



ANALYSTS

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Vertex Pharmaceuticals (NASDAQ:VRTX)
 Healthcare - Biotechnology

November 15, 2021
 Stock Rating:

BUY

Company Profile: Vertex Pharmaceuticals is a global biotechnology company based in Boston, Massachusetts. Founded in 1989, Vertex is now a leader in the biotechnology industry and has developed several highly successful drugs with a specialization in the treatment of Cystic Fibrosis, or CF. Vertex is established as a market leader for Cystic Fibrosis treatment, and is now in the process of developing drugs for Sickle Cell Disease, Type 1 Diabetes, and other viral diseases while still expanding existing CF treatments.

Investment Thesis

We recommend a BUY rating for Vertex Pharmaceuticals due to the Company's promising catalog of drugs for the treatment of Cystic Fibrosis, no debt obligations, and aggressive growth of their newest drug, Trikafta.

Drivers of Thesis:

Vertex is the market leader for treating Cystic Fibrosis and their new drug, Trikafta, is a transformational advancement in the treatment of CF. The company's revenue has increased dramatically as a result of the drug's launch and is currently developing new drugs to treat Kidney Disease, Sickle Cell Disease, and more.

Low debt obligations

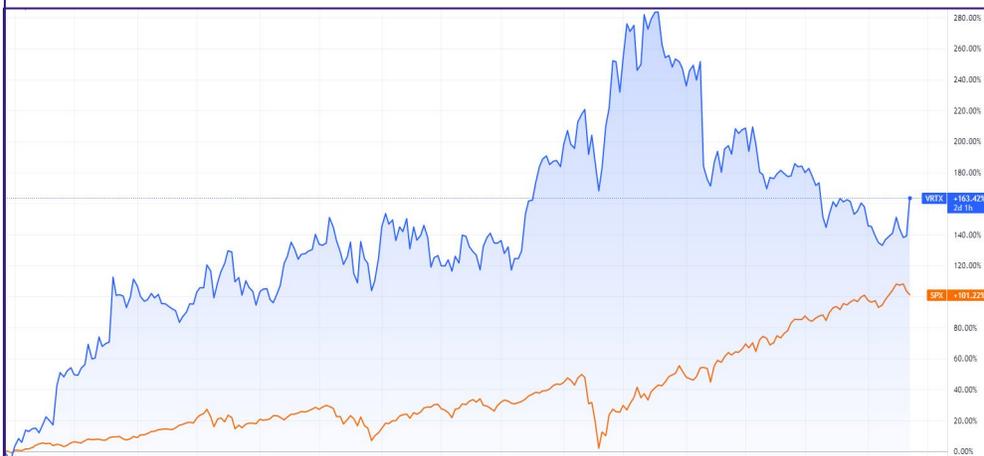
Vertex has very low debt obligations and a consistently growing free cash flow to fund future projects.

Risks of thesis:

Competitors entering the CF market

Abbvie has began developing a Cystic Fibrosis Drug to enter the CF market. The drug uses a similar compound to Vertex's main drugs, however the drug is currently in the early phases of approval.

5 year performance **VRTX** vs **S&P 500**



Forecast Price Projections

Current Price:	\$179.58
DDM:	\$207.04
DCF / EP:	\$267.58
Target Price:	\$255-\$270

Statistical Highlights

Stock Data

Current Price	\$179.58
Market Cap.	47.883 B
Beta	0.96

Key Statistics

P/E '21	14.80
Revenue '21	7,203.06(mm)
Net Income '21	2,521.25 (mm)

ROA	13.85%
ROE	24.64%
Gross Margin	3.64B
Profit Margin	30.52%

Earnings Estimates

EPS	2021	2022
Forecast	9.65	10.98
Consensus	12.73	13.31

EXECUTIVE SUMMARY

Vertex pharmaceuticals is a global biotechnology company based in Boston, Massachusetts. Vertex was founded in 1989 and is now a leading biotechnology company that specializes in the research, development, and manufacturing of Cystic Fibrosis (CF) drugs. Vertex is a market leader in the sub-industry of CF treatments within biotech, and after several product launches and establishing dominance in the CF drug space, Vertex has drugs in the pipeline that treat other illnesses and diseases such as Sickle Cell Disease, Kidney Disease, chronic pain, and other viral diseases.

Due to the historical success of Vertex's CF drugs, ongoing successful product launches into domestic and foreign markets, the company's minimal-debt capital structure and Vertex's promising catalog of drugs being commercialized in the near future, we recommend a BUY rating for Vertex.

ECONOMIC ANALYSIS

COVID 19

On March 11 of 2020, COVID 19 was declared a pandemic by the World Health Organization. Over the course of the last 20 months there have been over 47 million cases of the novel virus in the United States with 763,000 deaths and a 6.5% positivity rate associated with the disease. The pandemic had a jarring effect on the world's social and economic environment and has caused several changes in the way people and corporations engage with each other and how they engage with the economy. Within months of the virus landing in the US, the DJIA fell more than 40% in value and almost a tenth of the population filed for unemployment. (1)

As the virus spread, healthcare and pharmaceutical companies were engaged by the federal government to mobilize their resources and mitigate the effects that the virus had on the general population. Healthcare infrastructure was strengthened through stimulus fund distribution and leading pharmaceutical companies, namely biotech companies such as Moderna and Pfizer, were supported through government programs such as Operation Warp Speed.

COVID 19 and the subsequent economic downturn has had a substantial impact on the operations and profitability of companies in the healthcare industry. Specifically, biotechnology companies have experienced intense volatility in their operations due to the growing demand for the development of COVID vaccines, supply chain disruptions, and an overall increase in consumer concern with healthcare since the onset of the pandemic.

DEMOGRAPHICS

Demographics are a significant indicator for the healthcare industry, as several trends in US healthcare spending can be tied to age, gender, health status, income, and ethnicity. Age and income specifically dictates much of healthcare spending in the USA, as high income and older populations spend significantly more on healthcare than younger, lower income populations. (Chalise)

Insured populations are much more likely to get the medical attention they need, as out of pocket costs for healthcare are typically too high for the average person to afford, especially in specialized fields of medicine and more recent COVID complications.

According to the latest Census report, in 2020, 8.6% of people did not have any health insurance, while 91% of people have full or partial health insurance. (2)

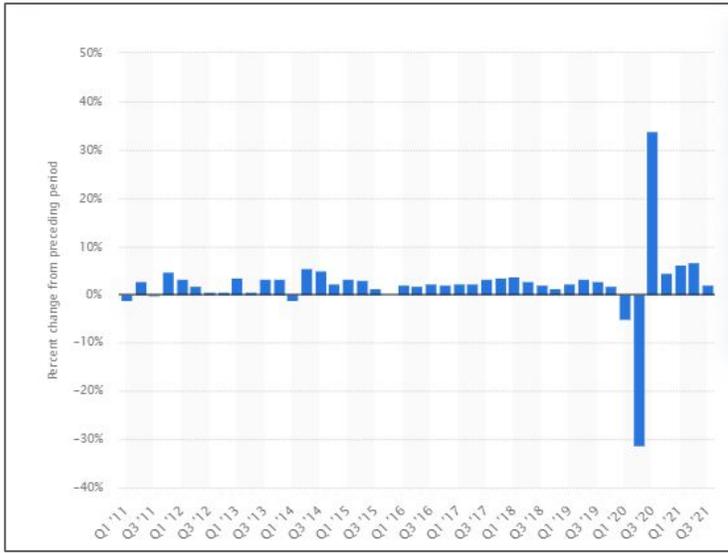
Medicare and Medicaid are federal programs that provide health insurance to the disabled, elderly, and people who have lower income. Currently, 1 in 3 Americans is covered by either Medicare or Medicaid, making the government a very large customer of medicines and treatments. (4)

A largely insured population is beneficial to the economy and the healthcare industry, as more people can securely seek out medical attention and continue to contribute to the economy.

REAL GDP

Real Gross Domestic Product is the value of goods and services produced by an economy, adjusted for inflation. Real GDP reflects the overall health and performance of an economy, and increases in GDP are linked to increased healthcare spending. Real GDP significantly dropped in the first quarters of 2020 due

to the COVID 19 pandemic, however it strongly rebounded in the following quarter and is reaching previous levels of growth. In Quarter 2 of 2020 Real GDP dropped 31%, and in quarter 3 increased by 33%.



Source: Statista (3)

Healthcare accounts for 18% of the US GDP, and there is a direct correlation between growth in the GDP and healthcare spending. There has been a steady increase in healthcare's growth in relation to GDP since 1960, and it is projected to continue gaining momentum as more people continue turning to more medical services.

POLITICAL CLIMATE

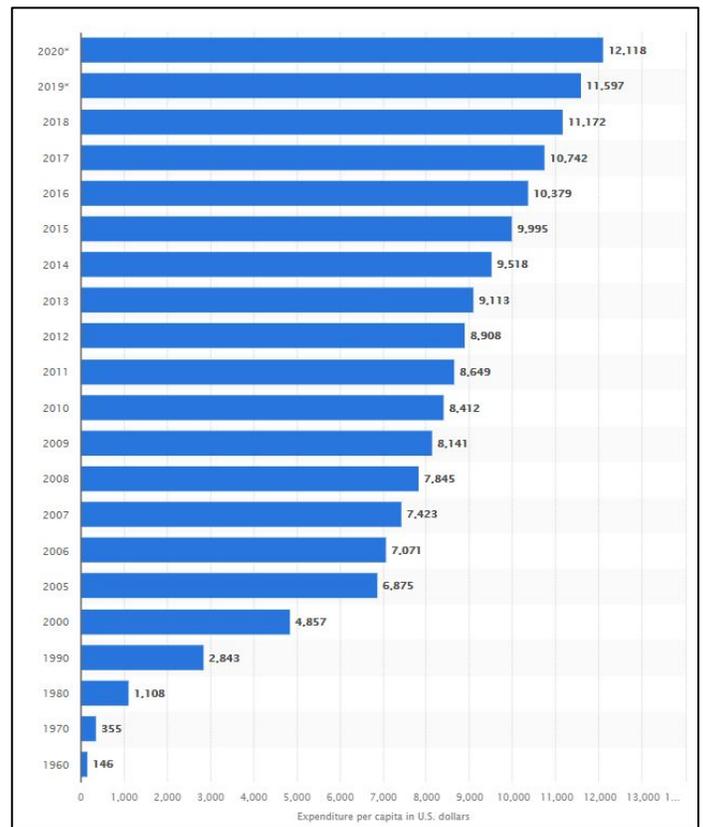
Healthcare matters are a top voting issue for most Americans and the need for healthcare reform is a view shared across the political spectrum. However, both parties have widely different methods of lowering healthcare costs and improving the quality of services and products.

Every election cycle, healthcare companies brace for the potential changes in healthcare policy. President Joe Biden proposed measures that could help and hurt the profitability and growth of pharmaceutical companies, in that he would both increase corporate tax rates, and allocate more funds to healthcare and relief for those needing medical attention.

Increasing the corporate tax rates from 21% to 28% would decrease profits for participants of the healthcare industry, though the additional funding would also catalyze the development of key projects that could generate more revenue.

HEALTHCARE EXPENDITURES IN THE USA

Healthcare expenditures per capita have been consistently growing since the 1960's. Year over year, per capita expenses have consistently grown between 6-10% in the last 30 years, indicating that healthcare is becoming increasingly important to American consumers.



Source: Statista (5)

US Healthcare spending outweighs the averages of other countries greatly. National Healthcare Expenditure, or NHE is projected to reach \$6.2 trillion by 2028, which positions the government to be a very large customer for major healthcare and pharmaceutical companies. (6)

As COVID cases and hospitalizations have increased over the past 20 months, the government has called upon major pharmaceutical manufacturers and biotech companies to help address the medical concerns of the American population, and this increased NHE projection could contribute to the growth of biotech companies.

INTEREST RATES

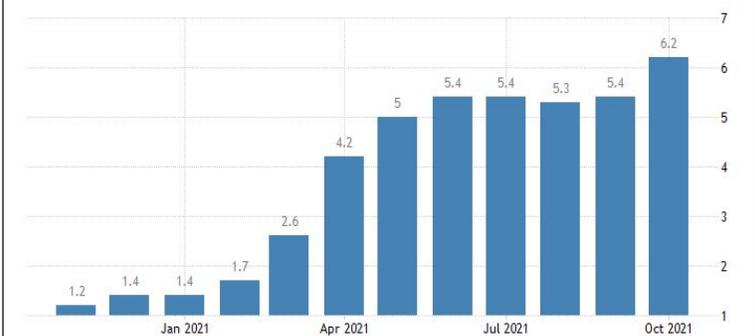
Currently, interest rates in the United States are at a historical low. Banks and the government want to make their debt attractive to companies looking to fuel new projects, so the cost to borrow is very low.

Pharmaceutical companies typically avoid accumulating large sums of debt and finance many of their projects through equity. Vertex has no long term debt obligations and do not plan on financing any of their projects through debt as they have a large sum of free cash they have expressed interest in using.

CPI / INFLATION

Over the course of the pandemic and the recent upswing in the economy, wages have increased, prices of goods have gone up, and subsequently inflation has began to increase significantly. Before the pandemic, inflation floated between 1% and 3%, with a dip during the onset of the pandemic.

In recent months, inflation has quickly began growing and outpacing typical inflation growth patterns. Inflation is now at 6.1% as of November 2021, and it is projected to continue growing. Many moving parts of the pharmaceutical manufacturing process are affected inflation, such as increased logistical expenses, wages, and raw materials. If inflation continues to increase as it is projected, it is likely that costs will increase and the sale price of drugs may increase.



Source: Statista (7)

CONSUMER CONFIDENCE

Consumer confidence is the measure of the degree of optimism consumers have towards the foreseeable future regarding their finances and the propensity to interact with the market. Major events like the 2008 crash and the recent pandemic severely damage consumer confidence and makes the relationship between the market and its' buyers unstable.



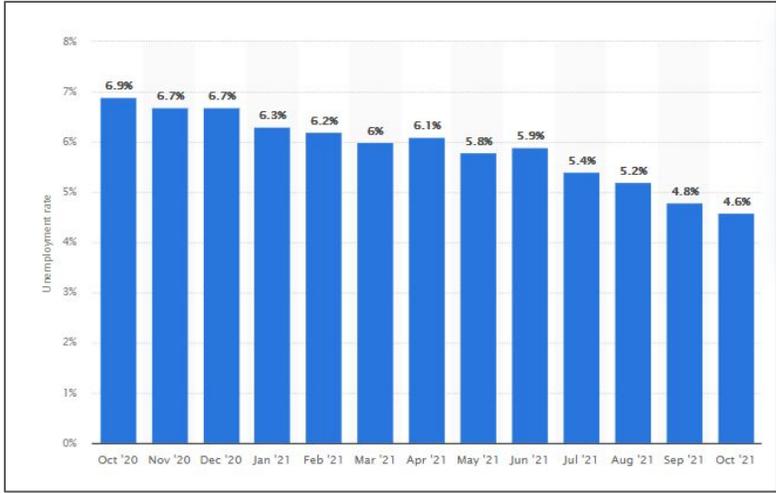
Source: OECD (9)

There was a significant decrease during the onset of COVID and during the second wave of COVID variants that increased infections and created more lockdowns.

However, consumer confidence bounced back sharply during the period of time where lockdowns eased and the economy opened back up. For this reason, we expect consumer confidence to increase sharply once again and regulate alongside the projected growth of GDP and lessened unemployment.

UNEMPLOYMENT

High unemployment rates could indicate lessened healthcare spending and overall engagement with the healthcare industry from consumers. It is also an indicator of the vitality of the economy and whether the population has access to funds necessary for healthcare expenditures.



Source: Statista *8

Unemployment in the United States has been steadily decreasing after reaching record high during the onset of COVID 19. Since unemployment highest rate in 2020 of 8.1%, the figure has consistently dropped every month by an average of .2%, and is now at 4.6%.

Unemployment is projected to level out at an average of 4.3% over the next 10 years after fully recovering from the effects of COVID in 2023. (8)

INDUSTRY ANALYSIS

Within the healthcare sector is the industry of biotechnology. The biotechnology industry includes companies that utilize biological compounds and living organisms to solve health programs stemming from inherited conditions to degenerative diseases. The biotechnology, or biotech, industry is mainly comprised of companies that focus on agricultural, environmental, industrial, or medical applications of biotech sciences. The medical applications of biotech will be the focus of our analysis.

Biotech companies pursue the research, development, and manufacturing of a drug so they can eventually commercialize their drug. This process is dictated by a rigid funnel of clinical trials and phases. Once granted approval, companies can take their drug to the open market and compete with other biotech products.

A unique aspect of the biotech industry is the patent issuance process. If a company is granted a patent upon successful approval through the 4 phases, the company can take their product to market without competition as they have the rights to their compound for a number of years. For this reason, many large biotech companies derive much of their revenue from a handful of drugs, and their catalog of products is relatively small.

COMPETITIVE LANDSCAPE

The competitive landscape for biotech companies in the US is a concentrated list of large companies that typically operate in different fields of specialized medicine. Larger companies have products that cater to larger parts of the population whereas smaller companies are much more specialized.

Companies that can create innovative drugs, secure patents and gain FDA approval prove to be the most lucrative companies. We believe Abbvie, Amgen, Bristol-Myers Squibb, and Gilead are comparable in terms of specialization of medicines and developed drugs.

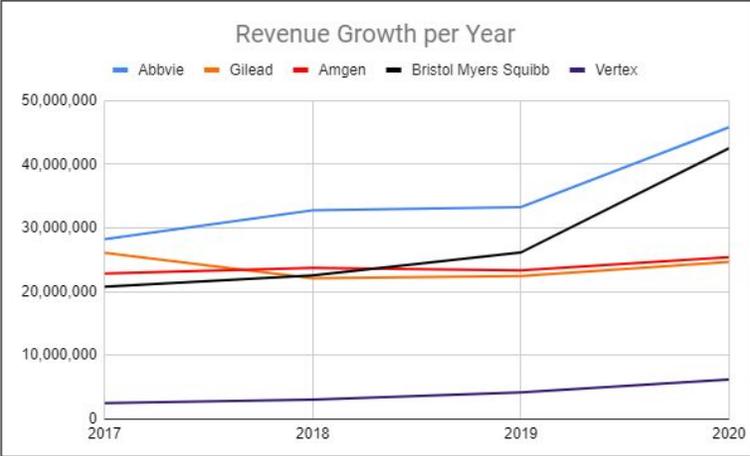
Currently, only Abbvie is a direct competitor in the creation of Cystic Fibrosis drugs. Abbvie only had one CF drug that is in phase 1/2 of the approval process.

Other private companies around the world create drugs that indirectly provide treatment for CF symptoms like overproduction of mucus and congestion related difficulties. However, Vertex is the clear market leader in treating Cystic Fibrosis and it is projected that Vertex will maintain its position as #1 in the market for treating CF into the late 2030's. (17)

This stronghold on the CF market can be attributed to Vertex's revolutionary drug formula for Symdeco, Orkambi and Kalydeco. These three drugs that preceded Trikafta in Vertex's drug catalog brought relief to an otherwise untreated population of over 100,000 people around the world. The drugs that are now being combined into a single more comprehensively effective drug, Trikafta, remain unchallenged in the market by a successfully commercialized drugs and will likely secure Vertex's leadership in the market for years to come.

COMPARATIVE REVENUE GROWTH

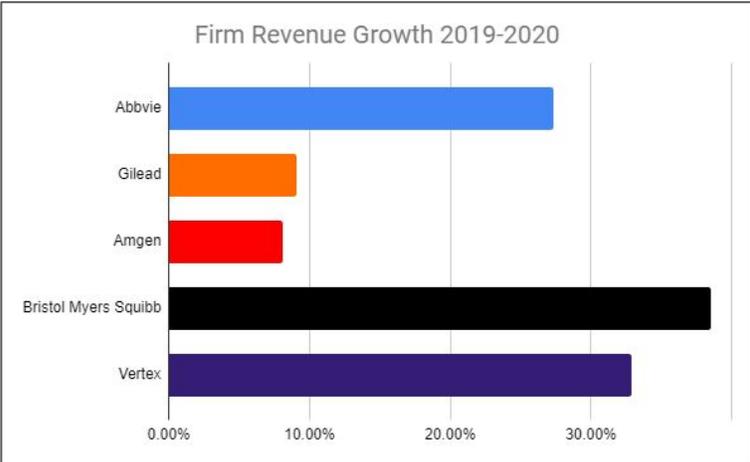
Compared to the other companies, Vertex has had low total sales since 2017. This is due to the size difference across the 5 companies; The average revenue between the 4 comparison companies was typically hovered at over 10-15 times the amount that Vertex generated in that given period.



Source: Yahoo Finance

However, when observing recent growth in revenue streams from 2019 to 2021, Vertex is 2nd in terms of revenue growth generated. This jump in revenue was derived from the company's new drug, Trikafta, which we project will heavily outweigh the revenues generated from drugs historically.

Trikafta generated more sales than all other drugs in Vertex's catalog combined, and we project that Trikafta will continue to grow aggressively as it is the company's primary new drug and its ongoing launch into domestic and foreign markets is successful.



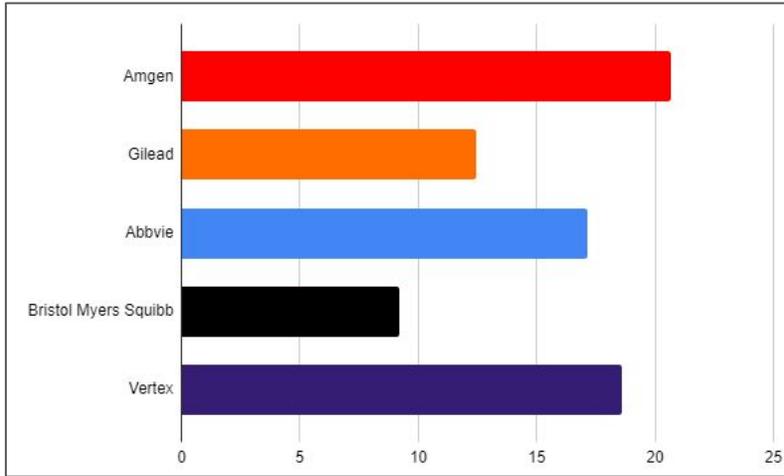
Source: Yahoo Finance

PROFIT / EARNINGS RATIO

The profit to earnings ratio for Vertex is above the industry average and above its competitors in the market.

Vertex had a P/E ratio of 18.6 in 2020, whereas the industry average was 14.8 when considering similar biotech companies. Vertex's only competitor in the CF space (Abbvie has no drugs for CF on the market yet, just in phase 1/2.)

Profit to earning ratio per company



Source: Yahoo Finance

Vertex has consistently grown in revenue and profitability in the last 8 years, Vertex is able to keep operating expenses level with no large volatility and use their growing profitability to fund new ventures in CF and new treatment markets.

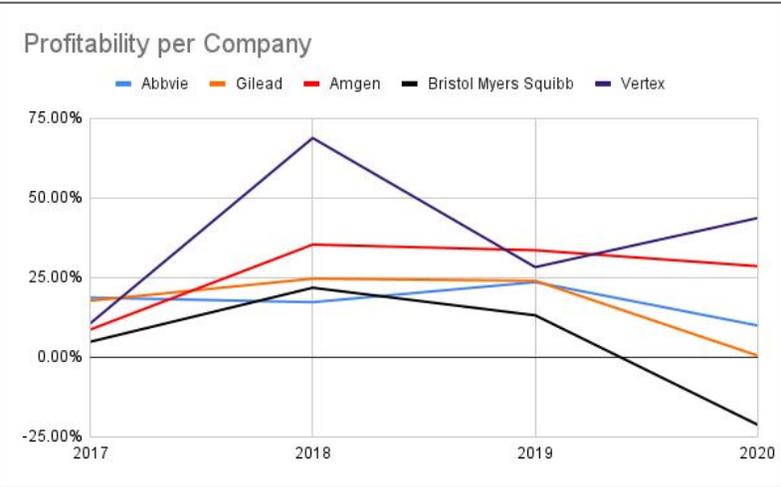


Source: Nasdaq VRTX earnings & revenue

PROFITABILITY

When considering the profitability across the 4 comparison companies, Vertex consistently outperformed other larger biotech industry players. This is due to the company's lean capital structure of minimizing debts and costs, but also has to do with the size of the companies. Vertex is the smallest company in terms of revenue and market capitalization, so the company doesn't have as many overhead costs to account for when calculating profit.

When Abbvie, Gilead, Amgen and BMS experienced a dip in their profitability, Vertex was still able to grow their profitability in 2020. This is due to the company's supply chain not being disrupted during COVID and having ample funds to fall back on during the economic downturn. Additionally, The new drug in their catalog Trikafta generated a substantial amount of revenue for the company as it was introduced to the market in late 2019.



Source: Mergent Online

SUB-INDUSTRY OF CF TREATMENT

Abbvie is the only major competitor that is in the process of creating a Cystic Fibrosis treatment, and the drug is currently in Phase 1/2. The market for CF treatments is growing as the industry technology consistently allows for more compounds to be added to a final drug, however Vertex's drug catalog is widely referred to as the standard for CF treatment within the network of CF patients, doctors, and researchers.

CONSUMER CONFIDENCE IN HEALTHCARE

Americans have historically been doubtful of large healthcare institutions and pharmaceutical companies and trust has typically been low between citizens and these market leaders. A 2018 pre-pandemic study by NRC health found that consumer confidence in healthcare was at an all time low for the few years leading up to the pandemic, with the consumer confidence in healthcare was rated at 65.5/100. (12)

However, biotechnology has played a pivotal role in the world's return to stability in recent months; So far, upwards of 195 million US citizens are fully vaccinated and businesses can open back up with less restrictions when catering to a vaccinated population. Recently the attention surrounding biotechnology companies is at a historical high, and confidence in the healthcare industry is on the rise as more Americans become more dependent on hospital services, mental health services, specialized medicine and COVID treatments. A recent study by Business Wire discovered that physician search is up by an average of 94% across major cities and that more patients are adopting telemedicine as their primary method of communicating with their healthcare providers. (13)

INDUSTRY BUSINESS OPERATIONS AND JOBS

US jobs in the pharma and biotech industries remained secure both before covid and throughout the development of COVID. Due to an increased awareness of consumers health and an increased demand for a vaccine worldwide, many established pharmaceutical companies were engaged by private investors and the federal government to mobilize their resources and create more treatment options, and subsequently the industry's workers were able to sustain an otherwise tumultuous job market. Medical supply chain workers were largely impacted by the onset of COVID.

For vertex specifically, the supply chain was not affected and business operations remained relatively unchanged. Much of the company's work could be done in smaller groups of scientists and bio-engineers and the supply chain was modular in nature, allowing the company to proactively address different links in the supply chain and address any potential barriers to normal operation.

PORTER'S FIVE FORCES ANALYSIS

Threats of New Entrants (Low): The initial costs to enter the biotechnology industry and educate employers on successful processes and procedures is extremely high. In particular, the process of researching and developing a new product line requires a large upfront investment and takes multiple years before it produces a positive return.

A company can try to avoid the threat of new entrants by investing money into research and development in order to create innovative products that are not easily replicable.

Competition in Industry (Moderate): Competition in the industry is strong but varies depending on the specific product lines a company produces. If a biotechnology company produces generic product lines without patent protection, they are likely to face high competition in the industry. In Vertex's specific case, they are currently focused on Cystic Fibrosis treatments and face low competition due to the specialization of their drug lines.

Threat of Substitutes (Low): In the biotechnology industry, patent protection minimizes the threat of substitutes until the patent expiration date. The threat of substitutes can also be minimized with innovative products that differentiate yourself from others. (15)

Bargaining Power of Buyers (Moderate): Consumers affected by a condition that requires a specific product have low bargaining power. Conversely, a consumer that has a condition that can be satisfied with multiple products has high bargaining power. Companies that produce product lines that have few to no substitutes are likely to be less affected by the bargaining power of buyers than companies with product lines that have many substitutes.

Bargaining Power of Suppliers (Moderate): The bargaining power of suppliers is typically low fluctuates on how unique a product they offer. Many biotechnology companies gather their supplies from the same or similar companies, lowering the bargaining power of the suppliers. However, companies that require special and innovative equipment, tools, and education may face higher bargaining power of their suppliers. (15)

RESEARCH & DEVELOPMENT

Biotechnology growth has been somewhat stagnant over the past 5 years, but a brighter future is on the horizon. Part of the slow growth rate can be partially attributed to rising R&D expenses that have risen disproportionately to revenue (McGrath, 2021). The industry average of R&D spending as a percentage of revenue is 22%, which is higher than in years prior. Part of this increase is due to increased competition among competitors and part is due to companies' changing preferences of investing their additional capital back into their company rather than a safer alternative. (19)

Symdeko: We expect Symdeko to experience -20% growth over the next two years with continuous declining returns.

Symdeko treats those aged 6+ with the general effects of CF. Though Symdeko demonstrated strong revenue patterns for the last 10 years, Trikafta, the company's newest drug that features three active ingredients, is becoming more popular and is absorbing product sales from Symdeko.

Kalydeco: We expect Kalydeco to experience -15% growth over the next two years with continuous declining returns.

Kalydeco serves a smaller population within the number of people globally that are affected by CF. Though Kalydeco is utilized for a larger age range (4 months +), while other drugs are for years 6+, the use of the drug is far more targeted to those with specific and rare mutations of CF, usually found in kids. Due to the patent expiring in 2027, declining growth until 2027 is expected.

Orkambi: We expect Orkambi to experience -12% growth over the next two years with continuous declining returns.

The active drugs in Orkambi treat a wider subset of the market and was leading product sales until last year's release of Trikafta. Different countries have regulatory standards that accept or reject some of Vertex's medicines, and France has cleared the way for the expanded use of Orkambi to treat the French CF population. However, Trikafta is also approved for widespread use and will likely dominate most markets it operates in. Due to Orkambi still being new to some international markets and it still being used (though less frequently) in the United States, we project higher returns than Kalydeco and Symdeko, although still negative growth rates.

DRUGS IN THE DEVELOPMENT PIPELINE

Vertex has experienced strong revenue growth over the past six years fueled by their Cystic Fibrosis treatments. Revenue growth in 2020 and 2021 has been driven by TRIKAFTA in particular as it experienced 820% in 2020. Vertex currently has six drugs in their development pipeline, as well as 2 drugs in a collaboration development pipeline. (18)

BUSINESS PROFILE

Vertex pharmaceuticals is a global biotechnology company that develops and manufactures treatments for degenerative diseases and chronic illnesses. Vertex derives a large proportion of its revenue from the sale of pharmaceutical drugs and treatments worldwide. The primary focus for Vertex's research, development and manufacturing of drugs has historically been for the treatment of Cystic Fibrosis, or CF. Cystic Fibrosis is an uncommon inherited disease that affects up to 100,000 people worldwide, and Vertex has been established as the dominant market leader in the sub-sector of CF treatment within biotechnology. (Healthline) In 2019, Vertex was granted approval for a transformative new drug for CF, Trikafta. Trikafta has generated more revenue than all of Vertex's other products combined in 2020, and has substantially outpaced the growth of typical pharmaceutical product launches.

Currently, Vertex has an additional CF drug in phase 3, along with new drugs in phases 1 and 2 that treat Sickle Cell Disease, Kidney Disease, Type 1 Diabetes, chronic pain and more.

PRODUCTS

Trikafta: We expect Trikafta to experience 35% and 25% growth in 2021 and 2022 respectively.

Trikafta was launched and granted FDA approval in late 2019. Trikafta has quickly become the world's most popular Cystic Fibrosis treatment medication due to its transformational drug composition, which takes the active drugs in the already popular Symdeko, and has an added drug, elexacaftor. In just the first year, Trikafta has done more in sales than all the other treatments that Vertex sells combined. We expect these trends to continue until Trikafta hits steady state growth in 2026.

Vertex continues to place an emphasis on developing treatments to Cystic Fibrosis in their drug pipeline but is also currently developing treatments for sickle cell disease, type 1 diabetes, and kidney diseases. These developments leave potential for Vertex to branch out of the Cystic Fibrosis market and reach new consumers. (18)

VALUATION ANALYSIS

WACC

WACC is a critical element to our valuation model, with multiple variables that have differing effects on our DCF/EP model. To calculate the WACC, we had to make several assumptions on the risk free rate, equity risk premium, marginal tax rate, and beta. The risk free rate of 1.56% that we chose to utilize is the 10 year treasury rate as of 11/16/2021. We chose a 10 year treasury rate due to it having extremely low default risk. The next assumption we made in order to calculate our WACC is a beta of 0.96. This beta was calculated by taking the average betas of the weekly 2y, 3y, 4y, 5y, and 10y from the Bloomberg terminals. Lastly, our marginal tax rate of 18.16% was calculated using the most recent tax information provided in Vertex's 2020 10-K. Taking all of these assumptions into account, we calculated a WACC of 6.22%.

COST OF EQUITY + DEBT

Many of the assumptions in the WACC calculations were also utilized in our cost of equity and debt calculations. Our cost of equity was calculated by multiplying beta by the equity risk premium and adding the risk free rate. For the equity risk premium, we used the Damodaran forward ERP of 4.93% to get a cost of equity of 6.3%. Cost of debt was calculated by multiplying the pre tax cost of debt by one minus the marginal tax rate. Our pre tax cost of debt assumption of 2.35% was the YTM on Regeneron's 10 year corporate bond. Vertex disclosed in their 2020 10-K they only invest in investment grade bonds and this bond has a Moody's rating of Baa3 and an S&P rating of BBB+, satisfying Vertex's requirements. Taking these assumptions into account, we calculated an after tax cost of debt of 1.93%.

DDM & DCF/EP MODEL

We generated our stock price estimate using multiple evaluation methods and then utilized the evaluation method believed to provide the most accurate stock price estimate. The Dividend Discount Model (DDM) evaluation method generated a price estimate of \$207. However, Vertex does not currently payout dividends, so we did not utilize this model. The DCF/EP model generated a price estimate of \$268, which is 46% higher than the current stock price. We chose the DCF/EP model as our evaluation method due it providing a more accurate estimate of Vertex's stock price.

Revenue Decomposition

Fiscal Years Ending Dec. 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Product Revenue (By Product)																	
INCIVEK	950.89	1161.813	466.36	24.07	17.99	0.61											
KALYDECO (proj. exp. 2027)		171.65	371.29	463.75	631.67	703.43	844.63	1007.5	991.06	802.87	682.44	580.07	464.06	371.25	278.44	208.83	208.83
ORKAMBI (proj. exp. 2030)					350.66	979.59	1320.85	1262.17	1331.89	907.51	798.61	597.36	507.76	406.20	406.20	324.96	243.72
SYMDEKO/SYMKEVI (proj. exp. 2027)								768.66	1417.67	628.58	502.86	402.29	301.72	226.29	169.72	118.80	83.16
TRIKAFTA/KAFTRIO (proj. exp. 2037)									420.1	3863.82	5216.16	6520.20	7824.24	8997.87	9897.66	10392.54	10912.17
Total Product Revenue	\$ 950.89	\$ 1,333.46	\$ 837.65	\$ 487.82	\$ 1,000.32	\$ 1,688.63	\$ 2,165.48	\$ 3,038.33	\$ 4,160.72	\$ 6,202.78	\$ 7,200.07	\$ 8,205.34	\$ 9,187.37	\$ 10,103.16	\$ 10,752.01	\$ 11,045.13	\$ 11,447.88
Collaborative Revenue	410	52	217.739	51.68	8.053	1.945	315.18	9.3	2.1	2.9	2.987	3.07661	3.1689083	3.263975549	3.361894815	3.46275166	3.56663421
Royalty Revenue	50.02	141.5	156.59	40.92	23.96	16.6	7.99	0	0	0	0	0	0	0	0	0	0
Total Collaborative and Royalty Revenue	459.74	193.59	374.33	92.60	32.01	18.55	323.17	9.30	2.10	2.90	2.987	3.07661	3.1689083	3.263975549	3.361894815	3.46275166	3.56663421
Total Revenue	\$ 1,410.63	\$ 1,527.05	\$ 1,211.98	\$ 580.42	\$ 1,032.33	\$ 1,702.18	\$ 2,488.65	\$ 3,047.63	\$ 4,162.82	\$ 6,205.68	\$ 7,203.06	\$ 8,208.41	\$ 9,190.54	\$ 10,106.43	\$ 10,755.38	\$ 11,048.60	\$ 11,451.44
Total Revenue Growth Rate	884%	8.25%	-20.63%	-52.11%	77.86%	64.89%	46.20%	22.46%	36.59%	49.07%	16.07%	13.96%	11.96%	9.97%	6.42%	2.73%	3.65%
Revenue Growth Rates by Product (y/y)																	
INCIVEK		22%	-60%	-94.84%	-25.26%	-96.61%	Discontinued										
KALYDECO			116%	24.90%	36.21%	11.36%	20.07%	19.28%	-1.63%	-18.99%	-15.00%	-15.00%	-20.00%	-20.00%	-25.00%	-25.00%	0.00%
ORKAMBI						179.36%	34.84%	-4.44%	5.22%	-31.86%	-12.00%	-15.00%	-15.00%	-20.00%	-20.00%	-25.00%	-25.00%
SYMDEKO/SYMKEVI									84.43%	-55.66%	-20.00%	-20.00%	-25.00%	-25.00%	-25.00%	-30.00%	-30.00%
TRIKAFTA/KAFTRIO										819.74%	35.00%	25.00%	20.00%	15.00%	10.00%	5.00%	5.00%
Total Product Revenue Growth Rate	n/a	40.23%	-37.18%	-41.76%	105.06%	68.31%	28.62%	40.31%	36.94%	49.08%	16.08%	13.96%	11.97%	9.97%	6.42%	2.73%	3.65%
Revenue by Geographic Location																	
United States	1389.57	1373.52	896.95	361.07	763.32	1321.81	1986.79	2365.08	3062.56	4829.28	5,527.41	6,298.89	7,052.55	7,755.37	8,253.36	8,478.36	8,787.50
Europe	20.29	129.79	279.56	197.61	219.60	320.46	420.32	543.18	885.76	1126.46	1,371.47	1,562.89	1,749.89	1,924.27	2,047.83	2,103.66	2,180.36
Other	0.77	23.74	35.47	21.73	49.42	59.91	81.55	139.34	214.50	249.94	304.17	346.62	388.10	426.77	454.18	466.56	483.57
Percent of Revenue by Geographic Location																	
United States	98.51%	89.95%	74.01%	62.21%	73.94%	77.65%	79.83%	77.60%	73.57%	77.82%	76.74%	76.74%	76.74%	76.74%	76.74%	76.74%	76.74%
Europe	1.44%	8.50%	23.07%	34.05%	21.27%	18.83%	16.89%	17.82%	21.28%	18.15%	19.04%	19.04%	19.04%	19.04%	19.04%	19.04%	19.04%
Other	0.05%	1.55%	2.93%	3.74%	4.79%	3.52%	3.28%	4.57%	5.15%	4.03%	4.22%	4.22%	4.22%	4.22%	4.22%	4.22%	4.22%

Income Statement

Vertex Pharmaceuticals																	
Income Statement																	
(In Millions)																	
Fiscal Years Ending Dec. 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Revenue:																	
Product revenues, net	950.89	1333.46	837.65	487.82	1000.32	1683.63	2165.48	3038.33	4160.73	6202.78	7200.07	8205.34	9187.37	10103.16	10752.01	11045.13	11447.88
Collaborative & royalty revenues	459.74	193.58	374.33	92.59	32.01	18.55	323.17	9.27	2.10	2.90	2.99	3.08	3.17	3.26	3.36	3.46	3.57
Total revenues	1410.63	1527.04	1211.98	580.42	1032.34	1702.18	2488.65	3047.60	4162.82	6205.68	7203.06	8208.41	9190.54	10106.43	10755.38	11048.60	11451.44
Expenses:																	
Cost of sales	63.63	236.74	88.98	39.73	117.15	206.81	272.68	409.54	547.76	736.30	901.23	1027.05	1149.97	1264.60	1345.82	1382.51	1432.92
Royalty expenses	16.88	43.14	41.30	21.26	7.36	3.65	2.44	-	-	-	-	-	-	-	-	-	-
Research & development expenses	707.71	806.19	918.78	855.51	995.92	1047.69	1324.63	1416.48	1754.54	1829.54	2160.92	2462.52	2757.16	3031.93	3226.61	3314.58	3435.43
Sales, general & administrative expenses	400.72	436.80	362.34	305.41	376.58	432.83	496.08	557.62	658.50	770.46	1196.87	1363.92	1527.11	1679.29	1787.12	1835.85	1902.78
Restructuring expenses (income)	2.07	1.84	40.52	50.93	2.21	1.26	14.25	-0.18	-	-	-	-	-	-	-	-	-
Intangible asset impairment charge	105.80	-	663.50	-	-	-	255.34	29.00	-	-	-	-	-	-	-	-	-
Depreciation & amortization expense	35.04	38.19	48.37	63.26	62.34	61.40	61.40	72.42	106.94	109.52	100.14	168.25	187.15	203.23	215.22	216.28	204.32
Total costs & expenses	1296.81	1524.71	2115.42	1272.83	1499.22	1692.24	2365.41	2412.45	2960.80	3336.29	4259.01	4853.50	5434.25	5975.82	6359.56	6532.93	6771.14
Income (loss) from operations	113.82	2.33	-903.45	-692.41	-466.88	9.94	123.24	635.15	1202.03	2869.39	2944.05	3354.92	3756.29	4130.60	4395.82	4515.66	4680.31
Interest income	1.88	1.94	0.00	0.00	0.00	0.00	0.00	0.00	63.68	22.24	213.08	258.35	341.49	437.93	547.56	669.27	799.83
Interest expense	38.45	16.65	22.73	72.86	84.21	81.43	57.55	34.12	58.50	58.15	190.58	202.37	229.56	256.13	280.90	298.45	306.38
Other Income (Expense), net	0.00	0.00	-49.94	30.40	-6.72	4.13	-81.38	-0.79	192.18	296.42	224.91	256.30	286.96	315.56	335.83	344.98	357.56
Income (loss) before provision for (benefit from) income taxes	77.25	-12.38	-976.12	-734.88	-557.80	-67.37	-15.69	600.24	1399.38	3129.90	3191.46	3667.20	4155.18	4627.97	4998.31	5231.46	5531.31
Income tax expense (benefit)	19.27	38.75	-288.57	6.96	30.38	16.67	-107.32	-1486.86	218.11	405.15	670.21	770.11	872.59	971.87	1049.65	1098.61	1161.58
Net income (loss)	57.98	-51.14	-687.55	-741.83	-588.18	-84.03	91.63	2087.10	1181.27	2724.75	2521.25	2897.09	3282.59	3656.10	3948.66	4132.85	4369.74
Basic EPS	0.14	-0.50	-1.98	-3.14	-2.31	-0.46	1.06	8.24	4.58	10.44	9.65	10.98	12.32	13.60	14.57	15.12	15.87
Total Shares Outstanding	209.30	217.29	233.79	241.76	246.31	248.30	253.25	255.17	258.99	259.89	262.57	265.13	267.58	269.93	272.17	274.32	276.39
Weighted Average Shares Outstanding		213.30	225.54	237.78	244.04	247.30	250.78	254.21	257.08	259.44	261.23	263.85	266.36	268.75	271.05	273.25	275.35
Does not pay a dividend																	

Balance Sheet

Vertex Pharmaceuticals												
Balance Sheet												
Fiscal Years Ending Dec. 31	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Scale	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions
Cash & cash equivalents	1183.95	1665.41	2650.13	3109.32	5988.19	7304.89	9878.23	12866.80	16266.59	20042.71	24094.88	28338.88
Marketable securities	250.61	423.25	518.11	698.97	670.71	768.62	793.22	818.60	844.80	871.83	899.73	928.52
Restricted cash & cash equivalents (Alios inc & variable interest entity)	47.76	1.49	-	-	-	-	-	-	-	-	-	-
Accounts receivable, net	201.08	281.34	409.69	633.52	885.35	951.47	1084.27	1214.01	1334.99	1420.71	1459.44	1512.65
Inventories	77.60	111.83	124.36	167.50	280.78	312.35	355.94	398.53	438.25	466.39	479.10	496.57
Prepaid expenses & other current assets	70.53	165.64	140.82	213.52	308.35	367.61	418.92	469.05	515.79	548.91	563.88	584.43
Total current assets	1831.54	2648.96	3843.11	4822.83	8133.38	9704.95	12530.59	15766.98	19400.41	23350.55	27497.03	31861.06
Total property & equipment, gross	1086.16	1221.56	1263.45	1437.62	1749.11	2501.31	2850.43	3191.48	3509.53	3734.88	3836.71	3976.60
Less: accumulated depreciation & amortization	387.80	432.12	451.44	692.54	790.58	890.72	1058.97	1246.12	1449.35	1664.57	1880.85	2085.17
Property & equipment, net	698.36	789.44	812.01	745.08	958.53	1610.60	1791.46	1945.36	2060.18	2070.32	1955.86	1891.43
Intangible assets	284.34	29.00	-	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00
Goodwill	50.38	50.38	50.38	1002.16	1002.16	1002.16	1002.16	1002.16	1002.16	1002.16	1002.16	1002.16
Deferred tax assets	-	-	1499.67	1190.82	882.78	881.36	880.60	880.60	880.60	880.60	880.60	880.60
Operating lease assets	-	-	-	-	325.56	547.04	608.47	660.74	699.74	703.18	664.30	642.42
Cost method investments	20.28	20.45	-	-	-	-	-	-	-	-	-	-
Notes receivable	-	-	-	-	-	-	-	-	-	-	-	-
Restricted cash	0.05	-	-	-	-	-	-	-	-	-	-	-
Other assets	11.83	7.78	40.73	157.58	49.39	49.79	50.19	50.59	50.99	51.40	51.81	52.22
Total assets	2896.79	3546.01	6245.90	8318.47	11751.81	14195.90	17263.46	20706.43	24494.09	28458.20	32451.76	36729.89
Accounts payable	61.45	73.99	110.99	87.61	155.14	213.64	243.46	272.59	299.75	319.00	327.69	339.64
Accrued expenses & other current liabilities	315.25	443.96	604.50	1116.91	1404.97	1522.23	1734.69	1942.25	2135.80	2272.94	2334.91	2420.04
Accrued interest	-	-	-	-	-	-	-	-	-	-	-	-
Deferred revenues, current portion	6.01	5.17	-	-	-	-	-	-	-	-	-	-
Accrued restructuring expense, current portion	6.05	2.18	-	-	-	-	-	-	-	-	-	-
Capital lease obligations, current portion	19.43	22.53	9.82	-	-	-	-	-	-	-	-	-
Senior secured term loan, current portion	300.00	-	-	-	-	-	-	-	-	-	-	-
Customer deposits	73.42	232.40	354.40	-	-	-	-	-	-	-	-	-
Income taxes payable (Alios)	-	-	-	-	-	-	-	-	-	-	-	-
Other current liabilities	10.94	27.03	40.59	130.31	317.42	152.45	173.72	194.51	213.89	227.63	233.83	242.36
Total current liabilities	792.54	807.26	1120.29	1334.83	1877.53	1888.31	2151.87	2409.34	2649.44	2819.57	2896.44	3002.05
Long-term finance lease liabilities	34.98	20.50	19.66	538.58	889.51	982.19	1119.28	1253.20	1378.09	1466.58	1506.56	1561.49
Long-term contingent consideration	-	-	-	176.50	189.60	262.74	299.41	335.23	368.64	392.31	403.01	417.70
Deferred revenues, excluding current portion	6.63	1.73	-	-	-	-	-	-	-	-	-	-
Accrued restructuring expense, excluding current portion	1.91	-	-	-	-	-	-	-	-	-	-	-
Convertible senior subordinated notes (due 2015)	-	-	-	-	-	-	-	-	-	-	-	-
Deferred tax liability	134.06	6.34	-	-	-	-	-	-	-	-	-	-
Construction financing lease obligation, excluding current portion	486.36	563.41	561.89	-	-	-	-	-	-	-	-	-
Senior secured term loan, excluding current portion	-	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	102.12	104.48	108.85	183.32	108.36	121.43	121.43	121.43	121.43	121.43	121.43	121.43

Balance Sheet

Vertex Pharmaceuticals												
Balance Sheet												
Fiscal Years Ending Dec. 31	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Convertible senior subordinated notes (due 2015)	-	-	-	-	-	-	-	-	-	-	-	-
Deferred tax liability	134.06	6.34	-	-	-	-	-	-	-	-	-	-
Construction financing lease obligation, excluding current portion	486.36	563.41	561.89	-	-	-	-	-	-	-	-	-
Senior secured term loan, excluding current portion	-	-	-	-	-	-	-	-	-	-	-	-
Other long-term liabilities	102.12	104.48	108.85	183.32	108.36	121.43	121.43	121.43	121.43	121.43	121.43	121.43
Total liabilities	1558.60	1503.71	1810.70	2233.22	3064.99	3254.67	3691.98	4119.20	4517.60	4799.88	4927.43	5102.66
Redeemable noncontrolling interest (Alios)	-	-	-	-	-	-	-	-	-	-	-	-
Common Equity	6508.87	7159.43	7423.55	7939.68	7896.63	7990.19	8083.74	8177.30	8270.86	8364.42	8457.98	8551.54
Additional paid-in capital	6506.80	7157.36	7421.48	7937.61	7894.03	7894.03	7894.03	7894.03	7894.03	7894.03	7894.03	7894.03
Foreign currency translation adjustment	-7.86	-21.03	-11.23	-0.90	-15.68	-15.68	-15.68	-15.68	-15.68	-15.68	-15.68	-15.68
Unrealized holding gains (losses) on available-for-sale debt securities	-	-	-0.54	0.50	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Unrealized holding gains (losses) on marketing securities	17.52	24.48	-	-	-	-	-	-	-	-	-	-
Unrealized gains (losses) on foreign currency forward contracts	11.51	-15.02	12.42	-1.58	-53.14	-53.14	-53.14	-53.14	-53.14	-53.14	-53.14	-53.14
Accumulated other comprehensive income (loss)	21.17	-11.57	0.66	-1.97	-68.48	-68.48	-68.48	-68.48	-68.48	-68.48	-68.48	-68.48
Retained earnings (accumulated deficit)	-5373.84	-5119.72	-2989.48	-1852.98	858.67	3019.53	5556.21	8478.41	11774.11	15362.37	19134.83	23144.16
Total Vertex Pharmaceuticals Incorporated shareholders' equity	1156.58	2028.58	4435.20	6085.24	8686.82	10941.23	13571.48	16587.23	19976.49	23658.32	27524.33	31627.22
Noncontrolling interest	181.61	13.73	-	-	0.00	-	-	-	-	-	-	-
Total shareholders' equity	1338.19	2042.31	4435.20	6085.24	8686.82	10941.23	13571.48	16587.23	19976.49	23658.32	27524.33	31627.22
Total Liabilities and Shareholders Equity	2896.79	3546.01	6245.90	8318.47	11751.81	14195.90	17263.46	20706.43	24494.09	28458.20	32451.76	36729.89

Historical Cash Flow Statement

Vertex Pharmaceuticals										
Historical Cash Flow Statement										
Fiscal Years Ending Dec. 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Scale	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions	Millions
Net income (loss)	41.179	-51.135	-687.55	-742.745	-588.181	-84.031	91.635	2087.103	1176.81	2711.647
Stock-based compensation expense	118.226	114.285	127.303	177.542	231.025	237.705	290.736	325.047	360.489	429.461
Depreciation & amortization expense	35.041	38.191	48.365	63.257	62.343	61.398	61.397	72.42	106.941	109.515
Deferred income taxes (including benefit from valuation allowance release in 2018)	-7.501	36.66	-285.053	0.281	3.283	16.961	-120.513	-1512.325	167.387	277.341
Losses (gains) on equity securities	-	-	-	-	-	-	-	-2.558	-197.597	-311.937
Increase in fair value of contingent consideration	-	-	-	-	-	-	-	-	4.459	13.1
Other non-cash items, net	0.264	-0.212	6.742	-	9.532	6.14	-2.804	12.089	16.942	78.832
Accounts receivable, net	-170.606	39.912	53.363	7.428	-104.847	-33.027	-71.759	-108.152	-225.587	-223.444
Inventories	-111.388	-29.925	7.142	-16.469	-23.146	-16.45	-44.984	-31.965	-64.047	-132.014
Prepaid expenses & other assets	-1.717	-12.259	-12.061	-15.771	-9.26	-8.699	-111.063	16.684	35.44	-297.562
Accounts payable	37.468	14.892	-49.234	25.048	-1.709	-11.745	8.753	36.554	-22.785	51.276
Accrued expenses & other liabilities	116.921	29.232	43.725	-3.27	102.746	88.649	246.217	195.623	210.878	547.29
Net cash flows from operating activities	143.735	267.841	-51.57	-513.199	-365.432	236.103	844.942	1270.286	1569.33	3253.505
Maturities of available-for-sale debt securities	1016.04	1367.927	2348.295	1557.938	1067.443	757.562	369.214	431.576	475.924	372.342
Sale of equity securities	-	-	-	-	-	-	-	-	94.936	437.567
Purchases of available-for-sale debt securities	-721.545	-1705.829	-2412.418	-1424.172	-633.041	-616.625	-532.581	-431.918	-537.196	-431.396
Purchases of property & equipment	-34.595	-71.14	-51.393	-51.201	-45.302	-56.563	-99.421	-95.524	-75.451	-259.798
Investment in equity securities	-	-	-	-	-	-	-	-83.471	-39.319	-19.327
Net cash flows from investing activities	212.412	-425.817	-54.13	73.959	268.856	104.469	-437.681	-202.158	-1235.318	99.388
Issuances of common stock under benefit plans	124.862	191.721	265.878	274.615	185.592	68.23	344.84	289.293	343.244	264.946
Repurchases of common stock	-	-	-	-	-	-	-	-350.043	-192.015	-539.136
Net cash flows from financing activities	-124.238	172.204	180.884	497.376	188.919	133.271	68.404	-71.219	126.773	-505.281
Effect of changes in exchange rates on cash	0.214	-0.141	4.708	-2.176	-2.834	-4.666	5.802	-6.182	1.643	20.552
Net increase (decrease) in cash & cash equivalents	232.123	14.087	79.892	55.96	89.509	469.177	481.467	990.727	462.428	2868.164
Cash, cash equivalents & restricted cash - beginning of period	243.197	475.32	489.407	569.299	625.259	714.768	1183.945	1667.526	2658.253	3120.681
Cash, cash equivalents & restricted cash - end of period	475.32	489.407	569.299	625.259	714.768	1183.945	1665.412	2658.253	3120.681	5988.845

Forecasted Cash Flow Statement

<i>Fiscal Years Ending Dec. 31</i>	2021E	2022E	2023E	2024E	2025E	2026E	2027E
<i>Scale</i>							
Net income (loss)	2521.25	2897.09	3282.59	3656.10	3948.66	4132.85	4369.74
Depreciation & amortization expense	100.14	168.25	187.15	203.23	215.22	216.28	204.32
Deferred income taxes (including benefit from valuation allowance release in 2018)	1.42	0.76	0.00	0.00	0.00	0.00	0.00
Increase in fair value of contingent consideration	73.14	36.67	35.82	33.41	23.67	10.70	14.69
Accounts receivable, net	-66.12	-132.80	-129.73	-120.98	-85.72	-38.73	-53.21
Inventories	-31.57	-43.60	-42.59	-39.72	-28.14	-12.71	-17.47
Prepaid expenses & other assets	-59.26	-51.31	-50.12	-46.74	-33.12	-14.96	-20.56
Other Assets	-0.39	-0.40	-0.40	-0.40	-0.41	-0.41	-0.41
Accounts payable	58.50	29.82	29.13	27.16	19.25	8.70	11.95
LT Finance Lease Liabilities	92.69	137.09	133.92	124.89	88.49	39.98	54.93
Operating Lease Assets	-221.47	-61.43	-52.27	-39.00	-3.44	38.88	21.88
Accrued expenses & other liabilities	117.26	212.46	207.55	193.55	137.14	61.97	85.13
Other LT Liabilities	13.07	0.00	0.00	0.00	0.00	0.00	0.00
Other Current Liabilities	-164.98	21.28	20.79	19.38	13.73	6.21	8.53
Net cash flows from operating activities	2433.66	3213.89	3621.84	4010.88	4295.34	4448.73	4679.52
Maturities of available-for-sale debt securities	-97.91	-24.60	-25.38	-26.20	-27.03	-27.90	-28.79
Capitilization of Intangible assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Change in Goodwill	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Purchases of property & equipment	-752.20	-349.12	-341.05	-318.05	-225.35	-101.82	-139.89
Net Cash Flows of Investing	-850.11	-373.71	-366.43	-344.24	-252.39	-129.72	-168.68
Issuance of Common Stock	93.56	93.56	93.56	93.56	93.56	93.56	93.56
Repurchases of common stock	-360.40	-360.40	-360.40	-360.40	-360.40	-360.40	-360.40
Net cash flows from financing activities	-266.84	-266.84	-266.84	-266.84	-266.84	-266.84	-266.84
Effect of changes in exchange rates on cash							
Cash, cash equivalents & restricted cash - beginning of period	5988.19	7304.89	9878.23	12866.80	16266.59	20042.71	24094.88
Net increase (decrease) in cash & cash equivalents	1316.71	2573.33	2988.57	3399.80	3776.12	4052.17	4244.00
Cash, cash equivalents & restricted cash - end of period	7304.89	9878.23	12866.80	16266.59	20042.71	24094.88	28338.88

Common Size Income Statement

Vertex Pharmaceuticals																	
Common Size Income Statement																	
Fiscal Years Ending Dec. 31	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Revenue:																	
Product revenues, net	67.41%	87.32%	69.11%	84.05%	96.90%	98.91%	87.01%	99.70%	99.95%	99.95%	99.96%	99.96%	99.97%	99.97%	99.97%	99.97%	99.97%
Collaborative & royalty revenues	32.59%	12.68%	30.89%	15.95%	3.10%	1.09%	12.99%	0.30%	0.05%	0.05%	0.04%	0.04%	0.03%	0.03%	0.03%	0.03%	0.03%
Total revenues	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Expenses:																	
Cost of sales (as % of product rev)	6.69%	17.75%	10.62%	8.14%	11.71%	12.28%	12.59%	13.48%	13.16%	11.87%	12.52%	12.52%	12.52%	12.52%	12.52%	12.52%	12.52%
Royalty expenses	1.20%	2.83%	3.41%	3.66%	0.71%	0.21%	0.10%	-	-	-	-	-	-	-	-	-	-
Research & development expenses	50.17%	52.79%	75.81%	147.40%	96.47%	61.55%	53.23%	46.48%	42.15%	29.48%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
Sales, general & administrative expenses	28.41%	28.60%	29.90%	52.62%	36.48%	25.43%	19.93%	18.30%	15.82%	12.42%	16.62%	16.62%	16.62%	16.62%	16.62%	16.62%	16.62%
Restructuring expenses (income)	0.15%	0.12%	3.34%	8.77%	0.21%	0.07%	0.57%	-0.01%	-	-	-	-	-	-	-	-	-
Intangible asset impairment charge	7.50%	-	54.75%	-	-	-	10.26%	0.95%	-	-	-	-	-	-	-	-	-
Depreciation & amortization expense	2.48%	2.50%	3.99%	10.90%	6.04%	3.61%	2.47%	2.38%	2.57%	1.76%	1.39%	2.05%	2.04%	2.01%	2.00%	1.96%	1.78%
Total costs & expenses	91.93%	99.85%	174.54%	219.30%	145.23%	99.42%	95.05%	79.16%	71.12%	53.76%	59.13%	59.13%	59.13%	59.13%	59.13%	59.13%	59.13%
Income (loss) from operations	8.07%	0.15%	-74.54%	-119.30%	-45.23%	0.58%	4.95%	20.84%	28.88%	46.24%	40.87%	40.87%	40.87%	40.87%	40.87%	40.87%	40.87%
Interest income	0.13%	0.13%	-	-	-	-	-	-	1.53%	0.36%	2.96%	3.15%	3.72%	4.33%	5.09%	6.06%	6.98%
Interest expense	2.73%	1.09%	1.88%	12.55%	8.16%	4.78%	2.31%	1.12%	1.41%	0.94%	2.65%	2.47%	2.50%	2.53%	2.61%	2.70%	2.68%
Other Income (Expense), net	-	-	-4.12%	5.24%	-0.65%	0.24%	-3.27%	-0.03%	4.62%	4.78%	3.12%	3.12%	3.12%	3.12%	3.12%	3.12%	3.12%
Income (loss) before provision for (benefit from) income taxes	5.48%	-0.81%	-80.54%	-126.61%	-54.03%	-3.96%	-0.63%	19.70%	33.62%	50.44%	44.31%	44.68%	45.21%	45.79%	46.47%	47.35%	48.30%
Income tax expense (benefit)	1.37%	2.54%	-23.81%	1.20%	2.94%	0.98%	-4.31%	-48.79%	5.24%	6.53%	9.30%	9.38%	9.49%	9.62%	9.76%	9.94%	10.14%
Net income (loss)	4.11%	-3.35%	-56.73%	-127.81%	-56.98%	-4.94%	3.68%	68.48%	28.38%	43.91%	35.00%	35.29%	35.72%	36.18%	36.71%	37.41%	38.16%

Common Size Balance Sheet

Fiscal Years Ending Dec. 31	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
<i>Scale</i>	Millions											
Cash & cash equivalents	69.55%	66.92%	86.96%	74.69%	96.50%	101.41%	120.34%	140.00%	160.95%	186.35%	218.08%	247.47%
Marketable Securities	14.72%	17.01%	17.00%	16.79%	10.81%	10.67%	9.66%	8.91%	8.36%	8.11%	8.14%	8.11%
Accounts receivable, net	11.81%	11.31%	13.44%	15.22%	14.27%	13.21%	13.21%	13.21%	13.21%	13.21%	13.21%	13.21%
Inventories	4.56%	4.49%	4.08%	4.02%	4.52%	4.34%	4.34%	4.34%	4.34%	4.34%	4.34%	4.34%
Prepaid expenses & other current assets	4.14%	6.66%	4.62%	5.13%	4.97%	5.10%	5.10%	5.10%	5.10%	5.10%	5.10%	5.10%
Total current assets	107.60%	106.44%	126.10%	115.85%	131.06%	134.73%	152.66%	171.56%	191.96%	217.11%	248.87%	278.23%
Total property & equipment, gross	63.81%	49.09%	41.46%	34.53%	28.19%	34.73%	34.73%	34.73%	34.73%	34.73%	34.73%	34.73%
Less: accumulated depreciation & amortization	22.78%	17.36%	14.81%	16.64%	12.74%	12.37%	12.90%	13.56%	14.34%	15.48%	17.02%	18.21%
Property & equipment, net	41.03%	31.72%	26.64%	17.90%	15.45%	22.36%	21.82%	21.17%	20.38%	19.25%	17.70%	16.52%
Intangible assets	16.70%	1.17%	0.00%	9.61%	6.45%	5.55%	4.87%	4.35%	3.96%	3.72%	3.62%	3.49%
Goodwill	2.96%	2.02%	1.65%	24.07%	16.15%	13.91%	12.21%	10.90%	9.92%	9.32%	9.07%	8.75%
Deferred tax assets	0.00%	0.00%	49.21%	28.61%	14.23%	12.24%	10.73%	9.58%	8.71%	8.19%	7.97%	7.69%
Operating lease assets	0.00%	0.00%	0.00%	0.00%	5.25%	7.59%	7.41%	7.19%	6.92%	6.54%	6.01%	5.61%
Total assets	170.18%	142.49%	204.94%	199.83%	189.37%	197.08%	210.31%	225.30%	242.36%	264.60%	293.72%	320.74%
Accounts payable	3.61%	2.97%	3.64%	2.10%	2.50%	2.97%	2.97%	2.97%	2.97%	2.97%	2.97%	2.97%
Accrued expenses & other current liabilities	18.52%	17.84%	19.83%	26.83%	22.64%	21.13%	21.13%	21.13%	21.13%	21.13%	21.13%	21.13%
Other current liabilities	0.64%	1.09%	1.33%	3.13%	5.12%	2.12%	2.12%	2.12%	2.12%	2.12%	2.12%	2.12%
Total current liabilities	46.56%	32.44%	36.76%	32.07%	30.26%	26.22%						
Long-term finance lease liabilities	2.05%	0.82%	0.65%	12.94%	14.33%	13.64%	13.64%	13.64%	13.64%	13.64%	13.64%	13.64%
Long-term contingent consideration	0.00%	0.00%	0.00%	4.24%	3.06%	3.65%	3.65%	3.65%	3.65%	3.65%	3.65%	3.65%
Other long-term liabilities	6.00%	4.20%	3.57%	4.40%	1.75%	1.69%	1.48%	1.32%	1.20%	1.13%	1.10%	1.06%
Total liabilities	91.56%	60.42%	59.41%	53.65%	49.39%	45.18%	44.98%	44.82%	44.70%	44.63%	44.60%	44.56%
Common Equity	382.39%	287.68%	243.58%	190.73%	127.25%	110.93%	98.48%	88.98%	81.84%	77.77%	76.55%	74.68%
Accumulated other comprehensive income (loss)	1.24%	-0.46%	0.02%	-0.05%	-1.10%	-0.95%	-0.83%	-0.75%	-0.68%	-0.64%	-0.62%	-0.60%
Retained earnings (accumulated deficit)	-315.70%	-205.72%	-98.09%	-44.51%	13.84%	41.92%	67.69%	92.25%	116.50%	142.83%	173.19%	202.11%
Total Vertex Pharmaceuticals Incorporated shareholders' equity	67.95%	81.51%	145.53%	146.18%	139.98%	151.90%	165.34%	180.48%	197.66%	219.97%	249.12%	276.19%
Total shareholders' equity	78.62%	82.06%	145.53%	146.18%	139.98%	151.90%	165.34%	180.48%	197.66%	219.97%	249.12%	276.19%
Total Liabilities and Shareholders Equity	170.18%	142.49%	204.94%	199.83%	189.37%	197.08%	210.31%	225.30%	242.36%	264.60%	293.72%	320.74%

Drivers

		2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
EBIT:													
Revenue		\$ 1,702.18	\$ 2,488.65	\$ 3,047.63	\$ 4,162.82	\$ 6,205.68	\$ 7,203.06	\$ 8,208.41	\$ 9,190.54	\$ 10,106.43	\$ 10,755.38	\$ 11,048.60	\$ 11,451.44
	R&D Expense	1047.69	1324.625	1416.476	1754.54	1829.537	2138.0724	2436.156444	2749.903115	2980.45906	3191.07336	3418.259301	3650.570664
	SG&A	432.829	496.079	557.616	658.498	770.456	1184.214725	1349.314613	1523.089564	1650.787646	1767.440644	1893.272181	2021.942537
	COGS	206.811	272.675	409.539	547.758	736.3	891.6937023	1016.052041	1146.944957	1243.127876	1330.990188	1425.766315	1522.680542
	Depreciation and amortization	61.398	61.397	72.42	106.941	109.515	100.1353215	165.492221	184.2490185	202.9403229	209.6193055	213.1891447	218.3899501
Interest PV		25.172402	23.750713	22.513846	21.26131748	2.417712032	9.183862376	15.43139503	17.16427091	18.63883103	19.73895072	19.83601707	18.73938174
EBIT		\$ (21.38)	\$ 357.62	\$ 614.09	\$ 1,116.34	\$ 2,762.29	\$ 2,898.12	\$ 3,256.83	\$ 3,603.52	\$ 4,047.75	\$ 4,275.99	\$ 4,117.94	\$ 4,056.60
Marginal Tax Rate													
Ebit:		\$ (21.38)	\$ 357.62	\$ 614.09	\$ 1,116.34	\$ 2,762.29	\$ 2,898.12	\$ 3,256.83	\$ 3,603.52	\$ 4,047.75	\$ 4,275.99	\$ 4,117.94	\$ 4,056.60
Adjusted Taxes:													
Provision for Income Tax		16.67	-107.32	-1486.86	218.11	405.15	670.21	770.11	872.59	971.87	1049.65	1098.61	1161.58
Interest Income		0	0	0	5.3541486	4.850834311	38.68632419	46.9048754	61.99811636	79.50832712	99.4123789	121.5076154	145.2116726
Interest Expense		28.848069	20.204951	11.861642	4.9189422	12.6840625	34.60017771	36.74136543	41.67817235	46.50091124	50.99836599	54.18503528	55.62488779
Other Income (Expense), net		1.4630922	-28.572012	-0.2746475	16.15855108	64.65597853	40.83282596	46.53201377	52.09951826	57.29150564	60.97028568	62.63249165	64.91617309
PV of Operating Leases		8.9175656	8.3385227	7.8270517	1.78768575	0.527358266	1.667364529	2.801627426	3.116237518	3.383949417	3.583680257	3.601303015	3.402204774
Total Adjusted Taxes:		52.97	-50.21	-1466.90	203.30	348.86	626.96	716.22	803.28	884.96	943.84	972.25	1010.47
Change in Deferred Taxes:													
Deferred Tax assets		0.00	0.00	1499.67	1190.82	882.78	881.36	880.60	880.60	880.60	880.60	880.60	880.60
Deferred Tax liabilities		134.06	6.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Change in Deferred Taxes		23.62	-127.72	-1506.01	308.86	308.04	1.42	0.76	0.00	0.00	0.00	0.00	0.00
NOPLAT		\$ (50.72)	\$ 280.11	\$ 574.98	\$ 1,221.90	\$ 2,721.47	\$ 2,272.58	\$ 2,541.37	\$ 2,800.24	\$ 3,162.79	\$ 3,332.15	\$ 3,145.69	\$ 3,046.13
Working Capital:													
Normal Cash	545.54	797.60	976.73	1334.16	1988.88	2308.53	2630.74	2945.51	3239.04	3447.03	3541.00	3670.11	
Accounts receivable, net	201.08	281.34	409.69	633.52	885.35	951.47	1084.27	1214.01	1334.99	1420.71	1459.44	1512.65	
Inventories	77.60	111.83	124.36	167.50	280.78	312.35	355.94	398.53	438.25	466.39	479.10	496.57	
Prepaid expenses & other current assets	70.53	165.64	140.82	213.52	308.35	367.61	418.92	469.05	515.79	548.91	563.88	584.43	
Total Operating Assets	894.76	1356.40	1651.60	2348.69	3463.36	3939.97	4489.88	5027.09	5528.07	5883.03	6043.42	6263.77	
Operating Liabilities:													
Accounts payable	61.45	73.99	110.99	87.61	155.14	213.64	243.46	272.59	299.75	319.00	327.69	339.64	
Accrued expenses & other current liabilities	315.25	443.96	604.50	1116.91	1404.97	1522.23	1734.69	1942.25	2135.80	2272.94	2334.91	2420.04	
Other current liabilities	10.94	27.03	40.59	130.31	317.42	152.45	173.72	194.51	213.89	227.63	233.83	242.36	
Total Operating Liabilities	387.64	544.98	756.07	1334.83	1877.53	1888.31	2151.87	2409.34	2649.44	2819.57	2896.44	3002.05	
Net Operating Working Capital	507.11	811.42	895.53	1013.86	1585.83	2051.65	2338.01	2617.75	2878.62	3063.47	3146.98	3261.73	
Net PPE (+)	698.36	789.44	812.01	745.08	958.53	1610.60	1791.46	1945.36	2060.18	2070.32	1955.86	1891.43	
Other Assets	11.83	7.78	40.73	157.58	49.39	49.79	50.19	50.59	50.99	51.40	51.81	52.22	
Operating Lease assets	0.00	0.00	0.00	0.00	325.56	547.04	608.47	660.74	699.74	703.18	664.30	642.42	
Intangible assets	284.34	29.00	0.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	400.00	
LT Finance Lease Liab	34.98	20.50	19.66	538.58	889.51	982.19	1119.28	1253.20	1378.09	1466.58	1506.56	1561.49	
Other LT Liabilities	102.12	104.48	108.85	183.32	108.36	121.43	121.43	121.43	121.43	121.43	121.43	121.43	
PV Operating Leases	1009.3801	956.81454	903.5834	102.7501926	390.3043934	655.8178932	729.4632772	792.1305156	838.8844336	843.0096502	796.403814	770.1684339	
Invested Capital	2373.93	2469.48	2523.34	1697.38	2711.77	4211.28	4676.88	5091.95	5428.91	5543.37	5387.37	5335.05	

Drivers Continued...

Free Cash Flow (FCF):																								
NOPLAT	\$	(50.72)	\$	280.11	\$	574.98	\$	1,221.90	\$	2,721.47	\$	2,272.58	\$	2,541.37	\$	2,800.24	\$	3,162.79	\$	3,332.15	\$	3,145.69	\$	3,046.13
Change in IC		168.08		95.55		53.86		-825.95		1014.38		1499.51		465.60		415.06		336.96		114.46		-155.99		-52.32
FCF	\$	(218.80)	\$	184.56	\$	521.12	\$	2,047.85	\$	1,707.09	\$	773.07	\$	2,075.77	\$	2,385.17	\$	2,825.83	\$	3,217.69	\$	3,301.68	\$	3,098.45
Return on Invested Capital (ROIC):																								
NOPLAT	\$	(50.72)	\$	280.11	\$	574.98	\$	1,221.90	\$	2,721.47	\$	2,272.58	\$	2,541.37	\$	2,800.24	\$	3,162.79	\$	3,332.15	\$	3,145.69	\$	3,046.13
Beginning IC		2205.86		2373.93		2469.48		2523.34		1697.38		2711.77		4211.28		4676.88		5091.95		5428.91		5543.37		5387.37
ROIC		-2.30%		11.80%		23.28%		48.42%		160.33%		83.80%		60.35%		59.87%		62.11%		61.38%		56.75%		56.54%
Economic Profit (EP):																								
Beginning IC		2205.86		2373.93		2469.48		2523.34		1697.38		2711.77		4211.28		4676.88		5091.95		5428.91		5543.37		5387.37
x (ROIC - WACC)		-8.52%		5.58%		17.07%		42.21%		154.12%		77.59%		54.13%		53.66%		55.90%		55.16%		50.53%		50.32%
EP		-187.88205		132.50256		421.42872		1064.999887		2615.928474		2103.970024		2279.519213		2509.431828		2846.180435		2994.58293		2801.011221		2711.144183

WACC

Cost of Equity:		<i>ASSUMPTIONS:</i>
Risk-Free Rate	1.56%	10 year treasury bond YTM
Beta	0.96	Average of weekly 2y, 3y, 4y, 5y, and 10 y beta
Equity Risk Premium	4.93%	Damodaran forward looking ERP
Cost of Equity	6.30%	
Cost of Debt:		
Risk-Free Rate	1.56%	10 year treasury bond YTM
Implied Default Premium	0.79%	
Pre-Tax Cost of Debt	2.35%	YTM on Regeneron 10 Year Corporate Bond. Investment grade
Marginal Tax Rate	18%	
After-Tax Cost of Debt	1.93%	
Cost of Preferred Stock:		
Market Value of Common Equity:		MV Weights
Total Shares Outstanding	259.89	
Current Stock Price	\$179.58	
MV of Equity	46,671.05	98.13%
Market Value of Debt:		
Short-Term Debt		
Current Portion of LTD		
Long-Term Debt		
PV of Operating Leases	889.51	
MV of Total Debt	889.51	1.87%
Market Value of the Firm	47,560.55	100.00%
Estimated WACC		6.22%

DCF/EP & DDM

Vertex Pharmaceuticals							
Discounted Cash Flow (DCF) and Economic Profit (EP) Valuation Models							
Key Inputs:							
CV Growth of NOPLAT	2.50%						
CV Year ROIC	56.54%						
WACC	6.22%						
Cost of Equity	6.30%						
Fiscal Years Ending Dec. 31							
	2021E	2022E	2023E	2024E	2025E	2026E	2027E
DCF Model:							
Free Cash Flow (FCF)	773.1	2075.8	2385.2	2825.8	3217.7	3301.7	3098.4
Continuing Value (CV)							78308.8
PV of FCF	727.8	1839.9	1990.3	2220.0	2379.9	2299.1	54528.6
Value of Operating Assets:	65985.5						
Non-Operating Adjustments							
Marketable Securities	670.7						
ESOP	-353.1						
Debt							
Value of Equity	66303.1						
Shares Outstanding	259.9						
Intrinsic Value of Last FYE	\$ 255.12						
Implied Price as of Today	\$ 267.58						
EP Model:							
Economic Profit (EP)	2104.0	2279.5	2509.4	2846.2	2994.6	2801.0	2711.1
Continuing Value (CV)							72921.4
PV of EP	1980.8	2020.4	2094.0	2236.0	2214.9	1950.4	50777.2
Total PV of EP	63273.8						
Invested Capital (last FYE)	2711.8						
Value of Operating Assets:	65985.5						
Non-Operating Adjustments							
marketable securities	670.7						
ESOP	-353.11						
Value of Equity	66303.1						
Shares Outstanding	259.9						
Intrinsic Value of Last FYE	\$ 255.12						
Implied Price as of Today	\$ 267.58						

Vertex Pharmaceuticals							
Dividend Discount Model (DDM) or Fundamental P/E Valuation Model							
Fiscal Years Ending Dec. 31							
	2021E	2022E	2023E	2024E	2025E	2026E	2027E
EPS	\$ 9.65	\$ 10.98	\$ 12.32	\$ 13.60	\$ 14.57	\$ 15.12	\$ 15.87
Key Assumptions							
CV growth of EPS	2.50%						
CV Year ROE	13.82%						
Cost of Equity	6.30%						
Future Cash Flows							
P/E Multiple (CV Year)							
EPS (CV Year)							
Future Stock Price							
Dividends Per Share	0	0	0	0	0	0	0
Discounted Cash Flows	0	0	0	0	0	0	0
Intrinsic Value as of Last FY	\$ 197.40						
Implied Price as of Today	\$ 207.04						

Leases

Vertex Pharmaceuticals																		
Present Value of Operating Lease Obligations																		
Fiscal Years Ending Dec. 31	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Year 1	41.0	46.9	132.3	119.3	104.4	85.6	87.9	84.5	85.1	14.6	15.3							
Year 2	38.2	47.8	112.4	116.5	84.7	87.1	84.9	92.9	96.0	12.9	34.1							
Year 3	35.8	106.1	109.5	101.5	84.5	84.8	91.2	95.7	94.2	12.6	34.7							
Year 4	32.2	104.2	95.5	100.1	81.3	92.7	92.9	93.9	93.8	12.5	34.1							
Year 5	36.5	90.1	94.4	86.7	81.9	92.5	92.1	93.3	94.1	11.5	31.6							
Thereafter	55.4	921.6	851.1	828.1	758.8	827.1	735.7	649.8	575.2	51.3	320.7							
Total Minimum Payments	239.1	1316.6	1395.2	1352.2	1195.6	1269.9	1184.7	1110.0	1038.3	115.3	470.4							
Less: Cumulative Interest	19.5	229.5	209.9	208.0	186.3	200.1	175.3	153.1	134.7	12.6	80.1							
PV of Minimum Payments	219.6	1087.1	1185.4	1144.2	1009.3	1069.8	1009.4	956.8	903.6	102.8	390.3	655.8	729.5	792.1	838.9	843.0	796.4	770.2
Implied Interest in Year 1 Payment		5.2	25.6	27.9	26.9	23.7	25.2	23.8	22.5	21.3	2.4	9.2	15.4	17.2	18.6	19.7	19.8	18.7
Pre-Tax Cost of Debt	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%	2.35%
Years Implied by Year 6 Payment	1.5	10.2	9.0	9.6	9.3	8.9	8.0	7.0	6.1	4.5	10.2							
Expected Obligation in Year 6 & Beyond	36.535	90.077	94.448	86.673	81.919	92.468	92.097	93.258	94.071	11.488	31.564							
Present Value of Lease Payments																		
PV of Year 1	40.0	45.8	129.3	116.6	102.0	83.6	85.9	82.5	83.1	14.3	14.9							
PV of Year 2	36.5	45.6	107.3	111.2	80.8	83.2	81.0	88.7	91.6	12.3	32.6							
PV of Year 3	33.4	98.9	102.1	94.7	78.8	79.1	85.1	89.2	87.9	11.8	32.3							
PV of Year 4	29.3	94.9	87.0	91.2	74.1	84.5	84.6	85.5	85.4	11.3	31.1							
PV of Year 5	32.5	80.2	84.1	77.2	72.9	82.3	82.0	83.0	83.7	10.2	28.1							
PV of 6 & beyond	47.9	721.6	675.6	653.4	600.7	657.1	590.7	527.8	471.8	42.8	251.3							
Capitalized PV of Payments	219.6	1087.1	1185.4	1144.2	1009.3	1069.8	1009.4	956.8	903.6	102.8	390.3							

Key Management Ratios

Vertex Pharmaceuticals																		
Key Management Ratios																		
Fiscal Years Ending Dec. 31	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E
Liquidity Ratios:																		
Current Ratio (Current assets / Current Liabilities)	3.39	3.67	3.99	4.20	2.78	2.31	3.28	3.43	3.61	4.33	5.14	5.82	6.54	7.32	8.28	9.49	10.61	
Quick Ratio (Cash + mark. secur. + a/r)/ current liabilities	2.94	3.39	3.90	3.97	2.41	2.06	2.94	3.19	3.33	4.02	4.78	5.46	6.18	6.96	7.92	9.13	10.25	
Cash Ratio (Cash + mark. secur.)/ current liabilities	2.47	3.05	3.68	3.77	2.06	1.81	2.59	2.83	2.85	3.55	4.28	4.96	5.68	6.46	7.42	8.63	9.75	
Asset-Management Ratios:																		
Total Asset Turnover (sales/total assets)	0.64	0.55	0.52	0.25	0.41	0.59	0.70	0.49	0.50	0.53	0.51	0.48	0.44	0.41	0.38	0.34	0.31	
Inventory Turnover (sales/inventory)	12.55	50.13	85.67	18.82	18.05	21.93	22.25	24.51	24.85	22.10	23.06	23.06	23.06	23.06	23.06	23.06	23.06	
Financial Leverage Ratios:																		
Debt to Assets (total debt / total assets)	There is no debt on Vertex's balance sheet			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt to Capital (total debt / total debt + shareholders equity)	There is no debt on Vertex's balance sheet			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt to Equity (debt / Equity)	There is no debt on Vertex's balance sheet			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Profitability Ratios:																		
Return on Equity (NI/Beg TSE)	-5.51%	-57.49%	-54.69%	-53.66%	-7.68%	6.85%	102.19%	26.63%	44.78%	29.02%	26.48%	24.19%	22.04%	19.77%	17.47%	15.88%	13.82%	
Return on Assets (NI / avg total assets)	2.34%	-2.01%	-29.55%	-30.70%	-21.80%	-2.61%	1.87%	28.66%	11.77%	21.00%	16.03%	15.26%	14.52%	13.81%	12.97%	11.95%	11.90%	
Gross Profit Margin (rev - cogs / rev)	95.49%	84.50%	92.66%	93.16%	88.65%	87.85%	89.04%	86.56%	86.84%	88.14%	87.49%	87.49%	87.49%	87.49%	87.49%	87.49%	87.49%	
Payout Policy Ratios:																		
Dividend Payout Ratio (Dividend/EPS)	no dividends paid			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Payout Ratio ((Divs. + Repurchases)/NI)	no dividends paid			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ESOP & Relative P/E

Vertex Pharmaceuticals

Valuation of Options Granted under ESOP

Current Stock Price	\$179.58
Risk Free Rate	1.56%
Current Dividend Yield	0.00%
Annualized St. Dev. of Stock Returns	30.90%

(in millions)

Range of Outstanding Options	Number of Shares	Average Exercise Price	Average Remaining Life (yrs)	B-S Option Price	Value of Options Granted
Range 1	0.060	38.06	0.85	\$ 142.02	\$ 9
Range 2	0.154	47.07	1.73	\$ 133.77	\$ 21
Range 3	0.097	74.53	3.25	\$ 109.94	\$ 11
Range 4	0.991	88.93	5.34	\$ 103.45	\$ 103
Range 5	0.127	109.24	4.07	\$ 85.32	\$ 11
Range 6	0.271	129.49	4.71	\$ 75.47	\$ 20
Range 7	0.715	155.49	7.05	\$ 73.18	\$ 52
Range 8	0.578	168.40	7.47	\$ 69.90	\$ 40
Range 9	1.222	185.31	7.85	\$ 65.64	\$ 80
Range 10	0.023	286.27	9.42	\$ 286.27	\$ 7
Total	4	\$ 138.94	6.29	\$ 77.36	\$ 353.108

Vertex Pharmaceuticals

Relative Valuation Models

Ticker	Company	Price	EPS	EPS	P/E 21	P/E 22	Est. 5yr EPS gr.	PEG 21	PEG 22	BV Tangible		Tangible	
			2021E	2022E						Equity	BV Equity	P/B	P/B
REGN	Regeneron	\$644.96	\$58.65	\$46.69	11.00	13.81	4.00%	274.92	345.34	20.00	16.00	32.25	40.31
AMGN	Amgen	\$211.52	\$10.23	\$14.43	20.68	14.66	5.82%	355.27	251.86	20.00	16.00	10.58	13.22
GILD	Gilead	\$65.85	\$5.28	\$5.32	12.47	12.38	1.37%	910.34	903.49	20.00	16.00	3.29	4.12
ABBV	Abbvie	\$114.83	\$6.69	\$9.73	17.16	11.80	4.48%	383.13	263.43	20.00	16.00	5.74	7.18
BMJ	Bristol-Myers Squibb	\$59.11	\$6.44	\$7.52	9.18	7.86	6.36%	144.32	123.59	20.00	16.00	2.96	3.69
MRNA	Moderna	\$326.85	\$31.08	\$26.33	10.52	12.41	16.80%	62.60	73.89	20.00	16.00	16.34	20.43
JNJ	Johnson & Johnson	\$163.07	\$7.96	\$9.14	20.49	17.84	8.12%	252.29	219.72	20.00	16.00	8.15	10.19
BIIB	Royalty Pharma	\$41.34	\$2.44	\$2.85	16.94	14.51	11.90%	142.37	121.89	20.00	16.00	2.07	2.58
			Average		14.80	13.16		315.65	287.90			10.17	12.72
VRTX	Vertex Pharmaceutica	\$179.58	\$9.65	\$10.98	18.6	16.4	0.07	270.0	237.3	30.00	20.00	5.99	8.98
Implied Relative Value:													
	P/E (EPS21)		\$	142.88									
	P/E (EPS22)		\$	144.49									
	PEG (EPS21)		\$	209.93									
	PEG (EPS22)		\$	217.83									
	P/Tangible BV		\$	254.30									

Share Change

Vertex Pharmaceuticals								
<i>Effects of ESOP Exercise and Share Repurchases on Common Stock Account and Number of Shares Outstanding</i>								
Number of Options Outstanding (shares):	4							
Average Time to Maturity (years):	6.29							
Expected Annual Number of Options Exercised:	1							
Current Average Strike Price:	\$ 138.94							
Cost of Equity:	6.30%							
Current Stock Price:	\$179.58							
Fiscal Years Ending Dec. 31		2021E	2022E	2023E	2024E	2025E	2026E	2027E
Increase in Shares Outstanding:		1	1	1	1	1	1	1
Average Strike Price:		\$ 138.94	\$ 138.94	\$ 138.94	\$ 138.94	\$ 138.94	\$ 138.94	\$ 138.94
Increase in Common Stock Account:		94						
Share Repurchases (\$)		-360	-360	-360	-360	-360	-360	-360
Expected Price of Repurchased Shares:		\$ 179.58	\$ 190.89	\$ 202.92	\$ 215.70	\$ 229.29	\$ 243.74	\$ 259.09
Number of Shares Repurchased:		(2)	(2)	(2)	(2)	(2)	(1)	(1)
Shares Outstanding (beginning of the year)		260	263	265	268	270	272	274
Plus: Shares Issued Through ESOP		1	1	1	1	1	1	1
Less: Shares Repurchased in Treasury		(2)	(2)	(2)	(2)	(2)	(1)	(1)
Shares Outstanding (end of the year)		263	265	268	270	272	274	276

SENSITIVITY ANALYSIS

Sensitivity Tables

We sensitivity tested a majority of the variables used to calculate our cost of debt, cost of equity, and WACC. These sensitivity tables exhibit how an increase or decrease in one variable affects our overall price. These tables are also very useful at discovering what assumptions would be unrealistic or unreliable. We discovered that changes in variables used to calculate our cost of equity have a greater impact on the equity price change than variables used to calculate the cost of debt.

Risk free rate, beta, and equity risk premium were the three components used to calculate our cost of equity and the sensitivity table that included both our equity risk premium and beta was observed to have the largest overall increase in our price. Conversely, the table that includes our WACC and CV ROIC was observed to have the largest decrease in price. These sensitivity tables can be referenced on page xxx.

		Beta						
		0.90	0.92	0.94	0.96	0.98	1.00	1.02
Equity Risk Premium	267.58	0.90	0.92	0.94	0.96	0.98	1.00	1.02
	#####	11.59	11.72	11.84	11.97	12.09	12.21	12.33
	4.83%	298.19	290.02	282.29	274.48	268.03	261.42	255.14
	4.88%	294.32	286.29	278.68	270.99	264.64	258.13	251.95
	4.93%	290.56	282.65	275.17	267.58	261.33	254.93	248.83
	4.98%	286.90	279.11	271.74	264.27	258.11	251.80	245.79
	5.03%	283.33	275.65	268.39	261.04	254.96	248.75	242.83
5.08%	279.84	272.28	265.13	257.88	251.90	245.77	239.94	

		CV Growth of NOPLAT						
		1.75%	2.00%	2.25%	2.50%	2.75%	3.00%	3.25%
Wacc	267.58	1.75%	2.00%	2.25%	2.50%	2.75%	3.00%	3.25%
	5.77%	260.08	273.11	287.98	305.13	325.11	348.71	377.00
	5.92%	250.47	262.41	275.97	291.51	309.51	330.60	355.63
	6.07%	241.53	252.50	264.90	279.05	295.32	314.25	336.54
	6.22%	233.19	243.29	254.67	267.58	282.36	299.43	319.37
	6.37%	225.38	234.72	245.19	257.01	270.47	285.92	303.85
	6.52%	218.08	226.72	236.37	247.23	259.52	273.57	289.76
6.67%	211.21	219.23	228.15	238.15	249.42	262.23	276.91	

		R&D Expense (% of sales)						
		15%	20%	25%	30%	35%	40%	45%
Cost of Equity	267.58	15%	20%	25%	30%	35%	40%	45%
	5.55%	266.11	266.11	266.11	266.11	266.11	266.11	266.11
	5.80%	266.60	266.60	266.60	266.60	266.60	266.60	266.60
	6.05%	267.09	267.09	267.09	267.09	267.09	267.09	267.09
	6.30%	267.58	267.58	267.58	267.58	267.58	267.58	267.58
	6.55%	268.08	268.08	268.08	268.08	268.08	268.08	268.08
	6.80%	268.57	268.57	268.57	268.57	268.57	268.57	268.57
7.05%	269.06	269.06	269.06	269.06	269.06	269.06	269.06	

		Pre Tax Cost of Debt						
		1.90%	2.05%	2.20%	2.35%	2.50%	2.65%	2.80%
Risk Free Rate	267.58	1.90%	2.05%	2.20%	2.35%	2.50%	2.65%	2.80%
	1.41%	278.15	278.27	278.39	278.50	278.62	278.73	278.83
	1.46%	274.42	274.54	274.65	274.77	274.88	274.98	275.09
	1.51%	270.79	270.90	271.02	271.13	271.24	271.34	271.45
	1.56%	267.25	267.36	267.47	267.58	267.69	267.80	267.90
	1.61%	263.80	263.91	264.03	264.13	264.24	264.35	264.45
	1.66%	260.44	260.55	260.66	260.77	260.88	260.98	261.08
1.71%	257.17	257.28	257.39	257.50	257.60	257.70	257.80	

		Marginal Tax Rate						
		12.16%	14.16%	16.16%	18.16%	20.16%	22.16%	24.16%
CV Growth of NOPL	267.58	12.16%	14.16%	16.16%	18.16%	20.16%	22.16%	24.16%
	1.75%	229.40	230.66	231.92	233.19	234.45	235.71	236.98
	2.00%	239.30	240.63	241.96	243.29	244.62	245.95	247.29
	2.25%	250.46	251.86	253.27	254.67	256.08	257.49	258.89
	2.50%	263.11	264.60	266.09	267.58	269.08	270.57	272.06
	2.75%	277.59	279.18	280.77	282.36	283.95	285.54	287.13
	3.00%	294.31	296.02	297.72	299.43	301.13	302.84	304.55
3.25%	313.85	315.69	317.53	319.37	321.21	323.05	324.90	

		CV ROIC						
		50.54%	52.54%	54.54%	56.54%	58.54%	60.54%	62.54%
WACC	267.58	50.54%	52.54%	54.54%	56.54%	58.54%	60.54%	62.54%
	3.22%	1,406.52	1,406.52	1,406.52	1,406.52	1,406.52	1,406.52	1,406.52
	4.22%	584.93	584.93	584.93	584.93	584.93	584.93	584.93
	5.22%	367.89	367.89	367.89	367.89	367.89	367.89	367.89
	6.22%	267.58	267.58	267.58	267.58	267.58	267.58	267.58
	7.22%	209.79	209.79	209.79	209.79	209.79	209.79	209.79
	8.22%	172.21	172.21	172.21	172.21	172.21	172.21	172.21
9.22%	145.82	145.82	145.82	145.82	145.82	145.82	145.82	

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