LM08 · EQUITY INVESTMENTS · LOS A–M

Equity Valuation: Concepts and Basic Tools

CFA Level I · 2025 Curriculum · The largest reading in Equity

The Core Question

Equity valuation is the process of estimating the **intrinsic value (IV)** of a share and comparing it to the **market value (MV)** to identify mispriced securities (i.e., where IV ≠ MV). When IV differs meaningfully from MV, an active analyst has an actionable view: buy, sell, or hold.

The Three Families of Valuation Models

1. Present-Value (DCF) Models

Discount future cash benefits to the shareholder. Sub-types: Dividend Discount Model (DDM) and Free-Cash-Flow-to-Equity (FCFE).

2. Multiplier Models

Price (or EV) stated as a multiple of some fundamental variable — earnings, sales, book value, cash flow, EBITDA.

3. Asset-Based Models

Equity = MV(Assets) − MV(Liabilities + Preferred). Market-value-based, not book-value-based.

What You Will Cover in This Module

1. **Valuation process:** IV vs MV, margin of safety, dividend mechanics, payment chronology.
2. **Present-value models:** single-period & infinite-horizon DDM, preferred stock, FCFE as a DDM alternative.
3. **Gordon (constant) growth model:** $P_0 = D_1/(r - g)$, assumptions, sensitivity.
4. **Multistage DDM:** high-growth + constant-growth stages, when each model is appropriate.
5. **Sustainable growth rate:** $g = b \times ROE$.
6. **Price multiples:** P/E, P/B, P/S, P/CF — comparables vs justified (fundamental) multiples.
7. **Enterprise value multiples:** EV/EBITDA, EV/Sales — and how to compute EV.
8. **Asset-based valuation:** when appropriate and when not.

> **Exam Tip:** This is the single largest reading in the Equity topic area. The exam typically tests the Gordon Growth Model, two-stage DDM, justified P/E, and EV multiples heavily — learn the formulas cold.

LOS A · INTRINSIC VALUE VS MARKET VALUE

Estimated Value vs. Market Price

The goal of analysis is to identify **mispriced securities** — situations where our estimate of **intrinsic (fundamental) value (IV)** differs from the observed **market value (MV)**. Based on the comparison, a security is classified as undervalued, fairly valued, or overvalued.

The Three Verdicts

IV > MV

Undervalued

Buy candidate — market price below fundamental value

IV = MV

Fairly valued

No mispricing signal

IV < MV

Overvalued

Sell / avoid — market price above fundamental value

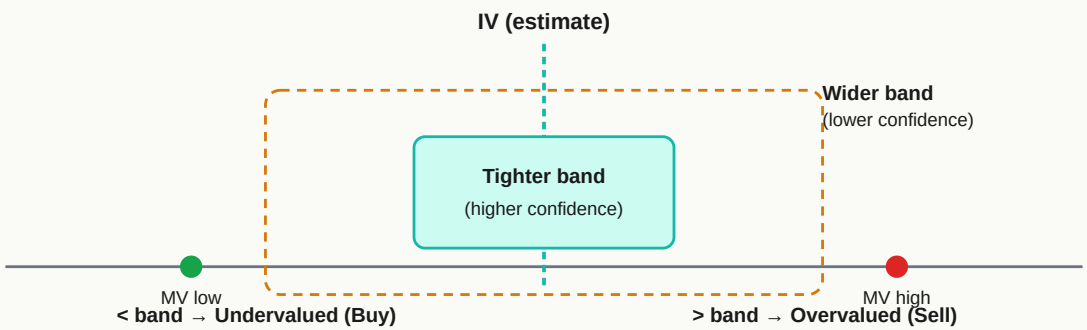
The Margin-of-Safety Caveat

Simply observing IV ≠ MV is not enough to act. Two judgment factors modulate the signal:

- **Confidence in the inputs.** DCF inputs (future dividends, r, g) are estimates. Greater confidence warrants *tighter bands* around IV; less confidence requires *wider bands* (e.g., ±10–20%) before classifying a security as mispriced.
- **Expected time frame of convergence.** Even if mispricing is real today, the view only pays off if MV converges to IV within a reasonable horizon. Patient capital is required.

A larger gap between IV and MV provides a **margin of safety** — protection against input error.

CONFIDENCE BANDS AROUND IV



Active vs passive implication. If markets are fully efficient, IV = MV always, and valuation is wasted effort. Active managers rely on recurring mispricing. Securities followed by many analysts are more likely to be fairly valued than neglected securities.

LOS B, M · MODEL CATEGORIES AND TRADE-OFFS

Major Categories of Equity Valuation Models

There are **three** major categories of valuation models. Each rests on a different conception of what drives share value, and each has distinct strengths and weaknesses.

1. Present-Value (DCF) Models

Value equals the **present value of future benefits** the security will deliver to its holder. Two sub-families:

- **Dividend Discount Model (DDM):** future benefit = cash *distributed* to shareholders as dividends.
- **Free-Cash-Flow-to-Equity (FCFE):** future benefit = cash *available* to pay dividends after meeting capital expenditure and working-capital needs.

$$V_0 = \Sigma\ CF_t/(1+r)^t$$

2. Multiplier (Market Multiple) Models

Price (or Enterprise Value) is expressed as some **multiple of a fundamental variable** — e.g., earnings, sales, book value, cash flow, or EBITDA. Multiples can be computed on a:

- **Trailing** basis (observed historical denominator, e.g., TTM EPS), or
- **Forward / leading** basis (estimate of next year's denominator, e.g., forward EPS).

$$\mathrm{P} = multiple\ \times\ fundamental \quad | \quad e.g., P_{target} = (industry\mathrm{P/E})\ \times\ EPS_{estimate}$$

3. Asset-Based Valuation Models

Equity value = **market value of assets − market value of liabilities and preferred**. Book values are adjusted to fair/market values where possible.

$$V_{equity} = \mathrm{MV}(Assets) - \mathrm{MV}(Liabilities) - \mathrm{MV}(Preferred)$$

Strengths & Weaknesses Summary

CATEGORY	ADVANTAGES (+)	DISADVANTAGES (–)
DCF (PV)	Theoretically sound (PV of future cash flows); widely used and accepted	Inputs must be estimated; calculated values are very sensitive to inputs
Price multiples	Good predictors of stock returns; easy to calculate and widely available; allow time-series and cross-sectional comparison	Lagging; may not be comparable across firms; cyclical-firm multiples affected by economic conditions; can conflict with fundamental valuation; negative denominators give meaningless ratios
Asset-based	Provide floor values; work well when assets have readily determinable market values; increasingly useful for valuing private firms	Market values of assets often differ from book values and are hard to determine; fails with large intangibles; difficult in hyperinflation

Exam Tip: For an exam question asking which model to use: DCF for stable cash-flow payers; multiples for comparative/relative work and where inputs are unreliable; asset-based for resource/financial firms or liquidation scenarios.

LOS E · DIVIDEND DISCOUNT MODEL

Dividend Discount Model (DDM)

The simplest present-value model. **Value today = present value of future dividends**. The discount rate *r* is the required rate of return on equity — usually estimated via **CAPM**.

General Form

$$V_0 = \Sigma_{t=1}^{\infty} D_t/(1+r)^t$$

- V_0 value of share today
- D_t expected dividend in year t
- r required rate of return (usually from CAPM: $r = r_f + \beta(r_M - r_f)$)

Finite Holding Period — DDM with Terminal Price

If you plan to hold for *n* years, value = PV of the dividends collected during the holding period **plus** PV of the terminal selling price P_n:

$$V_0 = \Sigma_{t=1}^{n} D_t/(1+r)^t + P_n/(1+r)^n$$

V_0 depends directly on dividends collected and indirectly (through P_n) on dividends expected after the holding period.

One-Period Special Case

$$V_0 = (D_1 + P_1)/(1+r)$$

WORKED EXAMPLE **3-year DDM with terminal value**

GIVEN

Expected dividends: $D_1 = 2.00$, $D_2 = 2.10$, $D_3 = 2.20$. Expected selling price at end of year 3: $P_3 = 20$. Required return r = 10%.

FIND

V_0, the value of the share today.

SOLUTION

1. Write out the 3-year DDM with terminal value:

$$V_0 = 2.00/(1.10)^1 + 2.10/(1.10)^2 + 2.20/(1.10)^3 + 20/(1.10)^3$$

2. Discount each term:

$$= 1.82 + 1.74 + 1.65 + 15.03$$

3. Sum:

$$\mathbf{V_0 = \$20.24}$$

Dividends & Payment Chronology (Quick Reference)

DATE	MEANING
Declaration	Board of directors authorizes the dividend — now a contractual obligation.
Ex-dividend	First day stock trades *without* the dividend. Stock typically opens lower by approximately the amount of the dividend.
Holder-of-record	Shareholders registered on this date receive the dividend (usually 2 business days after ex-dividend, reflecting T+2 settlement).

Payment	Dividend is paid to shareholders.

Types of dividends & related actions. *Regular cash* (paid at regular intervals); *extra/special* (one-off, discretionary, often cyclical firms); *liquidating* (distributed when a firm winds down); *stock dividend* (bonus shares, typically 2–4% — not relevant for valuation); *stock splits/reverse splits* (change share count but no economic effect); *share repurchase* (alternative to cash dividends; Treasury Stock is a contra-equity account).

QUIZ 1 · CHECKPOINT

Foundations: IV vs MV, Categories, DDM Basics

Q1. An analyst estimates a stock's intrinsic value at $48 while the market price is 52. Assuming the analyst has high confidence in the inputs, the stock is best described as:

Q2. Which of the following is *not* a major category of equity valuation model?

Q3. A stock paid a dividend of \$2 last year (D_0 = 2). The next dividend will be $10 42 at year-end. If the required return is 12%, the value today is closest to:

Q4. The date on which a stock first trades *without* the declared dividend is the:

Q5. Which of the following is *most* accurately described as an advantage of price-multiple models relative to DCF models?

LOS E, F · PREFERRED STOCK VALUATION & FCFE ALTERNATIVE

Preferred Stock & Free Cash Flow to Equity

Non-Callable, Non-Convertible Perpetual Preferred

These shares pay a fixed dividend forever with no maturity. They are valued as a **simple perpetuity**:

$$V_0 = \mathrm{D}/r$$

Where D is the annual preferred dividend (par × stated rate) and r is the required return on the issue (reflecting credit quality).

WORKED EXAMPLE **Perpetual preferred valuation**

GIVEN

Par = $100, stated rate = 4.75%, credit rating = Ba1/BB, required return on BB = 7.5%.

SOLUTION

1 Annual dividend:

$$\mathrm{D} = 100 \times 4.75 = 4.75$$

2 Apply perpetuity formula:

$$V_0 = 4.75 / 0.075$$

$$\mathbf{V_0 = \$63.33}$$

Finite-Maturity Preferred (e.g., Retractable)

If the preferred has a maturity (or retraction) date, it is valued **like a bond** — PV of periodic dividends plus PV of the par redemption:

$$V_0 = \Sigma_{t=1}^{n} D_t/(1+r)^t + F/(1+r)^n$$

Source example: Par $25@5$12.71.

FCFE — The Dividend-Free Alternative

DDM works for dividend-paying stocks. For firms that **don't pay dividends** (or pay unstable dividends), use **Free Cash Flow to Equity (FCFE)** — a measure of dividend-*paying capacity*.

Definition

$$\text{FCFE} = \text{CFO} - FCInv + NetBorrowing$$

CFO = cash flow from operations. FCInv = fixed-capital investment (roughly CAPEX). Net Borrowing = new debt issued − debt repaid.

FCFE Valuation

$$V_0 = \Sigma_{t=1}^{\infty} FCFE_t/(1+r)^t$$

Discount FCFE at the required return on equity. The required return r can be estimated from CAPM: $r = r_f + \beta(r_M - r_f)$, from the firm's own bond yield plus a risk premium, or by economic judgement.

Use DDM when…

- Firm pays dividends, and
- Dividend policy is clear and related to earnings, and
- Minority (non-control) perspective — you can't affect payout.

Use FCFE when…

- Firm does *not* pay dividends, or
- Dividends differ markedly from FCFE (dividends ≠ capacity), or
- Control perspective — you could redirect cash.

LOS G, H · GORDON (CONSTANT) GROWTH MODEL

Gordon Growth Model

The **Gordon Growth Model** (constant-growth DDM) prices a share under the assumption that dividends grow forever at a single constant rate g. It is the closed-form sum of an infinite geometric series of discounted dividends.

The Formula

$$V_0 = D_1/(r - g) = D_0(1 + g)/(r - g)$$

- D_0 most recent dividend just paid
- D_1 expected dividend next period = $D_0(1 + g)$
- r required rate of return on equity
- g constant dividend growth rate, perpetually

If g = 0, the formula collapses to the perpetuity V_0 = D/r.

The Four Key Assumptions

1. **Dividends are the correct metric** for valuation purposes.
2. **g is constant forever** (perpetual and never changes).
3. **r is also constant over time.**
4. **g < r strictly.** If g ≥ r the formula blows up or becomes negative.

WORKED EXAMPLE **Gordon growth valuation**

GIVEN

D_0 = \$5.00, g = 4%, r = 8%.

SOLUTION

1 Compute next dividend:

$$D_1 = D_0(1 + g) = 5.00 \times 1.04 = 5.20$$

2 Apply Gordon:

$$V_0 = 5.20 / (0.08 - 0.04) = 5.20 / 0.04$$

$$\mathbf{V_0 = \$130}$$

Sensitivity — The Model is Fragile

The Gordon model is **extremely sensitive** to both r and g. As r approaches g, P_0 rises dramatically — hence the strict requirement g < r.

Source illustration: D_0 = 1.35, D_4 = 2.28 ⇒ implied g ≈ 14%. With r = 19%:

ASSUMPTION	V_0	DELTA
g = 0	≈ $7.11 (perpetuity)	baseline
g = 13%, r = 19%	≈ $25.43	—
g = 13%, r = 20%	≈ $21.80	r +1% ⇒ V falls sharply

Small changes in r or g cause large swings in V_0. Stress-test every Gordon calculation.

When Gordon is Appropriate

Appropriate

- Stable, mature firms
- Non-cyclical businesses
- Dividend-paying firms with a clear policy
- Growth has reached its long-run rate

Inappropriate

- Rapidly-growing companies
- Non-dividend payers
- Cyclical / volatile earners
- Firms where g ≈ r or g > r

Exam Tip: When Gordon doesn't fit, alternatives are to (a) modify the model for varying growth patterns (multi-stage DDM), (b) use a cash-flow measure other than dividends (FCFE), or (c) use some other approach (e.g., multiples).

LOS G · SUSTAINABLE GROWTH RATE

The Sustainable Growth Rate: g = b × ROE

Where does the *g* in the Gordon model come from? For a stable, expanding company, the **sustainable growth rate** is the rate at which earnings and dividends can grow indefinitely without issuing new equity — funded purely from retained earnings reinvested at the firm's ROE.

The Formula

$$g = b \times \text{ROE}$$

b earnings retention rate = 1 − dividend payout ratio (DPR)

DPR dividend payout ratio = D_1 / E_1

ROE return on equity

Two Equivalent Ways to Write It

$$g = (1 - DPR) \times \text{ROE}$$

Retain more of each dollar of earnings (higher b = lower DPR) → faster growth *ceteris paribus*.

Intuition — The Growth Trade-off

Higher retention (lower DPR)

- More equity plowed back into the business
- Higher g → higher P_0 via Gordon *numerator effect delayed*
- Less cash returned today — "dividend displacement of earnings"

Higher payout (lower b)

- More cash in shareholders' hands now
- Lower g
- Higher current D_1/E_1 (numerator of justified P/E)

Decomposing ROE (DuPont) for the Equity Case

$$\text{ROE} = Profit Margin \times Total Asset Turnover \times Financial Leverage$$

$$= (Net Income/Sales) \times (Sales/Total Assets) \times (Total Assets/Equity)$$

Higher margins, greater asset productivity, or more leverage all raise ROE — and therefore sustainable g.

WORKED EXAMPLE **Compute sustainable g and V_0**

GIVEN

A firm has ROE = 14%, DPR = 40%, D_0 = \$2.00, r = 10%.

SOLUTION

1. Retention ratio:

   `b = 1 − 0.40 = 0.60`

2. Sustainable growth:

   `g = 0.60 × 0.14 = 0.084 = 8.4%`

3. Next dividend & Gordon value:

   $D_1 = 2.00 \times 1.084 = 2.168$

   $V_0 = 2.168 / (0.10 - 0.084) = 2.168 / 0.016$

$V_0 \approx \$135.50$

Exam Tip: For a multistage DDM, note the consistency constraint: in the mature stage, long-run g must satisfy $g < (1 - DPR_{mature}) \times ROE_{mature}$, otherwise retained earnings cannot fund the assumed growth.

LOS G, H · MULTISTAGE DDM

Multistage Dividend Discount Model

Most real firms don't grow at a single constant rate forever. A **multistage DDM** models one or more *high-growth* stages followed by a *stable-growth* phase — using the Gordon formula to capture the terminal value at the start of the stable stage.

The Two-Stage DDM

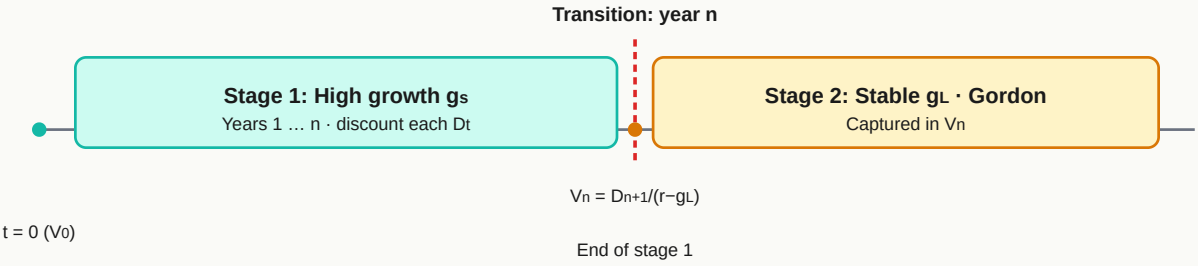
Forecast dividends explicitly for the finite high-growth phase. At the end of stage 1, use Gordon to compute the **terminal value** V_n based on stable-stage dividends:

$$V_0 = \Sigma_{t=1}^{n} D_0(1+g_s)^t/(1+r)^t \quad + \quad V_n/(1+r)^n$$

$$where \quad V_n = D_{n+1}/(r-g_L) = D_n(1+g_L)/(r-g_L)$$

- g_S short-term (high) growth rate
- g_L long-term (stable) growth rate
- n length of the high-growth phase (years)

TWO-STAGE DDM TIMELINE



WORKED EXAMPLE **Two-stage DDM**

GIVEN

D_0 = \$5.00. High-growth phase: g_s = 10% for 3 years. Stable phase thereafter: g_L = 5%. Required return r = 15%.

SOLUTION

1. Project dividends during the high-growth period:

$$D_1 = 5.00 \times 1.10 = 5.50$$

$$D_2 = 5.00 \times 1.10^2 = 6.05$$

$$D_3 = 5.00 \times 1.10^3 = 6.655$$

2. Terminal value at the end of year 3 (Gordon, using $D_4 = D_3 \times 1.05$):

$$V_3 = D_3(1 + g_L) / (r - g_L) = 6.655 \times 1.05 / (0.15 - 0.05) = 6.988 / 0.10 = \$69.88$$

3. Discount everything back to today at r = 15%:

$$V_0 = 5.50/1.15 + 6.05/1.15^2 + 6.655/1.15^3 + 69.88/1.15^3$$

$$= 4.783 + 4.574 + 4.376 + 45.949$$

$$\mathbf{V_0 \approx \$59.68}$$

Model Appropriateness Summary

MODEL	APPROPRIATE FOR
Constant growth (Gordon)	Stable, mature, non-cyclical, dividend-paying firms
Two-stage DDM	Older companies moving out of a growth stage toward maturity; or revitalized firms
Three-stage DDM	Young firms entering growth: growth → transition → maturity

Exam Tip: On the exam, identify the right model by company life-cycle. "Mature utility" → Gordon. "Tech firm moving past hyper-growth" → two-stage. "Early-stage biotech" → three-stage (or FCFE).

QUIZ 2 · CHECKPOINT

DDM Deep Dive: Gordon, Multistage & g

Q6. A stock just paid a dividend of $4. Dividends are expected to grow forever at 5%, and the required return is 9%. Using the Gordon model, V_0 is closest to:

Q7. The Gordon Growth Model is *least* appropriate for valuing:

Q8. A firm has ROE = 15% and pays out 60% of earnings as dividends. Its sustainable growth rate is:

Q9. An analyst uses a two-stage DDM with 3 years of high growth followed by perpetual stable growth. The terminal value at the end of year 3 is *best* calculated as:

Q10. A non-callable, non-convertible perpetual preferred stock has par $50, a stated dividend rate of 6%, and a required return of 5%. Its intrinsic value is closest to:

LOS I, J · PRICE MULTIPLES

Price Multiples: P/E, P/B, P/S, P/CF

A **price multiple** is a ratio that compares a share's price to some fundamental per-share quantity — earnings, book value, sales, or cash flow. Multiples are everywhere in practice because they are simple, comparable, and data-rich.

The Four Common Multiples

MULTIPLE	FORMULA	WHEN MOST USEFUL
P/E	Price per share / EPS	Dividend-paying firms; most common; strongly correlated to long-term returns
P/B	Price per share / Book Value per share	Financial firms; firms in distress; stable measure; works even if EPS < 0
P/S	Price per share / Sales per share	Cyclical firms with losses; not affected by accounting choices; works when EPS < 0
P/CF	Price per share / Cash Flow (or OCF) per share	More economic; harder to manipulate than EPS; less volatile

Pros & Cons of Each

P/E — Pros

- Easy to use, most common measure
- Strongly correlated to long-term returns

P/E — Cons

- Useless if EPS < 0, or if earnings are highly volatile
- Earnings are an accounting measure (manipulable)

P/B — Pros

- More stable measure
- Can be used even if EPS < 0
- Appropriate for firms in distress

P/B — Cons

- Book value ≠ market value
- Ignores relative asset size in comparisons

P/S — Pros

- Not influenced by accounting choices
- Better metric when EPS < 0

P/CF — Pros

- More of an economic measure
- Harder to manipulate than EPS
- Tends to be less volatile than EPS

P/S — Cons

- Revenue-recognition issues still apply
- Ignores cost structure (a high-margin and low-margin firm at same P/S are not comparable)
- Ignores non-cash revenues

- More reliable over long periods

P/CF — Cons

- Definition of "cash flow" varies (OCF, FCF, CFO…) — must standardize

Method of Comparables vs. Method Based on Forecasted Fundamentals

Comparables (“comps”)

Compare the stock's multiple to a benchmark. Rests on the **law of one price** — identical assets should sell for the same price.

Benchmark can be: a closely matched individual stock, the average multiple of a peer group or industry, or the stock's own historical average (time-series).

Based on forecasted fundamentals

Derive what the multiple *should* be from a valuation model. The canonical example is the **justified (leading) P/E** derived from Gordon:

$$Justified P_0/E_1 = (D_1/E_1)/(r-g) = DPR/(r-g)$$

Justified P/E — Derivation

Start with Gordon: $V_0 = D_1/(r - g)$. Assume $V_0 = P_0$. Divide both sides by next year's earnings E_1:

$$P_0/E_1 = (D_1/E_1)/(r-g) = DPR/(r-g)$$

Key relationships (from the justified-P/E formula):

- P/E is **positively related** to DPR (the higher the payout, the higher the numerator)…
- …but higher DPR means lower retention (b) → lower g → a larger (r − g) denominator. This is the "*dividend displacement of earnings*" trade-off — so the DPR effect on P/E is ambiguous.
- Using g = (1 − DPR) × ROE, P/E is **positively related to ROE**.
- P/E is **negatively related to r**.

WORKED EXAMPLE **Justified (leading) P/E**

GIVEN

A firm has expected DPR = 70%, expected g = 5%, r = 10%.

SOLUTION

1. Apply justified P/E formula:

$$P_0/E_1 = DPR / (r - g) = 0.70 / (0.10 - 0.05) = 0.70 / 0.05$$

Justified leading P/E = 14×

2. Interpretation: If peer group P/E is, say, 11×, this firm's higher payout, growth, or lower required return justifies a higher multiple — it is *not* "overvalued" on a fundamentals-adjusted basis.

Exam Tip: Distinguish *trailing* vs *leading* P/E: Trailing P/E = P_0 / E_0 (TTM EPS). Leading (forward) P/E = P_0 / E_1 (next year's estimated EPS). The justified-P/E formula above is the **leading** version.

LOS K · ENTERPRISE VALUE MULTIPLES

Enterprise Value Multiples

Rather than value only the equity, sometimes we want to value the **whole enterprise** — what it would cost to *take over* the firm. Enterprise Value (EV) multiples become most useful when comparing companies with **significantly different capital structures** (mix of debt vs. equity) or when **EPS < 0**.

Enterprise Value — Definition

$$\text{EV} = \text{Market Value of Equity} + \text{Market Value of Debt} + \text{Preferred} - \text{Cash \& Short-term Investments}$$

The intuition: to acquire the firm, a buyer must (i) buy out the equity, (ii) retire or assume the debt and preferred, and (iii) would effectively recoup the target's cash on hand — so cash is subtracted.

Note: EV may be difficult to calculate for companies whose debt is not publicly traded, because market values are hard to observe.

Common EV Multiples

MULTIPLE	FORMULA	USED WHEN
EV / EBITDA	EV / EBITDA	Most common EV multiple; useful when companies have different capital structures; works when earnings are negative (P/E fails); evaluating the cost of a takeover
EV / Sales	EV / Revenue	Works for unprofitable firms; useful cross-industry when margin structures differ

Why EBITDA? EBITDA is pre-interest and pre-tax, so it is not distorted by the firm's financing choices. It represents total earnings available to both debt and equity investors — the right numerator when the denominator is the total enterprise claim.

Sample EV Calculation

Share price $50 \times 1,000 shares outstanding$ =50,000 market cap. Market value of debt = $20,000. Market value of preferred$ =5,000. Cash & short-term investments = $8,000.

$$\text{EV} = 50,000 + 20,000 + 5,000 - 8,000 = \$67,000$$

If EBITDA = $10,000, then EV/EBITDA = 6.7×. Benchmark against peers to assess relative value.

Exam Tip: EV/EBITDA vs. P/E — a firm with high leverage will typically show a *lower* P/E and a *higher* EV/EBITDA compared to a peer with less debt, because debt swells EV while interest lowers EPS. Capital-structure-neutral comparisons require EV multiples.

LOS L, M · ASSET-BASED VALUATION & MODEL SUMMARY

Asset-Based Valuation

Asset-based valuation uses the **market values** (not book values) of a company's **assets and liabilities** to determine the value of the firm's equity as a whole.

The Formula

$$V_{equity} = \text{MV}(Assets) - \text{MV}(Liabilities) - \text{MV}(Preferred)$$

Book values are typically adjusted toward fair values using one or more approaches:

- Depreciated values
- Inflation-adjusted depreciated values
- Estimated replacement values

When Asset-Based Valuation is Appropriate

Use it for…

- Private companies
- Firms with few/no intangibles or off-book assets (little brand/reputation value)
- Firms with a high proportion of current assets and current liabilities
- Companies being liquidated
- **Natural-resource firms** (tangible reserves with observable market prices)
- **Financial firms** (assets and liabilities are mostly marketable securities)

Avoid for…

- Firms where market values of assets and liabilities are hard to determine
- Firms with a **significant amount of intangible assets** — service / brand / IP-heavy businesses
- Firms where future cash flows are not reflected in asset values
- Periods of hyperinflation (asset values distorted)

WORKED EXAMPLE **Asset-based equity valuation**

GIVEN

A firm has 1,000 shares outstanding trading at $50.80. Market values of assets sum to: $5,000 + 15,000 + 30,000 + 55,000 =$105,000. Market values of liabilities sum to: 3,000 + 17,000 + 25,000 =

$45,000.

SOLUTION

1. Equity value = MV(A) − MV(L):

$$V_{equity} = 105{,}000 - 45{,}000 = \$60{,}000$$

2. Per share:

$$V_0 = 60{,}000 / 1{,}000 = \$60.00$$

Asset-based V_0 = $60 vs $MV = $50.80 → ~20% undervalued

Putting the Three Families Together — Triangulation

In practice, analysts often run **multiple model families** on the same firm and compare:

MODEL	IMPLIED V_0 (ILLUSTRATIVE, PER SOURCE)
DDM (Gordon / multistage)	$51
P/E (method of comparables)	$58.80
Asset-based	$60

Disagreement across models is a signal to dig deeper: which assumptions drive the gap? Is the firm's tangible-asset base under-earning? Is the peer group not truly comparable?

Final Strengths & Weaknesses — Master Table

FAMILY	+ STRENGTHS	− WEAKNESSES

DCF (DDM, FCFE)	Theoretically sound; widely accepted	Inputs must be estimated; values very sensitive to inputs
Multiples (P/E, P/B, P/S, P/CF, EV/EBITDA)	Good predictors of stock returns; easy & data-rich; allow time-series and cross-sectional comparison	Lagging; peer construction difficult; cyclical-firm multiples distorted; may conflict with fundamentals; negative denominators meaningless
Asset-based	Provide floor values; work where assets have observable market prices; increasingly useful for private firms	MV vs BV gap; fails for intangible-heavy firms; difficult in hyperinflation

QUIZ 3 · CHECKPOINT

Multiples, EV, and Asset-Based

Q11. A firm has DPR = 40%, r = 12%, g = 4%. Its justified leading P/E ratio is closest to:

Q12. A company has 10 million shares outstanding at $30 per share, market value of debt of$ 120 million, market value of preferred stock of $20 million, and cash of$ 40 million. Enterprise value is closest to:

Q13. The EV/EBITDA multiple is *most* useful when:

Q14. Asset-based valuation is *least* appropriate for which of the following firms?

Q15. Compared with the method of comparables, valuation based on *forecasted fundamentals* (e.g., justified P/E) is *best* characterized as:

MODULE COMPLETE

Your Scorecard

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LM08 Key Takeaways — Exam-Ready Cheat Sheet

Valuation Framework

1. **IV vs MV:** IV > MV → undervalued (buy); IV = MV → fairly valued; IV < MV → overvalued (sell). Wider bands if input confidence is low; larger gap = bigger margin of safety.
2. **Three model families:** (i) Present-Value (DDM, FCFE); (ii) Multiples (P/E, P/B, P/S, P/CF, EV/EBITDA); (iii) Asset-based.

Present-Value Models

3. **General DDM:** $V_0 = \Sigma\, D_t/(1 + r)^t$; finite horizon adds $P_n/(1 + r)^n$.
4. **Preferred (perpetual):** $V_0 = D/r$. Finite preferred is valued like a bond.
5. **FCFE** = CFO − FCInv + Net Borrowing. Use FCFE instead of DDM when the firm doesn't pay dividends, dividends differ from capacity, or you have a control perspective.
6. **Gordon Growth:** $V_0 = D_1/(r - g)$. Requires constant g forever, stable r, and *g < r strictly*. Very sensitive to inputs.
7. **Sustainable g:** g = b × ROE where b = 1 − DPR.
8. **Two-stage DDM:** PV of high-growth dividends + PV of V_n, where $V_n = D_n(1 + g_L) / (r - g_L)$.

Price Multiples

9. **Justified leading P/E** = DPR / (r − g). Positively related to DPR (ambiguous through g trade-off), positively to ROE, negatively to r.

10. **Trailing P/E** uses E_0 (TTM). **Leading/forward P/E** uses E_1 (estimate).
11. **Comparables vs fundamentals:** Comparables rest on the law of one price (compare to peers/industry/history). Fundamentals-based multiples are derived from a model. The two can disagree.
12. **P/B** = stable, works when EPS < 0, good for distressed/financial firms. **P/S** = accounting-insensitive, good for unprofitable firms. **P/CF** = less manipulable than P/E.

EV & Asset-Based

13. **EV** = Market Cap + Debt + Preferred − Cash. Represents the cost of a takeover.
14. **EV/EBITDA** is capital-structure-neutral and works when EPS < 0. Most useful comparing firms with different leverage.
15. **Asset-based:** V_{equity} = MV(A) − MV(L) − MV(Preferred). Good for natural-resource and financial firms; poor for service/intangible-heavy firms.

Last-Minute Exam Checklist

Gordon: $V_0 = D_1/(r - g)$; assume constant g forever, g < r

Preferred perpetuity: $V_0 = D/r$

Two-stage V_n: $D_n(1 + g_L)/(r - g_L)$ — uses *next* stable-stage dividend

Sustainable g: g = b × ROE = (1 − DPR) × ROE

Justified leading P/E: DPR / (r − g)

EV: Market Cap + Debt + Preferred − Cash

Use EV/EBITDA when: capital structures differ or EPS < 0

Use asset-based for: natural-resource firms, financial firms, liquidations — NOT service/intangible firms