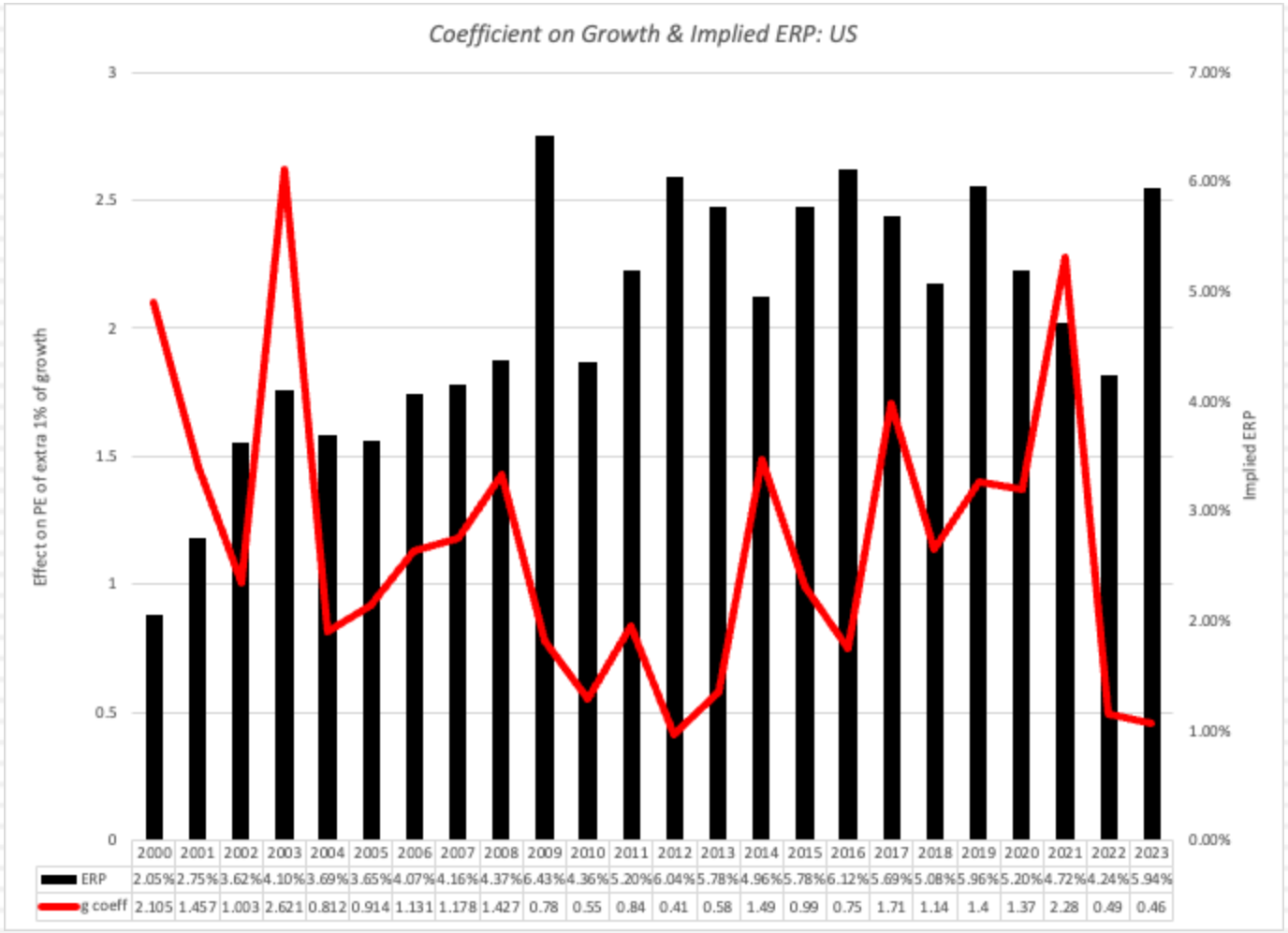
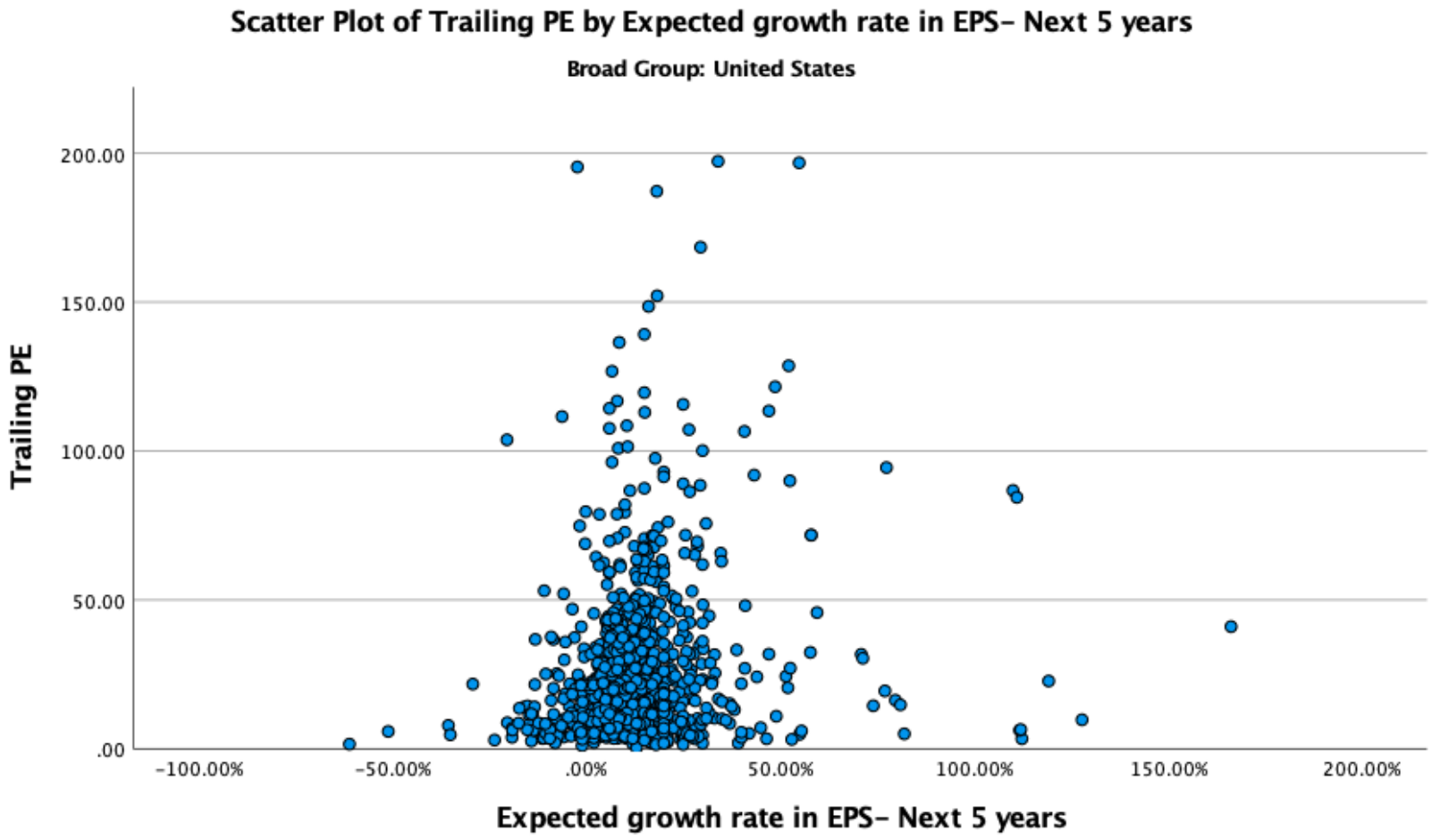
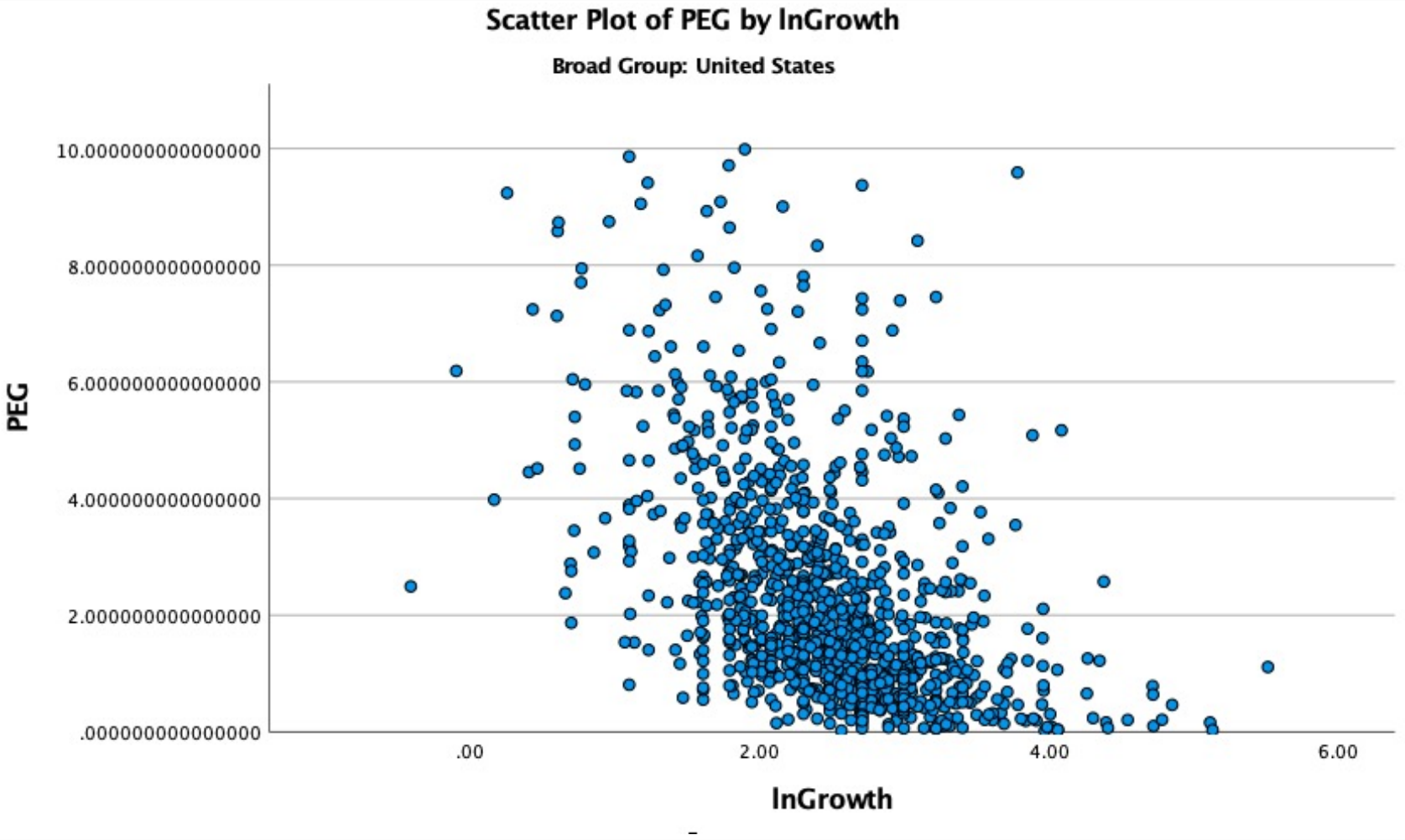
The value of growth



II. PEG Ratio versus the market
PEG versus Growth



PEG versus ln(Expected Growth)



PEG Ratio Regression - US stocks January 2022

Model Summary[a]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.754[b]	.568	.566	209.277240

a. Broad Group = United States

b. Predictors: (Constant), Payout ratio, lnGrowth, Beta

Coefficients[a,b,c]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	6.706	.242		27.753	<.001
	lnGrowth	-1.566	.082	-.546	-19.042	<.001
	Beta	-.770	.135	-.169	-5.717	<.001
	Payout ratio	.012	.002	.224	7.711	<.001

a. Broad Group = United States

b. Dependent Variable: PEG

c. Weighted Least Squares Regression - Weighted by Market Cap (in US $)

I. PE ratio regressions across markets

Region	Regression – January 2023	R^2
US	PE = 8.63 + 2.23 Beta + 46.20 g_{EPS} + 19.30 Payout	25.0%
Europe	PE = 1.59 + 2.33 Beta + 41.50 gEPS + 27.00 Payout	36.6%
Japan	PE = 0.17 + 1.38 Beta + 123.20 gEPS + 28.10 Payout	55.4%
Emerging Markets	PE = 10.88 + 1.76 Beta + 43.90 gEPS + 6.90 Payout	17.6%
Australia, NZ, Canada	PE = 14.38 – 9.42 Beta + 66.50 g_{EPS} + 16.10 Payout	26.9%
Global	PE = 8.17 + 0.98 Beta + 50.80 gEPS + 18.20 Payout	23.6%

g_{EPS}=Expected Growth: Expected growth in EPS or Net Income: Next 5 years (decimals)
Beta: Regression or Bottom up Beta
Payout ratio: Dividends/ Net income from most recent year. Set to zero, if net income < 0

II. PEG ratio regressions across markets

Region	Regression – January 2023	R^2
US	PEG = 6.71 + 1.20 Payout – 1.57 ln(gEPS) -0.77 Beta	56.6%
Europe	PEG = 4.50 + 0.50 Payout – 1.19 ln(gEPS) + . 0.176 Beta	30.1%
Japan	PEG = 4.30 + 1.40 Payout – 1.24 ln(gEPS) + 1.90 Beta	25.9%
Emerging Markets	PEG = 3.40 + 0.60 Payout – 0.55 ln(gEPS) - 0.268 Beta	21.5%
Australia, NZ, Canada	PEG = 5.98 + 0.80 Payout – 1.69 ln(gEPS) - 0.39 Beta	47.2%
Global	**PEG = 4.99 + 1.00 Payout – 1.16 ln(gEPS) - 0.262 Beta**	**36.6%**

g_{EPS}=Expected Growth: Expected growth in EPS or Net Income: Next 5 years (decimals)
Beta: Regression or Bottom up Beta
Payout ratio: Dividends/ Net income from most recent year. Set to zero, if net income < 0

III. Price to Book Ratio: Fundamentals hold in every market

Region	Regression – January 2023	R^2
US	PBV= 2.32 + 4.60 g_{EPS} - 1.33 Beta + 8.90 ROE + 0.80 Payout Ratio	36.9%
Europe	PBV= -0.04 + 4.10 g_{EPS} + 0.07 Beta + 9.60 ROE + 1.80 Payout Ratio	28.5%
Japan	PBV= -0.10 +7.30 g_{EPS} + 0.18 Beta + 12.40 ROE + 2.00 Payout Ratio	34.4%
Emerging Markets	PBV= 0.87 +3.10 gEPS + 0.23 Beta + 6.00 ROE + 1.00 Payout Ratio	28.0%
Australia, NZ, Canada	PBV= 2.26 +5.00 g_{EPS} - 1.53 Beta + 5.10 ROE + 0.50 Payout Ratio	25.4%
Global	PBV= 1.09 +3.60 g_{EPS} - 0.16 Beta + 7.50 ROE + 0.80 Payout Ratio	28.1%

g_{EPS}=Expected Growth: Expected growth in EPS/ Net Income: Next 5 years
Beta: Regression or Bottom up Beta
Payout ratio: Dividends/ Net income from most recent year. Set to zero, if net income < 0
ROE: Net Income/ Book value of equity in most recent year.

IV. EV/EBITDA across markets

Region	Regression – January 2023	R squared
United States	EV/EBITDA= 23.93 + 25.40 g - 8.20 DFR - 34.40 Tax Rate	5.3%
Europe	EV/EBITDA= 19.78 + 8.00 g - 9.90 DFR - 13.60 Tax Rate	8.8%
Japan	EV/EBITDA= 19.94 + 1.40 g - 0.60 DFR - 23.00 Tax Rate	3.5%
Emerging Markets	EV/EBITDA= 30.93 + 4.90 g - 17.30 DFR - 40.40 Tax Rate	11.9%
Australia, NZ & Canada	EV/EBITDA= 29.10 + 8.10 g – 14.90 DFR - 49.70 Tax Rate	13.3%
Global	EV/EBITDA= 25.62 + 9.20 g - 11.40 DFR - 32.70 Tax Rate	7.5%

g = Expected Revenue Growth: Expected growth in revenues: Near term (2 or 5 years)
DFR = Debt Ratio : Total Debt/ (Total Debt + Market value of equity)
Tax Rate: Effective tax rate in most recent year ROIC = Return on Capital

V. EV/Sales Regressions across markets…

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Region	Regression – January 2023	R Squared
United States	EV/Sales = 2.32 + 2.60 g + 10.60 Oper Margin -1.40 DFR- 3.50 Tax rate	30.6%
Europe	EV/Sales = 2.20 + 2.60 g + 5.10 Oper Margin + 3.90 DFR- 4.90 Tax rate	15.9%
Japan	EV/Sales = 1.21 + 4.00 g + 9.30 Oper Margin -1.00 DFR- 2.90 Tax rate	44.7%
Emerging Markets	EV/Sales = 3.22 + 1.60 g + 4.40 Oper Margin + 1.50 DFR- 2.80 Tax rate	5.6%
Australia, NZ & Canada	EV/Sales = -0.35 + 12.03 g+ 5.34 Operating Margin + 13.95 DFR- 2.60 Tax rate	36.3%
Global	EV/Sales = 2.68 + 2.50 g + 8.10 Oper Margin + 2.10 DFR- 5.10 Tax rate	17.8%

g =Expected Revenue Growth: Expected growth in revenues: Near term (2 or 5 years)
Tax Rate: Effective tax rate in most recent year; Operating Margin: Operating Income/ Sales

VI. EV/Invested Capital

Region	Regression – January 2023	R Squared
United States	EV/IC= 3.53 + 1.30 g + 7.30 ROIC – 4.20 DFR	56.7%
Europe	EV/IC= 3.10 + 1.90 g + 6.00 ROIC – 3.20 DFR	55.9%
Japan	EV/IC= 2.14 + 3.30 g + 7.80 ROIC – 2.80 DFR	53.6%
Emerging Markets	EV/IC= 2.80 + 1.20 g + 4.00 ROIC – 2.90 DFR	58.4%
Australia, NZ & Canada	EV/IC = 3.11 – 2.90 DFR + 1.10 g + 2.50 ROIC	44.5%
Global	**EV/IC= 3.01 + 1.40 g + 6.40 ROIC – 3.20 DFR**	**56.1%**

g =Expected Revenue Growth: Expected growth in revenues: Near term (2 or 5 years)
DFR: Debt Ratio
ROIC = Return on Invested Capital

The Pricing Game: Choices

Measure	Choices	Considerations/ Questions
Value	Enterprise, Equity or Firm Value?	1. Is this a financial service business? 2. Are there big differences in leverage?
Scalar	Revenues, Earnings, Cash Flows or Book Value?	1. How are you measuring value? 2. Is the scaling number positive? 3. How (and how much) do accounting choices affect the scaling measure?
Timing & Normalizing	Current, Trailing, Forward or Really Forward?	1. Where are you in the life cycle? 2. How much cyclicality is there in the number? 3. Can you get forecasted values?
Comparable	What is your peer group? (Global or local? Similar size or all firms? …)	1. How much do companies share in common globally? 2. Does company size affect business economics? 3. How big a sample of firms do you need? 4. How do you plan to control for differences?

Relative Valuation: Some closing propositions

- Proposition 1: In a relative valuation, all that you are concluding is that a stock is under or over valued, relative to your comparable group.
  - Your relative valuation judgment can be right and your stock can be hopelessly over valued at the same time.
- Proposition 2: In asset valuation, there are no similar assets. Every asset is unique.
  - If you do not control for fundamental differences in risk, cash flows and growth across firms when comparing how they are priced, your valuation conclusions will reflect your flawed judgments rather than market misvaluations.
- Bottom line: Relative valuation is pricing, not valuation.

Reviewing: The Four Steps to Understanding Multiples

- Define the multiple
  - Check for consistency
  - Make sure that they are estimated uniformly
- Describe the multiple
  - Multiples have skewed distributions: The averages are seldom good indicators of typical multiples
  - Check for bias, if the multiple cannot be estimated
- Analyze the multiple
  - Identify the companion variable that drives the multiple
  - Examine the nature of the relationship
- Apply the multiple

A DETOUR: ASSET BASED VALUATION

Value assets, not cash flows?

What is asset-based valuation?

- In intrinsic valuation, you value a business based upon the cash flows you expect that business to generate over time.
- In relative valuation, you value a business based upon how similar businesses are priced.
- In asset-based valuation, you value a business by valuing its individual assets. These individual assets can be tangible or intangible.

Why would you do asset-based valuation?

- Liquidation: If you are liquidating a business by selling its assets piece meal, rather than as a composite business, you would like to estimate what you will get from each asset or asset class individually.
- Accounting mission: As both US and international accounting standards have turned to "fair value" accounting, accountants have been called upon to redo balance sheet to reflect the assets at their fair rather than book value.
- Sum of the parts: If a business is made up of individual divisions or assets, you may want to value these parts individually for one of two groups:
  - Potential acquirers may want to do this, as a precursor to restructuring the business.
  - Investors may be interested because a business that is selling for less than the sum of its parts may be "cheap".

How do you do asset-based valuation?

- Intrinsic value: Estimate the expected cash flows on each asset or asset class, discount back at a risk adjusted discount rate and arrive at an intrinsic value for each asset.
- Relative value: Look for similar assets that have sold in the recent past and estimate a value for each asset in the business.
- Accounting value: You could use the book value of the asset as a proxy for the estimated value of the asset.

When is asset-based valuation easiest to do?

- Separable assets: If a company is a collection of separable assets (a set of real estate holdings, a holding company of different independent businesses), asset-based valuation is easier to do. If the assets are interrelated or difficult to separate, asset-based valuation becomes problematic. Thus, while real estate or a long-term licensing/franchising contract may be easily valued, brand name (which cuts across assets) is more difficult to value separately.
- Stand alone earnings/ cash flows: An asset is much simpler to value if you can trace its earnings/cash flows to it. It is much more difficult to value when the business generates earnings, but the role of individual assets in generating these earnings cannot be isolated.
- Active market for similar assets: If you plan to do a relative valuation, it is easier if you can find an active market for "similar" assets which you can draw on for transactions prices.

I. Liquidation Valuation

- In liquidation valuation, you are trying to assess how much you would get from selling the assets of the business today, rather than the business as a going concern.
- Consequently, it makes more sense to price those assets (i.e., do relative valuation) than it is to value them (do intrinsic valuation).
  - For assets that are separable and traded (example: real estate), pricing is easy to do.
  - For assets that are not, you often see book value used either as a proxy for liquidation value or as a basis for estimating liquidation value.
- To the extent that the liquidation is urgent, you may attach a discount to the estimated value.

II. Accounting Valuation: Glimmers from FAS 157

- The ubiquitous "market participant": Through FAS 157, accountants are asked to attach values to assets/liabilities that market participants would have been willing to pay/ receive.
- Tilt towards relative value: "The definition focuses on the price that would be received to sell the asset or paid to transfer the liability (an exit price), not the price that would be paid to acquire the asset or received to assume the liability (an entry price)." The hierarchy puts "market prices", if available for an asset, at the top with intrinsic value being accepted only if market prices are not accessible.
- Split mission: While accounting fair value is titled towards relative valuation, accountants are also required to back their relative valuations with intrinsic valuations. Often, this leads to reverse engineering, where accountants arrive at values first and develop valuations later.

III. Sum of the parts valuation

- You can value a company in pieces, using either relative or intrinsic valuation. Which one you use will depend on who you are and your motives for doing the sum of the parts valuation.
- If you are long term, passive investor in the company, your intent may be to find market mistakes that you hope will get corrected over time. If that is the case, you should do an intrinsic valuation of the individual assets.
- If you are an activist investor that plans to acquire the company or push for change, you should be more focused on relative valuation, since your intent is to get the company to split up and gain the increase in value.

Let's try this:
United Technologies: Raw Data - 2009

Division	*Business*	*Revenues*	*EBITDA*	*Pre-tax Operating Income*	*Capital Expenditures*	*Depreciation*	*Total Assets*
Carrier	Refrigeration systems	$14,944	$1,510	$1,316	$191	$194	$10,810
Pratt & Whitney	Defense	$12,965	$2,490	$2,122	$412	$368	$9,650
Otis	Construction	$12,949	$2,680	$2,477	$150	$203	$7,731
UTC Fire & Security	Security	$6,462	$780	$542	$95	$238	$10,022
Hamilton Sundstrand	Manufacturing	$6,207	$1,277	$1,099	$141	$178	$8,648
Sikorsky	Aircraft	$5,368	$540	$478	$165	$62	$3,985

The company also had corporate expenses, unallocated to the divisions of $408 million in the most recent year.

United Technologies: Relative Valuation Median Multiples

Division	*Business*	*EBITDA*	*EV/EBITDA for sector*	*Value of Business*
Carrier	Refrigeration systems	$1,510	5.25	$7,928
Pratt & Whitney	Defense	$2,490	8.00	$19,920
Otis	Construction	$2,680	6.00	$16,080
UTC Fire & Security	Security	$780	7.50	$5,850
Hamilton Sundstrand	Industrial Products	$1,277	5.50	$7,024
Sikorsky	Aircraft	$540	9.00	$4,860
Sum of the parts value for business =				$61,661

United Technologies: Relative Valuation Plus Scaling variable & Choice of Multiples

Division	Business	Revenues	EBITDA	Operating Income	Capital Invested
Carrier	Refrigeration systems	$14,944	$1,510	$1,316	$6,014
Pratt & Whitney	Defense	$12,965	$2,490	$2,122	$5,369
Otis	Construction	$12,949	$2,680	$2,477	$4,301
UTC Fire & Security	Security	$6,462	$780	$542	$5,575
Hamilton Sundstrand	Industrial Products	$6,207	$1,277	$1,099	$4,811
Sikorsky	Aircraft	$5,368	$540	$478	$2,217
Total		$58,895	$9,277	$8,034	$28,287

Business	Best Multiple	Regression	R^2
Refrigeration systems	EV/EBITDA	EV/EBITDA = 5.35 – 3.55 Tax Rate + 14.17 ROC	42%
Defense	EV/Revenues	EV/Revenues = 0.85 + 7.32 Pre-tax Operating Margin	47%
Construction	EV/EBITDA	EV/EBITDA = 3.17 – 2.87 Tax Rate + 14.66 ROC	36%
Security	EV/Capital	EV/ Capital = 0.55 + 8.22 ROC	55%
Industrial Products	EV/Revenues	EV/Revenues = 0.51 + 6.13 Pre-tax Operating Margin	48%
Aircraft	EV/Capital	EV/ Capital = 0.65 + 6.98 ROC	40%

United Technologies: Relative Valuation Sum of the Parts value

Division	Scaling Variable	Current value for scaling variable	ROC	Operating Margin	Tax Rate	Predicted Multiple	Estimated Value
Carrier	EBITDA	$1,510	13.57%	8.81%	38%	5.35 – 3.55 (.38) + 14.17 (.1357) =5.92	$8,944.47
Pratt & Whitney	Revenues	$12,965	24.51%	16.37%	38%	0.85 + 7.32 (.1637) =2.05	$26,553.29
Otis	EBITDA	$2,680	35.71%	19.13%	38%	3.17 – 2.87 (.38)+14.66 (.3571) =7.31	$19,601.70
UTC Fire & Security	Capital	$5,575	6.03%	8.39%	38%	0.55 + 8.22 (.0603) =1.05	$5,828.76
Hamilton Sundstrand	Revenues	$6,207	14.16%	17.71%	38%	0.51 + 6.13 (.1771) =1.59	$9,902.44
Sikorsky	Capital	$2,217	13.37%	8.90%	38%	0.65 + 6.98 (.1337) =1.58	$3,509.61
Sum of the parts value for operating assets =							$74,230.37

United Technologies: DCF parts valuation
Cost of capital, by business

Division	Unlevered Beta	Debt/Equity Ratio	Levered beta	Cost of equity	After-tax cost of debt	Debt to Capital	Cost of capital
Carrier	0.83	30.44%	0.97	9.32%	2.95%	23.33%	7.84%
Pratt & Whitney	0.81	30.44%	0.95	9.17%	2.95%	23.33%	7.72%
Otis	1.19	30.44%	1.39	12.07%	2.95%	23.33%	9.94%
UTC Fire & Security	0.65	30.44%	0.76	7.95%	2.95%	23.33%	6.78%
Hamilton Sundstrand	1.04	30.44%	1.22	10.93%	2.95%	23.33%	9.06%
Sikorsky	1.17	30.44%	1.37	11.92%	2.95%	23.33%	9.82%

United Technologies: DCF valuation Fundamentals, by business

Division	*Total Assets*	*Capital Invested*	*Cap Ex*	*Allocated Reinvestment*	*Operating income after taxes*	*Return on capital*	*Reinvestment Rate*
Carrier	$10,810	$6,014	$191	$353	$816	13.57%	43.28%
Pratt & Whitney	$9,650	$5,369	$412	$762	$1,316	24.51%	57.90%
Otis	$7,731	$4,301	$150	$277	$1,536	35.71%	18.06%
UTC Fire & Security	$10,022	$5,575	$95	$176	$336	6.03%	52.27%
Hamilton Sundstrand	$8,648	$4,811	$141	$261	$681	14.16%	38.26%
Sikorsky	$3,985	$2,217	$165	$305	$296	13.37%	102.95%

United Technologies, DCF valuation Growth Choices

Division	Cost of capital	*Return on capital*	*Reinvestment Rate*	*Expected growth*	*Length of growth period*	*Stable growth rate*	*Stable ROC*
Carrier	7.84%	13.57%	43.28%	5.87%	5	3%	7.84%
Pratt & Whitney	7.72%	24.51%	57.90%	14.19%	5	3%	12.00%
Otis	9.94%	35.71%	18.06%	6.45%	5	3%	14.00%
UTC Fire & Security	6.78%	6.03%	52.27%	3.15%	0	3%	6.78%
Hamilton Sundstrand	9.06%	14.16%	38.26%	5.42%	5	3%	9.06%
Sikorsky	9.82%	13.37%	102.95%	13.76%	5	3%	9.82%

United Technologies, DCF valuation Values of the parts

Business	*Cost of capital*	*PV of FCFF*	*PV of Terminal Value*	*Value of Operating Assets*
Carrier	7.84%	$2,190	$9,498	$11,688
Pratt & Whitney	7.72%	$3,310	$27,989	$31,299
Otis	9.94%	$5,717	$14,798	$20,515
UTC Fire & Security	6.78%	$0	$4,953	$4,953
Hamilton Sundstrand	9.06%	$1,902	$6,343	$8,245
Sikorsky	9.82%	-$49	$3,598	$3,550
Sum				*$80,250*

United Technologies, DCF valuation
Sum of the Parts

Value of the parts = $80,250

Value of corporate expenses

$$= \frac{\text{Corporate Expenses}_{\text{Current}}(1-t)(1+g)}{(\text{Cost of capital}_{\text{Company}} - g)} = \frac{408(1-.38)(1.03)}{(.0868-.03)} = \$\ 4{,}587$$

Value of operating assets (sum of parts DCF) = $75,663

Value of operating assets (sum of parts RV) = $74,230

Value of operating assets (company DCF) = $71,410

Enterprise value (based on market prices) = $52,261

GE in 2018: The Parts

Business	Revenues- 2017	Revenue Growth in 2017	EBIT before G&A	EBIT after G&A	EBIT Margin	Invested Capital	ROIC in 2017	ROIC: 2013-2017	Cost of capital
Power	$ 36.00	-1.64%	$ 2.80	$ 1.69	4.68%	$328.34	3.85%	9.28%	4.91%
Renewable Energy	$ 10.30	14.44%	$ 0.70	$ 0.41	4.00%	$49.91	6.19%	8.00%	6.88%
Oil & Gas	$ 17.20	33.33%	$ 0.20	$ (0.31)	-1.78%	$275.95	-0.83%	3.71%	8.82%
Aviation	$ 27.40	4.18%	$ 6.60	$ 5.80	21.19%	$192.73	22.59%	20.27%	8.52%
Healthcare	$ 19.10	4.37%	$ 3.40	$ 2.86	15.00%	$132.81	16.18%	15.07%	7.97%
Transportation	$ 4.20	-10.64%	$ 0.80	$ 0.70	16.56%	$20.73	25.17%	26.67%	7.49%
Lighting	$ 2.00	-58.33%	$ 0.10	$ 0.03	1.59%	$3.34	7.16%	9.66%	8.50%
Capital	$ 9.10	-16.51%	$ (6.80)	$ (7.04)	-77.40%	$723.38	-7.30%	-2.81%	3.64%
Total	**$ 125.30**	**1.29%**	**$ 7.80**	**$ 4.15**	**3.31%**	**$1,727.18**	**1.80%**	**4.50%**	6.23%

GE: Value of the Parts

Business	Revenues in 2017	Average EBIT Margin before G&A, 2013-17	Normalized EBIT before G&A	Normalized EBIT (with corporate expenses allocated)	Normalized EBIT (1-t)	Cost of Capital	ROIC - Next 5 years	Expected growth next 5 years	Value of Business
Power	$ 35,990.00	14.34%	$ 5,161.92	$ 4,061.80	$ 3,046.35	4.91%	9.28%	6.10%	$ 73,138.18
Renewable Energy	$ 10,280.00	8.24%	$ 847.46	$ 532.70	$ 399.53	6.88%	8.00%	16.34%	$ 6,455.88
Oil & Gas	$ 17,231.00	10.97%	$ 1,890.80	$ 1,365.19	$ 1,023.89	8.82%	3.71%	-0.13%	$ 11,924.66
Aviation	$ 27,375.00	22.09%	$ 6,046.58	$ 5,209.28	$ 3,906.96	8.52%	20.27%	4.55%	$ 52,849.35
Healthcare	$ 19,116.00	17.01%	$ 3,251.87	$ 2,668.20	$ 2,001.15	7.97%	15.07%	0.99%	$ 26,233.80
Transportation	$ 4,178.00	20.71%	$ 865.41	$ 737.06	$ 552.80	7.49%	26.67%	-6.62%	$ 6,075.26
Lighting	$ 1,987.00	5.24%	$ 104.14	$ 43.03	$ 32.27	8.50%	9.66%	-24.94%	$ 280.49
Total (non-capital)	$ 116,157.00	15.35%	$ 17,829.69	$ 17,551.60	$ 13,163.70				$ 176,957.62
GE Capital Business	$ 9,070.00	3.00%	$ 272.10	$ (5.98)	$ (4.49)	6.23%	0.00%	-4.25%	$ 27,080.96
								Value of businesses	$ 204,038.59
								- GE Debt	$ 83,568.00
								- GE Capital Debt	$ 51,023.00
								- Minority Interests	$ 17,723.00
								+ Cash	$ 43,299.00
								Value of equity	$ 95,023.59
								- Options	$ 218.94
								Value of equity in common stock	$ 94,804.65
								Value per share	$ 10.92

GE: Pricing the Parts

Business	*Revenues in 2017*	*Normalized EBIT, using average margin (2013-17)*	*DA in 2017*	*EBITDA*	*Peer Group EV/EBITDA*	*Estimated Pricing*
Power	$ 35,990.00	$ 4,061.80	$1,358.00	$5,419.80	10.55	$ 57,179
Renewable Energy	$ 10,280.00	$ 532.70	$ 259.00	$ 791.70	15.13	$ 11,978
Oil & Gas	$ 17,231.00	$ 1,365.19	$1,026.00	$2,391.19	12.15	$ 29,053
Aviation	$ 27,375.00	$ 5,209.28	$ 979.00	$6,188.28	6.56	$ 40,595
Healthcare	$ 19,116.00	$ 2,668.20	$ 806.00	$3,474.20	10.97	$ 38,112
Transportation	$ 4,178.00	$ 737.06	$ 135.00	$ 872.06	11.22	$ 9,785
Lighting	$ 1,987.00	$ 43.03	$ 86.00	$ 129.03	12.8	$ 1,652
Total (non-capital)	$ 116,157.00	$ 17,551.60				$ 188,353
GE Capital Business	$ 9,070.00	$ (5.98)	$2,343.00	$2,337.02	10.13	$ 23,674
					Pricing of Business	$ 212,027.44
					- GE Debt	$ 83,568.00
					- GE Capital Debt	$ 51,023.00
					- Minority Interests	$ 17,723.00
					+ Cash	$ 43,299.00
					Pricing of Equity	$ 103,012.44
					- Options	218.94
					Pricing of Equity in common stock	$ 102,793.50
					Estimating Pricing per share	**$11.84**

PRIVATE COMPANY VALUATION

Aswath Damodaran

Process of Valuing Private Companies

- The process of valuing private companies is not different from the process of valuing public companies. You estimate cash flows, attach a discount rate based upon the riskiness of the cash flows and compute a present value. As with public companies, you can either value
  - The entire business, by discounting cash flows to the firm at the cost of capital.
  - The equity in the business, by discounting cashflows to equity at the cost of equity.
- When valuing private companies, you face two standard problems:
  - There is not market value for either debt or equity
  - The financial statements for private firms are likely to go back fewer years, have less detail and have more holes in them.

1. No Market Value?

- Market values as inputs: Since neither the debt nor equity of a private business is traded, any inputs that require them cannot be estimated.
  1. Debt ratios for going from unlevered to levered betas and for computing cost of capital.
  2. Market prices to compute the value of options and warrants granted to employees.
- Market value as output: When valuing publicly traded firms, the market value operates as a measure of reasonableness. In private company valuation, the value stands alone.
- Market price based risk measures, such as beta and bond ratings, will not be available for private businesses.

2. Cash Flow Estimation Issues

- Shorter history: Private firms often have been around for much shorter time periods than most publicly traded firms. There is therefore less historical information available on them.
- Different Accounting Standards: The accounting statements for private firms are often based upon different accounting standards than public firms, which operate under much tighter constraints on what to report and when to report.
- Intermingling of personal and business expenses: In the case of private firms, some personal expenses may be reported as business expenses.
- Separating "Salaries" from "Dividends": It is difficult to tell where salaries end and dividends begin in a private firm, since they both end up with the owner.

Private Company Valuation: Motive matters..

- You can value a private company for
  - 'Show' valuations
    - Curiosity: How much is my business really worth?
    - Legal purposes: Estate tax and divorce court
  - Transaction valuations
    - Sale or prospective sale to another individual or private entity.
    - Sale of one partner's interest to another
    - Sale to a publicly traded firm
  - As prelude to setting the offering price in an initial public offering
- You can value a division or divisions of a publicly traded firm
  - As prelude to a spin off
  - For sale to another entity
  - To do a sum-of-the-parts valuation to determine whether a firm will be worth more broken up or if it is being efficiently run.

Private company valuations: Four broad scenarios

1. Private to private transactions: You can value a private business for sale by one individual to another.
2. Private to public transactions: You can value a private firm for sale to a publicly traded firm.
3. Private to IPO: You can value a private firm for an initial public offering.
4. Private to VC to Public: You can value a private firm that is expected to raise venture capital along the way on its path to going public.

I. Private to Private transaction

- In private-to-private transactions, a private business is sold by one individual to another. There are three key issues that we need to confront in such transactions:
  - Neither the buyer nor the seller is diversified. Consequently, risk and return models that focus on just the risk that cannot be diversified away will seriously under estimate the discount rates.
  - The investment is illiquid. Consequently, the buyer of the business will have to factor in an "illiquidity discount" to estimate the value of the business.
  - Key person value: There may be a significant personal component to the value. In other words, the revenues and operating profit of the business reflect not just the potential of the business but the presence of the current owner.