

Market-Based
Valuation:
Price and Enterprise
Value Multiples

Valuation Indicators

Price
Multiples

Enterprise
Value
Multiples

Methods for Price and Enterprise Value Multiples

1. Method of Comparables

- Economic rationale is the law of one price

2. Method Based on Forecasted Fundamentals

- Reflects firm fundamentals and future cash flows

Justified Price Multiples

Example

EXAMPLE 1 The Method of Comparables at Its Simplest

Company A's EPS is \$1.50. Its closest competitor, Company B, is trading at a P/E of 22. Assume the companies have a similar operating and financial profile.

1. If Company A's stock is trading at \$37.50, what does that indicate about its value relative to Company B?
2. If we assume that Company A's stock should trade at about the same P/E as Company B's stock, what will we estimate as an appropriate price for Company A's stock?

Price-to-Earnings Multiple Rationales and Drawbacks

Rationales

EPS is driver of value

Widely used

Related to stock returns

Drawbacks

Zero, negative, or very small earnings

Permanent versus transitory earnings

Management discretion for earnings

Price-to-Earnings Multiple Definitions

Trailing P/E

Forward P/E

Uses last
year's
(current)
earnings

Preferred
when
forecasted
earnings are
not available

Uses next
year's
earnings

Preferred
when trailing
earnings are
not reflective
of future

Forward P/E

1. EPS for the next four quarters;
2. EPS for the next 12 months (NTM); or
3. EPS for the future fiscal year. The future fiscal year itself may be defined in different ways:
 - a) If the time of prediction is between fiscal year-ends, the fiscal year used can be the current one, for which some time has already elapsed.
 - b) The fiscal year used can be the next fiscal year.

Example: Forward P/E for November 2016

Stock price*	\$20.00
2016:Q1 EPS	\$0.18
2016:Q2 EPS	\$0.25
2016:Q3 EPS	\$0.32
2016:Q4 EPS	\$0.35
<i>2016 Fiscal year forecast</i>	<i>\$1.10</i>
2017:Q1 EPS	\$0.43
2017:Q2 EPS	\$0.48
2017:Q3 EPS	\$0.50
2017:Q4 EPS	\$0.59
<i>2017 Fiscal year forecast</i>	<i>\$2.00</i>

* Assume we are at the end of November 2016.

Example: Forward P/E

1) Forward P/E based on EPS for the next four quarters:

$$\text{EPS for the next four quarters} = \$0.35 + \$0.43 + \$0.48 + \$0.50 = \$1.76$$

$$\text{Forward P/E based on EPS for the next four quarters} = \$20 / \$1.76 = 11.4$$

2) Forward P/E based on EPS for the NTM (next 12 months):

$$\text{EPS for the NTM} = \left(\frac{1}{12}\right)\$1.10 + \left(\frac{11}{12}\right)\$2.00 = \$1.925$$

$$\text{Forward P/E based on EPS for the NTM} = \$20 / \$1.925 = 10.4$$

Example: Forward P/E

3) Forward P/E based on the current fiscal year's EPS:

EPS for the current fiscal year = \$1.10

Forward P/E based on EPS for the current fiscal year = $\$20 / \$1.10 = 18.2$

4) Forward P/E based on the next fiscal year's EPS:

EPS for the next fiscal year = \$2.00

Forward P/E based on EPS for the next fiscal year = $\$20 / \$2.00 = 10.0$

Example: Forward P/E

P/E = 11.4

P/E = 10.4

P/E = 18.2

P/E = 10.0

	2016: Q1 EPS	2016: Q2 EPS	2016: Q3 EPS	2016: Q4 EPS	2017: Q1 EPS	2017: Q2 EPS	2017: Q3 EPS	2017: Q4 EPS
growth	-	38.89%	28.00%	9.37%	22.86%	11.63%	4.17%	18.00%

EXAMPLE 6 Calculating a Forward P/E (2)

In this example, we use alternative definitions of “forward” to compute forward P/Es. Exhibit 4 presents actual and forecasted EPS for Boyd Gaming Corp. (NYSE: BYD) that owns and operates 21 gaming entertainment properties in Nevada, Mississippi, Illinois, New Jersey, Indiana, Kansas, Iowa, and Louisiana.

EXHIBIT 4 Quarterly EPS for BYD (in US Dollars; Excluding Nonrecurring Items and Discontinued Operations)

Year	31 March	30 June	30 September	31 December	Annual Estimate
2013	0.01	0.00	E(0.01)	E(0.05)	(0.05)
2014	E0.07	E0.08	E0.03	E(0.03)	0.15

Source: The Value Line Investment Survey.

On 9 August 2013, BYD closed at \$12.20. BYD’s fiscal year ends on 31 December. As of 9 August 2013, solve the following problems by using the information in Exhibit 4:

1. Calculate BYD’s forward P/E based on the next four quarters of forecasted EPS.
2. Calculate BYD’s NTM P/E.
3. Calculate BYD’s forward P/E based on a fiscal-year definition and current fiscal year (2013) forecasted EPS.
4. Calculate BYD’s forward P/E based on a fiscal-year definition and next fiscal year (2014) forecasted EPS.

Issues in Calculating EPS

EPS Dilution

Underlying
Earnings

Normalized
Earnings

Differences in
Accounting
Methods

IBM US \$ C **134.48** -1.11  N134.46 / 134.47N 61x128
  On 13 Nov d Vol 3,060,924 0 135.39N H 135.58D L 133.845D Val 411.476M

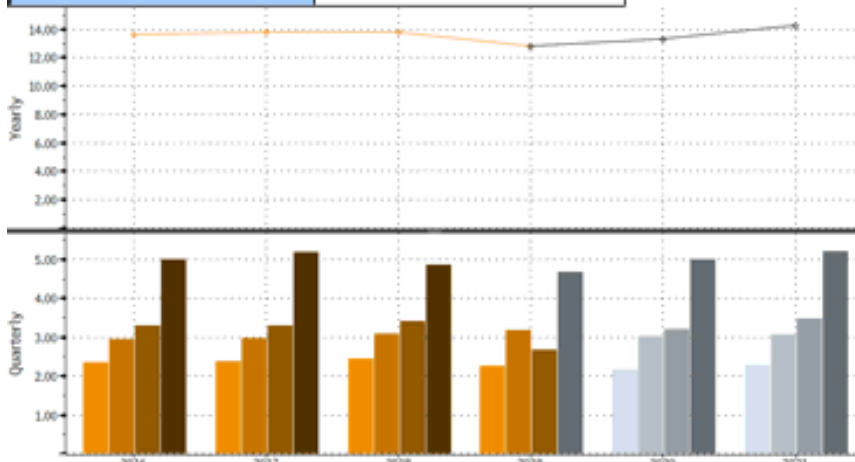
IBM US Equity Export Settings Earnings Trends

International Business Machines Corp Periodicity **Quarterly** Source **Standard** Currency **USD**

Measure	EPS, Adj+						<	>	YoY % Growth				PoP % Growth	
	2016	2017	2018	2019	2020	2021			2016	2017	2018	2019	2020	2021
Q1 Mar	2.35	2.38	2.45	2.25	2.17	2.29			-19%	1%	3%	-8%	-4%	5%
Q2 Jun	2.95	2.97	3.08	3.17	3.02	3.07			-23%	1%	4%	3%	-5%	1%
Q3 Sep	3.29	3.30	3.42	2.68	3.20	3.48			-1%	0%	4%	-22%	19%	9%
Q4 Dec	5.01	5.18	4.87	4.67	5.00	5.21			4%	3%	-6%	-4%	7%	4%
Year	13.59	13.80	13.81	12.80	13.30	14.23			-9%	2%	0%	-7%	4%	7%
Cal Yr	13.59	13.80	13.81	12.80	13.30	14.23			-9%	2%	0%	-7%	4%	7%

(Fiscal Period: Reported, Estimated)

3 Values Chart Growth Chart



Multiple	Last 4Q	Next 4Q	FY 19	FY 20	FY 21
P/E	10.37	10.29	10.51	10.11	9.45
P/S	1.55	1.51	1.55	1.49	1.46
P/B	6.63	3.81	6.28	5.11	4.42
P/CF	7.76	6.80	7.09	7.13	6.94
EV/Revenue	2.25	2.21	2.26	2.18	2.14
EV/EBITDA	9.87	9.09	9.66	9.10	8.58
EV/EBIT	16.38	12.16	14.10	12.02	11.33
EV/OPP	16.38	12.41	14.02	12.07	11.41
Dvd Yield	4.74	4.91	4.80	4.99	5.23

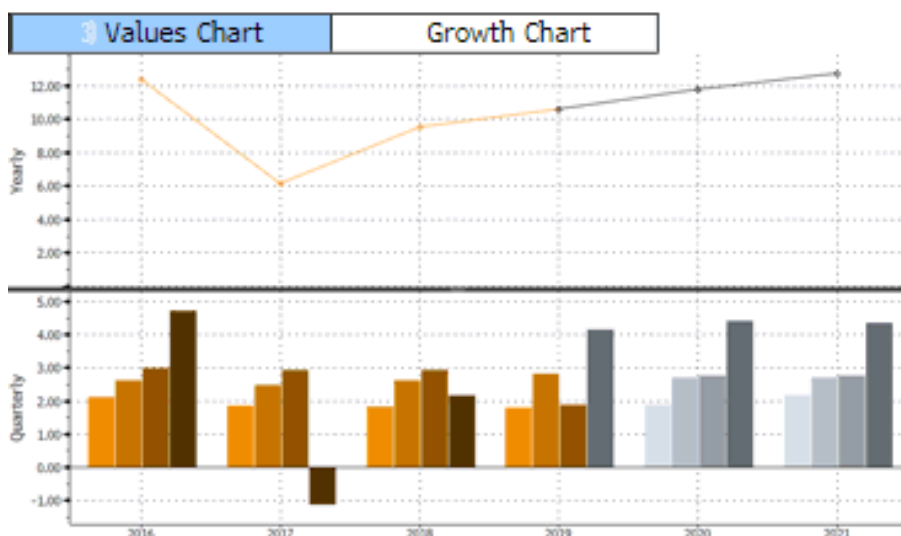
Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
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  On 13 Nov d Vol 3,060,924 0 135.39N H 135.58D L 133.845D Val 411.476M

IBM US Equity Export Settings Earnings Trends
 International Business Machines Corp Periodicity **Quarterly** Source **Standard** Currency **USD**

Measure	Diluted EPS						YoY % Growth					
	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
Q1 Mar	2.09	1.85	1.81	1.78	1.87	2.15	-11%	-11%	-2%	-2%	5%	15%
Q2 Jun	2.61	2.48	2.61	2.81	2.70	2.69	-25%	-5%	5%	8%	-4%	0%
Q3 Sep	2.98	2.92	2.94	1.87	2.75	2.76	-1%	-2%	1%	-36%	47%	0%
Q4 Dec	4.72	-1.14	2.17	4.15	4.42	4.34	3%	-124%	290%	91%	7%	-2%
Year	12.38	6.14	9.52	10.61	11.76	12.73	-8%	-50%	55%	11%	11%	8%
Cal Yr	12.38	6.14	9.52	10.61	11.76	12.73	-8%	-50%	55%	11%	11%	8%

(Fiscal Period: Reported, Estimated)



Multiple	Last 4Q	Next 4Q	FY 19	FY 20	FY 21
P/E	10.37	10.29	10.51	10.11	9.45
P/S	1.55	1.51	1.55	1.49	1.46
P/B	6.63	3.81	6.28	5.11	4.42
P/CF	7.76	6.80	7.09	7.13	6.94
EV/Revenue	2.25	2.21	2.26	2.18	2.14
EV/EBITDA	9.87	9.09	9.66	9.10	8.58
EV/EBIT	16.38	12.16	14.10	12.02	11.33
EV/OPP	16.38	12.41	14.02	12.07	11.41
Dvd Yield	4.74	4.91	4.80	4.99	5.23

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IBM US \$ C 151.57 +0.22 N151.58 / 151.59N 139x10
 On 08 Nov d Vol 4,634,439 0 151.60N H 151.7944D L 150.28D Val 701.063M

IBM US Equity 98) Report Page 1/5 Security Description: Equity

1) Profile 2) Issue Info 3) Ratios 4) Revenue & EPS 5) Industry Info

INTL BUSINESS MACHINES CORP

FIGI BBG000BLNNH6

Float Transparency

INTL BUSINESS MACHINES CORP (IBM US Equity)

Calculation of Float

Current Shares Outstanding - Stagnant Shares

Components	Position↓	% Out	Source	Date
- Float	871,056,273	94.088		
Shares Outstanding	925,791,378	100.000		
+ Stagnant Shares	54,735,105	5.912		

Close

Shrs Out/Float 925.8M/871.1M
 SI/% of Float 18.7M/2.15%
 Days to Cover 7.5

Beta vs SPX 1.02

2) Depository Receipts
 Active Receipts 4

Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
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Diluted Weighted Average Shares

IS_SH_FOR_DILUTED_EPS

958.714

Weighted average number of shares used to calculate Diluted EPS. Diluted shares is entered as disclosed even if reported EPS is anti-dilutive. The value is quoted in millions.

Malaysia:

Can be less than average number of shares for EPS due to calculation of the exercise of out-of-the-money stock options.

Available for all formats.

90) Definition

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Diluted EPS

AAPL.O ▼ **APPLE INC** 📱 Updated: 06-Dec-2023 17:17:11
Income Statement **INC**

United States | NASDAQ Global Select Consolidated | Phones & Handheld Devices

🕒 ▲ **192.61** USD -0.81 -0.4188 % Vol **13,585,901** **CAM 33** **CCR 95**

Overview | **News & Research** | **Price & Charts** | **Estimates** | **Financials** | **ESG** | **Event** | **Ownership** | **Debt & Credit** | **Peers & Valuation** | **D**

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INCOME STATEMENT 🔍 Consolidated Annual Standardized Update View Level 5 Show/Hide Levels

	2022	2021	2020	2019	2018	2017	2016
	SEP-2022	SEP-2021	SEP-2020	SEP-2019	SEP-2018	SEP-2017	SEP-2016
Currency	US Dollar						
Scaling	Thousands						
Number of Periods	Custom period range						
Start year	2013						
End year	2022						
Row/Text Size	Small						
Column Width	Extra Narrow						
Report Options	Statement Data						
Search by field							
Earnings Allocation Factor - Basic - Issue Specific, Crim...	-	-	-	-	-	-	-
Shares used to calculate Basic EPS - Issue Specific, ...	16,215,963	16,701,272	17,352,119	18,471,336	19,821,508	20,868,968	21,850,000
EPS - Basic - including Extraordinary Items Appli...	6.15	5.67	3.31	2.99	3	2.32	2.32
EPS - Basic - excluding Extraordinary Items Appli...	6.15	5.67	3.31	2.99	3.08	2.32	2.32
EPS - Basic - excluding Extraordinary Items - Nor...	6.15	5.67	3.31	2.99	3.08	2.32	2.32
EPS - Basic from Discontinued Operations & Extraordin...	0	0	0	0	-0.08	0	0
Comprehensive Earnings Per Share - Basic - Issue Spec...	5.46	5.7	3.31	3.14	2.85	2.28	2.28
Share/Per Share - Diluted							
Dilution Adjustment							
Net Income - Diluted - including Extraordinary Items Ap...	99,803,000	94,680,000	57,411,000	55,256,000	59,531,000	48,351,000	45,680,000
Diluted Income available to Common excluding Extr...	99,803,000	94,680,000	57,411,000	55,256,000	61,031,000	48,351,000	45,680,000
Shares used to calculate Diluted EPS - Total	16,325,819	16,864,919	17,528,214	18,595,652	20,000,436	21,006,768	22,000,000
EPS - Diluted - including Extraordinary Items Ap...	6.11	5.61	3.28	2.97	2.98	2.3	2.3
EPS - Diluted - excluding Extraordinary Items Ap...	6.11	5.61	3.28	2.97	3.05	2.3	2.3
EPS - Diluted - excluding Extraordinary Items - N...	6.11	5.61	3.28	2.97	3.05	2.3	2.3
Allocated Diluted Net Income including Extraordinary It...	99,803,000	94,680,000	57,411,000	55,256,000	59,531,000	48,351,000	45,680,000

Diluted EPS

EXAMPLE 2 Basic versus Diluted EPS

For the fiscal year ended 31 December 2012, WPP Group PLC (London: WPP) reported basic EPS of £66.2 and diluted EPS of £62.8. Based on a closing stock price of £1058.0 on 1 February 2013, the day on which the company issued its earnings press release, WPP's trailing P/E is $\frac{1058.0}{66.2} \approx 16.0$ if basic EPS is used and $\frac{1058.0}{62.8} \approx 16.8$ if diluted EPS is used.

Example: Underlying Earnings

Reported EPS from previous four quarters	\$4.00
Restructuring charges	\$0.10
Amortization of intangibles	\$0.15
Impairment charge	\$0.20
Stock price	\$50.00

Example: Underlying Earnings

P/E based on reported earnings = $\$50 / \$4.00 = 12.5$

Reported core earnings = $\$4.00 + \$0.10 + \$0.15 + \$0.20 = \$4.45$

P/E based on reported core earnings = $\$50 / \$4.45 = 11.2$

Underlying earnings = $\$4.00 + \$0.20 = \$4.20$

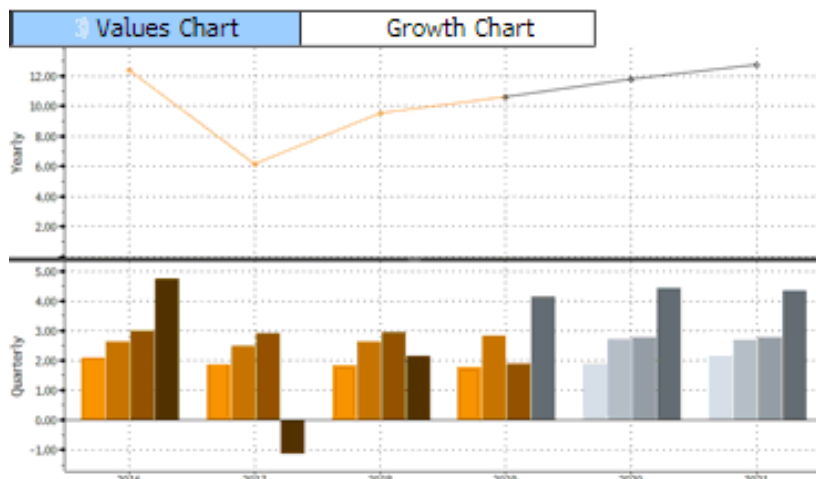
P/E based on underlying earnings = $\$50 / \$4.20 = 11.9$

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IBM US Equity Export Settings Earnings Trends
 International Business Machines Corp Periodicity Source Currency

Measure	EPS, GAAP						<	>	YoY % Growth						PoP % Growth				
	2016	2017	2018	2019	2020	2021			2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020
Q1 Mar	2.09	1.85	1.81	1.78	1.87	2.15			-14%	-11%	-2%	-2%	5%	15%					
Q2 Jun	2.62	2.48	2.61	2.81	2.70	2.69			-27%	-5%	5%	8%	-4%	0%					
Q3 Sep	2.98	2.92	2.94	1.87	2.75	2.76			-1%	-2%	1%	-36%	47%	0%					
Q4 Dec	4.73	-1.14	2.15	4.15	4.42	4.34			3%	-124%	289%	93%	7%	-2%					
Year	12.39	6.14	9.51	10.61	11.76	12.73			-9%	-50%	55%	12%	11%	8%					
Cal Yr	12.39	6.14	9.51	10.61	11.76	12.73			-9%	-50%	55%	12%	11%	8%					

(Fiscal Period: Reported, Estimated)



Multiple	Last 4Q	Next 4Q	FY 19	FY 20	FY 21
P/E	10.37	10.29	10.51	10.11	9.45
P/S	1.55	1.51	1.55	1.49	1.46
P/B	6.63	3.81	6.28	5.11	4.42
P/CF	7.76	6.80	7.09	7.13	6.94
EV/Revenue	2.25	2.21	2.26	2.18	2.14
EV/EBITDA	9.87	9.09	9.66	9.10	8.58
EV/EBIT	16.38	12.16	14.10	12.02	11.33
EV/OPP	16.38	12.41	14.02	12.07	11.41
Dvd Yield	4.74	4.91	4.80	4.99	5.23

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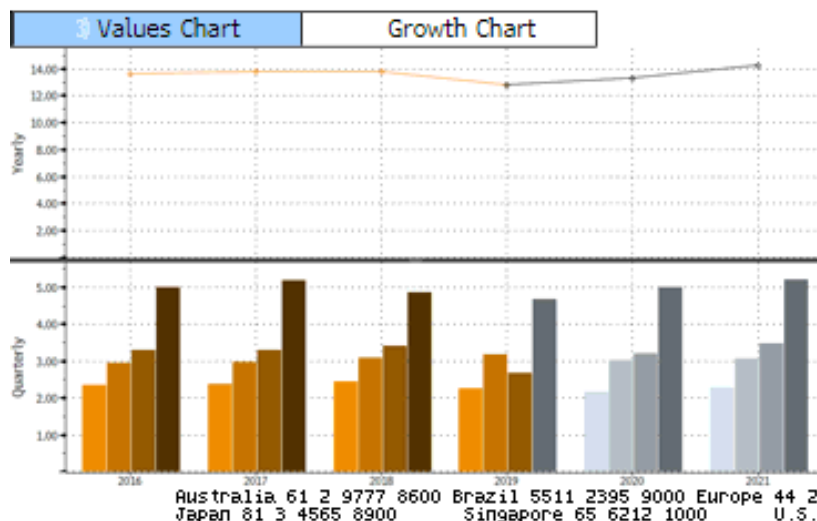
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 International Business Machines Corp Periodicity Source Currency

Measure	EPS, Adj+						<	>	YoY % Growth				PoP % Growth	
	2016	2017	2018	2019	2020	2021			2016	2017	2018	2019	2020	2021
Q1 Mar	2.35	2.38	2.45	2.25	2.17	2.29	Q1 Mar	-19%	1%	3%	-8%	-4%	5%	
Q2 Jun	2.95	2.97	3.08	3.17	3.02	3.07	Q2 Jun	-23%	1%	4%	3%	-5%	1%	
Q3 Sep	3.29	3.30	3.42	2.68	3.20	3.48	Q3 Sep	-1%	0%	4%	-22%	19%	9%	
Q4 Dec	5.01	5.18	4.87	4.67	5.00	5.21	Q4 Dec	4%	3%	-6%	-4%	7%	4%	
Year	13.59	13.80	13.81	12.80	13.30	14.23	Year	-9%	2%	0%	-7%	4%	7%	
Cal Yr	13.59	13.80	13.81	12.80	13.30	14.23	Cal Yr	-9%	2%	0%	-7%	4%	7%	

(Fiscal Period: Reported, Estimated)



Multiple	Last 4Q	Next 4Q	FY 19	FY 20	FY 21
P/E	10.37	10.29	10.51	10.11	9.45
P/S	1.55	1.51	1.55	1.49	1.46
P/B	6.63	3.81	6.28	5.11	4.42
P/CF	7.76	6.80	7.09	7.13	6.94
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EV/EBITDA	9.87	9.09	9.66	9.10	8.58
EV/EBIT	16.38	12.16	14.10	12.02	11.33
EV/OPP	16.38	12.41	14.02	12.07	11.41
Dvd Yield	4.74	4.91	4.80	4.99	5.23

Example: Normalized Earnings

Year	EPS	BVPS	ROE
2015	\$0.66	\$4.11	16.1%
2014	\$0.55	\$3.67	15.0%
2013	\$0.81	\$2.98	27.2%
2012	\$0.73	\$2.12	34.4%
2011	\$0.34	\$1.61	21.1%

2016 stock price

\$24.00

Example: Normalized Earnings

1) Method of historical average EPS

$$\text{Average (normalized) EPS} = \frac{(\$0.66 + \$0.55 + \$0.81 + \$0.73 + \$0.34)}{5} = \$0.618$$

$$\text{P/E} = \$24.00 / \$0.618 = 38.8$$

Example: Normalized Earnings

2) Method of average ROE

$$\text{Average ROE} = \frac{(16.1\% + 15.0\% + 27.2\% + 34.4\% + 21.1\%)}{5} = 22.8\%$$

$$\begin{aligned} \text{Average (normalized) EPS} &= \text{Average ROE} \times \text{Current equity book value per share} \\ \text{Average (normalized) EPS} &= 22.8\% \times \$4.11 = \$0.937 \end{aligned}$$

$$P / E = \$24.00 / \$0.937 = 25.6$$

Stock price \$18.21

EXHIBIT 1 Taiwan Semiconductor Manufacturing Company (Currency in US Dollars)

Measure	2006	2007	2008	2009	2010	2011	2012
EPS (ADR)	\$0.74	\$0.63	\$0.61	\$0.54	\$1.07	\$0.88	\$1.08
BVPS (ADR)	\$3.00	\$2.93	\$2.85	\$2.99	\$3.80	\$4.03	\$4.82
ROE	24.7%	21.5%	21.4%	18.1%	28.2%	21.8%	22.4%

Source: The Value Line Investment Survey.

Using the data in Exhibit 1:

1. Calculate a normalized EPS for TSM by the method of historical average EPS and then calculate the P/E based on that estimate of normalized EPS.
2. Calculate a normalized EPS for TSM by the method of average ROE and the P/E based on that estimate of normalized EPS.
3. Explain the source of the differences in the normalized EPS calculated by the two methods, and contrast the impact on the estimate of a normalized P/E.

Justified Forward P/E from Fundamentals

$$V_0 = \frac{D_1}{r - g}$$

$$\frac{P_0}{E_1} = \frac{D_1 / E_1}{r - g}$$

$$\frac{P_0}{E_1} = \frac{1 - b}{r - g}$$

Justified Trailing P/E from Fundamentals

$$V_0 = \frac{D_0(1+g)}{r-g}$$

$$\frac{P_0}{E_0} = \frac{D_0(1+g)/E_0}{r-g}$$

$$\frac{P_0}{E_0} = \frac{(1-b)(1+g)}{r-g}$$

Method of Comparables

Benchmark Value of the
Multiple Choices

Industry
peers

Industry
or sector
index

Broad
market
index

Firm's
historical
values

Comp Source **BICS Best Fit (Algo)** ▾Region **Global** ▾Mkt Cap > **5B**Curr **USD** ▾

vs Comps

Group Dynamics

vs Self

						3M	6M	1Yr	2Yr	5Yr
Current vs 5Yr Average Historical Multiple						5Yr Historical Multiple Range			Implied @ Hist Avg	
Metric	Current	Hist Avg	Diff	# SD	3M Trend	Low	Range	High	Hist Avg	Price (USD)
Current Price										151.57
							● Current ◆ Hist Avg			
● BF P/E	10.9x	10.6x	2%	0.3		8.6x		13.1x	10.6x	147.95
● BF EV/EBITDA	8.8x	8.5x	3%	0.5		7.3x		10.6x	8.5x	145.20
● BF EV/EBIT	12.0x	10.5x	14%	1.3		8.8x		13.6x	10.5x	127.86
● BF EV/Rev	2.2x	2.3x	-1%	-0.3		1.9x		2.6x	2.3x	154.27
● LF P/BV	7.1x	10.3x	-31%	-1.9		7.0x		14.1x	10.3x	219.22

Blended Forward P/E



Australia 61 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000

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IBM US \$ Market  P150.05 / 151.11P 2x1
 Prev 151.57 Vol 57 ExDiv

IBM US Equity Export to Excel Settings Equity Relative Valuation

Comp Source BICS Best Fit (Algo) Region Global Mkt Cap > 5B Curr USD

vs Comps Group Dynamics vs Self

Analysis of IBM US Multiples - Premium to Comps

Metric	Current vs 5Yr Average Historical Premium					5Yr Historical Premium Range			Implied @ Hist Avg	
	Current	Hist Avg	Diff	# SD	3M Trend	Low	Range	High	Multiple	Price (USD)
Current Price										151.57
1) BF P/E	-41%	-36%	-5%	-0.7		-47%		-18%	11.8x	164.76
12) BF EV/EBITDA	-3%	3%	-7%	-0.8		-12%		24%	9.4x	165.04
13) BF EV/EBIT	-12%	-8%	-3%	-0.5		-23%		9%	12.4x	158.31
14) BF EV/Rev	-6%	5%	-11%	-1.3		-9%		26%	2.5x	174.23
15) LF P/BV	112%	166%	-53%	-2.1		108%		217%	9.0x	189.75

9) View All Comps Below

Summary of Current Multiples

Name	2Y Corr	Mkt Cap (USD)	BF P/E	BF EV/EBITDA	BF EV/EBIT	BF EV/Rev	LF P/BV
1) International Business Machine		140.32B	10.9x	8.8x	12.0x	2.2x	7.1x
Current Premium to Comps Mean			-41%	-3%	-12%	-6%	112%
Mean (Including IBM US)		45.23B	18.6x	9.1x	13.5x	2.4x	3.4x
2) CDW Corp/DE	0.40	10.39B	15.9x	11.0x	11.9x	0.9x	12.9x
3) Oracle Corp	0.34	210.91B	16.5x	10.2x	11.0x	4.9x	3.8x
4) Iron Mountain Inc	0.28	10.88B	31.9x	13.2x	22.0x	4.5x	5.8x
5) Unisplendour Corp Ltd	0.21	10.50B	42.3x	--	--	1.7x	2.8x

Grey values are excluded from group stats.

10) Analyze List

Method of Comparables

Using Peer Company Multiples

- Law of one price
- Risk and earnings growth adjustments
- PEG limitations:
 - Assumes linear relationship
 - Does not account for risk
 - Does not account for growth duration

Example: Method of Comparables

Using P/E and PEG

Values for subject firm

Five-year EPS growth rate	8.0%
Consensus EPS forecast	\$4.50
Current stock price	\$28.00

Values for peer group

Median P/E	9.00
Median PEG	1.60

Example: Method of Comparables Using P/E and PEG

$$\text{P/E} = \$28.00 / \$4.50 = 6.2$$

$$\text{PEG} = 6.2 / 8.0 = 0.78$$

$$\text{Intrinsic value} = 9.0 \times \$4.50 = \$40.50$$

EXAMPLE 12 Valuation Relative to the Market

You are analyzing three large-cap US stock issues with approximately equal earnings growth prospects and risk. As one step in your analysis, you have decided to check valuations relative to the S&P 500 Composite Index. Exhibit 7 provides the data.

EXHIBIT 7 Comparison with an Index Multiple (Prices and EPS in US Dollars; as of 31 March 2013)

Measure	Stock A	Stock B	Stock C	S&P 500
Current price	23	50	80	1569.19
P/E	12.5	25.5	12.5	17.9
Five-year average P/E (as percent of S&P 500 P/E)	80	120	105	

Based only on the data in Exhibit 7, address the following:

1. Explain which stock appears relatively undervalued when compared with the S&P 500.
2. State the assumption underlying the use of five-year average P/E comparisons.

EXAMPLE 15 Valuation Relative to Own Historical P/Es

As of mid-September 2013, you are valuing Honda Motor Company (TSE: 7267; NYSE ADR: HMC), among the market leaders in Japan's auto manufacturing industry. You are applying the method of comparables using HMC's five-year average P/E as the benchmark value of the multiple. Exhibit 8 presents the data.

EXHIBIT 8 Historical P/Es for HMC

2012	2011	2010	2009	2008	Mean	Median
15.8	23.1	10.0	19.8	35.8	20.9	19.8

Sources: *The Value Line Investment Survey* for average annual P/Es; calculations for mean and median P/Es.

1. State a benchmark value for Honda's P/E.
2. Given EPS for fiscal year 2013 (ended 31 March) of ¥203.71, calculate and interpret a justified price for Honda.
3. Compare the justified price with the stock's recent price of ¥3,815.

Price-to-Book Value Multiple Rationales

Book Value Is Usually Positive

More Stable than EPS

Appropriate for Financial Firms

Appropriate for Firms that Will Terminate

Can Explain Stock Returns

Justified P/B

$$\frac{P_0}{B_0} = \frac{\text{ROE} - g}{r - g}$$

$$\frac{P_0}{B_0} = 1 + \frac{\text{PV}(\text{Expected future residual earnings})}{B_0}$$

Justified P/S

$$\frac{P_0}{S_0} = \frac{(E_0/S_0)(1-b)(1+g)}{r-g}$$

$$g = b \times \text{ROE}$$

$$g = b \times \text{PM}_0 \times \left(\frac{\text{Sales}}{\text{Total assets}} \right) \times \left(\frac{\text{Total assets}}{\text{Shareholders' equity}} \right)$$

Example: Calculating the Actual and Justified P/E, P/B, and P/S

Stock price	\$50.00
EPS	\$2.00
Dividends per share	\$1.20
Book value of equity per share	\$6.25
Sales per share	\$15.00
ROE	22.5%
Required return on stock	12.0%

Example: Calculating the Actual P/E, P/B, and P/S

$$\text{Actual } \frac{P_0}{E_0} = \frac{\$50}{\$2} = 25.0$$

$$\text{Actual } \frac{P_0}{B_0} = \frac{\$50}{\$6.25} = 8.0$$

$$\text{Actual } \frac{P_0}{S_0} = \frac{\$50}{\$15} = 3.3$$

Example: Calculating the Inputs for the Justified P/E, P/B, and P/S

$$\text{Dividend payout ratio} = \$1.20 / \$2.00 = 0.60$$

$$\text{Retention ratio } (b) = 1 - 0.60 = 0.40$$

$$\text{Growth rate in dividends } (g) = 0.40 \times 22.5\% = 9.0\%$$

Example: Calculating the Justified P/E, P/B, and P/S

$$\frac{P_0}{E_0} = \frac{(1-b)(1+g)}{r-g} = \frac{(1-0.60)(1+0.09)}{0.12-0.09} = 21.8$$

$$\frac{P_0}{B_0} = \frac{\text{ROE} - g}{r-g} = \frac{0.225 - 0.09}{0.12 - 0.09} = 4.5$$

$$\frac{P_0}{S_0} = \frac{(E_0/S_0)(1-b)(1+g)}{r-g} = \frac{(\$2/\$15)(0.6)(1.09)}{0.12-0.09} = 2.9$$

Inverse Price Ratios

EXHIBIT 3 Summary of Price and Inverse Price Ratios

Price Ratio	Inverse Price Ratio	Comments
Price-to-earnings (P/E)	Earnings yield (E/P)	Both forms commonly used.
Price-to-book (P/B)	Book-to-market (B/P)*	Book value is less commonly negative than EPS. Book-to-market is favored in research but not common in practitioner usage.
Price-to-sales (P/S)	Sales-to-price (S/P)	S/P is rarely used except when all other ratios are being stated in the form of inverse price ratios; sales is not zero or negative in practice for going concerns.
Price-to-cash flow (P/CF)	Cash flow yield (CF/P)	Both forms are commonly used.
Price-to-dividends (P/D)	Dividend yield (D/P)	Dividend yield is much more commonly used because P/D is not calculable for non-dividend-paying stocks, but both D/P and P/D are used in discussing index valuation.

* “Book-to-*market*” is probably more common usage than “book-to-*price*.” Book-to-market is variously abbreviated B/M, BV/MV (for “book value” and “market value”), or B/P.

Issues in Using Enterprise Value Multiples

$EV = \text{Market value of stock} + \text{Debt} - \text{Cash} - \text{Investments (marketable securities)}$

Justified EV/EBITDA

- Positively related to FCFF growth
- Positively related to ROIC
- Negatively related to WACC

Comparables May Use Total Invested Capital

Other EV Multiples

- EV/FCFF
- EV/EBITA
- EV/EBIT
- EV/S

Cross-Country Comparisons

US GAAP vs. IFRS

- Net income higher under IFRS
- Shareholder's equity lower under IFRS
- ROE higher under IFRS

Valuation Multiples

- P/CFO and P/FCFE most comparable
- P/B, P/E, and EBITDA multiples least comparable

Inflation

- Higher inflation → Lower justified price multiples
- Higher pass-through rates → Higher justified price multiples