



SESSION 13: LOOSE ENDS IN
VALUATION –III
DISTRESS, DILUTION AND ILLIQUIDITY

1. Distress and the Going Concern Assumption

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- Traditional valuation techniques are built on the assumption of a going concern, i.e., a firm that has continuing operations and there is no significant threat to these operations.
 - In discounted cashflow valuation, this going concern assumption finds its place most prominently in the terminal value calculation, which usually is based upon an infinite life and ever-growing cashflows.
 - In relative valuation, this going concern assumption often shows up implicitly because a firm is valued based upon how other firms - most of which are healthy - are priced by the market today.
- When there is a significant likelihood that a firm will not survive the immediate future (next few years), traditional valuation models may yield an over-optimistic estimate of value.

Current Revenue
\$ 4,390

Current Margin:
4.76%

EBIT
\$ 209m

Reinvestment:
Capital expenditures include cost of new casinos and working capital

Extended reinvestment break, due to investment in past

Industry average

Expected Margin:
-> 17%

Stable Growth
Stable Revenue Growth: 3%
Stable Operating Margin: 17%
Stable ROC=10%
Reinvest 30% of EBIT(1-t)

Terminal Value = $758 \cdot (0.0743 - 0.03)$
= \$ 17,129

Value of Op Assets \$ 9,793
+ Cash & Non-op \$ 3,040
= Value of Firm \$ 12,833
- Value of Debt \$ 7,565
= Value of Equity \$ 5,268

Value per share \$ 8.12

Revenues	\$4,434	\$4,523	\$5,427	\$6,513	\$7,815	\$8,206	\$8,616	\$9,047	\$9,499	\$9,974
Oper margin	5.81%	6.86%	7.90%	8.95%	10%	11.40%	12.80%	14.20%	15.60%	17%
EBIT	\$258	\$310	\$429	\$583	\$782	\$935	\$1,103	\$1,285	\$1,482	\$1,696
Tax rate	26.0%	26.0%	26.0%	26.0%	26.0%	28.4%	30.8%	33.2%	35.6%	38.00%
EBIT * (1 - t)	\$191	\$229	\$317	\$431	\$578	\$670	\$763	\$858	\$954	\$1,051
- Reinvestment	-\$19	-\$11	\$0	\$22	\$58	\$67	\$153	\$215	\$286	\$350
FCFF	\$210	\$241	\$317	\$410	\$520	\$603	\$611	\$644	\$668	\$701
Beta	3.14	3.14	3.14	3.14	3.14	2.75	2.36	1.97	1.59	1.20
Cost of equity	21.82%	21.82%	21.82%	21.82%	21.82%	19.50%	17.17%	14.85%	12.52%	10.20%
Cost of debt	9%	9%	9%	9%	9%	8.70%	8.40%	8.10%	7.80%	7.50%
Debt/ratio	73.50%	73.50%	73.50%	73.50%	73.50%	68.80%	64.10%	59.40%	54.70%	50.00%
Cost of capital	9.88%	9.88%	9.88%	9.88%	9.88%	9.79%	9.50%	9.01%	8.32%	7.43%

Term. Year
\$10,273
17%
\$ 1,746
38%
\$1,083
\$ 325
\$758

Forever

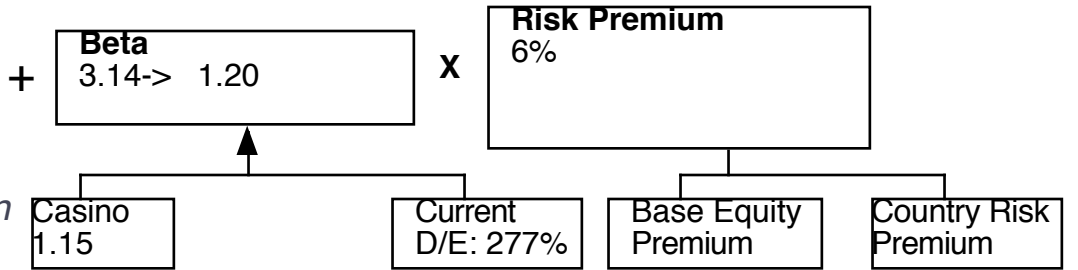
Cost of Equity
21.82%

Cost of Debt
3%+6%= 9%
9% (1-.38)=5.58%

Weights
Debt= 73.5% ->50%

Riskfree Rate:
T. Bond rate = 3%

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Las Vegas Sands
February 2009
Trading @ \$4.25

The Distress Factor

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- In February 2009, LVS was rated B+ by S&P. Historically, 28.25% of B+ rated bonds default within 10 years. LVS has a 6.375% bond, maturing in February 2015 (7 years), trading at \$529. If we discount the expected cash flows on the bond at the riskfree rate, we can back out the probability of distress from the bond price.

$$529 = \sum_{t=1}^{t=7} \frac{63.75(1 - p_{\text{Distress}})^t}{(1.03)^t} + \frac{1000(1 - p_{\text{Distress}})^7}{(1.03)^7}$$

- Solving for the probability of bankruptcy, we get:
- π_{Distress} = Annual probability of default = 13.54%
 - ▣ Cumulative probability of surviving 10 years = $(1 - .1354)^{10} = 23.34\%$
 - ▣ Cumulative probability of distress over 10 years = $1 - .2334 = .7666$ or 76.66%
- If LVS is becomes distressed:
 - ▣ Expected distress sale proceeds = \$2,769 million < Face value of debt
 - ▣ Expected equity value/share = \$0.00
- Expected value per share = $\$8.12 (1 - .7666) + \$0.00 (.7666) = \$1.92$

2. Analyzing the Effect of Illiquidity on Value

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- The simplest way to think about illiquidity is to consider it the cost of buyer's remorse: it is the cost of reversing an asset trade almost instantaneously after you make the trade.
- Defined thus, all assets are illiquid. The difference is really a continuum, with some assets being more

Most liquid

Least liquid



Which is more illiquid?

The Theory on Illiquidity Discounts

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- Illiquidity discount on value: You should reduce the value of an asset by the expected cost of trading that asset over its lifetime.
 - ▣ The illiquidity discount should be greater for assets with higher trading costs
 - ▣ The illiquidity discount should decrease as the time horizon of the investor holding the asset increases
- Illiquid assets should be valued using higher discount rates
 - ▣ Risk-Return model: Some illiquidity risk is systematic. In other words, the illiquidity increases when the market is down. This risk should be built into the discount rate.
 - ▣ Empirical: Assets that are less liquid have historically earned higher returns. Relating returns to measures of illiquidity (turnover rates, spreads etc.) should allow us to estimate the discount rate for less liquid assets.
- Illiquidity can be valued as an option: When you are not allowed to trade an asset, you lose the option to sell it if the price goes up (and you want to get out).

a. Illiquidity Discount in Value

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- Amihud and Mendelson make the interesting argument that when you pay for an asset today will incorporate the present value of all expected future transactions costs on that asset. For instance, assume that the transactions costs are 2% of the price and that the average holding period is 1 year. The illiquidity discount can be computed as follows:
 - ▣ Illiquidity discount $\frac{2\%}{(1.10)} + \frac{2\%}{(1.10)^2} + \frac{2\%}{(1.10)^3} \dots = \frac{2\%}{.10} = 20\%$
 - ▣ With a holding period of 3 years, the illiquidity discount will be much smaller (about 6.67%)
- It follows then that the illiquidity discount will be
 - ▣ An increasing function of transactions costs
 - ▣ A decreasing function of the average holding period

b. Adjusting discount rates for illiquidity

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- Liquidity as a systematic risk factor
 - If liquidity is correlated with overall market conditions, less liquid stocks should have more market risk than more liquid stocks
 - To estimate the cost of equity for stocks, we would then need to estimate a “liquidity beta” for every stock and multiply this liquidity beta by a liquidity risk premium.
 - The liquidity beta is not a measure of liquidity, per se, but a measure of liquidity that is correlated with market conditions.
- Liquidity premiums
 - You can always add liquidity premiums to conventional risk and return models to reflect the higher risk of less liquid stocks.
 - These premiums are usually based upon historical data and reflect what you would have earned on less liquid investments historically (usually smaller stocks with lower trading volume) relative to more liquid investments. Amihud and Mendelson estimate that the expected return increases about 0.25% for every 1% increase in the bid-ask spread.

3. Equity to Employees: Effect on Value

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- In recent years, firms have turned to giving employees (and especially top managers) equity option packages as part of compensation. These options are usually
 - ▣ Long term
 - ▣ At-the-money when issued
 - ▣ On volatile stocks
- Are they worth money? And if yes, who is paying for them?
- Two key issues with employee options:
 - ▣ How do options granted in the past affect equity value per share today?
 - ▣ How do expected future option grants affect equity value today?

Short cuts used to deal with options

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- Fully diluted value per share
 - Once you have estimated the overall value of equity, you can divide by the total number of shares outstanding, including those underlying the options.
 - Doing so will understate the value of your equity, since the options, even if exercised, will bring in cash to the firm.
- Treasury stock approach
 - Value per share = (Estimated Equity value + Proceeds from exercise of options) / (Number of shares + Number of options)
 - This approach will overstate the value of equity since it values options at exercise value and ignores the time premium on options.

Dealing with Employee Options: The Right way

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- Options outstanding
 - Step 1: List all options outstanding, with maturity, exercise price and vesting status.
 - Step 2: Value the options, taking into account dilution, vesting and early exercise considerations
 - Step 3: Subtract from the value of equity and divide by the actual number of shares outstanding (not diluted or partially diluted).
- Expected future option and restricted stock issues
 - Step 1: Forecast value of options that will be granted each year as percent of revenues that year. (As firm gets larger, this should decrease)
 - Step 2: Treat as operating expense and reduce operating income and cash flows
 - Step 3: Take present value of cashflows to value operations or equity.