What, as a team, we do

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In Citibank, we as a team work on the TradeCapture and LifeCycle of the derivative products.

As part of the TradeCapture, we support the booking of positions on derivative products. So we provide UI screens to book positions/trades on major derivative products like Options, Exotic Options and different types of Swaps (Equity Swaps, Interest Rate Swaps, etc.).

As part of LifeCycle, we support fixing (capturing the market value of the product based on its schedule). We do EQUITY, FLOATING and DIVIDEND fixings. We also do payment generation.

**1. Financial Instrument**

Source : <https://www.investopedia.com/terms/f/financialinstrument.asp>

Financial instruments are assets (or packages of capital) that can be traded.

These assets can be cash, a contractual right to deliver or receive cash or evidence of one's ownership of an entity.

**Takeaways:**

(i) A financial instrument is a real or virtual document representing a legal agreement involving any kind of monetary value.

(ii) Financial instruments may be divided into two types: cash instruments and derivative instruments.

(ii) Financial instruments may also be divided according to an asset class, which depends on whether they are debt-based or equity-based.

(iv) Foreign exchange instruments comprise a third, unique type of financial instrument.

**Types of Financial Instruments:**

***(i) Cash Instruments***

- Cash instruments may also be deposits and loans agreed upon by borrowers and lenders.

- These can be securities that are easily transferable.

***(ii) Derivative Instruments***

The value and characteristics of derivative instruments are based on the vehicle’s underlying components, such as assets, interest rates, or indices.

For example, An equity options contract, is a derivative because it derives its value from the underlying stock. The option gives the right, but not the obligation, to buy or sell the stock at a specified price and by a certain date. There can be over-the-counter (OTC) derivatives or exchange-traded derivatives. OTC is a market or process whereby securities–that are not listed on formal exchanges–are priced and traded.

**Types of Asset Classes of Financial Instruments**

**(i) Debt-Based Financial Instruments**

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| **Short-term debt-based financial instrument** | **long-term debt-based financial instrument** |
| financial instruments last for one year or less. | Long-term debt-based financial instruments last for more than a year. |
| Exchange-traded derivatives under short-term : debt-based financial instruments for short term interest rate futures | these are bonds. Cash equivalents are loans.  Exchange-traded derivatives: bond futures and options on bond futures. |
| OTC derivatives: forward rate agreements | OTC derivatives: IR swaps, interest rate caps and floors, interest rate options, and exotic derivatives. |

**(ii) Equity-Based Financial Instruments**

Securities under equity-based financial instruments are stocks. Exchange-traded derivatives in this category include **stock options and equity futures**. The OTC derivatives are stock options and exotic derivatives.

Special Considerations

There are no securities under foreign exchange. Cash equivalents come in spot foreign exchange, which is the current prevailing rate. Exchange-traded derivatives under foreign exchange are currency futures. OTC derivatives come in foreign exchange options, outright forwards, and foreign exchange swaps.

**2. Derivative**

Source : <https://www.investopedia.com/terms/d/derivative.asp>

What Is a Derivative?

Its a type of financial contract whose value is dependent on an underlying asset or group of assets. A derivative is set between two or more parties that can trade on an exchange or over-the-counter (OTC). Prices for derivatives derive from fluctuations in the underlying asset.

**TAKEAWAYS**

* Derivatives are financial contracts, set between two or more parties, that derive their value from an underlying asset or group of assets.
* A derivative can trade on an exchange or over-the-counter.
* Prices for derivatives derive from fluctuations in the underlying asset.
* Derivatives are usually leveraged instruments, which increases their potential risks and rewards.
* Common derivatives include futures contracts, forwards, options, and swaps.

**Types of Derivatives**

There are two classes of derivative products: "lock" and "option." Lock products (e.g., futures, forwards, or swaps) bind the respective parties from the outset to the agreed-upon terms over the life of the contract. Option products (e.g., stock options), on the other hand, offer the holder the right, but not the obligation, to buy or sell the underlying asset or security at a specific price on or before the option's expiration date. The most common derivative types are futures, forwards, swaps, and options.

**Futures**

A futures contract, or simply futures, is an agreement between two parties for the purchase and delivery of an asset at an agreed-upon price at a future date. Futures are standardized contracts that trade on an exchange.

**Forwards**

Forward contracts, or forwards, are similar to futures, but they do not trade on an exchange. These contracts only trade over-the-counter. When a forward contract is created, the buyer and seller may customize the terms, size, and settlement process.

**Swaps**

Swaps are another common type of derivative, often used to exchange one kind of cash flow with another. For example, a trader might use an interest rate swap to switch from a variable interest rate loan to a fixed interest rate loan, or vice versa.

**Options**

An options contract is similar to a futures contract in that it is an agreement between two parties to buy or sell an asset at a predetermined future date for a specific price. The key difference between options and futures is that with an option, the buyer is not obliged to exercise their agreement to buy or sell. It is an opportunity only, not an obligation, as futures are. As with futures, options may be used to hedge or speculate on the price of the underlying asset.

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| Advantage | Disadvantage |
| * Lock in prices * Hedge against unfavorable movements in rates * Mitigate risks | * Changes in the amount of time to expiration * The cost of holding the underlying asset * Interest rates |

**3. Asset class**

Source : <https://www.investopedia.com/terms/a/assetclasses.asp>

* An asset class is a grouping of investments that exhibit similar characteristics and are subject to the same laws and regulations.
* Equities (e.g., stocks), fixed income (e.g., bonds), cash and cash equivalents, real estate, commodities, and currencies are common examples of asset classes.
* There is usually very little correlation and in some cases a negative correlation, between different asset classes.
* Financial advisors focus on asset class as a way to help investors diversify their portfolios

**Understanding Asset Classes**

Simply put, an asset class is a grouping of comparable financial securities. For example, IBM, MSFT, AAPL are a grouping of stocks. Asset classes and asset class categories are often mixed together. There is usually very little correlation and in some cases a negative correlation, between different asset classes.

**Asset Class Types**

Equities (stocks), bonds (fixed-income securities), cash or marketable securities, and commodities are the most liquid asset classes

There are also alternative asset classes, such as real estate, and valuable inventory, such as artwork, stamps, and other tradable collectibles.

**4. Measurement for Investment Risk Management**

Source : <https://www.investopedia.com/ask/answers/041415/what-are-some-common-measures-risk-used-risk-management.asp>

**Risk management**

* Risk management is the analysis of an investment's returns compared to its risk with the expectation that a greater degree of risk is supposed to be compensated by a higher expected return.
* Risk—or the probability of a loss—can be measured using statistical methods that are historical predictors of investment risk and volatility.
* Commonly used risk management techniques include standard deviation, Sharpe ratio, and beta.
* Value at Risk and other variations not only quantify a potential dollar impact but assess a confidence interval of the likelihood of an outcome.
* Risk management also oversees systematic risk and unsystematic risk, the two broad types of risk impacting all investments.

**Standard Deviation**

Standard deviation measures the dispersion of data from its expected value. The standard deviation is commonly used to measure the historical volatility associated with an investment relative to its annual rate of return.

**R-squared**

R-squared is a statistical measure that represents the percentage of a fund portfolio or a security's movements that can be explained by movements in a benchmark index.

**Sharpe Ratio**

The Sharpe ratio measures investment performance by considering associated risks. To calculate the Sharpe ratio, the risk-free rate of return is removed from the overall expected return of an investment.

**Beta**

Beta measures the amount of systematic risk an individual security or sector has relative to the entire stock market.

**Value at Risk (VaR)**

Value at Risk (VaR) is a statistical measurement used to assess the level of risk associated with a portfolio or company. The VaR measures the maximum potential loss with a degree of confidence for a specified period. For example, suppose a portfolio of investments has a one-year 10% VaR of $5 million. Therefore, the portfolio has a 10% chance of losing $5 million over a one-year period.

**Conditional Value at Risk (CVaR)**

Conditional Value at Risk (CVaR) is another risk measurement used to assess the tail risk of an investment. Used as an extension to the VaR, the CVaR assesses the likelihood, with a certain degree of confidence, that there will be a break in the VaR. It seeks to assess what happens to investment beyond its maximum loss threshold. This measurement is more sensitive to events that happen at the tail end of a distribution.

**5. Risk Analysis**

source : <https://www.investopedia.com/terms/r/risk-analysis.asp>

Risk analysis is the process of assessing the likelihood of an adverse event occurring within the corporate, government, or environmental sector. Risk analysis is the study of the underlying uncertainty of a given course of action and refers to the uncertainty of forecasted cash flow streams, the variance of portfolio or stock returns, the probability of a project's success or failure, and possible future economic states.

Risk analysts often work in tandem with forecasting professionals to minimize future negative unforeseen effects.

**Takeaways:**

* Risk analysis seeks to identify, measure, and mitigate various risk exposures or hazards facing a business, investment, or project.
* Quantitative risk analysis uses mathematical models and simulations to assign numerical values to risk.
* Qualitative risk analysis relies on a person's subjective judgment to build a theoretical model of risk for a given scenario.
* Risk analysis is often both an art and a science.

**Understanding Risk Analysis**

Risk assessment enables corporations, governments, and investors to assess the probability that an adverse event might negatively impact a business, economy, project, or investment.

**Types of Risk Analysis**

**Quantitative Risk Analysis**

Under quantitative risk analysis, a risk model is built using simulation or deterministic statistics to assign numerical values to risk. Inputs that are mostly assumptions and random variables are fed into a risk model.

For any given range of input, the model generates a range of output or outcome. The model's output is analyzed using graphs, scenario analysis, and/or sensitivity analysis by risk managers to make decisions to mitigate and deal with the risks.

**Qualitative Risk Analysis**

Qualitative risk analysis is an analytical method that does not identify and evaluate risks with numerical and quantitative ratings. Qualitative analysis involves a written definition of the uncertainties, an evaluation of the extent of the impact (if the risk ensues), and countermeasure plans in the case of a negative event occurring.

Examples of qualitative risk tools include SWOT analysis, cause and effect diagrams, decision matrix, game theory, etc.

**6. Risk Management in Finance**

source : <https://www.investopedia.com/terms/r/riskmanagement.asp>

Risk management is the process of identification, analysis, and acceptance or mitigation of uncertainty in investment decisions. Essentially, risk management occurs when an investor or fund manager analyzes and attempts to quantify the potential for losses in an investment, such as a moral hazard, and then takes the appropriate action (or inaction) given the fund's investment objectives and risk tolerance.

**TAKEAWAYS**

* Risk management is the process of identification, analysis, and acceptance or mitigation of uncertainty in investment decisions.
* Risk is inseparable from return in the investment world.
* A variety of tactics exist to ascertain risk; one of the most common is standard deviation, a statistical measure of dispersion around a central tendency.
* Beta, also known as market risk, is a measure of the volatility, or systematic risk, of an individual stock in comparison to the entire market.
* Alpha is a measure of excess return; money managers who employ active strategies to beat the market are subject to alpha risk.

**Understanding Risk Management**

Risk management occurs everywhere in the realm of finance. It occurs when an investor buys U.S. Treasury bonds over corporate bonds, when a fund manager hedges his currency exposure with currency derivatives, and when a bank performs a credit check on an individual before issuing a personal line of credit. Stockbrokers use financial instruments like options and futures, and money managers use strategies like portfolio diversification, asset allocation and position sizing to mitigate or effectively manage risk.

**How Risk Management Works**

We tend to think of "risk" in predominantly negative terms. However, in the investment world, risk is necessary and inseparable from desirable performance.

A common definition of investment risk is a deviation from an expected outcome. We can express this deviation in absolute terms or relative to something else, like a market benchmark.

While that deviation may be positive or negative, investment professionals generally accept the idea that such deviation implies some degree of the intended outcome for your investments. Thus to achieve higher returns one expects to accept the greater risk. It is also a generally accepted idea that increased risk comes in the form of increased volatility. While investment professionals constantly seek—and occasionally find—ways to reduce such volatility, there is no clear agreement among them on how it's best done.

**Alpha and Active Risk Management**

If the level of market or systematic risk were the only influencing factor, then a portfolio's return would always be equal to the beta-adjusted market return. Of course, this is not the case: Returns vary because of a number of factors unrelated to market risk. Investment managers who follow an active strategy take on other risks to achieve excess returns over the market's performance. Active strategies include tactics that leverage stock, sector or country selection, fundamental analysis, position sizing, and technical analysis.

**Beta and Passive Risk Management**

Another risk measure oriented to behavioral tendencies is a drawdown, which refers to any period during which an asset's return is negative relative to a previous high mark. In measuring drawdown, we attempt to address three things:

1. the magnitude of each negative period (how bad)
2. the duration of each (how long)
3. the frequency (how often)