# From Cost of Equity to Cost of Capital



- The cost of capital is a composite cost to the firm of raising financing to fund its projects.
- In addition to equity, firms can raise capital from debt.
- To get to a cost of capital, you need to
  - Estimate a cost of debt
  - Estimate weights for debt and equity

# What is debt?



- General Rule: Debt generally has the following characteristics:
  - Commitment to make fixed payments in the future
  - The fixed payments are tax deductible
  - Failure to make the payments can lead to either default or loss of control of the firm to the party to whom payments are due.
- As a consequence, debt should include
  - Any interest-bearing liability, whether short term or long term.
  - Any lease obligation, whether operating or capital.

# Estimating the Cost of Debt



- If the firm has bonds outstanding, and the bonds are traded, the yield to maturity on a long-term, straight (no special features) bond can be used as the interest rate.
- If the firm is rated, use the rating and a typical default spread on bonds with that rating to estimate the cost of debt.
- If the firm is not rated,
  - and it has recently borrowed long term from a bank, use the interest rate on the borrowing or
  - estimate a synthetic rating for the company, and use the synthetic rating to arrive at a default spread and a cost of debt
- The cost of debt has to be estimated in the same currency as the cost of equity and the cash flows in the valuation.

# The easy route: Outsourcing the measurement of default risk

- For those firms that have bond ratings from global ratings agencies, I used those ratings:

| Company | S&P Rating | Risk-Free Rate | Default Spread | Cost of Debt |
|---|---|---|---|---|
| Disney | A | 2.75% (US $) | 1.00% | 3.75% |
| Deutsche Bank | A | 1.75% (Euros) | 1.00% | 2.75% |
| Vale | A- | 2.75% (US $) | 1.30% | 4.05% |

- If you want to estimate Vale's cost of debt in $R terms, we can again use the differential inflation approach we used for the cost of equity:

$$\text{Cost of debt}_{R\$} = (1+\text{Cost of debt}_{US\ \$})\frac{(1+\text{Expected Inflation}_{R\$})}{(1+\text{Expected Inflation}_{US\ \$})}-1$$

$$= (1.0405)\ \frac{(1.09)}{(1.02)} - 1 = 11.19\%\%$$

# A more general route: Estimating Synthetic Ratings

- The rating for a firm can be estimated using the financial characteristics of the firm. In its simplest form, we can use just the interest coverage ratio:

  Interest Coverage Ratio = EBIT / Interest Expenses

- For the non-financial service companies, we obtain the following:

| Company | Operating income | Interest Expense | Interest coverage ratio |
|---|---|---|---|
| Disney | $10.023 | $444 | 22.57 |
| Vale | $15,667 | $1,342 | 11.67 |
| Tata Motors | Rs 166,605 | Rs 36,972 | 4.51 |
| Baidu | CY 11,193 | CY 472 | 23.72 |
| Bookscape | $2,536 | $492 | 5.16 |

# Interest Coverage Ratios, Ratings and Default Spreads- November 2013

| *Large cap (>$5 billion)* | *Small cap or risky (<$5 billion)* | *Rating is (S&P/ Moody's)* | *Spread (11/13)* |
|---|---|---|---|
| >8.50 | >12,5 | Aaa/AAA | 0.40% |
| 6.5-8.5 | 9.5-12.5 | Aa2/AA | 0.70% |
| 5.5-6.5 | 7.5-9.5 | A1/A+ | 0.85% |
| 4.25-5.5 | 6-7.5 | A2/A | 1.00% |
| 3-4.25 | 4.5-6 | A3/A- | 1.30% |
| 2.5-3 | 4-4.5 | Baa2/BBB | 2.00% |
| 2.25-2.5 | 3.5-4 | Ba1/BB+ | 3.00% |
| 2-2.25 | 3-3.5 | Ba2/BB | 4.00% |
| 1.75-2.25 | 2.5-3 | B1/B+ | 5.50% |
| 1.5-1.75 | 2-2.5 | B2/B | 6.50% |
| 1.25-1.5 | 1.5-2 | B3/B- | 7.25% |
| 0.8-1.25 | 1.25-1.5 | Caa/CCC | 8.75% |
| 0.65-0.8 | 0.8-1.25 | Ca2/CC | 9.50% |
| 0.2-0.65 | 0.5-0.8 | C2/C | 10.50% |
| <0.2 | <0.5 | D2/D | 12.00% |

| | | | |
|---|---|---|---|
| Disney: Large cap, developed | 22.57 | → | AAA |
| Vale: Large cap, emerging | 11.67 | → | AA |
| Tata Motors: Large cap, Emerging | 4.51 | → | A- |
| Baidu: Small cap, Emerging | 23.72 | → | AAA |
| Bookscape: Small cap, private | 5.16 | → | A- |

# Synthetic versus Actual Ratings: Rated Firms

- Disney's synthetic rating is AAA, whereas its actual rating is A. The difference can be attributed to any of the following:
  - Synthetic ratings reflect only the interest coverage ratio whereas actual ratings incorporate all of the other ratios and qualitative factors
  - Synthetic ratings do not allow for sector-wide biases in ratings
  - Synthetic rating was based on 2013 operating income whereas actual rating reflects normalized earnings
- Vale's synthetic rating is AA, but the actual rating for dollar debt is A-. The biggest factor behind the difference is the presence of country risk, since Vale is probably being rated lower for being a Brazil-based corporation.
- Deutsche Bank had an A rating. We will not try to estimate a synthetic rating for the bank. Defining interest expenses on debt for a bank is difficult…

# Estimating Cost of Debt

- For Bookscape, we will use the synthetic rating (A-) to estimate the cost of debt:
  - Default Spread based upon A- rating = 1.30%
  - Pre-tax cost of debt = Riskfree Rate + Default Spread = 2.75% + 1.30% = 4.05%
  - After-tax cost of debt = Pre-tax cost of debt (1- tax rate) = 4.05% (1-.40) = 2.43%
- For the three publicly traded firms that are rated in our sample, we will use the actual bond ratings to estimate the costs of debt.

| Company | S&P Rating | Risk-Free Rate | Default Spread | Cost of Debt | Tax Rate | After-Tax Cost of Debt |
|---|---|---|---|---|---|---|
| Disney | A | 2.75% (US $) | 1.00% | 3.75% | 36.1% | 2.40% |
| Deutsche Bank | A | 1.75% (Euros) | 1.00% | 2.75% | 29.48% | 1.94% |
| Vale | A- | 2.75% (US $) | 1.30% | 4.05% | 34% | 2.67% |

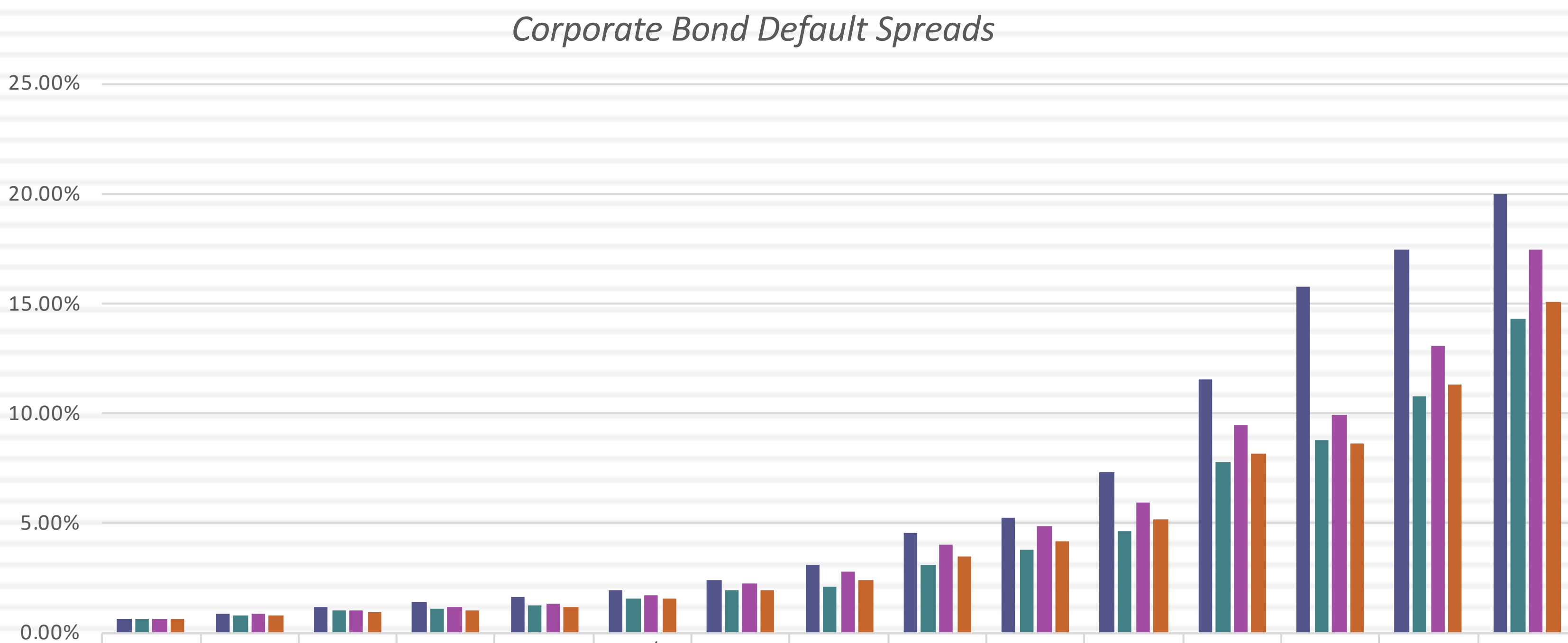
- For Tata Motors, we have a rating of AA- from CRISIL, an Indian bond-rating firm, that measures only company risk. Using that rating:

Cost of $\text{debt}_{TMT}$ = Risk free $\text{rate}_{Rupees}$ + Default $\text{spread}_{India}$ + Default $\text{spread}_{TMT}$

= 6.57% + 2.25% + 0.70% = 9.62%

After-tax cost of debt = 9.62% (1-.3245) = 6.50%

# Default Spreads – January 2023

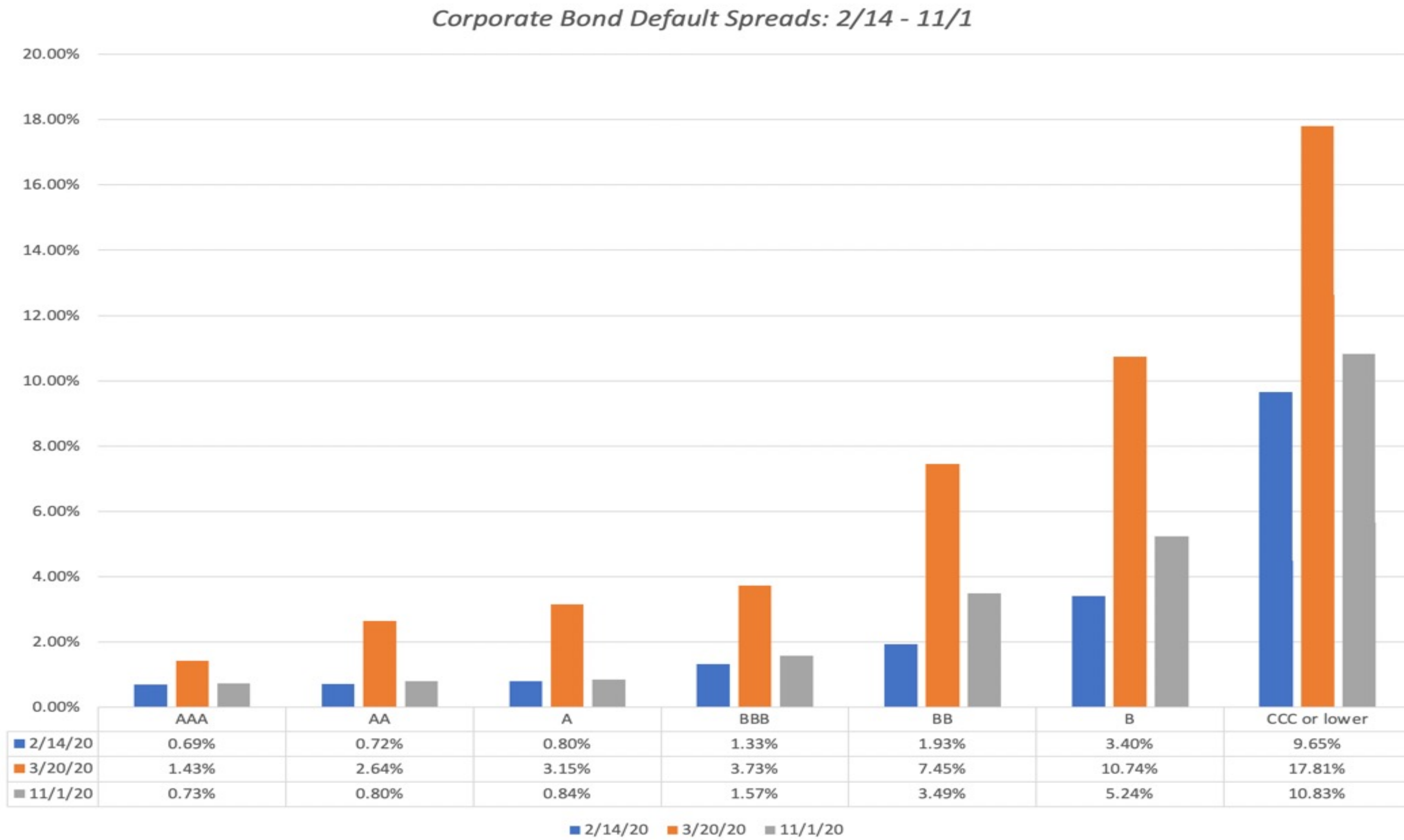



| | Aaa/AAA | Aa2/AA | A1/A+ | A2/A | A3/A- | Baa2/BBB | Ba1/BB+ | Ba2/BB | B1/B+ | B2/B | B3/B- | Caa/CCC | Ca2/CC | C2/C | D2/D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spread 2023 | 0.69% | 0.85% | 1.23% | 1.42% | 1.62% | 2.00% | 2.42% | 3.13% | 4.55% | 5.26% | 7.37% | 11.57% | 15.78% | 17.50% | 20.00% |
| Spread 2022 | 0.67% | 0.82% | 1.03% | 1.14% | 1.29% | 1.59% | 1.93% | 2.15% | 3.15% | 3.78% | 4.62% | 7.78% | 8.80% | 10.76% | 14.34% |
| Spread 2021 | 0.69% | 0.85% | 1.07% | 1.18% | 1.33% | 1.71% | 2.31% | 2.77% | 4.05% | 4.86% | 5.94% | 9.46% | 9.97% | 13.09% | 17.44% |
| Spread 2020 | 0.63% | 0.78% | 0.98% | 1.08% | 1.22% | 1.56% | 2.00% | 2.40% | 3.51% | 4.21% | 5.15% | 8.20% | 8.64% | 11.34% | 15.12% |

Spread 2023 Spread 2022 Spread 2021 Spread 2020

# But some years are volatile: 2020 as a case study..






| | AAA | AA | A | BBB | BB | B | CCC or lower |
|---|---|---|---|---|---|---|---|
| 2/14/20 | 0.69% | 0.72% | 0.80% | 1.33% | 1.93% | 3.40% | 9.65% |
| 3/20/20 | 1.43% | 2.64% | 3.15% | 3.73% | 7.45% | 10.74% | 17.81% |
| 11/1/20 | 0.73% | 0.80% | 0.84% | 1.57% | 3.49% | 5.24% | 10.83% |

# Application Test: Estimating a Cost of Debt



- Based upon your firm's current earnings before interest and taxes, its interest expenses, estimate
  - An interest coverage ratio for your firm
  - A synthetic rating for your firm (use the tables from prior pages)
  - A pre-tax cost of debt for your firm
  - An after-tax cost of debt for your firm

# Costs of Hybrids



- Preferred stock shares some of the characteristics of debt - the preferred dividend is pre-specified at the time of the issue and is paid out before common dividend -- and some of the characteristics of equity - the payments of preferred dividend are not tax deductible. If preferred stock is viewed as perpetual, the cost of preferred stock can be written as follows:
  - kps = Preferred Dividend per share/ Market Price per preferred share
- Convertible debt is part debt (the bond part) and part equity (the conversion option). It is best to break it up into its component parts and eliminate it from the mix altogether.

# Weights for Cost of Capital Calculation



- The weights used in the cost of capital computation should be market values.
- There are three specious arguments used against market value
  - *Book value is more reliable than market value because it is not as volatile*: While it is true that book value does not change as much as market value, this is more a reflection of weakness than strength
  - *Using book value rather than market value is a more conservative approach to estimating debt ratios*: For most companies, using book values will yield a lower cost of capital than using market value weights.
  - *Since accounting returns are computed based upon book value, consistency requires the use of book value in computing cost of capital*: While it may seem consistent to use book values for both accounting return and cost of capital calculations, it does not make economic sense.

# Disney: From book value to market value for interest bearing debt…

- In Disney's 2013 financial statements, the debt due over time was footnoted.

| Time due | Amount due | Weight | Weight *Maturity |
|---|---|---|---|
| 0.5 | $1,452 | 11.96% | 0.06 |
| 2 | $1,300 | 10.71% | 0.21 |
| 3 | $1,500 | 12.36% | 0.37 |
| 4 | $2,650 | 21.83% | 0.87 |
| 6 | $500 | 4.12% | 0.25 |
| 8 | $1,362 | 11.22% | 0.9 |
| 9 | $1,400 | 11.53% | 1.04 |
| 19 | $500 | 4.12% | 0.78 |
| 26 | $25 | 0.21% | 0.05 |
| 28 | $950 | 7.83% | 2.19 |
| 29 | $500 | 4.12% | 1.19 |
| | $12,139 | | 7.92 |

*The debt in this table does not add up to the book value of debt, because Disney does not break down the maturity of all of its debt.*

- Disney's total debt due, in book value terms, on the balance sheet is $14,288 million and the total interest expense for the year was $349 million. Using 3.75% as the pre-tax cost of debt:

Estimated MV of Disney Debt =

$$349\left[\frac{(1-\frac{1}{(1.0375)^{7.92}}}{.0375}\right]+\frac{14,288}{(1.0375)^{7.92}}=\$13,028 \text{ million}$$

PV of annuity of $349 million for 7.92 years

PV of face value of $14,288 million in 7.92 years

# Operating Leases at Disney

- The "debt value" of operating leases is the present value of the lease payments, at a rate that reflects their risk, usually the pre-tax cost of debt.
- The pre-tax cost of debt at Disney is 3.75%.

| Year | Commitment | Present Value @3.75% |
|---|---|---|
| 1 | $507.00 | $488.67 |
| 2 | $422.00 | $392.05 |
| 3 | $342.00 | $306.24 |
| 4 | $272.00 | $234.76 |
| 5 | $217.00 | $180.52 |
| 6-10 | $356.80 | $1,330.69 |
| Debt value of leases | | $2,932.93 |

Disney reported $1,784 million in commitments after year 5. Given that their average commitment over the first 5 years, we assumed 5 years @ $356.8 million each.

- Debt outstanding at Disney = $13,028 + $ 2,933= $15,961 million

# Accounting comes to its senses on operating leases



- In 2019, both IFRS and GAAP made a major shift on operating leases, requiring companies to capitalize leases and show the resulting debt (and counter asset) on the balance sheets.
- That said, the accounting rules for capitalizing leases are far more complex than the simple calculations that I have used, for two reasons:
  - Accounting has to balance its desire to do the right thing with maintaining some connection to its legacy rules.
  - Companies have lobbied to modify rules in their sectors to cushion the impact.

# Application Test: Estimating Market Value



- Estimate the
  - Market value of equity at your firm and Book Value of equity
  - Market value of debt and book value of debt (If you cannot find the average maturity of your debt, use 3 years): Remember to capitalize the value of operating leases and add them on to both the book value and the market value of debt.
- Estimate the
  - Weights for equity and debt based upon market value
  - Weights for equity and debt based upon book value

# Current Cost of Capital: Disney

- Equity
  - Cost of Equity = Riskfree rate + Beta * Risk Premium
    = 2.75% + 1.0013 (5.76%) = **8.52%**
  - Market Value of Equity = $121,878 million
  - Equity/(Debt+Equity ) = **88.42%**
- Debt
  - After-tax Cost of debt =(Riskfree rate + Default Spread) (1-t)
    = (2.75%+1%) (1-.361) = **2.40%**
  - Market Value of Debt = $13,028+ $2933 = $ 15,961 million
  - Debt/(Debt +Equity) = **11.58%**
- Cost of Capital = 8.52%(.8842)+ 2.40%(.1158) = 7.81%



121,878/ (121,878+15,961)

# Divisional Costs of Capital: Disney and Vale

## Disney

| | Cost of equity | Cost of debt | Marginal tax rate | After-tax cost of debt | Debt ratio | Cost of capital |
|---|---|---|---|---|---|---|
| Media Networks | 9.07% | 3.75% | 36.10% | 2.40% | 9.12% | 8.46% |
| Parks & Resorts | 7.09% | 3.75% | 36.10% | 2.40% | 10.24% | 6.61% |
| Studio Entertainment | 9.92% | 3.75% | 36.10% | 2.40% | 17.16% | 8.63% |
| Consumer Products | 9.55% | 3.75% | 36.10% | 2.40% | 53.94% | 5.69% |
| Interactive | 11.65% | 3.75% | 36.10% | 2.40% | 29.11% | 8.96% |
| Disney Operations | 8.52% | 3.75% | 36.10% | 2.40% | 11.58% | 7.81% |

## Vale

| *Business* | *Cost of equity* | *After-tax cost of debt* | *Debt ratio* | *Cost of capital (in US$)* | *Cost of capital (in $R)* |
|---|---|---|---|---|---|
| Metals & Mining | 11.35% | 2.67% | 35.48% | 8.27% | 15.70% |
| Iron Ore | 11.13% | 2.67% | 35.48% | 8.13% | 15.55% |
| Fertilizers | 12.70% | 2.67% | 35.48% | 9.14% | 16.63% |
| Logistics | 10.29% | 2.67% | 35.48% | 7.59% | 14.97% |
| Vale Operations | 11.23% | 2.67% | 35.48% | 8.20% | 15.62% |

# Costs of Capital: Tata Motors, Baidu and Bookscape

- To estimate the costs of capital for Tata Motors in Indian rupees:

  Cost of capital= 14.49% (1-.2928) + 6.50% (.2928) = 12.15%

- For Baidu, we follow the same path to estimate a cost of equity in Chinese RMB:

  Cost of capital = 12.91% (1-.0523) + 3.45% (.0523) = 12.42%

- For Bookscape, the cost of capital is different depending on whether you look at market or total beta:

| | Cost of equity | Pre-tax Cost of debt | After-tax cost of debt | D/(D+E) | Cost of capital |
|---|---|---|---|---|---|
| Market Beta | 7.46% | 4.05% | 2.43% | 17.63% | 6.57% |
| Total Beta | 11.98% | 4.05% | 2.43% | 17.63% | 10.30% |

# Application Test: Estimating Cost of Capital



- Using the bottom-up unlevered beta that you computed for your firm, and the values of debt and equity you have estimated for your firm, estimate a bottom-up levered beta and cost of equity for your firm.

- Based upon the costs of equity and debt that you have estimated, and the weights for each, estimate the cost of capital for your firm.

- How different would your cost of capital have been, if you used book value weights?

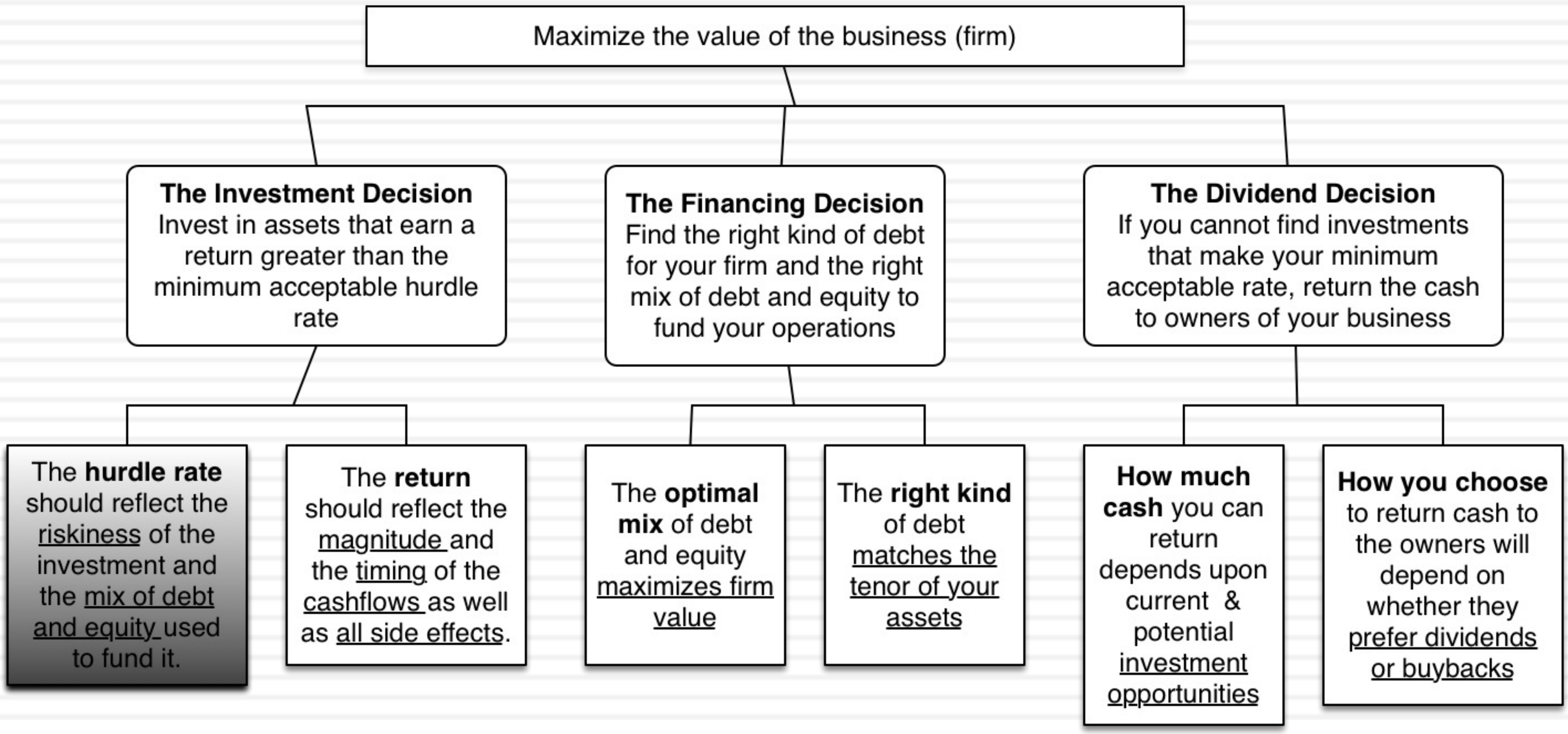
# Choosing a Hurdle Rate



- Either the cost of equity or the cost of capital can be used as a hurdle rate, depending upon whether the returns measured are to equity investors or to all claimholders on the firm (capital)
- If returns are measured to equity investors, the appropriate hurdle rate is the cost of equity.
- If returns are measured to capital (or the firm), the appropriate hurdle rate is the cost of capital.

# Back to First Principles





# MEASURING INVESTMENT RETURNS I: THE MECHANICS OF INVESTMENT ANALYSIS

"Show me the money"

from Jerry Maguire

# First Principles



- Maximize the value of the business (firm)
  - **The Investment Decision** Invest in assets that earn a return greater than the minimum acceptable hurdle rate
    - The **hurdle rate** should reflect the <u>riskiness</u> of the investment and the <u>mix of debt and equity</u> used to fund it.
    - The **return** should reflect the <u>magnitude</u> and the <u>timing</u> of the <u>cashflows</u> as well as <u>all side effects</u>.
  - **The Financing Decision** Find the right kind of debt for your firm and the right mix of debt and equity to fund your operations
    - The **optimal mix** of debt and equity <u>maximizes firm value</u>
    - The **right kind** of debt <u>matches the tenor of your assets</u>
  - **The Dividend Decision** If you cannot find investments that make your minimum acceptable rate, return the cash to owners of your business
    - **How much cash** you can return depends upon current & potential <u>investment opportunities</u>
    - **How you choose** to return cash to the owners will depend on whether they <u>prefer dividends or buybacks</u>

# Measures of return: earnings versus cash flows



- Principles Governing Accounting Earnings Measurement
  - Accrual Accounting: Show revenues when products and services are sold or provided, not when they are paid for. Show expenses associated with these revenues rather than cash expenses.
  - Operating versus Capital Expenditures: Only expenses associated with creating revenues in the current period should be treated as operating expenses. Expenses that create benefits over several periods are written off over multiple periods (as depreciation or amortization)
- To get from accounting earnings to cash flows, you have to:
  - add back non-cash expenses (like depreciation)
  - subtract out cash outflows which are not expensed (such as capital expenditures)
  - make accrual revenues and expenses into cash revenues and expenses (by considering changes in working capital).

# Measuring Returns Right: The Basic Principles



- *Use cash flows rather than earnings*. You cannot spend earnings.
- *Use "incremental" cash flows* relating to the investment decision, i.e., cashflows that occur as a consequence of the decision, rather than total cash flows.
- *Use "time weighted" returns*, i.e., value cash flows that occur earlier more than cash flows that occur later.

**The Return Mantra: "Time-weighted, Incremental Cash Flow Return"**

# Setting the table: What is an investment/project?



- An investment/project can range the spectrum from big to small, money making to cost saving:
  - Major strategic decisions to enter new areas of business or new markets.
  - Acquisitions of other firms are projects as well, notwithstanding attempts to create separate sets of rules for them.
  - Decisions on new ventures within existing businesses or markets.
  - Decisions that may change the way existing ventures and projects are run.
  - Decisions on how best to deliver a service that is necessary for the business to run smoothly.
- Put in broader terms, every choice made by a firm can be framed as an investment.

# Here are five examples…



- At Disney,
  - Rio Disney: Consider whether Disney should invest in its first theme parks in South America. These parks will require us to consider the effects of country risk and currency issues in project analysis.
  - A New Show for Disney +: An exercise where estimating the benefits is difficult to do, since it is in the form of keeping existing subscribers or adding new ones
- New iron ore mine for Vale: This is an iron ore mine that Vale is considering in Western Labrador, Canada.
- An Online Store for Bookscape: Bookscape is evaluating whether it should create an online store to sell books. While it is an extension of their basis business, it will require different investments (and potentially expose them to different types of risk).
- Acquisition of Harman by Tata Motors: A cross-border bid by Tata for Harman International, a publicly traded US firm that manufactures high-end audio equipment, with the intent of upgrading the audio upgrades on Tata Motors' automobiles. This investment will allow us to examine currency and risk issues in such a transaction.

# Earnings versus Cash Flows: A Disney Theme Park



- The theme parks to be built near Rio, modeled on Euro Disney in Paris and Disney World in Orlando.
- The complex will include
  - A "Magic Kingdom" to be constructed, beginning immediately, and becoming operational at the beginning of the second year
  - A second theme park modeled on Epcot Center at Orlando to be constructed in the second and third year and becoming operational at the beginning of the fourth year.
- The earnings and cash flows are estimated in nominal U.S. Dollars.

# Key Assumptions on Start Up and Construction



- Disney has already spent $0.5 Billion researching the proposal and getting the necessary licenses for the park; none of this investment can be recovered if the park is not built. This expenditure has been capitalized and will be depreciated straight line over ten years to a salvage value of zero.
- Disney will face substantial construction costs, if it chooses to build the theme parks.
  - The cost of constructing Magic Kingdom will be $3 billion, with $ 2 billion to be spent right now, and $1 Billion to be spent one year from now.
  - The cost of constructing Epcot II will be $ 1.5 billion, with $ 1 billion to be spent at the end of the second year and $0.5 billion at the end of the third year.
  - These investments will be depreciated based upon a depreciation schedule in the tax code, where depreciation will be different each year.

# Key Revenue Assumptions

- Revenue estimates for the parks and resort properties (in millions)

| Year | Magic Kingdom | Epcot II | Resort Properties | Total |
|---|---|---|---|---|
| 1 | $0 | $0 | $0 | $0 |
| 2 | $1,000 | $0 | $250 | $1,250 |
| 3 | $1,400 | $0 | $350 | $1.750 |
| 4 | $1,700 | $300 | $500 | $2.500 |
| 5 | $2,000 | $500 | $625 | $3.125 |
| 6 | $2,200 | $550 | $688 | $3,438 |
| 7 | $2,420 | $605 | $756 | $3,781 |
| 8 | $2,662 | $666 | $832 | $4,159 |
| 9 | $2,928 | $732 | $915 | $4,575 |
| 10 | $2,987 | $747 | $933 | $4,667 |

# Key Expense Assumptions



- The operating expenses are assumed to be 60% of the revenues at the parks, and 75% of revenues at the resort properties.
- Disney will also allocate corporate general and administrative costs to this project, based upon revenues
  - The G&A allocation will be 15% of the revenues each year.
  - It is worth noting that a recent analysis of these expenses found that only one-third of these expenses are variable (and a function of total revenue) and that two-thirds are fixed.

# Depreciation and Capital Maintenance



| Year | Depreciation as % of Book Value | Capital Maintenance as % of Depreciation |
|---|---|---|
| 1 | 0.00% | 0.00% |
| 2 | 12.50% | 50.00% |
| 3 | 11.00% | 60.00% |
| 4 | 9.50% | 70.00% |
| 5 | 8.00% | 80.00% |
| 6 | 8.00% | 90.00% |
| 7 | 8.00% | 100.00% |
| 8 | 8.00% | 105.00% |
| 9 | 8.00% | 110.00% |
| 10 | 8.00% | 110.00% |

- The capital maintenance expenditures are low in the early years, when the parks are still new but increase as the parks age.

# Other Assumptions



- Disney will have to maintain non-cash working capital (primarily consisting of inventory at the theme parks and the resort properties, netted against accounts payable) of 5% of revenues, with the investments being made at the end of each year.
- The income from the investment will be taxed at Disney's marginal tax rate of 36.1%.

# Laying the groundwork:
# Book Capital, Working Capital and Depreciation



| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Book Value of Pre-project inv* | *$500* | *$450* | *$400* | *$350* | *$300* | *$250* | *$200* | *$150* | *$100* | *$50* | *$0* |
| Depreciation: Pre-Project | | $50 | $50 | $50 | $50 | $50 | $50 | $50 | $50 | $50 | $50 |
| | | | | | | | | | | | |
| Magic Kingdom | $2,000 | $1,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Epcot Rio | $0 | $0 | $1,000 | $500 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Capital Maintenance | | $0 | $188 | $252 | $276 | $258 | $285 | $314 | $330 | $347 | $350 |
| - Depreciation on fixed assets | | $0 | $375 | $419 | $394 | $322 | $317 | $314 | $314 | $316 | $318 |
| *Book Value of new Fixed Assets* | *$2,000* | *$3,000* | *$3,813* | *$4,145* | *$4,027* | *$3,962* | *$3,931* | *$3,931* | *$3,946* | *$3,978* | *$4,010* |
| | | | | | | | | | | | |
| Book Value of Working Capital | | | $63 | $88 | $125 | $156 | $172 | $189 | $208 | $229 | $233 |
| Total Capital Invested in Project | $2,500 | $3,450 | $4,275 | $4,582 | $4,452 | $4,368 | $4,302 | $4,270 | $4,254 | $4,257 | $4,243 |

12.5% of book
value at end of
prior year
($3,000)

# Step 1: Estimate Accounting Earnings on Project



| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Magic Kingdom - Revenues | | $0 | $1,000 | $1,400 | $1,700 | $2,000 | $2,200 | $2,420 | $2,662 | $2,928 | $2,987 |
| Epcot Rio - Revenues | | $0 | $0 | $0 | $300 | $500 | $550 | $605 | $666 | $732 | $747 |
| Resort & Properties - Revenues | | $0 | $250 | $350 | $500 | $625 | $688 | $756 | $832 | $915 | $933 |
| **Total Revenues** | | | **$1,250** | **$1,750** | **$2,500** | **$3,125** | **$3,438** | **$3,781** | **$4,159** | **$4,575** | **$4,667** |
| Magic Kingdom – Direct Expenses | | $0 | $600 | $840 | $1,020 | $1,200 | $1,320 | $1,452 | $1,597 | $1,757 | $1,792 |
| Epcot Rio – Direct Expenses | | $0 | $0 | $0 | $180 | $300 | $330 | $363 | $399 | $439 | $448 |
| Resort & Property – Direct Expenses | | $0 | $188 | $263 | $375 | $469 | $516 | $567 | $624 | $686 | $700 |
| **Total Direct Expenses** | | | **$788** | **$1,103** | **$1,575** | **$1,969** | **$2,166** | **$2,382** | **$2,620** | **$2,882** | **$2,940** |
| Depreciation & Amortization | | $50 | $425 | $469 | $444 | $372 | $367 | $364 | $364 | $366 | $368 |
| Allocated G&A Costs | | $0 | $188 | $263 | $375 | $469 | $516 | $567 | $624 | $686 | $700 |
| **Operating Income** | | **-$50** | **-$150** | **-$84** | **$106** | **$315** | **$389** | **$467** | **$551** | **$641** | **$658** |
| Taxes | | -$18 | -$54 | -$30 | $38 | $114 | $141 | $169 | $199 | $231 | $238 |
| **Operating Income after Taxes** | | -$32 | -$96 | -$54 | $68 | $202 | $249 | $299 | $352 | $410 | $421 |