

Guide to LBO Modeling

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- Property of the ESCP Alternative Investment Society (AIS)
- Sources: Wall Street Prep
- Attachment: LBO Model Template & Answer Key

Section I: Introduction to LBO Modelling

Introduction

Why understanding LBO Modeling is essential

What is an LBO?

- LBOs are a preferred method for private equity firms to acquire targets
- An LBO involves acquiring a company using a significant amount of borrowed funds
- Investors form a HoldCo to pool equity and secure additional debt
- The HoldCo purchases the target company using its LFCF to pay off debt
- The aim is to enhance the company's operations and increase its market value
- Ultimately, the company is sold at a profit, delivering high returns to investors

What is a good target for an LBO?



- Companies with stable and predictable cash flow



- Firms undervalued relative to their industry peers



- Businesses operating in stable, non-cyclical markets



- Targets that offer opportunities for cost-cutting and operational efficiencies



- A strong management team

Out of all factors, stable cash flows are most important for LBOs, making industries with volatile revenues, like oil and gas, less ideal targets

Why do LBOs work

Key drivers of value creation in an LBO model

LBOs deliver higher returns compared to using 100% cash because:

- Using debt minimizes the upfront cash payment, enhancing overall returns.
- The company's cash flows are used to repay debt principal and interest, delivering a higher return compared to simply holding the cash.
- Selling the company in the future allows the PE firm to recoup most of the acquisition cost.

Minimized Initial Investment	Efficient Cash Flow Utilization	Profitable Exit Strategy
Debt reduces initial outlay, enhancing equity returns	FCF is used to pay down debt annually	Divest company at an enhanced valuation

Understanding the importance and mechanics of LBOs equips us with foundational finance skills and insights into value creation strategies, setting the stage for exploring the step-by-step process of executing a successful LBO model

Outline

To work through an LBO, we will use the following 5- step approach

1. Entry Assumptions: Determine acquisition price through methodologies such as CCA, CTA and DCF.



2. Sources and Uses: Identify capital structure for acquisition and allocation of funds.



3. Financial Projections: Forecast revenues, EBITDA, and capital expenditures to assess viability of transaction.



4. Debt Schedule: Develop detailed debt repayment plan that includes both mandatory and discretionary payments.



5. Exit and IRR: Calculate exit enterprise and equity values and measure MoM and IRR.

Section II: Assumptions

LBO Assumptions Framework

Establishing the suitable assumptions for the transaction is a fundamental step in the LBO process



First, the private equity firm needs to gather transaction assumptions

Gathering the right assumptions is a critical and time-consuming part of building an LBO model, requiring detailed inputs on the following areas

Entry price

The total amount paid to acquire the company

Fees and expenses

Costs incurred for legal, accounting, banking, and advisory services

Debt

Various tranches of borrowed capital used to finance the acquisition

Operating assumptions

Projections for revenue growth, margins, and other operational metrics

Exit price

The total value for which the company is sold

Financials

Historical income statements, cash flow statements, and balance sheets

Assumptions - Example

Entry assumptions that will be followed throughout the entirety of the LBO example

- Assumptions are based on a hypothetical scenario. For simplicity, the entry and exit multiples are assumed to be the same. However, in reality, some level of multiple expansion typically occurs

Entry		Financials (LTM)		Number Index		
LTM EBITDA	250	Revenue	1,000	Hard Coded Formula Amount brought from hard coded		
EBITDA Multiple	10.0x	EBITDA	250			
Enterprise Value	2,500	D&A	50			
Existing Net Debt	500	Capex	75			
Equity Value	2,000	NWC	100			
Fees and Expenses	50					
Exit		Operating Assumptions		Capital Structure		
EBITDA Multiple	10.0x	Revenue Growth	7.0%	Bank Debt	4.0x	6.0%
		YoY margin expansion	1.0%	Senior Notes	2.0x	12.0%
		Tax Rate	21.0%			

Section III: Sources and Uses

Sources and Uses Table

Sources and Uses determination is often an investor-specific decision with no universally correct approach

- The Sources and Uses table serves as a summary of how the acquisition will be financed and how these funds are allocated
- This overview, often a focal point in interviews, breaks down the origin of funds, such as equity contributions and various debt tranches, and their specific uses, including the purchase price, transaction fees, and refinancing requirements

$$\Sigma(\text{Sum of Sources}) = \Sigma(\text{Sum of Uses})$$

- In this process, it always makes sense to determine the uses first, asking “How much money will I need for the acquisition and to cover expenses that are not covered by the cash flow?”

Uses = Capital required to purchase the company

- **Purchase Enterprise Value:** Total cost to acquire company, including equity and debt
- **Cash to Balance Sheet:** Cash set aside for post-acquisition costs
- **Transaction fees:** Fees for financial and legal advisors
- **Financing Fees:** Costs for arranging debt financing

Sources = Capital required to fund the transaction

- **Sponsor Equity:** Private Equity sponsor’s cash contribution
- **Rollover Equity:** Reinvested Equity from existing shareholders
- **Term Loan:** Senior secured loan with a fixed repayment schedule
- **Subordinated Debt:** Higher risk debt with higher interest rates

Uses - Example

The uses detail where every dollar raised will go, ensuring that the capital structure supports the acquisition and all expenses

- In this example the **Total Uses** is mainly calculated using two inputs from the assumptions; Existing Net Debt and Equity Value

Entry Assumptions		Net Debt = Total Debt - Cash
Existing Net Debt	500	
Entry Assumptions		Equity Value = Enterprise Value – Net Debt
Equity Value	2,000	

- The **fees and expenses** value is already given; however, it's common practice to assume it will represent 2% of the uses

Entry Assumptions	
Fees and Expenses	50

Uses			
	Amount	xEBITDA	%Capital
Debt Retirement	500	4.0x	19.6%
Equity Payment	2,000	2.0x	78.4%
Fees and Expenses	50	0.2x	2.0%
Total Uses	2,550	10.2x	100.0%

Sources - Example

Sources represent the forms of capital raised to fund the acquisition, which may include both debt instruments and equity contributions

- In this example the **Total Debt** required is calculated using two main inputs from the assumptions; LTM EBITDA and Capital Structure as a ratio to EBITDA

Financial Assumptions		Bank Debt = LTM EBITDA x Bank Debt Assumption
LTM EBITDA	250	
Capital Structure Assumptions		Senior Notes = LTM EBITDA x Senior Notes Assumption
Bank Debt	4.0x	
Senior Notes	2.0x	

- Sponsor Equity** is determined as the remaining capital needed to bridge the gap between the Total Sources and the Total Uses

Uses		Sponsor Equity = Total Uses – Total Debt
Total Uses	2,550	

Sources			
	Amount	xEBITDA	%Capital
Bank Debt	1,000	4.0x	39.2%
Senior Notes	500	2.0x	19.6%
Total Debt	1,500	6.0x	58.8%

Sponsor Equity	1,050	4.2x	41.2%
Total Sources	2,550	10.2x	100.0%

Consolidated Sources and Uses - Example

This simplified example illustrates the typical structure encountered after completing the Sources and Uses Table

Sources				Uses			
	<u>Amount</u>	<u>xEBITDA</u>	<u>%Capital</u>		<u>Amount</u>	<u>xEBITDA</u>	<u>%Capital</u>
Bank Debt	1,000	4.0x	39.2%	Debt Retirement	500	2.0x	19.6%
Senior Notes	500	2.0x	19.6%	Equity Payment	2,000	8.0x	78.4%
Total Debt	1,500	6.0x	58.8%				
				Fees and Expenses	50	0.2x	2.0%
Sponsor Equity	1,050	4.2x	41.2%				
Total Sources	2,550	10.2x	100.0%	Total Uses	2,550	10.2x	100.0%

$$\Sigma(\text{Sum of Sources}) = \Sigma(\text{Sum of Uses})$$

Section IV: Financial Projections

Financial Projections Overview

Financial projections in an LBO assess cash flow, debt repayment, and returns, ensuring deal feasibility

Revenue Growth

- Assumed annual growth rate for revenue over the holding period
- Impacts projections for EBITDA, Free Cash Flow, and overall company valuation

EBITDA Margin

- Projected EBITDA as a percentage of revenue reflects operational efficiency and profitability over time

Capital Expenditures (Capex)

- Forecasted investment in long-term assets required for business operations
- Influences cash flow and potential need for financing

Net Working Capital (NWC)

- Changes in working capital required to support day-to-day operations.
- Helps manage liquidity and ensures business can meet short-term obligations

Free Cash Flow

- Cash generated after operating expenses, capital expenditures, and changes in working capital
- Used to pay down debt and grow equity, crucial for LBO success

Financial Projections - Example

Financial projections offer a five-year outlook on revenue, EBITDA, CapEx, NWC changes, and cash flow

1	Revenue Growth: 7% annually	3	EBITDA Margin: 25% of Revenue
2	CapEx: 7.5% of Revenue	4	NWC: 10% of Revenue

1	D&A: 5% of Revenue
2	Change in NWC: 7% increase per year

Year	Revenue (\$MM)	EBITDA (\$MM)	CapEx (\$MM)	NWC (\$MM)
Year 1	1,070	278	80	107
Year 2	1,145	309	86	114
Year 3	1,225	343	92	123
Year 4	1,311	380	98	131
Year 5	1,403	421	105	140

Year	Net Income (\$MM)	D&A (\$MM)	CapEx (\$MM)	Change in NWC (\$MM)	Levered Cash Flow (\$MM)
Year 1	83	54	80	7	49
Year 2	107	57	86	7	70
Year 3	133	61	92	8	95
Year 4	164	66	98	9	123
Year 5	198	70	105	9	154

Section V: Debt repayment

Understanding Debt Schedule

The role of the debt schedule in managing repayments in an LBO model

- With financial projections in place, the focus shifts towards understanding how cash flows will be used to manage debt effectively, as debt repayment is a critical component in an LBO model, impacting returns and the company's financial health

Purpose of the Debt Schedule:

- Ensuring that debt obligations are met without jeopardizing the company's liquidity needs, through a structured plan that tracks mandatory and optional debt repayments.



Mandatory Repayments

Fixed payments required by loan agreements that take priority each year



Optional Repayments

Additional payments applied when excess cash is available, allowing for accelerated debt reduction



Minimum Cash Balance

Cash reserve maintained to cover essential expenses and ensure stability in operations

By accurately projecting debt repayments, the debt schedule allows us to understand the pace of debt reduction and its impact on overall returns, balancing between leveraging debt and maintaining liquidity

Key Components

Breaking Down the Debt Schedule: Understanding Interest, Amortization, and Principal Repayment

- Bank debt gradually amortizes over time with increasing paydown; In this case Senior Notes act on a fixed principal balance with no amortization
- Amortizing debt is repaid gradually over time, lowering both the principal and interest expense, while bullet repayment debt remains unchanged until a lump sum is paid at the end of term

1. Beginning Balance: The amount of debt carried forward from the previous year or initially borrowed



2. Interest Expense: The cost of borrowing, based on the debt balance and rate, decreasing with paydown



3. Paydown: The portion of principal repaid during the period, reducing the outstanding balance



4. Ending Balance: The remaining debt after principal repayment carried forward to the next period

Debt Schedule - Example

Understanding amortization, bullet repayments, and free cash flow allocation for effective debt management

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Bank Debt						
Beginning Balance		1,000	951	881	786	663
Interest		60	57	53	47	40
Paydown		49	70	95	123	154
Ending Balance	1,000	951	881	786	663	509
Sr. Notes						
Beginning Balance		500	500	500	500	500
Interest		60	60	60	60	60
Paydown		0	0	0	0	0
Ending Balance	500	500	500	500	500	500
Total Debt						
Beginning Balance		1,500	1,451	1,381	1,286	1,163
Interest		120	117	113	107	100
Paydown		49	70	95	123	154
Ending Balance	1,500	1,451	1,381	1,286	1,163	1,009

Section VI: Exit and Return Metrics

Exit Valuation



The essential role of Exit Valuation in LBO Model

The Valuation offers insight into the projected returns at different exits of the PE firm. It's outcome influences investment decisions, by allowing to determine the feasibility, entry price, plan their exit, and benchmark their multiple against the market.

Exit Enterprise Value

$$\text{Exit Enterprise Value} = \text{LTM EBITDA} * \text{Exit Multiple}$$

Exit Equity Value

$$\text{Exit Equity Value} = \text{Exit Enterprise Value} - \text{Net Debt}$$

Return Metrics

Return Metrics are key financial measures used to assess the profitability and success of an investment

Multiple on Invested Capital (MOIC)

Otherwise known as Multiple on Money (MoM) is a key metric for assessing the return on an investment and evaluating the performance of a fund.

$$\text{MOIC} = \text{Total Cash Inflows} / \text{Total Cash Outflows}$$

Internal Rate of Return (IRR)

IRR is the discount rate that makes the net present value (NPV) of an investment's cash flows equal to zero. In other words, it's the annualized rate of return expected from an investment.

$$\text{IRR (\%)} = (\text{Future Value of CF} / \text{Present Value of CF})^{1/\text{periods}} - 1$$

$$\text{IRR (\%)} = \text{MoM}^{1/\text{periods}} - 1$$

IRR as a benchmark

- IRR can also be used as a conceptual benchmark to guide acquisition process of an LBO. Private Equity firms might target a specific IRR from an investment due to market conditions, risk, or the expected holding period until exit.

Excel Applications

Excel Application: IRR-Function

- The built-in function “=IRR” allows you to input the array of a periodic cash flow, to calculate a precise value

=IRR(values,[guess¹])

Excel Application: Goal Seek

- To determine the acquisition price, that will yield the IRR to equal the desired target, we can use the goal seek feature
 - Set value -> reference IRR cell
 - To value -> IRR target as a decimal
 - By changing cell -> reference acquisition price cell
- This will change the acquisition price to the maximum amount you could pay to still achieve your targeted IRR

Excel Application: XIRR-Function

- For aperiodic (unevenly timed) series of cash flows, the function “=XIRR” will calculate a precise value for the IRR

=XIRR(values, dates,[guess¹])

Excel Application: Data Tables for Sensitivity Analysis

- Analysis of how changes in one or two variables impact the resulting IRR
 - Data -> What-If-Analysis -> Data Tables
 - Row Input Cell -> reference variable 1
 - Column Input Cell -> reference variable 2
- Settings & Shortcuts:
 - Enable iterative calculation in your settings
 - Update/Refresh your Table with the following Shortcuts
Windows: F9
Mac: Command (⌘) + =

1. guess is a set default of 10%, if omitted

Exit and Return Metrics - Example

Analysing return metrics at different stages of the investment cycle is a critical step of the decision-making process

Exit Valuation			Y0	Y1	Y2	Y3	Y4	Y5
EBITDA at Exit (\$)				278	309	343	380	421
Exit Multiple Assumption (\$)				10x	10x	10x	10x	10x
Enterprise Value at Exit (\$)				2,780	3,090	3,430	3,800	4,210
Less: Net Debt (\$)				1,451	1,381	1,286	1,163	1,009
Sponsor Equity Value (\$)				1,329	1,709	2,144	2,637	3,198
Sponsor Equity Value at Entry (\$)				1,050	1,050	1,050	1,050	1,050
Cash Flow to Equity	IRR	MOIC	Initial					
Y1	4.8%	1.0x		(1,050)	1,329	-	-	-
Y2	10.2%	1.6x		(1,050)	-	1,709	-	-
Y3	15.3%	2.0x		(1,050)	-	-	2,144	-
Y4	20.2%	2.5x		(1,050)	-	-	-	2,637
Y5	25.0%	3.0x		(1,050)	-	-	-	-
								3,198

Sensitivity Analysis - Example

Sensitivity Analysis

In an LBO, sensitivity tables help evaluate how changes in key assumptions, such as entry multiple, exit multiple, or leverage, impact outcomes like IRR or equity returns. They provide a range of scenarios, aiding in risk assessment and decision-making.

IRR Table

Crucial for evaluating the impact of holding period length and cash flow timing on returns.

IRR (%)		Entry Multiple				
		9.0x	9.5x	10.0x	10.5x	11.0x
Exit Multiple	9.0x	28%	25%	21%	19%	16%
	9.5x	30%	26%	23%	21%	18%
	10.0x	32%	28%	25%	22%	20%
	10.5x	34%	30%	27%	24%	21%
	11.0x	35%	31%	28%	25%	23%

MOIC Table

Focuses on the absolute return, making it useful for assessing investment profitability without factoring duration.

MOIC (x)		Entry Multiple				
		9.0x	9.5x	10.0x	10.5x	11.0x
Exit Multiple	9.0x	4.3x	2.9x	2.2x	1.8x	1.5x
	9.5x	5.1x	3.5x	2.6x	2.1x	1.8x
	10.0x	5.8x	4.0x	3.0x	2.5x	2.1x
	10.5x	6.6x	4.5x	3.4x	2.8x	2.3x
	11.0x	7.4x	5.1x	3.9x	3.1x	2.6x



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