Can You Quickly Approximate the Internal Rate of Return (IRR) in a Leveraged Buyout?

Got Mental Math?
Quick Approximations for IRR

“Can you quickly approximate the IRR of a leveraged buyout? I don’t want to set up an entire model to calculate it.”

“Also, don’t you have to know this so you can answer ‘paper LBO model’ questions in case studies and check your work in modeling tests?”
Quick Approximations for IRR

• **SHORT ANSWER:** Yes, you can “kind of” approximate IRR, but only if specific conditions are true

• **Longer Answer:** There is a trick if it’s a simple upfront investment and exit, with no cash flows in between

• **Problematic:** Anything other than a simple M&A exit (e.g., an IPO in which the stake is sold off gradually) will throw this off

• **Also:** Dividends in between, dividend recaps, asset sales, etc. will also distort the rules and the math
Quick Approximations for IRR – Outline

- **Part 1:** The Rules and Rules of Thumb for IRR

- **Part 2:** How to Apply the Rules to a Simple LBO Model

- **Part 3:** How to Apply These Rules to a Real-Life Scenario (A 3-Hour Private Equity Case Study)
The **Rules** and Rules of Thumb

• **Real IRR:** The Discount Rate at which the NPV of cash flows from an investment equals 0:

\[ 0 = \sum_{t=0}^{N} \frac{CF_t}{(1 + IRR)^t} \]

• **Real IRR:** It has to be solved with “trial and error” – guess a number, go lower or higher, then try again... Excel does this automatically

• **Meaning:** IRR is the “effective compounded interest rate” – invest $100 today, earn 10% to get $110, earn 10% to get $121... if you end up with $150 after 5 years, what interest rate did it take to get there?

• **Approximation:** Calculate the Money-on-Money (MoM) Multiple and the investment period, and memorize a few simple IRRs
The Rules and Rules of Thumb

**QUESTION:** If you double your money in 2 years, what is the IRR?

**Intuition:** Doubling your money in 1 year is a 100% IRR... so if it takes 2 years, that’s *roughly* a 50% return each year

**BUT** due to the **compounding**, it’s actually less than 50% → closer to 40% if you calculate it in Excel

**Principle:** For “double your money” scenarios, take 100% and divide it by the # of years (e.g. 100% / 3 = 33% for 3 years)

**Approximate IRR:** Will be about 75-80% of this value due to compounding (~25% for 3 years, which is 75% * 33%)
The **Rules** and Rules of Thumb

- **Double Your Money in 1 Year** → 100% IRR
- **Double Your Money in 2 Years** → 41% IRR → ~40% IRR
- **Double Your Money in 3 Years** → 26% IRR → ~25% IRR
- **Double Your Money in 4 Years** → 19% IRR → ~20% IRR
- **Double Your Money in 5 Years** → 15% IRR → ~15% IRR
- **Triple Your Money in 3 Years** → 44% IRR → ~45% IRR
- **Triple Your Money in 5 Years** → 25% IRR → ~25% IRR
The **Rules** and Rules of Thumb

- **Example:** Buy a company for 7.0x EBITDA → Price of €350 million
- **4.5x Debt/EBITDA**, so roughly 2.5x Equity → €125 million equity

- **Year 3 EBITDA:** ~€70 million
- **Year 3 Exit Multiple:** 8.0x

- **Year 3 Remaining Debt:** €225 million – €90 million = €135 million

- **Year 3 Exit Proceeds** = €70 million * 8 – €135 million = €425 million

- **Approximate IRR** = Just over 45% since the PE firm earned more than 3x its money back in 3 years
The **Rules** and Rules of Thumb

- **Reality:** IRR was around 43%

- **Why?**

  - We ignored *transaction fees*, which increase the equity required

  - We also ignored the *PIK interest*, which increases the debt principal

  - And the Year 3 EBITDA figure was an approximation, not the exact #

- But still... pretty good for a **60-second estimate**!
Applying the Rules in Real Life

- **Scenario:** 3-hour private equity case study based on an **oilfield services** company

- **Assumptions:** Yes, they give you detailed numbers to use, and a partially complete Excel model... **BUT** you should resist the urge to jump in right away

- **Why:** The purpose is to make an **investment recommendation**, and it helps to know your decision in advance (plus, check your work!)

- **Recommendation:** Do a quick check of the numbers first...
Applying the Rules in Real Life

• **Purchase Price:** 5.5x EBITDA ($100 million @ $18 million EBITDA)

• **Leverage:** One Mezzanine tranche at 1x EBITDA, and “market rates” for Revolver and Term Loan → We can assume 3x for those

• **Leverage:** 4x EBITDA, so Equity = 1.5x EBITDA = $27 million
• **Plus Fees:** $3 million of fees, so Equity Required = $30 million

• **Rollover Equity:** $5 million, so PE contribution is $25 million (~80%)

• **Amortization:** Term Loan amortizes over 3 years, Mezzanine stays in place → We’ll likely have ~$40 million of debt at the end since the company can’t repay $18 million / year with only $18 million EBITDA
Applying the Rules in Real Life

• **Revenue**: 10% decline, 5% decline, then 10% growth in Years 3 – 5 → We’ll probably end up around 15% higher

• **Margins**: Gross margins stay the same, but SG&A increases 5% per year → Revenue falls at first, so our final margin is likely *lower*

• **Guesstimate**: Year 5 Revenue of $80 million and EBITDA of $20 million (25% margin, slightly lower than existing 26% margin)

• **Exit Enterprise Value** = 6x * $20 million = $120 million

• **Exit Proceeds to Equity Investors** = $120 – $40 = $80 million
Applying the Rules in Real Life

• **Rollover Equity** – Management owns ~20%, so the PE investors only get back $64 million of the $80 million.

• **Returns**: $64 million / $25 million = ~2.5x multiple

• **Returns**: 2.5x multiple over 5 years → We’re halfway in between doubling and tripling our money, so IRR is in between 15% and 25%

• **Approximate IRR**: Just over 20%, since the multiple is just over 2.5x

• **Conclusion**: We will *probably* lean toward a “Yes” in this recommendation and make sure our model supports that.
Recap and Summary

- **Part 1:** The Rules and Rules of Thumb for IRR

- **Part 2:** How to Apply the Rules to a Simple LBO Model

- **Part 3:** How to Apply These Rules to a Real-Life Scenario (A 3-Hour Private Equity Case Study)