

REGULATORY FINANCE: UTILITIES' COST OF CAPITAL

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Chapter 20

Double Leverage

The purpose of this chapter is to critically address the Double Leverage (DL) approach to determining the cost of capital of a regulated utility. The double leverage approach has serious conceptual and practical limitations and is not consistent with basic financial theory and the notion of fairness. The assumptions and logic underlying the method are questionable. The double leverage argument violates the core notion that an investment's required return depends on its particular risks. The chapter concludes that the Double Leverage approach has no place in regulatory practice and should be discarded.

The chapter is divided into two sections. Section 20.1 introduces the basic notion of double leverage and describes the alternative approaches of determining the cost of capital for a subsidiary of a parent corporation. Section 20.2 critiques the double leverage approach at both the conceptual and practical levels.

20.1 Intercorporate Ownership and Double Leverage

Determining the cost of capital for a utility operating company owned by a holding company is a controversial capital structure issue. Intercorporate ownership opens the possibility of leveraging the common equity of one corporate entity at two or even more corporate levels. If a parent corporation issues its own debt and if a wholly-owned subsidiary also builds debt over the base of equity invested by the parent, leveraging takes place twice on the single layer of the parent's publicly-held equity. A parent company and a single subsidiary can thus create double leverage; even more extensive leveraging can occur through the existence of parent-subsidiary horizontal and vertical networks of subsidiaries. The situation is common among utilities with clusters of subsidiaries and their parents. The term "double leverage" stems from a situation in which there is initial leverage on the earnings for the operating company's common stock and then additional leverage for the holding company's common stock to the extent that the holding company obtains part of the funds invested in the subsidiary's common stock from debt sources.

The issue does not arise for electric and gas companies that are subsidiaries of holding companies because the Public Utility Holding Company Act limits the amount of borrowing these companies may undertake. Telecommunications and water utilities are not governed by this Act, however.

Even though the DL approach has largely disappeared from regulatory practice, the method is occasionally encountered in regulatory proceedings involving independent telecommunications and water utility companies.

There are two methods of computing the cost of capital under double leverage conditions: the Independent Company, or Stand-Alone, approach, and the Double Leverage approach. Consider the following numerical example. An operating company's capital structure consists of equal proportions of debt and equity, with attaching costs of 10% and 20%, respectively. The company is a wholly owned subsidiary of a parent company whose own source of capital is 25% debt and 75% equity. It is assumed that the cost of debt to the parent is also 10%, and that a reasonable return to parent stockholders is 15%. The latter assumption will be revisited in the Example at the end of the chapter. The situation is summarized in Table 20-1 below.

TABLE 20-1
OPERATING AND PARENT COMPANY COST OF CAPITAL

	Amount	Weight	Cost	Weighted Cost
Operating Company				
Debt	\$ 50	.50	.10	.05
Equity	<u>\$ 50</u>	<u>.50</u>	.20	<u>.10</u>
	\$100	1.00		
			Total Cost	.15
Parent Company				
		Weight	Cost	Weighted Cost
Debt		.25	.10	.0250
Equity		.75	.15	<u>.1125</u>
			Total Cost	.1375

Independent Company Approach

One way to proceed is simply to ignore the parent-subsidiary relationship, and treat the operating company's cost of capital in the usual way as the weighted average cost of capital using the operating company's own capital structure and cost rates. Under this approach, often labeled the Stand-Alone Approach or Subsidiary Approach, the subsidiary is viewed as an independent operating company, and its cost of equity is inferred as the cost of equity of comparable risk firms. The methodology rests on the basic premise that the required return on an investment depends on its risk, rather than on the parent's financing costs.

In the example, the weighted cost is 15%. The allowed return of 20% on equity is derived from the techniques described in previous chapters, including DCF, Risk Premium, or CAPM. The equity return reflects the risk to which the equity capital is exposed and the opportunity return foregone by the company's shareholders in investments of similar risk. The identity of the shareholders is immaterial in determining the equity return.

Double Leverage Approach

Another approach is the Double Leverage methodology. This method has several variants. One treatment, shown in Table 20-2, traces the operating company's equity capital of \$50 to its source, namely the parent's debt and equity capital. The cost of equity to the operating company is simply the overall weighted average of capital to the parent, since the equity capital is said to have been raised by the parent through a mixture of debt and equity. The parent's composite capital cost is imputed to the subsidiary's equity.

TABLE 20-2
OPERATING COMPANY COST OF CAPITAL: DOUBLE LEVERAGE CONCEPT

	Amount	Weight	Cost	Weighted Cost
Debt-Subsidiary	\$50.00	.500	.10	.0500
Equity-provided by parent:				
Debt-parent (25%)	\$12.50	.125	.10	.0125
Equity-parent (75%)	\$37.50	.375	.15	.0563
			Weighted Cost	.1188

Advocates of the double leverage approach argue that the utility subsidiary only requires a 11.88% return on total capital rather than the 15.00% indicated in the previous calculation. Although the parent invested \$50 in the company, it used leverage itself in raising its capital, so that the true cost of capital to the subsidiary is the cost of its own debt capital, plus the proportionate cost of its parent's debt and equity capital. Moreover, if the parent was allowed a 20% return on its \$50 equity investment in the subsidiary, unreasonably high returns would be extracted by the parent's shareholders from ratepayers. In the example, gross dollar earnings of $.20 \times \$50 = \10 would accrue to the parent company's shareholders; but since 25% of that \$50, or \$12.50, was borrowed at an interest rate of 10%, \$1.25 must be subtracted from the gross earnings of \$10 to produce net equity earnings of \$8.75 on an equity investment of \$37.50. That is a 23.33% return on equity. The theoretical and conceptual fallacies of this reasoning will be discussed shortly.

Modified Double Leverage Approach

One refinement to the double leverage method is to recognize that the parent's weighted cost of capital should only be imputed to the portion of equity actually contributed by the parent. The subsidiary's retained earnings should be removed from the double leverage imputation since none of the subsidiary's retained earnings are traceable to the capital raised by the parent. This will associate proportionately the components of parent capital and their respective costs with that part of subsidiary equity ostensibly financed in this way. The revised calculation with retained earnings removed is shown in Table 20-3. It is assumed that \$40 of the \$50 of subsidiary equity capital was contributed by the parent, and the remaining \$10 is the subsidiary's own retained earnings, and the latter continues to be allowed a 20% return.

TABLE 20-3
OPERATING COMPANY COST OF CAPITAL: MODIFIED DOUBLE LEVERAGE
CONCEPT

	Amount	Weight	Cost	Weighted Cost
Debt-Subsidiary	\$50	.50	.10	.050
Retained Earnings—Subsidiary	\$10	.10	.20	.020
Equity-provided by parent:				
Debt-parent (25%)	\$10	.10	.10	.010
Equity-parent (75%)	\$30	.30	.15	.045
			Weighted Cost	.125

One procedural flaw in the above double leverage computation is the failure to recognize that the debt ratio of the operating company has increased from 50% to 60%. Hence both debt and equity cost rates should be higher as a result of the increased financial risk. The 20% return on equity should be adjusted upward in recognition of the increased financial risk.

Consolidated Approach

Another method of computing the subsidiary's cost of capital uses consolidated data of the parent and subsidiary companies on the grounds that the holding company and its units are financed as an integrated whole, based on system-wide financing objectives. The cost rates for debt and preferred capital are system-wide averages, and the cost of equity is determined by traditional methods. Before to the divestiture of AT&T, the Bell System supported the use of a consolidated capital structure rather than a double-levered capital structure.

A few points regarding consolidated capital structures are in order. First, the debt of the consolidated company is the sum of the holding company's debt and the subsidiary's debt. Hence, the consolidated cost of debt is a weighted cost of parent and subsidiary debt. Second, the cost of equity of the holding company is identical to that of the consolidated entity. This is because the value of the parent holding company's stock expressly recognizes subsidiary income to parent investment if accounted on an equity basis. Accounting on the equity basis treats subsidiary net income as income to the parent's equity investment whether such income is received as dividends or not. The parent's retained earnings necessarily reflect this. Accordingly, the cost of equity associated with market valuation of holding company equity is also the cost of equity for the consolidated network. Third, a consolidated capital structure is equivalent to a double-levered capital structure when all the parent's subsidiaries have the same amounts of leverage. Lastly, some analysts contend that assignment of the consolidated weighted cost to the equity cost of the subsidiary is equivalent to imputation of the holding company's equity cost. This can only be true in the highly unlikely event that the costs of consolidated debt and equity are exactly equal, or, if they are unequal, that the differences in weights between the consolidated and the subsidiary capital structure exactly offset the differences in costs. This is proven formally in Morin and Andrews (1993).

20.2 Critique of Double Leverage

Adherents to the double leverage calculation argue that the true cost of capital to a utility subsidiary is the weighted cost of its own debt and the weighted cost of the parent's debt and equity funding. Moreover, unless the subsidiary's equity is assigned the parent's weighted cost of capital, parent shareholders will reap abnormally high returns. Although persuasive on the surface, these arguments conceal serious conceptual and practical problems. Moreover, the validity of double leverage rests on questionable assumptions.

The flaws associated with the double leverage approach have been discussed thoroughly in the following academic literature. Pettway and Jordan (1983) and Beranek and Miles (1988) pointed out the flaws in the double leverage argument, particularly the excess return argument, and also demonstrated that the stand-alone method is a superior procedure. Rozeff (1983) discussed the ratepayer cross-subsidies of one subsidiary by another when employing double leverage. Lerner (1973) concluded that the returns granted an equity investor must be based on the risks to which the investor's capital is exposed and not on the investor's source of funds.

Theoretical Issues

The double leverage approach contradicts the core of the cost of capital concept. Financial theory clearly establishes that the cost of equity is the risk-adjusted opportunity cost to the investors and not the cost of the specific capital sources employed by investors. The true cost of capital depends on the use to which the capital is put and not on its source. The *Hope* and *Bluefield* doctrines have made clear that the relevant considerations in calculating a company's cost of capital are the alternatives available to investors and the returns and risks associated with those alternatives. The specific source of funding and the cost of those funds to the investor are irrelevant considerations.

Carrying the double leverage standard to its logical conclusion leads to even more unreasonable prescriptions. If the common shares of the subsidiary were held by both the parent and by individual investors, the equity contributed by the parent would have one cost under the double leverage computation while the equity contributed by the public would have another. This is clearly illogical. Or, does double leverage require tracing the source of funds used by each individual investor so that its cost can be computed by applying double leverage to each individual investor? Of course not! Equity is equity, irrespective of its source, and the cost of that equity is governed by its use, by the risk to which it is exposed.

For example, if an individual investor borrows money at the bank at an after-tax cost of 8% and invests the funds in a speculative oil exploration venture, the required return on the investment is not the 8% cost but rather the return foregone in speculative projects of similar risk, say 20%. Yet, under the double leverage approach, the individual's fair return on this risky venture would be 8%, which is the cost of the capital source, and not 20%, which is the required return on investments of similar risk. Double leverage implies that for all investors who inherited stock or received stock as a gift, the allowed return on equity would be zero, since the cost of the stock to the investors is zero. It also implies that if, tomorrow morning, a subsidiary were sold to a company with a higher cost of capital than the parent, the subsidiary's cost of equity would suddenly become higher as a result of the change in ownership. If we assumed that the double leverage concept were appropriate, we would also have to assume that the day following AT&T's divestiture in 1984, the cost of equity of the newly created Bell Regional Holding Companies suddenly rose by a substantial amount. This is logically absurd, as it is the use of capital that governs its cost, and not its source. For example, if a subsidiary with a double leverage cost of equity of 12% were sold to another company with a higher cost of capital of, for example, 15%, would regulation alter the return accordingly just because of the change in ownership?

If so, the same utility with the same assets and providing the same service under the new management would have a higher cost of service to ratepayers because of the transfer of ownership. Clearly, if a utility subsidiary were allowed an equity return equal to the parent's weighted cost of capital while the same utility were allowed a fair, presumably higher, return were it not part of a holding company complex, an irresistible incentive to dissolve the holding company structure would exist in favor of the one-company operating utility format. The attendant benefits of scale economies and diversification would then be lost to the ratepayers.

The cost of capital is governed by the risk to which the capital is exposed and not by the cost of those funds or whether it is they were obtained from bondholders or common shareholders. The identity of the subsidiary's shareholders should have no bearing on its cost of equity because it is the risk to which the subsidiary's equity is exposed that governs its cost of money, not whether it is borrowed from bondholders or sold to common shareholders for issued shares. Had the parent company not been in the picture, and had the subsidiary's stock been widely held by the public, the subsidiary would be entitled to a return that would fully cover the cost of both its debt and equity.

Just as individual investors require different returns from different assets in managing their personal affairs, why should regulation cause parent companies making investment decisions on behalf of their shareholders to act any differently? A parent company normally invests money in many operating companies of varying sizes and varying risks. These operating subsidiaries pay different rates for the use of investor capital, such as long-term debt capital, because investors recognize the differences in capital structure, risk, and prospects between the subsidiaries. Yet, the double leverage calculation would assign the same return to each activity, based on the parent's cost of capital. Investors do recognize that different subsidiaries are exposed to different risks, as evidenced by the different bond ratings and cost rates of operating subsidiaries. The same argument carries over to common equity. If the cost rate for debt is different because the risk is different, the cost rate for common equity is also different, and the double leverage adjustment should not obscure this fact.

The double leverage concept is at odds with the opportunity cost concept of economics. According to this principle of economics, the cost of any resource is the cost of an alternative foregone. The cost of investing funds in an operating utility subsidiary is the return foregone on investments of similar risk. If the fair risk-adjusted return assigned by the market on utility investments is 15%, and the regulator assigns a return less than 15% because of a double leverage calculation, there is no incentive or defensible reason for a parent holding company to invest in that utility.

Fairness and Capital Attraction

The double leverage approach is highly discriminatory, and violates the doctrine of fairness. If a utility is not part of a holding company structure, the cost of equity is computed using one method, say the DCF method, while otherwise the cost of equity is computed using the double leverage adjustment. Estimating equity costs by one procedure for publicly held utilities and by another for utilities owned by a holding company is inconsistent with financial theory and discriminates against the holding company form of ownership. Two utilities identical in all respects but their ownership format should have the same set of rates. Yet, this would not be the case under the double leverage adjustment.

The capital attraction standard may also be impaired under the double leverage calculation. This is because a utility subsidiary must compete on its own in the market for debt capital, and therefore must earn an appropriate return on equity to support its credit rating. Imputing the parent's weighted cost to the utility's equity capital may result in inadequate equity returns and less favorable coverage, hence impairing the utility subsidiary's ability to attract debt capital under favorable terms.

Questionable Assumptions

Several assumptions underlying the double leverage standard are questionable. One assumption to which the previous numerical illustrations have already alluded, is the traceability of the subsidiary's equity capital to its parent. None of the subsidiary's retained earnings can be traced to the capital raised by the parent. Some analysts salvage the double leverage approach by assigning one cost rate to retained earnings and another to the common equity capital raised by the parent, with the curious result that equity has two cost rates. The traceability issue goes further. If a parent company issues bonds or preferred stock to acquire an operating subsidiary, the traceability assumption is broken. Corporate reorganizations and mergers further invalidate the traceability assumption.

By virtue of using the parent's weighted cost as the equity cost rate for the subsidiary, another questionable assumption is that the parent capital is invested in subsidiaries that all have the same risks. Lastly, the double leverage procedure makes the unlikely assumption that the parent holding company invest its funds in each subsidiary proportionately to each subsidiary's debt-equity ratio, which is unreasonable.

Double Leverage: A Tautology

The double leverage approach is a tautology. It is not the parent's weighted average cost of capital (WACC) that determines the subsidiary's cost of equity because the parent's WACC is itself a weighted average of equity costs of all subsidiaries. Double leverage adherents confuse the direction of cause and effect. The equity cost of subsidiaries must be found on a stand-alone basis.

The last nail in the double leverage coffin can be shown as follows. If capital market equilibrium is to hold, the cash flows to the parent company's bondholders and stockholders must equal the cash flows from the parent's equity in each subsidiary. Letting K denote the cost of capital, the subscripts p and s denote the parent and subsidiary, D and E the dollar amounts of debt and equity, and the subscripts d and e denote debt and equity, we can therefore say:

$$K_{dp} D_p + K_{ep} E_p = \sum_s^n K_{es} W_s \quad (20-1)$$

The various unknowns, including the parent return on equity, can be found in terms of all the other given variables. What the above equation makes clear is that the parent cost of equity is determined by subsidiary cost of equity, and that parent capital costs cannot determine subsidiary capital costs. This can be seen even more clearly by dividing the above equation by total parent value V to obtain:

$$K_{dp} D_p/V + K_{ep} E_p/V = \sum_s^n K_{es} E_s/V \quad (20-2)$$

The left side of the equation is the usual expression for the parent's WACC, and the right side is the weighted average of equity costs of all subsidiaries. However,

$$\sum_s^n E_s = V \quad (20-3)$$

so that the parent's WACC is itself a weighted average of equity costs of all subsidiaries. The fundamental logical fault of double leverage is to arbitrarily equate the equity cost of each subsidiary to the left side of the above equation. The inescapable conclusion is that the subsidiary cost of equity must be found on a stand-alone basis, because the parent's WACC is itself a weighted average of subsidiary equity costs.

EXAMPLE 20-1

In the numerical example provided at the beginning of the chapter in Table 20-1, the parent's cost of equity capital was arbitrarily and wrongly assumed to be 15%. This example shows that the parent cost of equity consistent with the terms of the example is 23.33%, and not 15%. The fundamental point of the illustration was to show the logical inconsistency of the double leverage argument. When an illustration is constructed with an assumed subsidiary cost of equity, the assumed parent cost of equity must be consistent with it. This is shown below.

If the subsidiary was regulated in the standard correct way, the allowed return is computed as $.50 \times 10\% + .50 \times 20\% = 15\%$. According to advocates of double leverage, this implies excess returns to the parent, that is:

Earnings from the subsidiary to the parent: $\$100 \times 15\% = \15.00
 less total interest: $\$50 \times 10\% + \$12.50 \times 10\% = \$6.25$
 Earnings to parent equity: $\$8.75$

which represents a return of $\$8.75/\$37.50 = 23.33\%$, far in excess of the *assumed* parent equity cost of 15%.

Double leverage advocates adjust for this alleged excess by assigning the parent's overall return of 13.75% to the subsidiary's equity. The subsidiary's overall return becomes 11.875%, as shown below:

	Amount	Weight	Cost	Weighted Cost
Debt-Subsidiary	\$50.00	.500	.10	.05000
Equity-provided by parent:				
Debt-parent (25%)	\$12.50	.125	.10	.01250
Equity-parent (75%)	\$37.50	.375	.15	.05625
		Weighted Cost		.11875

The 11.875% becomes the double leverage allowed return on the subsidiary's total assets. Only with this allowed rate of return, according to the tenets of double leverage, does the parent's equity receive the *assumed* rate of return of 15%. That is, the parent receives $\$100 \times 11.875\% = \11.875 , less the interest cost of \$6.250, or \$5.625, on an equity investment of \$37.50, which is a 15% return. And, so it seems, the parent receives the required rate of return.

The fundamental flaw of this approach is that the assumptions of the example are internally inconsistent and illogical. When an illustration is constructed with assumed subsidiary cost of equity, the assumed parent cost of equity must be consistent with it. It is not the parent's weighted average cost of capital that determines the subsidiary's cost of equity because the parent's cost of capital is itself a weighted average of equity costs of all subsidiaries.

Equation 20-2 makes it clear that the parent cost of equity is determined by the subsidiary cost of equity, and that parent capital costs cannot determine subsidiary capital costs. Given the cost of debt K_{dp} , the subsidiary's cost of equity K_{es} , and the amounts of capital, the above equation implies that the parent equity cost consistent with 20% subsidiary cost of equity is 23.33%:

$$[\$50 \times 20\% - \$12.50 \times 10\%] / \$37.50 = 23.33\%$$

In summary, the double leverage adjustment has serious conceptual and practical limitations and violates basic notions of finance, economics, and fairness. The assumptions which underlie its use are questionable, if not unrealistic. The approach should not be used in regulatory proceedings.

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