

LM01 · DERIVATIVES · CFA LEVEL I

Derivative Instrument & Derivative Market Features

What a derivative is, what it derives from, and the two market structures where it trades

What This Reading Covers

A **derivative** is a financial instrument that **derives its value from the performance of an underlying asset**. Two parties agree today to exchange cash flows in the future at a price agreed now. The buyer is **long** (takes delivery); the seller is **short** (delivers). Derivatives trade **over-the-counter (OTC)** or on **exchanges**.

Learning Outcome Statements

LOS a Define a derivative and describe the basic features of a derivative instrument

LOS b Describe the basic features of derivative markets, and contrast over-the-counter and exchange-traded derivative markets

Exam Tip: The highest-frequency testables in LM01 are: (1) the five underlying categories plus the two "other" categories (weather, crypto); (2) the four advantages derivatives add to cash markets (short, diversify, hedge, lower cost / cap); (3) the five OTC vs exchange-traded differences; (4) the role of a central counterparty (CCP) in centrally-cleared OTC.

LOS A · DEFINITION

What Is a Derivative?

Derivative — a financial instrument that derives its value from the performance of an **underlying asset**. Cash flows are exchanged in the future at a price agreed on today.

It is a **legal agreement between counterparties** (one typically a financial intermediary) with:

- 1 A specific **maturity (settlement date)**
- 2 A specific **quantity** of the underlying
- 3 A specific **price**

Long vs Short

LONG (BUYER)

Takes delivery of the underlying. Benefits when the underlying price rises.

SHORT (SELLER)

Delivers the underlying. Benefits when the underlying price falls.

Stand-alone vs Embedded

- 1 **Stand-alone derivative** — separately traded (e.g., an exchange-traded call on GM).
- 2 **Embedded derivative** — part of another financial product. Classic example: a **callable bond** (issuer holds a call option on the bond).

The underlying can be an *asset*, a *group of standardized assets*, or a *variable* such as an interest rate.

LOS A · TWO CLASSES OF DERIVATIVES

Firm Commitments vs Contingent Claims

FIRM COMMITMENT

Both parties are obligated to engage in a transaction at a later point in time (the expiration), on terms agreed upon at the start.

Examples: forward contracts, futures contracts, swaps

CONTINGENT CLAIM

One party (the **buyer**) has a **right**; the other party (the **seller**) has an **obligation**. Payoff occurs only if some future event takes place.

Examples: call options, put options, credit default swaps

Why Use Derivatives? (4 benefits over cash markets)

- 1 **Short-selling** — benefit from a price decline without owning the asset.
- 2 **Diversification** — direct commodity / FX / credit exposure that is hard to obtain in cash markets.
- 3 **Hedging of risk** — financial and operational risks.
- 4 **Reduced capital requirements & lower transaction costs** — derivatives can also be *more liquid* than the underlying (especially for commodities).

Exam Tip: Every forward, future, and swap is a *commitment*. Every option and credit derivative is a *contingent claim*. Know this split cold.

LOS A · TYPES OF UNDERLYING

The Six Underlying Categories

#	CATEGORY	TYPICAL DERIVATIVES	KEY DETAIL
1	Equities	Options (most common at stock level); options, futures, forwards, swaps at index level	Individual stocks (GM), stock group (OIH), stock index (SPX). Equity swaps: pay equity return, receive floating + spread. Volatility derivatives manage dispersion separately from direction.
2	Fixed Income — bonds	Options, futures, forwards, swaps	$ZN = 10\text{-yr UST}(100k)$, $ZT = 2 - yrUST(200k)$. Generic 6% underlying, with a <i>cheapest-to-deliver (CTD)</i> actual bond + conversion factor.
3	Fixed Income — interest rates	Options, futures, forwards, swaps	MRR = market reference rate (e.g., SOFR — Secured Overnight Funding Rate, secured by UST). Interest-rate swap: pay fl. / rec. fx. or pay fx. / rec. fl.
4	Currencies	Full menu	Take a directional view or hedge a currency exposure.
5	Commodities	Full menu	Brokers <i>do not allow delivery</i> ; contract must be closed before the delivery period.
6	Credit	CDS — Credit Default Swap	Long CDS = short credit quality (long the spread; benefit if spread ↑). Short CDS = long credit quality (short the spread; benefit if spread ↓).
+	Other	Varies	Weather, cryptocurrencies.

Equity swap mechanics: the equity-return-payer surrenders the realized equity return; the counterparty pays a floating rate plus spread. This lets an investor *get or remove* exposure without actually buying / selling the underlying or taking delivery.

QUIZ 1 · CHECKPOINT

Test Your Understanding — Foundations

Q1. A derivative is *best* defined as:

Q2. Which of the following is a **contingent claim** rather than a firm commitment?

Q3. An investor who is **long a CDS** on XYZ is *most likely*:

Q4. A callable bond contains which feature?

Q5. The market reference rate used in USD interest-rate swaps today is *most likely*:

LOS B · MARKET STRUCTURES

Over-the-Counter vs Exchange-Traded

FEATURE	OVER-THE-COUNTER (OTC)	EXCHANGE-TRADED
Venue	Dealer market — market makers	Centralized exchange
Terms	Customized	Standardized
Transparency	Less transparent	Transparent
Regulation	Less regulated	Highly regulated
Counterparty	The other side (default risk exists)	Clearinghouse is counterparty to all contracts → free from default risk
Settlement	No daily settlement (traditional OTC)	Margin deposit + gains/losses settled daily
Liquidity	Less liquid (not always true)	Liquid (not always true)
Examples	Forwards, most swaps, CDS, many options	Futures, listed options

Central Clearing — the Modern Middle Ground

A recent addition for *some* OTC contracts (notably swaps). A **central counterparty (CCP)** assumes the counterparty credit risk of the financial intermediaries and provides **clearing and settlement** services — the CCP becomes buyer to every seller and seller to every buyer.

Diagram — the shift in counterparty

OLD: Party 1 ← swap → Party 2
 NEW: Party 1 ← swap → **Central Clearing** ← swap → Party 2

The CCP provides management of credit risk, clearing, and settlement.

SUPPLEMENT · ECOSYSTEM

Who Trades Derivatives?

End users

- Corporations hedging input prices, FX, rates
- Pension funds & insurers managing asset/liability mismatches
- Asset managers adjusting portfolio risk or gaining synthetic exposure
- Hedge funds taking directional or relative-value positions

Financial intermediaries

- Dealer banks (OTC market makers)
- Exchanges and their listed products (CME, CBOE, ICE, etc.)
- Clearinghouses / central counterparties
- Futures commission merchants (brokers)

The OTC derivative market is substantially larger in notional terms than the exchange-traded market; however, exchange-traded markets dominate in retail access and daily liquidity.

LOS B · POST-TRADE

Clearing, Settlement & Margin

Exchange-traded flow

- 1 **Contract opened** — buyer and seller each post *initial margin* with the clearinghouse.
- 2 **Daily mark-to-market** — gains and losses are credited / debited to each party's margin account at the settlement price.
- 3 **Maintenance margin** — if the account falls below this threshold, a *margin call* restores the balance to the initial margin level.
- 4 **Close-out** — either delivery, cash settlement, or offsetting trade.

Centrally-cleared OTC flow

Negotiated bilaterally, then novated to a CCP which imposes initial margin, variation margin, and a default-fund contribution. From the parties' perspective, counterparty credit risk collapses to the CCP.

Exam Tip: Daily settlement and clearinghouse counterparty are the two features that *eliminate default risk* on exchange-traded derivatives. OTC contracts that are *not* centrally cleared retain bilateral default risk.

QUIZ 2 · CHECKPOINT

OTC vs Exchange — Check Yourself

Q6. Which feature is *most characteristic* of an exchange-traded derivative relative to an OTC derivative?

Q7. A central counterparty (CCP) in a centrally-cleared swap market *most likely*:

Q8. Which of the following is *least likely* to trade OTC?

Q9. Derivatives offer all of the following advantages over cash-market exposure *except*:

Q10. Which statement about OTC derivatives is *most accurate*?

LOS A · UNDERLYING DEEP DIVE

Equity & Fixed-Income Derivatives

Equity Swap Mechanics

Party A: pays equity return | receives floating + spread
 Party B: pays floating + spread | receives equity return

Allows an investor to *get (or remove) exposure* to an equity without buying (or selling) the underlying, without delivery risk, and — for taxable investors — sometimes with different tax treatment.

Derivatives also exist on **realized volatility** of equities: investors can manage *dispersion* of returns separately from price *direction*.

UST Futures

ZN 10-yr UST futures, \$100,000 face value

ZT 2-yr UST futures, \$200,000 face value

Generic 6% underlying Actual bond delivered is the **cheapest-to-deliver (CTD)**, adjusted by a **conversion factor**

Interest-Rate Swap Directions

MRR = market reference rate (USD: SOFR).

Pay fixed / receive floating

Converts fixed-rate exposure → floating-rate exposure. Adds duration if you were receiving floating; reduces duration if you were paying fixed on a liability.

Pay floating / receive fixed

Converts floating-rate exposure → fixed-rate exposure. Reduces duration of a floating-rate liability.

LOS A · CREDIT UNDERLYING

Credit Default Swap — Long / Short Intuition

LONG CDS = BUY PROTECTION

Pays a periodic *CDS spread* (premium);
receives a contingent payout if the reference
entity has a credit event (default, bankruptcy,
restructuring, etc.).

Short credit quality $\iff$ long the spread.

Benefits if spread $\uparrow$ (credit deteriorates).

SHORT CDS = SELL PROTECTION

Receives the CDS spread; obligated to pay the
contingent amount on a credit event.

Long credit quality $\iff$ short the spread.

Benefits if spread $\downarrow$ (credit improves).

CDS is a **contingent claim**: payoff hinges on a specified credit event. It is the canonical OTC credit derivative.

Exam Tip: Direction memory trick: "Long CDS" = you bought the *protection*, so you benefit when the underlying credit *worsens*. The CDS spread and the underlying credit quality always move in opposite directions.

QUIZ 3 · INTEGRATION

Applying the Concepts

Q11. Which of the following *best* describes a feature of an OTC derivative that is **centrally cleared**?

Q12. An investor who goes **short** a CDS is *most likely*:

Q13. Which is a firm commitment rather than a contingent claim?

Q14. Commodity derivatives traded through brokers:

Q15. Which underlying category is *least likely* to have exchange-traded futures and options?

MODULE COMPLETE

Your Scorecard

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LM01 Key Takeaways — Exam-Ready Cheat Sheet

Definition & Features

- 1 **Derivative** — derives value from the performance of an **underlying asset**; cash flows exchanged in the future at a price agreed today.
- 2 Legal agreement with a specific **maturity, quantity, price**; **long** = buyer takes delivery, **short** = seller delivers.
- 3 Stand-alone (separately traded) or embedded (e.g., callable bond).

Two Classes

- 4 **Firm commitment** — both parties obligated: *forwards, futures, swaps*.
- 5 **Contingent claim** — payoff contingent on an event: *options, credit derivatives (CDS)*.

Underlyings

- 6 **Equity** (stock, index), **FI bonds** (ZN, ZT, CTD + conversion factor), **FI rates** (SOFR / MRR), **FX**, **Commodities**, **Credit (CDS)**, + other (weather, crypto).
- 7 **Long CDS** = short credit quality (long the spread). **Short CDS** = long credit quality.

OTC vs Exchange-Traded

- 8 **OTC:** customized, less transparent/regulated, no daily settlement, bilateral default risk (unless centrally cleared).
- 9 **Exchange:** standardized, transparent, highly regulated, margin + daily settlement, clearinghouse counterparty → no default risk.
- 10 **CCP (central clearing):** recent addition for some OTC (swaps). CCP assumes counterparty credit risk, provides clearing + settlement.

Benefits of Derivatives

- 11 Enable **short-selling**, **diversification** (direct commodity/FX), **hedging** (financial & operational), and **lower transaction costs / capital**; can be more liquid than the underlying.

Last-Minute Exam Checklist

Definition: derives value from underlying · maturity / quantity / price

Classes: commitments (fwd/fut/swap) · contingent (option/CDS)

Underlyings: equity · FI bond · FI rate (SOFR) · FX · commodity · credit · other

OTC: custom · bilateral · less regulated. **CCP:** removes counterparty risk for cleared OTC

Exchange: standardized · daily settlement · clearinghouse · no default risk