EBITDA Single Period Income Capitalization for Business Valuation

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LEAVING
COMFORT
ZONE


HELLO
I measure
EBITDA


Earnings
Before
Interest
Taxes
Depreciation
Amortisation

One (Important) Man's View

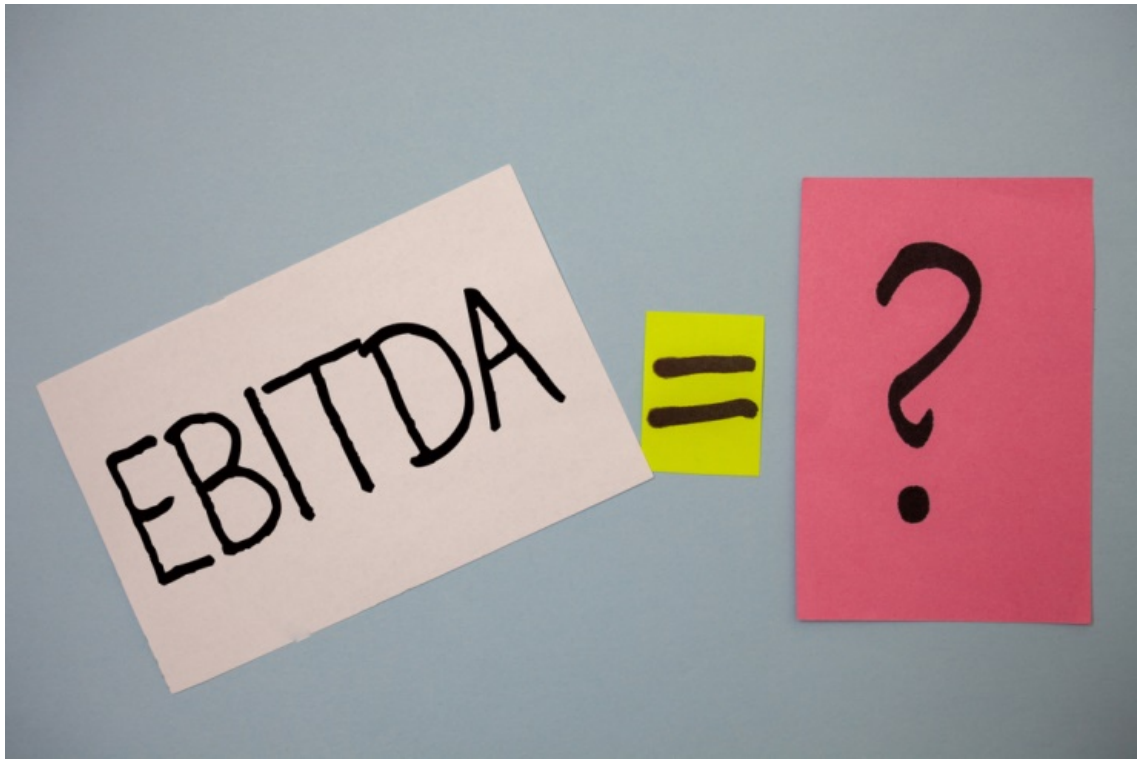
Charlie Munger, Berkshire Hathaway

"I think that, every time you see the word **EBITDA** [earnings], you should substitute the word "bullshit" earnings.

People who use **EBITDA** are either trying to con you or they're conning themselves.

Telecoms, for example, spend every dime that's coming in. Interest and taxes are real costs."

What is EBITDA?



Not B.S., but an analytical construct that can be helpful to business appraisers

Earnings **B**efore **I**nterest, **T**axes, **D**epreciation, and **A**mortization

Mantra for Today
Not all Dollars of EBITDA are

Created EQUAL

Who Focuses on EBITDA?

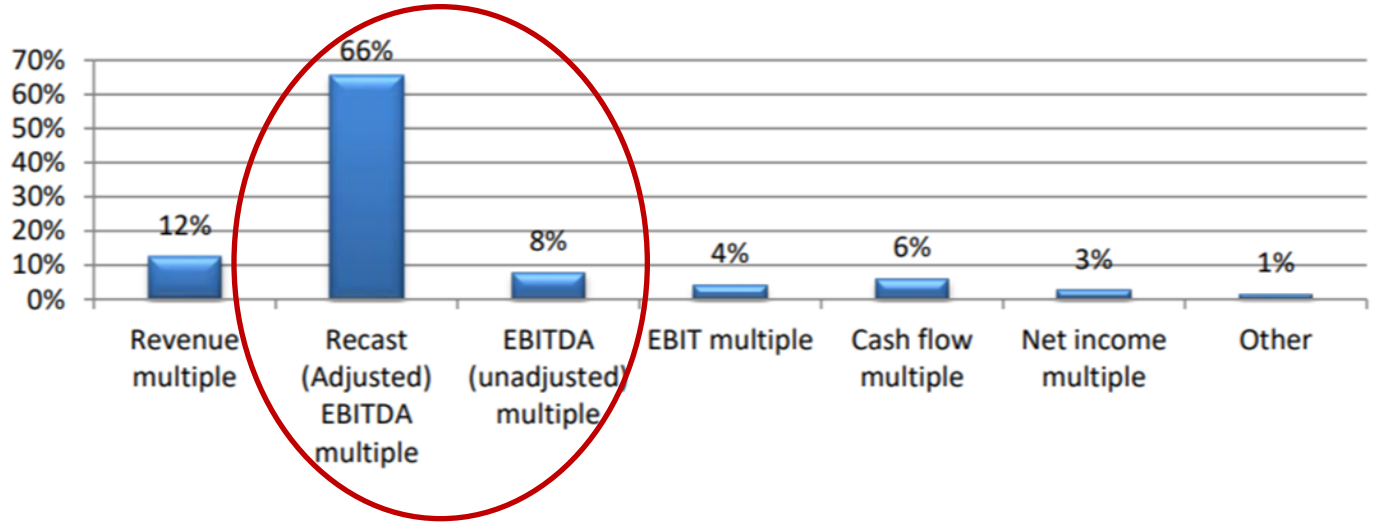
Pepperdine Study 2018

Who Uses EBITDA?

Investment Bankers

The most popular multiple method used by respondents when valuing privately-held businesses is the recast EBITDA multiple method, utilized by 66% of respondents.

Figure 43. Usage of Multiple Methods



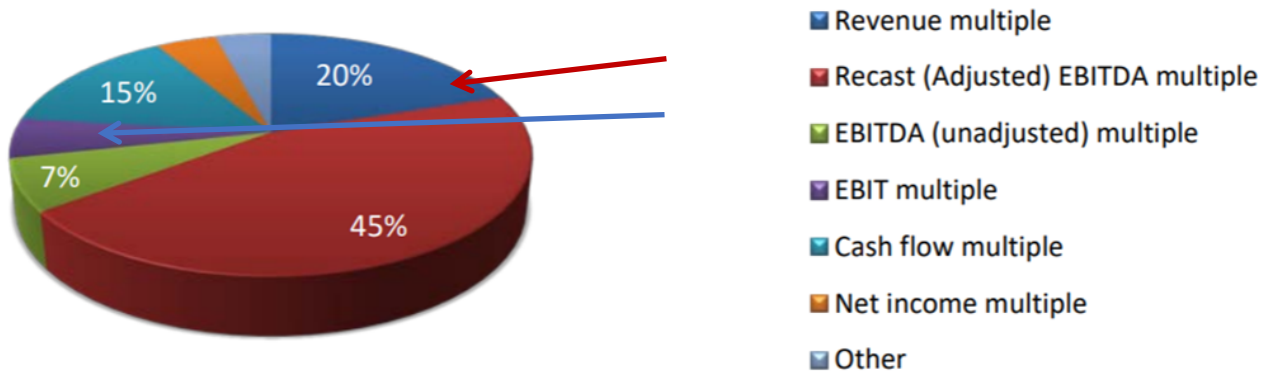
Pepperdine Study 2018

Business Appraisers

Respondents using multiples-based approaches indicate a preference for using recast (adjusted) EBITDA multiples (45%), followed by revenue multiples (20%).

Figure 85. Usage of Multiple Methods

Who Uses EBITDA?



Pepperdine Study 2018

Who Uses EBITDA?

Bank Lenders

Table 7. Senior Leverage Multiple by EBITDA Size

	$1M EBITDA	$5M EBITDA	$10M EBITDA	$25M EBITDA	$50M EBITDA	$50M+ EBITDA
Manufacturing	2.0	2.0	2.5	3.0	3.5	3.5
Construction & engineering	1.5	1.5	2.0	2.9	3.1	3.1
Consumer goods & services	2.5	2.5	2.8	3.3	3.5	3.5
Wholesale & distribution	1.5	2.0	2.6	3.1	3.1	3.5
Business services	2.6	2.8	2.9	3.0	3.1	3.1
Basic materials & energy	2.0	2.6	2.9	3.1	3.1	3.1
Healthcare & biotech	2.8	2.8	3.0	3.0	3.0	3.0
Information technology	2.0	2.0	2.3	2.3	2.3	2.3
Financial services	3.0	3.1	3.1	3.5	3.5	3.8
Media & entertainment	2.0	2.6	2.9	3.2	3.1	3.1
Total median	**2.0**	**2.6**	**2.8**	**3.1**	**3.1**	**3.1**

Pepperdine Study 2018

Who Uses EBITDA?

Everyone in "the Markets"

Average deal multiples on transactions from the prior twelve months as observed by respondents varied from 4.3 on the small deals to 9.5 for the large deals. These multiples are higher than last year.

Table 31. Median Deal Multiples by EBITDA Size of Company

EBITDA	Manufacturing	Construction & engineering	Consumer goods & services	Wholesale & distribution	Business services	Basic materials & energy	Healthcare & biotech	Information technology	Financial services	Media & entertainment	Avg
$0K - $999K EBITDA	3.5	3.8	4.8	3.8	4.3	2.5	6.0	5.5	6.0	2.5	**4.3**
$1M - $4.99M EBITDA	5.5	5.0	5.8	5.0	5.5	4.5	6.5	5.8	6.0	6.5	**5.6**
$5M - $9.99M EBITDA	*6.5*	6.5	7.5	6.0	5.8	5.0	6.5	6.3	6.5	7.0	**6.4**
$10M - $24.99M EBITDA	6.8	6.5	7.5	7.3	6.5	5.5	8.0	8.0	6.8	11.0	**7.4**
$25M - $49.99M EBITDA	9.0	n/a	9.5	n/a	7.3	6.5	11.0	9.0	8.3	n/a	**8.7**
$50M+ EBITDA	10.0	n/a	11.0	n/a	8.8	7.5	11.0	10.0	8.3	n/a	**9.5**

So Everybody's Doing It, But…

What Tools are Available to Business Appraisers to Develop Value Indications Using EBITDA?

- The **Guideline Transactions Method** under the Market Approach
- The **Guideline Public Company** under the Market Approach

How's that working for us?

Current Methods for Capitalizing EBITDA

1. Guideline transactions method
2. Guideline public company method
3. Income approach methods

The Guideline Transactions Method

Summary of Capitalization Factor

Acquiree // Acquiror	Transaction Date	Enterprise Value to: Sales	EBITDA	Transaction Value	Sales	EBITDA	EBITDA Margin	5 Year Sales Growth	Notes
Guideline Market Transactions									
(1) Sweet Leaf Tea // Nestle	Apr-09	nm	nm	$45	na	na	nm	na	*Nestle acquired 35% for $15.6 million, with option to acquire control*
Sweet Leaf Tea makes a range of natural and organic iced teas as well as other soft drinks.									
(2) Honest Tea // Coca-Cola	Feb-08	4.67x	nm	$108	$23	na	na	na	*Coke acquired 40% for $43 million, with option to acquire control*
Honest Tea makes low-calorie, organic tea from tea grown in a sustainable garden in India.									
(3) Energy Brands (Glaceau) // Coca-Cola	May-07	6.00x	30.0x	$4,200	$700	$140	20.0%	na	*Coke acquired 100% (including Tata stake) (2007 Est. EBITDA per Tata - SS006257)*
Glaceau is the maker of Vitaminwater as well as Fruitwater, an energy drink called Vitaminenergy, and Smartwater.									
(4) Fuze Beverages // Coca-Cola	Feb-07	2.63x	nm	$250	$95	na	na	na	
Fuze is a manufacturer of teas and non-carbonated fruit drinks enriched with vitamins.									
(5) Energy Brands (Glaceau) // Tata	Aug-06	6.36x	64.5x	$2,257	$355	$35	9.9%	na	*Tata acquired 30% stake for $677 million (2006 Est. EBITDA per Tata - SS006259)*
Glaceau is the maker of Vitaminwater as well as Fruitwater, an energy drink called Vitaminenergy, and Smartwater.									
(6) Horizon Organics // Dean Foods	Jun-03	1.33x	27.8x	$286	$215	$10	4.8%	39.6%	*Public target, 29.4% premium (per Mergerstat)*
Horizon Organics produces and markets organic milk and a full line of branded, refrigerated, organic dairy products, juices, and desserts. Horizon's products are marketed under the Horizon Organic and the Organic Cow of Vermont brand names in the U.S. and under the Rachel's Organic brand name in the U.K.									
(7) Aqual Cool Pure Bottled Water // Nestle	Dec-01	3.14x	nm	$220	$70	na	na	na	*Acquired division from Ionics, Inc.*
Aqua Cool water is delivered to offices and homes in the U.S., Britain, and France.									
(8) Odwalla // Coca-Cola	Oct-01	1.33x	14.8x	$170	$128	$11	9.0%	24.9%	*Public target, 45.2% premium (per Mergerstat)*
Odwalla's products include fresh fruit and vegetable juices, dairy-free shakes, and spring water.									
(9) Quaker Oats // Pepsi	Dec-00	2.66x	14.6x	$13,410	$5,041	$917	18.2%	-0.8%	*Public target, 19.6% premium (per Mergerstat)*
Quaker Oats is an international manufacturer and marketer of food and beverage products, including Gatorade brand sports drink.									
(10) South Beach Beverage (Sobe) // Pepsi	Oct-00	1.83x	nm	$411	$225	na	na	na	*Acquired 90% stake for $370 million*
SoBe makes fruit drinks and iced teas with vitamins or herbal ingredients added. Sobe's top-selling drink, SoBe Energy, is a juice cocktail containing guranara, herbal aphrodisiac yohimbe and amino acid arginine.									
(11) Snapple Beverage Group // Cadbury	Sep-00	1.88x	13.1x	$1,450	$772	$111	14.4%	na	*Transaction value, revenue, and earnings from press release*
Snapple is a US premium beverage company whose brands include Snapple, Mistic, Stewart's, and Royal Crown Cola.									
OVERALL AVERAGE		**3.18x**	**27.5x**	**$2,073**	**$762**	**$204**	**12.7%**	**21.3%**	
OVERALL MEDIAN		**2.65x**	**21.3x**	**$286**	**$220**	**$73**	**12.1%**	**24.9%**	
MEDIAN (Transactions > $1 billion)		**4.33x**	**22.3x**	**$3,229**	**$736**	**$126**	**16.3%**	**-0.8%**	
MEDIAN (Transactions < $1 billion)		**2.23x**	**21.3x**	**$220**	**$112**	**$11**	**6.9%**	**32.3%**	
MEDIAN (2000 through 2005)		**1.85x**	**14.7x**	**$349**	**$220**	**$61**	**11.7%**	**24.9%**	
MEDIAN (2006 through 2010)		**5.34x**	**47.2x**	**$250**	**$225**	**$88**	**14.9%**	**nm**	
Selected Capitalization Factor - AriZona Entities		**2.65x**	**21.3x**		**$1,008**	**$181**	**18.0%**	**13.1%**	*See Exhibit AV-1*

What About the Reliability of Transaction Data?

Analysis for Possible Use

- 11 Transactions
- Spread over nearly 9 years
- Only 6 of 11 transactions had EBITDA and EBITDA multiple data
- Was EBITDA normalized or adjusted in any way? We don't know
- Some transactions were "minority" but all were apparently strategic
- Historical growth data for only 3 transactions

What else don't we know about these transactions?

We Worked Hard to "Analyze" the Data!

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Question?

How comfortable would you be with this guideline transaction analysis and the multiples derived from it?

Bottom Line of Guideline Transactions Method (using *any* data source)

Virtually impossible **[at least normally difficult]** to obtain reliable transactional information to provide confidence in of transactional multiples

So how is an appraiser to capitalize EBITDA?

Guideline Public Company Analysis

INCOME SUMMARY

	Trailing Twelve Months Reported Income Statement												
	Sales $(Mil)	EBIT $(Mil)	Deprec/ Amort Expense $(Mil)	LTM CapEx $(Mil)	Net CapEx $(Mil)	EBITDA $(Mil)	EBITDA Deprec Factor	EBITDA Margin	EBIT Margin	Pre-Tax Profit Margin	Net Margin Bef Ext	ROE (common)	LTM CapEx / Sales
Huron Consulting Group Inc	844.85	117.56	58.05	(18.57)	39.48	175.62	1.49	20.8%	13.9%	11.6%	6.2%	8.0%	-2.2%
MAXIMUS Inc	2,189.50	237.39	59.85	(99.18)	(39.33)	297.24	1.25	13.6%	10.8%	10.8%	6.6%	23.4%	-4.5%
FTI Consulting Inc	1,779.15	164.51	43.12	(31.40)	11.72	207.63	1.26	11.7%	9.2%	5.9%	3.2%	4.9%	-1.8%
Korn/Ferry International	1,111.70	122.94	28.65	(21.20)	7.45	151.59	1.23	13.6%	11.1%	11.0%	8.0%	10.7%	-1.9%
CRA International Inc	309.56	20.19	6.47	(13.71)	(7.24)	26.66	1.32	8.6%	6.5%	6.4%	4.0%	5.7%	-4.4%
CEB Inc	928.43	139.16	76.09	(22.84)	53.25	215.25	1.55	23.2%	15.0%	12.7%	10.0%	**211.8%**	-2.5%
AVERAGE	1,193.87	133.62	45.37	(34.48)	10.89	179.00	1.35	15.2%	11.1%	9.7%	6.3%	10.6%	-2.9%
MEDIAN	1,020.07	131.05	50.59	(22.02)	9.59	191.62	1.29	13.6%	11.0%	10.9%	6.4%	8.0%	-2.3%

LTM	**15.9%**
Forward	**19.7%**
5-Year Avg	**17.0%**

Question? How comfortable would you be using this guideline public group to value your $5 million to $25 million professional services firm?

Bottom Line of Guideline Public Company Method (using *any* data source)

Difficult to develop guideline public company group having adequate similarities to most of our valuation clients in terms of business line, size, margin characteristics and so on…

So how is an appraiser to capitalize EBITDA?

What Are the Generally Available Methods Under the Income Approach?

So What About the Income Approach?

Single-period income capitalization

- Net income
- Debt-free net income
- Net cash flow
- Debt-free net cash flow
- Pre-tax measures
- *Capitalization of revenue*

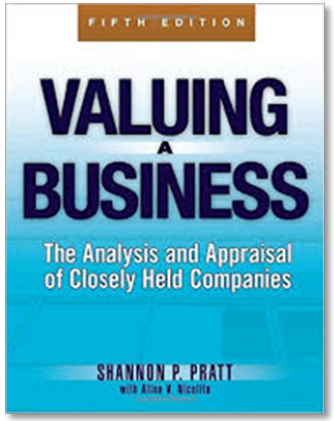
Discounted future benefits

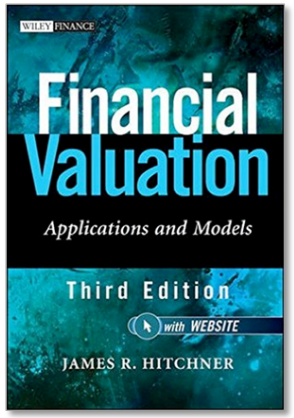
- Debt-free net cash flow
- Debt-free net income
- Net cash flow to equity

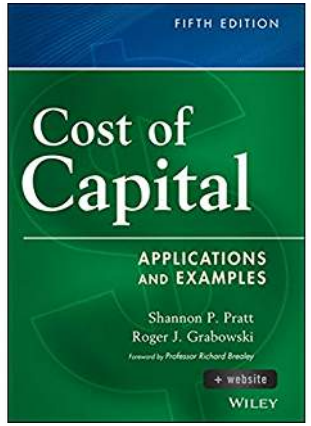
None of the generally available income approach methods enable business appraisers to capitalize EBITDA

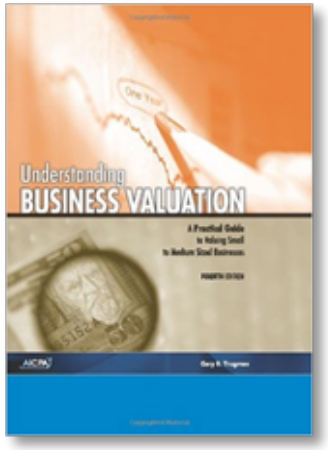
Valuation Texts on Capitalizing EBITDA

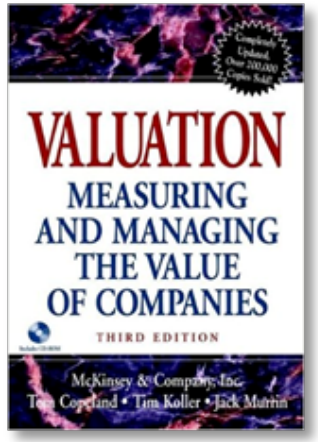
What Do Our Valuation Textbooks Say About EBITDA?

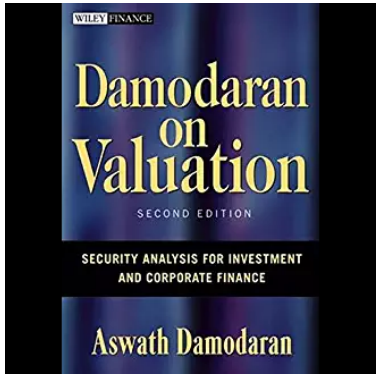


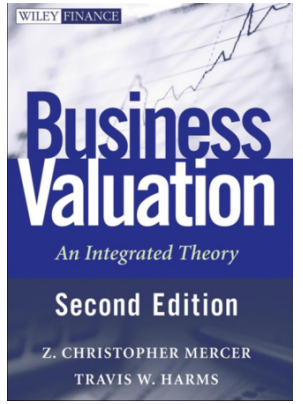






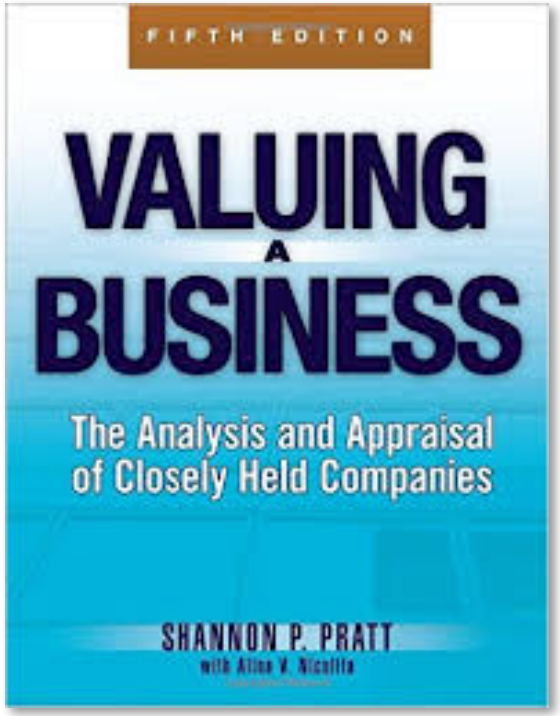




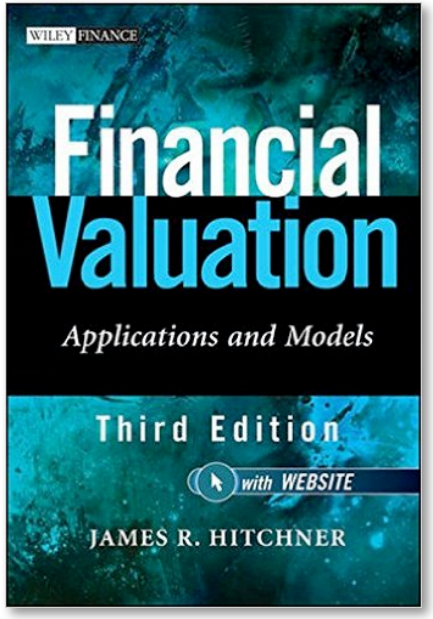


Valuation Text Review

Book	Author(s)	Page Reference	Summary of Discussion
Valuing a Business Fifth Edition	Shannon P. Pratt Alina V. Niculita	251	Mentions possibly capitalizing EBITDA to determine TV in DCF but prefers using the Gordon Model
		529	EBITDA mentioned and multiples calculated in sample report table

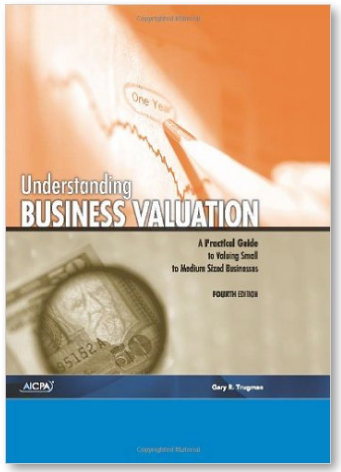


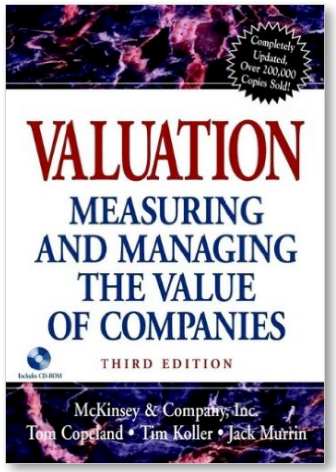
Valuation Text Review

Book	Author(s)	Page Reference	Summary of Discussion
Financial Valuation: Applications and Models Third Edition	James R. Hitchner	152	Use with guideline market data to determine TV in DCF. Used more by investment bankers than appraisers, who more frequently use the Gordon Model
		280	"Using concepts such as EBIT and EBITDA can be useful because they can reflect the economics of the business better than net income and cash flow, which are very much influenced by both the company's tax planning and its choice of capital structure."
		294	Mentions advantages of EBIT or EBITDA because they reflect the operations of the business and exclude nonoperating, financial (capital structure), and tax planning (depreciation policies for EBITDA) aspects that are part of net income. Because these things vary greatly between companies, EBIT or EBITDA may be preferable measures in some instances to net income.
		346	Notes that NOI before replacement reserves (in real estate) is similar to EBITDA, which is often used in business valuation.
		1120	Mentions the Invested Capital/EBITDA multiple and notes that public EBITDA multiples for hospitals often are considerably higher than relevant multiples for individual hospitals.

Valuation Text Review

Book	Author(s)	Page Reference	Summary of Discussion
Understanding Business Valuation: A Practical Guide to Valuing Small to Medium Sized Businesses	Gary R. Trugman		The Trugman book does not mention EBITDA (does discuss EBIT briefly)
PPC's Guide to Business Valuations	Fishman, Pratt, and Hitchner		EBITDA is not found in the Index
Valuation: Measuring and Managing the Value of Companies Third Edition	Copeland, Koller, Murrin		EBITDA is mentioned on two pages and not further discussed





Well…?

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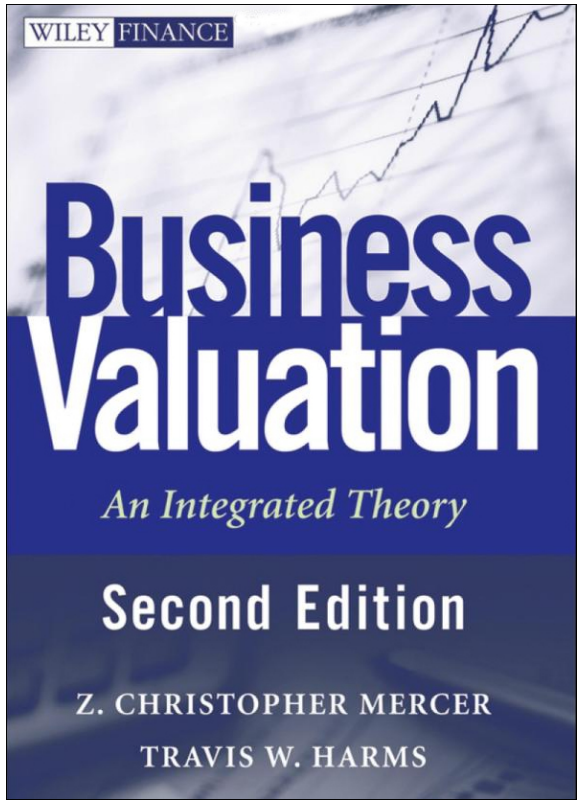


Not all appraisers use the Gordon Model to develop the terminal value. In practice, many appraisers (and market participants) use market-based methods to develop the terminal value multiple. Current market multiples (of net income, pre-tax income, EBITDA, debt-free net income, or others, as appropriate to the selected cash flow measure) are often applied to the forecasted cash flow in Year f, the last year of the discrete forecast, or to the year f + 1. Some appraisers have suggested that this method is "wrong" because it mixes an income approach method (DCF for the finite forecast) and a market approach method (usually guideline company methods for the terminal value). It is unclear why such a mixing is necessarily wrong. Given this procedure's widespread use and utility in developing reasonable indications of value using the DCF method, it should not be considered unusual or incorrect – provided that reasonable multiples from the public marketplace (or the market for transactions) are selected.[26] But "reasonable multiples" from the public marketplace today may not be reasonable for application five to 10 years from now, particularly if the industry is in a very rapid growth phase and growth is expected to slow in a few years.

[26] This point about the reliability of "mixing" approaches is further substantiated by common practice. If the Gordon Model is used to develop a terminal multiple, the very first test of the reasonableness of the derived multiple is to test it in the context of current public market multiples. For example, an appraiser used 1 / (*r-g)* to develop a terminal multiple of 20.0x debt-free net income in a subject company's DCF method. The credibility of that multiple will be supported if the median debt-free net income multiple for his guideline public group is in the range of 18x to 22x or so. However, its credibility might be questioned if the range of similar multiples in his guideline group was from 10x to 14x.

So What's An Appraiser to Do?

Everyone focuses on EBITDA but…

We have [virtually] no tools to value using EBITDA!

What if Business Appraisers Could Capitalize EBITDA Using a Method Under the Income Approach?

An Alternative Acronym

- **E**ager
- **B**usiness appraisers
- **I**magining
- **T**hey
- **D**etermine
- **A**nswers

Why Do Market Participants Focus on EBITDA?

Neutralizes tax differences across private companies

Neutralizes for capital structure differences

Neutralizes for accounting differences

Captures other differences

- Some companies “build” and others “buy” their capacity (or combinations)
- Amortization is included

No substitute for analysis

Cannot forget capital expenditures

Remember Charlie Munger

EBITDA is a Beginning Point

"Lowest common denominator" way to express relative value

- Compare a given company over time
- Compare other companies at a point in time or over time

EBITDA margin is a way of comparing the gross cash flow capabilities

- Between companies
- Of a specific company over time
- Relative to benchmarks

EBITDA is the beginning point of net cash flow that buyers seek

BGO Moment

Appraisers and investment bankers routinely develop EBIT and EBITDA multiples

- Did you ever wonder what causes the difference between a market multiple of EBIT and a comparable multiple of EBITDA?

Appraisers and investment bankers routinely examine EBIT and EBITDA margins

- Did you ever wonder what causes the difference between a company's EBIT margin and its EBITDA margin?

Here it is – For Every EBIT, There is a DA!

- And the DA's differ for a company over time and between different companies and across industries

Oh Where, Oh Where is My EBITDA?

Searching for EBITDA…

For all the Talk, EBITDA Does Not Appear in Company Financial Statements

EBITDA is an analytical construct that market participants have found useful to talk about gross cash flow, valuation, and more

Finding EBITDA

"Finding" EBITDA: Company 1

Sample Company 1: Representing Companies that Make or Sell Stuff			
Sales		$50,000,000	100.0%
Cost of Goods Sold (Excluding Depreciation)		$27,500,000	55.0%
Depreciation		$2,500,000	5.0%
Gross Profit		$20,000,000	40.0%
Operating Expenses			
Sales and Marketing		$6,000,000	12.0%
Administrative		$4,000,000	8.0%
Other Expenses		$3,000,000	6.0%
Amortization of Intangible Assets		$1,000,000	2.0%
Interest Expense		$500,000	1.0%
Total Operating Expenses		$14,500,000	29.0%
Pre-Tax Income		$5,500,000	11.0%
State Taxes	6.0%	$330,000	0.7%
Net Income for Pass-Through Entity		$5,170,000	10.3%

"Finding" EBITDA: Company 1

Pre-Tax Income	$5,500,000	11.0%
+ Interest Expense	$500,000	1.0%
= EBIT	$6,000,000	12.0%
+ Depreciation	$2,500,000	5.0%
+ Amortization of Intangible Assets	$1,000,000	2.0%
= EBITDA for Sample Company 1	$9,500,000	19.0%

For every EBIT, there is a DA

From on High
EBIT Multiple = 8.0x

"Finding" EBITDA: Company 2

Sample Company 2 - Representing Companies that Deliver Services			
Sales		$25,000,000	100.0%
Operating Expenses			
People Costs		$14,500,000	58.0%
Occupancy Costs		$2,500,000	10.0%
Depreciation		$125,000	0.5%
Interest Expense		$250,000	1.0%
All Other Costs		$2,250,000	9.0%
Total Operating Expenses		$19,625,000	78.5%
Pre-Tax Income		$5,375,000	21.5%
State Taxes	6.0%	$322,500	0.5%
Net Income for Pass-Through Entity		$5,052,500	20.2%

"Finding" EBITDA: Company 2

Pre-Tax Income	$5,375,000	21.5%
+ Interest Expense	$250,000	1.0%
= EBIT	$5,625,000	22.5%
+ Depreciation	$125,000	0.5%
+ Amortization of Intangible Assets	$0	0.0%
= EBITDA for Sample Company 2	$5,750,000	23.0%

For every EBIT, there is a DA

From on High
EBIT Multiple = 8.0x

Valuation Basics

$$V = \frac{CF_1}{r - g}$$

$$\text{Value} = \text{Earnings} \times \text{Multiple}$$

Basic Valuation Review
Discounted Cash Flow Method (DCF)

THE DCF Method is a valuation method under the Income Approach

In theory, the DCF model requires a forecast of expected annual cash flows for every year after the valuation date into the indefinite future. Valuation is a perpetuity concept. The business is expected to continue to generate cash flows into perpetuity. Expected cash flows are discounted to the present at a discount rate, r, that is commensurate with the risks associated with achieving the expected cash flows

$$\text{Value} = V_0 = \left(\frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \frac{CF_4}{(1+r)^4} + \ldots + \frac{CF_n}{(1+r)^n} \right)$$

Value = *f* (Expected Cash Flow, Risk and Growth)

Basic Valuation Review
Discounted Cash Flow Method (DCF)

The overview DCF formula is theoretically correct and absolutely inoperable

No one can conduct a realistic forecast into perpetuity, or essentially, forever

$$\text{Value} = V_o = \left(\frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \frac{CF_4}{(1+r)^4} + \ldots + \frac{CF_n}{(1+r)^n} \right)$$

Value = *f* (Expected Cash Flow, Risk and Growth)

Thank You, Professor Gordon!

$$V = \frac{CF_1}{r - g}$$

Two critical assumptions appraisers often forget

1. Cash flows grow at a constant rate of g
2. All cash flows are
   a. Distributed to owners each year, or
   b. Reinvested in the enterprise at the discount rate, r

Well-ingrained that "CF" is net and the "r" (or R) is applicable to net cash flow (net income)

Not EBITDA!

Two-Stage DCF Model

1. In the two-stage model, the analyst **forecasts cash flows for a finite period of years**, quite often five years (or three years or ten years).
2. The appraiser then estimates the remaining cash flows (into perpetuity) in the form of a **terminal value calculation**

$$V_0 = \left(\frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_3}{(1+r)^3} + \ldots + \frac{CF_f}{(1+r)^f} \right) + \left(\frac{CF_{f+1}/(r-g)}{(1+r)^f} \right)$$

Present Value of Interim Cash Flows (PVICF) Using this portion of the basic DCF model, the analyst is not constrained by the requirement of constantly growing cash flows during the finite forecast period ending with Year f. This part of the equation is the present value of interim cash flows through the finite forecast period ending with Year f, or PVICF.

Present Value of the Terminal Value (PVTV) Using the Gordon Model, all cash flows are capitalized after Year f, assuming cash flows are growing from that point at the constant rate of g. This portion of the equation therefore represents the present value of $CF_{f+1} = CF_f \times (1 + g)$

The big question?

How should appraisers estimate the terminal value?

Value = *f* (Expected Cash Flow, Risk and Growth)

Basic Valuation Review
Discounted Cash Flow Method (DCF)

1. **Finite projection.** Analyst estimates expected future cash flows of an enterprise for a finite number of years
2. **Expected growth.** Cash flow growth is estimated over the expected forecast horizon
3. **Terminal value**. All remaining cash flows after are capitalized after the finite forecast period in the form of a terminal value
4. **Discount to Present at R**. All cash flows, including those from the finite projection period and the terminal value are discounted to the present at a ***discount rate*** commensurate with the risks associated with achieving the expected cash flows

Can project expected cash flows to equity and discount with R, or projected expected debt-free net cash flows and discount with WACC

Where does R come from?

Finding R, the Discount Rate

The Adjusted Capital Asset Pricing Model (ACAPM)

Long-term Treasuries
+ ERP x *beta*
+ Size premium
+ Specific company risk premium
= Equity discount rate

ERPs and size premiums are based on examining returns from public companies over time (Ibbotson, Morningstar, and now Duff & Phelps)

Specific company risk premiums are based on analysts judgment in light of all relevant market evidence

Build-up discount rates (and corresponding WACCs) are considered to be applicable to net income or net cash flow

NOT EBITDA!

WACC and Enterprise Value

Enterprise Value = DFNI / (WACC – g)

Enterprise Value = DFNCF / (WACC – g*)

For growing companies

- Reinvestment reduces DFNCF
- Reinvestment should positively impact g
- If no growth enhancement from reinvestment, why do it?
- **Need to make realistic estimates of g and reinvestment**

Estimating the Terminal Value in DCF Models

There are two primary methods by which appraisers estimate terminal values in DCF valuation models (focus on enterprise values)

- **Income Approach**. The terminal value is estimated by developing a WACC less an expected long-term growth rate to obtain a cap rate (or multiple) of debt-free net income (or net cash flow)
- **Market Approach.** The terminal value is estimated by applying an enterprise level market multiple to final year (or final year plus one) EBITDA

"You're Mixing an Income Approach and a Market Approach!"

Frequent Response to Use of Market Multiples to Estimate Terminal Values

Investment Banker DCF
Apply a Market Multiple of EBITDA

DCF Analysis - AZ078174

	2008 Norm	2009E	2010E	2011E	2012E	2013E	Terminal
Revenue	$930	$964	$1,087	$1,189	$1,248	$1,310	
Growth		*3.7%*	*12.8%*	*9.4%*	*5.0%*	*5.0%*	
Tax-Effected EBIT	$80	$83	$86	$83	$88	$92	
Margin	*8.6%*	*8.6%*	*8.0%*	*7.0%*	*7.0%*	*7.0%*	
Depreciation	1	2	2	2	2	2	
Change in Working Capital	(23)	(24)	(27)	(30)	(31)	(33)	
Capital Expenditures	(2)	(2)	(2)	(2)	(2)	(3)	
Free Cash Flow	**$56**	**$59**	**$59**	**$53**	**$56**	**$59**	**$1,584**
Discounting Periods		1.0	2.0	3.0	4.0	5.0	5.0
Present Value Factors	11.0%	0.9009	0.8116	0.7312	0.6587	0.5935	0.5935
PV of Cash Flows		53	48	39	37	35	940
Indicated Value (Enterprise)	**$1,152**						

TV equals 82% of Enterprise Value

Terminal Value		$1,152	10.0x	11.0x	12.0x
2013E EBITDA	$144	**10.0%**	$1,111	$1,201	$1,290
times: Exit Multiple	11.0x	**10.5%**	$1,088	$1,176	$1,263
Terminal Enterprise Value	$1,584	**11.0%**	$1,066	$1,152	$1,237
		11.5%	$1,045	$1,128	$1,212
		12.0%	$1,024	$1,105	$1,187

Gordon Model Terminal Value

One of My Appraisals

Terminal Value Estimation

Free Cash Flow - 2020		$195.7
Terminal Growth Rate		4.5%
Free Cash Flow - 2021		$204.5
	"The Market"	
	r	10.8%
	g	-4.5%
x Terminal Multiple - Gordon Growth 1/(r-g)		6.3% 15.9
= Estimated Terminal Value (Enterprise Value)		$3,245.4

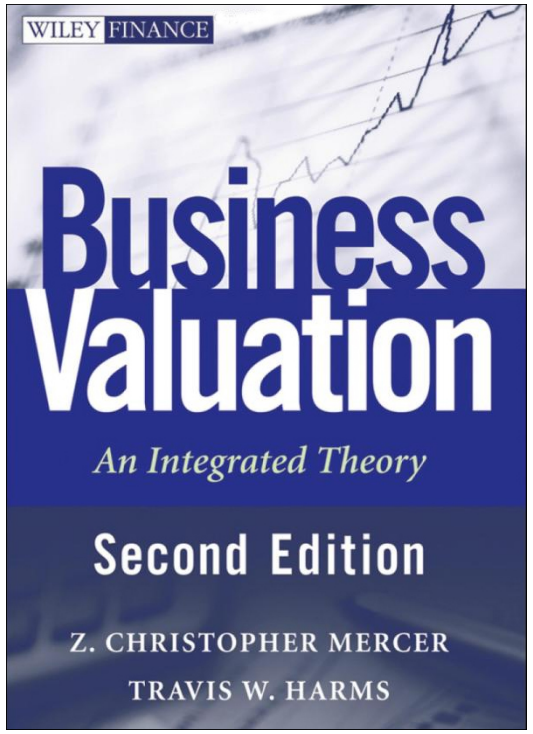
Implied Terminal Multiples

MVTC / 2020 Revenue		*1.61x*
MVTC / 2020 EBITDA	"The Market"	*8.9x*

There's that darned EBITDA again! If the "Income Approach" doesn't make sense with "the Market," something's bad wrong

Well…?

p. 26 (2007)



Not all appraisers use the Gordon Model to develop the terminal value. In practice, many appraisers (and market participants) use market-based methods to develop the terminal value multiple. Current market multiples (of net income, pre-tax income, EBITDA, debt-free net income, or others, as appropriate to the selected cash flow measure) are often applied to the forecasted cash flow in Year f, the last year of the discrete forecast, or to the year f + 1. **Some appraisers have suggested that this method is "wrong" because it mixes an income approach method (DCF for the finite forecast) and a market approach method** (usually guideline company methods for the terminal value). It is unclear why such a mixing is necessarily wrong. Given this procedure's widespread use and utility in developing reasonable indications of value using the DCF method, it should not be considered unusual or incorrect – provided that reasonable multiples from the public marketplace (or the market for transactions) are selected.[26] But "reasonable multiples" from the public marketplace today may not be reasonable for application five to 10 years from now, particularly if the industry is in a very rapid growth phase and growth is expected to slow in a few years.

[26] **This point about the reliability of "mixing" approaches is further substantiated by common practice. If the Gordon Model is used to develop a terminal multiple, the very first test of the reasonableness of the derived multiple is to test it in the context of current public market multiples**. For example, an appraiser used 1 / (*r-g)* to develop a terminal multiple of 20.0x debt-free net income in a subject company's DCF method. The credibility of that multiple will be supported if the median debt-free net income multiple for his guideline public group is in the range of 18x to 22x or so. However, its credibility might be questioned if the range of similar multiples in his guideline group was from 10x to 14x.

How Calculate the Terminal Value?

Income Approach?

or

Market Approach?

Appraisers seem to forget that all valuation methods relate to "the markets" in one way or another

Take your pick, but be sure that your income method makes sense in relation to "the markets" or that your market method makes sense in relation to the necessary assumptions of the income approach

(i.e., the implied WACCs and Gs)

Building Blocks of the EBITDA Depreciation Factor

(Net) Cash Flow to Equity

Derivation of Free Cash Flow to Equity
Net Income (Earnings Net of Taxes)
+ Depreciation and Amortization
- Capital Expenditures
- Incremental Working Capital for Growth
+ Depreciation
+/- Net Change in Long-Term Debt
= Free (Net) Cash Flow to Equity

Debt-Free Net Cash Flow – Take 1

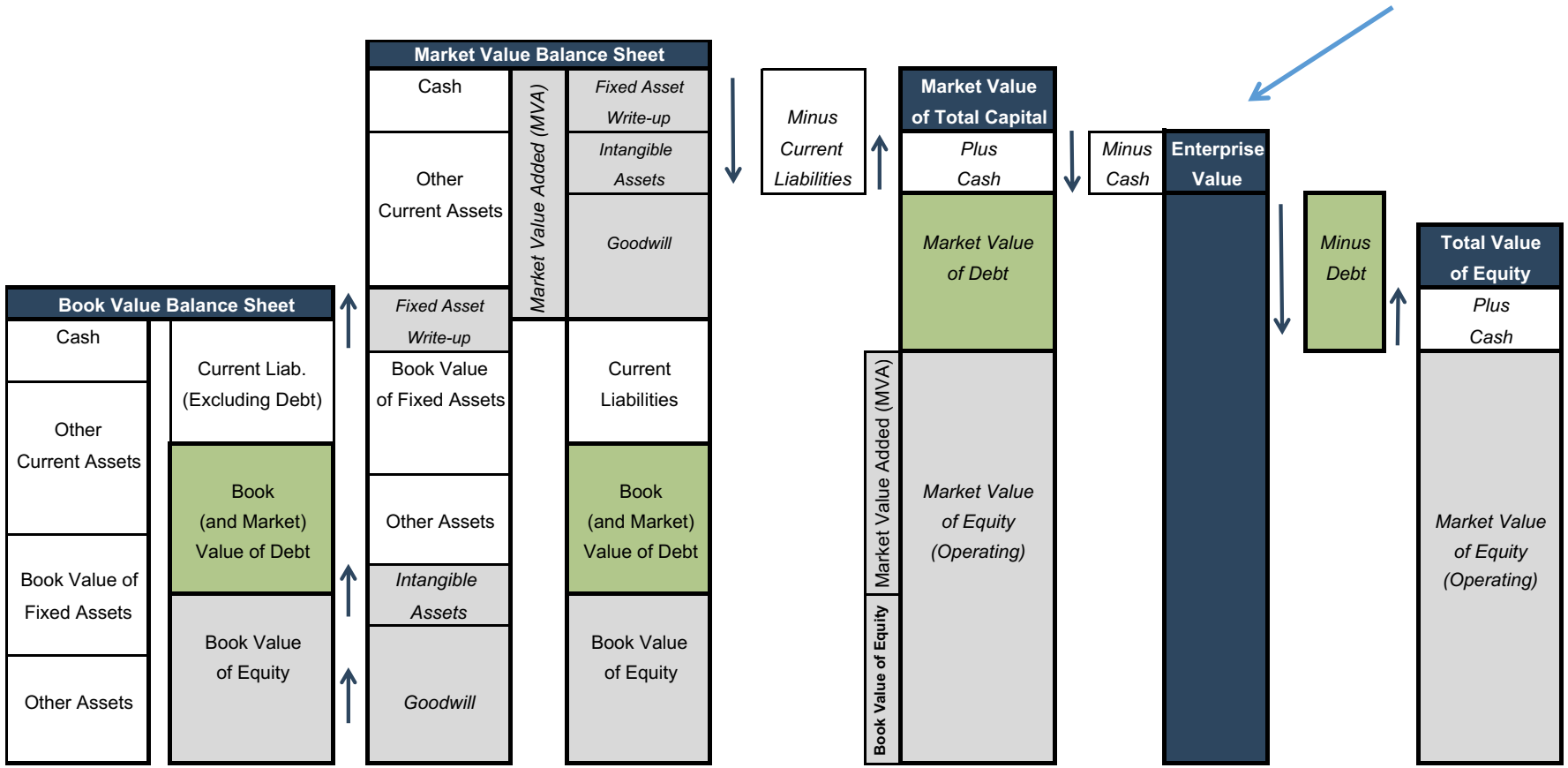
Debt-Free Net Cash Flow
Operating Income
- Taxes
Debt-Free Net Income
- Incremental Working Capital for Growth
+ Depreciation
- Capital Expenditures
Debt-Free Net Cash Flow

Debt-Free Net Cash Flow – Take 2

EBITDA is the Beginning Point of Debt-Free Net Cash Flow	
Pre-Tax Income	
+ Interest Expense	
EBIT	Debt-Free Pre-Tax Income
+ Depreciation and Amortization	
EBITDA	Beginning Point for Cash Flow
- Capital Expenditures	Reinvest in Business
- Incremental Working Capital for Growth	Reinvest in Business
- Interest	Interest on Loans from Lenders
- Taxes	We All Pay to Play
Debt-Free Net Cash Flow	What's Left

Remember: Buyers do not buy EBITDA. They buy (net) cash flow

MVTC, Enterprise Value, and MVE



EBITDA and EBIT

And the Relationship Between Depreciation (and Amortization) and EBIT

Depreciation (and Amortization) are non-cash expenses on the income statement

- Depreciation at a point in time is based on existing stock of depreciable assets on balance sheet across each period (D) – Not free! **The cash has already been spent on CapEx**
- Amortization is based on existing stock of amortizable intangible assets (A)
- EBITDA includes both D and A
- Some companies build and some buy their productive assets

Depreciation is Proxy for Need for Ongoing CapEx

Significant depreciation?

- Likely need for significant CapEx to maintain capital stock
- More if company growing

Capital expenditures are lumpy

- Depreciation tends to be more regular and anticipatable

Need for ongoing CapEx is reflected by level of depreciation in income statements

Cannot blindly capitalize EBITDA without consideration of reinvestment needed to replace and for growth if appropriate

Relationship Between Depreciation and EBIT

- Relationship between D and A and EBIT (DA)
- What percentage of EBIT is accounted for by Depreciation (and Amortization)?

EBIT = $1.0 million	EBIT = $1.0 million
DA = $300 thousand	DA = $500 thousand
DA = 30% of EBIT	DA = 50% of EBIT

- Depreciation is proxy for the need for ongoing capital expenditures for a business

EBITDA Depreciation Factor

EBITDA = EBIT + D + A

- Definition

Calculate Depreciation (DA) as % of EBIT

- DA / EBIT

EBITDA Depreciation Factor

- **(1 + DA / EBIT)**
- **EBITDA / EBIT**
- **A measure of the relationship between EBIT and EBITDA**
- **Relationship has always existed so choose to focus on it from a valuation perspective**

Logical Thinking

EBIT	Depreciation/ Amortization	EBITDA	% of EBITDA Available for EBIT	EBITDA/EBIT
$1,000	$0	$1,000	100%	**1.00**
$1,000	$200	$1,200	83%	**1.20**
$1,000	$400	$1,400	71%	**1.40**
$1,000	$600	$1,600	63%	**1.60**
$1,000	$800	$1,800	56%	**1.80**
$1,000	$1,000	$2,000	50%	**2.00**

All of EBITDA is available for EBIT

The EBITDA Depreciation Factor (EBITDA/EBIT) is a measure of need for replacement CapEx to maintain a business

Only half of EBITDA is available for EBIT

Logically, **other things being equal**, a company with a higher EBITDA Depreciation Factor should be worth a lower multiple of EBITDA than one with a lower factor.

Why?

The company with the lower factor delivers more dollars available for everything else after replacement expenditures

Some Obvious (In Retrospect) Math From the Public Markets

Five Public Companies
As of 12/31/17

Company	Sales	Enterprise Value	EBIT	EBITDA	Calculated Enterprise Value to EBIT	Calculated Enterprise Value to EBITDA
Vonage Holdings VG	$1,002	$2,528	$64	$137	39.2	**18.5**
Shoe Carnival Inc SCVL	$1,010	$432	$43	$67	10.0	**6.4**
Barnes & Noble E BNED	$2,107	$411	$55	$114	7.4	**3.6**
EMCOR Group In EME	$7,687	$4,652	$390	$478	11.9	**9.7**
Lennox Internatio LII	$3,840	$9,636	$486	$551	19.8	**17.5**

Company	EBIT Multiple	EBITDA Depreciation Factor	Implied EBITDA Multiple
Vonage Holdings Corp	39.2	2.12	**18.5**
Shoe Carnival Inc	10.0	1.56	**6.4**
Barnes & Noble Education Inc	7.4	2.07	**3.6**
EMCOR Group Inc	11.9	1.23	**9.7**
Lennox International Inc	19.8	1.13	**17.5**

(from above) ***EBITDA/EBIT*** ***EBIT Multiple / EBITDA Dep Factor***

Capitalizing EBITDA

Begin with familiar territory and develop a WACC

Development of WACC and DDFNI Cap Rate and Multiple (9 Assumptions)

Developing WACC and Cap Rates/Multiples					
Long-Term Treasury Rate		3.00%	1		
Equity Risk Premium	5.50%		2		
Beta	1.2		3		
Adjusted Equity Risk Premium		6.68%			
Size Premium		4.00%	4	Applicable Weights	Weighted Components
Company Specific Risk Premium		2.50%	5		
Equity Discount Rate (R)		**16.18%**		**75%**	12.14%
Applicable to Market Value of Equity					
				8	
Pre-Tax Cost of Debt	**6.00%**		6		
Less Taxes @	**26%**		7		
After-Tax Cost of Debt		**4.44%**		**25%**	1.11%
Weighted Average Cost of Capital (WACC)					**13.25%**
Less: Expected Long-Term Growth Rate				9	-4.00%
Debt-Free Net Income (CF) Cap Rate					9.25%
1 Divided by Cap Rate		*Turn Cap Rate into Multiple*			
Debt-Free Net Income (CF) Multiple					**10.81**

One More Step
Debt-Free Pre-Tax Cap Rate and Multiple

Let's Take One More Step			
Debt-Free Net Income (CF) Cap Rate	*From above*		9.25%
Divide by (1 - Tax Rate)	*From above*	**26%**	
Debt-Free Pre-Tax Cap Rate (EBIT)		7	12.50%
1 Divided by Cap Rate	*Turn Cap Rate into Multiple*		
EBIT Multiple			**8.00**

We could have similarly developed the EBIT cap rate and the EBIT multiple for either Sample Company 1 or Sample Company 2

That's how they can both have the same EBIT multiple of 8.0x

Capitalization of DFNI = DFPTI (EBIT)

Simple Proof of Equivalency of Capitalizing DFNI and Pre-Tax DFI

		(EBIT)
	After Tax DFNI	**Pre-Tax DFI**
EBIT	$1,351	
Tax Rate	*26%*	*26%*
Debt-Free Net Income (DFNI)	$1,000	$1,000
Tax Rate		*Divide by (1-Tax Rate)*
Pre-Tax Debt Free Income (EBIT)		$1,351
Weighted Average Cost of Capital	15.00%	15.00%
Less: Expected Growth	-5.00%	-5.00%
DFNI Cap Rate	10.00%	10.00%
		Divide by (1-Tax Rate)
Pre-Tax DFI Cap Rate		13.5%
Implied Multiples (1 / Cap Rate)	10.00	7.40
DFNI / Pre-Tax DFI	$1,000	$1,351
Implied Enterprise Value	**$10,000**	**$10,000**

Nine Assumptions Plus One to Capitalize EBITDA

	WACC / DFNI Cap Rate Assumptions
1	Long-Term Treasury Rate
2	Equity Risk Premium
3	Beta
4	Size Premium
5	Company Specific Risk Premium
6	Pre-Tax Cost of Debt
7	Tax Rate
8	Equity / Debt Weightings
9	Long-Term Growth Rate
	Capitalizing EBITDA Assumption
10	**EBITDA Depreciation Factor**

How much judgment is there in the selection of each of the first nine assumptions?

How much room is there for disagreement among appraisers?

Only one more assumption is needed to credibly capitalize EBITDA – the EBITDA Depreciation Factor

Direct Development of EBITDA Multiple Beginning with WACC

Weighted Average Cost of Capital (WACC)			**13.25%**
Less: Expected Long-Term Growth Rate		9	-4.00%
Debt-Free Net Income (CF) Cap Rate			9.25%
1 Divided by Cap Rate	*Turn Cap Rate into Multiple*		
Debt-Free Net Income (CF) Multiple			**10.81**
Let's Take One More Step			
Debt-Free Net Income (CF) Cap Rate	*From above*		9.25%
Divide by (1 - Tax Rate)	*From above*	**26%**	
Debt-Free Pre-Tax Cap Rate (EBIT)		7	12.50%
1 Divided by Cap Rate	*Turn Cap Rate into Multiple*		
EBIT Multiple			**8.00**
And One Final Step			
EBIT Multiple			**8.00**
Divided by EBITDA Depreciation Factor	← →	10	1.25
EBITDA Multiple			**6.40** ←

One more assumption beyond the debt-free net income (CF) cap rate and we have the applicable EBITDA multiple

Range of EBITDA Multiples

Assumptions		Lower		Higher
Calculated Results				
Equity Discount Rates	1	**20.0%**		**15.0%**
Pre-Tax Debt	2	**6.0%**		**6.0%**
Tax Benefit of Debt @	3	-2.3%	**38.0%**	-2.3%
After-Tax Cost of Debt	4	3.7%		3.7%
Portion of Enterprise Value fo Equity	5	**70.0%**		**70.0%**
Portion of Enterprise Value for Debt	6	30.0%		30.0%
Weighted Average Cost of Capital	7	**15.1%**		**11.6%**
Expected Long-Term Growth *(g)*	8	-4.0%		-5.0%
Debt-Free Net Income Cap Rate	9	11.1%		6.6%
DF Pre-Tax Cap Rate (EBIT Cap Rate)	10	**17.9%**		**10.7%**
DFNI Cap Rate / (1 - Tax Rate)				
EBIT Multiples (1 / EBIT Cap Rate)	11	5.6		9.4
EBITDA Depreciation Factor Range	12	**1.40**		**1.20**
EBITDA Multiples *(Row 11 / Row 12)*	13	**4.0**		**7.8**

Range of EBITDA Multiples

Assumptions		Lower		Higher
Calculated Results				
Equity Discount Rates	1	**20.0%**		**15.0%**
Pre-Tax Debt	2	**6.0%**		**6.0%**
Tax Benefit of Debt @	3	-1.6%	**26.0%**	-1.6%
After-Tax Cost of Debt	4	4.4%		4.4%
Portion of Enterprise Value fo Equity	5	**70.0%**		**70.0%**
Portion of Enterprise Value for Debt	6	30.0%		30.0%
Weighted Average Cost of Capital	7	**15.3%**		**11.8%**
Expected Long-Term Growth *(g)*	8	-4.0%		-5.0%
Debt-Free Net Income Cap Rate	9	11.3%		6.8%
DF Pre-Tax Cap Rate (EBIT Cap Rate)	10	**15.3%**		**9.2%**
DFNI Cap Rate / (1 - Tax Rate)				
EBIT Multiples (1 / EBIT Cap Rate)	11	6.5		10.8
EBITDA Depreciation Factor Range	12	**1.40**		**1.20**
EBITDA Multiples *(Row 11 / Row 12)*	13	**4.7**		**9.0**

Multiples Old Tax Law	**4.0**	**7.8**
Multiples New Tax Law	**4.7**	**9.0**
Change Based on Tax Law Change	***17.5%***	***15.4%***

EBITDA Multiples Over Ranges of Expected Risk and Growth

Single-Period EBITDA Capitalization to Develop Enterprise and Equity Values
Assumption Summary

1	Pre-Tax Debt	6.00%			
2	Tax Rate	26%	7	Highest Equity Discount Rate	20.0%
3	Portion Equity	70%	8	Highest Expected LT Growth Rate	6.0%
	Portion Debt	30%	9	EBITDA Estimate ($Millions)	$2.00
4	EBITDA Depreciation Factor	1.25	10	Total Debt Outstanding ($M)	$2.00
5	Decrement in Disc Rate	1.00%	11	Cash (and Oher Non-Op Asssets, $M)	$3.00
6	Decrement in Growth Rate	0.50%			

Four Quadrants of Expected EBITDA Multiples

	Implied Enterprise Value / EBITDA Multiples Based on Above Assumptions							
Equity R	20.00%	19.00%	18.00%	17.00%	16.00%	15.00%	14.00%	13.00%
WACC	15.33%	14.63%	13.93%	13.23%	12.53%	11.83%	11.13%	10.43%
Growth	II Higher Risk / Higher Growth				IV Lower Risk / Higher Growth			
6.0%	6.3	6.9	7.5	8.2	9.1	10.2	11.5	13.4
5.5%	6.0	6.5	7.0	7.7	8.4	9.3	10.5	12.0
5.0%	5.7	6.1	6.6	7.2	7.9	8.7	9.7	10.9
4.5%	5.5	5.8	6.3	6.8	7.4	8.1	8.9	10.0
4.0%	5.2	5.6	6.0	6.4	6.9	7.6	8.3	9.2
3.5%	5.0	5.3	5.7	6.1	6.6	7.1	7.8	8.5
3.0%	4.8	5.1	5.4	5.8	6.2	6.7	7.3	8.0
2.5%	4.6	4.9	5.2	5.5	5.9	6.3	6.9	7.5
	I Higher Risk / Lower Growth				III Lower Risk / Lower Growth			

Mirror the thinking of hypothetical willing buyers and sellers

EBITDA Multiples by Quadrant

	Implied Enterprise Value / EBITDA Multiples Based on Above Assumptions							
Equity R	20.00%	19.00%	18.00%	17.00%	16.00%	15.00%	14.00%	13.00%
WACC	15.33%	14.63%	13.93%	13.23%	12.53%	11.83%	11.13%	10.43%
Growth	II Higher Risk / Higher Growth				IV Lower Risk / Higher Growth			
6.0%	6.3			8.2	9.1			13.4
5.5%		Average 6.6				Average 9.7		
5.0%								
4.5%	5.5			6.8	7.4			10.0
4.0%	5.2			6.4	6.9			9.2
3.5%		Average 5.4				Average 7.3		
3.0%								
2.5%	4.6			5.5	5.9			7.5
	I Higher Risk / Lower Growth				III Lower Risk / Lower Growth			

5.7 4.6	Old Tax Law Multiples *(matching quadrants above)*	8.5 6.3

Enterprise Value Ranges
Assuming $2.0 Million in EBITDA

Equity R	20.00%	19.00%	18.00%	17.00%	16.00%	15.00%	14.00%	13.00%
WACC	15.33%	14.63%	13.93%	13.23%	12.53%	11.83%	11.13%	10.43%
Growth	Implied Range of Operating Enterprise Values ($Millions)							
6.0%	$12.7	$13.7	$14.9	$16.4	$18.1	$20.3	$23.1	$26.7
5.5%	$12.0	Average		$15.3	$16.8	Average		$24.0
5.0%	$11.5	$13.3		$14.4	$15.7	$19.5		$21.8
4.5%	$10.9	$11.7	$12.6	$13.6	$14.7	$16.1	$17.9	$20.0
4.0%	$10.4	$11.1	$11.9	$12.8	$13.9	$15.1	$16.6	$18.4
3.5%	$10.0	Average		$12.2	$13.1	Average		$17.1
3.0%	$9.6	$10.8		$11.6	$12.4	$14.6		$15.9
2.5%	$9.2	$9.8	$10.4	$11.0	$11.8	$12.7	$13.7	$14.9

EBITDA x Multiple = Enterprise Value

$2.0mm (assumed) x 6.3 (prior slide) = $12.7mm

EBITDA Depreciation Factor

BGO Moment

Appraisers and investment bankers routinely develop EBIT and EBITDA multiples

- Did you ever wonder what causes the difference between a market multiple of EBIT and a comparable multiple of EBITDA?

Appraisers and investment bankers routinely examine EBIT and EBITDA margins

- Did you ever wonder what causes the difference between a company's EBIT margin and its EBITDA margin?

Here it is – For Every EBIT, There is a DA!

- And the DA's differ for a company over time and between different companies and across industries

What About this EBITDA Depreciation Factor?

Every company, whether public or private, has an **EBITDA Depreciation Factor** that can be calculated every period and over time

The list of companies includes every client that your firm has had, currently has, or will have in the future

Why haven't we focused on the EBITDA Depreciation Factor before now?

Private Company Analysis of EBITDA Depreciation Factors

RMA Statement Studies 2017-2018

20 major industry sectors

760 6-Digit NAICS Sub-Industry Codes

5-year analysis

- EBIT and EBITDA margins
- Historical EBITDA Depreciation Factors

Bizminer Analysis by KC Conrad, ASA, CMEA, BCA

- 3-year analysis
- Hundreds of thousands of companies

Private Market Evidence (2014-2015)

EBITDA Depreciation Factors - 2014

Risk Management Associates 6-Digit NAICS Codes Summary				
	Number of	Depreciation as % of EBIT		Median Implied EBITDA
Sector	Companies	Median	Average	Depreciation Factors
Finance and Insurance	19	6.72%	8.55%	1.07
Wholesale Trade)	67	13.51%	17.53%	1.14
Professional, Scientific and Technical Services	33	14.29%	21.11%	1.14
Real Estate and Rental and Leasing	11	14.78%	26.35%	1.15
Construction - General	26	17.50%	22.73%	1.18
Admin and Support, Waste Mgt, Rem Svcs	24	22.77%	33.63%	1.23
Retail Trade	42	23.45%	29.50%	1.23
Construction - % of Completion Basis	9	25.00%	39.21%	1.25
Manufacturing	220	30.00%	33.59%	1.30
Management of Companies and Enterprises	2	31.78%	31.78%	1.32
Information	15	32.00%	41.68%	1.32
Other Services (Except Public Administration)	17	36.07%	35.19%	1.36
Transportation and Warehousing	26	37.30%	39.70%	1.37
Agriculture, Forestry, Fishing and Hunting	17	38.33%	43.59%	1.38
Arts, Entertainment and Recreation	8	42.30%	44.85%	1.42
Health Care and Social Assistance	30	44.68%	51.16%	1.45
Educational Services	6	45.17%	55.64%	1.45
Accommodation and Food Services	6	54.22%	51.57%	1.54
Utilities	3	75.84%	55.88%	1.76
Mining	7	86.42%	83.59%	1.86
Public Administration	6	99.03%	105.74%	1.99
Total / Overall RMA Medians/Averages	**594**	**27.69%**	**33.15%**	**1.28**

Source: Risk Management Associates 2014-2015 Annual Statement Studies, Mercer analysis
Note: Excludes 32 NAICS Codes for which data not available or factors reflect outliers

76% of the RMA companies have EBITDA Depreciation Factors (Medians) in range of 1.1x to 1.3x

Private Company (RMA) EBITDA Factors Analysis (2016-2017)

For 20 Major Industry Sectors | Focus on Information Companies

			Fiscal Years April 1, 2016 to March 31, 2017						
NAICS Codes	Information		# Companies	Total Sales (000's)	Avg Sales (000's)	Operating Profit *(Assumed EBIT)*	Depreciation / Sales	EBITDA Margin	EBTIDA Depreciation Factor
511110	I - Newspaper Publishers		32	$981,659	$30,677	4.60%	2.70%	7.30%	**1.59**
511120	I - Periodical Publishers		72	$3,371,767	$46,830	5.50%	0.80%	6.30%	**1.15**
511130	I - Book Publishers		74	$3,050,793	$41,227	7.20%	0.80%	8.00%	**1.11**
511199	I - All Other Publishers		39	$1,254,164	$32,158	6.40%	1.80%	8.20%	**1.28**
511210	I - Software Publishers		334	$16,302,979	$48,811	2.40%	1.80%	4.20%	**1.75**
512210	I - Motion Picture and Video Production		142	$4,026,598	$28,356	8.40%	2.10%	10.50%	**1.25**
512131	I - Motion Picture Theaters (except Drive-ins)		104	$2,757,250	$26,512	11.40%	6.00%	17.40%	**1.53**
512199	I - Other Motion Picture and Video Industries		20	$1,099,749	$54,987	9.00%	3.40%	12.40%	**1.38**
515112	I - Radio Stations		67	$680,549	$10,157	9.20%	5.00%	14.20%	**1.54**
515120	I - Television Broadcasting		78	$3,181,340	$40,786	11.90%	7.00%	18.90%	**1.59**
515210	I - Cable and Other Subscription Programming		34	$1,942,257	$57,125	13.00%	2.40%	15.40%	**1.18**
517110	I - Wired Telecommunication Carriers		173	$6,763,438	$39,095	9.80%	11.30%	21.10%	**2.15**
517210	I - Wireless Telecommunication Carriers (except Satellite)		79	$5,098,683	$64,540	8.80%	3.00%	11.80%	**1.34**
517911	I - Telecommunications Resellers		86	$5,681,323	$66,062	5.50%	1.60%	7.10%	**1.29**
517919	I - All Other Telecommunications		126	$4,937,744	$39,188	7.30%	1.70%	9.00%	**1.23**
518210	I - Data Processing, Hosting, and Related Services		267	$10,407,510	$38,979	7.50%	2.00%	9.50%	**1.27**
519130	I - Internet Publishing and Broadcasting and Web Search Portals		57	$3,150,928	$55,279	8.70%	0.90%	9.60%	**1.10**
519190	I - All Other Information Services		69	$2,000,262	$28,989	6.40%	2.10%	8.50%	**1.33**
18		**Totals**	**1,853**	**$76,688,993**					
Count		**Medians**			**$39,987**	**7.95%**	**2.10%**	**9.55%**	**1.31**
		Average			**$41,653**	**7.94%**	**3.13%**	**11.08%**	**1.39**

Private Market Evidence 5-Year Analysis (2012-2017)

By Industry Sector | Focus on Information Companies

		Five Year Average (Margin-Based)			Five Year	Fiscal Years Ending March 31, 2013-2017 Median Factors by RMA Fiscal Year Specification				
NAICS Codes	Information	Avg EBIT	Avg EBITDA	Avg Factor	Simple Average	2016-17	2015-16	2014-15	2013-14	2012-13
511110	I - Newspaper Publishers	5.38%	8.70%	1.62	1.64	1.59	1.55	1.51	1.71	1.83
511120	I - Periodical Publishers	6.16%	7.58%	1.23	1.23	1.15	1.28	1.24	1.20	1.31
511130	I - Book Publishers	6.80%	7.94%	1.17	1.17	1.11	1.16	1.17	1.24	1.17
511199	I - All Other Publishers	7.24%	8.84%	1.22	1.23	1.28	1.26	1.13	1.30	1.18
511210	I - Software Publishers	4.66%	6.64%	1.42	1.48	1.75	1.59	1.39	1.35	1.32
512210	I - Motion Picture and Video Production	9.58%	12.16%	1.27	1.27	1.25	1.26	1.19	1.33	1.32
512131	I - Motion Picture Theaters (except Drive-ins)	11.92%	18.50%	1.55	1.55	1.53	1.66	1.53	1.51	1.54
512199	I - Other Motion Picture and Video Industries	8.66%	12.68%	1.46	1.49	1.38	1.37	1.59	1.75	1.38
515112	I - Radio Stations	11.46%	15.96%	1.39	1.40	1.54	1.39	1.32	1.39	1.36
515120	I - Television Broadcasting	12.40%	20.10%	1.62	1.64	1.59	1.39	1.60	1.69	1.92
515210	I - Cable and Other Subscription Programming	12.38%	17.92%	1.45	1.45	1.18	1.66	1.62	1.43	1.36
517110	I - Wired Telecommunication Carriers	9.38%	20.40%	2.17	2.18	2.15	2.21	2.29	2.07	2.16
517210	I - Wireless Telecommunication Carriers (except Satellite)	8.22%	9.08%	1.10	1.05	1.34	1.25	1.25	0.00	1.43
517911	I - Telecommunications Resellers	6.54%	7.60%	1.16	1.17	1.29	1.09	1.21	1.16	1.13
517919	I - All Other Telecommunications	7.48%	9.40%	1.26	1.26	1.23	1.35	1.24	1.24	1.23
518210	I - Data Processing, Hosting, and Related Services	7.24%	9.62%	1.33	1.33	1.27	1.42	1.38	1.30	1.30
519130	I - Internet Publishing and Broadcasting and Web Search Portals	6.42%	7.60%	1.18	1.21	1.10	1.17	1.22	1.34	1.20
519190	I - All Other Information Services	9.52%	11.92%	1.25	1.28	1.33	1.54	1.19	1.18	1.17
18										
	Medians	**7.85%**	**9.51%**	**1.30**	**1.31**	**1.31**	**1.38**	**1.28**	**1.34**	**1.32**
	Average	**8.41%**	**11.81%**	**1.38**	**1.39**	**1.39**	**1.42**	**1.39**	**1.34**	**1.41**

Private Market Evidence 5-Year Analysis (2012-2017)

By Industry Sector | Focus on Information Companies

		Five Year Average (Margin-Based)		
NAICS Codes	Information	Avg EBIT	Avg EBITDA	Avg Factor
511110	I - Newspaper Publishers	5.38%	8.70%	1.62
511120	I - Periodical Publishers	6.16%	7.58%	1.23
511130	I - Book Publishers	6.80%	7.94%	1.17
511199	I - All Other Publishers	7.24%	8.84%	1.22
511210	I - Software Publishers	4.66%	6.64%	1.42
512210	I - Motion Picture and Video Production	9.58%	12.16%	1.27
512131	I - Motion Picture Theaters (except Drive-ins)	11.92%	18.50%	1.55
512199	I - Other Motion Picture and Video Industries	8.66%	12.68%	1.46
515112	I - Radio Stations	11.46%	15.96%	1.39
515120	I - Television Broadcasting	12.40%	20.10%	1.62
515210	I - Cable and Other Subscription Programming	12.38%	17.92%	1.45
517110	I - Wired Telecommunication Carriers	9.38%	20.40%	2.17
517210	I - Wireless Telecomminication Carriers (except Satellite)	8.22%	9.08%	1.10
517911	I - Telecommunications Resellers	6.54%	7.60%	1.16
517919	I - All Other Telecommunications	7.48%	9.40%	1.26
518210	I - Data Processing, Hosting, and Related Services	7.24%	9.62%	1.33
519130	I - Internet Publishing and Broadcasting and Web Search Portals	6.42%	7.60%	1.18
519190	I - All Other Information Services	9.52%	11.92%	1.25
18				
	Medians	**7.85%**	**9.51%**	**1.30**
	Average	**8.41%**	**11.81%**	**1.38**

Private Market Evidence 5-Year Analysis (2012-2017)

By Industry Sector | Focus on Information Companies

NAICS Codes	Information	Five Year Simple Average	Fiscal Years Ending March 31, 2013-2017 Median Factors by RMA Fiscal Year Specification 2016-17	2015-16	2014-15	2013-14	2012-13
511110	I - Newspaper Publishers	**1.64**	1.59	1.55	1.51	1.71	1.83
511120	I - Periodical Publishers	**1.23**	1.15	1.28	1.24	1.20	1.31
511130	I - Book Publishers	**1.17**	1.11	1.16	1.17	1.24	1.17
511199	I - All Other Publishers	**1.23**	1.28	1.26	1.13	1.30	1.18
511210	I - Software Publishers	**1.48**	1.75	1.59	1.39	1.35	1.32
512210	I - Motion Picture and Video Production	**1.27**	1.25	1.26	1.19	1.33	1.32
512131	I - Motion Picture Theaters (except Drive-ins)	**1.55**	1.53	1.66	1.53	1.51	1.54
512199	I - Other Motion Picture and Video Industries	**1.49**	1.38	1.37	1.59	1.75	1.38
515112	I - Radio Stations	**1.40**	1.54	1.39	1.32	1.39	1.36
515120	I - Television Broadcasting	**1.64**	1.59	1.39	1.60	1.69	1.92
515210	I - Cable and Other Subscription Programming	**1.45**	1.18	1.66	1.62	1.43	1.36
517110	I - Wired Telecommunication Carriers	**2.18**	2.15	2.21	2.29	2.07	2.16
517210	I - Wireless Telecomminication Carriers (except Satellite)	**1.05**	1.34	1.25	1.25	0.00	1.43
517911	I - Telecommunications Resellers	**1.17**	1.29	1.09	1.21	1.16	1.13
517919	I - All Other Telecommunications	**1.26**	1.23	1.35	1.24	1.24	1.23
518210	I - Data Processing, Hosting, and Related Services	**1.33**	1.27	1.42	1.38	1.30	1.30
519130	I - Internet Publishing and Broadcasting and Web Search Portals	**1.21**	1.10	1.17	1.22	1.34	1.20
519190	I - All Other Information Services	**1.28**	1.33	1.54	1.19	1.18	1.17
18							
	Medians	**1.31**	**1.31**	**1.38**	**1.28**	**1.34**	**1.32**
	Average	**1.39**	**1.39**	**1.42**	**1.39**	**1.34**	**1.41**

Private Market Evidence 5-Year Analysis (2012-2017)

By Industry Sector

	NAICS	Industry Sectors	#NAICS Codes	(2017 FYs) # Companies	Five Year Average (Margin-Based) EBIT	EBITDA	Avg Factor	Five Year Simple Average	Fiscal Years Ending March 31, 2013-2017 Median Factors by RMA Fiscal Year Specification 2016-17	2015-16	2014-15	2013-14	2012-13
1	522-525	Finance and Insurance	27	3,753	18.91%	19.14%	1.06	1.07	1.05	1.06	1.06	1.07	1.05
2	541	Professional, Scientific, and Technical Services	42	12,845	8.64%	10.12%	1.12	1.12	1.13	1.12	1.11	1.13	1.12
3	423-425	Wholesale Trade	70	17,289	3.84%	4.49%	1.17	1.17	1.16	1.15	1.16	1.15	1.15
4	551	Management of Companies and Enterprises	2	540	21.98%	26.21%	1.18	1.18	1.16	1.17	1.17	1.19	1.20
5	236-238	Construction - General Industries Format	30	12,856	5.20%	6.32%	1.19	1.20	1.17	1.16	1.21	1.20	1.27
6	561-562	Admin Support and Waste Mgt	35	5,096	7.70%	10.26%	1.20	1.20	1.21	1.20	1.20	1.18	1.19
7	441-454	Retail Trade	59	11,851	3.74%	4.68%	1.22	1.23	1.23	1.21	1.21	1.23	1.23
8	621-624	Health Care and Social Assistance	37	14,171	10.00%	13.34%	1.27	1.28	1.27	1.26	1.31	1.28	1.26
9	811-814	Other Services (Except Public Administration)	35	6,908	7.50%	10.20%	1.30	1.30	1.32	1.25	1.26	1.29	1.26
10	511-519	Information	18	1,853	7.85%	9.51%	1.30	1.31	1.31	1.38	1.28	1.34	1.32
11	311-339	Manufacturing	244	20,719	5.70%	7.73%	1.32	1.34	1.35	1.32	1.32	1.32	1.30
12	721-722	Accomodation and Food Services	12	7,637	9.66%	12.16%	1.43	1.45	1.42	1.42	1.46	1.44	1.44
13	481-493	Transportation and Warehousing	39	6,276	9.32%	14.62%	1.45	1.45	1.46	1.45	1.48	1.39	1.46
14	111-115	Agriculture, Forestry Fishing Hunting	35	2,838	9.34%	15.30%	1.46	1.50	1.56	1.47	1.42	1.41	1.37
15	711-713	Arts, Entertainment, and Recreation	18	1,980	11.23%	17.14%	1.53	1.54	1.48	1.48	1.44	1.63	1.58
16	611	Educational Services	10	3,473	7.37%	11.32%	1.50	1.55	1.49	1.51	1.48	1.48	1.43
17	531-533	Real Estate and Rental and Leasing	19	19,578	22.34%	35.78%	1.60	1.60	1.47	1.54	1.53	1.45	1.58
18	221	Utilities	7	891	16.42%	30.02%	1.75	1.77	1.84	1.77	1.64	1.92	1.73
19	211-213	Mining	8	1,025	9.08%	16.86%	1.83	1.80	1.78	1.78	1.57	1.77	1.64
20	921-926	Public Administration	13	1,236	10.34%	21.28%	1.96	1.98	1.73	1.69	1.96	1.97	1.92
		Totals / Medians of Above	**760**	**152,815**	**9.20%**	**12.75%**	**1.31**	**1.32**	**1.34**	**1.35**	**1.32**	**1.33**	**1.31**

57%

23%

20%

Historical Factors

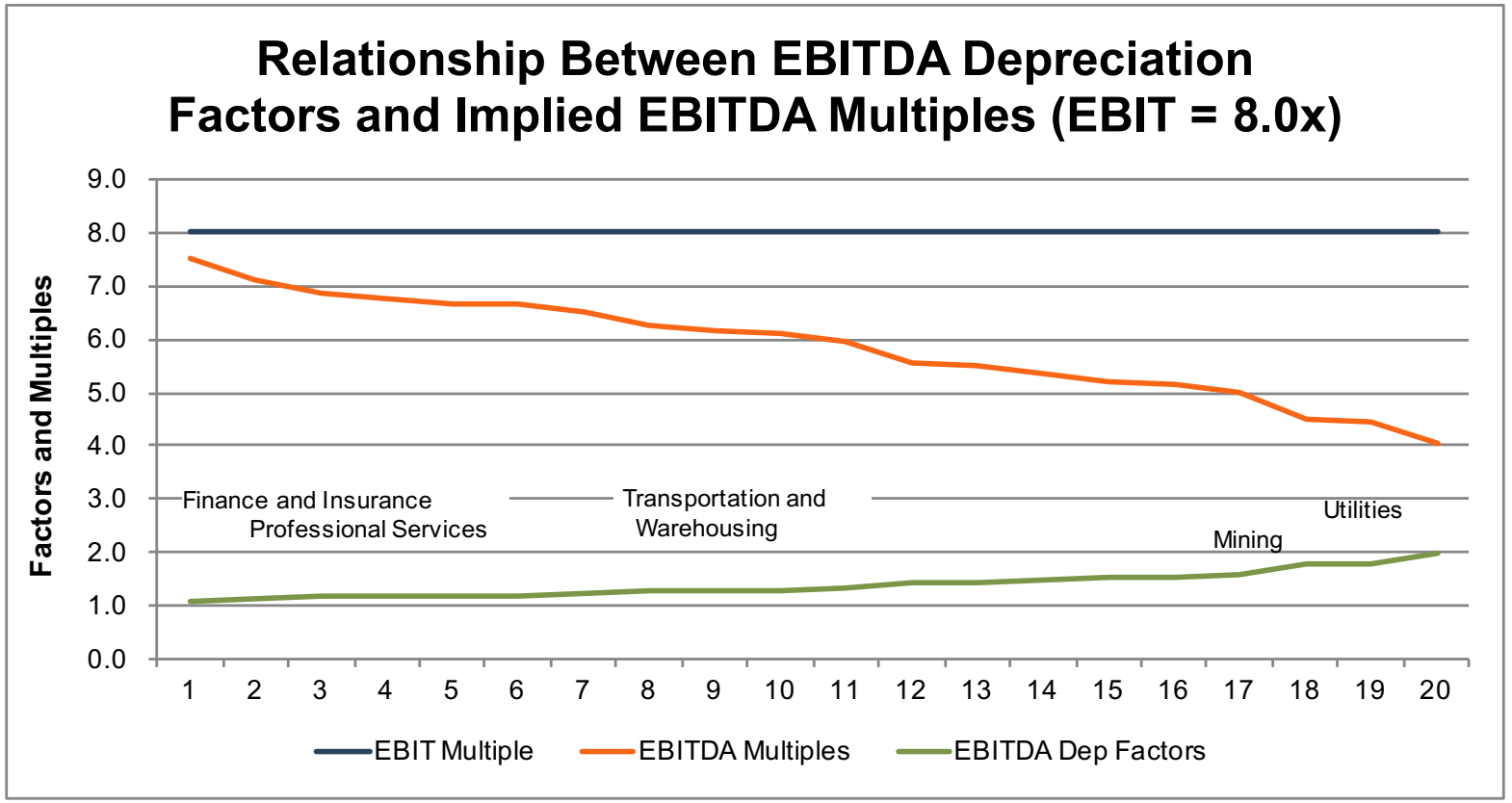
Bizminer

EBITDA Depreciation Factors
Bizminer.com Data Base

Sectors		Implied EBITDA Depreciation Factors				Number of Firms Analyzed		
		Averages	2016	2015	2014	2016	2015	2014
52	Finance & Insurance	1.06	1.06	1.06	1.07	201,669	204,828	233,807
55	Management Companies & Enterprises	1.08	1.07	1.08	1.07	5,257	5,444	5,647
62	Health Care, Social Assistance	1.22	1.22	1.21	1.33	253,613	243,262	244,232
54	Professional, Scientific, Technical Services	1.24	1.23	1.24	1.26	365,509	366,232	388,676
53	Real Estate, Rental & Leasing	1.26	1.25	1.28	1.28	209,188	212,055	229,392
23	Construction	1.31	1.31	1.31	1.26	399,950	441,420	473,461
72	Accommodation, Food Services	1.39	1.39	1.38	1.53	268,052	297,938	333,264
56	Administrative Support, Waste Remediation	1.41	1.39	1.42	1.31	218,747	241,724	263,154
42	Wholesale Trade	1.41	1.39	1.44	1.38	259,488	278,855	295,797
71	Arts, Entertainment, Recreation	1.45	1.41	1.48	1.67	110,491	120,190	119,500
31, 32, 33	Manufacturing	1.47	1.45	1.48	1.45	181,988	193,435	210,073
44, 45	Retail Trade	1.50	1.46	1.54	1.50	530,787	564,335	581,356
51	Information	1.53	1.51	1.55	1.58	98,412	108,991	118,555
48, 49	Transportation, Warehousing	1.66	1.64	1.68	1.73	89,338	92,842	93,149
61	Education Services	1.67	1.51	1.82	2.32	189,877	203,098	214,636
22	Utilities	1.87	1.83	1.91	1.88	13,859	14,900	15,478
21	Mining, Quarrying, Oil & Gas Extraction	2.35	2.44	2.27	2.08	10,270	11,133	11,758
	Medians	**1.41**	**1.39**	**1.44**	**1.45**			
	Means	**1.46**	**1.45**	**1.48**	**1.51**			

Source: Bizminer Information; www.bizminer.com
Prepared by: KC Conrad, ASA, CMEA, BCA
American Business Appraisal, Phoenix, AZ

Private Market Evidence and New Valuation Analysis



Public Market Evidence S&P 500 Non-Financials – 2014

EBITDA Depreciation Factors

S&P 500 Index EBITDA Depreciation Factors Non-Financial Companies				
	Number of	Depreciation as % of EBIT		Median Implied EBITDA
Sector	Companies	Median	Average	Depreciation Factors
Consumer Staples	40	20.98%	21.75%	1.21
Industrials	64	21.19%	29.65%	1.21
Healthcare	53	22.29%	32.28%	1.22
Consumer Discretionary	85	22.75%	32.85%	1.23
Information Technology	65	26.71%	30.40%	1.27
Materials	30	42.94%	44.52%	1.43
Energy	40	61.83%	77.69%	1.62
Utilities	29	62.96%	67.92%	1.63
Telecommunication Services	6	119.69%	133.14%	2.20
Total / Overall S&P Medians	**412**	**27.81%**	**39.95%**	**1.28**

65%

Source: Capital IQ, Mercer Analysis as of 12/31/14
Note: Results for four outlier companies excluded

S&P 1000 Non-Financials
Historical EBITDA Factors (2015 - 2017)

S&P 1000 Less Financials and Real Estate Years Ending December 2015-2017		2017		2016		2015	
Sector	Three Year Average	EBITDA Depr Factor	Number of Companies	EBITDA Depr Factor	Number of Companies	EBITDA Depr Factor	Number of Companies
Consumer Staples	**1.29**	1.28	37	1.31	38	1.30	38
Healthcare	**1.30**	1.34	110	1.28	106	1.28	104
Industrials	**1.34**	1.36	160	1.33	166	1.32	166
Consumer Discretionary	**1.34**	1.39	168	1.33	166	1.30	153
Energy	**1.35**	1.43	51	nm	47	1.28	51
Information Technology	**1.37**	1.40	153	1.37	154	1.34	162
Materials	**1.47**	1.49	64	1.47	68	1.44	72
Utilities	**1.57**	1.57	26	1.56	26	1.59	29
Telecommunication Services	**2.22**	2.40	9	2.25	9	2.01	7
Total S&P 1000 Medians	**1.39**	**1.44**	778	**1.43**	780	**1.29**	782

Source: Mercer analysis using Capital IQ

Private Service Company
EBITDA Depreciation Factor Analysis

Private Service Company Historical Income Statements	Last 12 mos.	For the Fiscal Years Ended December 31				
Income Statements	**9/30/17**	**2016**	**2015**	**2014**	**2013**	**2012**
Revenues	$24,365,973	$23,225,174	$19,833,233	$18,532,693	$16,240,800	$15,055,547
Operating Expense	23,172,190	19,553,773	14,554,350	13,345,070	12,886,841	12,086,544
Operating Income	1,193,783	3,671,401	5,278,883	5,187,623	3,353,959	2,969,003
Total Other Income/(Expense)	(5,994)	0	0	0	0	0
Pre-Tax Income	1,187,789	3,671,401	5,278,883	5,187,623	3,353,959	2,969,003
Income Tax Expense/(Benefit)	0	0	0	0	0	0
Net Income	$1,187,789	$3,671,401	$5,278,883	$5,187,623	$3,353,959	$2,969,003
Memo: EBITDA Derivation						
Pre-Tax Income	$1,187,789	$3,671,401	$5,278,883	$5,187,623	$3,353,959	$2,969,003
- Interest Income	0	0	0	0	0	0
+ Interest Expense	5,994	0	0	0	0	0
EBIT	**1,193,783**	**3,671,401**	**5,278,883**	**5,187,623**	**3,353,959**	**2,969,003**
+ Depreciation & Amortization	94,818	94,818	233,453	241,597	238,919	239,561
EBITDA	**$1,288,601**	**$3,766,219**	**$5,512,336**	**$5,429,220**	**$3,592,878**	**$3,208,564**
EBITDA Depreciation Factor (EBITDA/EBIT)	***1.08***	***1.03***	***1.04***	***1.05***	***1.07***	***1.08***
Average Factor	***1.06***					

Private Manufacturing Company
EBITDA Depreciation Factor Analysis

Private Manufacturing Company
Historical Income Statements

	For the Fiscal Years Ended December 31				
Income Statements	**2016**	**2015**	**2014**	**2013**	**2012**
Net Sales	$54,604,943	$48,647,256	$52,196,895	$48,511,584	$42,892,816
Cost of Sales	44,742,109	39,922,976	42,425,286	39,506,646	34,061,306
Gross Profit	9,862,834	8,724,279	9,771,609	9,004,938	8,831,510
Operating Expense	7,814,491	7,304,371	8,220,712	7,131,430	6,497,151
Operating Income	2,048,343	1,419,909	1,550,897	1,873,508	2,334,360
Other Income/(Expense)					
Total Other Income/(Expense)	(3,714)	(3,625)	(65,041)	(46,212)	(45,077)
Pre-Tax Income	2,044,630	1,416,283	1,485,856	1,827,295	2,289,283
Income Tax Expense/(Benefit)	149,194	139,187	174,333	140,316	56,875
Net Income from Continuing Operations	1,895,436	1,277,096	1,311,523	1,686,979	2,232,408
Extraordinary Income/(Expense)	0	0	0	0	0
Net Income	$1,895,436	$1,277,096	$1,311,523	$1,686,979	$2,232,408
Memo					
Pre-Tax Income	$2,044,630	$1,416,283	$1,485,856	$1,827,295	$2,289,283
- Interest Income	(28,461)	(30,040)	(30,929)	(33,962)	(30,765)
+ Interest Expense	52,175	53,600	89,250	76,038	76,225
EBIT	**2,068,343**	**1,439,844**	**1,544,177**	**1,869,372**	**2,334,743**
+ Depreciation & Amortization	2,222,078	2,216,168	2,300,621	1,573,154	1,488,926
EBITDA	**$4,290,421**	**$3,656,012**	**$3,844,798**	**$3,442,525**	**$3,823,669**
EBITDA Depreciation Factor	***2.07***	***2.54***	***2.49***	***1.84***	***1.64***
Average Factor	***2.12***				

Private Diversified Company
EBITDA Depreciation Factor Analysis

Large Diversified Private Company
Historical Income Statements

Income Statements	Last 12 mos. 3/31/18	For the Fiscal Years Ended June 30 2017	2016	2015	2014	2013
Net Sales	$2,666,953,183	$2,278,481,449	$2,131,917,676	$2,744,985,635	$3,306,775,097	$3,094,081,915
Cost of Sales	1,823,111,394	1,553,541,622	1,498,388,384	2,209,991,153	2,659,688,989	2,456,188,889
Gross Profit	843,841,789	724,939,827	633,529,292	534,994,482	647,086,108	637,893,026
Operating Expense	624,931,231	569,700,166	492,412,491	450,779,069	423,692,153	381,786,872
Operating Income	218,910,558	155,239,661	141,116,801	84,215,413	223,393,955	256,106,154
Other Income/(Expense)						
Total Other Income/(Expense)	(14,196,672)	(12,206,938)	(2,914,681)	9,436,522	(6,545,240)	(37,046,387)
Pre-Tax Income	204,713,886	143,032,723	138,202,120	93,651,935	216,848,715	219,059,767
Income Tax Expense/(Benefit)	(3,663,165)	52,793,996	53,120,690	34,437,463	76,905,058	78,697,136
Net Income from Continuing Operations	208,377,050	90,238,727	85,081,430	59,214,472	139,943,657	140,362,631
Income from Discontinued Operations, net	0	0	0	0	0	0
Loss on Disposal, net	0	0	0	0	0	0
Consolidated Net Income	$208,377,050	$90,238,727	$85,081,430	$59,214,472	$139,943,657	$140,362,631
Net Income Attributable to Noncontrolling Int.	13,512,433	5,876,842	1,036,531	1,618,782	1,421,183	992,558
Net Income Attributable to Controlling Int.	$194,864,618	$84,361,885	$84,044,899	$57,595,690	$138,522,474	$139,370,073
Memo						
Pre-Tax Income	$204,713,886	$143,032,723	$138,202,120	$93,651,935	$216,848,715	$219,059,767
- Interest & Dividend Income	(1,874,761)	(2,321,834)	(1,788,365)	(1,910,830)	(2,877,669)	(4,278,188)
+ Interest Expense	21,273,860	16,647,574	9,862,760	10,891,885	12,441,946	14,639,654
EBIT	**224,112,985**	**157,358,463**	**146,276,515**	**102,632,990**	**226,412,992**	**229,421,233**
+ Depreciation & Amortization	135,148,041	123,600,917	104,496,174	94,614,222	85,531,422	77,670,668
EBITDA	**$359,261,026**	**$280,959,380**	**$250,772,689**	**$197,247,212**	**$311,944,414**	**$307,091,901**
EBITDA Depreciation Factors	***1.60***	***1.79***	***1.71***	***1.92***	***1.38***	***1.34***
Average Factor	***1.62***					
Capital Expenditures	**$127,437,489**	**$143,510,954**	**$214,011,763**	**$189,541,277**	**$152,208,791**	**$134,737,552**

Capitalizing EBITDA & Valuing

Development of WACC and DDFNI Cap Rate and Multiple (9 Assumptions)

Developing WACC and Cap Rates/Multiples					
Long-Term Treasury Rate		3.00%	1		
Equity Risk Premium	5.50%		2		
Beta	1.2		3		
Adjusted Equity Risk Premium		6.68%			
Size Premium		4.00%	4	Applicable Weights	Weighted Components
Company Specific Risk Premium		2.50%	5		
Equity Discount Rate (R)		**16.18%**		**75%**	12.14%
Applicable to Market Value of Equity					
				8	
Pre-Tax Cost of Debt	**6.00%**		6		
Less Taxes @	**26%**		7		
After-Tax Cost of Debt		**4.44%**		**25%**	1.11%
Weighted Average Cost of Capital (WACC)					**13.25%**
Less: Expected Long-Term Growth Rate				9	-4.00%
Debt-Free Net Income (CF) Cap Rate					9.25%
1 Divided by Cap Rate		*Turn Cap Rate into Multiple*			
Debt-Free Net Income (CF) Multiple					**10.81**

One More Step: Debt-Free Pre-Tax Cap Rate and Multiple

Let's Take One More Step			
Debt-Free Net Income (CF) Cap Rate	*From above*		9.25%
Divide by (1 - Tax Rate)	*From above*	**26%**	
Debt-Free Pre-Tax Cap Rate (EBIT)		**7**	12.50%
1 Divided by Cap Rate	*Turn Cap Rate into Multiple*		
EBIT Multiple			**8.00**

Remember: The EBIT multiple is 8.0x

It came from an assumption set that could be relevant for either Sample Company #1 or Sample Company #2

Values of Company 1 and Company 2

	Company 1	Company 2	
EBIT Multiple	8.00	8.00	
EBITDA Depreciation Factors	1.60	1.02	
			% Difference
Implied EBITDA Multiples	**5.00**	**7.84**	56.9%
EBITDA	$9,500	$5,750	-39.5%
EBITDA Multiples	5.00	7.84	
Enterprise Values	**$47,500**	**$45,098**	**-5.1%**

Private Company "Valuation"

Old Tax Rates

Single-Period EBITDA Capitalization to Develop Enterprise and Equity Values
Assumption Summary ($Thousands)

1	Pre-Tax Debt	6.00%			
2	Tax Rate	38%	7	Highest Equity Discount Rate (R)	17.0%
3	Portion Equity	70%	8	Highest Expected LT Growth Rate	5.0%
	Portion Debt	30%	9	EBITDA Estimate	$2,000
4	EBITDA Depreciation Factor	1.25	10	Total Debt Outstanding	$2,000
5	Decrement in Disc Rate	0.50%	11	Cash (and Oher Non-Op Asssets)	$3,000
6	Decrement in Growth Rate	0.50%			

Private Company "Valuation"

Old Tax Rates

Develop a Range of EBITDA Multiples Over the Relevant Range of Expected Risk and Growth

Equity Disc. Rate (r)	17.00%	16.50%	16.00%
WACC	13.02%	12.67%	12.32%
Growth	Enterprise Value / EBITDA Multiples		
5.0%	6.2	6.5	6.8
4.5%	5.8	**6.1**	6.3
4.0%	5.5	5.7	6.0
	EBITDA ($000's)		$2,000

Calculate Enterprise and Equity Values Given Assumed Debt and Cash

Equity r	17.00%	16.50%	16.00%
WACC	13.02%	12.67%	12.32%
Growth	Implied Enterprise Values ($000's)		
5.0%	$12,380	$12,940	$13,560
4.5%	$11,650	**$12,140**	$12,690
4.0%	$11,000	$11,450	$11,930
	EBITDA x EBITDA Multiples		

Equity r	17.00%	16.50%	16.00%
WACC	13.02%	12.67%	12.32%
Growth	Implied Total Equity Values ($000's)		
5.0%	$13,380	$13,940	$14,560
4.5%	$12,650	**$13,140**	$13,690
4.0%	$12,000	$12,450	$12,930
	Enterprise Value less Debt plus Cash		

Private Company "Valuation"

New Tax Rates (26%)

Develop a Range of EBITDA Multiples Over the Relevant Range of Expected Risk and Growth

Equity Disc. Rate (r)	17.00%	16.50%	16.00%
WACC	13.23%	12.88%	12.53%
Growth	Enterprise Value / EBITDA Multiples		
5.0%	7.2	7.5	7.9
4.5%	6.8	**7.1**	7.4
4.0%	6.4	6.7	6.9
	EBITDA ($000's)		$2,000

Calculate Enterprise and Equity Values Given Assumed Debt and Cash

Equity r	17.00%	16.50%	16.00%
WACC	13.23%	12.88%	12.53%
Growth	Implied Enterprise Values ($000's)		
5.0%	$14,380	$15,020	$15,720
4.5%	$13,560	**$14,120**	$14,740
4.0%	$12,820	$13,330	$13,880
	EBITDA x EBITDA Multiples		

Equity r	17.00%	16.50%	16.00%
WACC	13.23%	12.88%	12.53%
Growth	Implied Total Equity Values ($000's)		
5.0%	$15,380	$16,020	$16,720
4.5%	$14,560	**$15,120**	$15,740
4.0%	$13,820	$14,330	$14,880
	Enterprise Value less Debt plus Cash		

After-tax income increases after the tax cut, but nothing happens to EBITDA

EBITDA multiples must increase to account for the change

When Might Capitalizing EBITDA Be Appropriate?

Terminal value calculations when assuming CapEx and Depreciation are about equivalent for the perpetuity period (same as with capitalizing DFNCF)

Single period capitalizations when the analyst examines the expected relationship between reinvestment and debt-free cash flow (same as required to capitalize DFNCF)

To facilitate understanding of clients or intended audience because of greater familiarity with EBITDA

Now, because the **method works**, is in the **mainstream of valuation theory**, will be **embraced by clients**, has been **published in a peer reviewed journal**…

EBITDA

- **E**xperienced
- **B**usiness appraisers
- **I**ncreasing the reasonableness of
- **T**heir
- **D**eterminations of
- **A**ppraisal conclusions

– Experience –

Earnings Before Interest, Taxes, Depreciation, and Amortization

You'll never think about **EBITDA** the same way again – I hope!

Z. Christopher Mercer, FASA, CFA, ABAR

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Z. Christopher Mercer is the founder and chief executive officer of Mercer Capital. Chris began his valuation career in the late 1970s. He has prepared, overseen, or contributed to hundreds of valuations for purposes related to tax, ESOPs, buy-sell agreements, and litigation, among others. In addition, he has served on the boards of directors of several private companies and one public company. He enjoys working with business owners to address ownership transition issues.

Chris has extensive experience in litigation engagements including statutory fair value cases, divorce, and numerous other matters where valuation issues are in question. He is also an expert in buy-sell agreement disputes.

Chris is a prolific author on valuation-related topics and a frequent speaker on business valuation issues for national professional associations and other business and professional groups.

Questions?

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