

Ch. 1 Equity Valuation

The Big Picture

Rich Jakotowicz CFA, CFP®
richj@udel.edu

Selling My 1973 Ford
For \$20,000

Is That A Good Price?



When We Buy A Business For X Dollars
What Are We Getting?

A Pinto or a Bronco

That's valuation

Even if it's a beautiful Bronco, we still need
to look under the hood to make sure the
engine operates the way it should!

Sales Price \$20,000





INCOME STATEMENT

Fiscal year	2017A	2018A	2019A	2020P	2021P	2022P	2023P	2024P
Fiscal year end date			9/24/2019	9/30/2020	9/30/2021	9/30/2022	9/30/2023	9/30/2024
Revenue	182,795	233,715	215,639	227,061	263,287	270,887	287,168	304,936
Cost of sales (enter as -)	(112,258)	(140,089)	(131,376)	(139,642)	(162,448)	(167,679)	(177,757)	(188,755)
Gross Profit	70,537	93,626	84,263	87,418	100,839	103,208	109,411	116,181
Research & development (enter as -)	(6,041)	(8,067)	(10,045)	(10,672)	(12,374)	(12,732)	(13,497)	(14,332)
Selling, general & administrative (enter as -)	(11,993)	(14,329)	(14,194)	(14,986)	(17,377)	(17,879)	(18,953)	(20,126)
Operating profit (EBIT)	52,503	71,230	60,024	61,761	71,087	72,598	76,961	81,723
Interest income	1,795	2,921	3,999	4,082	4,564	5,106	5,599	5,905
Interest expense (enter as -)	(384)	(733)	(1,456)	(2,063)	(2,063)	(2,063)	(2,063)	(2,063)
Other expense (enter as -)	(431)	(903)	(1,195)	(1,195)	(1,195)	(1,195)	(1,195)	(1,195)
Pretax profit	53,483	72,515	61,372	62,584	72,393	74,446	79,302	84,370
Taxes (enter expense as -)	(13,973)	(19,121)	(15,685)	(15,646)	(18,098)	(18,611)	(19,826)	(21,092)
Net income	39,510	53,394	45,687	46,938	54,295	55,834	59,477	63,277
Basic shares outstanding	6085.6	5753.4	5470.8	5,248.7	5,095.8	4,959.6	4,833.3	4,720.8
Impact of dilutive securities	37.1	39.6	29.5	29.5	29.5	29.5	29.5	29.5
Diluted shares outstanding	6122.7	5793.1	5500.3	5278.2	5125.3	4989.1	4862.8	4750.3
Basic EPS	\$ 6.49	\$ 9.28	\$ 8.35	\$ 8.94	\$ 10.65	\$ 11.26	\$ 12.31	\$ 13.40
Diluted EPS	\$ 6.45	\$ 9.22	\$ 8.31	\$ 8.89	\$ 10.59	\$ 11.19	\$ 12.23	\$ 13.32
Growth rates & margins								
Revenue growth		27.9%	-7.7%	5.3%	16.0%	2.9%	6.0%	6.2%
Gross profit as % of sales	38.6%	40.1%	39.1%	38.5%	38.3%	38.1%	38.1%	38.1%
R&D margin	3.3%	3.5%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%
SG&A margin	6.6%	6.1%	6.6%	6.6%	6.6%	6.6%	6.6%	6.6%
Tax rate	26.1%	26.4%	25.6%	25.0%	25.0%	25.0%	25.0%	25.0%
EBITDA reconciliation								
Depreciation & amortization	7,946	11,257	10,505	10,563	11,763	11,623	12,101	12,754
Stock based compensation	2,863	3,586	4,210	4,133	4,805	4,957	5,255	5,580
EBITDA	63,312	86,073	74,739	76,456	87,655	89,178	94,317	100,057

BALANCE SHEET

<i>Latest fiscal year end date</i>	2018A	2019A	2020P	2021P	2022P	2023P	2024P
		9/24/19	9/30/20	9/30/21	9/30/22	9/30/23	9/30/24
Cash & equivalents ST & LT market. securities	205,666	237,585	242,599	264,459	273,013	286,878	303,605
Accounts receivable	16,849	15,754	16,462	19,088	19,639	20,820	22,108
Inventory	2,349	2,132	2,304	2,680	2,767	2,933	3,114
Deferred tax assets	0	0	0	0	0	0	0
Other current assets (inc. non-trade receivables)	28,579	21,828	21,828	21,828	21,828	21,828	21,828
Property, plant & equipment	22,471	27,010	30,132	33,752	37,477	41,426	45,618
Acquired intangible assets (inc. Goodwill)	9,009	8,620	7,423	6,521	6,072	5,817	5,642
Other assets	5,422	8,757	8,757	8,757	8,757	8,757	8,757
Total assets	290,345	321,686	329,505	357,086	369,553	388,459	410,672
Accounts payable	35,490	37,294	37,703	43,861	45,273	47,994	50,964
Accrued expenses & def rev. (current & non-current)	37,745	33,037	35,194	40,809	41,987	44,511	47,265
Revolver			0	0	0	0	0
ST and Long term debt (inc. Com Paper)	64,328	87,032	87,032	87,032	87,032	87,032	87,032
Other non-current liabilities	33,427	36,074	34,059	39,493	40,633	43,075	45,740
Total liabilities	170,990	193,437	193,989	211,195	214,926	222,613	231,001
Common stock / additional paid in capital	27,416	31,251	35,384	40,188	45,146	50,401	55,981
Treasury stock			(29,722)	(59,444)	(89,166)	(118,888)	(148,610)
Retained earnings / accumulated deficit	92,284	96,364	129,221	164,513	198,013	233,699	271,666
Other comprehensive income / (loss)	(345)	634	634	634	634	634	634
Total equity	119,355	128,249	135,516	145,891	154,627	165,846	179,671

CASH FLOW STATEMENT

<i>Fiscal year</i>	2018A	2019A	2020P	2021P	2022P	2023P	2024P
Fiscal year end date		9/24/19	9/30/20	9/30/21	9/30/22	9/30/23	9/30/24
Net income			46,938	54,295	55,834	59,477	63,277
+Depreciation and amortization			10,563	11,763	11,623	12,101	12,754
+Stock based compensation			4,133	4,805	4,957	5,255	5,580
-Accounts receivable			(708)	(2,626)	(551)	(1,180)	(1,288)
-Inventory			(172)	(376)	(86)	(166)	(181)
+Accounts payable			409	6,157	1,412	2,721	2,970
+Accrued expenses & def revenues			2,157	5,615	1,178	2,524	2,754
-Other current assets (inc. non-trade receivables)			0	0	0	0	0
-Deferred tax assets (DTAs)			0	0	0	0	0
-Other assets	DON'T TRY TO RECONCILE		0	0	0	0	0
+Other non current liabilities			(2,015)	5,434	1,140	2,442	2,665
+Non-cash (PIK) interest	COMPANIES RECLASSIFY		0	0	0	0	0
Cash from operating activities	ITEMS IN THE CF STMNT		61,306	85,066	75,508	83,173	88,531
	AND DON'T DISCLOSE						
-Capital expenditures			(12,488)	(14,481)	(14,899)	(15,794)	(16,771)
-Purchases of intangible assets	WE DON'T REALLY NEED IT		0	0	0	0	0
Cash from investing activities	BC WE HAVE EVERYTHING		(12,488)	(14,481)	(14,899)	(15,794)	(16,771)
+ST and Long term debt	SWITCHING SIGNS		0	0	0	0	0
-Common dividends	IS A COMMON ERROR		(14,082)	(19,003)	(22,334)	(23,791)	(25,311)
+New share issuances			0	0	0	0	0
-Share repurchases			(29,722)	(29,722)	(29,722)	(29,722)	(29,722)
+/- Other comprehensive income / (loss)			0	0	0	0	0
+Revolver			0	0	0	0	0
Cash from financing activities			(43,804)	(48,725)	(52,056)	(53,513)	(55,033)
Net change in cash during period			5,014	21,860	8,553	13,866	16,726

Free cash flow buildup							
Fiscal year			2020P	2021P	2022P	2023P	2024P
Fiscal year end date			9/30/20	9/30/21	9/30/22	9/30/23	9/30/24
EBITDA			76,456	87,655	89,178	94,317	100,057
EBIT			61,761	71,087	72,598	76,961	81,723
tax rate			25.0%	25.0%	25.0%		
EBIAT (NOPAT)			46,320	53,316	54,448		
Depreciation and amortization			10,563	11,763	11,623		
Stock based compensation			4,133	4,805	4,957		
Accounts receivable			(708)	(2,626)	(551)		
Inventory			(172)	(376)	(86)		
Accounts payable			409	6,157	1,412		
Accrued expenses & def revenues			2,157	5,615	1,178		
Unlevered CFO			62,703	78,653	72,982		
Less: Capital expenditures			(12,488)	(14,481)	(14,899)		
Less: Purchases of intangible assets			0	0	0		
Unlevered FCF			50,215	64,172	58,083		
% growth				27.8%	(9.5%)	0.0%	0.2%
Present value of Unlevered FCF			8,002	59,324	50,182	51,015	50,642
Present value of Unlevered FCF - Mid Year adjusted			8,002	61,365	51,909	52,770	52,384

“Under the hood”

Valuation Effects

Firm recognizes revenue early using bill-and-hold sales

Reported income ↑, and future income ↓

Firm capitalizes product development expenses

Reported income ↑, and future income ↓

Firm has large amounts of off-balance-sheet financing

Liabilities are understated

Firm increases its loan-loss reserves

Current income ↓ so as to inflate future performance

Perpetuity approach		Exit EBITDA multiple approach	
FCF in last forecast period (t)	67,109	Terminal year EBITDA	100,057
Long term growth rate (g)	3.000%	Terminal value EBITDA multiple	16.000x
Growth Adjusted FCF (t+1)	69,122	Terminal value	1,600,907
Terminal value	1,728,044	Present value of terminal value	1,208,084
Present value of terminal value	1,304,024	Present value of stage 1 cash flows	226,430
Present value of stage 1 cash flows	226,430	Enterprise value	1,434,514
Enterprise value	1,530,454	Implied TV perpetual growth rate	2.682%
Implied TV to EBITDA multiple	17.271x		
Net Debt		Fair value per share	
Cash & equivalents ST & LT market. securities	237,585		
Debt	123,106	Enterprise value	1,530,454
Net debt	(114,479)	Less: Net debt	114,479
		Equity value	1,644,933
		Diluted shares	5,271.500
		Equity value per share	\$312.04
			\$293.84

How To Optimize Your Valuation Skills

There is no right decision but there are wrong decisions

- Art vs Science vs Craft
 - Warren Buffett and Charlie Munger on qualities of a great investor
- The Story AND The Data: You can't have one without the other
 - Aswath Damodaran on connecting the two
- Recognize that you have preconceived opinions and biases

Over 100 Behavioral Biases When Investing

Aka Behavioral Finance

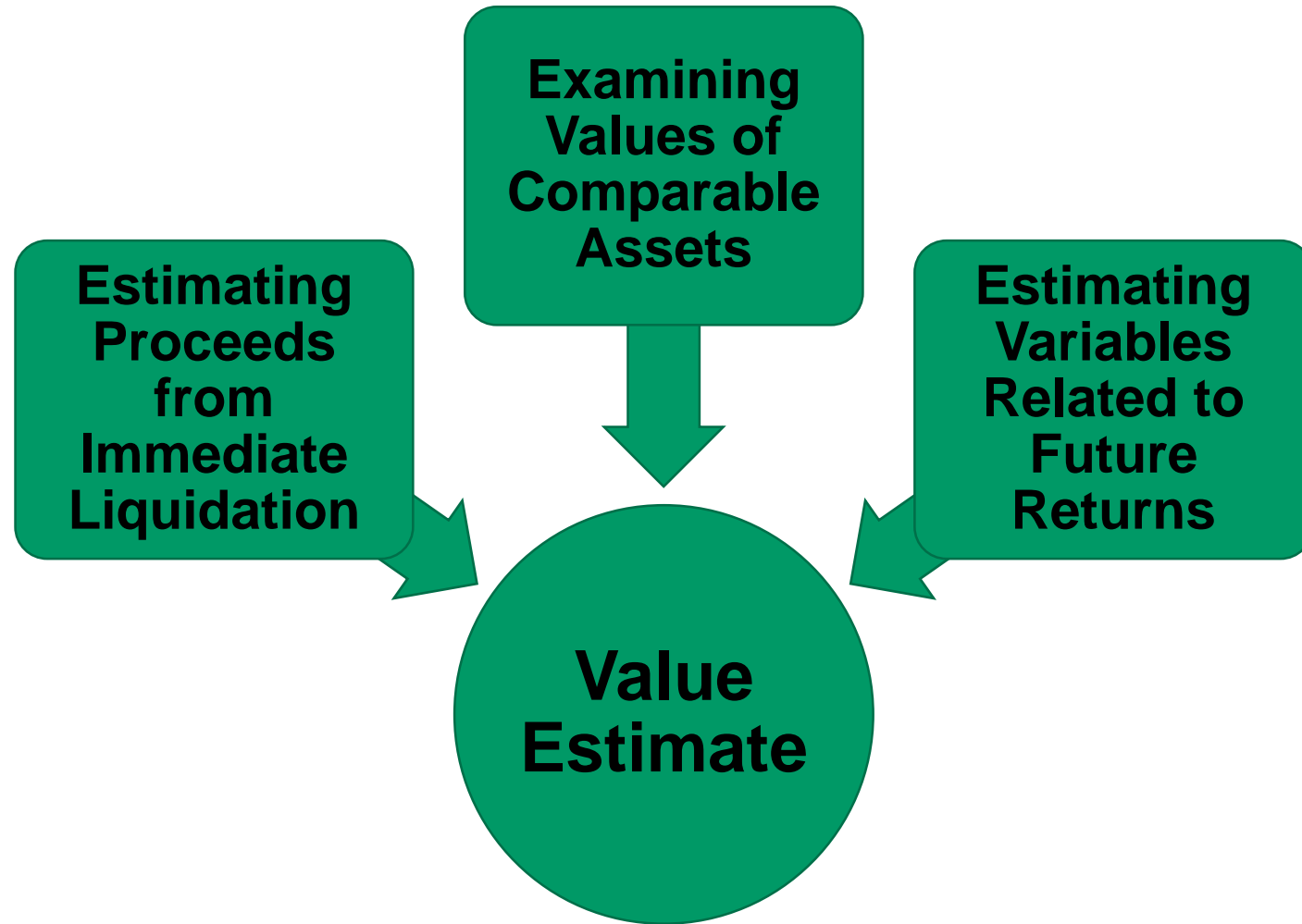
- Anchoring Bias
- Choice-Supportive Bias
- Availability Bias
- Clustering Bias
- Ostrich Effect
- Information Bias
- Placebo Effect
- Pro-Innovation Bias
- Confirmation Bias
- Outcome Bias
- Recency Bias
- Survivorship Bias
- Blind Spot Bias
- Conservatism Bias
- Overconfidence Bias
- Salience Bias
- Zero Risk Bias
- Disposition Effect
- Framing Effects
- Loss Aversion
- Selective Attention
- Herding Bias
- Gambler's Fallacy
- Illusion of Control

Consider which biases are influencing your analysis?

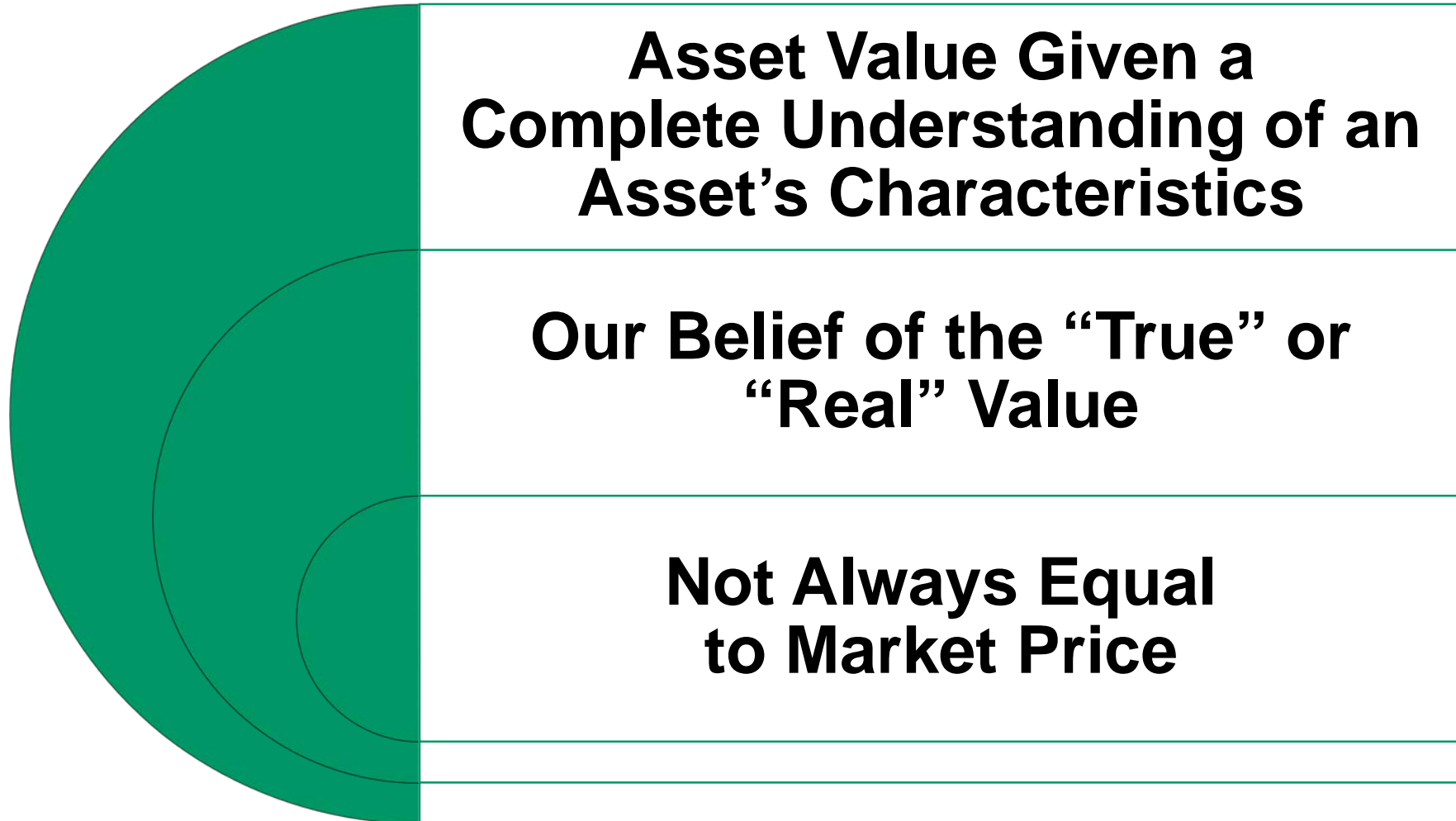
Tips Before We Get Started

- **Occam's razor:** If you can explain the world with one variable, don't use two. This keep-it-simple rule does not deny that reality is complex, nor does it say anything about simple minds. It forces you to focus on the most important fundamental drivers of markets and to cut out the clutter.
- **Ranges vs Price?** Analysts are asked to forecast future prices. This very hard, if not impossible to get right. Alternatively we can forecast ranges or direction instead of price levels. If markets are close to efficiently priced, what we know is already priced-in and we can't use that information to make an argument that asset prices should be too much different from today.
- **Hold conflicting views.** Real intelligence is the ability to hold conflicting viewpoints in your head simultaneously, because you realize the right view cannot be determined with any significant confidence.
- **Cherish your errors.** I have learned ten times more from being wrong than being right. Once you make a mistake, acknowledge it, analyze it in detail, and learn from it. Smart people learn from their mistakes and really smart people learn from the mistakes of others.
- **Geopolitics?** You should be aware of these risks but for the most part you can't model them with any real sense of confidence. If they do become market relevant, they typically hit markets so fast that it's too late to do much about them anyway.

ESTIMATING VALUE



INTRINSIC VALUE



ASSET MISPRICING

Efficient Market Hypothesis:

- Intrinsic value = Market price
- Actively looking for undervalued stocks is useless

EQUITY VALUATION TO FIND OVER/UNDERVALUED STOCKS,
ASSUMES MARKETS ARE NOT EFFICIENT

HAVE AN OPINION AND WORK AT A COMPANY WITH SHARED OPINIONS



US funds: PwC forecast for active-passive split

Assets under management

Passive
Active



* Estimates for 2025 based on PwC analysis
Source: PwC analysis based on data from ICI

GOING CONCERN VS. LIQUIDATION VALUE

- Liquidation value: Firm will be dissolved
 - Firm assets will be sold separately
 - 2 firms with the same level of assets and debt could have different liquidation values
 - ex: Firm A has a perishable inventory that would need to be sold asap resulting in a “fire sale”.
 - ex: Firm B has assets on their balance sheet whose market value is far different than book value
- Going-concern value: Firm will continue in its business activities
 - Firm will continue to sell its goods and services
 - Firm will use its assets for value maximization
 - Firm will access its optimal sources of financing
- Going-concern value > Liquidation value

OTHER DEFINITIONS OF VALUE



Fair Market Value

- Well-informed, willing buyer and seller

Fair Value

- Used by accountants in financial reporting. Similar to FMV

Investment Value

- Value to specific buyer due to potential synergies

USES OF PUBLIC EQUITY VALUATION

Stock Selection

- Is the stock under- or overvalued?

Inferring Market Expectations

- What does the security price say about expectations?

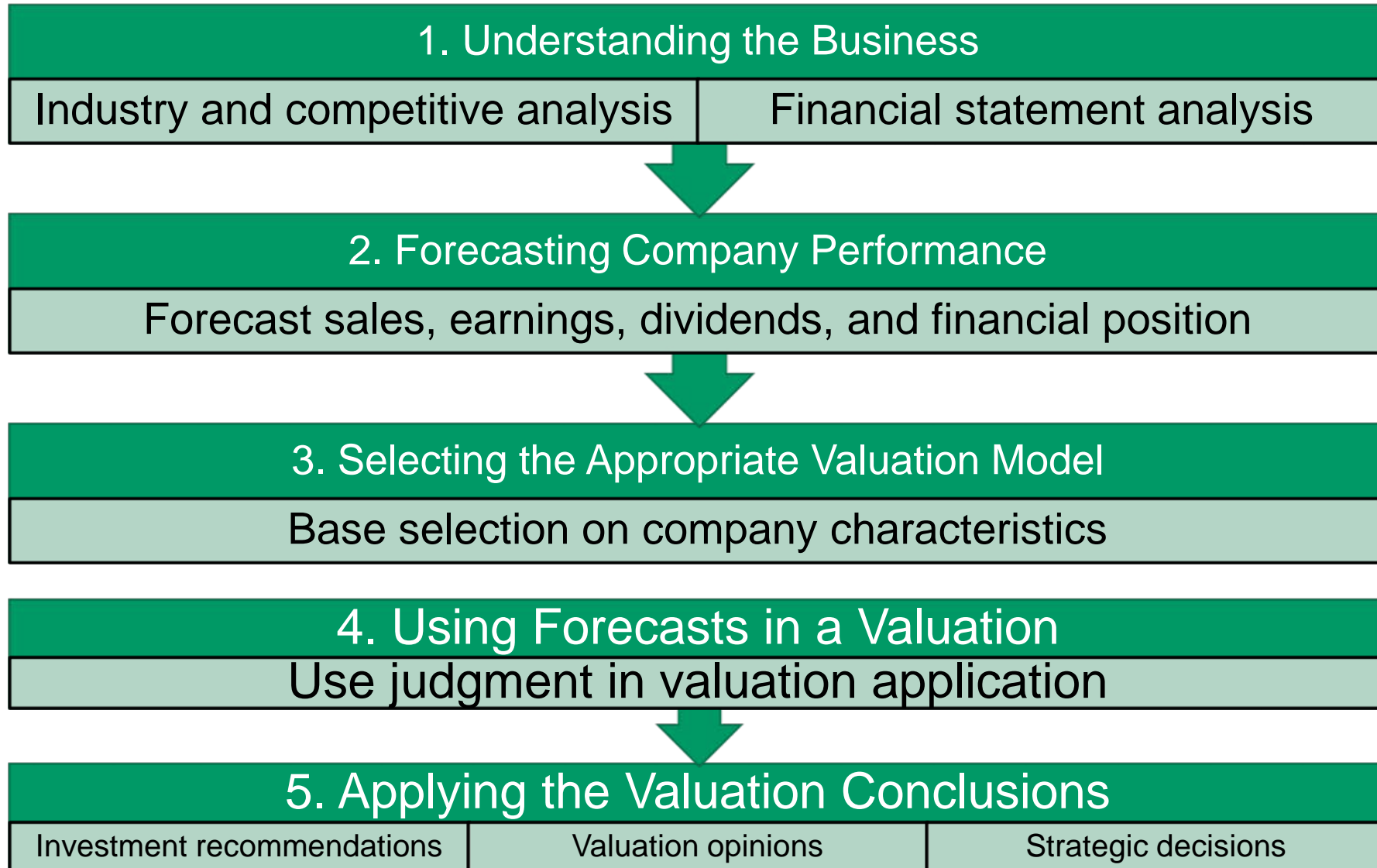
Evaluating Corporate Events

- What is the effect on firm value from M&A and divestitures/spin-offs?

Fairness Opinions

- Is the value paid for the firm fair?

THE VALUATION PROCESS



VALUATION MODELS

Intrinsic Valuation Models

- Present value models
 - Dividend discount models
 - Free cash flow to equity
 - Free cash flow to the firm
 - Residual income

Relative Valuation Models

- Price Multiples
 - Price-to-earnings ratio
 - Price-to-book-value ratio
 - Price-to-cash-flow ratio
- Enterprise value multiples

CHOOSING A VALUATION MODEL

What are the characteristics of the company?

What is the availability and quality of data?



What is the purpose of the valuation?

OTHER VALUATION MODEL ISSUES

Sum-of-the-Parts Valuation

Sensitivity Analysis

Scenario Analysis

SECURITY ANALYSIS

Qualitative Research



- Management:
Who, previous role & track record, tenure, compensation, corporate governance, etc.
- Products/Services trends over time
- Industry/Geographic Position:
Supply Chain Analysis, Porters 5 Forces, SWOT
- Conference Call Analysis
- MD&A section of financial statements

Develop your narrative. Subjective!

Answers the question:
Is it a good company?

Valuation Techniques



Fundamental Analysis

Intrinsic Value

- Value is based on future assumptions of sales, earnings, growth, etc.
 - Dividend Discount Model
 - Discount Cash Flow Model

Relative Value

- Value is based on the value of peers.
- Compare various metrics of the firm to the average of it's peers to determine value.
- Price Multiples
- Enterprise Value Multiples

Answers the question:
Is it trading at a price above or below Intrinsic Value?

