

# What Others Think

## Reconciling Rate Base and Capital Structure: The Balance Sheet Method

By Mark Cicchetti\*

Under the rate base and rate of return approach of determining revenue requirements, the investment in plant and related items (rate base) is multiplied by the required overall rate of return (cost of capital) to produce the required net operating income. This required net operating income is then compared to the expected net operating income to determine, after an appropriate adjustment for taxes, the necessary revenue increase or decrease. Under this methodology, the revenue requirement will equal the total of operations and maintenance expenses, depreciation, taxes, and the cost of capital invested in the rate base.

The reconciliation of the rate base and the capital structure is an integral, and often overlooked, segment of determining the required overall rate of return. The reasons why this is so, and an example of the balance sheet method of reconciling rate base and capital structure are presented in this article.

### Rate of Return Calculation

Under the rate base and rate of return approach, the required rate of return is determined by multiplying the relative percentages of the capital structure components by their associated cost rates and then summing the weighted average costs. In this way, the relative cost contribution associated with each capital structure component is recognized. Figure 1 illustrates a simple cost of capital calculation.

It is obvious that any change in the relative percentage of a capital structure component or to its associated cost rate will change the

\*Staff member, auditing and financial analysis, Florida Public Service Commission. Views expressed are the author's and do not necessarily reflect those of the Florida Public Service Commission.

**Figure 1**  
Cost of Capital Calculation

	Amount	Ratio	Cost Rate	Weighted Average Cost
Long-term Debt	\$ 400	40%	10%	4.0%
Short-term Debt	50	5	8	.4
Preferred Stock	200	20	9	1.8
Common Equity	350	35	15	5.25
	<u>\$1,000</u>	<u>100%</u>		<u>11.45%</u>

weighted cost of the component and therefore change the required overall rate of return. The purpose of the reconciliation of rate base and capital structure is to determine what per cent of the jurisdictional rate base each capital structure component supports. The per books relative percentages of the capital structure components may not be appropriate due to rate base adjustments that can be traced to a specific source (or sources) of funds or to regulatory philosophy.

### Reconciling Rate Base and Capital Structure

Under the balance sheet method, rate base is defined as: net plant in service; property held for future use; construction work in progress; and working capital. Capital structure is defined as the funds used by the company to support the rate base. By definition, the rate base and the capital structure are equal. This is shown in Figures 2 and 3. Figure 2 is a sample balance sheet and Figure 3 shows the various accounts related to the rate base and the capital structure based on the sample balance sheet.

By combining similar items, the rate base and capital structure can be presented as shown in Figure 4.

As adjustments are made to remove items from the rate base, corresponding adjustments must be made to the capital structure to

keep the rate base and capital structure in balance. If a pro-rata adjustment is made to the capital structure (an adjustment to each capital structure component in proportion to its relative weight) there is no change in the required overall rate of return. However, if an adjustment is made to a specific capital structure component, the relative percentages change and the required overall rate of return changes.

### Pro-rata Reduction versus Tracing Funds

Sources of particular funds are readily traceable but the uses of particular funds are not. Debt, equity, deferred taxes, and other capital structure components are all sources of funds available to a company and readily traceable to their source (the bond issue, the shares of stock, the plant purchased, et cetera). The funds made available to a company are placed in a cash account, or if you will, the cash register. When a dollar is taken out of the cash account or cash register, one cannot tell whether one is holding an equity dollar or a debt dollar, or some other kind of dollar. Therefore, the sources of particular funds are traceable but the uses of particular funds are not.

The capital structure of a utility company represents the funds used by the company to finance the rate base. When it is determined that an

**Figure 2**  
Sample Balance Sheet

Line No.	Account No.	Account Name	Company Total Per Books (000)
<b>Utility Plant</b>			
1	101	Electric Plant in Service	\$ 1,124,498
2	105	Electric Plant Held for Future Use	18,669
3	106	Completed Construction not classified - Electric*	*
4	107	Construction Work in Progress - Electric	315,305
5	108	Accum. Prov. for Depr. of Elec. Utility Plant	(316,409)
6	111	Accum. Prov. for Amort. of Elec. Utility Plant	(285)
7			<u>1,141,778</u>
<b>Other Property and Investments</b>			
8			307
9	121	Nonutility Property	(34)
10	122	Accum. Prov. for Depre. of Nonutility Property	1
11	128	Other Special Funds	<u>274</u>
12			
<b>Current and Accrued Assets</b>			
13			99
14	125	Sinking Funds	6,918
15	131	Cash	182
16	134	Other Special Deposits	146
17	135	Working Funds	0
18	136	Temporary Cash Investments	0
19	141	Notes Receivable	53,840
20	142	Customer Accounts Receivable	7,149
21	143	Other Accounts Receivable	(530)
22	144	Accum. Provision for Uncollectible Accounts	0
23	145	Notes Receivable from Associated Companies	128
24	146	Accounts Receivable from Associated Companies	67,474
25	151	Fuel Stock	0
26	152	Fuel Stock Expenses Undistributed	0
27	153	Residuals	26,294
28	154	Plant Materials and Operating Supplies	34
29	156	Other Materials and Supplies	12
30	163	Stores Exp. Undistributed	1,105
31	165	Prepayments	2,372
32	171	Interest and Dividends Receivable	13,248
33	173	Unbilled Revenue Receivable	<u>173,640</u>
34			
<b>Deferred Debits</b>			
35			4,608
36	181	Unamortized Debt Expense	226
37	182	Extraordinary Property Loss	1,405
38	183	Preliminary Survey and Investigation	110
39	184	Clearing Accounts	4,195
40	186	Deferred Debits	49
41	188	Research and Development Expenditures	2,498
42	190	Deferred Income Tax	<u>13,091</u>
43			
44		<b>Total Assets and Other Debits</b>	<b>\$ 1,333,574</b>

\*Included in 101.

asset should be removed from rate base, it is logical to want to remove the cost associated with financing the asset from the capital structure. However, should we remove the cost from equity? debt? deferred taxes? Since we cannot trace which funds were used to purchase the asset, it is only logical (and fair) to remove the item from the capital structure on a pro-rata basis. By making pro-rata adjustments, the rel-

ative percentages of the capital structure components remain intact and we get as accurate a reflection as possible of the cost of capital.

There is a school of thought that believes although the dollar cannot be traced, it is desirable to trace the benefits. In other words, all customer deposits, investment tax credits, and deferred taxes should be fully reflected in the jurisdictional capital structure. In addition to vio-

lating the tracing of funds cost this method does not allow the utility company to recover its capital costs. This may result in company underearning and in a possible higher future capital cost, exactly the opposite of what the philosophy set out to accomplish.

Although most adjustments cannot be traced to a specific source (or sources) of funds, it would be desirable to adjust a sp-

## Sample Balance Sheet — (Continued)

Line No.	Account No.	Account Name	Company Total Per Books (000)
		<b>Proprietary Capital</b>	
1	201	Common Stock Issued	\$ 119,697
2	204	Preferred Stock Issued	84,956
3	202	Capital Stock Subscribed	0
4	207	Premium on Capital Stock	19
5	210	Gain on Resale or Cancel. of Reacq. Capital Stock	28
6	211	Miscellaneous Paid in Capital	154,932
7	214	Capital Stock Expense	(1,589)
8	216	Unapprop. Retained Earnings	182,586
9			<u>540,629</u>
10		<b>Long-term Debt</b>	
11	211	Bonds	407,953
12	225	Unpaid Premium on Long-term Debt	695
13			<u>408,648</u>
14		<b>Current and Accrued Liabilities</b>	
15	231	Notes Payable	65,790
16	232	Accounts Payable	20,754
17	233	Notes Payable to Associated Companies	0
18	234	Accounts Payable to Associated Companies	4,823
19	235	Customer Deposits	14,756
20	236	Taxes Accrued	5,003
21	237	Interest Accrued	10,369
22	238	Dividends Declared	4,136
23	241	Tax Collections Payable	2,292
24	242	Miscellaneous Current and Accrued Liabilities	9,000
25			<u>136,923</u>
26		<b>Deferred Credits</b>	
27	253	Other Deferred Credits	18,094
28	255	Accumulated Deferred Investment Tax Credit	66,059
29			<u>84,153</u>
30		<b>Operating Reserve</b>	
31	262	Injuries and Damages Reserves	1,026
32			<u>1,026</u>
33		<b>Accumulated Deferred Income Tax</b>	
34	281	Accum. Deferred Income Tax — Amort. Property	7,543
35	282	Accum. Deferred Income Tax — Other Property	110,914
36	283	Accum. Deferred Income Tax — Other	43,738
37			162,195
38		<b>Total Liabilities and Other Credits</b>	<u>\$ 1,333,574</u>

source (or sources) of funds for accounting or regulatory purposes. For example, an item that is being recovered through a separate clause should have all its effects removed from the balance sheet. This would affect particular accounts and therefore particular capital structure components. Deferred taxes is the capital structure component most often affected by this type of adjustment.

If a regulatory authority desires to minimize any possible negative effects to ratepayers resulting from a

utility financing nonutility property or nonregulated subsidiary, then all nonutility property and nonregulated subsidiary should be removed from the capital structure directly from equity. (This may increase the required return on equity.)

Also, if a regulatory authority decides to use the effective cost rates for the various capital structure components in calculating the required overall rate of return, then consistency dictates that items such as unamortized debt expense and

prepaid interest on short-term debt be removed from long-term debt and short-term debt, respectively, and their cost rates adjusted accordingly.

Since the purpose of removing an item from a specific capital structure component is to remove the effect of that item from the capital structure, all pro-rata adjustments should be made using ratios calculated after the adjustments to specific capital structure components have been made.

**Figure 3**Relation of Accounts to Rate Base and  
Capital Structure

Rate Acct. No.	Base Amount	Capital Structure Acct. No.	Amount
101	\$ 1,124,498	201	\$ 119,697
105	18,669	204	84,956
107	315,305	207	19
108	(316,409)	210	28
111	(285)	211	154,932
121	307	214	(1,589)
122	(34)	216	182,586
128	1	211	407,953
125	59	225	695
131	6,918	231	65,790
134	182	235	14,756
135	146	255	66,059
142	53,840	281	7,543
143	7,149	282	110,914
144	(530)	283	43,738
146	128	190	(2,498)
151	67,474		
154	26,294	Total	\$ 1,255,579
156	34		
163	12		
165	1,105		
171	2,372		
173	13,248		
182	226		
183	1,405		
184	110		
186	4,195		
188	49		
232	(20,754)		
234	(4,823)		
236	(5,003)		
237	(10,369)		
238	(4,136)		
241	(2,292)		
242	(9,000)		
253	(18,094)		
262	(1,026)		
181	4,608		
Total	\$ 1,255,579		

**Jurisdictional Separation Factors**

For rate base items, the jurisdictional separation factors represent the per cent of the system amount that is jurisdictional. For capital structure purposes the jurisdictional separation factor is simply a plug number that maintains the relative capital structure component percentages when going from a system amount to a jurisdictional amount as shown in Figure 5.

If a regulatory authority decides that the jurisdictional separation factor for customer deposits should be 100 per cent, then the capital structure jurisdictional separation factor is calculated as shown in Figure 6.

**Conclusion**

The reconciliation of rate base and capital structure is an integral part of determining the required overall rate of return. Since the required overall rate of return directly affects the revenue requirement, examining the logic behind capital structure adjustments is time well spent. A several basis point change in the required overall rate of return can mean a difference of several million dollars to a large utility.

By using the balance sheet method of reconciling the rate base and capital structure, one can analyze, on a step-by-step basis, the adjustments made to rate base and how they affect the capital structure and required overall rate of return. A sample rate base and capital structure reconciliation, with a limited number of adjustments, is presented in Figure 7. All accounts are assumed to be 100 per cent jurisdictional.

**Figure 4**

## Rate Base

Net Plant in Service	808,078
CWIP - No AFUDC	315,305
Plant held for future use	18,669
Working Capital	113,527
	<u>1,255,579</u>

## Capital Structure

Long-term Debt	408,648
Short-term Debt	65,790
Preferred Stock	84,956
Customer Deposits	14,756
Common Equity	455,673
Tax Credits - O Cost	3,272
Tax Credits - WTD. Cost	62,787
Accumulated Def. Inc. Taxes	159,697
	<u>1,255,579</u>

Figures 5, 6, and 7 follow  
on next page.

**Figure 5**  
Rate Base

	System Amount	Jurisdictional Separation Factor	Jurisdictional Amount
Net Plant in Service	\$ 808,078	.81115	\$ 655,472
CWIP - No AFUDC	315,305	.95025	299,619
Plant Held for Future Use	18,669	.98000	18,296
Working Capital	113,527	.99000	112,392
	<u>\$1,255,579</u>	<u>.864764</u>	<u>\$1,085,779</u>

  

**Capital Structure**

	Amount	Jurisdictional Separation Factor	Jurisdictional Amount
Long-term Debt	\$ 408,648	.864764	\$ 353,384
Short-term Debt	65,790	.864764	56,893
Preferred Stock	84,956	.864764	73,467
Customer Deposits	14,756	.864764	12,760
Common Equity	455,673	.864764	394,049
Tax Credits - O Cost	3,272	.864764	2,830
Tax Credits - WTD Cost	62,787	.864764	54,296
Accumulated Def. Inc. Taxes	159,697	.864764	138,100
	<u>\$1,255,579</u>		<u>\$1,085,779</u>

**Figure 6**  
Calculation of Jurisdictional Amount

	Amount	Jurisdictional Separation Factor	Jurisdictional Amount
Long-term Debt	\$ 408,648	.863155	\$ 352,727
Short-term Debt	65,790	.863155	56,787
Preferred Stock	84,956	.863155	73,330
Customer Deposits	14,756	1.0000	14,756
Common Equity	455,673	.863155	393,317
Tax Credits - O Cost	3,272	.863155	2,824
Tax Credits - WTD Cost	62,787	.863155	54,195
Accumulated Def. Inc. Taxes	159,697	.863155	137,843
	<u>\$1,255,579</u>		<u>\$1,085,779</u>

  

1,255,579	1,085,779		
- 14,756	- 14,756	1,071,023	= .863155
<u>1,240,823</u>	<u>1,071,023</u>	<u>1,240,823</u>	

**Figure 7**  
Sample Reconciliation  
(\$000)

Component	Amount Per Books	Non-Utility	Unamort. Debt Expense	Prepaid Interest Short-Term Debt	Adjusted Rate Base Adjustments				Weighted Average Cost Rate	Weighted Average Cost Rate
					CWIP	Amount	Rate Base	Adjustments		
Net Plant in Service	808,078	-273				807,805	Nonutility		9.89%	3.1960%
CWIP - No AFUDC	315,305				-129,159	186,146	Unamor. Debt. Ex. Pre. Int. Std.		7.96	0.4164
Plant Held for Future Use	18,669					18,669	CWIP		9.00	0.6155
Working Capital	113,527		-4,608	-392		108,527			7.88	0.0930
	<u>1,255,579</u>	<u>-273</u>	<u>-4,608</u>	<u>-392</u>	<u>-129,159</u>	<u>1,121,147</u>			15.00	5.4635

  

Component	Amount Per Books	Non-Utility	Unamort. Debt Expense	Prepaid Interest Short-Term Debt	Adjusted Rate Base Adjustments				Weighted Average Cost Rate	Weighted Average Cost Rate	
					CWIP	Amount	Per Cent	Per Cent			
Long-term Debt	408,648		-4,608	-392	404,040	32.3153	-41,738	362,302	32.3153	9.89%	3.1960%
Short-term Debt	65,790				65,398	5.2306	-6,756	58,643	5.2306	7.96	0.4164
Preferred Stock	84,956				84,956	6.7948	-8,776	76,180	6.7948	9.00	0.6155
Customer Deposits	14,756				14,756	1.1802	-1,524	13,232	1.1802	7.88	0.0930
Common Equity	455,673	-273			455,400	36.4231	-47,044	408,356	36.4231	15.00	5.4635
Tax Credits - O	3,272				3,272	0.2617	-338	2,934	0.2617	0.00	0.0000
Tax Credits - WTD	62,787				62,787	5.0217	-6,486	56,301	5.0217	10.30	0.5171
Def. Income Taxes	159,697				159,697	12.7726	-16,497	143,200	12.7726	0.00	0.0000
	<u>1,255,579</u>	<u>-273</u>	<u>-4,608</u>	<u>-392</u>	<u>1,250,306</u>	<u>1</u>	<u>-129,159</u>	<u>1,121,147</u>	<u>1</u>		<u>10.2974%</u>