



Biogen

Biogen (NASDAQ:BIIB)

Anthony Sebanc | Mackenzie Sesto | Matthew Lebre

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Business Overview

- **Biogen Inc. (NASDAQ: BIIB)** is a biopharmaceutical company which focuses on discovering, developing, manufacturing and delivering therapies to people living with serious neurological, rare and autoimmune diseases.
- The Company markets products, including TECFIDERA, AVONEX, PLEGRIDY, TYSABRI, ZINBRYTA and FAMPYRA for multiple sclerosis (MS), FUMADERM for the treatment of severe plaque psoriasis and SPINRAZA for the treatment of spinal muscular atrophy (SMA).
- The Company's product candidates includes OCREVUS; Biosimilar adalimumab; Aducanumab; E2609; BIIB074; BAN2401; Opicinumab; CIRARA; BIIB061; BIIB054; BIIB067, and BIIB068.

Management Team



Michel Vounatsos
Chief Executive Officer

Prior to joining Biogen, Mr. Vounatsos spent 20 years at Merck & Co., Inc., a pharmaceutical company, where he most recently served as President, Primary Care Business Line and Merck Customer Centricity.



Michael McDonnell
Executive Vice President
Chief Financial Officer

Prior to joining Biogen in 2015, Mr. McDonnell, served for seven years as CFO at Intelsat, a leading global satellite service provider. Before that, he was CFO at both MCG Capital Corporation and EchoStar Communications (DishNetwork). Earlier in his career, he was a partner at PricewaterhouseCoopers



Alphonse Galdes, Ph.D.
Executive Vice President
Operations and Technology

Since joining Biogen in 1995, Dr. Galdes has held several senior executive positions, including most recently as Senior Vice President, Asset Development and Portfolio Management from November 2015 to September 2019

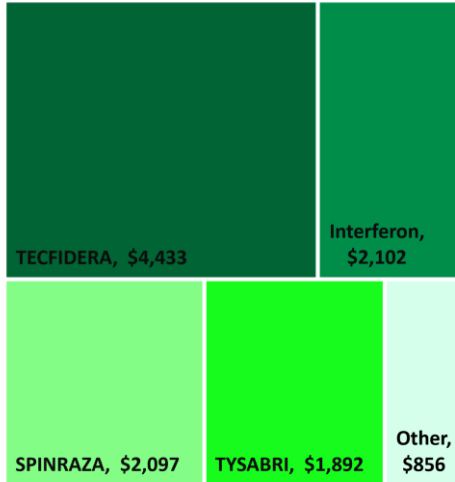
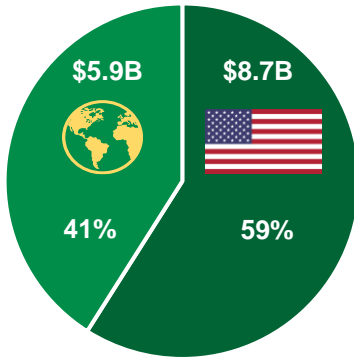


Alfred W. Sandrock, Jr., M.D., Ph.D.
Executive Vice President
Research & Development

Since joining the company in 1998, Alfred has held several senior executive positions, including Senior Vice President of Development Sciences, Senior Vice President of Neurology Research and Development, and Vice President of Clinical Development, Neurology.

Revenue Breakdown (FY19)

Total Revenue: \$11.38B



Treatments



Multiple Sclerosis (MS): Main product lines for MS are TECFIDERA, and Interferon. MS affects roughly 303/100k people in the US. ⁽¹⁾

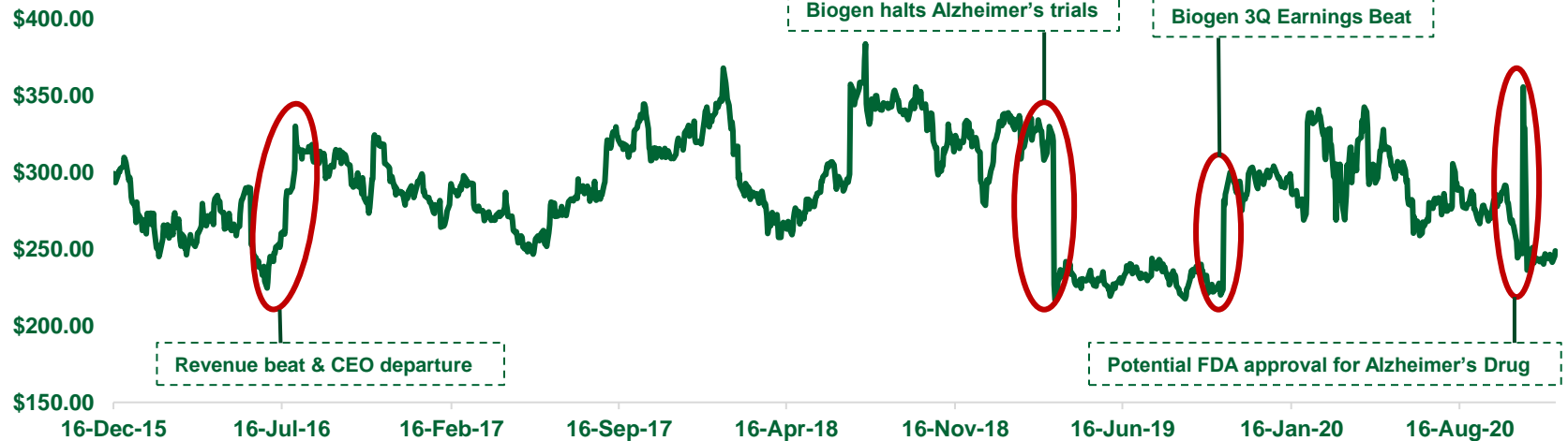


Spinal Muscular Atrophy: Biogen's only treatment for Spinal Muscular Atrophy is SPINRAZA, affects 1/8000 people worldwide. ⁽²⁾



Biosimilar & Other: Biosimilar drugs are similar versions of biologic medicines, and are used for anemia, diabetes, psoriasis, etc.

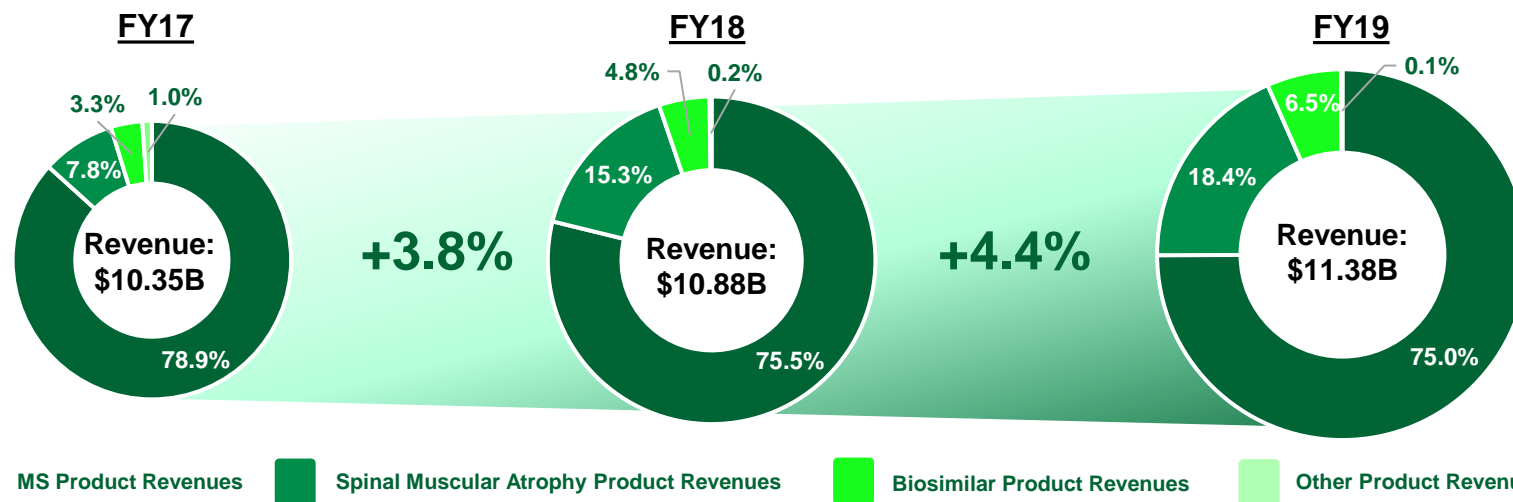
5-Year Historic Stock Performance



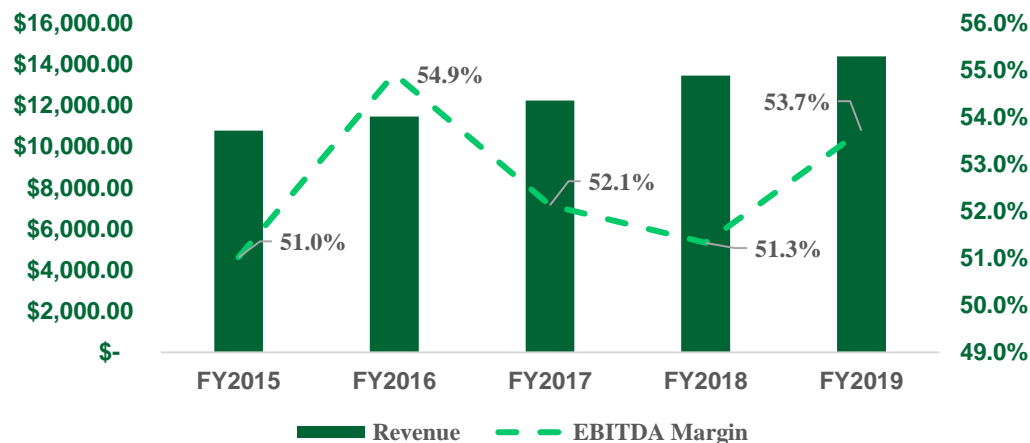
Source: Capital IQ, Company material, Wall Street Research

4 (1) National Multiple Sclerosis Society
(2) Medline Plus

Revenue Growth & Product Breakdown



Revenue & Margins



Liquidity (FY19)

Cash	\$2.91B
Total Debt	\$5.95B
Net Debt	\$3.04B
Liquidity ⁽¹⁾	\$4.78B
Leverage ⁽²⁾	0.77x

5 Source: Capital IQ, Company material, Market data. Wall Street Research

(1) Cash & equivalents + Short-Term Investments

(2) Total Debt / FY19 EBITDA

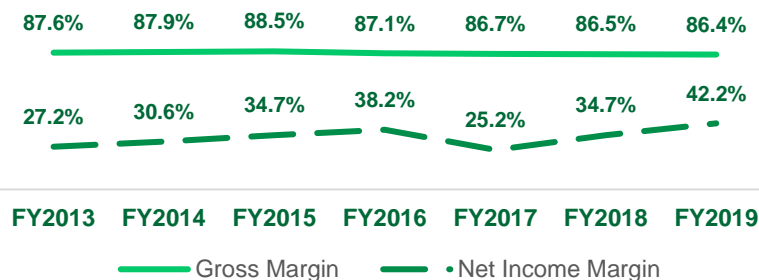
Accessing a New Market: Aducanumab Alzheimer's Treatment

- A new treatable market for Biogen:
 - Potential annual Aducanumab sales of \$4.1-10 billion by 2028
 - Current TAM of \$9.9 billion (US market) growing at a CAGR of 10.9% through 2023
- Touted as the “most prominent biotech event in 2021”
- SVB Leerink pegs a 70% chance of approval, UBS states rejection is priced in
- FDA rejects council advice in 20% of reviews and approval rates have doubled in the 2010's vs. 2000's
- The Alzheimer's Association has submitted a formal approval request to the FDA

Date	Key Development
03/07/2021	FDA deadline to approve or reject application
11/06/2020	FDA council rejects effectiveness: 1 yes, 8 no, 2 uncertain
11/04/2020	FDA notes support for the safety of the drug
08/07/2020	FDA accepts license and priority review
07/08/2020	BIIB submits license application to FDA

Strong Margins Propelling Reinvestment and R&D

- Biogen has sustained gross margins at above 86%.
- Net income margin has significantly improved since FY17 to 42.2% in FY19.
- Biogen's strong operating leverage positions the company well to capitalize on future growth.



Discount on a Relative Basis

- Biogen has a high relative value when compared to other companies in Pharmaceutical Manufacturing and R&D Biotechnology
- The EPS as well as EV/EBITDA and Revenue CAGR for Biogen are all higher compared to its peers within the industry

	EPS	EV/Revenue	EV/EBITDA	Revenue CAGR	WACC
Comparable Average	13.67	4.5x	9.5x	6.4%	4.2%
Biogen	25.28	3.7x	7.9x	12.6%	6.9%

Source: Alzheimer's Association, Benzinga, Company material, Decision Resources Group, FDA, Pharma's Almanac, UBS, Market Data

Healthcare Overview

- The Healthcare industry is a sector that provides good and services to treat patients with curative, preventive, rehabilitative, or palliative care.
- The Biotechnology industry in the US is the 7th ranked Healthcare industry by market size and the 103rd largest in the US
- **Segments:**
 1. Healthcare Services and Facilities
 2. Medical Equipment Manufacturing
 3. Medical Insurance and managed care
 4. Pharmaceuticals and related segments

Healthcare Services & Facilities

Medical Equipment Manufacturing

Medical Insurance and Managed Care

Pharmaceuticals and related segments

Key Players

Trends



Collaborations in R&D– R&D activities are extensively distributed, with firms coordinating and integrating with each other



Computation Technology– The emergence of advanced computing enables companies to expand the scale of their research and improve efficiency in the manufacturing process



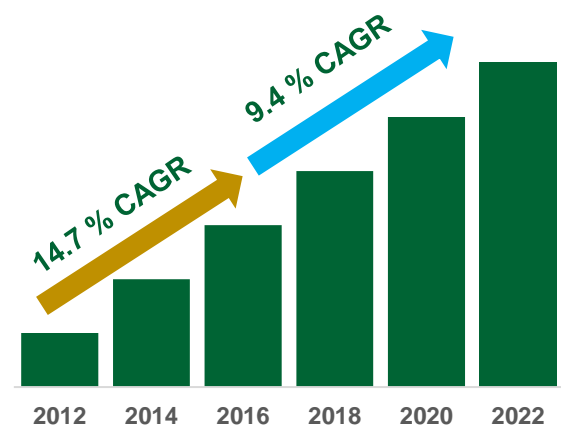
Personalised Treatment– The dramatically reduced cost of genetic sequencing has enabled the development of personalised treatment plans and targeted therapies




Industry Performance and Outlook

Growth:

- Global Biotechnology market is expected to surpass 775 billion USD by 2024
- US Biotechnology industry grew at a 14.7% CAGR from 2013-2017 and is projected to grow at 9.4% CAGR from 2017 to 2022.

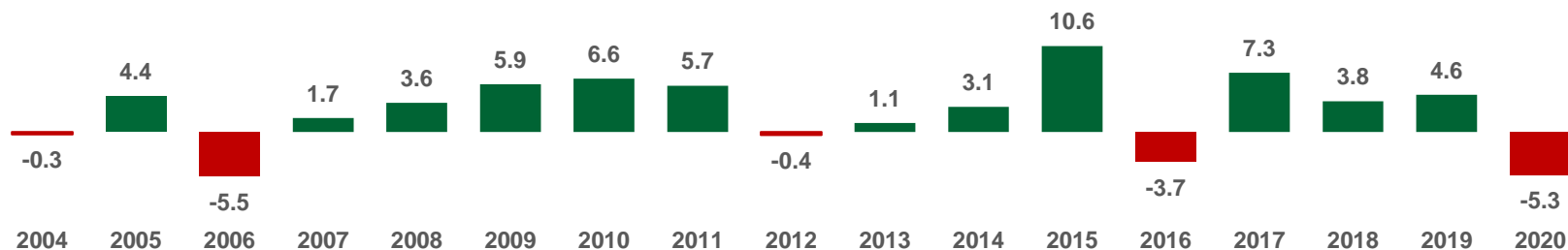
Industry Value (\$ Billions USD)



Competitor	Segment	Distribution	Analysis
	<ul style="list-style-type: none"> Healthcare Services and Facilities Pharmaceuticals and Related segments 	<ul style="list-style-type: none"> Wholesalers, Group Purchasing Organizations, Pharmacy Chains & Banners 	<ul style="list-style-type: none"> ⊕ Strong distribution network that can reach potential market, High return on capital expenditure ⊖ R&D below growing industry players, Lackluster demand forecasting leading higher inventory levels
	<ul style="list-style-type: none"> Healthcare Services and Facilities Pharmaceuticals and Related segments Medical Equipment Manufacturing Medical Insurance and Managed care 	<ul style="list-style-type: none"> Retailers, Pharmacies, Hospitals, Clinics/Points of administration 	<ul style="list-style-type: none"> ⊕ Highly successful go to market strategies for products, successful integration of complimentary firms through M&A activities ⊖ High attrition rate in work force, higher than industry avg. Profitability ratio below industry
	<ul style="list-style-type: none"> Healthcare Services and Facilities Medical Equipment Manufacturing Medical Insurance and managed care Pharmaceuticals and related segments 	<ul style="list-style-type: none"> Pharmacies, Hospitals, Wholesalers 	<ul style="list-style-type: none"> ⊕ Strong distribution network that can reach majority of potential market. Strong dealer community ⊖ Limited success outside core business. High attrition rate

R&D Spending

U.S. Research and Development Spending (Annual Change %)



- Total R&D spending is tied to revenue and as a result moves closely with the overall economy.
- It is estimated to have grown about 4% each year between 2013 and 2019
- R&D expenditure is expected to decline 5.3% due in 2020 due to the worst recession in nearly a century with a high rebound expected in 2021

Aging Population

- Most baby boomers are crossing the threshold into senior adulthood, causing a growth of 3.2% in the 65+ demographic since 2015
- A greater life expectancy has increased the incidence of age-related illnesses and has increased the demand of age-related illnesses
- This translates into higher demand for biotechnology as the public sector will seek to reduce cost of treatment by using more-effective drugs, as well as curative and preventive treatments developed by the industry

Investor Uncertainty

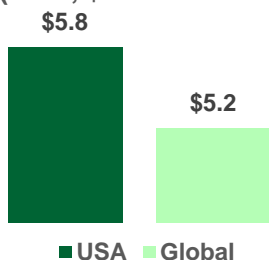
- Investor uncertainty rises during recessions since investors are usually risk-averse and fear the effects of any economic downturn
- 2020 has seen a steep increase in investor uncertainty as COVID-19 has spread globally, with every advanced economy in the world expected to see GDP decline in 2020
- May still remain at heightened levels, especially if a vaccine for COVID-19 is not efficient in reviving the economy and long-term economic damage from 2020 isn't realized

Catalysts & Risks

Internal Catalysts

- Introduction of **SB11** (Lucentis) and **SB15** (Eylea) biosimilars in 2019
- **Aducanamab** (Alzheimer's treatment) in New Drug Application Phase

Lucentis, Eylea Sales (2018, \$USD Billions)



Alzheimer's Treatment TAM (\$USD Billions)



External Environment

External Risks

Regulatory Price Caps in US and Europe

Declining Institutional Holders

External Catalysts

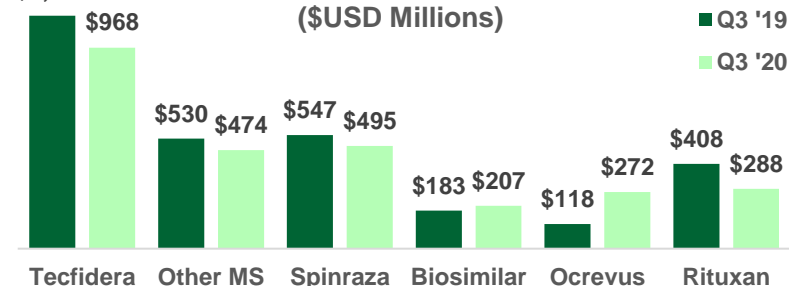
Can Meet Industry 4.0 Requirements

Global Biosimilar Production Boom

Internal Risks

- Loss of **Tecfidera** (MS drug) patent protection
- Declining portfolio performance due to loss of patents and the introduction of competitors' biosimilars

Product Revenues (\$USD Millions)



Summary

Revenue Protection

- Biosimilar market is expected to grow at a CAGR of 46.2% from 2020-2027
- Stronger brand and partnerships (i.e. Samsung Bioepis) to compete with Asian competitors in the biosimilar market
- Aducanumab, SB11, SB15 and future biosimilar products will bring additional and steady revenue, thus mitigating internal drug portfolio patent risks
- Production of biosimilars will help maintain market position and mitigate future regulatory price caps

DCF Valuation

Base Case Output

Gordon Growth Method	
PV of Forecast Period	24,365
% of Enterprise Value	27.9%
Terminal Value	
Terminal Year UFCF	5,899
Perpetuity Growth Rate	0.5%
Terminal Value	88,291
PV of Terminal Value	63,104
% of Enterprise Value	72.1%
Enterprise Value	87,469
Less: Net Debt	(8,393)
Add: Cash	4,476
Equity Value	83,552
Fully Diluted Shares Outstanding	187
Implied Share Price	\$445.85
Current Share Price	\$247.75
Implied Margin of Safety	80.0%
Implied Cashflow Yield ⁽¹⁾	12.92%
Implied EBITDA Yield ⁽²⁾	17.36%

Terminal Multiple Method	
Cumulative PV of Free Cash Flow	24,365
% of Enterprise Value	41.3%
Terminal Value	
Terminal Year EBITDA	8,090
EBITDA Multiple	6.0x
Terminal Value	48,542
PV of Terminal Value	34,695
% of Enterprise Value	58.7%
Enterprise Value	59,059
Less: Net Debt	(8,393)
Add: Cash	4,476
Equity Value	55,142
Fully Diluted Shares Outstanding	187
Implied Share Price	\$294.25
Current Share Price	\$247.75
Implied Margin of Safety	18.8%
Implied IRR Cashflow Yield ⁽¹⁾	12.92%
Implied Earnings Yield ⁽²⁾	17.36%

Sensitivity Analysis

Terminal Growth Share Price Sensitivity (\$)

Terminal Growth	WACC	WACC				
		6.7%	6.8%	6.9%	7.0%	7.1%
0.3%		451.08	444.17	437.47	430.95	424.63
0.4%		455.51	448.45	441.61	434.96	428.51
0.5%		460.05	452.84	445.85	439.06	432.47
0.6%		464.70	457.33	450.19	443.26	436.54
0.7%		469.47	461.94	454.64	447.56	440.70

Exit Multiple Share Price Sensitivity (\$)

Exit Multiple	WACC	WACC				
		6.7%	6.8%	6.9%	7.0%	7.1%
5.5x		280.99	279.90	278.82	277.75	276.67
5.8x		288.78	287.65	286.54	285.42	284.32
6.0x		296.56	295.40	294.25	293.10	291.96
6.3x		304.35	303.15	301.96	300.78	299.60
6.5x		312.14	310.90	309.68	308.46	307.24

11 (1) Based on UFCF for 2020E
(2) Based on EBITDA for 2020E

Comparable Companies Valuation Summary

Universe of Comparable Companies

Company	Market Cap.	EV	Cash & S-t Inv.	Revenue NTM	EBITDA NTM	Price Per Share	EPS NTM	EV/Revenue NTM	EV/EBITDA NTM	P/E NTM	After Tax NI CAGR 3-Yr Hist.	Revenue CAGR 3-Yr Hist.	EBITDA Margin (%)	WACC
<u>Pharmaceutical Manufacturing</u>														
Sanofi SA	116,537	126,831	15,393	46,095	14,670	\$ 92.57	7.65	2.8x	8.7x	12.1x	(17.1%)	9.7%	28.7%	2.6%
Novartis AG	221,793	249,168	11,234	52,468	19,373	\$ 89.90	6.40	4.7x	12.9x	14.0x	2.7%	0.6%	32.5%	7.5%
Teva Pharmaceutical	11,249	36,042	11,045	16,747	5,072	\$ 10.26	2.67	2.2x	7.1x	3.8x	(17.2%)	3.8%	26.5%	5.4%
Bayer AG	56,218	89,099	10,450	50,812	13,994	\$ 57.22	7.63	1.8x	6.5x	7.5x	28.7%	8.3%	28.5%	5.2%
Vertex Pharmaceuticals Inc	59,322	53,718	9,830	6,954	4,013	\$ 228.13	11.52	7.7x	13.4x	19.8x	31.2%	2.1%	31.4%	5.6%
Abbvie Inc	183,962	263,090	6,178	53,750	28,354	\$ 104.20	12.17	4.9x	9.3x	8.6x	(19.6%)	2.4%	46.8%	4.4%
Bristol-Myers Squibb	135,517	159,383	4,476	45,927	21,855	\$ 59.97	7.46	3.5x	7.3x	8.0x	8.7%	13.6%	36.7%	4.0%
Merck & Co Inc	203,212	224,681	3,808	51,645	21,953	\$ 80.32	6.36	4.4x	10.2x	12.6x		31.9%	36.4%	3.4%
Pfizer Inc	218,006	270,891	1,975	51,977	22,578	\$ 39.21	3.00	5.2x	12.0x	13.1x		(12.1%)	43.3%	4.2%
<u>Research & Development in Biotechnology</u>														
Amgen Inc	133,584	155,511	8,911	26,370	14,853	\$ 229.46	17.01	5.9x	10.5x	13.5x	(0.0%)	8.0%	51.1%	4.7%
Gilead Sciences Inc	75,011	80,352	24,352	23,659	12,233	\$ 59.84	6.60	3.4x	6.6x	9.1x	(18.6%)	(7.7%)	26.1%	3.5%
Regeneron Pharmaceuticals Inc	53,394	53,063	3,214	10,260	4,769	\$ 500.38	36.77	5.2x	11.1x	13.6x	13.5%	18.0%	30.8%	2.8%
<u>Cumulative Average</u>							13.67	4.5x	9.5x	11.6x	(0.4%)	6.4%	35.3%	4.2%
Biogen Inc	37,739	39,214	39,924	11,347	5,243	\$ 247.75	25.28	3.7x	7.9x	9.7x	0.7%	12.6%	55.5%	6.9%

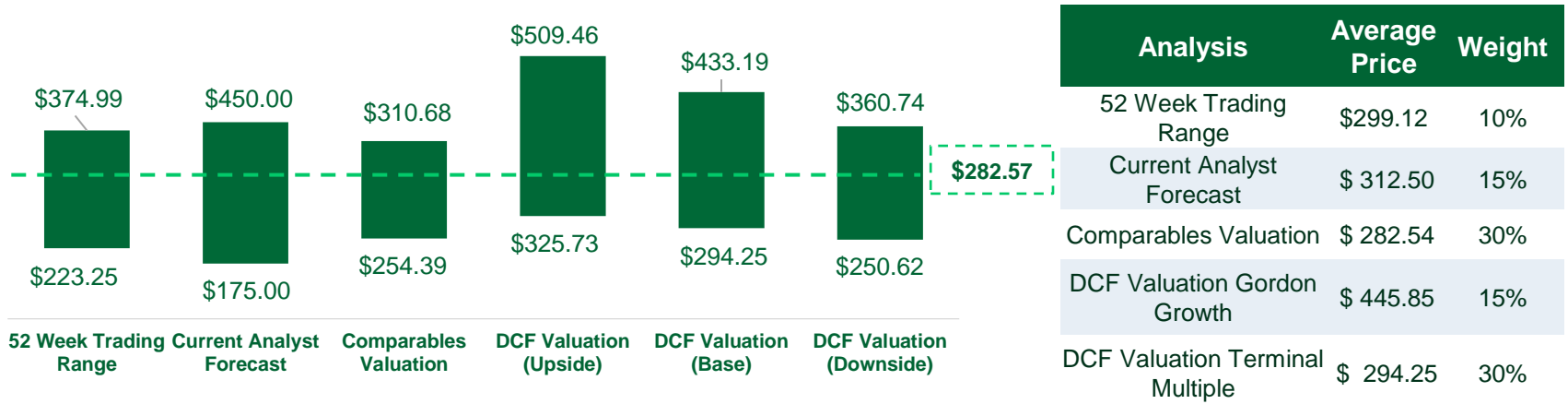
Analysis & Valuation Summary

- Biogen is trading approx. 16% below the average of its peers on EV/EBITDA and P/E basis
- Biogen exceeds peer after-tax NI and revenue CAGR significantly while also boasting a significantly higher EBITDA Margin

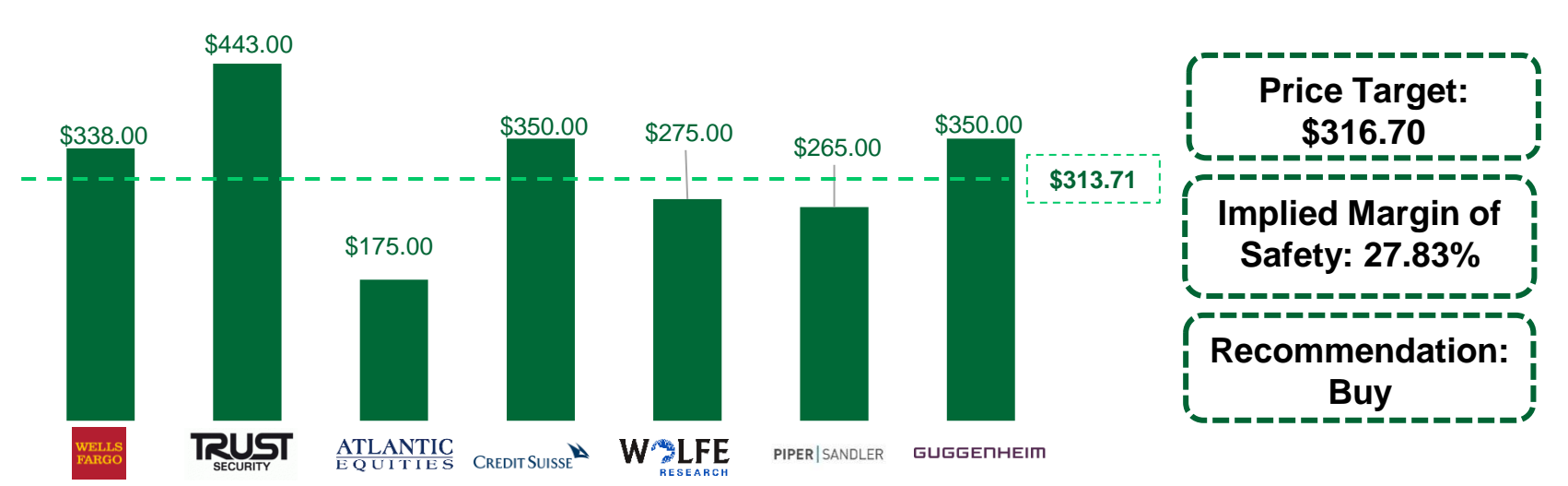
Comparables EV/EBITDA	9.8x	Comparables P/E	12.3x
Biogen EBITDA (NTM)	\$5,243	Biogen EPS (NTM)	\$25.28
Total Enterprise Value	51,597	Fair Value Share Price	\$ 310.68
- Net debt (as of valuation date)	(8,399)		
+ Cash	4,476		
Equity Value	47,673		
Shares Outstanding (m)	187		
Fair Value Share Price	\$ 254.39		

Final Recommendation

Football Field



Selected Broker Price Targets





Appendices

Base Assumptions



Balance Sheet Assumptions	2020E	2021E	2022E	2023E	2024E
Investments, % of Revenue	7.0%	11.5%	14.5%	17.5%	19.5%
AR, % of Revenue	17.0%	14.0%	14.0%	14.0%	14.0%
Due from unconsolidated joint business, net, % of Revenue	2.9%	2.0%	2.0%	2.0%	2.0%
Inventories, % of Revenue	6.0%	6.0%	6.0%	7.0%	7.0%
Other Short-term assets, % of Revenue	4.0%	4.0%	4.0%	4.0%	4.0%
Marketable Securities, % of Revenue	9.0%	8.0%	7.0%	7.0%	7.0%
Property, plant and equipment, net % of Revenue	18.5%	18.5%	17.5%	17.5%	18.5%
Growth of intangible assets, nets % of Revenue	39.5%	29.5%	39.5%	39.5%	49.5%
Goodwill, % of Revenue	34.5%	34.5%	34.5%	34.5%	32.5%
Deferred tax asset, % of revenue	19.5%	19.5%	19.5%	19.5%	19.5%
Investments and other assets, % of Revenue	10.5%	10.5%	10.5%	10.5%	10.5%
Current portion of notes payable % of Revenue	1.5%	1.5%	1.5%	1.5%	1.5%
Taxes Payable, % of Revenue	0.50%	0.50%	0.50%	0.50%	0.50%
Accounts Payable, % of Revenue	2.50%	2.50%	2.50%	2.50%	2.50%
Accrued Expenses and other, % of Revenue	18.5%	16.5%	15.5%	14.5%	15.5%
Notes Payable, % of Revenue	30.5%	30.5%	30.5%	30.5%	30.5%
Deffered Tax Liability, % of Revenue	10.5%	3.5%	2.5%	2.5%	2.5%
Long-term operating lease liabilities, % of Revenue	0.5%	0.5%	0.5%	0.5%	0.5%
Other long-term liabilities, % of Revenue	10.5%	10.5%	10.5%	10.5%	10.5%
Diluted Shares Outstanding Growth	(8.5%)	(6.5%)	(10.5%)	(12.5%)	(12.5%)

Income Statement Assumptions	2020E	2021E	2022E	2023E	2024E
Product Net Growth	3.0%	3.0%	2.0%	1.0%	1.0%
Unconsolidated Joint Businesses Revenue Growth	5.0%	3.0%	2.0%	1.0%	1.0%
Other Growth	1.0%	2.0%	2.0%	1.0%	1.0%
Cost of Sales Growth	9.0%	10.0%	11.0%	12.0%	13.0%
Research and Development Growth	3.0%	3.0%	2.0%	2.0%	2.0%
Sales and Marketing Expense Growth	5.0%	6.0%	4.0%	5.0%	5.0%
Amortization of Intangible Assets Growth	14.0%	19.0%	(16.0%)	(26.0%)	29.0%
(Gain) Loss on Fair Value Remeasurement Growth	71.0%	82.0%	39.0%	(18.0%)	28.0%
Collaboration on profit sharing	(4.5%)	10.5%	15.5%	20.5%	20.5%
Income Tax Rate	23.0%	23.0%	24.0%	24.0%	24.0%

PPE&E Schedule Assumptions	2020E	2021E	2022E	2023E	2024E
Additions to PP&E, % of sales	2.0%	2.0%	2.0%	2.0%	2.0%
PP&E Depreciation, % of gross	16.0%	16.0%	15.0%	15.0%	15.0%
Other D&A, % of Gross	40.0%	40.0%	40.0%	40.0%	40.0%

Supplementary Inputs	
Terminal Growth Rate	0.5%
Exit Multiple	6.0x
Forecast Period Start	2020

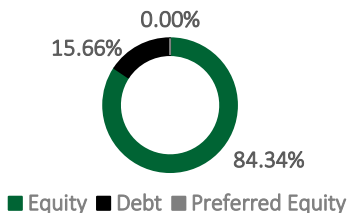
Cashflow Statement Assumptions	2020E	2021E	2022E	2023E	2024E
Stock-Based Compensation, % of Revenue	2.0%	2.0%	2.0%	1.5%	1.5%
Purchases of investments, % of Revenue	33.0%	33.0%	33.0%	33.0%	33.0%
Proceeds from sales of investments, % of Revenue	30.0%	30.0%	30.0%	30.0%	30.0%
Purchases of Treasury Stock, % of Revenue	(10.0%)	(20.0%)	(17.0%)	(12.0%)	(10.0%)
Other Financing Activities Adjustment	\$ 19.07	-\$ 336.18	\$ 525.31	-\$ 448.33	-\$ 125.80

Debt & WACC

Capital Structure	Total Value (\$Mm)	Weight
Equity	\$45,244.0	84.34%
Debt	\$8,399.5	15.66%
Preferred Equity	-	0.00%
Total	\$53,643.5	100.00%

WACC Analysis	
10-Year U.S. Treasury	0.9%
Market Risk Premium	12.1%
Beta	0.550
Cost of Equity	7.6%
Cost of Preferred Equity	-
Cost of Debt	4.3%
Tax Rate	16.0%
After-Tax Cost of Debt	3.6%
WACC	6.93%

Capital Structure



Equity Analysis		
Price:	Current Trading Price	\$241.43
Shares Outstanding:	Fully Diluted Share O/S	187,400,000
Cost Breakdown:	10-Year U.S. Treasury	0.9%
	Market Return (SPY 10 Yr)	13.0%
	Market Risk Premium	12.1%
	5Yr Levered Beta	1.00
	2Yr Levered Beta	1.00
	Manual Beta	0.55
Cost of Equity		7.6%
Total Weight		84.34%
Total Value (\$Mm)		\$45,243.98

Debt Tranche Analysis Summary

Description	Price	Payment Frequency	Interest Paid Every x Months	Time to Maturity (Months)	Period	Period Rounded	Coupon Rate	Coupon Payment	Future Value	YTM/2	YTM	Market Value Of Debt Issued (\$Mm)
BIIB 3.625 15-Sep-2022	105.690	Semi-Annual	6	21	3.51	3	3.63%	1.81	100	0.23%	0.47%	\$ 1,055.12
BIIB 4.050 15-Sep-2025 '25	113.956	Semi-Annual	6	57	9.52	9	4.05%	2.03	100	0.53%	1.07%	\$ 1,991.06
BIIB 2.250 01-May-2030 '30	102.385	Semi-Annual	6	113	18.77	18	2.25%	1.13	100	0.99%	1.97%	\$ 1,535.42
BIIB 5.200 15-Sep-2045 '45	132.999	Semi-Annual	6	297	49.55	49	5.20%	2.60	100	1.63%	3.25%	\$ 2,323.84
BIIB 3.150 01-May-2050 '49	99.6025	Semi-Annual	6	353	58.80	58	3.15%	1.58	100	1.59%	3.17%	\$ 1,494.03
-	-	-	-	-	-	-	-	-	100	-	0.00%	
												Weighted Average: 2.14%

DCF Valuation

Bull Case Output

Gordon Growth Method	
PV of Forecast Period	25,612
<i>% of Enterprise Value</i>	25.8%
Terminal Value	
Terminal Year UFCF	6,604
Perpetuity Growth Rate	0.5%
Terminal Value	103,166
PV of Terminal Value	73,784
<i>% of Enterprise Value</i>	74.2%
Enterprise Value	99,396
Less: Net Debt	(8,399)
Add: Cash	4,476
Equity Value	95,473
Fully Diluted Shares Outstanding	187
Implied Share Price	\$509.46
Current Share Price	\$247.75
Implied Margin of Safety	111.0%
Implied Cashflow Yield	10.85%
Implied EBITDA Yield	18.23%

Terminal Multiple Method	
Cumulative PV of Free Cash Flow	25,612
<i>% of Enterprise Value</i>	39.4%
Terminal Value	
Terminal Year EBITDA	9,171
EBITDA Multiple	6.0x
Terminal Value	55,024
PV of Terminal Value	39,353
<i>% of Enterprise Value</i>	60.6%
Enterprise Value	64,965
Less: Net Debt	(8,399)
Add: Cash	4,476
Equity Value	61,041
Fully Diluted Shares Outstanding	187
Implied Share Price	\$325.73
Current Share Price	\$247.75
Implied Margin of Safety	34.9%
Implied IRR Cashflow Yield	10.85%
Implied Earnings Yield	18.23%

Sensitivity Analysis

Terminal Growth Share Price Sensitivity (\$)

Terminal Growth	WACC				
	6.7%	6.8%	6.9%	7.0%	7.1%
0.3%	515.65	507.34	499.29	491.49	483.91
0.4%	521.03	512.54	504.31	496.34	488.60
0.5%	526.55	517.87	509.46	501.31	493.41
0.6%	532.21	523.33	514.73	506.40	498.33
0.7%	538.03	528.94	520.14	511.63	503.37

Exit Multiple Share Price Sensitivity (\$)

Exit Multiple	WACC				
	6.7%	6.8%	6.9%	7.0%	7.1%
5.5x	310.68	309.45	308.23	307.01	305.81
5.8x	319.51	318.24	316.98	315.72	314.47
6.0x	328.34	327.03	325.73	324.43	323.14
6.3x	337.17	335.82	334.48	333.14	331.81
6.5x	346.00	344.61	343.23	341.85	340.48

DCF Valuation

Bear Case Output

Gordon Growth Method	
PV of Forecast Period	20,803
<i>% of Enterprise Value</i>	29.1%
Terminal Value	
Terminal Year UFCF	4,540
Perpetuity Growth Rate	0.5%
Terminal Value	70,922
PV of Terminal Value	50,724
<i>% of Enterprise Value</i>	70.9%
Enterprise Value	71,527
Less: Net Debt	(8,399)
Add: Cash	4,476
Equity Value	67,603
Fully Diluted Shares Outstanding	187
Implied Share Price	\$360.74
Current Share Price	\$247.75
Implied Margin of Safety	49.4%
Implied Cashflow Yield	10.39%
Implied EBITDA Yield	17.41%

Terminal Multiple Method	
Cumulative PV of Free Cash Flow	20,803
<i>% of Enterprise Value</i>	40.9%
Terminal Value	
Terminal Year EBITDA	7,011
EBITDA Multiple	6.0x
Terminal Value	42,067
PV of Terminal Value	30,086
<i>% of Enterprise Value</i>	59.1%
Enterprise Value	50,889
Less: Net Debt	(8,399)
Add: Cash	4,476
Equity Value	46,966
Fully Diluted Shares Outstanding	187
Implied Share Price	\$250.62
Current Share Price	\$247.75
Implied Margin of Safety	2.8%
Implied IRR Cashflow Yield	10.39%
Implied Earnings Yield	17.41%

Sensitivity Analysis

Terminal Growth Share Price Sensitivity (\$)

Terminal Growth	WACC				
	6.7%	6.8%	6.9%	7.0%	7.1%
0.3%	365.04	359.31	353.76	348.37	343.13
0.4%	368.74	362.89	357.21	351.70	346.36
0.5%	372.54	366.55	360.74	355.12	349.66
0.6%	376.43	370.30	364.37	358.62	353.05
0.7%	380.43	374.16	368.09	362.21	356.52

Exit Multiple Share Price Sensitivity (\$)

Exit Multiple	WACC				
	6.7%	6.8%	6.9%	7.0%	7.1%
5.5x	239.11	238.17	237.24	236.31	235.39
5.8x	245.86	244.89	243.93	242.97	242.02
6.0x	252.61	251.61	250.62	249.63	248.65
6.3x	259.36	258.33	257.31	256.29	255.27
6.5x	266.12	265.05	264.00	262.95	261.90