Business Valuation Update

March 2002 (BVUpdate)

A Business Valuation Resources Publication, www.BVResources.com

Guest Article

CapX = depreciation is unrealistic assumption for most terminal values; Frequent error causes overvaluation

By Gilbert Matthews, MBA, CFA

Key words: Discounted cash flow method (DCF), Subsequent events



This article calls attention to a very common error made by valuation analysts. In a growing company, capital expenditures logically should exceed depreciation in most instances. Yet, many analysts assume capital expenditures equal to depreciation when calculating the terminal value, thus leading to overstatement of net cash flow and overvaluation.-SP

Gil Matthews

There are two methods commonly used to determine terminal value in a discounted cash flow calculation. Academics favor the Gordon Growth Model, while investment bankers

typically use a multiple of EBIT or EBITDA. The terminal value in a growth model is a function of the assumed growth and discount rates.

The valuation specialist who uses a growth model to calculate terminal value should compute the resultant multiples as a sanity check. If the calculated terminal value leads to a multiple of EBIT, EBITDA, or net income that is materially inconsistent with current multiples of comparable companies, the valuator should examine the assumptions used. When the calculated multiples of terminal value appear to be unreasonably high, the error may arise from assumptions in the underlying data.

A common error in valuation reports is an unrealistic relationship between capital expenditures and depreciation. The author has recently seen valuation reports in which the Gordon Growth Model was applied to a projection in which depreciation was substantially higher than capital expenditures. This is clearly impossible in a perpetuity model.

There is little written in valuation literature about the relationship between capital expenditures and depreciation.¹ It is common for valuators to calculate terminal value using a model with depreciation equal to capital expenditures. However, this assumption is only appropriate in a zero-growth scenario.

Year	Capital Expenditures	Depreciation Rate	Depreciated in 2011
2001	\$1,000	5%	\$50.0
2002	\$1,030	10%	\$103.0
2003	\$1,061	10%	\$106.1
2004	\$1,093	10%	\$109.3
2005	\$1,126	10%	\$112.6
2006	\$1,159	10%	\$115.9
2007	\$1,194	10%	\$119.4
2008	\$1,230	10%	\$123.0
2009	\$1,267	10%	\$126.7
2010	\$1,305	10%	\$130.5
2011	\$1,344	5%	\$67.2
	Tota Capita	l Depreciation in 201 I Excenditures in 201	1 <u>\$1,164</u> 11 \$1,344
		Difference % Difference	te \$180

If a company is growing, its normalized capital expenditures must exceed depreciation. Let us assume that a company increases its depreciation by 3% each year, and that it capital expenditures its fixed assets in 10 years on a straight-line basis. Table 1 calculates the depreciation charge that would result in the eleventh year, and shows that capital expenditures would exceed depreciation by 15.5% (180/1,164 x 100).

If a company has a 5% growth rate and a 15-year depreciation life, capital expenditures will exceed depreciation by 41%! When a company uses an accelerated depreciation method, such as double declining balance or sum-of-the-digits, the difference is reduced, but it is still material. Table 2 shows the excess of capital expenditures over depreciation with various growth rates and depreciation periods, using either double declining balance or straight-line depreciation.

 TABLE	ABLE 2: EXCESS OF CAPITAL KPENDITURES OVER DEPRECIATION					Gate
Life	Method	2%	Growt 3%	h Rate 4%	5%	
10 years	Double declining	7.7%	11.6%	15.5%	19.4%	
15 years	Double declining	11.9%	18.0%	24.2%	30.3%	
10 years	Straight line	10.2%	15.5%	20.9%	26.3%	
15 years	Straight line	15.6%	23.8%	32.3%	41.0%	

			Growth Rate			
Life	Method	2%	3%	4%	5%	
10 years	Double declining	92.8%	89.6%	86.6%	83.7%	
15 years	Double declining	89.3%	84.7%	80.5%	76.7%	
10 years	Straight line	90.7%	86.6%	82.7%	79.1%	
15 years	Straight line	86.5%	80.8%	75.6%	70.9%	

When valuation experts review their own calculations (or the calculations of another expert), they ought to observe the amount of projected depreciation relative to projected capital expenditures in the terminal year. Table 3 shows depreciation as a percentage of capital expenditures with the various assumptions.

Many valuation reports overstate depreciation in growth models, and thus overestimate free cash flow. A discounted cash flow calculation that uses an excessive free cash flow projection necessarily overvalues a company.

¹ Damodaran, *Investment Valuation* (New York: John Wiley & Sons, Inc., 1996), pp. 224, 229; Hawkins & Paschall, *CCH Business Valuation Guide* (Riverwoods, IL: CCH Incorporated, 2000), p. 12,028.

Last update: 2/22/2002 12:00:00 AM

Article #1306

Copyright © 2017 Business Valuation Resources, LLC. All rights reserved. (503) 291-7963

Accessed: Thursday, 2/16/2017 8:31:50 AM.