About Derivatives

Part I – Features of Derivatives

- **Definition of Derivatives**
  In financial markets, derivative products are generally investment products derived from spot market products. Spot market products are usually traded on the spot at the current price. The period of time from entering a contract to settlement normally only involves a few days. Examples of spot market products include stocks, indices, foreign currencies, commodities and gold ("underlying assets"). Derivative products, instead, are derived from their respective underlying assets. The settlement price and date of the products are specified in the contract. In contrast, the period of time required from entering a contract to settlement could be relatively longer for derivative products.

- **Value of derivatives products**
  The value of a derivative product is mainly affected by the value of the underlying asset, but also other factors such as market interest rates, the expected market trend, volatility of the underlying asset price, market liquidity, supply reserves, maturity date and macroeconomic environment etc.

- **Settlement of derivative products**
  A settlement date is specified in a derivative product contract. Investors are required to fulfill the contract on or before the settlement date. Derivative products with a shorter investment horizon are more affected by time value.

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Part II – Types of Derivative Products

Derivative products include, for example, futures and options.

1. Futures

- **Definition of futures**
  By signing a contract, the buyer and the seller undertake to buy or sell a specified quantity or unit of the underlying asset at a specified price on a specified date. On the contract expiry date, both the buyer and the seller must fulfil their respective responsibilities to complete the contract. Futures products can be "listed" or "over-the-counter".

- **Exchange-listed futures**
  Exchange-listed futures refer to futures contracts which are traded on standardized contract terms, i.e. traded on the date and unit specified by the exchange, for instance, the Hang Seng Index futures listed on the Hong Kong Futures Exchange.

- **Over-the-counter futures**
  Over-the-counter futures are forward contracts whose contract terms such as price, quantity or transaction amount are determined by an agreement between the buyer and the seller. Interest rate forward contracts, agricultural forward contracts and commodity forward contracts are examples of over-the-counter futures.

- **Examples of futures**
  Futures traded on the Hong Kong Stock Exchange are mainly cash-settled. For example, an investor is optimistic about the trend of the Hang Seng Index and buys a Hang Seng Index futures contract that expires in three months at the market price. After the contract is established, if the trend of the Hang Seng Index is in line with the investor's expectations, he/she can choose to sell the contract (close the position) at the market price at any time to earn a profit of HK$50 per index point.

  Over-the-counter futures contracts can be physically-settled or cash-settled. For example, in order to mitigate the foreign currency exchange rate risk, a businessman made a foreign exchange futures contract agreement with a financial institution to buy Euros at a specified exchange rate after half-year. When the contract expires, he can exercise the contract at the agreed price.

2. Options

- **Definition of options**
  Option contracts are negotiated between the buyer and the seller. The contract entitled the buyer to exercise the right but not an obligation to buy or sell the underlying asset from/to the seller. The buyer and the seller agree on the quantity (units), price, settlement date or expiry date of the option stated in the contract. Within the contract period, if the buyer exercises the contractual rights, the seller must fulfil the obligation to sell or buy a specified amount of the underlying asset at the specified price.

- **Call options and put options**
  Options can be divided into "call options" and "put options". The holder of a call option has the right to buy the underlying asset at a specified price and quantity within the valid period specified in the contract. The holder of a put option has the right to sell the underlying asset at a specified price and quantity within the valid period specified in the contract.

- **The value of options**
  The value of an option is generally affected by several factors:

a. Price of the underlying asset

- As the price of the underlying asset rises, the value of the call option rises while the value of the put option falls.
- As the price of the underlying asset falls, the value of the call option falls while the value of the put option rises.

b. Strike price

- Strike price can be "in-the-money", "out-of-the-money" or "at-the-money".
- "In-the-money options" refer to options with intrinsic value. In the case of an "in-the-money call option", the current price of the underlying asset is higher than the strike price; "in-the-money put option" means that the current price of the underlying asset is lower than the strike price. Assuming a favorable direction, the further the current price of the underlying asset is away from the strike price, the greater the intrinsic value of the option.
- An "out-of-the-money option" has no intrinsic value. In the case of an "out-of-the-money call option", the current price of the underlying asset is lower than the strike price; an "out-of-the-money put option" means that the current price of the underlying asset is higher than the strike price.
- "At-the-money options" have an exercise price equals to the current price of the underlying asset, with no intrinsic value.

	Call Option	Put Option	Intrinsic Value
In-the-money	Spot Price > Strike Price	Spot Price < Strike Price	Yes
Out-of-the-money	Spot Price < Strike Price	Spot Price > Strike Price	No
At-the-money	Spot Price = Strike Price	Spot Price = Strike Price	No

c. Time value

- As the time to the expiration of contract gets closer, the option's time value decreases.
- The above rule applies to both call options and put options.

d. Implied volatility of underlying asset

- When the implied volatility of the underlying asset increases, the option's value increases; when the implied volatility of the underlying asset decreases, the option's value decreases.
- The above rule applies to both call and put options.

e. Risk free rate

- When the risk-free rate rises, the value of the call option rises and the value of the put option falls.
- When the risk-free rate falls, the value of the call option falls and the value of the put option rises.

f. Dividend payout from underlying asset

- When the dividend/bonus distribution of the underlying asset increases, the value of the call option decreases and the value of the put option increases.
- When the dividend/bonus distribution of the underlying asset decreases, the value of the call option increases and the value of the put option will decreases.

- **Premium**
  The buyer pays an option premium to the seller when the contract is established. After receiving the premium, the seller is responsible for fulfilling the contract and completing the transaction when the buyer exercises the rights.

- **European and U.S. options**
  The buyer of a European option can only exercise the right on the contract expiration date or on a specified date, while a U.S. option allows the buyer to exercise the right on any trading day before the contract expiration date.

3. Other products

Other derivative products are available on the market. Those traded on the Hong Kong Stock Exchange include warrants and callable bull/bear contracts (CBBCs). Structured products are pre-packaged investments that normally include one or more derivatives. Common over-the-counter structured products include equity-linked notes (ELNs), currency-linked deposits, accumulators and decumulators.

Part III – Common Uses of Derivatives

Derivative products are commonly used in the following ways:

- **Risk hedging**
  Example: An investor is bearish on stock A but does not want to sell it at the moment. He/she can buy a put option with stock A as the underlying asset to hedge part of the risk. If the price of stock A falls, he/she can get a certain profit from the put warrant to cover some of the losses suffered by holding stock A.

- **Yield enhancement and/or capital appreciation**
  Example: An investor is optimistic about the trend of stock B and believes that although the price of this stock may not rise sharply in the short term, it will not fall sharply. Hence, he/she is willing to buy stock B if its price retrieves in a short period of time. In this view, if the investor buys an equity-linked note and becomes the seller of equity put options, he/she has the opportunity to earn the potential return of the note upon the investment matures in order to enhance the yield. If the price of stock B is not as expected by the investor, he/she may have to buy stock B at the agreed price of the note without any return and incur an investment loss. In the worst case, the investor will lose his entire principal invested.

  Example: An investor is very optimistic about the trend of stock C and believes that the price of the stock will rise sharply in the short term. In this view, he/she can subscribe for the Minimum Redemption note to become the buyer of stock call options, and participate in (or leverage) the increase in the relevant stock price to achieve capital appreciation; if the price of the stock is not as expected by the investor, he/she is also safeguarded by a partial capital protection level.

Equity-linked notes

Equity-linked notes are over-the-counter traded structured products where investment returns are linked to the performance of a single or a basket of stocks. By buying an equity-linked note, an investor becomes the seller of a put option on the stock, and the premium earned as the seller of the put option is also included in the potential return of the note. Price fluctuations in the underlying stocks can affect the investment returns and determine whether the investor could receive cash or stock when the investment matures.

- **Indirect investments in different classes of assets**
  Example: Through derivative products, investors can indirectly invest in markets or assets that are normally difficult to participate in Hong Kong. For example, some synthetic exchange-traded funds (Synthetic ETFs) use derivatives to track the performance of certain market indices. These funds buy derivative products, and although they do not directly hold the constituent stocks of the market, they can also invest indirectly in the market.

- **Leverage**
  Different stocks and warrants have different leverage ratios, and the cost to investors depends on the terms of the warrant issuer. By investing in warrants, the potential returns and risks are also leveraged.

Part IV – Potential Risks of Derivatives

The main risks involved in derivative products including but not limited to:

- **Counterparty risk and uncollateralized product risk**
  Derivatives can be issued by third parties such as listed companies or financial institutions, i.e. the so-called issuers. If the issuer's financial situation has problems and its credit rating is lowered, or the issuer has solvency difficulties, or even goes bankrupt, the price of the derivative product will be affected.

  Uncollateralized derivative products are not asset backed. In the event of issuer bankruptcy, investors can lose their entire investment. Investors should read the offering documents to determine if a product is uncollateralized.

- **Risk of underlying assets and/or market risk**
  The price of a derivative product depends on the price of its underlying asset. Under normal circumstances, the price fluctuation of the underlying asset will affect the price of its derivative products, and this is the risk of the underlying asset.

  Market risk, also known as systematic risk, stems from economic, geographical, political, social or other factors of that market. Market risk generally refers to the risks associated with a particular market that can make asset prices volatile and unpredictable.

- **Risk of early redemption and potential loss of capital**
  Early redemption may result in the investor getting back only part of the initial investment amount and hence losses for the investor. Therefore, investors should be cautious on whether the provisions of early redemption will affect their investment amount.

- **Liquidity risk**
  This type of risk generally involves the ease of liquidation of derivative products held by investors in the market. Some derivative products are difficult to sell or cash out before its expiration. If the relevant derivative products cannot be sold in a short period of time, investors' funds may not be available until the relevant derivative products mature. If investors need to use funds at any time, they need to pay special attention to such risks.

- **Interest rate risk**
  Interest rates are closely related to derivative products. Since derivative products may involve the transaction of assets and cash or the exchange of two currencies, and the calculation of cash and currency returns is related to interest rates, changes in interest rates will affect the prices of derivative products.

- **Leverage risk**
  As derivative products may involve leveraged investments, small movements in the stock market or foreign exchange market may result in relatively large changes in the prices of their derivatives. The higher the leverage ratio, the greater the leverage risk.

- **Foreign exchange risk**
  Investors trading derivative products with underlying assets not denominated in the same currency are exposed to exchange rate risk. Currency rate fluctuations can adversely affect the value of underlying assets and subsequently the derivative products' prices.

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