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
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

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

	A. C							
	After-tax	BV of pre-	BV of	BV of Warking	DV of	Average		
	Operating	project	nxea	working	BVOI	BV OF		
Year	Income	investment	assets	capital	Capital	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

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(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



Measuring ROC for existing investments..

			BV of		BV of	Return on	Cost of	ROC - Cost
Company	EBIT(1-t)	BV of Debt	Equity	Cash	Capital	Capital	Capital	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 Cost of Capital) (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
- After-tax ROC = EBIT (1-tax rate)/ (BV of debt + BV of Equity-Cash)previous year
- For the most recent period for which you have data, compute the return spread earned by your firm:
- Return Spread = After-tax ROC Cost of Capital
- For the most recent period, compute the EVA earned by your firm

EVA = Return Spread * ((BV of debt + BV of Equity-Cash)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 <i>,</i> 500	\$1,000	\$1,188	\$752	\$276	\$258	\$285	\$314	\$330	\$347	\$350
- Change in non-cash Working 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
+ 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 > 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 in year 11/(Cost of Capital Growth Rate) =715 (1.02) /(.0846-.02) = \$ 11,275 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

Discounted at Rio Disney cost of capital of 8.46%

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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, Discount at \$R cost of capital = Exchange Rate today $* (1.09/1.02)^{t}$ = (1.0846) (1.09/1.02) - 1 = 15.91%Cashflow (\$) \$R/\$ Cashflow (\$R) Present Value Year 0 -R\$ 2,000.00 R\$ 2.35 -R\$ 4,700.00 -R\$ 4,700.00 -R\$ 1,000.00 R\$ 2.51 -R\$ 2,511.27 -R\$ 2,166.62 1 -R\$ 859.03 2 R\$ 2.68 -R\$ 2,305.29 -R\$ 1,715.95 3 -R\$ 267.39 R\$ 2.87 -R\$ 766.82 -R\$ 492.45 R\$ 340.22 R\$ 3.06 R\$ 1,042.63 R\$ 577.68 4 R\$ 466.33 R\$ 3.27 R\$ 1,527.21 R\$ 730.03 5 R\$ 745.36 6 R\$ 516.42 R\$ 3.50 R\$ 1,807.31 R\$ 2,075.89 R\$ 738.63 R\$ 555.08 R\$ 3.74 7 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 Aswath Damodaran NPV is equal to NPV in dollar terms 137

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.

	the second se				
, 5	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
Death a shall 10.2 see and	10	\$715	-\$237	\$317	-\$1,708
Payback = 10.3 years	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
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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.
- <u>Caveat 1</u>: When analyzing the effects of changing a variable, we often hold all else constant. In the real world, variables move together.
- <u>Caveat 2</u>: 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).

And here is a really good picture...



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



The resulting simulation...

Average = \$3.40 billion Median = \$3.28 billion



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

