

GLOBAL  
EDITION



# Excel Modeling in Corporate Finance

FIFTH EDITION



Craig W. Holden

ALWAYS LEARNING

PEARSON

# EXCEL<sup>®</sup> MODELING IN CORPORATE FINANCE

*Fifth Edition*

**Global Edition**

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FIGURE 10.2 Firm and Project Valuation—Cash Flows for 5 Equiv Methods.

	A	B	C	D	E	F	G	H
1	<b>FIRM AND PROJECT VALUATION</b>			<b>Five Equivalent Methods</b>				
2								
3	<b>Inputs</b>							
4	Valuation Object	<input checked="" type="radio"/> Firm <input type="radio"/> Project		1				
5	Date 0 Proj Investment or Firm Cap		\$800.00					
6	Tax Rate		40.0%					
7	Unlevered Cost of Equity Capital		10.0%					
8	Riskfree Rate=Cost of Riskfree Debt		3.0%					
9	Infinite Horizon Growth Rate		5.0%					
10	Include Infinite Horizon?	<input checked="" type="radio"/> Yes <input type="radio"/> No		1				
54		(14) Interest Expense Enter =C20 and copy across		(18) FCFE + CFD + Tax Shield Benefit Enter =C34+C67-C69 and copy across				
55		(15) - New Borrowing (Repayment) Enter =-C32 and copy across		(19) Earnings Enter =C23 and copy across				
56		(16) Interest + Less New Borrow (Repay) Enter =C65+C66 and copy across		(20) (1 - Tax Rate) * Interest Expense Enter =(1-\$B\$6)*C20 and copy across				
57		(17) Debt(t-1) * Cost of Riskfree Debt * Tax Rate Enter =B80*\$B\$8*\$B\$6 and copy across		(21) Earnings + After-tax Interest Expense Enter =C73+C74 and copy across				
58								
59								
60								
61								
62								
63	Interest		\$7.50	\$7.65	\$7.80	\$7.95	\$8.10	\$8.25
64	Less New Borrowing (Repayment)		(\$5.00)	(\$5.00)	(\$5.00)	(\$5.00)	(\$5.00)	(\$13.75)
65	Cash Flow to Debtholders (CFD)		\$2.50	\$2.65	\$2.80	\$2.95	\$3.10	(\$5.50)
66								
67	Tax Shield Benefit		\$3.00	\$3.06	\$3.12	\$3.18	\$3.24	\$3.30
68	Free Cash Flow to the Firm (FCFF)		\$98.00	\$107.00	\$119.00	\$125.00	\$137.00	\$140.50
69								
70								
71								
72	<b>Alternative Way to get FCFF</b>							
73	Earnings		\$103.50	\$112.41	\$124.32	\$130.23	\$142.14	\$178.05
74	After-tax Interest Expense		\$4.50	\$4.59	\$4.68	\$4.77	\$4.86	\$4.95
75	Net Oper. Profit After Tax (NOPAT)		\$108.00	\$117.00	\$129.00	\$135.00	\$147.00	\$183.00
76	Depreciation		\$60.00	\$60.00	\$60.00	\$60.00	\$60.00	\$60.00
77	Cash Flows from Investments		(\$70.00)	(\$70.00)	(\$70.00)	(\$70.00)	(\$70.00)	(\$102.50)
78	Free Cash Flow to the Firm (FCFF)		\$98.00	\$107.00	\$119.00	\$125.00	\$137.00	\$140.50
79								
80	Debt (D)		\$250.00	\$255.00	\$260.00	\$265.00	\$270.00	\$275.00
81	Book Value of Equity		\$550.00	\$555.00	\$560.00	\$565.00	\$570.00	\$575.00
82	Total Capital		\$800.00	\$810.00	\$820.00	\$830.00	\$840.00	\$850.00
83								
84	<b>Economic Profit</b>							
85	Net Oper. Profit After Tax (NOPAT)		\$108.00	\$117.00	\$129.00	\$135.00	\$147.00	\$183.00
86	Capital Charge		\$78.93	\$79.95	\$80.97	\$81.99	\$83.01	\$84.02
87	Economic Profit		\$29.07	\$37.05	\$48.03	\$53.01	\$63.99	\$98.98
88								
89	(22) Date 0 Proj Inv or Firm Cap - Debt Enter =B5-B80							
90								
91	(23) Debt + Book Value of Equity Enter =B80+B81 and copy across							
92								
93								
94	(24) Depreciation Enter =C18 and copy across							
95								
96	(25) Cash Flows From Investments Enter =C30 and copy across							
97								
98	(26) NOPAT + Depreciation + Cash Flow from Invest Enter =C75+C76+C77 and copy across							
99								
100								
101								
102								
103								

## 10.2 Adjusted Present Value

**Problem.** Given the cash flow streams, compute the current value of the firm and the value added by the firm using Adjusted Present Value.

**Solution Strategy.** Take the Free Cash Flow to the Firm and discount at the Unlevered Cost of Equity Capital to obtain the Value of the Unlevered Firm. Take the Tax Shield Benefit and discount at the Cost of Riskfree Debt to obtain the Value of the Tax Shield. Sum the Value of the Unlevered Firm and the Value of the Tax Shield to get the Value of the Firm. Subtract Date 0 Capital to get the Value Added by the Firm.

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FIGURE 10.3 Firm and Project Valuation – Adjusted Present Value.

	A	B	C	D	E	F	G	H
1	FIRM AND PROJECT VALUATION			Five Equivalent Methods				
2								
3	Inputs							
4	Valuation Object	<div>Valuation Object</div> <div><input checked="" type="radio"/> Firm <input type="radio"/> Project</div>		1				
5	Date 0 Proj Investment or Firm Cap		\$800.00					
6	Tax Rate		40.0%					
7	Unlevered Cost of Equity Capital		10.0%					
8	Riskfree Rate=Cost of Riskfree Debt		3.0%					
9	Infinite Horizon Growth Rate		5.0%					
10	Include Infinite Horizon?	<div>Infinite Horizon</div> <div><input checked="" type="radio"/> Yes <input type="radio"/> No</div>		1				
106	(33) Free Cash Flow to the Firm Enter =C78 and copy across			(35) Tax Shield Benefit Enter =C69 and copy across				
107								
108								
109	(34) (FCFF(t) + Value of the Unlevered Firm(t)) / (1 + Unlevered Cost of Equity Capital) Enter =(C116+C117)/(1+\$B\$7) and copy to the range C117:F117			(36) FCFF(T+1) / (Unlevered Cost of Equity Capital - Infinite Horizon Growth Rate) Enter =H116/(B7-B9)				
110								
111								
112								
113	(1.) Adjusted Present Value (APV)			First Stage: Finite Horizon				2nd Stage: Infin Horiz
114								
115	Date	0	1	2	3	4	5	6
116	Free Cash Flow to the Firm (FCFF)		\$98.00	\$107.00	\$119.00	\$125.00	\$137.00	\$140.50
117	Value of the Unlevered Firm	\$2,182.16	\$2,302.37	\$2,425.61	\$2,549.17	\$2,679.09	\$2,810.00	
118	Tax Shield Benefit		\$3.00	\$3.06	\$3.12	\$3.18	\$3.24	\$3.30
119	Value of the Tax Shield Benefit	\$52.76	\$55.04	\$57.49	\$60.11	\$62.95	\$66.00	
120	Value of the Firm (APV Method)	\$2,234.92						
121	- Date 0 Firm Capital	\$800.00						
122	Value Added by Firm (APV Method)	\$1,434.92						
123								
124	(39) Value of Unlevered Firm(0) + Value of the Tax Shield Benefit(0) Enter =B117+B119			(40) Date 0 Proj Invest or Firm Cap Enter =\$B\$5		(37) Tax Shield Benefit (T+1) / (Unlevered Cost of Equity Capital - Infinite Horizon Growth Rate) Enter =H118/(B7-B9)		
125								
126								
127								
128	(41) Value of Project or Firm (APV Method) - Date 0 Proj Invest or Firm Capital Enter =B120-B121			(38) (Tax Shield Benefit(t) + Value of Tax Shield Benefit (t)) / (1 + Unlevered Cost of Equity Capital) Enter =(C118+C119)/(1+\$B\$7) and copy to C119:F119				
129								
130								

The value of the firm is \$2,234.92. This is the amount of money you would be willing to pay if you were going to buy the firm on Date 0, since the Date 0 Firm Capital is already sunk into the firm. Considering that the firm is currently using \$800.00 in capital, the (Net Present) Value Added by the Firm is \$1,434.92.



## 10.3 Free Cash Flow To Equity

**Problem.** Given the cash flow streams, compute the current value of the firm and the value added by the firm using Free Cash Flow to Equity.

**Solution Strategy.** Take the Free Cash Flow to Equity and discount at the Levered Cost of Equity Capital to obtain the Value of Equity. Take the Cash Flow to Debtholders and discount at the Cost of Riskfree Debt to obtain the Value of Debt. Sum the Value of Equity and the Value of Debt to get the Value of the Firm. Subtract Date 0 Capital to get the Value Added by the Firm.

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FIGURE 10.4 Firm and Project Valuation – Free Cash Flow To Equity.

FIRM AND PROJECT VALUATION		Five Equivalent Methods					
<b>Inputs</b>							
Valuation Object	<input checked="" type="radio"/> Firm <input type="radio"/> Project	1					
Date 0 Proj Investment or Firm Cap	\$800.00						
Tax Rate	40.0%						
Unlevered Cost of Equity Capital	10.0%						
Riskfree Rate=Cost of Riskfree Debt	3.0%						
Infinite Horizon Growth Rate	5.0%						
Include Infinite Horizon?	<input checked="" type="radio"/> Yes <input type="radio"/> No	1					
(42) Value of the Unlevered Firm(t) + Value of the Tax Shield Benefit(t) Enter =B117+B119 and copy across		(44) Unlev Cost of Equity Capital + (Unlev Cost of Equity Capital - Riskfree Rate) * (Debt(t-1) / (Equity(t-1))) Enter =\$B\$7+(\$B\$7-\$B\$8)*(B80/B145) and copy to the range D146:G146					
(43) [Debt + Equity](t) - Debt(t) Enter =B144-B80 and copy across		(45) If Equity(T) = 0, Then 0, Else Unlev Cost of Equity Capital + (Unlev Cost of Equity Capital - Riskfree Rate) * (Debt(T) / (Equity(T))) Enter =IF(G145=0,0,\$B\$7+(\$B\$7-\$B\$8)*(G80/G145))					
(2) Free Cash Flow to Equity (FCFE)							
Date	0	1	2	3	4	5	6
Debt + Equity (D+E)	\$2,234.92	\$2,357.42	\$2,483.10	\$2,609.29	\$2,742.04	\$2,876.00	
Equity (E)	\$1,984.92	\$2,102.42	\$2,223.10	\$2,344.29	\$2,472.04	\$2,601.00	
Levered Cost of Equity Capital		10.88%	10.85%	10.82%	10.79%	10.76%	10.74%
Free Cash Flow to Equity (FCFE)		\$98.50	\$107.41	\$119.32	\$125.23	\$137.14	\$149.30
Value of Equity (E)	\$1,984.92	\$2,102.42	\$2,223.10	\$2,344.29	\$2,472.04	\$2,601.00	
Value of Debt (D)	\$250.00	\$255.00	\$260.00	\$265.00	\$270.00	\$275.00	
Value of the Firm (FCFE Method)	\$2,234.92						
- Date 0 Firm Capital	\$800.00						
Value Added by Firm (FCFE Method)	\$1,434.92						
(49) Value of Debt above =B80 and copy across							
(50) Value of Equity(0) + Value of Debt(0) Enter =B149+B150							
(52) Value of Project or Firm (FCFE Method) - Date 0 Proj Invest or Firm Capital							
(46) FCFE(t) Enter =C34 and copy across							
(47) FCFE(T+1) / (Lev Cost of Equity Capital(T+1) - Infinite Horizon Growth Rate)							
(48) (FCFE(t) + Value of Equity(t)) / (1 + Lev Cost of Equity Capital) Enter =(G148+G149)/(1+G146) and copy to the left							

As above, the Value of the Firm is **\$2,234.92** and (Net Present) Value Added by the Firm is **\$1,434.92**.

## 10.4 Free Cash Flow to the Firm

**Problem.** Given the cash flow streams, compute the current value of the firm and the value added by the firm using Free Cash Flow to the Firm.

**Solution Strategy.** Take the Free Cash Flow to the Firm and discount at the Cost of Firm Capital (WACC) to obtain the Value of Firm. Subtract Date 0 Capital to get the Value Added by the Firm.

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FIGURE 10.5 Firm and Project Valuation – Free Cash Flow To The Firm.

	A	B	C	D	E	F	G	H
1	<b>FIRM AND PROJECT VALUATION</b>			<b>Five Equivalent Methods</b>				
2								
3	<b>Inputs</b>							
4	Valuation Object	<input checked="" type="radio"/> Firm <input type="radio"/> Project		1				
5	Date 0 Proj Investment or Firm Cap		\$800.00					
6	Tax Rate		40.0%					
7	Unlevered Cost of Equity Capital		10.0%					
8	Riskfree Rate=Cost of Riskfree Debt		3.0%					
9	Infinite Horizon Growth Rate		5.0%					
10	Include Infinite Horizon?	<input checked="" type="radio"/> Yes <input type="radio"/> No		1				
166								
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169								
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	0	1	2	3	4	5	6
Equity Weight (E / (D+E))	88.8%	89.2%	89.5%	89.8%	90.2%	90.4%	
Debt Weight (D / (D+E))	11.2%	10.8%	10.5%	10.2%	9.8%	9.6%	
Cost of Firm Capital (WACC)		9.87%	9.87%	9.87%	9.88%	9.88%	9.89%
Free Cash Flow to the Firm (FCFF)		\$98.00	\$107.00	\$119.00	\$125.00	\$137.00	\$140.50
Value of the Firm (FCFF Method)	\$2,234.92	\$2,357.42	\$2,483.10	\$2,609.29	\$2,742.04	\$2,876.00	
- Date 0 Firm Capital	\$800.00						
Value Added by Firm (FCFF Method)	\$1,434.92						

As above, the Value of the Firm is **\$2,234.92** and (Net Present) Value Added by the Firm is **\$1,434.92**.

## 10.5 Dividend Discount Model

**Problem.** Given the cash flow streams, compute the current value of the firm and the value added by the firm using a Dividend Discount Model.

**Solution Strategy.** Take the Dividends and discount at the Levered Cost of Equity Capital to obtain the Value of Equity. Take the Cash Flow to Debtholders and discount at the Cost of Riskfree Debt to obtain the Value of Debt. Sum the Value of Equity and the Value of Debt to get the Value of the Firm. Subtract Date 0 Capital to get the Value Added by the Firm.

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FIGURE 10.6 Firm and Project Valuation – Dividend Discount Model.

	A	B	C	D	E	F	G	H
1	<b>FIRM AND PROJECT VALUATION</b>			<b>Five Equivalent Methods</b>				
2								
3	<b>Inputs</b>							
4	Valuation Object	<div>Valuation Object</div> <div><input checked="" type="radio"/> Firm <input type="radio"/> Project</div>		1				
5	Date 0 Proj Investment or Firm Cap		\$800.00					
6	Tax Rate		40.0%					
7	Unlevered Cost of Equity Capital		10.0%					
8	Riskfree Rate=Cost of Riskfree Debt		3.0%					
9	Infinite Horizon Growth Rate		5.0%					
10	Include Infinite Horizon?	<div>Infinite Horizon</div> <div><input checked="" type="radio"/> Yes <input type="radio"/> No</div>		1				
199								
200	<div>(65) (Dividend(t) + Value of Equity(t)) / (1 + Levered Cost of Equity Capital) Enter =(C207+C208)/(1+C146) and copy to the range C208:F208</div>							
201								
202								
203								
204	<b>(4) Dividend Discount Model (DDM)</b>						<b>2nd Stage:</b>	
205							<b>Infin Horiz</b>	
206	Year	0	1	First Stage: Finite Horizon			5	6
207	Dividend		\$98.50	\$107.41	\$119.32	\$125.23	\$137.14	\$149.30
208	Value of Equity (E)	\$1,984.92	\$2,102.42	\$2,223.10	\$2,344.29	\$2,472.04	\$2,601.00	
209	Value of Debt (D)	\$250.00	\$255.00	\$260.00	\$265.00	\$270.00	\$275.00	
210	Value of the Firm (DDM Method)	\$2,234.92						
211	- Date 0 Firm Capital	\$800.00						
212	Value Added by Firm (DDM Method)	\$1,434.92						
213	<div>(67) Value of Equity(0) + Value of the Debt(0) Enter =B208+B209</div>							
214	<div>(66) Value of Debt above Enter =B80 and copy</div>							
215								
216	<div>(68) Date 0 Proj Invest or Firm Cap Enter =\$B\$5</div>							
217	<div>(69) Value of Project or Firm (DDM Method) - Date 0 Proj Invest or Firm Capital Enter =B210-B211</div>							
218								

As above, the Value of the Firm is **\$2,234.92** and (Net Present) Value Added by the Firm is **\$1,434.92**.



## 10.6 Residual Income

**Problem.** Given the cash flow streams, compute the current value of the firm and the value added by the firm using Residual Income.

**Solution Strategy.** Take the Economic Profit and discount at the Cost of Firm Capital (WACC) to obtain the Value of Economic Profit. Add the Date 0 Book Value of the Firm to get the Value of the Firm. Subtract Date 0 Capital to get the Value Added by the Firm.

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FIGURE 10.7 Firm and Project Valuation – Residual Income.

	A	B	C	D	E	F	G	H
1	<b>FIRM AND PROJECT VALUATION</b>			<b>Five Equivalent Methods</b>				
2								
3	<b>Inputs</b>							
4	Valuation Object	<input checked="" type="radio"/> Firm <input type="radio"/> Project		1				
5	Date 0 Proj Investment or Firm Cap	\$800.00						
6	Tax Rate	40.0%						
7	Unlevered Cost of Equity Capital	10.0%						
8	Riskfree Rate=Cost of Riskfree Debt	3.0%						
9	Infinite Horizon Growth Rate	5.0%						
10	Include Infinite Horizon?	<input checked="" type="radio"/> Yes <input type="radio"/> No	1					
221								
222								
223								
224								
225								
226								
227								
228	(5) Residual Income (RI)							
229								
230	Year	0	1	2	3	4	5	6
231	Economic Profit		\$29.07	\$37.05	\$48.03	\$53.01	\$63.99	\$98.98
232	Economic Profit on Salvage Value						\$0.00	
233	Value of the Economic Profit	\$1,434.92	\$1,547.42	\$1,663.10	\$1,779.29	\$1,902.04	\$2,026.00	
234	+ Date 0 Book Value of the Firm	\$800.00						
235	Value of the Firm (RI Method)	\$2,234.92						
236	- Date 0 Firm Capital	\$800.00						
237	Value Added by Firm (RI Method)	\$1,434.92						
238								
239								
240								
241								
242								
243								
244								

Valuation Object  
☒ Firm ☐ Project

Infinite Horizon  
☒ Yes ☐ No

(70) Economic Profit  
 Enter =C87  
 and copy across

(71) If Include Infinite Horizon = Yes,  
 Then 0  
 Else After-tax Salvage Value(T)  
 - Book Value(T)  
 Enter =IF(C10=1,0,G28-G81)

(72) If Cost of Firm Cap(T+1)  
 - Infinite Horizon Growth Rate = 0,  
 Then 0,  
 Else Economic Profit (T+1)  
 / (Cost of Firm Cap(T+1)  
 - Infinite Horizon Growth Rate)  
 Enter =IF(H181-B9=0,0,H231/(H181-B9))

First Stage: Finite Horizon

2nd Stage:  
 Infin Horiz

(75) Value of the Economic Profit(0)  
 + Date 0 Book Value of the Firm  
 Enter =B233+B234

(73) Date 0 Book Value  
 of the Firm  
 Enter =\$B\$5

(74) (Economic Profit(t) + Economic Profit on  
 Salvage Value(t) + Value of Equity(t))  
 / (1 + Cost of Firm Capital(t))  
 Enter =(G231+G232+G233)/(1+G181)  
 and copy to the left

(77) Value of Project or Firm (RI Method)  
 - Date 0 Proj Invest or Firm Capital  
 Enter =B235-B236

(76) Date 0 Proj Invest  
 or Firm Cap  
 Enter =\$B\$5

As above, the Value of the Firm is **\$2,234.92** and (Net Present) Value Added by the Firm is **\$1,434.92**.