

## Teaching Case Study to Finance Majors: A Class Room Experience

Raj K. Kohli

In recent years, case study has become an extremely important component of the class room teaching. The employers are looking at the prospective employee's capability of handling a situation that arises during a real practical problem (case study) in the work place.

### PART I

This project is continuation of my work at Indiana University South Bend that exposes finance majors to the corporate finance case study and integrates the case analysis to the technology. This course, called, *Applications in Financial Management*, has become a CAPSTONE course at our school and is taught in a computer lab.

This is a non structured class that does not consist of any lectures. Finance students solve and present Corporate Finance Cases on many topics throughout the semester. Number of students graduating with finance degree from IUSB fluctuates from fifteen to twenty each year, so this course is taught only during Spring Semester. Students work in a group of two, three or four students (depending on the class size) for each case. In order to make sure that student can work with different people (team working), students are assigned to different groups for each round of case presentation in the beginning of the semester. Once the groups are formed, they are assigned the cases to be presented during the entire semester. In general, each group presents about five cases during the semester.

To start the ball rolling, professor presents the very first case of the semester. Starting from scratch, the professor solves a case using spreadsheet and power point presentation (in the class) taking about two weeks. This helps the students in understanding and knowing the expectations from the presentation.

A group of students is responsible for completely solving the case and presenting it to the class on scheduled dates in the semester. The students are required to solve a Corporate Finance case using their knowledge of various concepts in finance from other courses, such as Investments, Financial Management, and Money & Banking. Some of the topics case topics are as follows: Cash Flow Estimation, Risk and Rate of Return, Risk Adjusted Cost of Capital and Divisional Hurdle Rates, Financial Forecasting, Working Capital Policy and Financing, Lease Analysis, Bond Refunding, Mergers and Acquisition, and valuing a New Venture. In general, two to three cases are covered from each topic.

Although students are given guidelines and clues, but they actually work themselves in solving the assigned case from a finance point of view. And, more importantly, they have to prepare a comprehensive spreadsheet showing solution to all numerical questions of a case. The spreadsheet includes various worksheets interlinked. Students are allowed to enter any input variable only one time in the spreadsheet. One of the important cases is completing a capital budgeting case.

### PART II

This is the most important part in integrating the computers in an Upper-Level Finance Course. Students have gathered all the knowledge required to solve the case in part I. Now, they are required to prepare an extensive, detailed and accurate spreadsheets model to solve the case. \_

-----  
Raj K. Kohli is a Professor of Finance at Indiana University South Bend.

The spreadsheet model is graded according to the thoroughness, completeness, and its accuracy. Students are instructed to prepare the spreadsheet models so that any information is entered only once in the model. In order to explain it further, let us examples from three different types of Corporate Finance Cases. Please note that students complete identical work as shown in the following three cases as an example.

### **A) Capital Budgeting Case**

This is a complete budgeting case that requires estimation of cash flows, NPV, IRR, MIRR, and Payback Period computation. I have picked selected questions from this case to show the importance of the spreadsheet in class room.

#### Question 5

Estimate the project's operating cash flows. (Hint: Again, use Table A<sup>1</sup> as a guide.) What are the project's NPV, IRR, modified IRR (MIRR), and payback? Should the project be undertaken? [Remember: The MIRR is found in three steps: (1) compound all cash flows forward to the terminal year at the cost of capital, (2) sum the compounded cash inflows to obtain the terminal value of the inflows, and (3) find the discount rate which forces the present value of the terminal value to equal to the present value of the net investment outlays. This discount rate is defined as the MIRR.]

#### Question 8

Now assume that the sales price will increase by the 5 percent inflation rate beginning after Year 0. However, assume that cash operating costs will increase by only 2 percent annually from the initial cost estimate, because over half of the costs are fixed by long-term contracts. For simplicity, assume that no other cash flows (net externality costs, salvage value, or net working capital) are affected by inflation. What are project's NPV, IRR, MIRR, and payback with inflation taken into account? (Hint: The Year 1 cash flows, as well as succeeding cash flows, must be adjusted for inflation because the original estimates were in Year 0 dollars.)

As you may see that the only difference in questions five and eight is the inflation rates for price and cost. Therefore, we see that spreadsheet solution in table I (for question 5) and in table II (for question 8) are almost identical. The spreadsheet answers to these two questions reinforce the importance of using computers in solving financial cases. Once students have accurately prepared spreadsheet model for question five, the model can be modified to answer the question eight within less than a minute.

Table I and Table II below show the complete spreadsheet models for questions 5 and 8 respectively.

---

<sup>1</sup>Table A is in the case and is an incomplete version of Table 1.

Table I  
Capital Budgeting Case (Question 5)  
Input Variables Are Shown in the Shaded Area

	A	B	C	D	E	F	G	H	I
1									
2									
3	Net Investment	Dep. Basis				End of year BV	Note: +Sum(b6:b9)		
4	Price	\$500,000	MACRS %	Dep. Expense	\$570,000	Note: +f6-a7			
5	Freight	\$20,000	Year 1 33.00%	\$188,100	\$381,900				
6	Installation	\$50,000	Year 2 45.00%	\$256,500	\$125,400				
7	Change in NWC	\$10,000	Year 3 15.00%	\$85,500	\$39,900				
8			Year 4 7.00%	\$39,900	\$0				
9	Unit Sales	425,000				Note: +d5*d7			
10	Unit Price	\$2.00							
11	Oper. costs	\$1.50							
12	Other Project effects	\$20,000							
13	Tax rate	40.00%							
14	Salvage value	\$100,000							
15	cost of capital	10.00%							
16	Price Inflation	0.00%							
17	Cost Inflation	0.00%	Note: +b512*(1+b518)						
18									
19	Cash Flow Statements:								
20		Year 0	Year 1	Year 2	Year 3	Year 4			
21	Unit Price	\$2.00	\$2.00	\$2.00	\$2.00	\$2.00	Note: +b511		
22	Unit Sales	425,000	425,000	425,000	425,000	425,000	Note: +f23*f24		
23	Revenues	850,000	850,000	850,000	850,000	850,000	Note: +c526*(1+b519)^4		
24	Opr. Costs	1.50	1.50	1.50	1.50	1.50	Note: +f24*f26		
25	Operating costs	637,500	637,500	637,500	637,500	637,500	Note: +e10 transposed		
26	depreciation	188,100	256,500	85,500	39,900		Note: +b14		
27	Other Project effects	20,000	20,000	20,000	20,000		Note: +f25-sum(f27:f29)		
28	BT Income	4,400	(64,000)	107,000	152,600		Note: +f30*b515		
29	Taxes	1,760	(25,600)	42,800	61,040		Note: +f27		
30	Net Income	2,640	(38,400)	64,200	91,560		+f32+f33		
31	Add back depreciation	188,100	256,500	85,500	39,900		+b16		
32	Net Op.cash flows	190,740	218,100	149,700	131,460		+(f35-f10)*b515		
33	Salvage value				\$100,000		+b9		
34	SV tax				\$40,000		+f35-f36+f37		
35	Recovery of NWC				\$10,000		+f34+f38		
36	Termination cash flows				\$70,000		+e40+f39		
37	Project's NCF	(\$580,000)	\$190,740	\$218,100	\$149,700	\$201,460			
38	Cumulative Cash Flows	(\$580,000)	(\$389,260)	(\$171,160)	(\$21,460)	\$180,000			
39			+npv(b17,c39:f39)+b39						
40				+irr(b39:f39)					
41	NPV	\$23,719.65							
42	IRR	11.90%		+mirr(b9:f39,b17,b17)					
43	MIRR	11.11%							
44	Payback period=	3.10652							

Table II  
 Capital Budgeting Case (Question 8)  
 Input Variables Are Shown in the Shaded Area

	A	B	C	D	E	F	G	H	I
1									
2									
3	Net Investment		Dep. Basis			End of year BV	Note: +Sum(b6:b9)		
4	Price	\$500,000		MACRS %	Dep. Expense	\$570,000	Note: +f6-e7		
5	Freight	\$20,000	Year 1	33.00%	\$188,100	\$381,900			
6	Installation	\$50,000	Year 2	45.00%	\$256,500	\$125,400			
7	Change in NWC	\$10,000	Year 3	15.00%	\$85,500	\$39,900			
8			Year 4	7.00%	\$39,900	\$0			
9	Unit Sales	425,000					Note: +d45*d7		
10	Unit Price	\$2.00							
11	Oper. costs	\$1.60							
12	Other Project effects	\$20,000							
13	Tax rate	40.00%							
14	Salvage value	\$100,000							
15	cost of capital	10.00%							
16	Price Inflation	5.00%							
17	Cost Inflation	2.00%							
18									
19	Cash Flow Statements:								
20		Year 0	Year 1	Year 2	Year 3	Year 4			
21	Unit Price		\$2.10	\$2.21	\$2.32	\$2.43	+b511	Note: +f23*f24	Note: +c526*(1-b519)^4
22	Unit Sales		425,000	425,000	425,000	425,000	Note: +f24*f26	Note: +e10 transposed	Note: +f24*f26
23	Revenues		892,500	937,125	983,981	1,033,180	Note: +b14	Note: +f25-sum(f27:f29)	Note: +f30-f31
24	Opr. Costs		1.53	1.56	1.59	1.62	Note: +f27	Note: +f30-f31	Note: +f32+f33
25	Operating costs		650,250	663,255	676,520	690,051	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
26	depreciation		188,100	256,500	85,500	39,900	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
27	Other Project effects		20,000	20,000	20,000	20,000	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
28	BT Income		34,150	(2,630)	201,961	283,230	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
29	Taxes		13,660	(1,052)	80,784	113,292	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
30	Net income		20,490	(1,578)	121,177	169,938	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
31	Add back depreciation		188,100	256,500	85,500	39,900	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
32	Net Op.cash flows		208,590	254,922	206,677	209,838	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
33	Salvage value					\$100,000	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
34	SV tax					\$40,000	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
35	Recovery of NWC					\$10,000	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
36	Termination cash flows					\$70,000	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
37	Project's NCF	(\$580,000)	\$208,590	\$254,922	\$206,677	\$279,838	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
38	Cumulative Cash Flows	(\$580,000)	(\$371,410)	(\$116,488)	\$90,189	\$370,027	Note: +f30-f31	Note: +f32+f33	Note: +f32+f33
39									
40									
41	NPV	\$166,718.91							
42	IRR	22.21%							
43	MIRR	17.17%							
44	Payback period=	2.56362							

**B) Valuation Case**

Another simple case is bond and stock valuation. Here again students first solve the case and then create a spreadsheet template to show their analytical work. Again, I have picked selected questions from this case.

Question 1: (Bond Question) Suppose you buy 5 years, 10-years and 15-years bonds at par with 10 percent coupon payment, what happens to the bonds prices when interest rates go up to 13 percent? Use semi-annual compounding.

Question 2: (Preferred Stock Question) Suppose Series F with a \$1,000 par value preferred stock and a 9.75 percent cumulative dividend, has a mandatory sinking fund provision. 60,000 of 300,000 shares outstanding must be redeemed annually at par beginning at the end of next year. If the nominal required rate of return is 8 percent, what is the current value per share?

Question 3: (Supernormal Growth Stock Question) Suppose Don Johnson Company will pay a dividend of \$1.80 next year and is going through tough periods so will have 6 percent supernormal growth period for 5 years after which it will return to 7.5 percent growth rate for ever. If the required rate of return is 13.5 percent, what is the value of a share as of today?

Table III shows a complete spreadsheet model for the selected questions from this case.

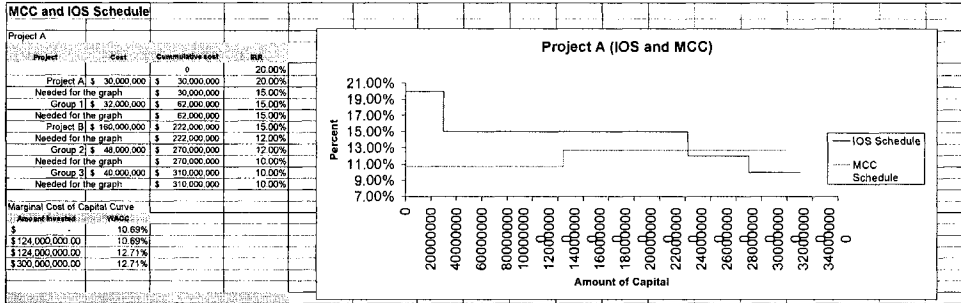
Table III  
Valuation Case  
Input Variables Are Shown in the Shaded Area

	A	B	C	D	E	F	G
1	Bond Question						
2							
3	Input Area						
4	Semi Annual Coupon payments		\$50				
5	Years to Maturity		5	15	25		
6	New Interest rates		13.00%				
7	Old Interest rates		10.00%				
8	Par Value		\$1,000				
9							
10	Output Area New Bond Prices						
11	5 Year	(\$892.17)					
12	15 Year	(\$804.12)					
13	25 Year	(\$779.13)					
14							
15	Preferred Stock Question						
16							
17	Shares to be redeemed	300000					
18	Called a year	60000					
19	Par	100					
20	Annual Dividend	\$9.75					
21	Nominal Rate	8.00%					
22	Number of years to call	5					
23							
24	Output Area						
25	Quarterly Dividend	\$2.44					
26	Nominal Qrt Rate	2.00%					
27	Percentage called	20.00%					
28							
29	Average Holding Period	3					
30		(\$104.63)					
31							
32	Common Stock Question						
33	Input Variables						
34	supernormal growth rate	0.06					
35	normal growth rate	0.075					
36	k (Required return)	0.135					
37	D <sub>1</sub>	1.8					
38							
39	Output Area						
40	dividends or Stock Price	value		PV			
41	D1	1.8000		1.5859			
42	D2	1.9080		1.4811			
43	D3	2.0225		1.3832			
44	D4	2.1438		1.2918			
45	D5	2.2725		1.2065			
46	D6	2.4429					
47	P5	40.71488196		21.6159			
48				28.5645			
49							
50							
51							

**C) Cost of Capital Case**

Table IV shows graph representing Marginal Cost of Capital (MCC) and Investment Opportunity Schedule (IOS) drawn using spreadsheet.

Table IV: MCC and IOS Graph



**PART III**

After finishing the first two parts of this project, students are required to present the case solution to the class in a professional manner. It is mandatory that they must answer all the conceptual questions in a Power Point Presentation. The spreadsheet models in the Part II must be used as a hyper link in their power point presentations.

All together, when students present a case successfully, the entire process as explained in Parts I-III is as intense as the requirements of a Financial Information System (FIS) Course. However, at IUSB, we do not offer a Financial Information System Course. But, this course has emerged as a CAPSTONE COURSE at our school.

In conclusion, while Part I of this project is intended to help students to successfully apply their knowledge of various concepts in finance to solve the Corporate Finance Cases. Part II of this project is extremely (and probably the most beneficial) to students as they integrate the concepts of finance in spreadsheet models. Part III helps them in increasing their presentation skills.

Although these exercises are more time consuming and sometimes very perplexing, but the ultimate result is the students' satisfaction and their learning.