Forecasting Value: The FCF Model[1]
Central Camp Railroad, LTD.
In-Class Problem[2]

The subject firm for the problems represented in this case, Central Camp Railroad, Ltd.is, a fictional firm for which hypothetical values have been presented. The Income Statement, Balance Sheet, and Other Financial Information used herein are also used in support of building a body of Corporate Finance In-Class Problems and Case Studies.

Central Camp Railroad (CCRR), a privately held company, is considering a public offering for their equity shares as an exit strategy for the firm's principal shareholders. Rail transport is a capital intensive industry with firms enjoying some monopoly power given access to certain rail lines and transport corridors, in which CCRR has invested heavily. As can be seen through the following FCF values, the firm is pursuing a growth strategy and has explicitly forecast values for 2019-2022, with assumed values for 2023 based on an expected long-run growth in the rail trans industry of 2.5%.

	FCF	NOPLAT
2019	34,657,717	60,454,747
2020	37,049,099	64,626,124
2021	39,605,487	69,085,327
2022	42,338,266	73,852,214
2023	63,492,574	75,698,520

As the firm's CFO, you've been assigned to identify a valuation of the firm from the firm's perspective, based on the following information and the available set of income statement, balance sheet, and market values as of year-end 2018:

Bond Portfolio		**Equity Portfolio**	
YTM	6.31%	R_M	9.00%
Years remaining	20	Beta	1.35
P/YR	2	R_F	2.45%
Coupon Rate	8.00%	Investor Required Returns	18.00%
Face Value (per bond)	1000		
# Bonds outstanding	165,750		

Outsized returns in industries requiring high levels of capital and for which firms have some form of government sanctioned monopoly power may not be reasonable. These firms often enjoy their market positions as a function of state-level protection and are commonly subject to regulatory oversite at which pricing is determined and the level of profit may be limited. The trade-off being an assurance of profit assuming demand remains robust. As such, investors seeking these returns may find less than favorable reactions from existing stakeholders as offers are made and evaluated.

Tax rates are based on 2018 Utah and Federal Tax Schedules.

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[1] This problem and solution set is intended to present an abbreviated discussion of the included finance concepts and is not intended to be a full or complete representation of them or the underlying foundations from which they are built.

[2] This problem set was developed by Richard Haskell, PhD (rhaskell@westminstercollege.edu), Gore School of Business, Westminster College, Salt Lake City, Utah (2017).

1. **Calculate a market based WACC for the firm as of year-end 2018.** *Show all of your work*

Capital Components (Market)	**Value**	**Weight**
Common	450,000,000	58.99%
Preferred	50,000,000	6.55%
Debt	262,828,193	34.45%
Total	762,828,193	100.00%

R_E (via CAPM) = $R_F + (R_M - R_F)$ x B = .0245 + (.09 - .0245) x 1.35 = .1129 or 11.29%
R_P = Pref Div/Mkt Val Pref = 9,000,000/50,000,000 = .18 or 18%
R_D = YTM = Current Yield = 0.0631 or 6.31% (unadjusted for periods per year)
Tax Rate = 0.2595 or 25.95% (based on 2018 Utah and Federal Tax Schedules)

$$\text{WACC} = \left(\frac{E}{V}\, x\, R_E\right) + \left(\frac{P}{V}\, x\, R_P\right) + \left(\frac{D}{V}\, x\, R_D\right)(1 - T_{Taxable\ Income})$$

= .5899 x .1129 + .0655 x .18 + .3445 x .0631 x (1-.2595) = .0945 or 9.45%

If you calculated WACC using a spreadsheet and had no loss of fidelity, the value for WACC is slightly different than 9.45%; it is more like 9.448662% - this results in modestly different valuation estimates

2. **Given the cash flows indicated, estimate the firm's value as of the end of 2018 using a Free Cash Flow model from the perspective of the firm.** *Show all of your work in the multi-column format discussed in class*

$$\textbf{Value}_{\textbf{FCF}} = \sum \frac{\text{FCF}_i}{(1+\text{WACC})^t} + \frac{\frac{FCF_1}{(WACC-g)}}{(1+WACC)^t}$$

Period	**FCF**	**PV_{FCF}**	**$\sum PV_{FCF}$**
0	39,353,616		
1	34,657,717	31,664,971	31,664,971
2	37,049,099	30,926,869	62,591,840
3	39,605,487	30,205,971	92,797,811
4 (0)	42,338,266	29,501,877	122,299,688
5 (1)	63,492,574		

PV_{FCF}	122,299,688
CV	913,393,756
PV_{CV}	636,465,153
$VALUE_{FCF}$	758,764,841

3. **You've also been asked to help the firm's stakeholders, of which you are one, to prepare for possible offers from private equity investors interested in acquiring all or part of the firm. At what valuation might you expect private equity investors would be interested in the firm and how, or why, might this differ from the value(s) you've estimated?** *Show all of your work in the multi-column format discussed in class using the FCF model.*

When valuing the firm based on the investor required return of 18% (*required rate of return* or *hurdle rate*), the values fall dramatically, as shown below. The initial valuation estimates based on WACC using the FCF model ($758,764,841) is not altogether dissimilar to the firm's calculated Enterprise Value (EV) of $745,328,193 (market based), which was low enough (when compared to the initial estimates) to suggest an investment may be warranted and could possibly result in an economic profit, or a return in excess of the discount rate (WACC). But the firm's calculated EV (market-based) is already well above the estimates using the investor's required return as the discount rate ($313,204,103 and $309,724,533 respectively), so why would the current owners entertain an offer from such an investor group? Is the 18% required return reasonable given the risk/reward scenario of this railroad? For many reasons, it likely is not and current owners would not entertain such an offer. Further, investors interested in firms in this space may not be likely to seek a high risk/reward opportunity.

FCF Model

Period	FCF	PV_{FCF}	$\sum PV_{FCF}$
0	39,353,616		
1	34,657,717	29,370,946	29,370,946
2	37,049,099	26,608,086	55,979,032
3	39,605,487	24,105,122	80,084,154
4 (0)	42,338,266	21,837,606	101,921,761
5 (1)	63,492,574		

PV_{FCF}	101,921,761
CV	409,629,507
PV_{CV}	211,282,343
$VALUE_{FCF}$	313,204,103

Central Camp Railroad, Ltd.
Balance Sheet
Year Ending December 31

	2017	2018		2017	2018
Current Assets			Current Liabilitites		
Cash & Securities	16,500,000	17,500,000	Accounts Payable	16,500,000	18,500,000
Accounts Receivable	6,500,000	7,500,000	Wages Payable	5,000,000	4,500,000
Inventory		-	Total	21,500,000	23,000,000
Total	23,000,000	25,000,000			
			Long Term Debt		
Fixed Operating Assets			Mortgages	35,000,000	38,500,000
PPE	303,750,000	313,750,000	Bank Notes Payable	32,000,000	27,000,000
Operating Investments	25,000,000	25,000,000	Bonds	176,000,000	165,750,000
Total	328,750,000	338,750,000	Total	243,000,000	231,250,000
Non-Operating Assets			Owner's Equity		
Land/Livestock	33,500,000	33,500,000	Common Stock	12,500,000	12,500,000
Mining Interest	15,051,000	21,750,000	Preferred Stock	9,551,000	20,000,000
Total	48,551,000	55,250,000	Accumulated Retained Earnings	113,750,000	132,250,000
			Total	135,801,000	164,750,000
Total Fixed Assets	377,301,000	394,000,000			
Total Assets	400,301,000	419,000,000	Total Liabilities and Owner's Equity	400,301,000	419,000,000

Additional Financial Information

Preferred Stock Value	2017	2018	Common Stock Value	2017	2018
Shares Outstanding (millions)	7,823,125	10,000,000	Shares Outstanding (millions)	12,500,000	12,500,000
12/31 Price per Share	4.75	5.00	12/31 Price per Share	22.00	36.00
Market Value (millions)	37,159,844	50,000,000	P/E Multiple	11.42	12.43
			EPS	1.926	2.896
			Market Value (millions)	275,000,000	450,000,000

Central Camp Railroad, Ltd.
Income Statement
January 1 - December 31

	2017	2018
Income		
Transportation Revenue	265,000,000	281,580,000
Operating Services	15,000,000	19,000,000
Investment Revenue	425,000	4,750,000
Total Income	280,425,000	305,330,000
Expenses		
COGS	150,000,000	159,000,000
Sales & Marketing	28,000,000	32,000,000
Administration	14,500,000	15,829,148
Depreciation	17,600,000	22,130,000
Total Expenses	210,100,000	228,959,148
EBIT	70,325,000	76,370,852
Interest Paid		
General Interest	19,440,000	19,140,000
Total Interest Paid	19,440,000	19,140,000
Taxable Income	50,885,000	57,230,852
Taxes Paid	17,809,750	12,030,798
Net Income	33,075,250	45,200,054
Distribution of Earnings		
Dividends (Common)	14,075,250	17,700,054
Dividends (Preferred)	9,000,000	9,000,000
Addition to Retained Earnings	10,000,000	18,500,000