

# Analyze NYSE Data

S&P 500 companies Data

Maimoona Munir

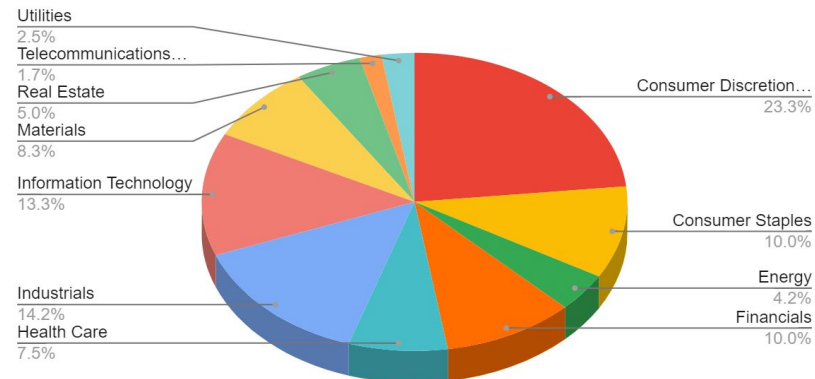
[Google Sheet Link](#)

# Industry Overview

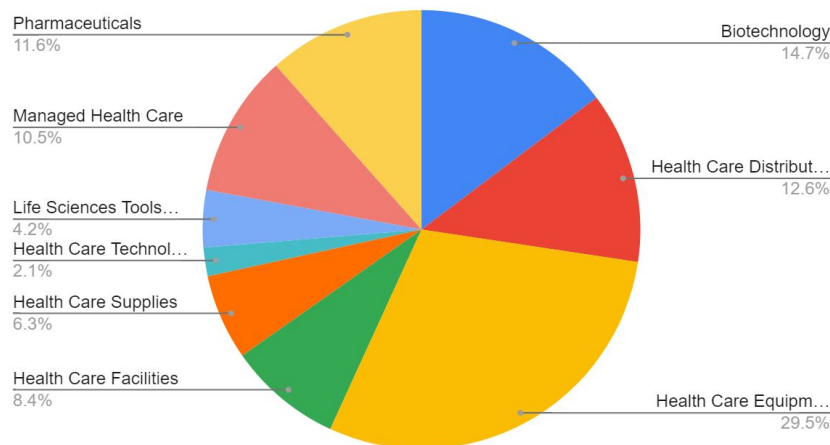
The New York Stock exchange data is being used from [kaggle](#). Which includes 1781 companies from different sectors. They are divided into eleven GICS Sectors they can be further subcategorized into 120 GICS subsectors.

For my analysis I focus on Healthcare GICS sector and specifically on the Biotechnology industry.

GICS Sector Breakdown

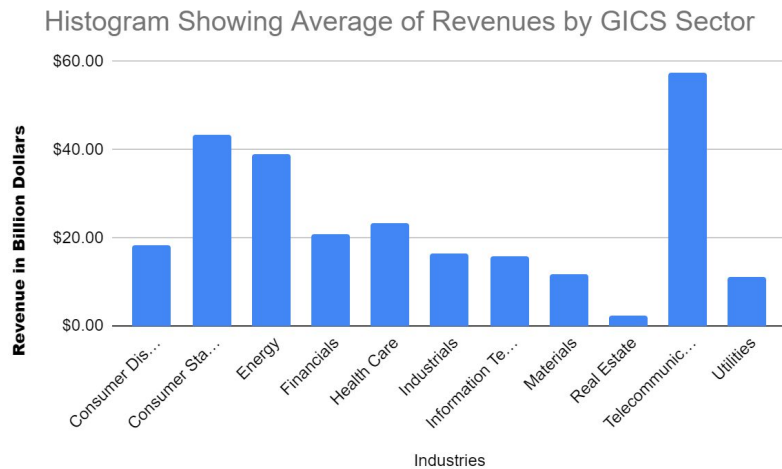
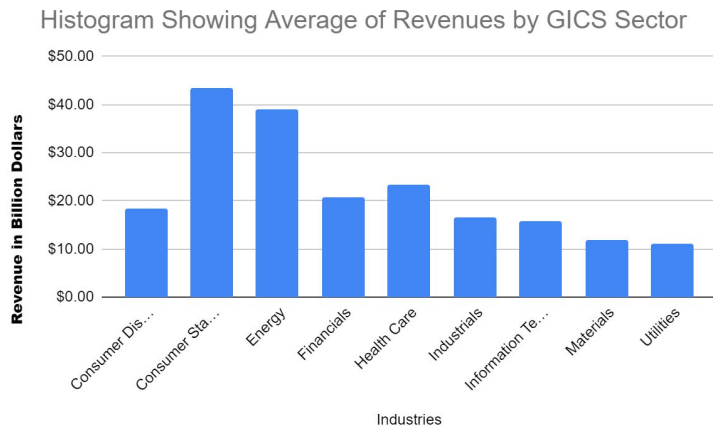


GICS Health Industry Breakdown



# What are the average revenue trend over the span of four years in the NYSE S&P 500 industries

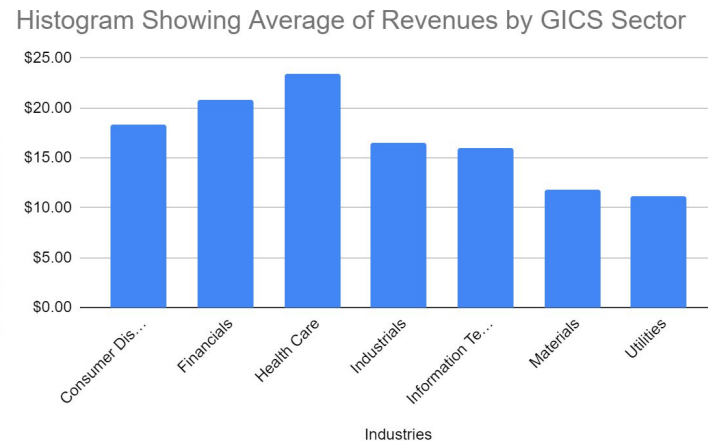
- The Chart shows the average of revenues from diverse industries and the histogram is showing that Telecommunication services and Real Estate are the outliers one is too high(\$57,537,392,650.00) and the other is too low(\$2,511,715,663.46) over the four years span.



Removing the two extreme values we see the graph is right/positive skewed which means that the mean for each is higher than the median. The mean for the rest is \$22 billion and Median \$18 billion. Details are shown in the table on next slide.

Only 22% of the companies revenue is \$44 billion but the rest 77% are the ones which are having revenue in the range from \$10 to \$20 billion. After removing the 22% comparatively high values we are left with a distribution which is close to normal but still positively skewed. The table shows the skewness of the mean towards right. Lets Focus now on Health Care industry.

<i>GICS Sector</i>	MEDIAN of Total Revenue	AVERAGE of Total Revenue
Consumer Discretionary	\$8,441,971,000.00	\$18,318,138,785.02
Consumer Staples	\$13,859,500,000.00	\$43,407,926,143.94
Energy	\$11,777,257,500.00	\$38,984,796,516.13
Financials	\$10,375,126,500.00	\$20,825,589,774.39
Health Care	\$8,563,050,000.00	\$23,463,223,026.32
Industrials	\$9,969,168,500.00	\$16,547,665,399.19
Information Technology	\$5,039,000,000.00	\$15,925,183,565.22
Materials	\$9,648,000,000.00	\$11,834,515,578.95
Utilities	\$10,900,461,000.00	\$11,135,678,864.58

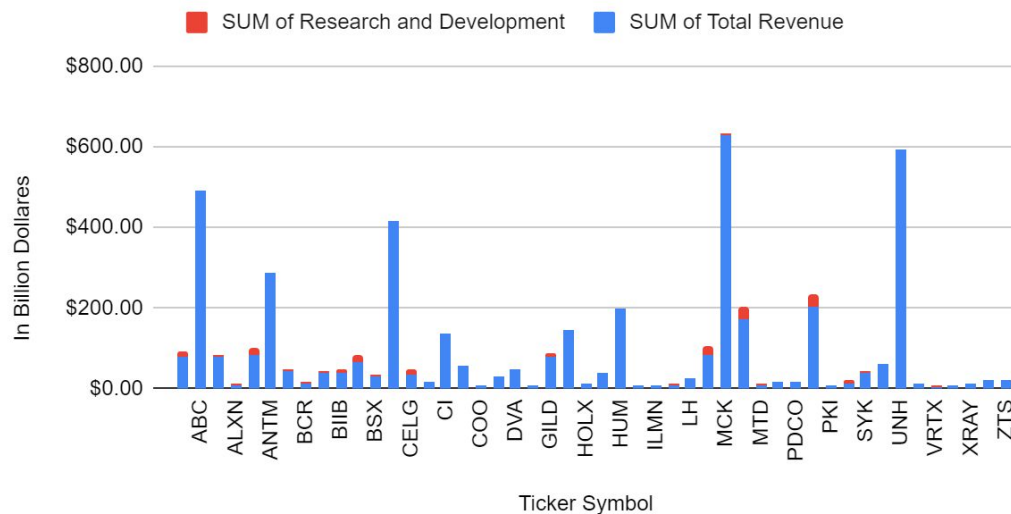


# Do companies in Health Care spent comparable amounts on Research and Development.

The companies are spending a small amount of funds on Research and Development with an Average of \$4 billion with a Standard Deviation of \$7 billion which shows a dispersion of data and means it has some extreme values among companies in Health sector which is visible from Figure.

Choosing the Biotechnology subcategory to refine our search whose mean is \$8 billion and SD of \$5 billion Which shows that the Biotechnology is spending comparatively more on the Research and Development with a data spread around mean and better performing than the whole industry.

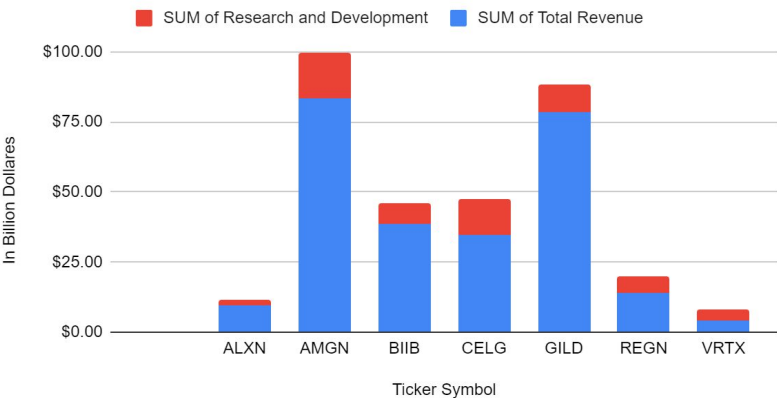
Total Revenue and Research and Development funds of companies in Health Sector



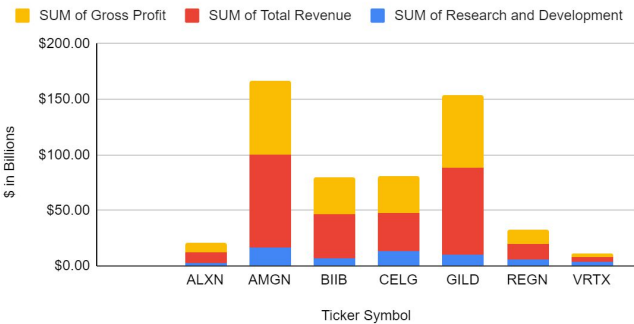
# Statistics for the Biotechnology Industry

The Statistical overview of the Biotechnology industry shows that they believe more in research and development to grow then the other sub industries are the data is better spread around the mean. The Gross profit shows that 25% of the profit is below \$10 billion 50% of profit is below than 33 billion and 75% of companies have profit under \$49 Billion dollars.

Total Revenue and Research and Development funds of companies in Biotechnology subsector



SUM of Research and Development, SUM of Total Revenue and SUM of Gross Profit



	Revenue	RnD	Gross Profit
Mean	\$37,576,595,857.14	\$8,255,213,571.43	\$32,133,139,714.29
Median	\$34,649,500,000.00	\$7,323,600,000.00	\$33,065,100,000.00
Stdv	\$32,231,690,901.93	\$5,044,039,849.36	\$26,036,912,615.77
Min	\$4,351,768,000.00	\$2,297,093,000.00	\$3,756,107,000.00
Max	\$83,392,000,000.00	\$16,290,000,000.00	\$67,235,000,000.00
Interquartile			
Range	\$46,959,648,500.00	\$6,634,299,000.00	\$38,971,414,500.00
Quartile 1	\$11,680,901,500.00	\$4,651,801,000.00	\$10,733,235,500.00
Quartile 2	\$34,649,500,000.00	\$7,323,600,000.00	\$33,065,100,000.00
Quartile 3	\$58,640,550,000.00	\$11,286,100,000.00	\$49,704,650,000.00

The two highly profitable companies are AMGN and GILD, the former grows organically however the latter is dependent on huge revenue with a growth percent of about 336.42 % from the year 1 to year 4.

Industry

<i>Ticker Symbol</i>	SUM of Research and Development	SUM of Total Revenue	SUM of Gross Profit
	\$0.00	\$0.00	\$0.00
ALXN	\$2,297,093,000.00	\$9,473,346,000.00	\$8,630,790,000.00
AMGN	\$16,290,000,000.00	\$83,392,000,000.00	\$67,235,000,000.00
BIIB	\$7,323,600,000.00	\$38,848,100,000.00	\$34,100,300,000.00
CELG	\$12,824,200,000.00	\$34,649,500,000.00	\$33,065,100,000.00
GILD	\$9,748,000,000.00	\$78,433,000,000.00	\$65,309,000,000.00
REGN	\$5,804,172,000.00	\$13,888,457,000.00	\$12,835,681,000.00
VRTX	\$3,499,430,000.00	\$4,351,768,000.00	\$3,756,107,000.00
<b>Grand Total</b>	<b>\$57,786,495,000.00</b>	<b>\$263,036,171,000.00</b>	<b>\$224,931,978,000.00</b>

# Profit And Loss Statement AMGN

Amgen Inc. (Ticker: AMGN) is an American multinational biopharmaceutical company and one of the world's largest independent biotechnology companies.

Here is the profit and loss statement for the years 2013-2016.

Ticker Choice	AMGN						
Income Statement							
		Historical				Forecast	
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Revenue		\$18,676,000,000	\$20,063,000,000	\$21,662,000,000	\$22,991,000,000.00	\$24,140,550,000.00	\$25,299,296,400.00
COGS		\$3,346,000,000.00	\$4,422,000,000.00	\$4,227,000,000.00	\$4,162,000,000.00		
Gross Profit		\$15,330,000,000	\$15,641,000,000	\$17,435,000,000	\$18,829,000,000.00	\$14,310,040,000.00	\$11,161,831,200.00
Sales, General and Admin.		\$5,380,000,000	\$5,153,000,000.00	\$4,895,000,000.00	\$5,195,000,000.00		
Other operating expenses		\$0.00	\$0.00	\$0.00	\$0.00		
Research & Development		\$4,083,000,000.00	\$4,297,000,000.00	\$4,070,000,000.00	\$3,840,000,000.00		
Total operating expenses		\$9,463,000,000	\$9,450,000,000	\$8,965,000,000	\$9,035,000,000		
Operating income/ EBIT		\$5,867,000,000	\$6,191,000,000	\$8,470,000,000	\$9,794,000,000.00	\$7,483,570,500.00	\$8,854,753,740.00
Operating Statistics							
		Historical				Assumptions	
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Revenue Growth(%)		0.00%	7.43%	7.97%	6.14%	5.00%	4.80%
Gross Margin		0.82	0.78	0.80	0.82	0.76	0.78
Operating Margin		0.31	0.31	0.39	0.43	0.31	0.35



# Sensitivity Analysis AMGN

Operating Statistics		Historical				Assumptions	
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Revenue Growth(%)		0.00%	7.43%	7.97%	6.14%	5.00%	4.80%
Gross Margin		0.82	0.78	0.80	0.82	0.76	0.78
Operating Margin		0.31	0.31	0.39	0.43	0.31	0.35
Scenario	Weak Case						
Operating Scenarios - Sensitivity Analysis							
						Assumptions	
Revenue Growth(%)						Year 5	Year 6
Strong Case	1					7.98%	8.00%
Base Case	2					7.20%	7.30%
Weak Case	3					5.00%	4.80%
						Assumptions	
Gross Margin						Year 5	Year 6
Strong Case	1					0.85	0.87
Base Case	2					0.83	0.83
Weak Case	3					0.76	0.78
						Assumptions	
Operating Margin						Year 5	Year 6
Strong Case	1					0.52	0.53
Base Case	2					0.45	0.5
Weak Case	3					0.31	0.35

Revenue of AMGN in 2018 was \$23.7 Billion, which is shown in my weak case scenario.

# Measures of Dispersion for AMGN

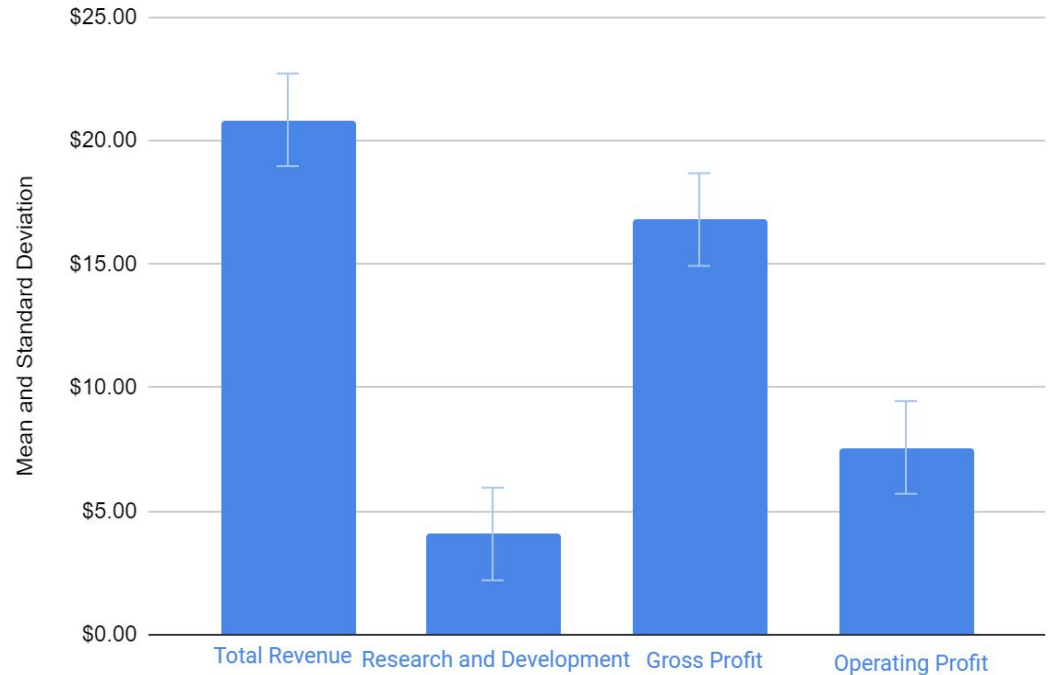
The mean and standard deviation of the Total Revenue, Research and Development funds, Gross profit and Operating Margin are displayed.

Which shows a subtle increase of the Total Revenue and Research and Development.

The Revenue 123% increased in the span of 4 years in a subtle way. The research and development funds are also increased with a mean percentage of 19.6%.

The AMGN is a biopharmaceutical company which is investing almost 20% of its Revenue on the Research and Development to maximize Gross and Operating Profits.

Mean and Standard Deviation



## Performance over the years

The AMGN is a biopharmaceutical company which is investing almost 20% of its Revenue on the Research and Development to maximize Gross and Operating Profits however they are keeping their operating expenses constant which means they keeping their Sales, General and Admin costs almost same over the years.

Cost of Goods sold is zero over the years.

Performance over the Years

