

# 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, and 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.

# 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
<b>Total Revenues</b>			<b>\$1,250</b>	<b>\$1,750</b>	<b>\$2,500</b>	<b>\$3,125</b>	<b>\$3,438</b>	<b>\$3,781</b>	<b>\$4,159</b>	<b>\$4,575</b>	<b>\$4,667</b>
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
<b>Total Direct Expenses</b>			<b>\$788</b>	<b>\$1,103</b>	<b>\$1,575</b>	<b>\$1,969</b>	<b>\$2,166</b>	<b>\$2,382</b>	<b>\$2,620</b>	<b>\$2,882</b>	<b>\$2,940</b>
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
<b>Operating Income</b>		<b>-\$50</b>	<b>-\$150</b>	<b>-\$84</b>	<b>\$106</b>	<b>\$315</b>	<b>\$389</b>	<b>\$467</b>	<b>\$551</b>	<b>\$641</b>	<b>\$658</b>
Taxes		-\$18	-\$54	-\$30	\$38	\$114	\$141	\$169	\$199	\$231	\$238
<b>Operating Income after Taxes</b>		<b>-\$32</b>	<b>-\$96</b>	<b>-\$54</b>	<b>\$68</b>	<b>\$202</b>	<b>\$249</b>	<b>\$299</b>	<b>\$352</b>	<b>\$410</b>	<b>\$421</b>

Direct expenses: 60% of revenues for theme parks, 75% of revenues for resort properties

Allocated G&A: Company G&A allocated to project, based on projected revenues. Two thirds of expense is fixed, rest is variable.

Taxes: Based on marginal tax rate of 36.1%

# And the Accounting View of Return

Year	After-tax Operating Income	BV of pre-project investment	BV of fixed assets	BV of Working capital	BV of Capital	Average BV of Capital	ROC(a)	ROC(b)
0		500	2000	0	\$2,500			
1	-\$32	\$450	\$3,000	\$0	\$3,450	\$2,975	-1.07%	-1.28%
2	-\$96	\$400	\$3,813	\$63	\$4,275	\$3,863	-2.48%	-2.78%
3	-\$54	\$350	\$4,145	\$88	\$4,582	\$4,429	-1.22%	-1.26%
4	\$68	\$300	\$4,027	\$125	\$4,452	\$4,517	1.50%	1.48%
5	\$202	\$250	\$3,962	\$156	\$4,368	\$4,410	4.57%	4.53%
6	\$249	\$200	\$3,931	\$172	\$4,302	\$4,335	5.74%	5.69%
7	\$299	\$150	\$3,931	\$189	\$4,270	\$4,286	6.97%	6.94%
8	\$352	\$100	\$3,946	\$208	\$4,254	\$4,262	8.26%	8.24%
9	\$410	\$50	\$3,978	\$229	\$4,257	\$4,255	9.62%	9.63%
10	\$421	\$0	\$4,010	\$233	\$4,243	\$4,250	9.90%	9.89%
Average							4.18%	4.11%

- (a) Based upon book capital at the start of each year  
 (b) Based upon average book capital over the year

# Estimating a hurdle rate for Rio Disney

- We did estimate a cost of capital of 6.61% for the Disney theme park business, using a bottom-up levered beta of 0.7537 for the business.
- This cost of equity may not adequately reflect the additional risk associated with the theme park being in an emerging market.
- The only concern we would have with using this cost of equity for this project is that it may not adequately reflect the additional risk associated with the theme park being in an emerging market (Brazil). We first computed the Brazil country risk premium (by multiplying the default spread for Brazil by the relative equity market volatility) and then re-estimated the cost of equity:
  - Country risk premium for Brazil = 5.5% + 3% = 8.5%
  - Cost of Equity in US\$ = 2.75% + 0.7537 (8.5%) = 9.16%
- Using this estimate of the cost of equity, Disney's theme park debt ratio of 10.24% and its after-tax cost of debt of 2.40% (see chapter 4), we can estimate the cost of capital for the project:
  - Cost of Capital in US\$ = 9.16% (0.8976) + 2.40% (0.1024) = 8.46%

# Would lead us to conclude that...

- Do not invest in this park. The return on capital of 4.18% is lower than the cost of capital for theme parks of 8.46%; This would suggest that the project should not be taken.
- Given that we have computed the average over an arbitrary period of 10 years, while the theme park itself would have a life greater than 10 years, would you feel comfortable with this conclusion?
  - ▣ Yes
  - ▣ No

# A Tangent: From New to Existing Investments: ROC for the entire firm

How “good” are the existing investments of the firm?

Assets		Liabilities	
Existing Investments Generate cashflows today Includes long lived (fixed) and short-lived (working capital) assets	Assets in Place	Debt	Fixed Claim on cash flows Little or No role in management <i>Fixed Maturity</i> <i>Tax Deductible</i>
Expected Value that will be created by future investments	Growth Assets	Equity	Residual Claim on cash flows Significant Role in management <i>Perpetual Lives</i>

Measuring ROC for existing investments..

Company	EBIT (1-t)	BV of Debt	BV of Equity	Cash	BV of Capital	Return on Capital	Cost of Capital	ROC - Cost of Capital
Disney	\$6,920	\$16,328	\$41,958	\$3,387	\$54,899	12.61%	7.81%	4.80%
Vale	\$12,432	\$49,246	\$75,974	\$5,818	\$119,402	10.41%	8.20%	2.22%
Baidu	¥9,111	¥13,561	¥27,215	¥10,456	¥30,320	30.05%	12.42%	17.63%
Tata Motors	120,905₹	471,489₹	330,056₹	225,562₹	575,983₹	20.99%	11.44%	9.55%
Bookscape	\$1,775	\$12,136	\$8,250	\$1,250	\$19,136	9.28%	10.30%	-1.02%

# Old wine in a new bottle.. Another way of presenting the same results...

- The key to value is earning excess returns. Over time, there have been attempts to restate this obvious fact in new and different ways. For instance, Economic Value Added (EVA) developed a wide following in the the 1990s:
- $EVA = (ROC - \text{Cost of Capital}) \times (\text{Book Value of Capital Invested})$
- The excess returns for the four firms can be restated as follows:

Company	ROC - Cost of Capital	BV of Capital	EVA
Disney	4.80%	\$54,899	\$2,632
Vale	2.22%	\$119,402	\$2,645
Baidu	17.63%	\$30,320	\$5,347
Deutsche Bank	NMF	NMF	NMF
Tata Motors	9.55%	\$575,983	\$55,033
Bookscape	-1.02%	\$19,136	-\$195

# Application Test: Assessing Investment Quality

- For the most recent period for which you have data, compute the after-tax return on capital earned by your firm, where after-tax return on capital is computed to be
- $\text{After-tax ROC} = \text{EBIT} (1 - \text{tax rate}) / (\text{BV of debt} + \text{BV of Equity-Cash})_{\text{previous year}}$
- For the most recent period for which you have data, compute the return spread earned by your firm:
- $\text{Return Spread} = \text{After-tax ROC} - \text{Cost of Capital}$
- For the most recent period, compute the EVA earned by your firm

$$\text{EVA} = \text{Return Spread} * ((\text{BV of debt} + \text{BV of Equity-Cash})_{\text{previous year}})$$

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# The cash flow view of this project..

	0	1	2	3	4	5	6	7	8	9	10
After-tax Operating Income		-\$32	-\$96	-\$54	\$68	\$202	\$249	\$299	\$352	\$410	\$421
+ Depreciation & Amortization	\$0	\$50	\$425	\$469	\$444	\$372	\$367	\$364	\$364	\$366	\$368
- Capital Expenditures	\$2,500	\$1,000	\$1,188	\$752	\$276	\$258	\$285	\$314	\$330	\$347	\$350
- Change in non-cash Work Capital		\$0	\$63	\$25	\$38	\$31	\$16	\$17	\$19	\$21	\$5
Cashflow to firm	(\$2,500)	(\$982)	(\$921)	(\$361)	\$198	\$285	\$314	\$332	\$367	\$407	\$434

To get from income to cash flow, we

- I. added back all non-cash charges such as depreciation. Tax benefits:

	1	2	3	4	5	6	7	8	9	10
Depreciation	\$50	\$425	\$469	\$444	\$372	\$367	\$364	\$364	\$366	\$368
Tax Bendfits from Depreciation	\$18	\$153	\$169	\$160	\$134	\$132	\$132	\$132	\$132	\$133

- II. subtracted out the capital expenditures
- III. subtracted out the change in non-cash working capital

# The incremental cash flows on the project

	0	1	2	3	4	5	6	7	8	9	10
After-tax Operating Income		-\$32	-\$96	-\$54	\$68	\$202	\$249	\$299	\$352	\$410	\$421
+ Depreciation & Amortization	\$0	\$50	\$425	\$469	\$444	\$372	\$367	\$364	\$364	\$366	\$368
- Capital Expenditures	\$2,500	\$1,000	\$1,188	\$752	\$276	\$258	\$285	\$314	\$330	\$347	\$350
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Cashflow to firm	(\$2,500)	(\$982)	(\$921)	(\$361)	\$198	\$285	\$314	\$332	\$367	\$407	\$434
+ Pre-project investment (sunk)	\$500										
- Pre-project Depreciation * tax rate		\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18	\$18
+ Non-incremental Allocated Expense (1-t)		\$0	\$80	\$112	\$160	\$200	\$220	\$242	\$266	\$292	\$298
Incremental Cash flow to the firm	(\$2,000)	(\$1,000)	(\$860)	(\$267)	\$340	\$467	\$516	\$555	\$615	\$681	\$715

\$ 500 million has already been spent & \$ 50 million in depreciation will exist anyway

2/3rd of allocated G&A is fixed.  
Add back this amount (1-t)  
Tax rate = 36.1%

# To Time-Weighted Cash Flows

- Net Present Value (NPV): The net present value is the sum of the present values of all cash flows from the project (including initial investment).
  - ▣ NPV = Sum of the present values of all cash flows on the project, including the initial investment, with the cash flows being discounted at the appropriate hurdle rate (cost of capital, if cash flow is cash flow to the firm, and cost of equity, if cash flow is to equity investors)
  - ▣ Decision Rule: Accept if  $NPV > 0$
- Internal Rate of Return (IRR): The internal rate of return is the discount rate that sets the net present value equal to zero. It is the percentage rate of return, based upon incremental time-weighted cash flows.
  - ▣ Decision Rule: Accept if  $IRR > \text{hurdle rate}$

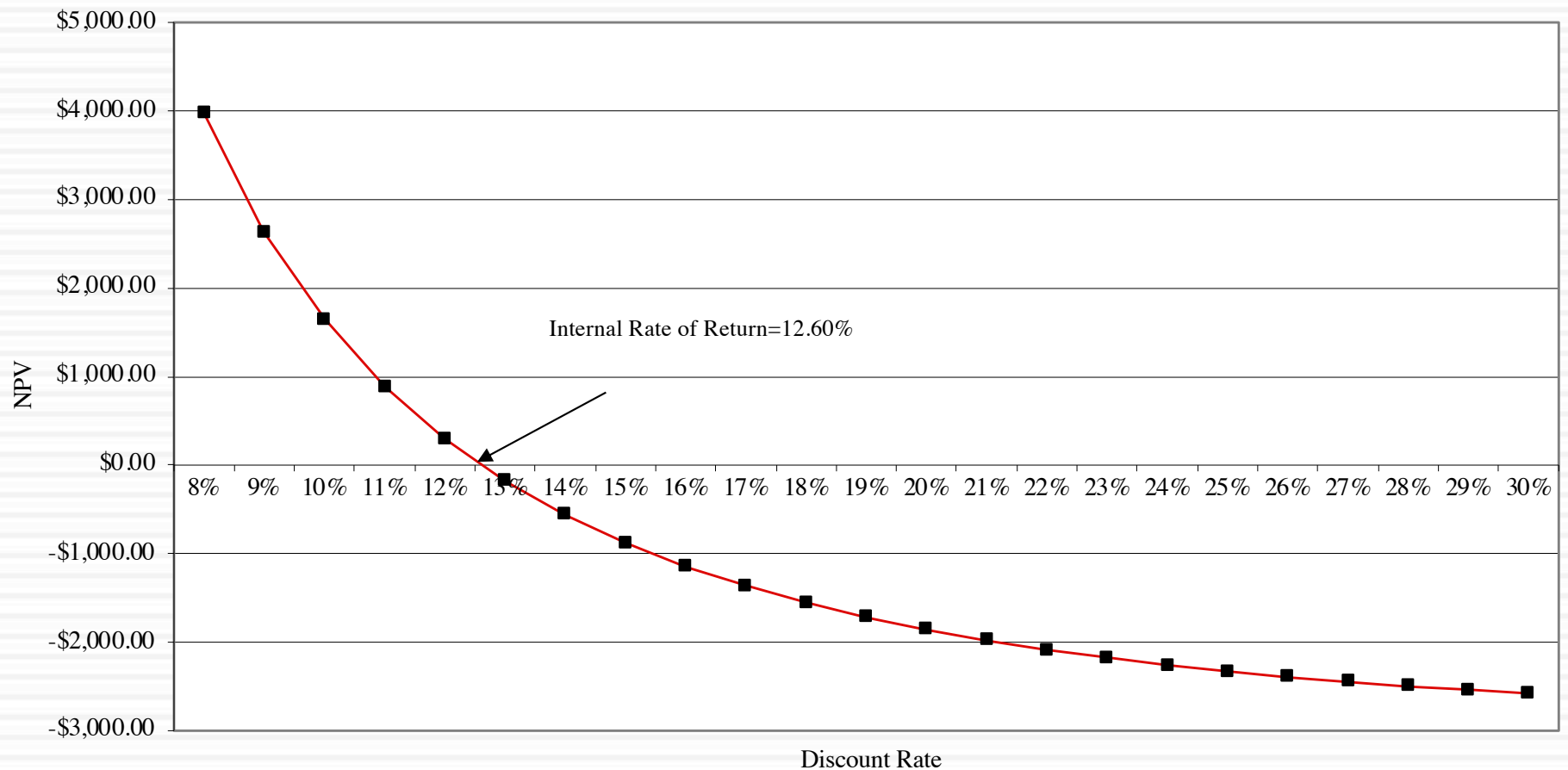
# Closure on Cash Flows

- In a project with a finite and short life, you would need to compute a salvage value, which is the expected proceeds from selling all of the investment in the project at the end of the project life. It is usually set equal to book value of fixed assets and working capital
- In a project with an infinite or very long life, we compute cash flows for a reasonable period, and then compute a terminal value for this project, which is the present value of all cash flows that occur after the estimation period ends..
- Assuming the project lasts forever, and that cash flows after year 10 grow 2% (the inflation rate) forever, the present value at the end of year 10 of cash flows after that can be written as:
  - Terminal Value in year 10 =  $CF \text{ in year 11} / (\text{Cost of Capital} - \text{Growth Rate})$   
 $= 715 (1.02) / (.0846 - .02) = \$ 11,275 \text{ million}$

# Which yields a NPV of..

Year	Annual Cashflo	Terminal Value	Present Value
0	-\$2,000		-\$2,000
1	-\$1,000		-\$922
2	-\$859		-\$730
3	-\$267		-\$210
4	\$340		\$246
5	\$466		\$311
6	\$516		\$317
7	\$555		\$314
8	\$615		\$321
9	\$681		\$328
10	\$715	\$11,275	\$5,321
			\$3,296

# The IRR of this project



# Does the currency matter?

- The analysis was done in dollars. Would the conclusions have been any different if we had done the analysis in Brazilian Reais?
  - a. Yes
  - b. No

# Disney Theme Park: \$R NPV

Expected Exchange Rate<sub>t</sub>  
= Exchange Rate today \* (1.09/1.02)<sup>t</sup>

Discount at \$R cost of capital  
= (1.0846) (1.09/1.02) – 1 = 15.91%

Year	Cashflow (\$)	\$R/\$	Cashflow (\$R)	Present Value
0	-R\$ 2,000.00	R\$ 2.35	-R\$ 4,700.00	-R\$ 4,700.00
1	-R\$ 1,000.00	R\$ 2.51	-R\$ 2,511.27	-R\$ 2,166.62
2	-R\$ 859.03	R\$ 2.68	-R\$ 2,305.29	-R\$ 1,715.95
3	-R\$ 267.39	R\$ 2.87	-R\$ 766.82	-R\$ 492.45
4	R\$ 340.22	R\$ 3.06	R\$ 1,042.63	R\$ 577.68
5	R\$ 466.33	R\$ 3.27	R\$ 1,527.21	R\$ 730.03
6	R\$ 516.42	R\$ 3.50	R\$ 1,807.31	R\$ 745.36
7	R\$ 555.08	R\$ 3.74	R\$ 2,075.89	R\$ 738.63
8	R\$ 614.95	R\$ 4.00	R\$ 2,457.65	R\$ 754.45
9	R\$ 681.46	R\$ 4.27	R\$ 2,910.36	R\$ 770.81
10	R\$ 11,989.85	R\$ 4.56	R\$ 54,719.84	R\$ 12,503.50
				R\$ 7,745.43

NPV = R\$ 7,745/2.35= \$ 3,296 Million  
NPV is equal to NPV in dollar terms

# Uncertainty in Project Analysis: What can we do?

- Based on our expected cash flows and the estimated cost of capital, the proposed theme park looks like a very good investment for Disney. Which of the following may affect your assessment of value?
  - a. Revenues may be over estimated (crowds may be smaller and spend less)
  - b. Actual costs may be higher than estimated costs
  - c. Tax rates may go up
  - d. Interest rates may rise
  - e. Risk premiums and default spreads may increase
  - f. All of the above
- How would you respond to this uncertainty?
  - a. Will wait for the uncertainty to be resolved
  - b. Will not take the investment
  - c. Ignore it.
  - d. Other

# One simplistic solution: See how quickly you can get your money back...

- If your biggest fear is losing the billions that you invested in the project, one simple measure that you can compute is the number of years it will take you to get your money back.

Year	Cash Flow	Cumulated CF	PV of Cash Flow	Cumulated DCF
0	-\$2,000	-\$2,000	-\$2,000	-\$2,000
1	-\$1,000	-\$3,000	-\$922	-\$2,922
2	-\$859	-\$3,859	-\$730	-\$3,652
3	-\$267	-\$4,126	-\$210	-\$3,862
4	\$340	-\$3,786	\$246	-\$3,616
5	\$466	-\$3,320	\$311	-\$3,305
6	\$516	-\$2,803	\$317	-\$2,988
7	\$555	-\$2,248	\$314	-\$2,674
8	\$615	-\$1,633	\$321	-\$2,353
9	\$681	-\$952	\$328	-\$2,025
10	\$715	-\$237	\$317	-\$1,708
11	\$729	\$491	\$298	-\$1,409
12	\$743	\$1,235	\$280	-\$1,129
13	\$758	\$1,993	\$264	-\$865
14	\$773	\$2,766	\$248	-\$617
15	\$789	\$3,555	\$233	-\$384
16	\$805	\$4,360	\$219	-\$165
17	\$821	\$5,181	\$206	\$41

Payback = 10.3 years →

Discounted Payback  
= 16.8 years

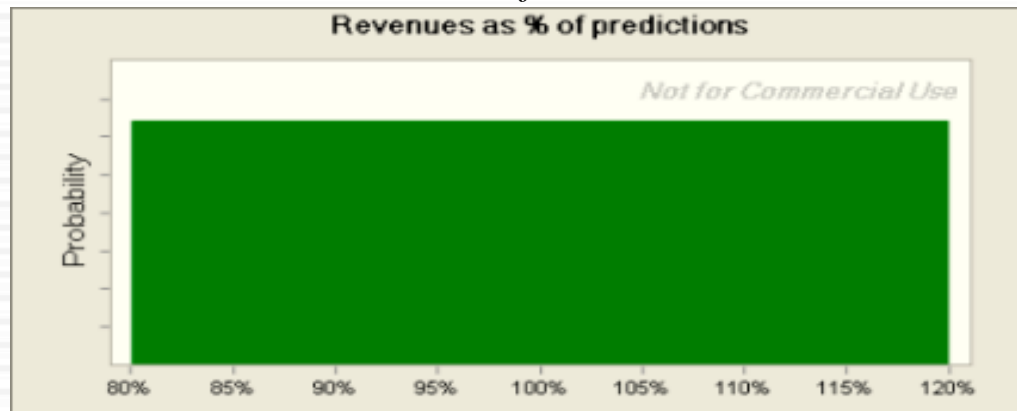
# A slightly more sophisticated approach: Sensitivity Analysis & What-if Questions...

- The NPV, IRR and accounting returns for an investment will change as we change the values that we use for different variables.
- One way of analyzing uncertainty is to check to see how sensitive the decision measure (NPV, IRR..) is to changes in key assumptions. While this has become easier and easier to do over time, there are caveats that we would offer.
- Caveat 1: When analyzing the effects of changing a variable, we often hold all else constant. In the real world, variables move together.
- Caveat 2: The objective in sensitivity analysis is that we make better decisions, not churn out more tables and numbers.
  - Corollary 1: Less is more. Not everything is worth varying...
  - Corollary 2: A picture is worth a thousand numbers (and tables).

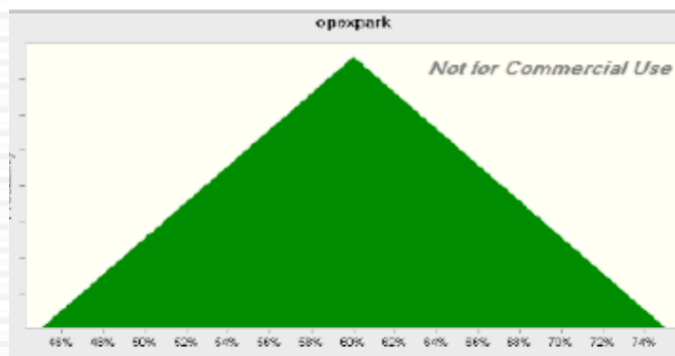


# The final step up: Incorporate probabilistic estimates.. Rather than expected values..

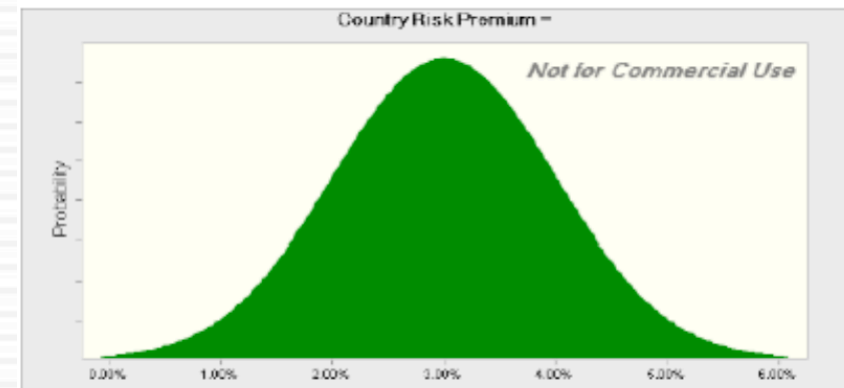
*Actual Revenues as % of Forecasted Revenues (Base case = 100%)*



*Operating Expenses at Parks as % of Revenues (Base Case = 60%)*



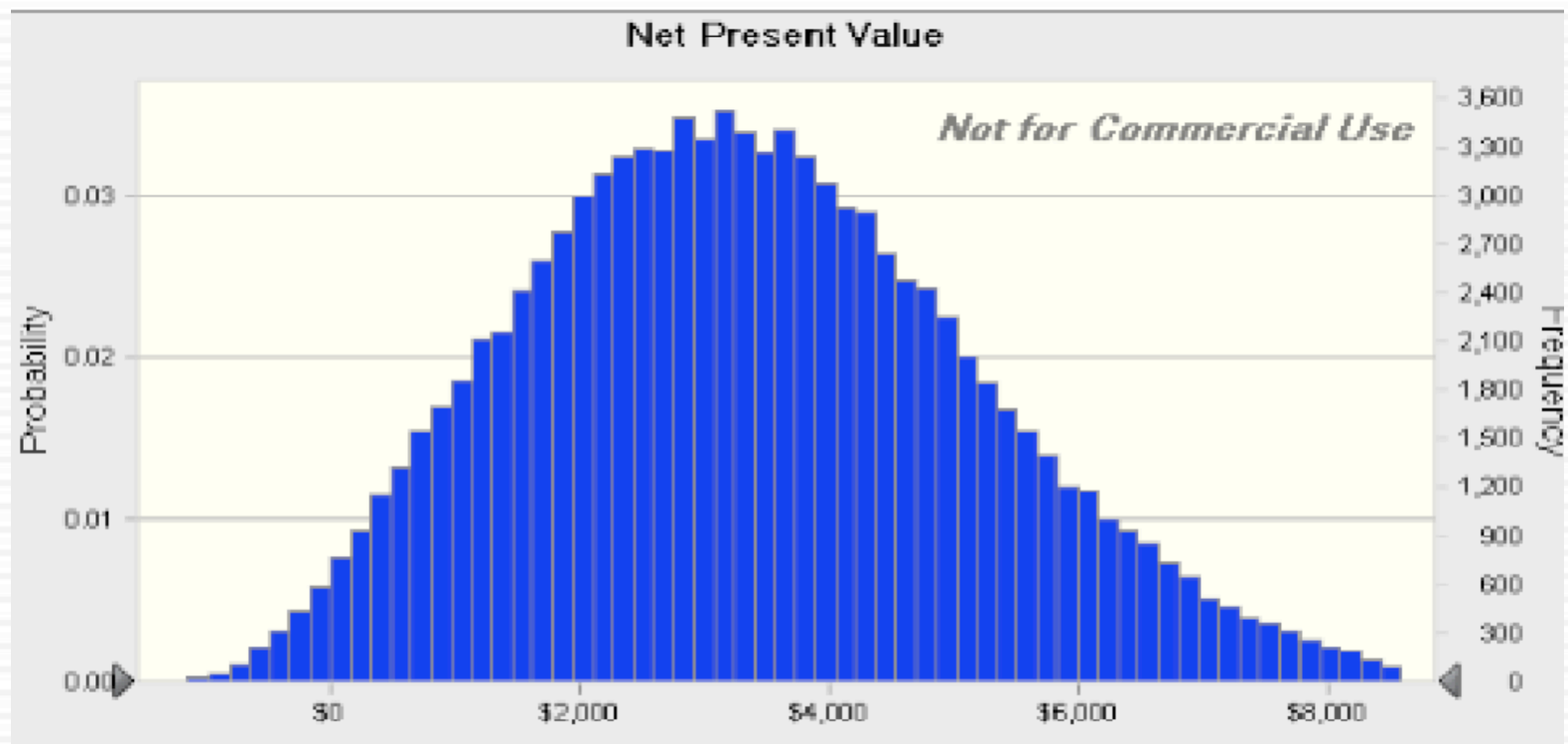
*Country Risk Premium (Base Case = 3% (Brazil))*



# The resulting simulation...

Average = \$3.40 billion

Median = \$3.28 billion



NPV ranges from -\$1 billion to +\$8.5 billion. NPV is negative 12% of the time.

## A side bar: Should you hedge risks?

- Disney can reduce the risk in this project by hedging against exchange rate risk. Should it?
  - a. Yes
  - b. No
  - c. Maybe

