Glossary

annualization. Annualization is the process of calculating the annual equivalent of returns that were measured at higher frequencies, such as daily or monthly returns. To annualize the monthly return for a particular month, we compound 12 times. To annualize a daily return, we must consider how many days a year the asset in question actually generates returns, that is, how many trading days there are in a year.

benchmark asset. A reference investment used to evaluate the performance of assets or portfolios is called the benchmark asset. These are typically market indices, like the S&P 500, or "risk-free" investments, like US treasuries.

beta. An asset's "market beta" is a coefficient measuring how sensitive the returns of the asset are to movements in the overall market. This is the slope of excess market returns in a capital asset pricing model.

beta risk. Beta risk is the risk associated with the covariance between an asset and an independent variable. In a capital asset pricing model, beta risk is captured by the regression coefficient on that independent variable.

β risk. See *beta risk*.

capital asset pricing model. A capital asset pricing model (CAPM) is a model for the relationship between an asset's return and independent variables. According to the CAPM, the return we can expect from an asset is equal to the risk-free rate, plus a risk premium that is proportional to the mean of the independent variables in the model.

CAPM. See *capital asset pricing model*.

dollar return. The change in the price of an asset between two periods is sometimes called the dollar return, that is, $P_t - P_{t-1}$.

excess return. It is often desirable to study the returns an asset generates in excess of the returns generated by some benchmark asset. These are called excess returns.

factor. In the context of asset-pricing models, factors are sources of risk considered in the model. Factors such as market volatility and firm size serve as independent variables in such models.

federal funds rate. The interest rate at which banks in the United States lend reserves to each other overnight. The rate is set by the Federal Reserve, and it is a key benchmark for short-term interest rates in all debt markets.

financial data. Data containing characteristics of stocks, bonds, currency, portfolios, and other series of financial interest. Prices, returns, interest rates, dividends, and exchange rates are all examples of financial data.

financial statistics. The branch of statistics that provides methods for the analysis of financial data. The methods of financial statistics are used to explain and predict the performance of various assets and portfolios. Financial summary statistics provide information on returns and risk. In the analysis of stocks, for instance, one may estimate the market beta, value at risk, and various risk-return ratios. The CAPM and Fama–MacBeth regressions provide model-based financial statistics. Additional time-series models such as autoregressive integrated moving-average models and autoregressive conditional heteroskedasticity models provide statistics that are useful for analysis and forecasting of financial data.

gross return. The ratio of the price of an asset between two periods is called the gross return, that is, P_t/P_{t-1}.

hedge. A hedge is an investment whose purpose is to counteract the risk of another investment. For example, one may counterbalance the risk of investing in the fossil fuel industry by also investing in clean-energy stocks. To hedge an investment means to counterbalance its risk in this manner. An asset is called a hedge against a benchmark in a CAPM regression if its slope coefficient is less than zero; see *Remarks and examples* in [FIN] **finregress capm**.

inflation. Inflation is the general increase in prices that occurs over time in an economy, reducing the purchasing power of currency.

Jensen's alpha. The intercept in a capital asset pricing model measures the average return in excess of market returns and is called Jensen's alpha.

log return. The change in the log of the price of an asset between two periods is called the log return, that is, $\log P_t - \log P_{t-1}$.

market beta. See *beta*.

multifactor model. A capital asset pricing model where factors other than market risk are additionally included is called a multifactor model.

portfolio. A collection of assets held by an investor is called a portfolio. The returns and risk of a portfolio depend on the returns and risk of its component assets, as well as on the correlation between its component assets.

portfolio return. The portfolio return is a weighted average of the returns of individual assets in a portfolio.

portfolio risk. Portfolio risk is a measure of the variability of portfolio return.

portfolio weights. Portfolio weights indicate the fraction of total investment allocated to each asset in a portfolio.

price of risk. Different risky assets compensate investors differently for the risk they entail; that is, they have different risk premiums. The price of risk is a summary measure of how well or poorly risk is compensated in a particular market. Specifically, price of risk is the factor by which expected returns grow with the so-called beta risk. See *Fama–Macbeth regression* in [FIN] **fin** for details.

return. Return is the value an investment gains or loses over a period of time.

risk. The risk of an investment is the variability of its returns, that is, any measure that reflects the probability that returns will deviate from expected returns.

risk-free rate. A rate of return that can be obtained with negligible or no risk, such as the returns of sovereign debt in stable economies, is called a risk-free rate.

risk premium. A rational investor will take on risk only if they consider this risk to be "worth it", that is, compensated in terms of the returns they expect to obtain. The risk premium is the difference between the expected returns of a risky investment and the expected returns of investing in a risk-free asset. Investors will consider allocating wealth to risky assets only when the risk premium is positive, that is, when the risky assets offer expected returns above what one may obtain in the market without incurring risk. In a Fama–MacBeth regression, the intercept term can be interpreted as the risk premium on an asset with zero beta risk.

Sharpe ratio. A ratio of excess returns to the variability of an asset, or a ratio of excess returns to the variability of excess returns of an asset, is a popular performance measure. When variability is represented by the standard deviation of returns or of excess returns, the performance measure is called a Sharpe ratio.

short selling. When the price of an asset is expected to fall, investors may borrow and then sell the asset to buy it back at a later date and a lower price. They can then deliver the asset to the original lender and pocket the price difference. This strategy is called short selling.

simple return. The proportional change in the price of an asset between two periods is called the simple return, that is, $(P_t/P_{t-1}) - 1$.

Treynor index. A ratio of excess returns to the variability of an asset, or a ratio of excess returns to the variability of excess returns of an asset, is a popular performance measure. When variability is represented by the beta of a capital asset pricing model, the performance measure is called a Treynor index.

value at risk. Value at risk (VaR) is a measure of potential loss on the value of an asset or portfolio over a specified length of time for a given confidence level. It is often expressed as a number representing an amount of loss (or percentage loss) at a particular confidence level for a particular period. If the VaR on a portfolio is \$100 at a 95% confidence level at a one-month horizon, then there is a 5% chance of losing \$100 or more by the end of the month.

volatility. Volatility is the degree to which asset prices fluctuate over time, as measured, for example, by their variance or standard deviation.