UCD Michael Smurfit
Graduate Business School

Yale SCHOOL OF
MANAGEMENT

Pharmaceutical Preparation Industry — SIC 2834

Vertex Pharmaceuticals Inc.

Ticker: VRTX

Current Market Capitalization: $109 Billion Dollars
Current Share Price: $409 Dollars
Target Share Price: $473 Dollars
Implied upside/downside: +16%

Investment Recommendation: **BUY**

10th November 2025

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Vertex Pharmaceuticals

Vertex Pharmaceuticals is a U.S. based biopharmaceutical company. Since late 2011, Vertex has ranked among the top 15 best-performing pharmaceutical firms. The company focuses on developing first-in-class therapies using genetic and molecular approaches.

Vertex Launched Products Matrix

Since the launch of its first small-molecule drug Kalydeco for Cystic Fibrosis (CF) in 2012, Vertex has gradually expanded and now dominates the US and European CF market. According to the company's Q3 2025 10-K financial report, revenue from CF products accounted for 98.6% of Vertex's total product revenue.

Vertex products metrix						
Disease	**Drug name**	**Launch time**	**Patient expiration**	**Official Pricing**	**2025 revenue percentage**	
Cystic fibrosis (CF)	ALYFTREK	2025 July	2039	0.37 Million dollars/person/year	5.3%	98.6%
	TRIKAFTA	2019	2037	0.31 Million dollars/person/year	86.7%	
	SYMDEKO	2018	2027	0.31 Million dollars/person/year	6.6%	
	ORKAMBI	2015	2030	0.31 Million dollars/person/year		
	KALYDECO	2012	2027	0.31 Million dollars/person/year		
Sickle Cell Disease + Beta Thalassemia	CASGEVY	2023 November	2034	2.2 Million dollars/person/ one-time gene therapy	1%	
Acute Pain	JOURNAVX	2025 January	2040	15.5 dollars/pill, 31dollars per day	0.4%	

Vertex Pharma Clinical Pipeline Matrix

Vertex has established itself as a global leader in gene and cell therapy, particularly in the treatment of rare and serious diseases. The company continues to expand its pipeline beyond CF, focusing on innovative cell and gene therapies for conditions such as sickle cell disease, beta thalassemia, and type 1 diabetes.

Vertex pipeline metrix			
Disease	**Pipeline name**	**Phrase**	**Year to market**
APOL1-mediated kidney disease (AMKD)	Inaxaplin	3	3~5
Kidney disease (ADPKD)	VX-407	2	6~8
CF	VX-522	1.5	7~9
Myotonic dystrophy type 1 (DM1)	VX-670	1.5	7~9
Chronic Pain	Suzetrigine (painful diabetic peripheral neuropathy)	3	3~5
Primaru membranous nephropathy	Povetacicept	2.5	5~7
Type 1 diabetes	Zimislecel	3	3~5

Vertex Preclinical Research

In addition to its current pipeline portfolio, Vertex is conducting research on several serious diseases. Several of these investigational therapies are approaching Phase I clinical trials and are expected to reach the market within the next decade. We believe Vertex holds significant market potential given its innovative focus.

Forecasting

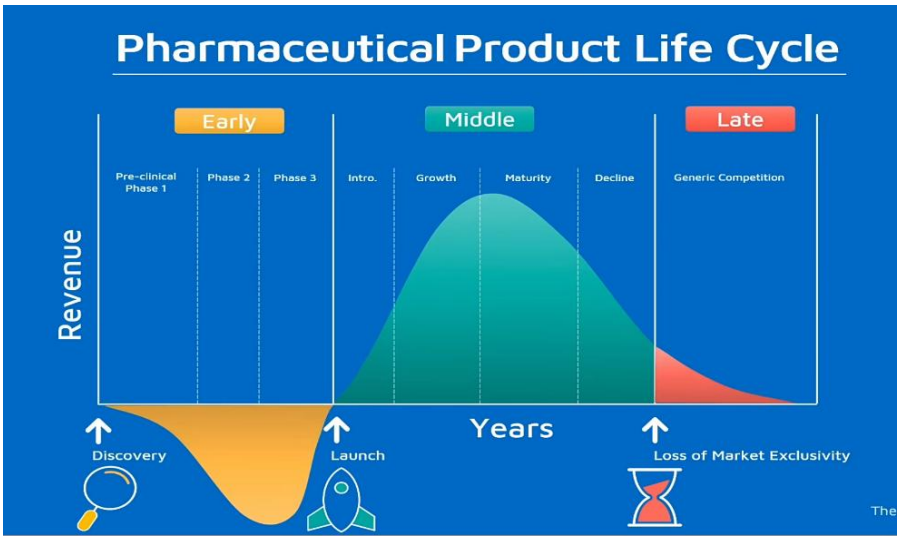
Since 2020, the product revenue has accounted for 100% of company total revenue (Vertex financial report). The 5-year forecasting analysis divides into two parts: launched products, and Phase III pipeline products.

Macro Considerations

Vertex's leading product, Trikafta (for CF), is covered under most U.S. Medicare Part D prescription drug plans. In addition, the Center for Medicare & Medicaid Services (CMS) has entered into an agreement with Vertex to improve patient access to its gene therapies, such as Casgevy, under Medicaid and other government-sponsored coverage programs.

However, the current Medicare drug price negotiation list under the Inflation Reduction Act does not include any of Vertex's products. In our subsequent financial modelling and valuation, we will apply the company's official list prices without incorporating any potential Medicare-driven price adjustments.

Product life cycle



Cystic Fibrosis

CF is a rare genetic disorder caused by mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. Vertex is the only company that has developed effective treatments for CF. Traditional treatments for CF focused only on managing symptoms such as improving lung function and fighting infections but did not address the underlying genetic defect. Vertex has transformed CF from a fatal pediatric disease into a manageable chronic condition.

Kalydeco (ivacaftor, 2012)	The first CFTR potentiator, designed for patients with specific gating mutations.
Orkambi (lumacaftor/ivacaftor, 2015)	Expanded treatment to patients with the common F508del mutation.
Symdeko (tezacaftor/ivacaftor, 2018)	Improved efficacy and tolerability compared with Orkambi, further broadening the eligible patient population.
Trikafta (elexacaftor/tezacaftor/ivacaftor, 2019)	A triple-combination therapy providing significant improvements in lung function, quality of life, and survival. It is now the standard of care for more than 90% of CF patients with at least one F508del mutation.
Alyftrek (vanzaftor/tezacaftor/deutivacaftor, 2024)	The next-generation triple combination, extend treatment coverage to patients with additional CFTR variants and offers simplified dosing with sustained clinical benefit

By comparing the evolution of CF therapies, we conclude that the company's latest CF launches are improvements on previous therapeutic mechanism (modulating CFTR protein activity to correct the molecular). Therefore, we treat the five CF products as a single product line for the purpose of our analysis and revenue forecast.

We forecasted the CF products revenue based on epidemiologic trends in the disease.

Prevalence:

$$Prevalence = \frac{Number\ of\ people\ with\ the\ disease}{Total\ population}$$

Penetration Rate:

$$\boldsymbol{Penetration\ Rate = \frac{Patients\ treated\ with\ the\ drug}{Number\ of\ people\ with\ the\ disease}}$$

Calculation Flow:

We obtained historical total population from official statistical website, and prevalence from current disease research, to calculate historical penetration rate. Then forecast next five years penetration rate, using forecasted total population from official statistical website, to calculate next 5 years patients treated with the drug, then calculate the future revenue.

Historical part calculation

$$Historical\ number\ of\ people\ with\ the\ disease = Prevalence * Historical\ total\ population$$

$$Historical\ patients\ treated\ with\ the\ drug = \frac{Hostorical\ products\ revenue}{products\ price}$$

$$\boldsymbol{Historical\ penetration\ Rate} = \frac{Patients\ treated\ with\ the\ drug}{Number\ of\ people\ with\ the\ disease}$$

Forecasting part calculation

$$Forecasted\ products\ revenue = Forecasted\ patients\ treated\ with\ the\ drug * Products\ Price$$

$$Forecasted\ patients\ treated\ with\ the\ drug = \boldsymbol{Forecasted\ penetration\ Rate} * Forecasted\ number\ of\ people\ with\ the\ disease$$

$$Forecasted\ number\ of\ people\ with\ the\ disease = Prevalence * Forecasted\ total\ population$$

The problem at this stage is how to obtain forecasted penetration rate via historical penetration rate.

Calculation process

CF serious products are sold in the U.S. and Europe.

We start with patient numbers and historical drug penetration rate. Historical population data is collected by the World Bank. The CF prevalence in the U.S. is 0.995 per 10000 people (Guo et al., 2022), the prevalence in Europe is 0.737 per 10000 people (Farrel, 2008). CF is included in newborn screening programs; the diagnosis rate is nearly 100%. This allows us to estimate the historical CF patient number.

CF Patient Number							
	2012	2013	2014	2015	2016	2017	2018
US population	313,870,000	316,060,000	318,386,329	320,738,994	323,071,755	325,122,128	326,838,199
US patient	29,975	30,184	30,406	30,631	30,853	31,049	31,213
EU population	442,069,839	442,425,741	442,920,819	443,793,218	444,676,652	445,321,060	446,329,890
EU patient	32,581	32,607	32,643	32,708	32,773	32,820	32,895
Total patient	62,555	62,791	63,049	63,338	63,626	63,869	64,108
	2019	2020	2021	2022	2023	2024	2025
US population	328,329,953	331,526,933	332,048,977	333,271,411	334,914,895	341,814,420	342,532,230
US patient	31,356	31,661	31,711	31,827	31,984	32,643	32,712
EU population	446,910,453	446,870,959	446,227,358	447,703,403	449,425,965	450,185,396	451,389,451
EU patient	32,937	32,934	32,887	32,996	33,123	33,179	33,267
Total patient	64,293	64,595	64,598	64,823	65,107	65,822	65,979

The price of the 4 “legacy” CF products is 0.31 million dollars per person per year. We use product revenue divided by product price to calculate the number of patients using the drug.

$$Patients\ treated\ with\ the\ drug = \frac{Products\ Revenue}{Products\ Price}$$

2025 total revenue is calculated by three quarters financial reports released by Vertex.

CF History Penetration Rate Calculation							
	Drug K launched			Drug O launched			Drug S launched
	2012	2013	2014	2015	2016	2017	2018
Total CF product revenue	172	371	464	982	1,683	2,165	3,038
Patient treated with the drug	554	1,198	1,496	3,169	5,429	6,985	9,801
Total patient	62,555	62,791	63,049	63,338	63,626	63,869	64,108
Penetration rate	0.89%	1.91%	2.37%	5.00%	8.53%	10.94%	15.29%
		Drug T launched					Drug A launched
	2019	2020	2021	2022	2023	2024	2025
Total CF product revenue	4,161	6,203	7,673	8,931	9,869	11,031	11,707
Patient treated with the drug	13,422	20,009	24,753	28,809	31,836	35,583	37,766
Total patient	64,293	64,595	64,598	64,823	65,107	65,822	65,979
Penetration rate	20.88%	30.98%	38.32%	44.44%	48.90%	54.06%	57.24%

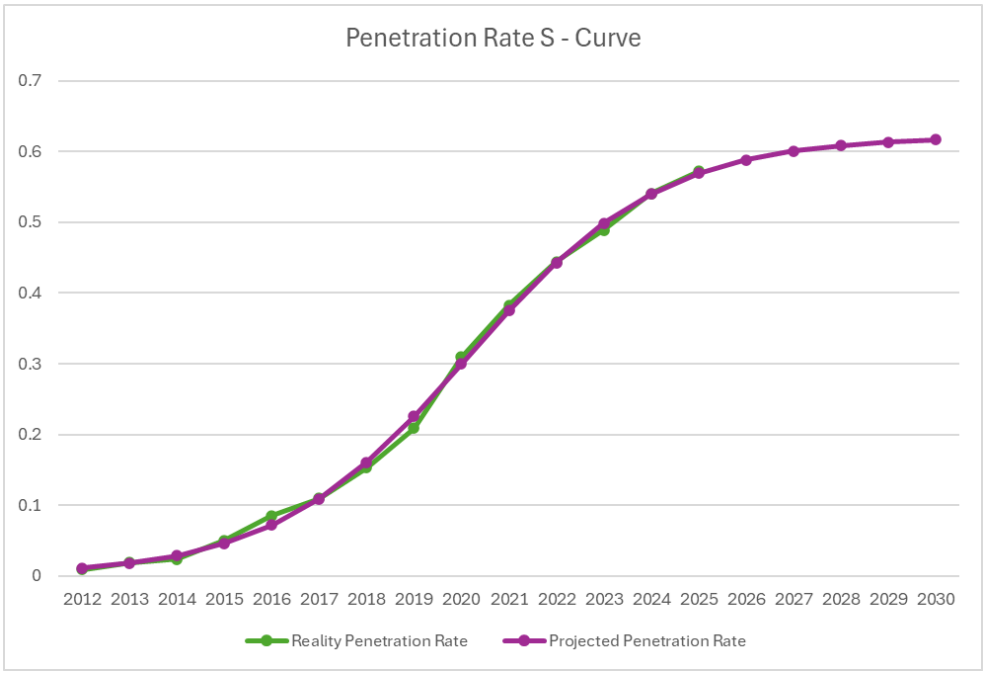
Penetration rate projection

The adoption of innovation drugs (penetration rate) often follows a S curve growth function, consistent with diffusion of innovation theory (Bass et.al, 1969) and empirically supported in drug uptake studies (Fischer et al., 2010). CF market happens to be a monopoly market, represents an idealized scenario. Therefore, we set the penetration rate follows S-logic trends.

$$P(t) = \frac{P_{max}}{1 + e^{-k(t-t_0)}}$$

where
P(t) is penetration rate at time t
P_max is Maximum penetration rate
t_0 is inflection point
t is time (year) — independent variable
k is penetration rate growth rate

We fitted the S-shaped diffusion curve of the historical penetration rate, next forecasted the penetration rate over the next five years.



Reality penetration rate is the CF drug penetration rate we calculated.

The projected population data are collected from Census and Eurostat.

	2026E	2027E	2028E	2029E	2030E
US population	343,251,548	343,903,726	344,522,753	345,108,441	345,591,593
US patient	32,781	32,843	32,902	32,958	33,004
EU population	452,137,301	452,663,985	452,960,191	453,047,675	453,106,414
EU patient	33,323	33,361	33,383	33,390	33,394
Total patient	66,103	66,204	66,285	66,347	66,398

The forecasted penetration rate and revenue in next 5 years as following:

	2026E	2027E	2028E	2029E	2030E
Total patient	66,103	66,204	66,285	66,347	66,398
Penetration rate	58.85%	60.10%	60.88%	61.38%	61.68%
Patient treated with the drug	38,902	39,786	40,356	40,721	40,954
Projected revenue (0.31)	12,060	12,334	12,511	12,624	12,696

The legacy products official list price is 0.31 million dollars per year. Alyftrek price is 0.37 million dollars per year. By considering the transfer rate of the first 5 years of Trikaftas launch, we estimate the projected revenue via weighted price.

	2020(2025)	2021(2026)	2022(2027)	2023(2028)	2024(2029)	2025(2030)
Drug T(A) revenue percentage	10.10%	62.29%	75.55%	86.07%	90.63%	92.82%
Weighted price	0.310	0.347	0.356	0.362	0.364	0.366
Calibrated revenue		13507	14148	14593	14822	14981

Sickle Cell Disease + Beta Thalassemia

CASGEVY

Casgevy is a **one-time treatment gene-editing therapy** developed jointly by Vertex and CRISPR Therapeutics. It is the first FDA-approved CRISPR-based gene therapy and is used to treat severe sickle cell disease (SCD) and transfusion-dependent β-thalassemia (TDT). CRISPR is a new gene-editing therapy approved by FDA in 2020.

SCD and TDT are **rare disease**, both caused by mutations in the β-globin gene (HBB) and therefore can be treated using the same gene therapy approach. Similar to the CF market, current treatment options for SCD can only manage symptoms rather than cure the disease. At present, Casgevy, Lyfgenia and Zynteglo are the only approved curative therapies for SCD.

However, Lyfgenia was launched in the same year as Casgevy (2023), Zynteglo was launched in 2022 and has comparable limited clinical data, they cannot serve as a reliable reference for Casgevy's revenue growth projection.

We broadened our search scope and identified Zolgensma, a one-time gene therapy launched in 2019 for spinal muscular atrophy (SMA). We think Zolgensma and Casgevy as isomorphic in market diffusion mechanics.

As one-time gene therapies, their revenue growth follows an identical diffusion dynamic: infrastructure and treatment center build-out (first year low patient low revenue) → reimbursement access expansion → **patient pool release** → peak penetration (Most of time takes three or four years from expansion to peak) → post-saturation declines as the prevalent patient is exhausted.

Based on above, we constructed a growth model for Zolgensma and then calibrated its key parameters (Total patients K, growth rate b, time-to-peak t0) by known data (revenue in 2024 and 2025) to derive the Casgevy cumulated patient and future revenue.

Our modelling for **Zolgensma** begins with the **cumulative number of treated patients**. We use total revenue divided by price (2.1 million dollars) to calculate **Zolgensma** total patient.

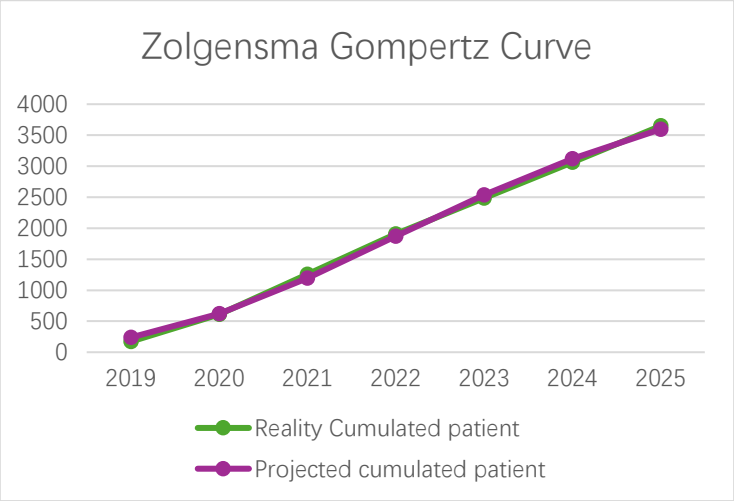
	2019	2020	2021	2022	2023	2024	2025
Total revenue	361	920	1,351	1,370	1,214	1,214	1,233
Total patient	172	438	643	652	578	578	587
Cumulated patient	172	610	1,253	1,906	2,484	3,062	3,649

Under ASC 606 (U.S. GAAP), revenue for one-time therapies is recognized when treatment is administered, even if payers pay in instalments. Thus, reported revenue already reflects the full transaction price at treatment time.

Cumulative treated patients are expected to follow a parameterized S-curve pattern because cumulated treated patients are highly related with penetration rate. To capture this front-loaded market diffusion pattern, we adopt a left-skewed S-curve formulation, the Gompertz growth model (Tsoularis and Wallace, 2002), which better represents processes characterized by slow initial adoption, rapid mid-phase acceleration, and gradual stabilization in later years.

$$N_t = K \cdot e^{-e^{-b(t-t_0)}}$$

where
N_t is cumulated patient number at time t
K is total potential patient
b is growth rate
t_0 is inflection point
t is time (year) — independent variable

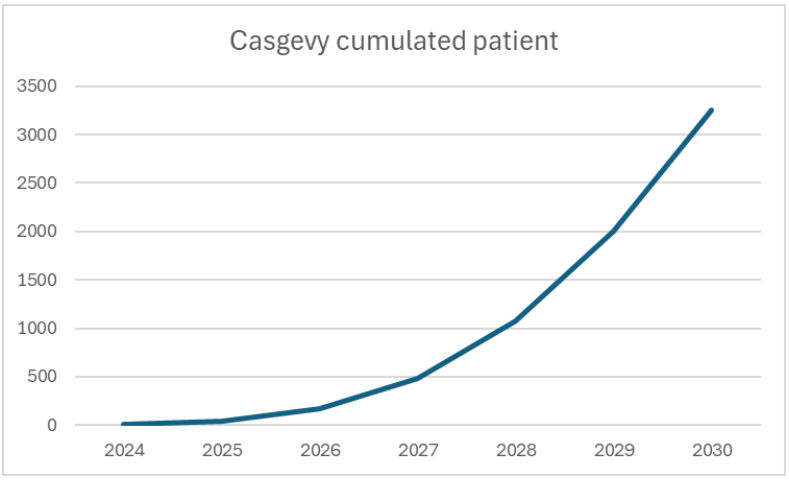


Then we use two points (Casgevy cumulated patients in 2024 and 2025) calibrate growth rate b and inflection point t_0. The growth rate is logarithmic growth rate.

	2024	2025
Revenue	17	82
Patient per day	8	37
Cumulated patient	8	45

We set K of Casgevy is 17,000 patients. According to Vertex news call, approximately 1,000 TDT patients and 16,000 SCD patients in the U.S. are eligible for Casgevy. Recall our analysis of CF patients, the annual increase in the rare disease patient population is minimal.

We generated the Casgevy cumulative treated-patient curve.



We calculate each year patients and revenue in next 5 years.

	2024	2025	2026F	2027F	2028F	2029F	2030F
Projected cumulated patient	8	45	171	483	1,079	2,008	3,250
Each year patient	8	37	126	312	596	929	1,242
Revenue	18	81	277	686	1,311	2,044	2,732

Acute Pain

Journaxy

The pain drug market is substantial. In the United States, more than 80 million patients receive prescriptions for moderate-to-severe acute pain each year.

Journavx is positioned as an in-hospital analgesic, primarily used in anaesthesia and postoperative pain. Its commercial pathway and **prescribing dynamics process** are therefore highly comparable to those of existing hospital-based pain medications. Consequently, its market diffusion curve (in both shape and speed) is expected to be broadly analogous to established injectable analgesics.

As Journavx currently lacks historical sales data, we employ an analogue approach, using the sales growth trends of another in-hospital acute pain drug Ofirmev as a proxy for its diffusion pattern.

	2011	2012	2013	2014	2015	2016
Ofirmev Revenue	16	111	227	284	376	355
Growth rate		588.82%	104.42%	25.28%	32.39%	-5.59%
	2025	2026F	2027F	2028F	2029F	2030F
Journavx Revenue	44	302	618	774	1024	967

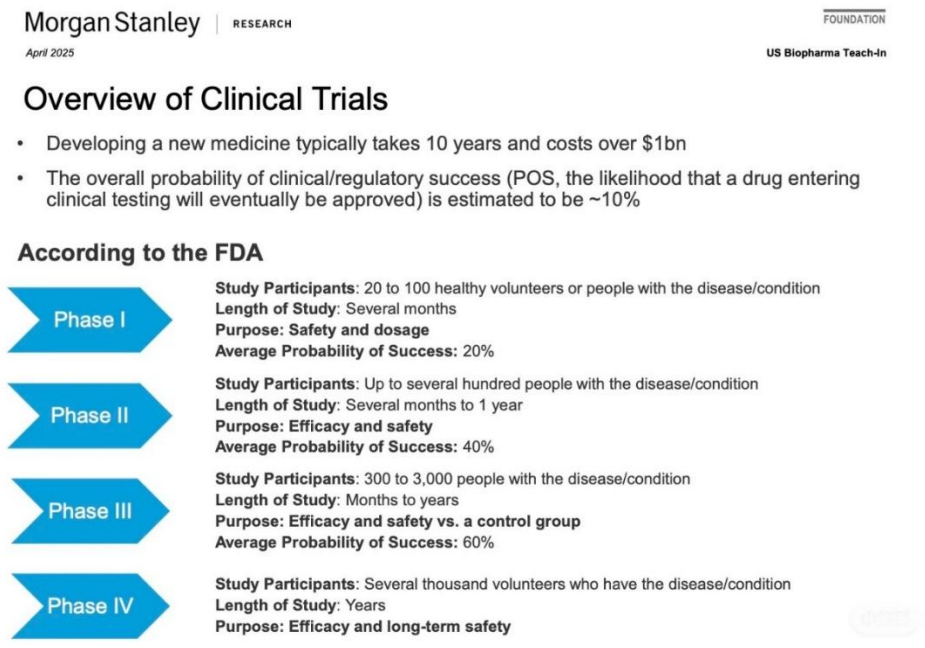
Pipeline Forecasting

We estimate the yearly revenue of pipeline follows function:

$$Pipeline\ Revenue = Potential\ Patient * Penetration\ Rate * Prabobility * Price$$

Vertex pipeline metrix			
Disease	**Pipeline name**	**Current Phase**	**Anticipated Filing/Approval**
APOL1-mediated kidney disease (AMKD)	Inaxaplin	3	2027+
Kidney disease (ADPKD)	VX-407	2	2030+
CF	VX-522	1/2	2031+
Myotonic dystrophy type 1 (DM1)	VX-670	1/2	2031+
Chronic Pain	Suzetrigine (painful diabetic peripheral neuropathy)	3	2028+
Primaru membranous nephropathy	Povetacicept	2/3	2028+
Type 1 diabetes	Zimislecel	3	2028+

The pipeline phase successful rate follows the FDA and Morgan Stanley, Phase I average successful rate is 0.2, Phase II average successful rate is 0.4, Phase III average successful rate is 0.6.



Inaxaplin

Inaxaplin is designed for APOL1-mediated chronic kidney disease (AMKD). AMKD is a rare kidney disease with a potential U.S. patient population of 120,000.

Benchmarking against IgAN therapies Filspari (0.15 million dollars per year) and Tarpeyo (0.12 million dollars per year), we assume the annual price of Inaxaplin is 0.15 million dollars per patient. Filspari is a medication used for the treatment of primary immunoglobulin A nephropathy. Filspari and Tarpeyo are appropriate pricing benchmarks for inaxaplin because U.S. nephrology pricing is driven by disease-modifying impact. All three target progressive chronic kidney disease, are prescribed by nephrologists, rely on proteinuria and eGFR as key clinical and reimbursement endpoints, and aim to delay dialysis, which is the dominant cost driver for payers. From a payer perspective, they compete for the same specialty nephrology budget, making them relevant commercial comparators despite different underlying etiologies.

Inaxaplin is the first potential drug in the AMKD market. Currently no approved or late-stage rival drug specifically targeting AMKD. Due to a similar situation, as CF drug was launched. We employed the CF drug's first three years penetration rate (calculated in product forecasting) as Inaxaplin's first three years penetration rate.

Population	120,000				
Price	0.15	million			
Successful Rate	0.6				
Year	2027	2028	2029	2030	
Penetration rate	0.89%	1.91%	2.37%	5%	
Revenue	96	206	256	540	Million

Povetacicept

In Vertex’s third-quarter earning call, management expressed confidence in the launch of Pove. Pove has completed full enrollment in the Phase III RAINIER trial. In addition, Vertex plans to use a Priority Review Voucher, which gives Vertex confidence that Pove’s BLA for the IgA nephropathy (IgAN) indication will receive accelerated priority review in the U.S. Therefore, although the program has not yet fully progressed through all late-stage milestones, we assume that Pove can be launched in 2028.

IgA nephropathy (IgAN), a disease affecting more than 300,000 diagnosed patients across the United States and Europe and over 1 million patients globally. In the United States, the diagnosed IgAN patient population was approximately 133,000 in 2024 (National Library of Medicine, 2024).

Povetacicept is not an oral therapy but a subcutaneous biologic that requires long-term, continuous treatment. Currently, there are no approved therapies that treat the underlying cause of this disease, leaving a significant patient population with high unmet need.

Povetacicept and inaxaplin can reasonably share a similar pricing framework because U.S. payer pricing in nephrology is driven by payment logic rather than disease identity. Both drugs are long-term, non-curative therapies prescribed by nephrologists for progressive chronic kidney disease, with clinical value measured primarily by proteinuria reduction, preservation of eGFR, and delay of dialysis, which is the dominant cost driver for payers. As a result, they draw from the same specialty nephrology budget and are benchmarked against the same willingness-to-pay ceiling, even though they target different mechanisms and patient populations.

Similar to CF and AMKD, IgAN is a rare disease; we continue to use the CF penetration rate as the rare disease drug penetration rate.

Population	133,000			
Price	0.15	million		
Successful Rate	0.6			
Year	2028	2029	2030	
Penetration rate	0.89%	1.91%	2.37%	
Revenue	107	229	284	Million

Zimislecel

Zimislecel is a stem cell–derived pancreatic β-cell replacement one-time therapy being developed for Type 1 diabetes (T1D). According to Vertex's public statements, the initial potential patient pool for Zimislecel in the U.S. is approximately 60,000 individuals.

Yescarta is a kind of cell-derived replacement one-time treatment drug made from the patient's own immune system to treat certain types of non-Hodgkin lymphoma. Most of its commercial characteristics, such as high price, one-time treatment, and patients need to take treatment at professional medicine center, are similar to Zimislecel.

Due to the diffusion model of Yescarts and Zimislecel being similar, we mirrored the first three years revenue growth rate (73% and 23%) to Zimislecel's first three years revenue growth rate. We take the first-year penetration rate as 1% by industry average estimation. We also employed Yescarts price of 0.4 million dollars per person as Zimislecel price.

Population	60000		
Price	0.4	million	
Successful Rate	0.6		
Year	2028	2029	2030
Penetration rate	1%		
Revenue	144	249	306
		73%	23%

Suzetrigine

Suzetrigine is a chronic analgesic developed for the treatment of painful diabetic peripheral neuropathy (PDPN). The potential patient in the U.S is estimated at approximately 2 million individuals. Suzetrigine is also the substance of Journaxy for anaesthesia and postoperative pain. Therefore, the price of Suzetrigine is basically the same as Journaxy, 0.011 million per year.

Lyrica is an analgesic used to treat neuropathic pain. Neuropathic pain is a chronic condition that requires long-term treatment. We believe that its commercial diffusion path should be comparable to that of Suvetrigine. We infer that the first three years growth rate of Lyrica will be the same as the first three years revenue growth rate.

Population	2,000,000		
Price	0.01	Million	
Successful Rate	0.6		
Year	2028	2029	2030
Penetration rate	1%		
Revenue	132	198	297
		50%	50%

Remaining Pipeline

VX522, VX670, and VX407 are early-stage candidates currently in Phase 1 and Phase 2. Given standard clinical development timelines and industry success rates, none of these candidates is expected to reach commercialization before 2030.

Then we calculate the whole pipeline revenue in 2030.

Pipeline Revenue					
Year	2026E	2027E	2028E	2029E	2030E
Inaxaplin		96	206	256	540
Povetacicept			107	229	284
Zimislecel			144	249	306
Suzetrigine			132	198	297
Total revenue		96	589	932	1427

Vertex Preclinical Research

Vertex Preclinical Research	
Desease	**Therapies**
Alpha-1 antitrypsin deficiency (AATD)	Small Molecules
APOL1-mediated kidney disease (AMKD)	Additional Small Molecules
Beta thalassemia	Conditioning Regimens
	In vivo Gene Editing
	Small Molecules
Cystic fibrosis (CF)	Additional Small Molecules
	Additional mRNA Therapeutics/Genetic Therapies
Duchenne muscular dystrophy (DMD)	DMD
Myotonic dystrophy type 1 (DM1)	Small Molecules
Pain	Additional Small Molecules
Sickle cell disease (SCD)	Conditioning Regimens
	In vivo Gene Editing
	Small Molecules
Type 1 diabetes (T1D)	Device With Cell Therapy
	Hypoimmune Cell Therapy

Currently, Vertex revenue is mainly supported by CF drugs. The company strategies are occupying CF market shares and developing the next revenue pillar over the next 10 years. Vertex mentioned in the third quarter earning call that they are on track to make global regulatory submissions for TRIKAFTA in this population of 1 to 2-year-olds in the first half of 2026. Additionally, the next-generation CF drug VX-522, being developed to create new CFTR regimens, is intended to reach our long-standing objective of bringing the majority of patients of any age with CF to normal levels of sweat chloride.

Except for CFTR regimens, the mRNA regimen is the other way to cure the last 10% CF patients who are not affected by CFTR gene mutations. Some drugs are in the research phase and expected to be launched after 5 years. RCT2100 in Phase II is currently the lead clinical mRNA candidate specifically positioned for patients not benefiting from CFTR modulators. Vertex is interested in the mRNA market as well; the new CF preclinical research focused on mRNA therapy and Small Molecules. Therefore, we believe Vertex CF market share is steady in the future.

We also note that Vertex's preclinical research focuses on rare kidney diseases, type 1 diabetes, pain, beta thalassemia, and sickle cell disease. From a commercial perspective, Vertex's current products and pipeline are expanding addressable markets, while next-generation assets are positioned to support and defend future market share, demonstrating the competitiveness of its portfolio. From a medical and scientific perspective, Vertex's capabilities in gene and cell-based research are highly differentiated and difficult to replicate. Most of its programs represent first-in-class applications of gene or stem cell therapies, with limited or no direct competitors. Taken together, these factors suggest that Vertex's products have strong competitive positioning and significant pricing power, with pricing relatively insulated from competitive pressure in the broader market.

Vertex also faces challenges related to the high cost of treatment resulting from its therapeutic approaches. Vertex has chosen to collaborate with public health insurance to reduce the payment risk associated with Casgevy. Due to the extremely high upfront treatment cost, healthcare systems have proposed new instalment-based payment models; however, these payment mechanisms have not yet been implemented in practice.

Total Revenue Forecasting

	2025	2026F	2027F	2028F	2029F	2030F	2030 Revenue Percentage
CF products	11,707	13,507	14,148	14,593	14,822	14,981	75%
Casgevy	82	277	686	1,311	2,044	2,732	14%
Journavx	44	302	618	774	1,024	967	5%
Total Pipeline			96	589	932	1427	7%
Total Revenue	11,833	14,086	15,548	17,267	18,822	20,108	
Growth Rate		19%	10%	11%	9%	7%	
CAGR						11%	

In our forecasting, Vertex demonstrates a strong and resilient performance over the next 5 years. Total revenue has a growth rate jump in 2026 because new products Casgevy and Journavx are in the expansion phase.

COST Forecasting

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Revenue	580	1,032	1,702	2,489	3,048	4,163	6,206	7,574	8,931	9,869	11,020	11,833
Growth rate		78%	65%	46%	22%	37%	49%	22%	18%	11%	12%	7%
COGS	61	125	210	275	410	548	736	904	1,080	1,262	1,531	1,587
% Revenue	11%	12%	12%	11%	13%	13%	12%	12%	12%	13%	14%	13%
SG&A	305	377	433	496	558	659	771	840	945	1,137	1,464	1,570
% Revenue	53%	36%	25%	20%	18%	16%	12%	11%	11%	12%	13%	13%
D&A	63	62	61	61	72	107	110	126	148	181	207	200
% Revenue	11%	6%	4%	2%	2%	3%	2%	2%	2%	2%	2%	2%
R&D	856	996	1,048	1,325	1,417	1,755	1,645	3,051	2,540	3,690	3,630	3,914
% Revenue	147%	96%	62%	53%	46%	42%	27%	40%	28%	37%	33%	33%
Capital Expenditures	-51	-45	-57	-99	-96	-75	-260	-235	-205	-200	-298	-347
% Revenue	-9%	-4%	-3%	-4%	-3%	-2%	-4%	-3%	-2%	-2%	-3%	-3%

From 2012 to 2017, Vertex experienced significant revenue growth driven by the launches of Kalydeco (2012) and Orkambi (2015). Many products were in the preclinical/pipeline period, resulting in an elevated R&D to revenue ratio. In 2018–2019, revenue growth temporarily slowed (to 22–37%) as early CF products entered decline period. The sharp rebound in 2020 (49%) coincided with the launch of Trikafta. Since 2021, revenue growth has moderated (11%–22%) as the CF franchise matured and market penetration approached peak levels.

As CF drug penetration increased, both SG&A ratio and R&D ratio declined, reflected in a significant improvement in profitability. CAPEX ratio has remained structurally stable over time, reflecting Vertex's consistent long-term investment discipline and sustained capacity for strategic expansion.

We noted R&D ratio slightly increased in 2021, reaching 40% of revenue. Vertex 2024 Corporate Responsibility Report stated that Vertex's collaboration payments to CRISPR increased significantly in 2021, resulting in significantly higher R&D expenditures that year. The R&D ratio increased in 2023 because higher acquired In-Process Research and Development incurred year-to-date. (Vertex 2023 Q2 financial report)

During the Q3 2025 earnings call, Vertex increased its guidance for combined non-GAAP R&D, acquired IPR&D, and SG&A expenses to roughly 5~5.5 billion dollars for 2025. Management explicitly attributed part of this increase to accelerated R&D and commercial investment in its pipeline programs. In the Q2 2025 results, Vertex reiterated its full-year guidance includes continued R&D investment in multiple mid- and late-stage clinical pipelines, such as zimislecel, povetacicept, inaxaplin, and others.

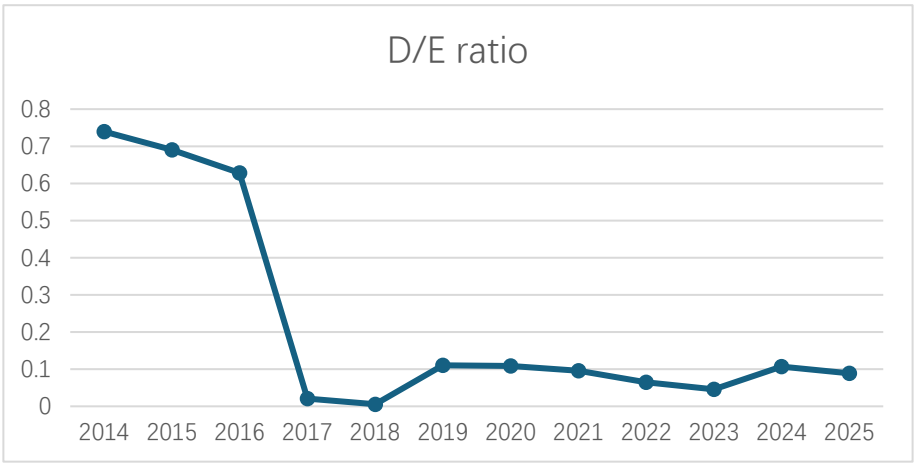
Combined with the Vertex pipeline and preclinical research, we believe it is a signal that Vertex will improve the future R&D investment at least to 5 billion next year. Therefore, we calculated the R&D/revenue rate for 2026 to be 36%, then used this rate as the future R&D investment rate.

Overall, we believe cost variables will keep the long-term equilibrium in the future. We use the cost ratio to calculate the next 5 years.

		2025	2026F	2027F	2028F	2029F	2030F
	Revenue	11833	14086	15548	17267	18822	20108
13%	COGS	1587	1831	2021	2245	2447	2614
12%	SG&A	1570	1694	1870	2077	2264	2418
2%	D&A	200	282	311	345	376	402
36%	R&D	3914	5071	5597	6216	6776	7239
-2%	CAPX	-347	-351	-387	-430	-468	-500
	ΔNWC	1146	1364	1506	1673	1823	1948

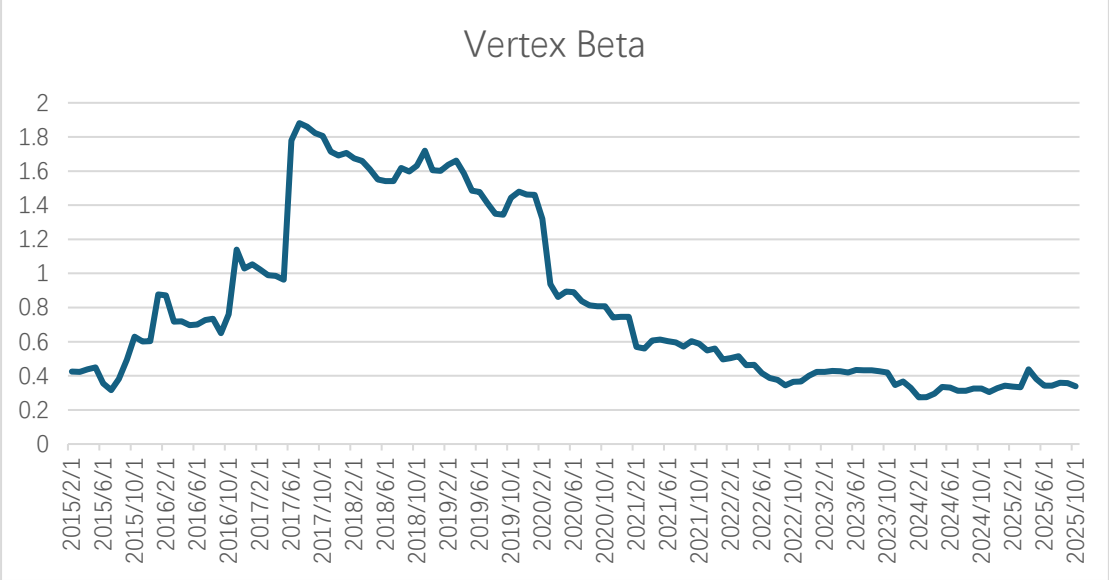
Valuation

D/E ratio



Since 2019, Vertex maintained a D/E ratio of 0.1, reflecting a highly conservative capital structure. Our forecasting predicts future revenue and cash flows increasing at a stable rate. We forecast that the recent historical trend for D/E ratio holds at 0.1 over the next 5 years.

Company beta



Based on our calculation, the current company beta in October 2025 is 0.34. Third-party website Yahoo Finance reports the 5-years monthly beta is 0.37. Historical industry suggests a traditional pharmaceutical beta is between 0.8 and 1.0.

Vertex's low beta is due to the company's unique product portfolio. Firstly, Vertex focuses on rare diseases, and the sales of these drugs are typically unaffected by macroeconomic variables. Secondly, Vertex essentially monopolizes 90% of the global CF market, providing a

stable source of cash flow. Furthermore, Vertex has diversified its product portfolio, no longer relying on a single product line. Additionally, Vertex's D/E ratio is 0.1, indicating virtually no financial leverage. Accordingly, Vertex currently has extremely low systemic risk.

The high beta from 2017 to 2020 was due to Vertex's market expectations at the time being entirely centered around its single pipeline, Trikafta, which was still in Phase III. The company's market capitalization and valuation depended almost entirely on whether the drug would be successfully approved. Furthermore, R&D accounted for approximately 50%~60% of revenue, indicating that the company was still in a period of heavy R&D investment. We note that the company's risk decreased significantly after Trikafta's approval.

In August, Vertex stopped developing its experimental non-opioid painkiller as a solo treatment after a mid-stage trial failure and will not start a study for expanded use of its approved pain drug, sending its shares down 14.4% after the bell, which reflected potential rising risk.

Considering the Vertex abundant pipeline and preclinical research, we believe the future 5-year company risk will increase but slightly. Therefore, we forecast the expected β to 0.45 over the next five years.

WACC

WACC is calculated using the following formula:

$$WACC = (E/V \times Re) + ((D/V \times Rd) \times (1 - T))$$

We calculated WACC at 6.51% using the following assumptions:

- Debt to Equity ratio D/V=9%, E/V=91%.
- Market risk premium was taken as 5.5% (Damodaran, 2025).
- Beta was taken as 0.45 from rolling beta analysis.
- Risk-free rate was taken as 4.13% (10-year U.S. treasury yield).
- Cost of equity was calculated as 7.43%.
- Corporate effective tax rate is reported by 16.6% in Vertex 2025 financial reports.
- The Vertex pre-tax cost of debt from Valueinvesting is 6.65%, we calculated the post-tax cost of debt is 5.54%.

NWC

$$NWC = operating\ current\ asssets - operating\ current\ liability$$

Net working capital is the balance after deducting various current liabilities from the total current assets of an enterprise. Operating current assets consists of accounts receivable, inventories, and other current assets, operating current liabilities includes accounts payable, and other current liabilities. The historical data shows that NWC has remained a stable

percentage of revenue as Vertex has matured. Accordingly, we project NWC for the next five years based on the five-year historical average of 10% of revenue.

	2014/12/31	2015/12/31	2016/12/31	2017/12/31	2018/12/31	2019/12/31	2020/12/31	2021/12/31	2022/12/31	2023/12/31	2024/12/31	
Revenue	580	1,032	1,702	2,489	3,048	4,163	6,206	7,574	8,931	9,869	11,020	
ΔNWC	143	293	265	494	297	313	477	752	906	1,228	1,141	
Margin	25%	28%	16%	20%	10%	8%	8%	10%	10%	12%	10%	10%

	2025	2026F	2027F	2028F	2029F	2030F
ΔNWC	1,146	1,364	1,497	1,616	1,733	1,864

PV

We calculated EBIT via:

$$EBIT = Revenue - COGS - SG\&A - R\&D$$

We set the perpetual growth rate as 1%. By industry experience, innovation drugs perpetual growth rate would be -2% ~ 2% because of the patient cliff. We set it 1% because Vertex has solid products revenue.

The FCF is calculated by:

$$FCF = EBIT * (1 - Tax) + D\&A - Capex - Change\ in\ NWC$$

We set the current time point November 2025; we use n=0.92, 1.92, 2.92…to calculate PV (140 million dollars)

$$PV = \sum \frac{FCF}{(1 + WACC)^n}$$

	2025	2026F	2027F	2028F	2029F	2030F	
Revenue	11833	14086	15548	17267	18822	20108	
COGS	1,587	1,831	2,021	2,245	2,447	2,614	
SG&A	1,570	1,694	1,870	2,077	2,264	2,418	
D&A	200	282	311	345	376	402	
R&D	3,914	5,071	5,597	6,216	6,776	7,239	
EBIT	4,762	6,335	6,992	7,765	8,465	9,043	
CAPX	-347	-351	-387	-430	-468	-500	
ΔNWC	1,146	1,364	1,506	1,673	1,823	1,948	Terminal value
FCF	3,372	5,603	6,184	6,868	7,487	7,998	152,118
Discounted FCF		5,287	5,479	5,713	5,847	5,864	111,539
PV	139729						

We have the valuation result:

Market capital size	108,886	Million
Net debt	-12,010	Negative
Equity Value	120,896	Million
PV	139,729	Million
Outstanding Shares	295	
Current Price	409	
Implied Price	473	
Upside potential	16%	

Recommendation: **BUY**

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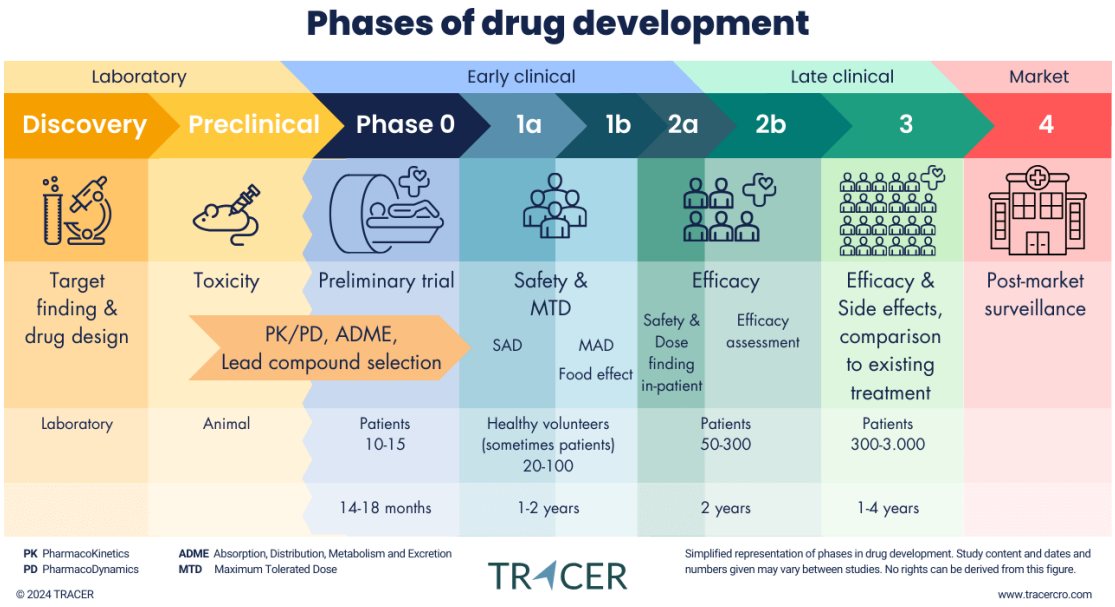
Appendix I


Phases of drug development
Laboratory
Early clinical
Late clinical
Market
Discovery
Preclinical
Phase 0
1a
1b
2a
2b
3
4
Target finding & drug design
Toxicity
Preliminary trial
Safety & MTD
SAD
MAD
Food effect
Efficacy
Safety & Dose finding in-patient
Efficacy assessment
Efficacy & Side effects, comparison to existing treatment
Post-market surveillance
PK/PD, ADME, Lead compound selection
Laboratory
Animal
Patients 10-15
Healthy volunteers (sometimes patients) 20-100
Patients 50-300
Patients 300-3.000
14-18 months
1-2 years
2 years
1-4 years
PK PharmacoKinetics
PD PharmacoDynamics
ADME Absorption, Distribution, Metabolism and Excretion
MTD Maximum Tolerated Dose
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Simplified representation of phases in drug development. Study content and dates and numbers given may vary between studies. No rights can be derived from this figure.
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Appendix III

History CF products revenue

(Million)	2014/12/31	2015/12/31	2016/12/31	2017/12/31	2018/12/31	2019/12/31	2020/12/31	2021/12/31	2022/12/31	2023/12/31	2024/12/31
Trikafa						420.1	3863.8	5797.2	7686.8	8944.7	10238.6
(Growth rate)							8.197334	0.5003882	0.3259505	0.1636442	0.1446555
Symdeko					768.66	1417.7	628.6	420.4	180	123	100.8
(Growth rate)						0.8443785	-0.556606	-0.331212	-0.571836	-0.316667	-0.180488
Orkambi		350.66	979.59	1320.85	1262.17	1331.9	907.5	771.6	510.7	326	252.92
(Growth rate)			1.7935607	0.3483702	-0.044426	0.0552461	-0.318643	-0.149752	-0.338129	-0.36166	-0.224172
Kalyderco	463.75	631.67	703.43	844.63	1007.5	991	802.9	684.2	553.2	475.5	438.55
(Growth rate)		0.3620916	0.1136036	0.2007307	0.19283	-0.016377	-0.189808	-0.147839	-0.191464	-0.140456	-0.077708
Total CF product	463.75	982.33	1683.02	2165.48	3038.33	4160.7	6202.8	7673.4	8930.7	9869.2	11030.87
(Growth rate)		1.118232	0.713294	0.286663	0.403075	0.369404	0.490807	0.237086	0.163852	0.105087	0.117707

Appendix B

Vertex targeted disease area epidemiology estimates

	DISEASE STATE	ASSET	APPROACH/MODALITY	PATIENT OPPORTUNITY
COMMERCIALIZED	Cystic fibrosis	5 approved, incl. ALYFTREK	Small molecules	~109,000
	Sickle cell disease + TDT	CASGEVY	Cell and gene therapy	~60,000 severe
	Acute Pain	JOURNAVX	Small molecule NaV1.8 inhibitor	~80M
IN PIVOTAL STUDIES (in progress or near term)	Diabetic peripheral neuropathy	Suzetrigine	Small molecule NaV1.8 inhibitor	>2M
	AMKD	Inaxaplin	Small molecule inhibitor	~250,000
	T1D	Zimislecel Other approaches	Cell and gene therapy	~60,000 w/initial filing* ~3.8M
	IgA nephropathy	Povetacicept	Fusion protein	~300K U.S./Europe >750K China
	pMN	Povetacicept	Fusion protein	~150,000 U.S./Europe >300K China
PIPELINE	DM1	VX-670	Oligonucleotide with cyclic peptide	~110,000
	CF	VX-522	mRNA	~5,000**
	ADPKD	VX-407 Other potential approaches	Small molecule corrector	Up to ~30K ~300,000
	gMG	Povetacicept	Fusion protein	~175,000
	wAIHA	Povetacicept	Fusion protein	~35,000