Equations | Formulas

Linear Regression Analysis	y = mx + b y = dependent variable; m = slope; x = dependent variable; b = y-intercept
Shareholders' Equity	= Total Assets−Total Liabilities
Balanced Sheet	Assets = Liabilities + Shareholders Equity
Working Capital	= (Current Assets - Current Liabilities)
Current Ratio	= (Current Assets / Current Liabilities)
Acid Test (Quick) Ratio	= (cash + accounts receivable + market securities) / Current Liabilities
Debt to Equity Ratio	= (Long Term Debt / Shareholders Equity)
Debt to Assets Ratio	= (Total Liabilities / Total Assets)
Coefficient of Variation	= Standard Deviation / Mean
Mean	= (sum of the values / the number of values)
Expected Value	= (probability x possibe outcomes)
Expected Loss Ratio	= Probability of Default (PD) x Loss Given Default (LGD) x Exposure at Default (EAD)

Financial Ratios

Shareholders' Equity: represents the net worth of a company, which is the dollar amount that would be returned to shareholders if a company's total assets were liquidated, and all of its debts were repaid. Typically listed on a company's balance sheet, this financial metric is commonly used by analysts to determine a company's overall fiscal health.
Shareholders' equity is also used to determine the value of ratios, such as the debt-to-equity ratio (D/E), return on equity (ROE), and the book value of equity per share (BVPS).

Financial Ratios (cont)

Standard Deviation is a statistic that measures the dispersion of a dataset relative to its mean and is calculated as the square root of the variance.
If the data points are further from the mean, there is a higher deviation within the data set; thus, the more spread out the data, the higher the standard deviation.

*A volatile stock has a high standard deviation, while the deviation of a stable blue-chip stock is usually rather low.
*the smaller the degree of dispersion, the lesser the volatility, and the greater the accuracy of predicitions.
*As a downside, the standard deviation calculates all uncertainty as risk, even when it's in the investor's favor - *such as above average returns.*

Variance: The term variance refers to a statistical measurement of the spread between numbers in a data set. Variance measures how far each number in the set is from the mean and thus from every other number in the set.
The square root of the variance is the standard deviation (σ), which helps determine the consistency of an investment's returns over a period of time

Investors use variance to see how much risk an investment carries and whether it will be profitable.

Value at Risk (VaR): measures and quantifies the level of financial risk within a firm, portfolio or position over a specific time frame. This metric is most commonly used by investment and commercial banks to determine the extent and occurrence ratio of potential losses in their institutional portfolios.
Risk managers use VaR to measure and control the level of risk exposure. One can apply VaR calculations to specific positions or whole portfolios or to measure firm-wide risk exposure.

Capital Asset Pricing Model (CAPM): describes the relationship between systematic risk and expected return for assets, particularly stocks.

Securities|Investment Risks

Derivative: A derivative is a financial security with a value that is reliant upon or derived from, an underlying asset or group of assets —a benchmark. The derivative itself is a contract between two or more parties, and the derivative derives its price from fluctuations in the underlying asset.

Sponsored by **CrosswordCheats.com**
Learn to solve cryptic crosswords!
http://crosswordcheats.com

Securities|Investment Risks (cont)

Securities: "security" refers to a fungible, negotiable financial instrument that holds some type of monetary value. It represents an ownership position in a publicly-traded corporation via stock; a creditor relationship with a governmental body or a corporation represented by owning that entity's bond; or rights to ownership as represented by an option.
There are primarily three types of securities: equity—which provides ownership rights to holders; debt—essentially loans repaid with periodic payments; and hybrids—which combine aspects of debt and equity.

Technical Analysis

Skewness: refers to a distortion or asymmetry that deviates from the symmetrical bell curve, or normal distribution, in a set of data. If the curve is shifted to the left or to the right, it is said to be skewed. Skewness can be quantified as a representation of the extent to which a given distribution varies from a normal distribution. A normal distribution has a skew of zero, while a lognormal distribution, for ex, would exhibit some degree of right-skew.

Guide to Volatility

Volatility: a statistical measure of the dispersion of returns for a given security or market index. In most cases, the higher the volatility, the riskier the security. Volatility is often measured as either the standard deviation or variance between returns from that same security or market index.

Calculate Volatility: Volatility is often calculated using variance and standard deviation. The standard deviation is the square root of the Variance.
1. Find the mean of the data set.
2. Calculate the difference between each data value and the mean.
This is often called deviation.
3. Square the deviations.
4. Add the squared deviations together.
5. Divide the sum of the squared deviations by the number of data values.

Implied volatility: the parameter component of an option pricing model, such as the Black-Scholes model, which gives the market price of an option. Implied volatility shows how the marketplace views where volatility should be in the future.
Since implied volatility is forward-looking, it helps us gauge the sentiment about the volatility of a stock or the market. However, implied volatility does not forecast the direction in which an option is headed.

Guide to Volatility (cont)

Implied Volatility vs. Historical Volatility:
Implied, or projected, volatility is a forward-looking metric used by options traders to calculate probability.
Implied volatility, as its name suggests, uses supply and demand, and represents the expected fluctuations of an underlying stock or index over a specific time frame.

With Historical Volatility, traders use past trading ranges of underlying securities and indexes to calculate price changes. Calculations for historical volatility are generally based on the change from one closing price to the next.

Black Scholes Model: also known as the Black-Scholes-Merton (BSM) model, is a mathematical model for pricing an options contract. In particular, the model estimates the variation over time of financial instruments. It assumes these instruments (such as stocks or futures) will have a lognormal distribution of prices. Using this assumption and factoring in other important variables, the equation derives the price of a call option.

Volatility is a metric that measures the magnitude of the change in prices in a security. Generally speaking, the higher the volatility—and, therefore, the risk—the greater the reward. If volatility is low, the premium is low as well.

Financial Analysis

Monte Carlo Simulation: used to model the probability of different outcomes in a process that cannot easily be predicted due to the intervention of random variables.
It is a technique used to understand the impact of risk and uncertainty in prediction and forecasting models.

Correlation: a statistic that measures the degree to which two variables move in relation to each other.
Correlation measures association, but doesn't show if x causes y or vice versa, or if the association is caused by a third–perhaps unseen–factor.

Correlation Coefficient: a statistical measure of the strength of the relationship between the relative movements of two variables. The values range between -1.0 and 1.0. A calculated number greater than 1.0 or less than -1.0 means that there was an error in the correlation measurement. A correlation of -1.0 shows a perfect negative correlation, while a correlation of 1.0 shows a perfect positive correlation. A correlation of 0.0 shows no linear relationship between the movement of the two variables.

Sponsored by **CrosswordCheats.com**
Learn to solve cryptic crosswords!
http://crosswordcheats.com

Financial Analysis (cont)

Linear Relationship: a statistical term used to describe a straight-line relationship between two variables. Linear relationships can be expressed either in a graphical format where the variable and the constant are connected via a straight line or in a mathematical format where the independent variable is multiplied by the slope coefficient, added by a constant, which determines the dependent variable.
Linear relationships can be expressed either in a graphical format or as a mathematical equation of the form y = mx + b.

Expected Value: A weighted average of the values of the random variable, for which the probability function provides the weights, based on its Theoretical Probability.
If an experiment can be repeated a large number of times, the expected value can be interpreted as long-run average

Statistical Measures

Dispersion: that describes the size of the distribution of values expected for a particular variable. Dispersion can be measured by several different statistics, such as range, variance, and standard deviation. In finance and investing, dispersion usually refers to the range of possible returns on an investment, but it can also be used to measure the risk inherent in a particular security or investment portfolio. It is often interpreted as a measure of the degree of uncertainty, and thus, risk, associated with a particular security or investment portfolio. {{nl}} *Generally speaking, the higher the dispersion, the riskier an investment is, and vice versa.*

Random Variable: a variable whose value is unknown or a function that assigns values to each of an experiment's outcomes. Random variables are often designated by letters and can be classified as discrete, which are variables that have specific values, or continuous, which are variables that can have any values within a continuous range.
The use of random variables is most common in probability and statistics, where they are used to quantify outcomes of random occurrences.

Regression: a statistical method used in finance, investing, and other disciplines that attempts to determine the strength and character of the relationship between one dependent variable (usually denoted by Y) and a series of other variables (known as independent variables).
Regression helps investment and financial managers to value assets and understand the relationships between variables, such as commodity prices and the stocks of businesses dealing in those commodities.

Statistical Measures (cont)

Coefficient of Variation (CV): is a statistical measure of the dispersion of data points in a data series around the mean. The coefficient of variation represents the ratio of the standard deviation to the mean, and it is a useful statistic for comparing the degree of variation from one data series to another, even if the means are drastically different from one another.
**The lower the ratio of the standard deviation to mean return, the better risk-return trade-off.*

Macroeconomics

Probability Analysis: A technique for forecasting events, such as accidental and business losses, on the assumption that they are governed by an unchanging probability distribution.

Theoretical Probability: Probability that is based on theoretical principles rather than real experiences.

Empirical Probability (Posteriori Probability): Probability measure that is based on actual experience through historical data or observation of facts.
What is Empirical Probability? Empirical probability uses the number of occurrences of an outcome within a sample set as a basis for determining the probability of that outcome. The number of times "-event X" happens out of 100 trials will be the probability of event X happening. *An empirical probability is closely related to the relative frequency of an event.*

Probability Distribution: A presentation (table, chart, or graph) of probability estimates of a particular set of circumstances and of probability of each possible outcome.

Normal Distribution: A balanced probability distribution that is symmetric about the mean, showing that data near the mean are more frequent in occurrence than data far from the mean. In graph form, normal distribution will appear as a bell curve.

Discreet Probability Distribution: Consists of the values a random variable can assume and the corresponding probabilities of the values.

Continuous Probability Distribution: represented as either graphs or by dividing the distribution into a finite # of bins and calculating the probability of an outcome failing within the range represented by each bin; shows all the possible outcomes and associated probabilities for a given event.

Sponsored by **CrosswordCheats.com**
Learn to solve cryptic crosswords!
http://crosswordcheats.com

CH.9 VOCAB

Probability Analysis: A technique for forecasting events, such as accidental and business losses, on the assumption that they are governed by an unchanging probability distribution.

Probability Distribution: A presentation (table, chart, or graph) of probability estimates of a particular set of circumstances and of probability of each possible outcome.

Theoretical Probability: Probability that is based on theoretical principles rather than real experiences (Coin Toss/Rolling Dice)

Empirical Probability: Probability measure that is based on actual experience through historical data or observation of facts – this method is most often used by insurance professionals

Law of Large Numbers: A mathematic principle stating that as the number of similar but independent exposure units increase, the relative accuracy or predictions about future outcomes (losses) also increase.

Earnings at Risk (EaR): A technique used to assess earnings by measuring the likelihood that earnings will be below a specific dollar amount over a specific period of time.

Value at Risk (VaR): A technique to quantify financial risk by measuring the likelihood of losing more than a specific dollar amount over a specific period of time.

Conditional Value at Risk (cVaR): A technique to quantify the likelihood of losing a specific dollar amount that exceeds the VaR threshold.

Trend Analysis: An analysis that identifies patterns in past data and then projects these patterns into the future.

Regression Analysis: A statistical technique that is used to estimate relationships between variables.

Linear Regression Analysis: A form of regression analysis that assumes that the change in the dependent variable is constant for each unit of change in the independent variable.

Sponsored by **CrosswordCheats.com**
Learn to solve cryptic crosswords!
http://crosswordcheats.com