Leveraged Buyout (LBO) Model – Student Manual & Reading Material

Outline – Sequence of Steps in Building & Understanding the LBO Model

A Leveraged Buyout (LBO) model simulates the purchase of a company financed substantially with debt, and projects how that investment performs over a defined holding period (often 5 years). In our classroom "Paper LBO" template, we follow these logical steps:

1. **Set the Assumptions** – Define the key inputs that will drive the model: revenue, margins, growth, financing structure, costs, and exit conditions.
2. **Calculate the Entry Values** – From the target's current performance, determine the enterprise value, split between debt and equity.
3. **Project the Income Statement** – Build a 5-year projection of Sales, EBITDA, EBIT, and Net Income.
4. **Build the Cash Flow Statement** – Calculate annual Free Cash Flow after operating, tax, interest, and reinvestment needs.
5. **Determine the Exit Values** – Apply the exit multiple to the final year EBITDA to estimate the sale value, and adjust for debt and cumulative cash flows.
6. **Calculate Returns** – Measure performance using Multiple on Invested Capital (MOIC) and Internal Rate of Return (IRR).
7. **Interpret & Analyse** – Understand what drives returns and how assumptions impact them.

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1. Introduction – The Concept of an LBO

An **LBO** is the acquisition of a company using a significant proportion of borrowed funds (debt) along with equity from investors. The debt is serviced and repaid using the company's own free cash flows.

The goal for the equity investors (often private equity firms) is to enhance returns through:

- **Deleveraging**: Paying down debt over time.
- **Operational Improvements**: Increasing revenues, margins, and efficiency.
- **Exit Multiple Effects**: Selling at a higher (or sometimes equal) valuation multiple.

The **Paper LBO** is a simplified but powerful tool to learn these mechanics without overwhelming detail.

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2. Section-by-Section Guide to the Model

2.1 Assumptions Section

This is the **"control panel"** of the model — all major variables are entered here.
Each input here acts like a lever: changing it alters the entire deal's economics.
In professional LBO models, assumption sections are kept separate so they can be adjusted for **sensitivity testing** and **scenario analysis**.

Target Company's LTM Sales (₹ 80,00,000)

- **Meaning:**
  LTM stands for **Last Twelve Months** revenue — the sales the company has generated in the most recent 12-month period before the acquisition date. This figure may not align perfectly with the company's fiscal year; it is a rolling measure designed to capture the freshest operational picture.
- **Purpose:**
  Serves as the **starting point** for the model's revenue projections. All subsequent growth assumptions will compound from this base number.
- **Why important:**
  Unlike using the last fiscal year's results (which might be outdated), LTM figures capture the most up-to-date performance, including recent trends — crucial when valuing and structuring an acquisition.

Target Company's LTM EBITDA Margin (40%)

- **Meaning:**
  EBITDA Margin is the ratio of **Earnings Before Interest, Taxes, Depreciation, and Amortization** to Sales. Here, 40% means that for every ₹100 of sales, ₹40 remains as EBITDA.
- **Purpose:**
  Converts LTM Sales into LTM EBITDA:

$$LTM\ EBITDA = Sales \times EBITDA\ Margin$$

- **Why important:**
  EBITDA is the most commonly used proxy for operating cash profitability in LBO valuations because it strips out financing and accounting effects, focusing purely on the core operations.

Entry EBITDA Multiple (4×)

- **Meaning:**
  A market-derived multiple that tells you how many times the company's LTM EBITDA you will pay for the business. A multiple of 4× means you are paying 4 years' worth of the company's current EBITDA.
- **Purpose:**
  Determines the **Entry Enterprise Value**:

$$Entry\ EV = LTM\ EBITDA \times Entry\ Multiple$$

- **Why important:**
  This is the bridge between operating performance and valuation. A higher multiple means a higher purchase price, increasing the equity required and potentially lowering returns unless matched by strong growth.

Annual Sales Growth – 5y Projection (15%)

- **Meaning:**
  The assumed annual percentage growth in sales during the 5-year holding period.
  Here, 15% means each year's sales are expected to be 15% higher than the previous year's.
- **Purpose:**
  Projects the **top-line revenue** for the future income statements:

$$Salest = Salest - 1 \times (1 + g)$$

- **Why important:**
  Revenue growth compounds over time, directly increasing EBITDA and potential exit value — but it can also require more investment in working capital and capital expenditures.

EBITDA Margin – 5y Projection (35%)

- **Meaning:**
  Expected long-term, steady-state EBITDA margin during the holding period.
  This might differ from the LTM margin if operational improvements or efficiency gains are planned.

- **Purpose:**
  Converts projected Sales into EBITDA for each year:

$$EBITDAt = Salest \times EBITDA\ Margin$$

- **Why important:**
  Reflects anticipated operating efficiency after acquisition. Even small changes in margin have a large impact on EBITDA and therefore on debt service and exit valuation.

Corporate Income Tax Rate – 5y Projection (20%)

- **Purpose:**
  Applied to **Earnings Before Tax (EBT)** to compute the annual income tax expense:

$$Tax = EBT \times Tax\ Rate$$

- **Why important:**
  Taxes reduce net income and free cash flow. The effective tax rate assumption must align with the local tax environment and any deal-specific tax structuring.

Exit EBITDA Multiple (4×)

- **Meaning:**
  The multiple applied to Year-5 EBITDA to estimate the **Exit Enterprise Value**. An exit multiple of 4× means the buyer at exit will pay four years' worth of Year-5 EBITDA.
- **Why important:**
  A key driver of returns — higher exit multiples boost equity value, while lower multiples compress returns. Since multiples are influenced by market conditions, this assumption carries market risk.

% of Debt Used for Acquisition (25%)

- **Meaning:**
  The proportion of the purchase price financed with debt rather than equity. Here, 25% means one-quarter of the purchase price is borrowed.

- **Purpose:**
  Sets the **initial debt balance** and leverage level:

Debt at Entry=Entry EV×% Debt\text{Debt at Entry} = \text{Entry EV} \times \text{\% Debt}Debt at Entry=Entry EV×% Debt

- **Why important:**
  Higher leverage can magnify equity returns if the business performs well, but increases financial risk if cash flows are insufficient to meet interest obligations.

D&A as % of Sales – 5y Projection (10%)

- **Meaning:**
  Depreciation & Amortization as a fixed percentage of sales, used to estimate non-cash charges.
- **Purpose:**
  Reduces EBIT in the income statement but does not directly reduce cash flow (added back in cash flow statement).
- **Why important:**
  Affects taxable income and thus cash taxes. In capital-intensive industries, D&A levels can signal ongoing asset replacement needs.

Capex as % of Sales – 5y Projection (15%)

- **Meaning:**
  Annual capital expenditures expressed as a percentage of sales.
- **Purpose:**
  Deducted in the cash flow statement to reflect the cash required to maintain or expand assets.
- **Why important:**
  Higher Capex reduces Free Cash Flow, which in an LBO directly impacts the ability to repay debt and build equity value.

NWC Investments as % of Sales – 5y Projection (10%)

- **Meaning:**
  Assumed cash investment into Net Working Capital each year, expressed as a percentage of sales.

In this paper model, it's treated as a level amount each year rather than the *change*.

- **Purpose:**
  Deducted from Free Cash Flow to reflect the cash tied up in operating assets like inventory and receivables.
- **Why important:**
  Growing companies often require more working capital; this can be a silent drag on cash flows even when profits are rising.

Interest Rate – 5y Projection (12%)

- **Meaning:**
  Annual interest rate on the debt used to fund the acquisition.
- **Purpose:**
  Used to compute annual interest expense in the income statement:

$$Interest\ Expense = Debt\ Balance \times Interest\ Rate$$

Why important:
Higher interest rates increase financing costs, reduce net income, and consume cash flow, leaving less available for debt repayment or equity distributions.

2.2 Entry Value Section

This section translates the operating performance of the target company (from the Assumptions section) into its valuation at acquisition and breaks down how that valuation is financed. In an LBO, understanding the entry value is essential because it defines the purchase price, the capital structure, and ultimately the potential for equity returns.

Step 1 – LTM EBITDA (₹ 32,00,000)

- **Meaning:**
  LTM EBITDA is the company's **Earnings Before Interest, Taxes, Depreciation, and Amortization** over the last twelve months. It is derived from the LTM Sales and the LTM EBITDA margin, and serves as a measure of the company's recurring operating profitability.
- **Calculation:**

$$LTM\ EBITDA = ₹80,00,000 \times 40\% = ₹32,00,000$$

Purpose:
This figure is the **core earnings base** used to value the company. Most LBO and M&A valuations apply a multiple to EBITDA to determine enterprise value, as EBITDA is widely viewed as a cash flow proxy that is not distorted by capital structure or tax differences.

Why Important:

LTM EBITDA connects **operating performance** to **market valuation**. If EBITDA is overstated (e.g., through aggressive accounting) or understated (due to temporary downturns), it can materially skew the entry valuation and misalign the deal's economics.

Step 2 – Entry Enterprise Value (₹ 1,28,00,000)

- **Meaning:**
  Enterprise Value (EV) is the **total value of the business operations**, independent of how it is financed. It represents the combined value of debt and equity needed to acquire the company.
- **Calculation:**

$$Entry\ EV = ₹32,00,000 \times 4.0 = ₹1,28,00,000$$

Purpose:
Determines the **purchase price** of the business as a whole, based on the agreed multiple of LTM EBITDA. This is the starting point for deciding how much debt and equity will be used to fund the acquisition.

Why Important:

Entry EV sets the **scale** of the transaction. Every financing decision, leverage calculation, and return projection stems from this number. Overpaying at entry (via a high EV) can severely compress investor returns unless there is strong EBITDA growth or multiple expansion at exit.

Step 3 – Entry Debt Balance

- **Meaning:**
  This is the portion of the purchase price funded through **borrowed capital**. In LBOs, debt is intentionally used to amplify equity returns, provided the company's cash flows are sufficient to service and repay it.
- **Calculation:**

$$Entry\ Debt = ₹1{,}28{,}00{,}000 \times 25\% = ₹32{,}00{,}000$$

- **Purpose:**
  Sets the initial level of leverage in the capital structure and defines the future interest expense burden. The size of the debt affects both risk and return potential.
- **Why Important:**

  Debt financing allows equity investors to contribute less cash upfront, magnifying percentage returns if the company performs well. However, higher leverage also increases the **financial risk**: if free cash flows drop, debt obligations can quickly strain liquidity.

Step 4 – Entry Equity Value

- **Meaning:**
  This is the amount of **equity capital** investors must commit at acquisition. It is the residual after subtracting debt from the enterprise value.
- **Calculation:**

$$Entry\ Equity = Entry\ EV - Entry\ Debt$$

$$₹1{,}28{,}00{,}000 - ₹32{,}00{,}000 = ₹96{,}00{,}000$$

Purpose:
Defines the **investor's capital at risk** in the deal. This is the base amount used when calculating **MOIC** (Multiple on Invested Capital) and **IRR** at exit.

Why Important:

The equity amount determines the **skin in the game** for the investors. Lower equity (higher leverage) can improve IRR but also increases default risk; higher equity reduces risk but may lower the amplified return benefits of leverage.

2.3 Projected Income Statement Section

The **Projected Income Statement** translates the high-level operational assumptions from Section 2.1 and the valuation starting point from Section 2.2 into a year-by-year projection of profitability. In the **Paper LBO**, this statement remains straightforward, as it does not yet account for dynamic debt repayment or changes in working capital (those come into play more in a Best Practice LBO).

The goal here is to understand how **sales growth, margins, and fixed assumptions** (like interest expense) flow through to net income.

Step-by-Step Breakdown for Each Year

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1. Sales

- **Meaning:**
  The projected revenue the company will generate in each year of the 5-year holding period.
- **Calculation:**

$$Salest = Salest-1 \times (1+g)$$

For example, if Year 0 sales are ₹ 80,00,000 and growth is 15%, Year 1 sales = ₹ 92,00,000.

- **Purpose:**
  Forms the top line of the income statement and the primary driver of EBITDA growth.
- **Why Important:**
  Sales growth is a critical driver of value in an LBO, as it multiplies through margins, EBITDA, and eventually exit value.

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2. EBITDA

- **Meaning:**
  Earnings Before Interest, Taxes, Depreciation, and Amortization — a measure of core operational profitability before non-cash charges and financing costs.
- **Calculation:**

$$\text{EBITDA}_t = \text{Sales}_t \times \text{EBITDA Margin}$$

Here, the margin is assumed constant at 35%.

- **Purpose:**
  Serves as the baseline for enterprise valuation (at exit) and for calculating the ability to cover interest payments.
- **Why Important:**
  In an LBO, EBITDA is the most closely watched operating metric because debt repayment capacity is tied directly to cash flow from operations, which EBITDA approximates.

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3. D&A (Depreciation & Amortization)

- **Meaning:**
  Non-cash expenses representing the allocation of capital asset costs over their useful lives.
- **Calculation:**

$$\text{D\&A}_t = \text{Sales}_t \times \%\ \text{D\&A}$$

In this case, the assumption is 10% of sales.

- **Purpose:**
  Reduces EBIT for accounting and tax purposes but does not directly reduce cash flow (it's added back in the cash flow statement).
- **Why Important:**
  Impacts taxable income — higher D&A lowers reported profit and taxes, which can improve after-tax cash flow.

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4. EBIT (Earnings Before Interest and Taxes)

- **Meaning:**
  Profit after deducting depreciation and amortization but before interest and taxes.

- **Calculation:**

$$\text{EBIT}_t = \text{EBITDA}_t - \text{D\&A}_t$$

- **Purpose:**
  Represents operating profit available to cover interest costs before tax obligations.
- **Why Important:**
  EBIT is the key measure used to calculate **interest coverage ratios** — a major risk consideration for lenders in leveraged deals.

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5. Interest Expense

- **Meaning:**
  The annual cost of servicing the acquisition debt.
- **Calculation:**

$$\text{Interest}_t = \text{Debt Balance} \times \text{Interest Rate}$$

In the Paper LBO, the debt balance is constant (no amortization), so the interest expense is the same each year.

- **Purpose:**
  Captures the financing cost, reducing taxable income and net profit.
- **Why Important:**
  High interest expense can squeeze free cash flow and raise default risk if EBITDA underperforms.

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6. EBT (Earnings Before Tax)

- **Meaning:**
  Profit before taxes, after deducting both operating expenses and interest.
- **Calculation:**

$$\text{EBT}_t = \text{EBIT}_t - \text{Interest}_t$$

- **Purpose:**
  An intermediate step to calculate tax expense.
- **Why Important:**
  EBT connects the operating performance to the actual tax obligation — critical for cash flow projections.

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7. Income Tax

Meaning:
Cash tax expense on *positive* taxable profit (ignoring loss carrybacks/credits unless modeled separately).

Calculation:
Use a clamp-to-zero so losses don't create negative tax in the model:

$$Taxt = max(0, \tau \cdot EBTt)$$

where ' t' is the statutory (or effective) tax rate.

Excel implementation:
=MAX(0, EBT_t * TaxRate)

Purpose:
Removes the government's share of profits before computing cash flows to lenders/equity.

Why Important:

Without max function, a loss year would show a negative tax (i.e., a refund), which is usually not received in cash in LBO cases and would overstate CFADS and repayments. The clamp keeps cash taxes conservative and covenant-friendly.

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8. Net Income

- **Meaning:**
  The "bottom line" profit after all expenses, including financing costs and taxes.
- **Calculation:**

$$\text{Net Income}_t = \text{EBT}_t - \text{Tax}_t$$

- **Purpose:**
  Final profitability measure in the income statement; while not directly used for valuation in LBOs, it's a key metric for reporting and comparisons.
- **Why Important:**
  Provides a clear picture of residual profit after fulfilling all obligations — though in LBO analysis, **cash flow** is the more critical measure for debt repayment.

Overall Purpose of the Projected Income Statement

- **Translates operational assumptions into profit metrics** so we can see the business's profitability trajectory over the holding period.
- **EBT and Net Income** serve as intermediate steps before calculating **Free Cash Flow**, which is what actually determines debt service capability and equity returns in an LBO.

2.4 Cash Flow Estimates

The Cash Flow Statement translates accounting profits (from the income statement) into actual cash available to repay debt or return to equity holders.
In the Paper LBO, this section is simplified to focus on Free Cash Flow (FCF), without separate breakdowns for changes in cash balances or complex financing flows.
It is a crucial link between the operating side of the model and the financing side, because in leveraged transactions, cash — not accounting profit — repays debt.

Line-by-Line Breakdown

EBITDA

- **Meaning:**
  Earnings Before Interest, Taxes, Depreciation, and Amortization — starting point for measuring cash generated by operations.
- **Purpose:**
  Used as a cash proxy because it excludes non-cash expenses (like D&A) and financing costs.
- **Why Important:**

  In LBOs, EBITDA is the foundation of debt service capacity — higher EBITDA generally means more ability to repay debt.

Less: Interest Expense

- **Meaning:**
  Actual cash paid to lenders for borrowing funds.

- **Purpose:**
  Subtracted to account for financing costs that consume cash before it can be used for debt principal repayment or equity distributions.
- **Why Important:**

  Even if a business is profitable, high-interest obligations can restrict its ability to deleverage. In the Paper LBO, interest is flat because debt is not amortized.

Less: Corporate Income Tax

- **Meaning:**
  Cash taxes paid to the government based on Earnings Before Tax (EBT).
- **Purpose:**
  Reflects the portion of profits that must be paid to tax authorities.
- **Why Important:**
  Taxes are a real cash outflow that reduce funds available for debt repayment. In LBOs, structuring can sometimes reduce effective taxes and improve cash flows.

Less: Capex (Capital Expenditure)

- **Meaning:**
  Cash spent to acquire, upgrade, or maintain physical assets like property, plant, and equipment.
- **Calculation in Paper LBO:**
  Projected as a fixed percentage of sales each year.
- **Purpose:**
  Deducted to account for reinvestment needs that keep the business operational and competitive.
- **Why Important:**

  High Capex requirements reduce FCF and limit the speed of debt repayment; industries with heavy Capex are generally less attractive for LBOs unless matched with high returns on investment.

Less: NWC (Net Working Capital)

- **Meaning:**
  Cash tied up in operational assets (inventory, receivables) minus operational liabilities (payables).
- **Treatment in Paper LBO:**
  Assumed as a fixed percentage of sales, and the *full level* is deducted annually (a simplification).
- **Purpose:**
  Models the need to invest cash in supporting higher sales as the business grows.
- **Why Important:**
  Growth often consumes working capital before generating extra cash — a key consideration in deal planning.
  *(Note: In a Best Practice LBO, only the **change** in NWC is deducted, which is more realistic.)*

= Free Cash Flow (FCF)

- **Meaning:**
  Cash generated from operations after servicing interest, paying taxes, investing in fixed assets, and funding working capital.
- **Formula in Paper LBO:**

$$\text{FCF}_t = \text{EBITDA}_t - \text{Interest}_t - \text{Tax}_t - \text{Capex}_t - \text{NWC}_t$$

- **Purpose:**
  Shows cash available for debt repayment or distribution to equity holders.
- **Why Important:**
  FCF is the central measure of success in an LBO — without strong FCF, debt cannot be reduced, and equity returns suffer.

Cumulative Free Cash Flow

- **Meaning:**
  Sum of FCFs over the holding period.
- **Purpose:**
  Indicates the total amount of cash generated during the investment life.

- **Why Important:**
  In the Paper LBO, cumulative FCF is added to equity value at exit (since debt is not repaid), making it a direct contributor to investor returns.

Overall Purpose

The Cash Flow Statement in the Paper LBO:

- **Shows the business's ability to generate cash** from operations after covering necessary obligations.
- **Links profitability to return potential** by quantifying how much cash is left for investors and/or lenders.
- **Highlights operational constraints** (like high Capex or working capital needs) that can reduce the pace of equity value creation.

2.5 Exit Value Section

The **Exit Value Section** calculates how much the business is worth at the end of the investment period and determines the portion of that value attributable to equity investors.
In a leveraged buyout, the value created (or lost) over the holding period comes from:

1. **Growth in EBITDA**
2. **Changes in the valuation multiple** applied at exit
3. **Reduction in debt** (deleverage)
4. **Cash accumulation** from Free Cash Flow

In the **Paper LBO**, debt is kept constant over the holding period, so changes in equity value come primarily from **EBITDA growth** and the cumulative cash generated during ownership.

EBITDA – Year 5 (₹ 56,31,800)

- **Meaning:**
  Earnings Before Interest, Taxes, Depreciation, and Amortization in the final projected year. This reflects the company's operating profit before non-cash charges and financing effects at the point of sale.
- **Calculation:**

$$\text{EBITDA}_{\text{Year 5}} = \text{Sales}_{\text{Year 5}} \times \text{EBITDA Margin}$$

- **Purpose:**
  Serves as the base for applying the exit multiple to determine the terminal Enterprise Value.
- **Why Important:**

  Year-5 EBITDA is one of the biggest drivers of exit value in an LBO model. Even small improvements in EBITDA have a magnified impact when multiplied by the exit multiple.

Exit Enterprise Value

- **Meaning:**
  The total market value of the company's operations at the time of sale, before considering how the company is financed.
- **Calculation:**

  $$\text{Exit EV} = \text{EBITDA}_{\text{Year 5}} \times \text{Exit Multiple}$$

  Here:
  ₹ 56,31,800 × 4.0 = ₹ 2,25,27,201
- **Purpose:**
  Represents the amount a buyer would be willing to pay for the business at exit, based on its earnings and prevailing market valuation multiples.
- **Why Important:**
  Exit EV is the starting point for calculating equity value at sale. Any shift in market multiples between entry and exit can significantly alter returns.

Exit Debt Balance

- **Meaning:**
  The outstanding debt at the time of sale.
- **Treatment in Paper LBO:**
  Debt is assumed constant, so Exit Debt = Entry Debt. In a real LBO, debt would typically decline each year as Free Cash Flow is used for repayment.
- **Purpose:**
  Needs to be subtracted from Exit EV because the buyer would assume or pay off the company's debt at acquisition.

- **Why Important:**
  In leveraged finance, **debt reduction is a major driver of equity value creation**. By holding debt constant in the Paper LBO, we isolate the effects of operational performance.

Cumulative Free Cash Flow (₹ 15,65,495)

- **Meaning:**
  The sum of all annual Free Cash Flows generated over the holding period.
- **Purpose in Paper LBO:**
  Added to equity value at exit, assuming this cash has been retained in the business (rather than distributed).
- **Why Important:**
  In the Paper LBO, because debt isn't repaid, cumulative cash acts as a proxy for **cash on hand** at sale, directly increasing the amount returned to equity holders.

Exit Equity Value (₹ 2,08,92,696)

- **Meaning:**
  The total value attributable to the equity investors at exit, after paying off any outstanding debt and including retained cash.
- **Calculation:**

$$\text{Exit Equity} = \text{Exit EV} - \text{Exit Debt} + \text{Cumulative FCF}$$

  ₹ 2,25,27,201 − ₹ 32,00,000 + ₹ 15,65,495 = ₹ 2,08,92,696
- **Purpose:**
  This is the **final payoff** to the equity investors, from which we calculate MOIC and IRR.
- **Why Important:**
  The difference between **Entry Equity** and **Exit Equity** reflects the total value creation during the investment — the central measure of LBO success.

Key Point for Exit Value in Paper LBO

- In a real LBO, **debt repayment amplifies equity value growth**. In the Paper LBO, because debt is constant, the uplift in equity comes only from EBITDA growth, constant exit multiple, and cash accumulation.

- This makes the Paper LBO an excellent *first step* for learning LBO mechanics, before introducing **Best Practice** debt schedules and ΔNWC.

2.6 Rate of Return

Once we have the **Entry Equity** (initial investor capital) and the **Exit Equity** (value to investors at sale), we can measure the deal's performance using two common return metrics in LBO analysis:

- **MOIC** (Multiple on Invested Capital) — a simple measure of how many times the invested equity has grown.
- **IRR** (Internal Rate of Return) — the annualized rate of return that accounts for the time value of money.

In the **Paper LBO**, these metrics can appear less attractive compared to real LBOs because:

1. Debt is not repaid during the holding period.
2. Cumulative Free Cash Flow is modest relative to the size of the transaction.
3. Exit multiples are constant.

MOIC – Multiple on Invested Capital

- **Meaning:**
  MOIC tells us **how many times** the original equity investment has been returned by the end of the holding period, regardless of the timing of those returns.
- **Calculation:**

$$\text{MOIC} = \frac{\text{Exit Equity Value}}{\text{Entry Equity Value}}$$

  Using our Paper LBO numbers:

$$\text{MOIC} = \frac{₹\,2{,}08{,}92{,}696}{₹\,96{,}00{,}000} \approx 2.18$$

- **Purpose:**
  Provides a **simple multiple** that's easy to interpret — e.g., "We got 2.18 times our money back.

- **Why Important:**
  MOIC is a quick snapshot for investors comparing multiple deals. However, it ignores *when* the cash flows occur, so it cannot differentiate between a 2.18× return in 3 years versus 7 years.

IRR – Internal Rate of Return

Meaning:
The Internal Rate of Return (IRR) is the **annualized effective rate of return** that makes the present value of equity inflows (Exit Equity Value) equal to the present value of equity outflows (Entry Equity Value), considering the exact investment holding period.

$$\text{IRR} = \left(\frac{\text{Exit Equity Value}}{\text{Entry Equity Value}}\right)^{\frac{1}{n}} - 1$$

Where:

- **Exit Equity Value** = ₹ 2,08,92,696
- **Entry Equity Value** = ₹ 96,00,000
- **n** = Number of years in holding period (5 years in this case)

Computation:

2. **Annualized IRR**

$$\text{IRR} = (2.17718)^{\frac{1}{5}} - 1 = 1.16505 - 1 = 0.16505\ (16.51\%\ \text{theoretical})$$

3. **Model Output Adjustment**

   In this paper LBO, **no debt is repaid** and cash flows are modest. The actual IRR is calculated using Excel's =IRR() function on the equity cash flow series:

- IRR is a key measure for private equity and LBO investors to assess whether the deal meets target return thresholds (often 20%+).
- Observation: Here, the IRR is moderately strong because the equity value more than doubled in 5 years without interim equity payouts.

Why Important:

- In LBO analysis, IRR is the **primary performance metric** for private equity returns.

- Even if MOIC is over 2×, spreading it over 5 years without interim payouts can yield a very low IRR.
- The result here highlights how leverage without debt paydown can depress annualized returns despite a positive exit gain.

Key Points for Rate of Return Analysis

1. **MOIC is simple, IRR is richer:** MOIC ignores timing, IRR captures it.
2. **Time matters:** The same MOIC over a longer holding period yields a much lower IRR.
3. **Paper LBO limitation:** Without debt paydown, IRR is often understated compared to a realistic LBO.
4. **Benchmarking:** Professional investors compare deals against **target IRR thresholds** and MOIC multiples simultaneously.

Rule of 72 / 114 / 144

Meaning:
These are short-hand mental math tools for quickly estimating an approximate IRR based on a known MOIC (Multiple on Invested Capital) and holding period:

- Rule of 72 – For doubling your money (~2.0×),

$$\text{IRR} \approx \frac{72}{\text{Years}} \quad \Rightarrow \quad \frac{72}{5} \approx 14.40\%$$

- **Rule of 114** – For tripling your money (~3.0×),

$$\text{IRR} \approx \frac{114}{\text{Years}} \quad \Rightarrow \quad \frac{114}{5} \approx 22.80\%$$

- **Rule of 144** – For quadrupling your money (~4.0×),

$$\text{IRR} \approx \frac{144}{\text{Years}} \quad \Rightarrow \quad \frac{144}{5} \approx 28.80\%$$

Purpose:
Provides a fast, back-of-the-envelope method for checking deal returns without a full model.

Why Important:
In deal discussions, being able to mentally translate an MOIC into an annualized return is a valuable skill. It allows investors to instantly assess whether a transaction is in line with return expectations before deep financial modeling.

Insights from LBO

- Leverage is a double-edged sword: It can boost returns if cash flow is strong, but crush them if performance falters.
- EBITDA growth matters more than net income: In LBOs, EBITDA drives both valuation and debt service.
- Working capital management is critical: Even profitable firms can have poor cash flow if WC demands are high.
- Exit multiple risk: If the market contracts, a lower multiple can wipe out equity gains.
- Debt amortization changes the story: A model with debt paydown will typically yield higher IRR than this static-debt version.