a higher total return on these investments (20% average) - thus the "risk premium" on these is 15% (that is, these securities yield 15% above the "risk free" Treasury rate of 5%).

The risk premium is apparently justified because the standard deviation of returns on these securities is 35%. Thus, while the average return is 20% over time, the return tends to vary greatly over time - it is just as likely to be -15% (20% - 35% Standard Deviation) as it is to be 55% (20% + 35% Standard Deviation).

Risk-Adjusted Rate Of Return

Another way of looking at risk premium is from the standpoint of Risk-Adjusted Rate of Return. It seeks to compare the risk premium (incremental return earned above and beyond the risk-free rate of return) to the incremental risk assumed by making that investment. There are a number of ways of measuring risk-adjusted rate of return, but the most common is the Sharpe Ratio.

Sharpe Ratio

Sharpe Ratio

The Sharpe ratio seeks to measure:

Reward, as defined by the Risk adjusted rate of return; versus

Volatility as defined by standard deviation.

Sharpe Ratio =

$$\frac{\textbf{Total Return - Risk Free Rate of Return}}{\textbf{Portfolio Standard Deviation}}$$

Sharpe Ratio Shows Incremental Reward Of Assuming Risk

The Sharpe ratio measures the incremental reward of assuming incremental risk. The larger the ratio, the greater the incremental reward of assuming risk. If the ratio is "0," there is no reward for assuming risk and one is better off holding Treasuries.

Historical Sharpe Ratios for various asset classes are:

Treasury Bills	0
Treasury Bonds	.20
S & P 500 Index	.35
Mid-Cap Stocks	.45
Small Cap Stocks	.55

When making an investment decision, the Sharpe Ratio of the specific investment should be compared to the closest matching asset class. If it is higher, then that investment gives a greater return per unit of risk assumed as compared to that asset class and is a good investment. If it is lower, then it is an inferior investment as compared to that asset class.

Arithmetic Mean Return Compared To Geometric Mean Return

Another factor to consider when measuring investment returns is the effect of "compounding" on the return achieved. The average annual return that an investment generates is the "arithmetic mean" return. The

compounded average rate of return is the "geometric mean" return.

For example, assume that an investment generates the following returns:

Year 1: +20%
Year 2: -10%
Year 3: +20%

The arithmetic mean return is: + 20% - 10% + 20% = 30% / 3 years = 10% a year

However, this is not the actual average return achieved.

If this individual started by investing $1 in year 1, then after the first year, the investor would have $1.20 (20% return).

In the second year, the investor lost 10%, so his investment is now worth 90% of $1.20 = $1.08.

In the third year, the investment grew by another 20% = 1.2 x $1.08 = $1.296.

So at the end of 3 years, this investor has approximately 30% more. This is an average annual growth rate of about 9% a year ($1 x 1.09 x 1.09 x 1.09 = $1.295).

Thus, arithmetic mean return of 10% overstates the actual compound (geometric) rate of return, which we computed as 9%, by 1%.

Geometric Return Takes Compounding Into Account

For the exam, you will not need to compute geometric rate of return, but you must know that geometric average rate of return takes compounding into effect, while arithmetic average rate of return does not.

Other measures of evaluating portfolio investment returns consider the following:

1) Probability that the return may vary

2) The fact that the holding period of an investment can greatly affect the investment's return

3) The bite that taxes take out of investment return

Expected Return

The "expected return" of an investment is the calculation of the weighted average of its possible returns, with the weighting being the probability of achieving each scenario.

For example, assume that the investment return of a company's stock varies directly with economic conditions (a cyclical stock) Let's also assume that there are three possible economic scenarios forecast for the upcoming year, with the following probability of occurrence assigned to each scenario.

Economic Forecast	Probability Of Occurrence	Projected Return
Deep Recession	25%	-5%
Low GDP Growth	25%	+4%
High GDP Growth	50%	+12%

Expected Return Calculation

The "expected return" is calculated by multiplying the probability of each scenario by the projected return and adding these up. This computes as follows:

Economic Forecast	Probability Of Occurrence		Projected Return	Expected Return
Deep Recession	25%	x	-5% =	- 1.25%
Low GDP Growth	25%	x	+4% =	+ 1.00%
High GDP Growth	50%	x	+12% =	+ 6.00%
			Expected Return =	**+5.75%**

Over a short period of time, it is unlikely that the expected rate of return would be achieved - the probability of actual returns being different from the forecast is too great. However, over a long time horizon, given that the assigned probabilities are close to what is really experienced, the expected rate of return should closely match the actual rate of return achieved (keeping all other factors constant).

Holding Period Return

Another factor to consider is that, if an equity investment is held over a long period of time, the expected rate of return will not change much; but the variability of holding period compound returns falls dramatically. This occurs because there is more opportunity for good years to offset bad years when stocks are held for long time periods. If stocks are held for short time periods, then the holding period rate of return can change dramatically.

Another way of looking at this is to say that the standard deviation of returns depends on the holding period of the investments. Thus:

The shorter the holding period, the greater the variability of the return; and

The longer the holding period, the smaller the variability of the return.

Common stock price volatility may hurt short term holding period performance; but over the long term, the equity risk premium that common stocks give produces a superior return with much lower overall volatility.

S.T. Holding Period = Return Volatility

L.T. Holding Period = Return Stability

Thus, returns achieved on an investment are highly dependent of the investment's holding period. In the short run, returns can be dramatically lower or higher due to changes in economic conditions. However, over the long term, returns do not vary much for each investment class.

Another factor to consider when calculating portfolio returns is the bite that taxes take out of the investment return. The after-tax return on investment is calculated by deducting out all applicable taxes from the investment yield.

> For example, if a customer buys a corporate bond yielding 10%, and if the customer is in the 40% tax bracket, then 40% of the 10% return (4%) goes to pay taxes. The remaining 6% is the after-tax return on investment.

After-Tax Yield

The formula to compute after-tax yield for taxable investments is:

After-Tax Yield (Taxable Investment) =

Taxable Yield x (100% - Tax Bracket %)

Another consideration regarding after-tax yield is that interest income is taxed at a different rate than both cash dividends received and long term capital gains. Interest income received is taxed at a maximum 35% rate, while cash dividends received and long-term capital gains (gains on assets held over 1 year) are taxed at a maximum 15% rate. When computing after-tax yield, the appropriate tax bracket percentage must be applied to each type of income realized from the investment.

Please note that if a customer buys a municipal bond, where the interest is free from Federal Income Tax, then the yield of the investment already is "after tax" since no tax is due on the interest received. Also note that capital gains on municipal bonds are Federally taxable.

Return Comparisons To Benchmark Portfolios

In measuring portfolio returns achieved by a manager, comparison is made to a "benchmark" portfolio. Institutional investment managers typically specialize, so to compare the investment return of a specialized portfolio to, say, the Standard and Poor's 500 Index, would not be very relevant.

Portfolio returns achieved by a manager need to be compared against the relevant benchmark. For example, the return achieved by a manager of a "Small Cap" Fund might be measured against the performance Russell 2000 Index (which is an index of 2,000 small capitalization stocks.)

Active Return

A manager's "Active Return" is the difference between the return achieved versus the benchmark return - this measures the value of the manager's performance.

Passive Return

Active Return = Excess Over Passive Return

For example, assume that person who buys Russell 2000 Index Fund shares achieves a 15% annual return. This is a "Passive Return." Assume that the manager of a small cap stock portfolio achieves a 20% return over the same time horizon. The manager's active return is: 20% - 15% = 5%. This is the excess of return over the benchmark portfolio achieved by the manager.

Real Rate of Return

Another measure that can be used is the "Real Rate of Return." This is the excess of return from an investment over the current inflation rate.

For example, if an investment yields 10%; and the inflation rate is currently running at 3%; then the Real Rate of Return is 10% - 3% = 7%.

Thus, the formula for the Real Rate of Return is:

Real Rate of Return

= Nominal Rate - Inflation Rate

Annualized Return

Any returns achieved, must be reported in a manner that is consistent with the way in which yields are generally measured - that is, in time periods of 1 year.

Thus, if a manager achieves a return of 10% over a 6 month time horizon, the annualized rate of return is twice this or 20% (actually it is a bit higher than this if compounding is factored in).

Conversely, if the manager achieves a 30% rate of return over a 3 year time horizon, the annualized rate of return is 10% (actually it is a bit less than this, if compounding is factored in).

Time Weighted Average Return

Time weighted average return is another measure that must be known. It is the measure used by mutual fund performance charts and shows the growth of a 1-time investment over a fixed time period (mutual fund performance charts show 1, 3, 5 and 10 year growth).

Same As Total Return For A Mutual Fund

Time weighted average return reflects a "buy and hold" strategy. A single investment is made, no more investor cash inflows or withdrawals occur, and all dividends and capital gains are reinvested. Another name for this is "Total Return" of the fund. This method allows for a consistent comparison of one mutual fund's performance to other funds.

Dollar Weighted Average Return

Same As Internal Rate Of Return For A Specific Fund Investor

In contrast, the return that an individual investor achieves in a mutual fund is dependent on when money is deposited into the fund and when withdrawals are made by that investor. An investor's specific return in a fund is the "dollar weighted average return." Dollar weighted average return is the same as Internal Rate of Return (which is covered in the next section).

Because mutual fund investors often "chase" past performance, they will often time their investment into a fund "too late" (after the fund has posted its best performance which attracted the new investors and now the fund enters a period of lesser performance); and these investors will also sell too soon (after a period of poor performance discourages the investors, so they sell and do not enjoy a following period of improved performance). Thus, for the individual investor in a mutual fund, dollar weighted average return is often lower than time weighted average return.

Compound Value Of A Sum

Finally, the basic formula for "Compound Interest", also called "Compound Value of a Sum" must be known. Assume that an investment of $1,000 is expected to grow at the rate of 10% per year for 3 years.

In this case, then at the end of each year, the amount of the investment should be 1.1 times higher than at the beginning of the year. At the end of 3 years, the value of the investment would be:

$1,000 x 1.1 = $1,100 at the end of Year 1
$1,100 x 1.1 = $1,210 at the end of Year 2
$1,210 x 1.1 = $1,331 at the end of Year 3

Future Value

The mathematical formula for this is:

$$FV = P (1 + r)^n$$

In this formula, FV = Future Value; P = original Principal amount; r = interest rate; and n = number of years of compounding.

1d. PORTFOLIO RISKS

The portfolio that is properly constructed includes stock selections based on investment objectives of the owner(s). As more and more companies operating in different industries are added to the portfolio, diversification increases. This reduces the risk of loss if any one of the investments turns bad. In portfolio theory, this is termed "non-systematic risk." As the portfolio is more completely diversified, this risk is minimized.

However, if the market as a whole tumbles, your investments will decline as well. This risk is termed "systematic," or market risk, and cannot be minimized or eliminated by diversification. To summarize:

Systematic Risk

Systematic Risk: The risk of a general market decline affecting the portfolio; called Market Risk and cannot be diversified away.

Non-Systematic Risk

Non-Systematic Risk: The risk of a single investment going sour, also known as Selection Risk. By diversifying the portfolio, this risk is minimized.

In addition to Systematic and Non-Systematic risk, portfolio management entails:

Capital Risk

Capital Risk: The risk that the amount invested may not be fully recovered.

Timing Risk

Timing Risk: The risk that buying and selling occur at disadvantageous price levels due to poor market timing.

Monte Carlo Simulation

A computer-driven mathematical technique for estimating the value at risk in a portfolio is known as "Monte Carlo" simulation. This technique assesses the probability of achieving a given portfolio return under differing scenarios - with the scenarios varying based on different market interest rate levels; different inflation rate levels; different economic growth rates; different stock price growth rates; etc. There are thousands of potential outcomes to these simulations.

Value At Risk

Monte Carlo simulations are used to find a portfolio's "value at risk" - for example, if the simulation shows that a portfolio has a 1-week 95% value at risk of $50,000, then it would be expected that the portfolio would not lose more than $50,000 in 95 weeks out of 100.

1e. EFFICIENT MARKET THEORY

Correlation Coefficient

Portfolio theorists measure risk by computing a correlation coefficient called "beta." Beta is derived by performing what is known as a multiple regression analysis. This is a statistical process where price movements of a given stock are correlated to price movements of "the market" as defined by a market index.

Beta

Beta measures stock price volatility based solely on general market movements. The higher the beta, the more volatile the stock relative to the market. Beta solely measures price volatility of a stock relative to the market - the fundamental characteristics of that stock are ignored when computing beta.

+ Beta

For example, a beta of +1 means the stock is exactly as volatile as the market, with the usual market indicator being the Standard and Poor's 500 Average. If the beta is +2, this indicates that the stock moves twice as fast as the market.

- Beta

If the stock has a beta of -1, this means that when the market moves up, this stock moves down at exactly the same rate (a counter cyclical stock, such as gold would fall into this category). If a stock has a beta of -2, this means that when the market moves up, this stock moves down twice as fast. Please note that there are very few "negative beta" stocks.

High Beta Stocks

Stocks that are noted for their high positive "betas" are airlines and toy companies. Their price movements are quite volatile, since their earnings are quite volatile.

Low Beta Stocks

Stocks that are noted for their low "betas" are drug companies and utilities. Their prices generally move more slowly than the market as a whole, since their earnings are generally consistent from year to year.

Portfolio With Beta Of 1 Only Has Systematic Risk

As more and more securities are added to any stock portfolio, the "beta" of the portfolio must approach that of the overall market. Thus, a completely diversified portfolio would have a beta of "1" - indicating that its movements match that of the overall market. A portfolio with a beta of "1" would only be subject to systematic risk. All nonsystematic risk has been diversified away.

Portfolio With Beta Greater Than 1 Has Nonsystematic Risk

A portfolio with a beta of greater than "1" indicates that nonsystematic risk is still present in the portfolio.

Delta Measures Price Volatility For Options

Regarding the price volatility of options, a similar measure is used, called "Delta." The delta of an option contract measures how fast the price of the option moves in response to a price movement in the underlying stock.

For example, if a stock price moves from $50 per share to $51 per share; and the underlying call option contract moves up in price by $1, the option premium has a "delta" of +1.

If a stock price moves from $50 per share to $51 per share; and the underlying call option contract moves up in price by $.50, the option premium has a "delta" of +.5.

If a stock price moves from $50 per share to $51 per share; and the underlying call option contract moves up in price by $.25, the option premium has a "delta" of +.25.

Alpha Measures Excess Return Versus Risk-Adjusted Benchmark Return

Alpha, unlike "beta" and "delta," is not a price volatility measure. In its most simplistic form, alpha is the excess return of an investment as compared to the risk-adjusted return of the market.

If a stock produces an excess return (over the risk-free rate of return) of, say 6%, and the excess risk-adjusted return of the market during that period was 4%, then the stock has an "alpha" of 2%.

Alpha Computation

For example, assume that during a given period of time, the overall stock market, which has a Beta of 1, is up 20% in value. XYZ stock, which has a Beta of 1.50, is up 30% during the same period. Assuming that the risk-free rate of return is "0," the "alpha" of XYZ stock computes to "0." To find this, the following are compared:

The excess actual rate of return given by this investment over the risk-free rate of return. Actual Return of Specific Investment - Risk-Free-Return = 30% - 0% = 30%.

The excess return of the benchmark index over the risk-free rate of return: Market Index Return - Risk-Free Return = 20% - 0% = 20%.

To compute "alpha" we must compare the rate of return that the "benchmark index" would have given if it had the same "beta" as this stock. Since this stock has a beta of 1.50 x 20% excess benchmark return = 30% risk-adjusted excess benchmark return of the market index.

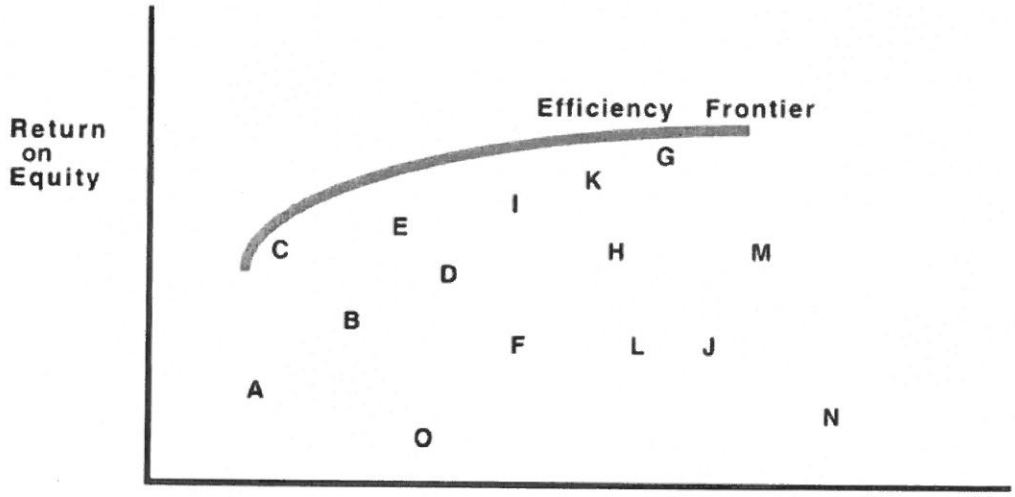
Since the actual excess return of the stock was 30%, this stock has an "alpha" of "0" - the actual excess return of the stock (30%) minus the expected excess return of the benchmark index (30%). This means that, on a risk adjusted basis, an investment in the stock was no better than an investment in the benchmark index.

An alpha of more than "0" indicates that the investment outperformed the market on a risk-adjusted basis. A negative alpha indicates that the investment underperformed the market on a risk adjusted basis.

Market theorists believe that the market is "efficient," meaning that information is instantly available to all participants and there are no impediments to buying and selling. (In reality, this is far from true.)

When constructing a portfolio, the stocks that are selected should be those that offer the highest return with the lowest risk level. These are the stocks along the "efficiency frontier."

For example, following is a chart of selected NYSE issues comparing "Return On Common Equity" to overall risk.



Efficiency Frontier

The companies are plotted with an identifying letter (Company "A," "B," etc.). The best combination is the highest return for the lowest risk. These are the companies plotted towards upper left hand corner of the diagram. The line that is drawn is called the "efficiency frontier" because it represents the companies that offer the highest return relative to risk.

Capital Asset Pricing Model

The methodology for identifying these investments was set forth in the "Capital Asset Pricing Model" (CAPM). The CAPM breaks down an investment's return into a risk-free

rate of return (the rate of a security only having systematic risk) plus a risk premium (the unsystematic risk component). The market pricing of the asset must take both of these risks into account.

CAPM Formula

A simplified version of the CAPM formula is:

Expected Return Of A Specific Investment =

= Risk-Free Rate of Return + Risk Premium*

*** Risk Premium = Beta x (Excess of Expected Market Return over Risk-Free Rate of Return)**

Simplified, the "Risk Premium" is the Excess of Expected Market Return over the Risk-Free Rate of Return, multiplied by the risk level of that investment as measured by Beta.

For example, ABCD stock has a Beta of +2. The Expected Market Rate of Return is 7% and the Risk-Free Rate of Return is 2%. What is the Expected Return of ABCD stock?

The Risk Premium is: 7% Expected Market Rate of Return - 2% Risk Premium = 5% x +2 Beta = 10%.

The Expected Return of ABCD Stock is: 2% Risk Free Rate of Return + 10% Risk Premium = 12%

If ABCD stock generates a return of 12% or better, CAPM identifies it as a good investment.

Efficient Market Theory

Efficient market theory holds that securities prices instantaneously and fully reflect all available information. Because of this, random selection of a portfolio should provide a return that is as good as selection by any other analytical method. In essence, the theory says that there is no way to improve on the return that the market is giving.

There are 3 versions of this theory:

Weak Form: States that securities prices only reflect "old" information. Thus, attempting to predict future market movements based on historical data is impossible, because what has happened in the past is not necessarily a predictor of the future.

Semi-Strong Form: States that securities prices fully reflect all publicly available information. Thus, the use of publicly reported information to select stocks cannot result in a better return, since their prices already reflect this information.

Strong Form: States that securities prices fully reflect all information, whether publicly available or not.

Semi-Strong Efficient Market Theory

The only version of efficient market theory that is widely accepted is the "semi-strong" version. Essentially, it states that "insiders," who have information that is not publicly available, can select stocks to generate a better return than the market, since the market price only reflects "publicly" available information; not "inside" information.

Thus, under the semi-strong version of the theory, the average investor cannot do "better" than the market by selecting specific stocks. The growing popularity of index funds purchased by individual investors attests to the fact that more and more people understand this theory (and the reality behind it).

