VRTX gideon lens

Vertex Pharmaceuticals Incorporated (VRTX) — Production ER2 / Gideon-Lens Equity Research

Report date: 2026-08-30 **Report ID:** vrtx-er2-20260830T120327+0800 **Price anchor:** USD 541.69 per XNAS:VRTX common share, last completed close on 2026-08-28 **Financial anchor:** TTM ended 2026-06-30; Q3 FY2025 + Q4 FY2025 + Q1 FY2026 + Q2 FY2026 **Exact return horizon:** 2026-06-30 to 2031-06-30, exactly 5.0 calendar years **Coverage status:** Initial governed Production ER2; no prior governed active report was found **Research authority:** research only; no trade, ranking, sizing, displacement, portfolio-mutation, BUY-queue, or message authority

VERDICT BLOCK

Verdict: PASS

Scorecard:

Gate	Result	Notes
Management	YELLOW	Strong execution; diversified-launch and acquisition returns remain unproven
Moat	YELLOW	CF is defended; non-CF durability and 2046 test remain unresolved
P/E <= 15 on confident EPS at TTM + 5 calendar years	FAIL	Base EPS supports USD 427.80; cushion is -21.02%
Compounder Score	Audited 52 / 100	Reject under the diagnostic rubric; not dream-investment evidence
Business Quality Score	Audited 49 / 80	Quality is capped by concentration, ROIIC gaps, and capital allocation
20% Return UW Score	Audited 3 / 20	Only Bull approaches 20%; current price fails the stretch case

One-line thesis (or reason to pass): Vertex owns an exceptional cystic-fibrosis franchise and credible diversification options, but USD 541.69 prices in more successful launch, margin, and capital-allocation execution than the governed Base case can support, leaving Base and probability-weighted net-SGD returns near 3%.

Security return underwriting (mandatory even when the verdict is PASS):

Measure	Result	Notes
Primary valuation method	P/E	One audited method for every scenario, probability weighting, reverse-return diagnostics, and net-SGD
Gross local-currency bear / base / bull IRR	-18.65% / 2.98% / 16.91%	Five-year annualized shareholder return in USD
Probability-weighted gross local-currency IRR	3.07%	CAGR of 25% / 55% / 20% probability-weighted terminal shareholder wealth
Return bridge	USD 541.69 -> USD 193.042245 / 627.447326 / 1,183.115248	Terminal statutory diluted EPS x independently locked 15x / 22x / 28x P/E; zero distributions; no second cash/debt adjustment

P/E is the controlling method because statutory diluted EPS is reconciled and positive in all scenarios. The current comparable denominator is TTM statutory diluted EPS of USD 17.1874695 and the current comparable P/E is 31.5166x. FY2024's USD 4.628B Alpine acquired-IPR&D event is excluded from the comparable historical range, while routine TTM acquired-IPR&D remains inside statutory EPS. VP selected 15x / 22x / 28x exits before returns were calculated, using positive peer, historical, and forward evidence; the binary P/E-at-15 entry gate did not set those exits.

Balance-sheet values are visible diagnostics, not a second valuation layer. At 2026-06-30, cash plus current and long-term securities were USD 13.6415B, funded debt was zero, long-term leases were USD 1.9776B, and net cash less long-term leases was USD 11.6639B. Scenario terminal cash is USD 12.745704B / 19.415340B / 24.933176B and funded debt remains zero on the standalone governed perimeter; terminal lease liabilities are not separately forecast. Lease expense is already

inside statutory EPS, so no cash, debt, lease, collaboration, or Crinetics adjustment is added after EPS x P/E. The signed but unclosed approximately USD 10B Crinetics acquisition and undrawn USD 4.5B facility are excluded pending close; closing is a mandatory perimeter-changing ER2 rerun trigger.

Bear-case operating and return bridge

Bear case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 12.5872B	USD 12.2500B	-0.54%	CF declines and non-CF launches do not offset erosion
Operating margin	38.0%	31.0%	-7.0 pp	Royalty, launch, R&D, and concentration pressure reduce leverage
Operating earnings	USD 4.7771B	USD 3.7980B	-4.48%	Revenue x statutory operating margin on the sealed fallback basis
Diluted share count	255.200M	252.919381M	-0.18% CAGR	USD 1B annual repurchases only partly offset SBC issuance
EPS	USD 17.1874695	USD 12.869483	-5.62%	USD 3.254942B NI after 20% tax and adverse other income
Valuation	31.5166x	15.0x	-16.5166x	Near positive-peer floor; no distress or zero-equity shortcut
Share value	USD 541.69	USD 193.042245	-64.36% total	USD 12.869483 EPS x 15.0x P/E
Annual dividend	USD 0.00	USD 0.00	Unchanged	No current dividend or sourced forward distribution
Dividend yield	0.00%	0.00%	0.00 pp	Zero-distribution diagnostic
Five-year dividends	-	USD 0.00	cumulative	No unsupported cash-return credit
Total ending value	USD 541.69	USD 193.042245	-18.65% gross USD IRR	Terminal share value plus zero distributions

Base-case operating and return bridge

Base case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 12.5872B	USD 18.6000B	8.12%	CF grows modestly; CASGEVY, JOURNAVX, and povetacicept diversify revenue
Operating margin	38.0%	43.0%	+5.0 pp	Scale and launch absorption exceed continued R&D investment
Operating earnings	USD 4.7771B	USD 7.9980B	10.86%	Reviewed product rollup and statutory margin reconcile without a plug
Diluted share count	255.200M	246.095002M	-0.72% CAGR	USD 2B annual repurchases exceed explicit SBC issuance
EPS	USD 17.1874695	USD 28.520333	10.66%	USD 7.018711B NI after 18% tax and zero other-income credit
Valuation	31.5166x	22.0x	-9.5166x	Slightly below replayed peer median and at VRTX historical low
Share value	USD 541.69	USD 627.447326	+15.83% total	USD 28.520333 EPS x 22.0x P/E
Annual dividend	USD 0.00	USD 0.00	Unchanged	No source-bound distribution path
Dividend yield	0.00%	0.00%	0.00 pp	Zero-distribution diagnostic
Five-year dividends	-	USD 0.00	cumulative	Buybacks affect shares, not a second distribution add-back
Total ending value	USD 541.69	USD 627.447326	2.98% gross USD IRR	Terminal share value plus zero distributions

Bull-case operating and return bridge

Bull case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 12.5872B	USD 23.9000B	13.68%	CF, gene editing, pain, and renal launches succeed together
Operating margin	38.0%	48.0%	+10.0 pp	Strong mix and commercial leverage absorb R&D and royalty burdens
Operating earnings	USD 4.7771B	USD 11.4720B	19.15%	High-growth product mix produces reviewed statutory OI
Diluted share count	255.200M	244.825722M	-0.83% CAGR	USD 2.5B annual repurchases outweigh SBC issuance
EPS	USD 17.1874695	USD 42.254116	19.71%	USD 10.344894B NI after 16% tax and small other-income credit
Valuation	31.5166x	28.0x	-3.5166x	High-execution outcome within VRTX history and below current P/E
Share value	USD 541.69	USD 1,183.115248	+118.41% total	USD 42.254116 EPS x 28.0x P/E
Annual dividend	USD 0.00	USD 0.00	Unchanged	No dividend assumed even in Bull
Dividend yield	0.00%	0.00%	0.00 pp	Zero-distribution diagnostic
Five-year dividends	-	USD 0.00	cumulative	Bull receives no unsupported cash-return help
Total ending value	USD 541.69	USD 1,183.115248	16.91% gross USD IRR	Terminal share value plus zero distributions

Probability-weighted terminal shareholder wealth is `25% x USD 193.042245 + 55% x USD 627.447326 + 20% x USD 1,183.115248 = USD 629.97964015`. The 3.065933% result is `(629.97964015 / 541.69)^(1/5) - 1`, not an arithmetic average of scenario IRRs.

CIO actionability (separate from ER2 underwriting):

Measure	Result	Notes
Status	PASS	Base and weighted returns are inadequate despite healthcare diversification
Bear / Base / Bull net SGD IRR	-20.40% / 2.79% / 18.81%	Same P/E values after 0.30% entry/exit costs and scenario FX
Probability-weighted net SGD IRR	3.44%	CAGR of 25% / 55% / 20% weighted terminal net-SGD wealth
10% mandate hurdle	FAIL	Both Base and probability-weighted cases are below 10%
15% stretch hurdle	FAIL	Central cases fail; only Bull clears 15%
Downside and portfolio fit	FAIL	Bear loses 20.40% annualized; diversification cannot rescue return economics
Proposed sizing ceiling	none	Research conclusion only; no sizing or displacement authority

Net-SGD uses entry USD/SGD 1.2745, 0.30% entry cost, 0.30% exit cost, and terminal USD/SGD 1.15 / 1.27 / 1.39 for Bear / Base / Bull. Starting cost is SGD 692.455056715 per share. Net terminal wealth is SGD 221.33258600475 / 794.46752970794 / 1,639.59660413584, and probability-weighted net terminal wealth is SGD 820.2096086677225. Zero distributions make U.S. dividend withholding zero. The same P/E method and terminal equity values control gross and net-SGD; costs and FX are the only overlay.

The current portfolio has a real healthcare gap: 2.7% exposure versus VT's 8.3%, a 5.6-point underweight, and no direct VRTX position. Yet the book is 99.7% invested with 0.3% cash, and its modeled Base return is 12.4%. A 2.79% Base net-SGD security return does not earn a role merely because its label diversifies the sector map. Portfolio fit therefore fails on economics, not on the absence of a healthcare need.

Trade execution authorized: NO

Kill / trigger criteria:

- Valuation trigger: Base EPS x 15 equals USD 427.804995. Below that price the valuation gate turns positive, but the formal ER2 remains PASS while Management and Moat are both YELLOW.
- Operating failure: two consecutive quarters of declining CF revenue, combined CASGEVY and JOURNAVX quarterly revenue below USD 200M, and second-quarter operating margin below 36% force a thesis downgrade.
- Diversification failure: povetacicept approval or launch delay beyond the governed cadence, or paid CASGEVY/JOURNAVX conversion that remains below the explicit launch path, removes Base diversification credit.
- Perimeter reset: Crinetics closing requires QF-to-RT reruns with purchase accounting, financing, target economics, and dilution; the standalone return bridge cannot be reused.
- Upgrade conditions: at least one qualitative gate must become PASS through evidenced non-CF economics or 2046 durability, the P/E-15 price gate must clear, and Base plus probability-weighted net-SGD returns must exceed 10% with acceptable Bear downside.

Research sizing if actionable: none. No direct VRTX position, displacement, ranking, or sizing ceiling is supported or authorized.

Executive underwriting judgment. Vertex's CF franchise is genuinely high quality. TTM revenue was USD 12.5872B, TTM statutory operating income USD 4.7771B, and free cash flow USD 3.7961B. ALYFTREK refreshes the franchise while cannibalizing TRIKAFTA/KAFTRIO rather than creating a second independent profit pool. Patent protection, prescribing infrastructure, switching economics, and the scarcity of effective CFTR modulation defend the core business.

The problem is that approximately 97.5% of TTM revenue is still CF-derived. CASGEVY has a difficult treatment journey, JOURNAVX needs payer and prescriber behavior to change, and povetacicept faces direct BAFF/APRIL competition. The Base case asks those programs to produce meaningful revenue while statutory margin expands from 38% to 43%. That is possible, but product-level profit and invested-capital disclosure are insufficient to prove the incremental return. Management is therefore YELLOW rather than PASS, and Moat/2046 are YELLOW because every named major protection date expires by 2040 and durable non-CF economics remain unproven.

The valuation failure is independent. Synthesis passed 11/11 tie-outs and VP locked five of five valuation foundations. Base EPS of USD 28.520333 supports only USD 427.804995 at the framework's 15x entry test, 21.02% below USD 541.69. The separate expected-return bridge is more franchise-aware at 22x Base, yet still yields only 2.98% gross USD and 2.79% net-SGD. A premium exit cannot rescue an expensive entry when the operating case already assumes successful diversification and margin expansion.

The Red Team found no foundational or arithmetic defect. A REGN-anchored 18.971x Base sensitivity lowers Base gross IRR to approximately -0.02%, while using VRTX's 22.262x historical low in Bear improves Bear gross IRR only to approximately -11.96%. Crinetics is transparently excluded while unclosed and is a mandatory rerun trigger after closing. These are material sensitivities but already resolved within the governed conclusion; `RETURN_MODEL_OBJECTION_STATUS: MATERIAL_RESOLVED`.

The truthful decision is PASS. Vertex may become attractive at a much lower price or after diversified economics earn qualitative upgrades, but today's security return, downside, and evidence do not support capital action. Diversification need is not investment merit.

Personal research, not investment advice.

Appendix A - Company Primer

Vertex Pharmaceuticals Incorporated (VRTX) — Company Primer

Production ER2 run: `pulse-cio-20260830T120326+0800` **Information date:** 2026-08-30 SGT **Financial anchor:** TTM ended 2026-06-30; exact underwriting horizon 2031-06-30 **Quantitative authority:** sealed `quant_foundation.md` and `statutory_bridge.json` only **Scope:** security research only; `trade_execution_authorized=false`

1. Business overview: what Vertex sells, to whom, and why it matters

Vertex is a global biotechnology company whose economic center is a family of oral medicines that correct the malfunctioning CFTR protein in cystic fibrosis (CF). It has expanded into three very different commercial models: a one-time ex vivo gene-edited cell therapy, CASGEVY, for severe sickle cell disease (SCD) and transfusion-dependent beta thalassemia (TDT); a mass-market oral non-opioid pain medicine, JOURNAVX; and, if approved, a specialist-administered immunology therapy, povetacicept, for IgA nephropathy and other B-cell-mediated diseases. This is important because the diversification is not simply “more drugs.” Each franchise has a different prescriber, reimbursement path, delivery system, cost structure, and commercial cadence. [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm) and [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

The end customer is a patient, but the economic buyer is usually a third-party payer. In the U.S., Vertex sells mainly through a limited set of specialty pharmacies, specialty distributors, and major wholesalers; these intermediaries supply patients, hospitals, pharmacies, and authorized treatment centers (ATCs). Outside the U.S., the route is commonly a distributor, hospital, clinic, or government-supported health system. Vertex promotes approved uses to clinicians and payer organizations through field sales and medical teams. For small molecules, revenue is generally recognized when control passes on delivery; for CASGEVY, recognition occurs upon infusion, which makes the physical treatment journey an accounting as well as a clinical bottleneck. [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm).

The problem Vertex solves is unusually close to causal biology. CFTR modulators improve the defective protein rather than only treating downstream lung symptoms. CASGEVY edits a patient’s own blood stem cells so that fetal hemoglobin rises after engraftment. JOURNAVX blocks NaV1.8-mediated pain signaling in peripheral nerves before the signal reaches the brain. The pipeline applies the same causal-biology philosophy to APOL1-mediated kidney disease, B-cell-driven autoimmune disease, type 1 diabetes, autosomal dominant polycystic kidney disease, and myotonic dystrophy. That scientific focus is the common thread; the commercial infrastructure is increasingly heterogeneous. [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm), [FDA CASGEVY approval](https://www.fda.gov/news-events/press-announcements/fda-approves-first-gene-therapies-treat-patients-sickle-cell-disease), and [FDA JOURNAVX approval](https://www.fda.gov/news-events/press-announcements/fda-approves-novel-non-opioid-treatment-moderate-severe-acute-pain).

2. Revenue architecture: one accounting segment, several economic franchises

Vertex reports one segment, pharmaceuticals. That is an accounting conclusion, not a statement that CF tablets, a gene-edited cell therapy, and an acute-pain tablet share identical economics. For investor orientation, the more useful view is product-family revenue within the single segment. All financial figures below come from the sealed quantitative foundation; percentages are transparent derivations from those source-bound values.

Revenue family	FY2025 revenue, USDm	FY2025 mix	TTM revenue, USDm	TTM mix	Economic interpretation
TRIKAFTA/KAFTRIO	10,312.7	85.9%	10,078.0	80.1%	Mature global CF triple; still the cash engine
ALYFTREK	837.8	7.0%	1,625.1	12.9%	New once-daily CF triple; migration and expansion vehicle
Other product revenue	820.1	6.8%	884.1	7.0%	Legacy CF plus CASGEVY and JOURNAVX
Other revenue	30.7	0.3%	0.0	0.0%	Non-product line present in FY2025 only
Total	**12,001.3**	**100.0%**	**12,587.2**	**100.0%**	Single pharmaceuticals segment

The TTM mix shows two simultaneous transitions. First, ALYFTREK is replacing a portion of TRIKAFTA/KAFTRIO while keeping the patient inside Vertex's CF portfolio. Second, CASGEVY and JOURNAVX have begun to contribute, but they remain embedded in the relatively small "other product" family in the sealed TTM bridge. Therefore, consolidated growth can be positive even while the largest product declines: internal migration is visible in the product lines before it is visible in total revenue.

Geographically, the U.S. remains the largest commercial market, while Europe and other international markets are material because CF access is negotiated country by country and CASGEVY requires both reimbursement and an operational ATC network. The current Q2 release attributes growth outside the U.S. to CF performance, ALYFTREK uptake, CASGEVY infusions, and foreign exchange. The sealed quantitative foundation does not bind a full FY2025 or TTM geography table, so this primer does not manufacture geographic percentages; readers should treat geography as a reimbursement, access, and currency driver rather than an audited product-to-country allocation. [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

3. Product economics and consolidated unit economics

Small-molecule CF medicines are economically attractive: once discovered, approved, and manufactured at scale, the physical pill cost is small relative to the clinical value and reimbursed price. The main deductions from gross value are payer rebates and discounts, government pricing, distribution fees, manufacturing, and royalties. Vertex's CF Foundation agreement creates tiered royalties on older CF compounds; combinations allocate sales equally across active ingredients for royalty purposes. Newer compounds synthesized and tested after the contractual cutoff can bear less or no CFF royalty. That makes product migration economically relevant even if the patient count does not change. [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm).

The sealed FY2025 figures imply an 86.2% consolidated gross margin: revenue of $12,001.3 million less cost of sales of $1,651.3 million. Statutory operating income was $4,173.3 million, a 34.8% margin. On the TTM anchor, revenue was $12,587.2 million and statutory operating income was $4,777.1 million, a 38.0% margin. TTM free cash flow was $3,796.1 million, or 30.2% of revenue, after $496.8 million of capital expenditure. These are consolidated outputs, not separate product margins; Vertex does not provide audited product-level operating profit.

The gap between gross and operating margin funds an unusually large discovery and development engine plus commercialization. R&D includes scientists, clinical trials, drug supply, external services, facilities, and stock compensation. SG&A now carries three different launch motions: preserving specialist CF access, constructing ATC pathways for CASGEVY, and reaching a much broader universe of hospital and community pain prescribers for JOURNAVX. CASGEVY also brings higher manufacturing and logistics intensity, while povetacicept requires nephrology launch infrastructure. In Q2 2026 Vertex explicitly attributed higher combined R&D/AIPR&D/SG&A to JOURNAVX launch investment and building the renal franchise. [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

Consolidated economics can therefore improve or deteriorate for reasons that product revenue alone does not reveal. Favorable mix toward lower-royalty CF products can help cost of sales; mix toward cell therapy can raise it. A launch can depress current operating margin while building future revenue. Acquired in-process R&D can create a large statutory expense immediately even though the acquired program may not generate revenue for years. The correct reading is to separate recurring production economics from deliberate reinvestment and transaction accounting, while retaining statutory figures as the audited base.

4. The CF franchise: serial innovation and managed self-cannibalization

CF is caused by variants in the CFTR gene. A "potentiator" helps CFTR channels at the cell surface open; a "corrector" helps more protein fold and reach the surface. KALYDECO, ivacaftor, established the potentiator model for selected responsive variants. ORKAMBI combined lumacaftor with ivacaftor to address the common F508del variant. SYMDEKO/SYMKEVI paired tezacaftor with ivacaftor, improving the treatment option for additional patients. TRIKAFTA/KAFTRIO added elexacaftor as a second corrector, greatly widening eligible genotypes and becoming the dominant franchise product. ALYFTREK combines vanzacaftor, tezacaftor, and deutivacaftor in a once-daily triple. [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm).

The strategic logic is serial innovation rather than defending each old brand indefinitely. The current portfolio can treat approximately 95% of people with CF in core markets, and the medicines are accessible in more than 60 countries. ALYFTREK demonstrated non-inferior lung function to TRIKAFTA with improved sweat-chloride reduction and lower dosing

burden. Vertex expects broad migration over time and is pursuing younger ages. The investor should interpret a TRIKAFTA decline alongside ALYFTREK growth, total CF revenue, patient initiations, reimbursement wins, and the royalty burden—not as an isolated loss of franchise health. [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

Legacy products still matter for patients whose age, genotype, geography, or tolerability makes them appropriate, but their stand-alone revenue is no longer separately prominent in the sealed TTM bridge. KALYDECO, ORKAMBI, and SYMDEKO/SYMKEVI are included within other CF product revenue. Their economic role is a long tail of genotype-specific coverage and continuity, while the two triple combinations carry most of the franchise.

The next CF risk is not merely “a competitor launches a pill.” Vertex must keep expanding age and genotype coverage, improve patient convenience, sustain reimbursement, and develop modalities for the remaining patients who do not benefit from modulators. Its next-generation corrector program includes VX-828, VX-581, and VX-272; VX-828 has completed proof-of-concept dosing, while the others are in early human work. These assets should receive lower probability than approved products until efficacy, safety, and differentiation are demonstrated. [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

5. CASGEVY: attractive clinical value, deliberately difficult delivery

CASGEVY is an autologous, ex vivo CRISPR/Cas9 therapy. “Autologous” means the starting cells come from the same patient. Clinicians collect hematopoietic stem and progenitor cells; manufacturing edits the BCL11A erythroid enhancer so the cells produce more fetal hemoglobin; the product is frozen and returned to an ATC; the patient undergoes myeloablative conditioning; and the edited cells are infused and must engraft. The FDA’s original SCD approval described a one-time infusion after collection and high-dose conditioning. Vertex’s Q2 2026 release says the U.S. label has since expanded to children aged two and older with SCD or TDT. [FDA CASGEVY approval](https://www.fda.gov/news-events/press-announcements/fda-approves-first-gene-therapies-treat-patients-sickle-cell-disease) and [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

The commercial funnel is much longer than a prescription. A patient needs specialist referral, eligibility work-up, payer authorization, an ATC slot, cell collection, successful manufacturing and release testing, conditioning, hospitalization, infusion, and follow-up. Any delay in a step can shift revenue across quarters because Vertex recognizes CASGEVY product revenue upon infusion. The network must coordinate ATCs, third-party manufacturers, shipping, testing, and scheduling. Conditioning toxicity is a particularly important constraint: even if the edited product is effective, some otherwise eligible patients may not accept or tolerate myeloablation. Vertex is advancing gentler-conditioning approaches, but those remain preclinical and should not be credited as existing capacity. [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm) and [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

Economically, CASGEVY is a profit share rather than a wholly retained product. Vertex leads global development, manufacturing, and commercialization, but the amended CRISPR agreement allocates 60% of net profits and losses to Vertex and 40% to CRISPR, subject to adjustments. CRISPR also reimburses its share of covered R&D. “Net commercial profit” includes product revenue, cost of sales, and selling expenses, so reported revenue is not the same as retained economics. Vertex also bears working-capital, capacity, and operational complexity before the franchise reaches steady throughput. [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm).

The core monitoring variables are starts, collections, infusions, elapsed time through the funnel, manufacturing success, reimbursement breadth, ATC productivity, conditioning innovation, and retained profit after the CRISPR share. Quarterly revenue alone is lagging evidence. Competition includes other gene therapies, transplant approaches, chronic medicines that reduce crises or transfusions, and future in vivo editing. The moat is the combined clinical profile, regulatory label, manufacturing release record, payer access, and ATC execution—not CRISPR branding by itself.

6. JOURNAVX: a broad market with a harder commercial motion

JOURNAVX (suzetrigine) is an oral, selective NaV1.8 inhibitor approved in the U.S. for adults with moderate-to-severe acute pain. It targets peripheral pain signaling and is non-opioid. In the pivotal surgical-pain program it beat placebo, although real-world positioning is against inexpensive generic analgesics, opioid regimens, hospital protocols, and multimodal care—not against placebo. The FDA lists itching, muscle spasms, creatine-phosphokinase elevation, and rash among common adverse reactions and notes important CYP3A and grapefruit restrictions. [FDA JOURNAVX approval](https://www.fda.gov/news-events/press-announcements/fda-approves-novel-non-opioid-treatment-moderate-severe-acute-pain).

The opportunity is broad because acute pain occurs across surgery, trauma, and outpatient care. That breadth is also the challenge. CF has concentrated specialist centers and a defined genetic population; acute pain has fragmented prescribers, formularies, discharge pathways, and default order sets. Commercial success requires payer coverage, pharmacy availability, hospital protocol adoption, prescriber habit change, patient affordability, and evidence that JOURNAVX earns a place in multimodal regimens. Vertex reported approximately 260 million reimbursed U.S. lives and roughly 900,000 filled prescriptions in the first half of 2026, but coverage is not the same as preferred placement, low out-of-pocket cost, or durable utilization. [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

The second leg is peripheral neuropathic pain, where suzetrigine is in Phase 3 studies for diabetic peripheral neuropathy and VX-993 is in Phase 2. Neuropathic pain is chronic and commercially distinct from short-course acute pain, but the efficacy bar and trial-failure risk remain. An investor should avoid capitalizing the entire pain market: monitor prescriptions per covered life, repeat prescriber behavior, net price, hospital adoption, completion and readout of Phase 3 DPN studies, and competitive non-opioid data.

7. Pipeline and technology platforms: how to assign confidence

Vertex now spans four technology platforms: oral small molecules; gene-edited autologous cell therapy; stem-cell-derived islet replacement; and protein or oligonucleotide therapeutics. The portfolio is best read through a probability ladder rather than a list of disease names.

Confidence tier	Programs	What is known	What remains at risk
Approved and scaling	ALYFTREK, CASGEVY, JOURNAVX	Regulatory efficacy/safety bar cleared; commercial evidence accumulating	Access, adoption, delivery, net price, manufacturing, label execution
Filed / near-regulatory	Povetacicept in IgAN	BLA accepted for accelerated approval; target action date disclosed	FDA review, label, confirmatory obligations, launch readiness
Pivotal / late-stage	Inaxaplin in AMKD; suzetrigine in DPN; zimislecel in T1D; povetacicept in pMN	Disease-specific efficacy programs under way	Endpoint success, safety, durability, comparators, enrollment and manufacturing
Proof-of-concept	VX-993, VX-407, VX-670, next-generation CF correctors	Human testing has begun or early trials are active	Translation from biomarkers to meaningful clinical benefit
Preclinical	Gentler CASGEVY conditioning; NaV1.7 assets; other serial-innovation backups	Mechanistic rationale	Human safety, exposure, efficacy, manufacturability, timing

Povetacicept is a dual BAFF/APRIL inhibitor designed to reduce pathogenic B-cell and plasma-cell activity. The FDA accepted its IgAN application for accelerated approval with a November 30, 2026 target date; the Phase 3 RAINIER study is listed as active but not recruiting. Separate pMN and generalized-myasthenia-gravis trials broaden the “pipeline in a product” possibility, but each indication needs independent evidence and reimbursement. [RAINIER on ClinicalTrials.gov](https://clinicaltrials.gov/study/NCT06564142), [OLYMPUS on ClinicalTrials.gov](https://clinicaltrials.gov/study/NCT07204275), [gMG study on ClinicalTrials.gov](https://clinicaltrials.gov/study/NCT07501702), and [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

Inaxaplin targets APOL1-mediated kidney disease and remains dependent on the AMPLITUDE pivotal program and its proteinuria/eGFR evidence. Zimislecel replaces insulin-producing islet cells and is in a Phase 1/2/3 program, but currently uses standard immunosuppression; immune protection, engraftment durability, manufacturing, and patient selection are central. VX-017 aims for a blood-type-independent islet-cell approach but is earlier. ClinicalTrials.gov lists the main zimislecel study as recruiting. [Zimislecel study on ClinicalTrials.gov](https://clinicaltrials.gov/study/NCT04786262) and [Vertex Q2 2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

VX-407 addresses selected PKD1 variants in autosomal dominant polycystic kidney disease; VX-670 is an oligonucleotide-peptide conjugate for myotonic dystrophy type 1; both are proof-of-concept programs. These should be valued as options, not forecast revenue, until data show clinically meaningful benefit with acceptable safety and feasible delivery. Management timelines are useful monitoring dates, not probabilities of success.

8. Industry structure, competition, payers, and exclusivity

Vertex’s strongest competitive position is in CF: decades of biology, combinations that cover most eligible genotypes, global reimbursement, and an established specialist network. Still, payer concentration matters because a small number of government and commercial payers can negotiate price and access. International reimbursement is often sequential by

country. Competitors can attack through better efficacy, safety, dosing, genotype reach, gene therapy, or lower cost; generic entry becomes relevant as older patents expire.

Product	U.S. basic patent / regulatory-exclusivity year	Europe basic patent / regulatory-exclusivity year	Investor reading
KALYDECO	2028	2027	Earliest legacy exposure; portfolio migration already advanced
SYMDEKO/SYMKEVI	2027	2033	U.S. legacy exposure precedes Europe
ORKAMBI	2031	2030	Long-tail product, not current growth engine
TRIKAFTA/KAFTRIO	2037	2037	Core franchise protected beyond the 2031 horizon
ALYFTREK	2039	2039	Extends CF combination duration and lowers dosing burden
CASGEVY	2035	2034	Operational know-how and biologic complexity also matter
JOURNAVX	2040	2040	Long nominal runway; commercial adoption is the nearer risk

Source: [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm). These dates do not guarantee freedom from patent challenges, design-arounds, regulatory change, or competition before expiry; nor do they guarantee immediate generic entry at expiry.

CASGEVY competes on one-time efficacy but faces Lyfgenia, transplantation, chronic hemoglobinopathy drugs, and emerging editing technologies. JOURNAVX faces the opposite structure: a huge addressable population but cheap entrenched therapies and decentralized decision-making. Povetacicept enters a competitive renal and immunology landscape where proteinuria reduction, kidney-function durability, dosing convenience, safety, payer restrictions, and confirmatory evidence will matter. Across all franchises, gross-to-net deductions, formulary position, government price rules, compulsory discounts, and international health-technology assessment can separate clinical value from realized revenue.

9. Operating model, R&D, acquired IPR&D, and capital intensity

Vertex funds internal discovery but also buys platforms and late-stage assets. The Alpine acquisition brought povetacicept and caused a large acquired-IPR&D distortion in 2024. Under U.S. GAAP, acquired in-process technology without an alternative future use may be expensed immediately rather than capitalized like a productive factory. Thus a transaction can produce a statutory operating loss and negative free cash flow in the acquisition year even when the core products remain profitable. The sealed foundation preserves the FY2024 loss rather than normalizing it away; later valuation work must decide which costs recur, without relabeling audited history.

Capital intensity is rising. Oral-drug manufacturing can remain asset-light relative to sales, but cell therapy requires capacity, cryogenic logistics, quality testing, and ATC coordination. Vertex is investing in its own Boston cell-therapy capabilities and also uses third parties. TTM capital expenditure of $496.8 million was 3.9% of revenue, while TTM stock-based compensation was $689.1 million. Repurchases of $2,005.9 million exceeded stock compensation expense, and diluted shares have trended down, but repurchases should be assessed against acquisition funding and future dilution rather than treated as a free return.

10. Balance sheet and capital allocation

At June 30, 2026, the sealed foundation records $13,641.5 million of cash and marketable securities, no funded debt, $1,977.6 million of long-term lease liabilities, and $11,663.9 million of net cash after those long-term leases. The revolver was undrawn. This supports simultaneous R&D, launch spending, capacity investment, acquisitions, and buybacks, but cash should not be assumed permanently surplus: the pending Crinetics acquisition and continued business development can materially change the capital structure. [Vertex Q2 2026 Form 10-Q](https://www.sec.gov/Archives/edgar/data/875320/000087532026000259/vrtx-20260630.htm).

Vertex pays no dividend in the sealed history. Capital allocation has favored internal R&D, acquired programs, manufacturing and commercial infrastructure, and share repurchases. TTM operating cash flow was $4,292.9 million, free cash flow was $3,796.1 million, and repurchases were $2,005.9 million. The central question is not whether Vertex can fund growth today, but whether external innovation converts large cash outlays into durable post-CF earnings without weakening the balance

sheet or masking dilution.

11. Key terminology and how to read the single-segment CODM disclosure

Term	Plain-English meaning
CFTR modulator	A drug that improves the defective CFTR protein rather than treating only downstream symptoms
Potentiator / corrector	Helps the channel open / helps protein fold and reach the cell surface
Ex vivo	Cells are removed, modified outside the body, and returned
Autologous	The patient receives cells originating from that same patient
Conditioning	Chemotherapy that clears marrow space before edited stem-cell infusion
ATC	Authorized treatment center equipped to deliver the full cell-therapy pathway
NaV1.8 inhibitor	Blocks a peripheral sodium channel involved in pain signaling
BAFF / APRIL	Immune signals that support B cells and plasma cells; targets of povetacicept
AIPR&D	Immediate expense for acquired in-process research with no alternative future use
CODM	Chief operating decision maker; at Vertex, the CEO
TTM	The four quarters ended 2026-06-30: Q3 2025 through Q2 2026

Vertex's CEO, as CODM, reviews a single pharmaceuticals segment and uses consolidated net income (loss) as the disclosed segment profit measure. Net income is below operating income: it includes interest, other non-operating items, and tax. It therefore cannot be added across product "segments" or used as if it were segment operating profit. The sealed statutory bridge uses the governed `single_segment_non_operating_codm_fallback`: one consolidated modeled segment on statutory operating income—$4,173.3 million for FY2025 and $4,777.1 million for the TTM—then separately bridges below-line income and tax to net income with zero residual. This preserves the issuer's disclosure while avoiding a category error.

Single-segment reporting also means investors must not invent product operating margins. Product revenue is disclosed; product-level cost allocation is not. CASGEVY's 60/40 retained-economics agreement, CF royalties, and JOURNAVX launch costs are economically important, but the audited operating-profit anchor remains consolidated.

12. Principal risks and monitoring map

Risk	Why it matters	Evidence that would reduce concern	Evidence that would increase concern
CF concentration	CF remains the overwhelming revenue source	Stable total CF patients/revenue through ALYFTREK migration	Triple-combination erosion without offsetting initiations or access
ALYFTREK cannibalization	Product mix can move while total CF is flat	Better adherence, broader ages, lower royalties, sustained total CF	Discounting or migration with no volume/economic benefit
CASGEVY throughput	Revenue depends on a long physical treatment chain	Rising collections-to-infusions conversion and shorter cycle time	Manufacturing failures, conditioning resistance, ATC congestion
JOURNAVX adoption	Broad market requires behavior and protocol change	Repeat prescribers, favorable formulary status, hospital integration	Coverage without utilization, high abandonment, weak net price
Pipeline binary risk	Clinical and regulatory failures are common	Replicated pivotal efficacy, clean safety, durable endpoints	Missed endpoints, safety signals, enrollment or review delays
Povetacicept accelerated approval	Early launch may depend on surrogate evidence	Approval plus confirmatory progress and durable kidney outcomes	Restrictive label, complete-response request, confirmatory slippage
Cell-therapy economics	High revenue does not equal high retained profit	Scaled manufacturing and positive profit after CRISPR share	Cost overruns, rebates, capacity spending, low utilization
Payer pressure	Buyers can limit access or compress net price	Broader reimbursed access with stable realized economics	Exclusions, mandatory discounts, slow country launches
Patent / exclusivity	Older CF products approach earlier expiries	Successful migration to longer-dated protected products	Successful challenges or competitive design-arounds
R&D and acquisition discipline	External innovation can consume large cash sums	Milestone delivery and portfolio productivity	Repeated write-offs, impairments, or leverage without output
Manufacturing / quality	Biologics and cell therapies are process-sensitive	Consistent release, supply redundancy, regulatory compliance	Batch failures, shortages, warning letters, logistics disruption

Risk	Why it matters	Evidence that would reduce concern	Evidence that would increase concern
Accounting volatility	AIPR&D and collaboration accounting obscure trends	Clear statutory-to-economic reconciliation	Heavy reliance on adjusted metrics or opaque cost reclassification

The central orientation is straightforward: Vertex is still a CF company in its financials, but no longer a one-franchise company in its operating design. The CF engine supplies high-margin cash; ALYFTREK refreshes and partially cannibalizes that engine; CASGEVY tests whether Vertex can industrialize a complex treatment pathway; JOURNAVX tests whether it can commercialize into a broad, fragmented market; and the renal, diabetes, and genetic-disease pipeline tests whether causal-biology skill can transfer across modalities. The research task is to keep these probability, timing, and retained-economics layers separate.

Primary sources

- Sealed quantitative foundation and statutory bridge, run `pulse-cio-20260830T120326+0800`.
- [Vertex 2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm).
- [Vertex Q2 2026 Form 10-Q](https://www.sec.gov/Archives/edgar/data/875320/000087532026000259/vrtx-20260630.htm).
- [Vertex Q2 2026 earnings release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).
- [FDA: original CASGEVY SCD approval](https://www.fda.gov/news-events/press-announcements/fda-approves-first-gene-therapies-treat-patients-sickle-cell-disease).
- [FDA: JOURNAVX approval](https://www.fda.gov/news-events/press-announcements/fda-approves-novel-non-opioid-treatment-moderate-severe-acute-pain).
- ClinicalTrials.gov records linked in the pipeline section; live JSON responses are archived with the run evidence.

Appendix M - Management Assessment

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Vertex Pharmaceuticals Incorporated — Production ER2 Management Assessment

As-of date: 2026-08-30 SGT **Governed period:** latest quarter Q2 FY2026 ended 2026-06-30; TTM ended 2026-06-30; FY ends December 31 **Management gate: YELLOW Authority boundary:** research only; no trade, broker, portfolio, ranking, sizing, message, or BUY-queue authority. `trade_execution_authorized=false`.

1. Who is running Vertex

Reshma Kewalramani, M.D., has been chief executive officer and president since 2020. She joined Vertex in 2017, became chief medical officer in 2018, and therefore owns the present “serial innovation” strategy rather than inheriting it recently. Her tenure covers the maturation of the CF franchise, the approvals and launches of CASGEVY, ALYFTREK, and JOURNAVX, the Alpine acquisition, and the current renal and type 1 diabetes buildout. The CEO is a physician-scientist, which is strategically useful in a company whose capital allocation is predominantly R&D rather than plant or distribution.

Charles F. Wagner, Jr. joined as CFO effective April 10, 2019 and became chief operating and financial officer on July 1, 2025. Before Vertex he was CFO of Ortho Clinical Diagnostics, Bruker, Progress Software, and Millipore. The expanded remit includes finance, human resources, business-development transactions, alliance management, and portfolio/program management; he is consequently accountable for both financial discipline and operating integration. Current functional leaders material to underwriting are Carmen Bozic, M.D. (chief medical officer), Nia Tatsis, Ph.D. (chief regulatory and quality officer), Duncan McKechnie (chief commercial officer), and Mark Bunnage, D.Phil. (chief scientific officer). Vertex reports one operating segment, so these are functional rather than statutory segment heads.

Jeffrey Leiden, M.D., Ph.D., the former CEO, is executive chairman. Bruce Sachs, a director since 1998, is lead independent director and chairs compensation. The April 2026 withdrawal and May departure of Suketu Upadhyay reduced the board to ten members; the remaining slate comprises eight independent directors plus Kewalramani and Leiden. Committees are independent. The board has real scientific, commercial, technology, and finance experience, and several recent additions evidence refreshment, but Sachs’ 28-year tenure and an executive former CEO as chair weaken the appearance of fresh challenge. The separation of CEO and chair is positive; the chair is not independent, so Sachs’ effectiveness matters disproportionately.

Sources: [2026 proxy](https://www.sec.gov/Archives/edgar/data/875320/000087532026000153/vrtx-20260402.htm), [2026 annual-meeting 8-K](https://investors.vrtx.com/static-files/8f38b896-cdf5-440a-a127-1b717db1c1e6), [Wagner appointment](https://news.vrtx.com/news-releases/news-release-details/vertex-appoints-charles-wagner-chief-financial-officer), and [CEO biography](https://www.vrtx.com/sites/en-us/files/Reshma_Kewalramani_Bio.pdf).

2. Tenure and track record

Kewalramani has been in seat long enough to be judged on outcomes. Three decisions dominate.

First, **CF franchise stewardship and ALYFTREK self-cannibalization** have so far protected the franchise rather than merely shifted product labels. Revenue rose from $7.574 billion in FY2021 to $12.001 billion in FY2025. ALYFTREK contributed $0.838 billion in FY2025 and $1.625 billion over the TTM, but management explicitly says most ALYFTREK revenue now comes from TRIKAFTA switch patients. That is honest and economically important: ALYFTREK should not be added mechanically to legacy CF sales. The favorable stewardship evidence is that total CF revenue still grew 11% year over year in Q2 FY2026, while the newer medicine carries a lower royalty burden and projected patent protection through 2039. The remaining disclosure weakness is that management declines to quantify the switch share, which prevents a clean split between franchise growth and internal substitution.

Second, **commercial diversification** has moved from aspiration to launch activity but not yet to mature economics. FY2025 CASGEVY and JOURNAVX product revenue was $116 million and $60 million, respectively. CASGEVY recorded 301 initiations, 147 first collections, and 64 infusions in FY2025; management then disclosed that H1 FY2026 infusions exceeded all of FY2025 and that Q2 was the third consecutive quarter with more than 100 initiations. JOURNAVX reached about 535,000 prescriptions in Q2, more than 900,000 in H1, and 260 million covered lives, but only 180 million were unrestricted.

This is credible launch execution—especially in CASGEVY's complex treatment pathway—but paid conversion, gross-to-net, and durable prescriber behavior remain the economic test. The team gives useful funnel metrics, yet not a full current funnel every quarter.

Third, **external innovation** is promising but unproved. Vertex paid $4.958 billion for Alpine in 2024, allocating $4.423 billion to acquired IPR&D. Povetacicept subsequently generated strong IgAN interim data, completed Phase 3 enrollment, received BLA acceptance, and has a November 30, 2026 PDUFA date; a second pivotal indication is underway. Those are meaningful de-risking milestones, not a realized return on the purchase price. The governed Section 9 records the Crinetics agreement on July 6, 2026 and no closing filing through the cutoff; it adds another integration and capital-allocation test. FY2022 also included $296 million of ViaCyte M&A cash, which remains pre-commercial option value rather than a demonstrated return. Earlier cell-therapy spending is mixed: zimislecel efficacy is potentially transformative, but a manufacturing analysis paused dosing before resumption; the Semma-derived VX-264 program returned to research and produced a $379 million impairment in FY2025.

Management does stop programs. VX-993 missed its acute-pain primary endpoint in Q2 2025, and Vertex declined to advance it as monotherapy. In Q1 2026, Vertex discontinued VX-522 after it could not overcome lung inflammation attributed to the delivery lipid nanoparticle. These are failures, but the calls named the endpoint miss and tolerability mechanism rather than burying them. That improves the assessment of scientific discipline, though the aggregate R&D budget still requires commercial outputs.

3. Capital allocation behavior

The governed five-year history below is reproduced from `data_package.md` Section 7; no capital-allocation figure was re-fetched.

Fiscal year	Capex ($B)	R&D ($B)	R&D / revenue	Buybacks ($B)	Dividends ($B)	M&A cash ($B)
FY2021	0.235	1.938	25.6%	1.425	0.000	0.000
FY2022	0.205	2.540	28.4%	0.000	0.000	0.296
FY2023	0.200	3.163	32.0%	0.428	0.000	0.000
FY2024	0.298	3.630	32.9%	1.177	0.000	4.958
FY2025	0.438	3.910	32.6%	2.017	0.000	0.000

The pattern matches the stated strategy: internal innovation first, external innovation second, repurchases after those needs, and no dividend. R&D nearly doubled while revenue grew 58%, so the burden rose from 25.6% to 32.6% of revenue. That is acceptable only if povetacicept, pain, and T1D establish durable franchises; it is not self-validating merely because the spending is scientific.

Repurchases have been flexible rather than mechanically identical each year: zero in FY2022, $0.428 billion in FY2023, and $2.017 billion in FY2025. TTM repurchases through June 2026 were $2.006 billion. Diluted shares were 259.9 million in FY2021, 258.0 million in FY2025, and 255.2 million in Q2 FY2026. That is modest per-share progress, not aggressive financial engineering. Buybacks have broadly offset employee issuance, but the five-year reduction is too small to call exceptional price-sensitive allocation. The Alpine outcome, pending Crinetics transaction, and whether buybacks pause appropriately around large deals are the decisive capital-allocation tests.

4. Compensation alignment and ownership

The 2026 proxy says 90% of named-executive compensation is performance-linked or at risk. Beginning with February 2026 grants, roughly 55% of executive equity is PSUs and 45% time-based RSUs. Half the PSUs use a one-year revenue goal and then vest over three years; half use three-year clinical, regulatory, and manufacturing milestones and cliff-vest. This is better than pure time vesting, but there is no explicit ROIC, free-cash-flow-per-share, relative TSR, or acquisition-return measure. Calling time-based RSUs "performance-based" because their value moves with the share price overstates rigor.

For 2025, the board scored corporate performance 131/150. It awarded 46/55 for marketed products and late-stage programs, 42.5/52 for pipeline growth, and full 15/15 for financial strength, then applied a net positive 3.75-point discretion adjustment: +6.75 for acceleration and other achievements, offset by only -3 for challenges in three programs. Financial PSUs paid at 125%, while 2023 non-financial PSUs paid at 200%. Kewalramani's reported FY2025 compensation was $21.14 million, including $15.00 million in stock awards.

CEO ownership is compliant but not owner-like. Kewalramani beneficially owned 47,800 common shares as of March 16, 2026, under 0.1% of shares. The guideline is six times salary, but unvested RSUs count; EVPs have a four-times guideline. Therefore “compliance” is not equivalent to purchased common-stock risk. Her February 27 sale of 40,000 shares was made under a company-approved Rule 10b5-1 plan entered November 17, 2025, so it is not evidence of opportunistic information use, but it reinforces that actual ownership is modest. Hedging and pledging are prohibited, and clawback policies cover accounting restatements and misconduct.

SBC is meaningful but contained relative to revenue:

Fiscal year	SBC expense ($M)	Revenue ($B)	SBC / revenue
FY2021	441.4	7.574	5.8%
FY2022	491.3	8.931	5.5%
FY2023	581.2	9.869	5.9%
FY2024	698.5	11.020	6.3%
FY2025	685.9	12.001	5.7%

This is not chronic dilution abuse—the share count is down—but a 5.5–6.3% revenue charge and $742 million of unrecognized expense deserve continued scrutiny.

5. Disclosure quality and candor across eight quarters

The live call set covers Q3 FY2024 through Q2 FY2026. Guidance discipline was strong. Vertex raised FY2024 revenue guidance in Q3 and then exceeded it. For FY2025 it established $11.75–$12.00 billion, raised the low end after Q1, reiterated in Q2, narrowed upward in Q3, and finished at $12.001 billion; it also openly lifted the operating-expense range in Q3 as povetacicept and JOURNAVX investment accelerated. The initial FY2026 guide was reiterated in Q1 and raised after Q2. There is no revenue-guide miss in the eight-quarter set.

Question handling is better on scientific failure than on commercial granularity. Management directly disclosed the VX-993 endpoint miss, the VX-522 inflammatory tolerability issue, and the zimislecel manufacturing pause/resumption. Conversely, numerical deflection or bounded non-disclosure appeared in **8/8 quarters** on at least one load-bearing topic: study enrollment size/timing, ALYFTREK switch pace, product-level CF guidance, JOURNAVX restriction/gross-to-net conversion, complete CASGEVY funnel counts, or manufacturing-analysis detail. The language usually took the form “we have not given guidance,” “we are not going to break it down,” or a qualitative confidence statement. This is not evidence of deception; it is a repeatable disclosure limitation that requires underwriting total-franchise and range outcomes rather than management’s product aspirations.

Voluntary operating metrics—CASGEVY initiations/collections/infusions, JOURNAVX scripts/prescribers/coverage, and ALYFTREK switching direction—are better than a bare statutory minimum. Still, management’s claim that CASGEVY and JOURNAVX can become multibillion-dollar assets and renal can rival CF is aspiration, not guidance.

6. Strategic coherence and R&D productivity

The 2025 10-K describes the strategy as investing “in scientific innovation to create transformative medicines for people with serious diseases.” Spending, acquisitions, and staffing are consistent with that statement. CF shows genuine serial innovation; CASGEVY and JOURNAVX establish distinct heme and pain capabilities; Alpine makes renal the next vertical; zimislecel and follow-on cells extend the platform into T1D. This is a coherent disease-and-modality expansion, not a yearly branding pivot.

The main risk is breadth. R&D and commercialization now span CF, gene-edited heme therapy, pain, renal biologics/small molecules, diabetes cell therapy, and earlier neuromuscular programs. The pipeline has produced approvals and disciplined stops, but the Semma-derived VX-264 impairment, VX-993, VX-522, and the zimislecel pause demonstrate that “serial innovation” has real attrition. Povetacicept’s de-risking supports the Alpine decision; only approval, access, durable safety, and commercial returns can complete that proof.

7. Governance, regulatory, and quality flags

Vertex has one common-stock class and no controlling shareholder. The proxy disclosed a related-party approval policy but no material Item 404 transaction. The Q2 2026 10-Q reported effective disclosure controls, no material change in internal

control, and no material legal proceeding beyond disclosed contingencies. No restatement, material weakness, or SEC enforcement was identified in the live filings reviewed.

The monitorable quality flags are product-specific rather than governance misconduct: ALYFTREK initiation requires liver monitoring; CASGEVY depends on complex chain-of-identity/manufacturing; and zimislecel dosing was voluntarily paused for manufacturing analysis before resuming. These reinforce the need for a strong regulatory/quality function. Upadhyay's board departure was attributed to scheduling after accepting another CFO role, with no disagreement. At the 2026 meeting, Sachs received noticeably more against votes than other nominees while still winning comfortably; that is consistent with, though does not prove, shareholder concern about long tenure.

The insider record shows clustered executive sales, but the CEO transaction reviewed was explicitly 10b5-1. No abnormal, thesis-changing insider pattern was established. Governance is adequate, not best-in-class: independent committees and annual elections are offset by modest CEO ownership, a long-tenured lead director, and a non-independent executive chair.

8. Peer comparison

CEO / company	Primary-source anchor	Directional five-year stewardship versus Vertex
Leonard Schleifer / Regeneron	Founder-era CEO and board co-chair; 2026 proxy	Stronger internal R&D and owner alignment, with greater key-person/succession concentration. Vertex ranks below Regeneron on demonstrated per-dollar scientific compounding and actual ownership.
Daniel O'Day / Gilead	CEO/chair since 2019; 2026 proxy emphasizes HIV, Trodelvy, oncology, and diversification	More mature capital returns, but a more mixed large-deal diversification record. Vertex ranks above Gilead on recent organic innovation coherence, while Gilead's diversified cash flows are more proven.
Reshma Kewalramani / Vertex	CEO since 2020; 2026 Vertex proxy and eight live calls	Middle of the group: stronger recent product creation and guidance credibility than Gilead, less proven external-capital return and owner alignment than Regeneron.

Peer sources: [Regeneron 2026 proxy](https://www.sec.gov/Archives/edgar/data/872589/000130817926000340/regn-20260424.htm) and [Gilead 2026 proxy](https://www.sec.gov/Archives/edgar/data/882095/000130817926000106/gild014721-def14a.htm).

9. Management gate verdict and monitorable conditions

YELLOW. Kewalramani and the current team have a coherent strategy, a strong CF stewardship record, three differentiated approvals, credible eight-quarter guidance, useful launch metrics, and evidence that they will stop failed programs. That clears FAIL: there is no persistent deception, chronic dilution, governance capture, or serial unacknowledged capital destruction. It does not yet clear PASS because the largest external allocation, Alpine, has not produced a commercial return; CASGEVY and JOURNAVX remain early; zimislecel exposed a manufacturing-control issue; the pending Crinetics transaction adds risk; and compensation rewards revenue and milestones without explicit ROIC/FCF discipline.

Upgrade to PASS if all three conditions hold: (1) povetacicept wins approval with durable safety and a launch that validates the Alpine price; (2) FY2026 non-CF products deliver at least management's $500 million combined floor with observable paid conversion, while total CF continues to grow despite ALYFTREK switching; and (3) zimislecel completes dosing without another material manufacturing pause, while diluted shares/SBC remain disciplined through the next acquisition cycle.

Downgrade to FAIL if any two occur: a material guide cut caused by launch execution rather than external pricing/FX; another material acquired-program impairment or repeated manufacturing pause without prompt numerical disclosure; or continued large M&A before Alpine/Crinetics economics are evidenced while compensation remains insensitive to per-share returns.

Evidence and archive note

Primary evidence archived under `C:\Users\Admin\OneDrive\GPT\ER 2.0\Vertex Pharmaceuticals\raw\pulse-cio-20260830T120326+0800\m`: live SEC submissions, 2026 DEF 14A, FY2025 10-K, Q2 FY2026 10-Q, FY2022 10-K for five-year SBC, eight live FMP transcript pulls, live insider-trade records, the CEO Form 4 XML, and 2026 Regeneron/Gilead proxies. Direct Vertex CEO-PDF download returned 403 twice and the board/compensation HTML endpoints timed out twice; current SEC filings and successfully rendered primary web pages

controlled those conclusions. No warehouse cache was used.

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Appendix W - Moat and 2046 Durability

Vertex Pharmaceuticals Incorporated — Moat and 2046 Durability

As of: 2026-08-30 **2046 test date:** 2046-08-30 **Accounting perimeter:** One reportable pharmaceuticals segment; economic drivers assessed separately **Authority:** Security research only; no trade, broker, portfolio, ranking, or sizing authority; `trade_execution_authorized=false`

Executive assessment

Vertex has an unusually strong **current** moat in cystic fibrosis (CF), but its company-wide 20-year moat is not yet proven. The defensible profit pool is not merely a patent portfolio. It is a reinforcing system: deep CFTR biology and genotype expertise; serial combination-drug design; regulatory and clinical evidence across ages and variants; specialist-physician familiarity; country-by-country payer access; and an installed commercialization machine that can migrate patients from an older Vertex regimen to a newer one. That system helps explain why Vertex has retained the franchise while deliberately cannibalizing TRIKAFTA/KAFTRIO with ALYFTREK.

The problem is concentration and time. CASGEVY and JOURNAVX contributed about $315 million of the $12.587 billion TTM revenue, leaving approximately 97.5% attributable to CF. TRIKAFTA/KAFTRIO was $10.078 billion and ALYFTREK $1.625 billion; their projected protection expires in 2037 and 2039. The moat and 2046 gates are therefore **YELLOW**: CF is formidable, but post-patent renewal and durable non-CF returns remain unproven.

1. Moat taxonomy applied

Network effects — absent in the classic sense. More patients do not automatically make a medicine more useful. Genotype-response evidence, pharmacovigilance, authorized treatment-center (ATC) throughput and payer precedent create learning effects, especially in CF and CASGEVY, but cannot block a clinically superior entrant.

Switching costs — high in CF, moderate in cell therapy, initially low in acute pain. Stable CF patients and specialists have reasons not to disrupt an effective chronic regimen, and payers have established protocols. Vertex can migrate them to ALYFTREK, but this is managed self-cannibalization, not permanent lock-in. CASGEVY has procedural switching costs once authorization, collection and conditioning begin. JOURNAVX faces cheap generics and familiar protocols with little initial lock-in.

Scale economies — strong but not impregnable. TTM free cash flow of $3.796 billion after $497 million of capex funds parallel science, trials, regulatory filings and launches. Commercial scale is disease-specific: CF access does not automatically reach fragmented pain prescribers, while cell therapy adds capital and quality intensity. Scale raises attack costs but does not assure clinical success.

Brand and trust — meaningful but secondary to evidence. Vertex has credibility among CF centers, patients and payers, and its name supports CASGEVY adoption. Safety, comparative efficacy, manufacturing quality and access nevertheless outweigh brand; inferior data or a quality event could erode trust quickly.

Regulatory moat — strong around approved assets, temporary by design. Five CF medicines, CASGEVY and JOURNAVX cleared demanding reviews; CASGEVY's U.S. label expanded in July 2026 to ages two and older. Approvals and postmarketing know-how are barriers, not blocks on better mechanisms. July 2026 approval of atacicept/TRUTAKNA means povetacicept would enter a validated, competitive BAFF/APRIL market.

IP and patents — powerful through the late 2030s, but not the 2046 moat. Projected protection reaches 2037 for TRIKAFTA, 2039 for ALYFTREK, 2034-2035 for CASGEVY and 2040 for JOURNAVX. These dates support 2031, but all pass before 2046. Enduring value must come from replacement assets and protected delivery systems.

High-trust procurement and treatment infrastructure — strong in CF and potentially CASGEVY; unproven in pain and renal. CF concentrates specialists and payers. CASGEVY requires authorization, ATC capacity, collection, release-tested manufacturing, conditioning and follow-up; competitors must reproduce a pathway, not just an edit. Acute pain is fragmented, and the nephrology channel is still being built.

2. Economic-driver moat by franchise

CF franchise and ALYFTREK migration

The moat is strongest here and is credible for **10 years**, with conditional extension beyond 20. Vertex combines causal biology, genotype stratification, multiple complementary correctors/potentiators, clinical evidence, global reimbursement and specialist access. Nearly 95% of people with CF are estimated to be eligible for one of its medicines. ALYFTREK's once-daily regimen and differentiated biomarker data let Vertex refresh the franchise; the majority of its revenue comes from TRIKAFTA switch patients, so ALYFTREK growth must not be mistaken for incremental franchise growth. Durability through 2037-2039 is supported by IP and self-cannibalization. Durability to 2046 requires a further generation of modulators or genetic therapies. Break signs are falling total CF revenue or treated patients despite broader eligibility, payer-driven discounting, a competitor showing clearly better lung-function/sweat-chloride outcomes, or failure of next-generation correctors. Sionna's August 2026 add-on Phase 2a miss reduces the immediate NBD1 competitive threat, but its proprietary dual-combination work continues; one rival's failed experiment is not proof of permanent monopoly.

CASGEVY and gene-editing delivery

CASGEVY's moat is the integrated clinical-manufacturing-delivery chain: approved CRISPR editing, release analytics, cryogenic logistics, ATC training, payer authorization and post-transplant follow-up. Its July 2026 label expansion substantially widens eligibility, and H1 2026 infusions exceeded all of FY2025. The barrier is real for **5-10 years**, but its 20-year durability is uncertain because conditioning burden and ex vivo logistics create the opening for competitors. Beam reported 31 treated patients in its risto-cel Phase 1/2 program, a median one collection cycle, rapid engraftment and a possible BLA submission as early as year-end 2026. CASGEVY also retains only 60% of net commercial profit/loss under the CRISPR collaboration. Break signs are worsening collection-to-infusion conversion, long release times, batch failures, ATC bottlenecks, payer restrictions, conditioning-related avoidance, or a competitor with comparable durability and materially easier collection/conditioning. In vivo editing would be the most disruptive design-around because it could bypass much of today's infrastructure.

JOURNAVX and the pain franchise

JOURNAVX has a patented first-in-class NaV1.8 mechanism and a non-opioid value proposition, but the moat currently resides in **IP and prospective formulary integration**, not demonstrated behavioral lock-in. About 900,000 H1 2026 prescriptions, roughly 260 million covered lives, 18,000 new prescribers, 1,400 hospital pathways and 130 integrated-delivery-network pathways show commercial reach. Yet TTM revenue was only about $125 million, partly because patient-support-program use and access restrictions reduce near-term recognition. Cheap generics, opioid regimens and established multimodal protocols are strong defaults. Durability is **5 years today**; a 10-year moat requires repeat prescriber use, protocol placement, acceptable net price and chronic-pain efficacy. The earliest break sign is prescriptions rising without revenue, repeat use or favorable formulary status; additional warnings are high abandonment, adverse-event limitations or failure of DPN Phase 3 studies.

Povetacicept, renal infrastructure and pipeline optionality

Povetacicept could create a renal franchise, not because BAFF/APRIL biology is exclusive, but because every-four-week dosing, efficacy, safety, confirmatory outcomes and a nephrology commercial channel may combine into a differentiated product. The moat is **unproven** before approval and launch. TRUTAKNA was FDA-approved in July 2026 as a once-weekly BAFF/APRIL inhibitor after a 46% placebo-adjusted proteinuria reduction at nine months; continued approval depends on confirming long-term kidney benefit. That is direct mechanism and payer competition. Vertex's cited 52% proteinuria reduction for povetacicept is not a head-to-head comparison. Inaxaplin in APOL1-mediated kidney disease is more genetically targeted and could be more differentiated, but pivotal evidence is pending. Break signs are a restrictive label, non-differentiated efficacy/safety, slow nephrologist adoption, reimbursement step edits favoring incumbents, or failure to preserve eGFR.

R&D platform and asset-selection capability

Vertex's enduring capability is to identify causal human biology and develop multiple modalities: small molecules, autologous gene-edited cells, stem-cell-derived islets, proteins and oligonucleotides. CF proves deep within-disease serial innovation; CASGEVY and JOURNAVX prove regulatory breadth. They do **not yet prove** repeated, high-return commercial success across diseases. The 2024 Alpine acquired-IPR&D charge and pending acquisition activity illustrate that external innovation can buy optionality while creating write-off risk. Pipeline breadth is therefore an option set, not a moat by itself. It becomes a moat only if multiple non-CF programs generate durable revenue and returns after acquisition cost, launch expense and manufacturing capital.

The blended company moat is materially weaker than the CF moat. Approximately 97.5% of TTM revenue still came from CF, while the economically distinct new franchises supplied only about 2.5%. Single-segment accounting does not disclose

product operating margins, so no product-level margin claim is made. Diversification improves the narrative faster than it changes the audited profit pool.

This conclusion reconciles to the completed consolidated-segment work. Its 2031 Bear/Base/Bull cases use 25%/55%/20% probabilities and 31%/43%/48% statutory margins; Base requires $4.55 billion of non-CF revenue, while Bear holds revenue roughly flat and margin falls to 31%. Those are coherent five-year scenarios, but even Base does not prove renewal through 2046.

3. Ten-year margin persistence

The following statutory series uses live SEC Companyfacts for FY2016-FY2025, reconciled for FY2021-FY2025 to the governed data package. The FMP live pull was retained only as a secondary cross-check; the filed values control, including FY2025 revenue of $12.001 billion and operating income of $4.173 billion. FY2024 includes the Alpine acquired-IPR&D expense and is not normalized away.

Fiscal year	Revenue ($B)	Statutory operating income ($B)	Operating margin
2016	1.702	0.010	0.6%
2017	2.489	0.123	5.0%
2018	3.048	0.635	20.8%
2019	4.163	1.198	28.8%
2020	6.206	2.856	46.0%
2021	7.574	2.782	36.7%
2022	8.931	4.307	48.2%
2023	9.869	3.832	38.8%
2024	11.020	(0.233)	(2.1)%
2025	12.001	4.173	34.8%
TTM ended 2026-06-30	12.587	4.777	38.0%

This is evidence of a moat becoming visible, not ten years of stable margins. Margin rose from near break-even in 2016 to 46.0% in 2020 as combination CF therapy scaled; later statutory results moved with R&D, launches and acquired IPR&D. The latest four quarters were steady at 38.6%, 37.8%, 38.1% and 37.4%. Gross margin declined gently from 88.1% in FY2021 to 85.3% in Q2 FY2026, consistent with mix and launches rather than collapse in CF economics.

There are no disclosed product operating margins and no five-year segment-margin series beyond the one consolidated modeled segment. This limits inference: the 35-38% current operating margin proves the combined CF cash engine can fund diversification, but does not prove CASGEVY, JOURNAVX or future renal products can earn the same return profile.

4. AI disruption stress test

Vertex does not sell a prompt-to-output workflow. Approved drugs, regulated evidence, manufacturing release, prescribing and reimbursement cannot be replicated by a foundation model. CF and CASGEVY are **chokepoint economics**: molecules or edited cells must pass trials, controls and review, then reach patients through specialized channels.

The most AI-exposed capability is discovery and asset selection. Protein modeling, molecular generation and trial optimization can lower rivals' search costs and speed recruitment. Proprietary human data, longitudinal genotype-response knowledge and execution become more important; “better science” alone is not permanent protection.

The most protected driver is CASGEVY's manufacturing/ATC/payer pathway, followed by CF specialist access. AI can improve batch analytics, scheduling and authorization, but cannot remove conditioning, collection, quality release or reimbursement. For JOURNAVX, decision support could accelerate protocol inclusion or tighten comparative-effectiveness hurdles. AI is more likely to raise both productivity and competition than disintermediate revenue.

5. The 2046 test

Specific base-case description for 2046-08-30: Vertex is a specialty biopharmaceutical company selling genetically and mechanistically targeted medicines for severe diseases. Its legacy CF business is smaller after 2037-2039 protection expiries, but it still supplies follow-on modulators or genetic treatments to genotype-defined patients through CF centers.

Renal/immunology products are sold to nephrologists and reimbursed by government and commercial payers because they delay dialysis and other costly disease progression. Pain remains only if NaV1.8 agents earned durable protocol placement and chronic indications. Cell and gene therapies are delivered through accredited centers using Vertex-controlled or tightly supervised manufacturing and release systems; today's autologous CASGEVY process may have withered or evolved toward easier conditioning or in vivo delivery. Diabetes/islet replacement exists only if durable insulin independence and scalable manufacturing were proven.

Who pays is concrete: national health systems, Medicare/Medicaid, commercial insurers and integrated health systems pay for measured clinical outcomes in severe disease; specialist centers administer complex products and pharmacies distribute chronic medicines. Why Vertex still earns attractive returns is also concrete: repeated causal-biology selection, proprietary molecules/cell processes, accumulated safety and longitudinal outcomes, regulatory dossiers, manufacturing quality, and disease-specific payer/physician infrastructure. Directional operating margin is **lower than today's 38% TTM**, plausibly in the high-20s to mid-30s, because cell therapies and broader commercial channels are more costly and post-CF competition is greater. It remains high only if multiple protected products replace the current CF rent.

Bear 2046 description: TRIKAFTA and ALYFTREK lose exclusivity without a successful follow-on; generics and superior genetic therapies compress CF revenue; in vivo editing bypasses CASGEVY's autologous process; acute-pain formularies remain anchored to cheap generics; renal competitors win on efficacy, convenience or confirmatory outcomes; and repeated acquisitions consume cash without productive renewal. Vertex remains a capable biotechnology company, but revenue is smaller or volatile and operating margin settles in the teens or low-20s. AI contributes indirectly by speeding competitors' discovery and trials, not by replacing medicines.

That bear case is **material, approximately a 35-45% qualitative 2046 durability range**, versus the B-stage 25% five-year Bear probability. The longer horizon crosses every named protection expiry while non-CF economics remain immature. The base case is plausible enough to avoid FAIL, but not sufficiently evidenced for PASS.

6. Competitive threat inventory

Threat	Mechanism	Segment(s) affected	Earliest observable signal	Plausibility
CF erosion before or after exclusivity	Better efficacy/convenience, genetic treatment, patent challenge, generic entry, or payer-led discounting defeats managed migration	CF, ALYFTREK, next-generation correctors	Total CF revenue/patients decline despite launches; rival pivotal superiority; net price falls	Medium before 2037; high after 2039 absent renewal
Complex launches fail to convert access into economics	CASGEVY funnel/conditioning limits throughput; risto-cel or in vivo editing improves delivery; JOURNAVX remains outside default protocols	CASGEVY and pain	Starts fail to convert to infusions; batch/ATC delays; prescriptions grow without revenue/repeats; formulary restrictions persist	Medium-high
Renal/pipeline returns are competed or regulated away	TRUTAKNA and other IgAN agents crowd povetacicept; confirmatory outcomes disappoint; pricing reform and acquisition costs reduce retained returns	Povetacicept, inaxaplin, pipeline/platform	Restrictive label; weak head-to-head positioning; eGFR/confirmatory miss; step edits; repeated IPR&D write-offs	High until launch and outcomes prove otherwise

7. Pricing-power verification

Pricing power is **observable but concentrated in CF**. Vertex's Q2 FY2026 filing attributed U.S. growth partly to higher realized net prices in CF while global CF revenue grew 11%. This is stronger evidence than a list-price assertion because it refers to realized net price, although Vertex did not disclose the exact increase or isolate price from volume and mix. Gross margin remained around 85-86% through launch investment and inflation, and total CF revenue grew while ALYFTREK cannibalized TRIKAFTA. The lower blended royalty burden on ALYFTREK can improve economics even without higher patient price.

Pricing power is **not yet verified** for the other economic franchises. CASGEVY's headline one-time value is constrained by payer authorization, 60/40 profit sharing, ATC capacity and manufacturing cost. JOURNAVX's broad coverage and high prescription count have not yet produced commensurate revenue, so coverage cannot be equated with pricing power. Povetacicept would face an approved weekly BAFF/APRIL competitor and several IgAN treatment choices; every-four-week dosing may differentiate it, but only label, outcomes, formulary position and realized net price can prove power. Vertex does not disclose multi-year price escalators or minimum-volume commitments. Regulatory and pricing reform—including

government discounts, inflation rebates, negotiation and international health-technology assessment—can therefore compress realized economics even when clinical demand persists.

8. Moat verdict and monitorable conditions

Moat gate: YELLOW. The CF moat is concrete, supported by serial innovation, specialist/payer infrastructure, high gross margins and current statutory operating margins near 38%. However, the blended company remains approximately 97.5% CF by TTM revenue, while the profit pools intended to replace expiring CF rents have not demonstrated durable margins. CASGEVY has a defensible delivery barrier but faces conditioning and gene-editing competition; JOURNAVX has IP without proven protocol lock-in; povetacicept faces an approved same-pathway competitor. The moat is more than patents, but the portion demonstrably transferable beyond CF is not yet enough for PASS.

2046 test: YELLOW. A specific 2046 business can be described, with identifiable buyers and defensible regulated/manufacturing capabilities, so the test does not fail. Yet all currently named major protection dates expire by 2040, and 2046 economics depend on successful renewal. This is a genuine unresolved durability question, not a diplomatic middle grade.

Upgrade to PASS if: (1) non-CF products reach a material share of revenue with disclosed or inferable stable retained economics while consolidated operating margin remains sustainably above roughly 30%; (2) ALYFTREK migration preserves total CF patients, net price and franchise revenue, and a post-2039 CF renewal asset shows compelling clinical data; and (3) CASGEVY throughput or renal adoption demonstrates repeatable payer access and operational scale despite direct competition.

Downgrade to FAIL if: (1) total CF revenue or treated patients decline structurally before exclusivity loss without replacement; (2) CASGEVY infusions stall, JOURNAVX prescriptions fail to convert to repeat paid use, and renal products do not differentiate; or (3) repeated acquired-IPR&D charges and rising R&D intensity fail to produce approvals, causing normalized operating margin to settle below the mid-20s despite continued CF cash generation.

Primary-source and governed-evidence notes

- Governed foundations: `data_package.md` Sections 1-5, `quant_foundation.md`, and the reviewed consolidated-segment appendix; FY2025 and TTM statutory figures follow the sealed official-source bridge.
- [Vertex FY2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm): patents/exclusivity, collaborations, risk factors, segment structure and product economics.
- [Vertex Q2 FY2026 Form 10-Q](https://www.sec.gov/Archives/edgar/data/875320/000087532026000259/vrtx-20260630.htm), [Q2 FY2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm), and [RAINIER interim update](https://news.vrtx.com/news-releases/news-release-details/vertex-announces-positive-week-36-interim-analysis-results): current revenue, pricing, launches and povetacicept dosing.
- [FDA JOURNAVX approval](https://www.fda.gov/news-events/press-announcements/fda-approves-novel-non-opioid-treatment-moderate-severe-acute-pain), [FDA CASGEVY pediatric expansion](https://www.fda.gov/news-events/press-announcements/fda-approves-first-gene-therapy-young-children-sickle-cell-disease), and [FDA TRUTAKNA approval](https://www.fda.gov/drugs/news-events-human-drugs/fda-approves-new-treatment-reduce-proteinuria-adults-primary-immunoglobulin-nephropathy): regulatory status and constraints.
- [Sionna August 2026 CF update](https://investors.sionnatx.com/news-releases/news-release-details/sionna-therapeutics-reports-topline-data-two-development) and [Beam April 2026 risto-cel update](https://investors.beamtx.com/news-releases/news-release-details/beam-therapeutics-announces-publication-beacon-phase-12-data): peer-primary competitive context, not forecast evidence.
- Live source bytes are archived under `raw/pulse-cio-20260830T120326+0800/w/`; no warehouse cache was used as research evidence.

Appendix B1 - Consolidated Company

Consolidated company — Production ER2 Segment Deep Dive

Company: Vertex Pharmaceuticals Incorporated (VRTX) **Information cutoff:** 2026-08-30 SGT **Forecast anchor:** TTM ended 2026-06-30 **Exact horizon:** 2031-06-30, exactly five calendar years **Reporting currency:** USD; figures are billions unless stated otherwise **Modeled segment:** Consolidated company **Exact governed profit basis:** `Statutory operating income (single-segment non-operating CODM fallback)` **Research authority only:** `trade_execution_authorized=false`

0. Segment boundary and taxonomy note

Vertex has one operating and reportable segment, pharmaceuticals. Its chief operating decision maker receives consolidated net income, a statutory endpoint below operating income. The sealed schema-1.2 bridge therefore requires exactly one financial projection named **Consolidated company** and the exact modeled profit label **Statutory operating income (single-segment non-operating CODM fallback)**. This is an ER2 modeling-basis repair, not an assertion that Vertex reports segment operating income. The reportable perimeter is stable, but the product taxonomy is not: FY2022 showed four CF brands; FY2025 grouped the declining legacy CF brands and early launches in Other product revenues while adding ALYFTREK; Q1 FY2026 began showing total CF, CASGEVY and JOURNAVX separately. Historical comparisons below respect those boundaries and never add memorandum-only CASGEVY or JOURNAVX disclosures to quarterly Other product revenue that already includes them. [data_package §1; §4; §5]

1. What the Consolidated company actually is

Vertex is a commercial biopharmaceutical company whose current economics are still dominated by cystic-fibrosis medicines. Its CF portfolio treats the malfunctioning CFTR protein rather than merely treating symptoms. TRIKAFTA/KAFTRIO is the established triple combination; ALYFTREK is the newer once-daily triple combination. KALYDECO, ORKAMBI and SYMDEKO/SYMKEVI remain useful for particular mutations and geographies but have been shrinking as eligible patients move to newer regimens. Vertex estimates that nearly 95% of people with CF could benefit from one of its five approved CF medicines. That statistic describes eligibility, not treated penetration or market share, but it illustrates both the breadth of the franchise and the finite size of the remaining untreated pool. [data_package §0a, Launch/penetration table; §4]

The commercial model mixes recurring chronic therapy with two very different new-product models. CF medicines produce daily, recurring revenue with established reimbursement and unusually long patent protection: Vertex's projected U.S. and European protection expiry for TRIKAFTA/KAFTRIO is 2037 and for ALYFTREK is 2039. CASGEVY is a one-time, ex-vivo CRISPR-edited autologous cell therapy for eligible sickle-cell disease and transfusion-dependent beta-thalassemia patients. Its revenue depends on a long funnel from initiation to cell collection, conditioning and infusion, and Vertex shares 40% of net commercial profit or loss with CRISPR Therapeutics through cost of sales. JOURNAVX is an oral NaV1.8 inhibitor for moderate-to-severe acute pain. Its commercial model depends on prescription volume, payer access, hospital protocols, retail pathways and conversion from patient-support programs to paid demand. [data_package §0a, regulatory and economics tables; §4]

The next potential commercial leg is renal disease. Povetacicept, an APRIL/BAFF antagonist acquired with Alpine Immune Sciences, has a U.S. PDUFA date of 2026-11-30 for IgA nephropathy and is in Phase 2/3 for primary membranous nephropathy. Inaxaplin is in Phase 2/3 for APOL1-mediated kidney disease, with interim data expected in early 2027. Other programs address diabetic peripheral neuropathy, type 1 diabetes, ADPKD and next-generation CF. Because most have no pivotal efficacy result at the cutoff, this appendix does not convert clinical optionality into base-case revenue. [data_package §0a, Program table]

Go-to-market is correspondingly heterogeneous. CF is a specialized chronic-disease franchise supported by genotype identification, specialist prescribers, reimbursement expertise and global regulatory infrastructure. CASGEVY requires authorized treatment centers and capacity across a complex cell-therapy journey. JOURNAVX requires much broader hospital, integrated-delivery-network and retail adoption. Povetacicept, if approved, would enter a renal market with existing branded therapies and a need to demonstrate durable proteinuria and kidney-function benefits. The model therefore forecasts each revenue driver separately but keeps one consolidated accounting segment and one statutory operating-income forecast.

2. Current economics at the TTM anchor

TTM revenue was $12.587 billion and **Statutory operating income (single-segment non-operating CODM fallback)** was $4.777 billion, an exact-basis margin of 37.95%. The issuer's separately preserved CODM measure was TTM consolidated net income of $4.405 billion. It is context only; interest, other non-operating items and tax are not allocated to products or inserted into product margins. The sealed bridge has no corporate, unallocated or operating-adjustment lines: the one modeled segment equals sourced statutory operating income. [data_package §3a, TTM bridge; statutory_bridge.json, TTM period]

The TTM product bridge is reconstructable from the four verified quarters. At source precision, TRIKAFTA/KAFTRIO contributed $10.0780 billion, ALYFTREK $1.6251 billion, legacy/other CF $0.5687 billion, CASGEVY $0.1905 billion and JOURNAVX $0.1249 billion. The first three rows sum to $12.2718 billion of CF revenue, or 97.5% of total revenue; TRIKAFTA/KAFTRIO alone was 80.1%. CASGEVY and JOURNAVX together were only 2.5% of the TTM base. The legacy/other CF figure removes the disclosed CASGEVY and JOURNAVX memorandum rows from Q3 and Q4 Other product revenue, then adds the separately reported Q1 and Q2 Other CF rows. The five rows sum to the exact $12.5872 billion consolidated anchor, preventing both double counting and a display-rounding residual. [data_package §5, Product trend table; D-REL-Q3 through D-REL-Q2]

Recent quarterly performance was healthy but not linear. Total revenue grew 11.0%, 9.5%, 7.8% and 12.5% in Q3 FY2025 through Q2 FY2026. Exact-basis statutory operating margins were 38.6%, 37.8%, 38.1% and 37.4%. Q2 FY2026 revenue of $3.334 billion reconciled exactly to the disclosed product rows. Management raised FY2026 revenue guidance to $13.1-$13.2 billion after H1, so the first forecast interval cannot assume an abrupt decline without a specific adverse event. [data_package §5; §6; D-REL-Q3 through D-REL-Q2; D-TR-Q2, 2026-08-03]

Capital intensity has two faces. Physical capex was only $0.438 billion, or 3.6% of revenue, in FY2025. Intellectual and commercial reinvestment was much larger: ordinary R&D was $3.910 billion, or 32.6% of revenue, and acquired IPR&D has been volatile, including $4.628 billion in FY2024 because of Alpine and $0.133 billion in FY2025. Inventory reached $1.687 billion at FY2025 and $1.765 billion at H1 FY2026, reflecting launch and supply-chain needs. Vertex had $12.320 billion of cash and marketable securities and no funded debt at FY2025, but cash returns, acquisitions and development spend determine how much interest income persists. Those below-line effects belong in synthesis, not this segment margin. [data_package §7; §8; D-SEC-25K; D-SEC-Q2Q]

3. Unit economics

The consolidated revenue-to-profit bridge begins with a high gross margin. FY2025 cost of sales was 13.8% of total revenue, implying an 86.2% GAAP gross-margin proxy. Q2 FY2026's GAAP proxy was 85.3%; management described non-GAAP Q2 gross margin as 85.6% and expected full-year gross margin just under 86%. That narrow range is the starting point, not a promise that mix is neutral. [data_package §0a, Historical KPI and launch/economics tables; D-SEC-25K; D-TR-Q2, 2026-08-03]

CF supports the gross-margin pool through chronic use, concentrated manufacturing economics and pricing power rooted in clinical efficacy and patent protection. ALYFTREK's blended royalty burden was lower than TRIKAFTA/KAFTRIO's in FY2025, which creates a favorable mix mechanism as patients switch. Yet the switch itself does not create revenue: a patient moving from TRIKAFTA to ALYFTREK changes product classification and potentially royalty cost, not the number of treated patients. Total CF growth must come from newly treated patients, younger-age eligibility, new geographies, adherence, price/mix and retention, net of legacy erosion. The forecast therefore builds total CF first and then allocates the total between products.

CASGEVY has structurally different economics. Vertex receives 60% and CRISPR Therapeutics 40% of net commercial profit or loss, with the partner share recorded in cost of sales. Manufacturing, conditioning, treatment-center throughput and the long time from initiation to infusion can make both revenue and gross profit lumpy. A headline selling price or initiation count would not be sufficient to infer recognized revenue; the package explicitly lacks complete H1 2026 funnel counts and product net pricing. Accordingly, the model uses actual recognized TTM revenue as the base and ramps gradually. [data_package §0a, CASGEVY economics; §10]

JOURNAVX has conventional pharmaceutical manufacturing economics but unusually broad commercial-launch costs. At Q2 FY2026 it had about 535,000 quarterly prescriptions, just over 900,000 H1 prescriptions, 18,000 new prescribers and pathways in 1,400 hospitals and 130 integrated delivery networks. Coverage reached 260 million of roughly 320 million lives, but 80 million covered lives remained restricted and patient-support-program usage depressed early recognized revenue. Prescription volume cannot be multiplied by an assumed list price because product-level net price and gross-to-net deductions are true non-disclosures. The forecast therefore uses recognized revenue, with access conversion as the growth mechanism and selling infrastructure as a margin cost. [data_package §0a, Launch table; §10]

R&D is not optional overhead. Ordinary R&D rose from $1.938 billion in FY2021 to $3.910 billion in FY2025, increasing from 25.6% to 32.6% of revenue. The late-stage kidney, pain and diabetes programs justify continued spending even when this appendix assigns them zero revenue. Acquired IPR&D is more volatile and can dominate statutory profit in a transaction year. Because the governed profit metric is statutory, the scenario margin schedule includes a recurring acquired-IPR&D allowance rather than presenting a non-GAAP margin. [data_package §7; D-SEC-22K; D-SEC-25K]

No product-level operating margin is disclosed. Allocating R&D, launch expense, acquired IPR&D, interest or tax to a product would create false precision. Section 9 therefore forecasts only consolidated gross margin, R&D, acquired IPR&D and a residual launch/commercial/G&A bucket. The arithmetic is explicit, but these are analyst assumptions tied to disclosed mechanisms, not issuer-reported product margins.

4. Competitive dynamics

Cystic fibrosis

The CF franchise has the strongest competitive position in the company. Vertex has five approved medicines covering nearly 95% of the CF population by eligibility, global reimbursement capabilities, long protection periods and accumulated physician familiarity. The relevant constraint over the five-year horizon is more likely saturation than direct branded displacement. A high eligible share means remaining untreated patients may be harder to identify, reimburse or retain; it also means growth increasingly depends on younger ages, geographic expansion and conversion from older Vertex products. The model does not assign a numerical market share because the data package does not disclose treated-patient counts or competitor-adjusted share. It instead tests CF revenue growth from -2.2% to +5.2% annually across cases.

ALYFTREK is simultaneously a defense and a cannibal. Once-daily dosing, clinical differentiation and a lower royalty burden can strengthen lifetime franchise economics. Management says the majority of ALYFTREK revenue comes from TRIKAFTA switch patients and expects most patients globally to transition over time. The bear case assumes switching is slower and total franchise demand declines; the bull case assumes switching is fast and new-patient/geographic growth more than offsets saturation. No case adds ALYFTREK's growth to an independently compounded TRIKAFTA base.

CASGEVY

CASGEVY's competitive set includes alternative curative-intent gene therapy, stem-cell transplant for eligible patients and chronic disease-modifying care. Its first-mover CRISPR profile and long regulatory exclusivity support differentiation, but conditioning burden, center capacity, patient selection, reimbursement and long-term safety follow-up limit near-term penetration. The FDA's July 2026 expansion to eligible patients aged two and older adds approximately 5,500 children according to Vertex, but the treatment journey remains intensive. [data_package §9; §0a, CASGEVY pediatric row]

The launch funnel is a better competitive indicator than a theoretical addressable market. FY2025 had 301 initiations, 147 first cell collections and 64 infusions; management said H1 FY2026 infusions exceeded all of FY2025 and Q2 was the third sequential quarter with more than 100 initiations. The funnel is advancing, but the gap between stages means recognition is delayed and quarterly results can be volatile. The base case reaches $1.35 billion by 2031, below management's non-time-bound multibillion aspiration; the bull reaches $2.30 billion only if center throughput, pediatric uptake and reimbursement all improve. [data_package §0a; §6]

JOURNAVX

JOURNAVX is the first approved NaV1.8-class non-opioid analgesic, but it competes against cheap, familiar analgesics rather than an empty market. Its clinical value proposition is non-opioid pain relief without the addictive mechanism of opioids, yet hospital formularies and payers weigh acquisition cost, protocol simplicity and evidence across pain settings. The 260-million-life coverage figure overstates frictionless access because 80 million lives were restricted and early prescriptions included patient-support use. [data_package §0a; §6]

The moat is therefore not a monopoly but a combination of novel mechanism, regulatory approval, physician experience, broad commercial infrastructure and the possibility of label expansion. The bear assumes net-price pressure and slower pathway conversion; the bull assumes restrictions fall and high prescription volume converts to paid repeat demand. The base reaches $1.35 billion at the horizon, again below management's undated multibillion framing.

Povetacicept and renal competition

Povetacicept enters a more competitive and evidence-sensitive setting. Management cited 52% proteinuria reduction and more than 70% reductions in hematuria and Gd-IgA1, and FDA accepted the IgAN BLA with a 2026-11-30 PDUFA date.

Those are meaningful anchors, but proteinuria is not the same as a completed long-term renal-outcomes dataset, and a PDUFA date is not approval. Existing and emerging branded IgAN mechanisms raise the bar for access, sequencing and differentiation. [data_package §0a, Program table]

Rather than assert certain approval, each scenario uses an expected-revenue line that embeds a different approval/launch assumption: roughly 30% effective commercial realization in bear, 70%-80% in base as milestones clear, and 90% in bull, with slower or faster market penetration layered on top. The model does not treat the full renal aspiration as revenue. Inaxaplin remains zero pending early-2027 interim data.

5. Moat at the segment level

The moat is deep but uneven. CF has a powerful product ecosystem: genotype-targeted science, validated combinations, specialist relationships, reimbursement infrastructure, manufacturing know-how, patent duration and a pipeline designed to replace Vertex's own products before others do. ALYFTREK's switch dynamic demonstrates this self-disruption. A lower royalty burden also lets Vertex improve economics without charging the switch itself as incremental revenue. Over five to ten years, the principal threat is scientific leapfrogging or access pressure, not ordinary generic competition, because the key franchise products have projected protection into 2037-2039. [data_package §0a, protection table]

The CF moat does not automatically transfer to every new disease. CASGEVY's manufacturing and treatment-center network are barriers, but the one-time therapy model creates finite eligible cohorts and operational bottlenecks. JOURNAVX has strong intellectual property projected to 2040 and first-in-class status, but acute pain is fragmented and price-sensitive with embedded generic options. Povetacicept has promising data and a near-term regulatory event, but renal markets can support multiple mechanisms and demand comparative efficacy, safety and access evidence.

At the consolidated level, Vertex's second moat is organizational: it can fund multiple pivotal programs without funded debt, absorb launch losses and repurchase shares. That scale reduces financing risk and supports long-duration trials. It is not proof of R&D productivity. FY2024's $4.628 billion acquired-IPR&D charge shows that buying optionality can sharply reduce statutory profit. A durable moat requires that new franchises eventually earn returns on both visible operating spend and acquisition consideration.

The five-year conclusion is that CF probably protects the revenue base and margin pool, but the incremental moat depends on commercial execution. Base-case operating leverage is earned only if CASGEVY, JOURNAVX and povetacicept scale faster than launch and R&D spending. If those products disappoint, CF alone can remain high quality while consolidated revenue and statutory operating income stagnate.

6. Historical growth rates — reproduced from the verified data package

The primary table uses the comparable FY2023-FY2025 presentation. The requested “3-year CAGR” column is the two-interval CAGR from the first to last of those three fiscal-year observations. Every value is tied to a named data-package row; no dollar figure is back-solved.

Product / sub-segment	FY2023 revenue	FY2024 revenue	FY2025 revenue	FY2023→FY2025 CAGR	Most recent FY YoY	Data package cite
Consolidated company	$9.869B [§3 Revenue row]	$11.020B [§3 Revenue row]	$12.001B [§3 Revenue row]	10.3% [calculated from §3]	8.9% [§3 YoY row]	data_package §3; D-SEC-25K
TRIKAFTA/KAFTRIO	$8.945B [§4 row 1]	$10.239B [§4 row 1]	$10.313B [§4 row 1]	7.4% [calculated]	0.7% [calculated]	data_package §4; D-SEC-25K
ALYFTREK	n/a, prelaunch [§4 row 2]	n/a, prelaunch [§4 row 2]	$0.838B [§4 row 2]	n.m.	n.m.	data_package §4; D-SEC-25K
Other product revenues	$0.925B [§4 row 3]	$0.782B [§4 row 3]	$0.820B [§4 row 3]	(5.8)% [calculated]	4.9% [calculated]	data_package §4; D-SEC-25K; unstable composition
CASGEVY	not separately presented [§4 row 7]	not separately presented [§4 row 7]	$0.116B [§4 row 7]	n.m.	n.m.	data_package §4; D-TR-Q4, 2026-02-12
JOURNAVX	prelaunch [§4 row 8]	prelaunch [§4 row 8]	$0.060B [§4 row 8]	n.m.	n.m.	data_package §4; D-TR-Q4, 2026-02-12

The pre-aggregation legacy series is shown separately because those brands ceased to be separately disclosed after FY2023.

Legacy CF product	FY2021 revenue	FY2022 revenue	FY2023 revenue	FY2021→FY2023 CAGR	Most recent disclosed YoY	Data package cite
KALYDECO	$0.684B [§4 row 4]	$0.553B [§4 row 4]	$0.476B [§4 row 4]	(16.6)%	(13.9)%	data_package §4; D-SEC-22K; D-FMP-PROD-A
ORKAMBI	$0.772B [§4 row 5]	$0.511B [§4 row 5]	$0.326B [§4 row 5]	(35.0)%	(36.2)%	data_package §4; D-SEC-22K; D-FMP-PROD-A
SYMDEKO/SYMKEVI	$0.420B [§4 row 6]	$0.180B [§4 row 6]	$0.123B [§4 row 6]	(45.9)%	(31.7)%	data_package §4; D-SEC-22K; D-FMP-PROD-A

Internal arithmetic checks: $9.869B x 1.117 = $11.024B versus $11.020B disclosed, a 0.04% difference; $11.020B x 1.089 = $12.001B. TRIKAFTA/KAFTRIO $8.945B x 1.145 = $10.242B versus $10.239B, and $10.239B x 1.007 = $10.311B versus $10.313B. Other product revenue $0.925B x 0.845 = $0.782B and $0.782B x 1.049 = $0.820B. KALYDECO $0.553B x 0.861 = $0.476B; ORKAMBI $0.511B x 0.638 = $0.326B; SYMDEKO/SYMKEVI $0.180B x 0.683 = $0.123B. Every check is within the 2% tolerance.

No row was back-solved. The TTM decomposition used later is a direct four-quarter sum from data_package §5 and D-REL-Q3 through D-REL-Q2: TRIKAFTA/KAFTRIO $10.0780B, ALYFTREK $1.6251B, legacy/other CF $0.5687B, CASGEVY $0.1905B and JOURNAVX $0.1249B.

The governed historical profit series is consolidated because no product profit is disclosed. CODM consolidated net income is shown separately as context and is not an operating adjustment.

Historical Consolidated company metric	FY2023	FY2024	FY2025	Data package cite
Revenue	$9.869B	$11.020B	$12.001B	data_package §3; D-SEC-25K
Statutory operating income (single-segment non-operating CODM fallback)	$3.832B	$(0.233)B	$4.173B	data_package §3; D-SEC-25K
Statutory operating income (single-segment non-operating CODM fallback) margin	38.8%	(2.1)%	34.8%	data_package §3; D-SEC-25K; calculated
CODM consolidated net income (context only)	$3.620B	$(0.536)B	$3.953B	data_package §2; §3a; D-SEC-25K

7. Management guidance — verbatim from data_package §6

- **Q3 FY2025 revenue — Charles Wagner, CFO; 2025-11-03:** “We now expect 2025 total revenue to be in a range of $11.9 billion to $12 billion versus prior guidance of $11.85 billion to $12 billion, representing growth of approximately 8% to 9% for the full year at current exchange rates.” [data_package §6, D-TR-Q3] This narrowed the FY2025 anchor upward and was achieved.
- **Q3 FY2025 ALYFTREK — Stuart Arbuckle, COO; 2025-11-03:** “Overall, we are pleased with the response to ALYFTREK and continue to expect that the majority of patients around the globe will transition to ALYFTREK over time given its multiple benefits.” [data_package §6, D-TR-Q3] This supports a large product reclassification, not additive CF revenue.
- **Q3 FY2025 CASGEVY — Charles Wagner, CFO; 2025-11-03:** “As Duncan mentioned, full year revenue guidance also includes over $100 million of CASGEVY revenue as we treat more patients in geographies where we have secured regulatory approval and reimbursement.” [data_package §6, D-TR-Q3] Throughput and reimbursement are the near-term gates.
- **Q4 FY2025 FY2026 revenue — Charles Wagner, CFO; 2026-02-12:** “We expect full year 2026 total company revenue to be in the range of $12.95 billion to $13.1 billion, representing 8% to 9% growth versus the prior year.” [data_package §6, D-TR-Q4] This was the initial FY2026 baseline.
- **Q4 FY2025 non-CF contribution — Charles Wagner, CFO; 2026-02-12:** “This outlook anticipates continued solid performance from our CF franchise and a $500 million or greater revenue contribution from non-CF products, including greater volumes of patient infusions for CASGEVY and a ramp of JOURNAVX prescriptions.” [data_package §6, D-TR-Q4] The figure is a combined floor, not a mechanical allocation.

- **Q4 FY2025 ALYFTREK efficacy — Reshma Kewalramani, CEO; 2026-02-12:** “Importantly, 65% of these ALYFTREK patients achieved levels of sweat chloride below the normal or carrier level of 30 millimoles when treated through 24 weeks.” [data_package §6, D-TR-Q4] This supports differentiation and younger-age expansion.
- **Q1 FY2026 unchanged revenue — Charles Wagner, CFO; 2026-05-04:** “We are reiterating our 2026 total revenue guidance of $12.95 billion to $13.10 billion, representing growth of 8% to 9%.” [data_package §6, D-TR-Q1] Launch volatility had not forced a reduction.
- **Q1 FY2026 expense investment — Charles Wagner, CFO; 2026-05-04:** “We are also reiterating our combined non-GAAP operating expense guidance of $5.65 billion to $5.75 billion, reflecting continued investment in our late-stage clinical pipeline, commercial infrastructure, and activities for new launches and revenue diversification.” [data_package §6, D-TR-Q1] Margin expansion must be gradual.
- **Q1 FY2026 inaxaplin timing — Reshma Kewalramani, CEO; 2026-05-04:** “Fortunately, the IA enrollment is complete, the full study enrollment will complete this year, and we fully expect to have results from the IA in early 2027.” [data_package §6, D-TR-Q1] Inaxaplin is not a 2026 revenue driver.
- **Q2 FY2026 raised revenue — Charles Wagner, COO and CFO; 2026-08-03:** “Given our strong first half performance and the momentum across the business, we are raising our full year 2026 total revenue guidance to a range of $13.1 billion to $13.2 billion” [data_package §6, D-TR-Q2] This is the controlling first-year anchor.
- **Q2 FY2026 ALYFTREK switching — Duncan McKechnie, Chief Commercial Officer; 2026-08-03:** “The majority of ALYFTREK revenue continues to come from these TRIKAFTA switch patients, which reflects the benefits of ALYFTREK and our success establishing ALYFTREK as the new standard of care.” [data_package §6, D-TR-Q2] Switch revenue is explicitly cannibalistic.
- **Q2 FY2026 CASGEVY funnel — Duncan McKechnie, Chief Commercial Officer; 2026-08-03:** “There were more CASGEVY infusions in the first half of 2026 than in all of 2025.” [data_package §6, D-TR-Q2] The funnel accelerates, but exact H1 counts are undisclosed.
- **Q2 FY2026 JOURNAVX access — Duncan McKechnie, Chief Commercial Officer; 2026-08-03:** “At this point, we have a total of 260 million lives covered out of a total possible of approximately 320 million.” [data_package §6, D-TR-Q2] Restricted access and paid conversion still matter.
- **Q2 FY2026 long-term ambition — Reshma Kewalramani, CEO; 2026-08-03:** “We view CF as a long-duration franchise with sustained growth. We continue to expect both CASGEVY and JOURNAVX to be multibillion-dollar assets and we anticipate our emerging renal franchise could one day rival CF in revenue.” [data_package §6, D-TR-Q2] This is aspiration without a date, not the base terminal value.

8. Forward growth assumptions — explicit and product-level

The TTM anchor is $12.587B. Product CAGRs are calculated from direct TTM values to 2031-06-30. Povetacicept's CAGR is not meaningful from zero, so its table states the launch assumption. “Other pipeline” covers inaxaplin, suzetrigine DPN, VX-993, zimislecel, VX-017, VX-407 and VX-828; all are explicit zero-revenue diagnostics because the package has no pivotal result or approved label at cutoff. The unclosed Crinetics acquisition is also zero because the governed Vertex perimeter has no completed closing or source-bound target revenue. No separate royalty or collaboration revenue is governed in the TTM product bridge: CFF royalties and CRISPR Therapeutics' CASGEVY share are modeled through cost of sales, not fabricated as revenue.

Povetacicept expected revenue embeds a scenario-specific effective regulatory/commercial realization assumption rather than false certainty. Bear assumes roughly 30% realization and a delayed/limited launch, base 70%-80% with a 2027 ramp after a timely decision, and bull about 90% with rapid access. These factors combine regulatory outcome, timing and commercial penetration; they are not claimed issuer probabilities. The outer 25%/55%/20% scenario weights then apply to the complete company outcomes.

Base case growth assumptions

Product	Historical growth anchor	Latest YoY / launch observation	Management FY+1 guide	Base CAGR TTM→2031	Concise justification
Total CF franchise	FY2023-FY2025 disclosed rows	Q2 FY2026 global CF +11%	“continued solid performance”	2.8%	Younger ages/geographies and retention offset saturation; switch adds zero total revenue
TRIKAFTA/KAFTRIO	7.4% FY2023-FY2025	Q2 FY2026 (2.1)%	No separate guide	(20.5)%	Deliberate migration to ALYFTREK, not franchise loss
ALYFTREK	Launch; FY2025 $0.838B	Q2 FY2026 +265.8%	Majority expected to transition	45.2%	Switch plus younger ages, constrained by total CF build
Legacy/other CF	Legacy brands declined double digits	Q2 Other CF (29.2)%	No guide	(7.7)%	Continued migration with residual niches
CASGEVY	FY2025 $0.116B	Q2 FY2026 +151.3%	Non-CF at least $0.5B combined	47.9%	Infusion throughput improves; one-time funnel limits pace
JOURNAVX	FY2025 $0.060B	Q2 FY2026 +313.3%	Prescription ramp in combined guide	61.0%	Coverage converts; restrictions and gross-to-net slow adoption
Povetacicept	Prelaunch; BLA accepted	PDUFA 2026-11-30	No revenue guide	Launch to $1.85B expected revenue	Approval and timing adjusted, not certain sales
Other pipeline / Crinetics	No governed commercial base	Milestones / deal unclosed	No guide	0.0% / $0	Zero until pivotal evidence or completed perimeter

Bull case growth assumptions

Product	Historical growth anchor	Latest YoY / launch observation	Management FY+1 guide	Bull CAGR TTM→2031	Concise justification
Total CF franchise	Same verified history	Q2 FY2026 global CF +11%	Long-duration sustained growth	5.2%	Faster new-patient/geographic additions and retention
TRIKAFTA/KAFTRIO	7.4% FY2023-FY2025	Q2 FY2026 (2.1)%	No guide	(24.3)%	Faster successful switch, not external displacement
ALYFTREK	Launch	Q2 FY2026 +265.8%	Majority expected to transition	51.2%	Rapid global switching within total CF ceiling
Legacy/other CF	Declining legacy rows	Q2 Other CF (29.2)%	No guide	(4.6)%	Niche persistence offsets erosion
CASGEVY	Launch	Q2 FY2026 +151.3%	Multibillion aspiration, undated	64.6%	Pediatric expansion, throughput and reimbursement outperform
JOURNAVX	Launch	Q2 FY2026 +313.3%	Multibillion aspiration, undated	86.3%	Restrictions ease; hospital/retail pathways convert
Povetacicept	Prelaunch	Accepted BLA; cited efficacy	No guide	Launch to $3.00B expected revenue	Timely approval, differentiation and broad access
Other pipeline / Crinetics	No governed base	Milestones / deal unclosed	No guide	0.0% / $0	Bull still excludes unsourced optionality

Bear case growth assumptions

Product	Historical growth anchor	Latest YoY / launch observation	Management FY+1 guide	Bear CAGR TTM→2031	Concise justification
Total CF franchise	Same verified history	Q2 FY2026 global CF +11%	Current guide positive	(2.2)%	Saturation, access/price pressure and fewer new patients
TRIKAFTA/KAFTRIO	7.4% FY2023-FY2025	Q2 FY2026 (2.1)%	No guide	(14.1)%	Switching continues but more slowly
ALYFTREK	Launch	Q2 FY2026 +265.8%	Majority expected to transition	29.2%	Internal conversion with limited franchise growth
Legacy/other CF	Declining legacy rows	Q2 Other CF (29.2)%	No guide	(4.6)%	Residual niche use prevents zero
CASGEVY	Launch	Q2 FY2026 +151.3%	Combined non-CF floor only	23.6%	Center bottlenecks and reimbursement slow infusions
JOURNAVX	Launch	Q2 FY2026 +313.3%	Combined non-CF floor only	32.0%	Restrictions, net-price pressure and generic competition

Product	Historical growth anchor	Latest YoY / launch observation	Management FY+1 guide	Bear CAGR TTM→2031	Concise justification
Povetacicept	Prelaunch	PDUFA pending	No guide	Launch to $0.20B expected revenue	Delay or weak differentiation reduces realization
Other pipeline / Crinetics	No governed base	Milestones / deal unclosed	No guide	0.0% / $0	No revenue without governed evidence

Annual product cadence — Bear

Product ($B)	TTM 2026-06-30	2027-06-30	2028-06-30	2029-06-30	2030-06-30	2031-06-30
TRIKAFTA/KAFTRIO	10.0780	9.400	8.100	6.800	5.600	4.700
ALYFTREK	1.6251	2.200	3.350	4.350	5.150	5.850
Legacy/other CF	0.5687	0.500	0.450	0.420	0.400	0.450
Total CF franchise	12.2718	12.100	11.900	11.570	11.150	11.000
CASGEVY	0.1905	0.300	0.400	0.480	0.520	0.550
JOURNAVX	0.1249	0.220	0.320	0.400	0.460	0.500
Povetacicept expected revenue	0.000	0.020	0.070	0.120	0.160	0.200
Other pipeline / Crinetics diagnostic	0.000	0.000	0.000	0.000	0.000	0.000
Royalty/collaboration revenue diagnostic	0.000	0.000	0.000	0.000	0.000	0.000
Consolidated company revenue	12.5872	12.640	12.690	12.570	12.290	12.250
Statutory operating income (single-segment non-operating CODM fallback)	4.7771	4.677	4.442	4.148	3.933	3.798

Annual product cadence — Base

Product ($B)	TTM 2026-06-30	2027-06-30	2028-06-30	2029-06-30	2030-06-30	2031-06-30
TRIKAFTA/KAFTRIO	10.0780	9.100	7.150	5.400	4.000	3.200
ALYFTREK	1.6251	3.050	5.450	7.580	9.350	10.470
Legacy/other CF	0.5687	0.500	0.450	0.420	0.400	0.380
Total CF franchise	12.2718	12.650	13.050	13.400	13.750	14.050
CASGEVY	0.1905	0.360	0.600	0.850	1.100	1.350
JOURNAVX	0.1249	0.280	0.550	0.850	1.100	1.350
Povetacicept expected revenue	0.000	0.100	0.350	0.750	1.250	1.850
Other pipeline / Crinetics diagnostic	0.000	0.000	0.000	0.000	0.000	0.000
Royalty/collaboration revenue diagnostic	0.000	0.000	0.000	0.000	0.000	0.000
Consolidated company revenue	12.5872	13.390	14.550	15.850	17.200	18.600
Statutory operating income (single-segment non-operating CODM fallback)	4.7771	5.222	5.820	6.499	7.224	7.998

Annual product cadence — Bull

Product ($B)	TTM 2026-06-30	2027-06-30	2028-06-30	2029-06-30	2030-06-30	2031-06-30
TRIKAFTA/KAFTRIO	10.0780	8.950	6.750	4.900	3.500	2.500
ALYFTREK	1.6251	3.200	6.100	8.750	11.250	12.850
Legacy/other CF	0.5687	0.550	0.500	0.480	0.460	0.450
Total CF franchise	12.2718	12.700	13.350	14.130	15.210	15.800
CASGEVY	0.1905	0.450	0.850	1.300	1.800	2.300
JOURNAVX	0.1249	0.350	0.800	1.400	2.100	2.800

Product ($B)	TTM 2026-06-30	2027-06-30	2028-06-30	2029-06-30	2030-06-30	2031-06-30
Povetacicept expected revenue	0.000	0.150	0.550	1.200	2.000	3.000
Other pipeline / Crinetics diagnostic	0.000	0.000	0.000	0.000	0.000	0.000
Royalty/collaboration revenue diagnostic	0.000	0.000	0.000	0.000	0.000	0.000
Consolidated company revenue	12.5872	13.650	15.550	18.030	21.110	23.900
Statutory operating income (single-segment non-operating CODM fallback)	4.7771	5.528	6.609	8.023	9.816	11.472

Cannibalization and new-to-Vertex reconciliation

In base, total CF grows from $12.272B to $14.050B, a $1.778B increase attributable to net new-to-Vertex patients, younger ages, geographies, adherence and price/mix. Product reclassification is separate: TRIKAFTA/KAFTRIO falls by $6.878B while ALYFTREK rises by $8.845B and legacy CF falls by $0.189B. The net of those product movements equals the same $1.778B franchise increase. No ALYFTREK switch dollar is counted twice. Bear and bull use identical discipline: total CF is set independently, and brand rows merely allocate it.

9. Forward Statutory operating income (single-segment non-operating CODM fallback) margin assumptions

The TTM exact-basis margin is 37.95%. Product profitability is not disclosed, so the model does not invent product margins. Instead it uses a consolidated statutory expense stack. Gross margin is supported by the 86.2% FY2025 proxy, 85.3% Q2 FY2026 proxy and management's “just under 86%” FY2026 expectation. Ordinary R&D is anchored by FY2025's 32.6% revenue ratio. Acquired IPR&D receives an explicit allowance because statutory history includes $0.133B in FY2025 and $4.628B in FY2024. The residual launch/commercial/G&A line is analytical, not a disclosed product allocation. Interest and tax are excluded because they are below the governed metric.

Case at 2031-06-30	Gross margin	R&D / revenue	Acquired IPR&D / revenue	Launch, commercial and G&A / revenue	Statutory operating income (single-segment non-operating CODM fallback) margin	Mechanism versus TTM
Bear	83.5%	31.5%	2.5%	18.5%	31.0%	CASGEVY mix/partner share, price pressure, failed leverage and renewed deal expense
Base	86.2%	28.5%	1.0%	13.7%	43.0%	ALYFTREK royalty benefit and launch scale while preserving R&D
Bull	87.0%	25.0%	0.5%	13.5%	48.0%	Strong mix, commercial scale and R&D absorption

The FY2025 comparison stack makes the leverage claim testable: 86.2% gross margin less 32.6% ordinary R&D, about 1.1% acquired IPR&D and 34.8% statutory operating margin implies a 17.7% residual launch/commercial/G&A burden. Base does not assume gross-margin expansion; its 8.2-point operating-margin improvement versus FY2025 instead requires 4.1 points of R&D absorption and 4.0 points of launch/commercial/G&A leverage over five years, with acquired IPR&D approximately flat as a share of revenue. Base R&D still rises to $5.30 billion and launch/commercial/G&A to $2.55 billion at the horizon, so this is ratio absorption rather than an absolute cost cut. Bull is deliberately harder to earn: versus FY2025 it requires 0.8 points of gross-margin benefit from royalty/mix, 7.6 points of R&D absorption, 4.2 points of commercial/G&A leverage and a 0.6-point lower acquired-IPR&D burden. Bear reverses the operating mechanism: the 2.7-point gross-margin loss from CASGEVY collaboration economics, royalty/COGS mix and price pressure, plus higher acquired-IPR&D and launch burden, more than offsets modest R&D-ratio absorption. [data_package §0a; §2; §7; D-SEC-25K]

The arithmetic is direct. Bear: 83.5% - 31.5% - 2.5% - 18.5% = 31.0%. Base: 86.2% - 28.5% - 1.0% - 13.7% = 43.0%. Bull: 87.0% - 25.0% - 0.5% - 13.5% = 48.0%. The bull margin is not simple historical peak recapture: FY2022 reached 48.2%, but bull requires a much larger revenue base to absorb diversified R&D and launch infrastructure. Bear stays profitable because CF remains high margin, yet loses nearly 700 basis points as unsuccessful diversification strands expense.

Case	TTM 2026-06-30 exact-basis margin	2027-06-30	2028-06-30	2029-06-30	2030-06-30	2031-06-30
Bear — Statutory operating income (single-segment non-operating CODM fallback)	37.95%	37.0%	35.0%	33.0%	32.0%	31.0%
Base — Statutory operating income (single-segment non-operating CODM fallback)	37.95%	39.0%	40.0%	41.0%	42.0%	43.0%
Bull — Statutory operating income (single-segment non-operating CODM fallback)	37.95%	40.5%	42.5%	44.5%	46.5%	48.0%

Base expansion is phased. Near-term R&D and launch infrastructure remain heavy, consistent with management's FY2026 expense guidance. Scale appears after non-CF revenue exceeds roughly $2B and povetacicept contributes. Bear margin declines because the company funds governed programs while revenue stalls. Bull still includes 25% of revenue for R&D and a statutory acquired-IPR&D allowance.

10. Segment rollup — bottom-up and arithmetically tied

Every revenue total is the sum of Section 8 product rows. Every profit equals revenue times the case-specific Section 9 exact-basis margin. The rollup contains no corporate allocation, tax or below-line item.

Case / date	Product revenue sum	Reconciled Consolidated company revenue	Revenue residual	Statutory operating income (single-segment non-operating CODM fallback) margin	Statutory operating income (single-segment non-operating CODM fallback)
Bear 2027-06-30	$12.640B	$12.640B	$0.000B	37.0%	$4.677B
Bear 2028-06-30	$12.690B	$12.690B	$0.000B	35.0%	$4.442B
Bear 2029-06-30	$12.570B	$12.570B	$0.000B	33.0%	$4.148B
Bear 2030-06-30	$12.290B	$12.290B	$0.000B	32.0%	$3.933B
Bear 2031-06-30	$12.250B	$12.250B	$0.000B	31.0%	$3.798B
Base 2027-06-30	$13.390B	$13.390B	$0.000B	39.0%	$5.222B
Base 2028-06-30	$14.550B	$14.550B	$0.000B	40.0%	$5.820B
Base 2029-06-30	$15.850B	$15.850B	$0.000B	41.0%	$6.499B
Base 2030-06-30	$17.200B	$17.200B	$0.000B	42.0%	$7.224B
Base 2031-06-30	$18.600B	$18.600B	$0.000B	43.0%	$7.998B
Bull 2027-06-30	$13.650B	$13.650B	$0.000B	40.5%	$5.528B
Bull 2028-06-30	$15.550B	$15.550B	$0.000B	42.5%	$6.609B
Bull 2029-06-30	$18.030B	$18.030B	$0.000B	44.5%	$8.023B
Bull 2030-06-30	$21.110B	$21.110B	$0.000B	46.5%	$9.816B
Bull 2031-06-30	$23.900B	$23.900B	$0.000B	48.0%	$11.472B

Base terminal revenue CAGR is 8.1%, compared with 10.3% for FY2023-FY2025 and 8.9% latest FY growth. That deceleration has a specific cause: CF slows to 2.8%, while CASGEVY, JOURNAVX and povetacicept reach $4.55B. Bear revenue CAGR is (0.5)% and bull is 13.7%. The first base interval reaches $13.39B, consistent with the raised FY2026 guide without confusing a June-ending TTM interval with FY2026.

The exact-basis profit path is more dispersed because statutory operating margin includes R&D and acquired IPR&D. Base profit grows from $4.777B to $7.998B, a 10.9% CAGR. Bear terminal profit falls to $3.798B despite roughly flat revenue. Bull reaches $11.472B because revenue and expense absorption outperform. This dispersion is economically preferable to assigning the same margin to every revenue case.

11. Key risks and wildcards

- **CF saturation and switch accounting — Bear/Base.** ALYFTREK may grow rapidly while total CF grows slowly. Treating switch revenue as additive would overstate the terminal base; the model explicitly prevents that.

- **Clinical leapfrogging in CF — Bear.** A superior modulator, genetic therapy or alternative mechanism could compress retention before patent expiry. The bear captures this through declining total CF rather than fabricated market-share points.
- **CASGEVY funnel conversion — Bear.** Initiations, collections and infusions are not equivalent. Conditioning burden, center capacity, reimbursement and monitoring can keep recognized revenue below the apparent funnel.
- **CASGEVY unit economics — Bear/Base.** Vertex records CRISPR Therapeutics' 40% share of net commercial profit/loss in cost of sales. A high price does not guarantee a CF-like gross margin.
- **JOURNAVX access and net price — Bear.** Coverage includes restricted lives, and product net price is undisclosed. Generic medicines and hospital budgets can make prescriptions grow faster than revenue.
- **Povetacicept approval and differentiation — all cases.** A PDUFA date is not approval. Renal competition, safety, durability and payer sequencing determine uptake; scenario revenue is probability/timing adjusted.
- **Pipeline zero may be too conservative — Bull wildcard.** Several programs could create material revenue, but with no pivotal result or approved label at cutoff the model assigns zero.
- **Crinetics perimeter — all cases.** The acquisition was agreed but not shown closed. Purchase accounting, target revenue and IPR&D are absent from the governed package; revenue stays zero.
- **Statutory acquired-IPR&D volatility — Bear.** A transaction resembling Alpine could erase a year's statutory operating income. The allowance normalizes burden but cannot predict exact deal timing.
- **R&D productivity — Bear/Base.** Ordinary R&D exceeded 32% of FY2025 revenue. Failure can leave expense without revenue.
- **Gross-margin mix — Bear.** ALYFTREK's lower royalty burden helps, but CASGEVY partner economics, launch inventory and pricing can offset it.
- **Guidance extrapolation — Base.** The $13.1-$13.2B FY2026 guide is near term and does not validate five-year launch aspirations.

Segment summary

Case	Segment TTM+5y Revenue	Exact profit metric	Segment TTM+5y Profit Margin	Segment TTM+5y Profit	Probability
Bear	$12.250B	Statutory operating income (single-segment non-operating CODM fallback)	31.0%	$3.798B	25%
Base	$18.600B	Statutory operating income (single-segment non-operating CODM fallback)	43.0%	$7.998B	55%
Bull	$23.900B	Statutory operating income (single-segment non-operating CODM fallback)	48.0%	$11.472B	20%

The 25%/55%/20% weights are deliberately nonuniform. Base is most likely because it respects the raised FY2026 guide, preserves CF growth but not at Q2's rate, and probability/timing-adjusts povetacicept. Bear is more likely than bull because one launch or clinical failure can impair leverage, whereas bull requires simultaneous success in CF expansion, CASGEVY throughput, JOURNAVX access and renal launch. These are underwriting scenarios, not rankings or portfolio instructions. This appendix grants no trade, broker, portfolio, message, sizing, BUY-queue or memo-publication authority, and `trade_execution_authorized=false`.

Appendix S - Synthesis (Combined Earnings Model)

Vertex Pharmaceuticals Incorporated — Production ER2 Combined Earnings Synthesis

Run ID: `pulse-cio-20260830T120326+0800`. This appendix consolidates the reviewed single-segment forecast and performs the mechanical earnings hard gate. It does not select a security-return valuation method, set an exit multiple, calculate shareholder IRRs, rank the security, propose sizing, or authorize trading. Those valuation decisions belong to the subsequent valuation-preflight stage. `trade_execution_authorized=false`.

1. Anchors and governed perimeter

- Today and information cutoff date: 2026-08-30.
- Fiscal year end: December 31.
- Forecast anchor: TTM ended 2026-06-30, comprising Q3 FY2025, Q4 FY2025, Q1 FY2026, and Q2 FY2026.
- Latest completed fiscal year for the historical cross-check: FY2025.
- Horizon: 2031-06-30, exactly 5.0 calendar years after the TTM anchor. No forecast row compounds from FY2025 or across six fiscal years.
- Valuation price: USD 541.69 per Vertex common share, `XNAS:VRTX`, raw exchange close on 2026-08-28. Quote type is last completed close; actionability expiry is 2026-09-01T04:00:00+08:00.
- Quote evidence: raw-source SHA-256 `a97b6e53aa90569ffc785e9fce040de270f922e31e6c3a4dc10fa6e89165cf7d`; QFR-sealed packet SHA-256 `10ab806570e9fbc5e8a10b058e5bfeaa1bc837ba5b6dd24d40a57e7f0017a5c4`.
- Reporting and quote currency are both USD. The financial-statement and quoted class is common stock, $0.01 par value; one listed security is one financial share.
- Quote-date split bridge: 255.2 million financial-statement diluted shares at 2026-06-30 x split factor 1.0 = 255.2 million quote-basis diluted financial shares. The split search found no intervening split; its governed hash is `4636bbd888fcfc31d2eb5ce71df00fb0f748ed216ebe4a2aa2920b37916171e0`.
- Listed-unit bridge: depositary ratio 1.0 x share-class factor 1.0 = 1.0 financial share per listed unit; 255.2 million quote-basis financial shares / 1.0 = 255.2 million listed-unit equivalents.
- FX bridge: USD 1.0 quote currency per USD 1.0 reporting currency, identity rate dated 2026-08-28. No currency conversion is required.
- Historical statutory bridge SHA-256 is `e213fc6c2a19807cbdb4d8fc426633cf9a1db0c4bd7ba6381fea2b3be280133d`. The installed validator returned `STATUTORY_BRIDGE_VALID`; the quote validator returned `QUOTE_PACKET_VALID`; the durable manifest records `STATUTORY BRIDGE VERIFIED — CLEARED FOR FORECASTING` and `DATA PACKAGE VERIFIED — CLEARED FOR WAVE 2`.

Vertex has exactly one operating/reportable segment. The issuer-disclosed CODM measure is consolidated net income, a below-operating-income statutory endpoint. It is preserved separately and never treated as an operating adjustment. The sole modeled segment is therefore `Consolidated company`, and its exact profit basis remains `Statutory operating income (single-segment non-operating CODM fallback)`. Both historical bridge periods have empty corporate/unallocated and operating-adjustment arrays, so the forward consolidation also contains no corporate or operating plug.

2. Segment-level forward assumptions reproduced from reviewed B

The values below reproduce, without re-derivation, reviewed `appendix_B_consolidated_company.md` Sections 8-10, exact SHA-256 `2f5955d3caafac53e5af3eca718c09106721b8665eccd688e9256e264268a52e`. Terminal operating

income is the reviewed rounded output corresponding to the displayed exact-basis margin.

Segment	Exact profit metric	TTM revenue (USD B)	Bear TTM+5y rev	Base TTM+5y rev	Bull TTM+5y rev	Bear margin	Base margin	Bull margin
Consolidated company	Statutory operating income (single-segment non-operating CODM fallback)	12.5872	12.250	18.600	23.900	31.0%	43.0%	48.0%

The product rollups are also reproduced rather than reconstructed. At the horizon, Bear is total CF USD 11.000B + CASGEVY USD 0.550B + JOURNAVX USD 0.500B + povetacicept expected revenue USD 0.200B = USD 12.250B. Base is USD 14.050B + USD 1.350B + USD 1.350B + USD 1.850B = USD 18.600B. Bull is USD 15.800B + USD 2.300B + USD 2.800B + USD 3.000B = USD 23.900B. Other pipeline/Crinetics and royalty/collaboration diagnostics are zero in all cases because no governed commercial revenue was available at the cutoff. ALYFTREK switching is contained inside total CF and is not added again.

3. Combined revenue build

There is one modeled segment and no corporate revenue elimination. Implied growth uses the 2026-06-30 TTM anchor and exactly five calendar years.

Line	Bear	Base	Bull
Sum of segment TTM+5y revenue (USD B)	12.250	18.600	23.900
Corporate eliminations (USD B)	0.000	0.000	0.000
Combined TTM+5y revenue (USD B)	**12.250**	**18.600**	**23.900**
Implied TTM 2026-06-30 to TTM+5y CAGR	(0.54)%	8.12%	13.69%

The base path is 12.5872, 13.390, 14.550, 15.850, 17.200, and 18.600 billion dollars from the TTM anchor through the five annual horizon dates. Bear is 12.5872, 12.640, 12.690, 12.570, 12.290, and 12.250 billion. Bull is 12.5872, 13.650, 15.550, 18.030, 21.110, and 23.900 billion. These annual values are reproduced from reviewed B and retain the raised FY2026 guidance as a near-term reality check without treating a December fiscal guide as a June-ending TTM value.

4. Combined operating-income build

The sealed fallback metric already equals statutory operating income. Corporate/unallocated adjustments and operating bridge adjustments are empty by contract; zero is shown here solely to demonstrate the consolidation, not to introduce a zero-valued adjustment into the sealed historical arrays.

Line	Bear	Base	Bull
Sum of segment TTM+5y profit on sealed common metric (USD B)	3.798	7.998	11.472
Corporate/unallocated adjustments (USD B)	0.000	0.000	0.000
Consolidated TTM+5y segment-profit metric (USD B)	3.798	7.998	11.472
Operating bridge adjustments (USD B)	0.000	0.000	0.000
Combined statutory TTM+5y operating income (USD B)	**3.798**	**7.998**	**11.472**
Implied statutory OI margin	31.0%	43.0%	48.0%

The annual operating-income paths are likewise fixed to B: Bear 4.677, 4.442, 4.148, 3.933, and 3.798 billion; Base 5.222, 5.820, 6.499, 7.224, and 7.998 billion; Bull 5.528, 6.609, 8.023, 9.816, and 11.472 billion. The margin cadence is Bear 37.0%, 35.0%, 33.0%, 32.0%, 31.0%; Base 39.0%, 40.0%, 41.0%, 42.0%, 43.0%; and Bull 40.5%, 42.5%, 44.5%, 46.5%, 48.0%. Interest, other non-operating income, and tax are excluded from this exact profit basis.

5. Annual below-line, tax, cash, and statutory EPS build

The below-line rules reproduce the verified data-package Section 3a schedule. Net interest is average cash and marketable securities times the scenario earned yield, less funded-debt interest. The funded-debt schedule is zero because the 2026-06-30 anchor reports no funded debt and this synthesis assumes no new borrowing; leases are not relabeled funded debt. Other income is negative USD 0.050B per year in Bear, zero in Base, and positive USD 0.025B per year in Bull. Cash tax rates are 20%, 18%, and 16%, respectively.

To make interest calculable rather than plugged, each scenario has an explicit cash/securities roll-forward from the governed USD 13.6415B balance at 2026-06-30. Ending cash equals beginning cash plus a scenario retention share of statutory net income after all operating investment, capex, repurchases, acquisitions and other cash deployment: negative 5% in Bear, positive 20% in Base, and positive 30% in Bull. These are constrained synthesis assumptions anchored to TTM FCF of USD 3.7961B, TTM net income of USD 4.4052B, TTM repurchases of USD 2.0059B, and management's acquisition-first/repurchase-after-needs policy. They do not claim a complete cash-flow statement. The simultaneous equations are solved exactly because net interest affects NI while NI affects ending cash.

Bear annual statutory path

Date	Revenue	OI	Begin cash/ securities	End cash/se curities	Net interest	Other	Pretax	Tax at 20%	NI	End diluted shares	EPS
2027-06-30	12.640	4.677	13.641500	13.442878	0.338555	(0.050000)	4.965555	0.993111	3.972444	254.640000	15.600235
2028-06-30	12.690	4.442	13.442878	13.253849	0.333709	(0.050000)	4.725709	0.945142	3.780567	254.129796	14.876521
2029-06-30	12.570	4.148	13.253849	13.076764	0.329133	(0.050000)	4.427133	0.885427	3.541706	253.671463	13.961784
2030-06-30	12.290	3.933	13.076764	12.908452	0.324815	(0.050000)	4.207815	0.841563	3.366252	253.267207	13.291307
2031-06-30	12.250	3.798	12.908452	12.745704	0.320677	(0.050000)	4.068677	0.813735	3.254942	252.919381	12.869483

Base annual statutory path

Date	Revenue	OI	Begin cash/ securities	End cash/se curities	Net interest	Other	Pretax	Tax at 18%	NI	End diluted shares	EPS
2027-06-30	13.390	5.222	13.641500	14.567302	0.423132	0.000000	5.645132	1.016124	4.629008	252.967857	18.298800
2028-06-30	14.550	5.820	14.567302	15.595983	0.452449	0.000000	6.272449	1.129041	5.143408	250.967857	20.494291
2029-06-30	15.850	6.499	15.595983	16.741369	0.485060	0.000000	6.984060	1.257131	5.726929	249.170982	22.983934
2030-06-30	17.200	7.224	16.741369	18.011598	0.521295	0.000000	7.745295	1.394153	6.351141	247.553335	25.655649
2031-06-30	18.600	7.998	18.011598	19.415340	0.561404	0.000000	8.559404	1.540693	7.018711	246.095002	28.520333

Bull annual statutory path

Date	Revenue	OI	Begin cash/ securities	End cash/se curities	Net interest	Other	Pretax	Tax at 16%	NI	End diluted shares	EPS
2027-06-30	13.650	5.528	13.641500	15.167905	0.504165	0.025000	6.057165	0.969146	5.088018	252.333333	20.163877
2028-06-30	15.550	6.609	15.167905	16.981452	0.562614	0.025000	7.196614	1.151458	6.045156	249.950980	24.185364
2029-06-30	18.030	8.023	16.981452	19.168972	0.632632	0.025000	8.680632	1.388901	7.291731	247.950980	29.407955
2030-06-30	21.110	9.816	19.168972	21.829708	0.717477	0.025000	10.558477	1.689356	8.869121	246.260504	36.015197
2031-06-30	23.900	11.472	21.829708	24.933176	0.818350	0.025000	12.315350	1.970456	10.344894	244.825722	42.254116

Terminal NI and listed-unit EPS bridge

All amounts are USD billions except shares and per-share values. The formula is `NI / quote-basis diluted financial shares x financial shares per listed unit x FX`.

Line	Bear	Base	Bull
Combined terminal OI	3.798000	7.998000	11.472000
Net interest income	0.320677	0.561404	0.818350
Other income / expense	(0.050000)	0.000000	0.025000
Pretax income	4.068677	8.559404	12.315350
Tax rate	20.0%	18.0%	16.0%
Tax provision	0.813735	1.540693	1.970456

Line	Bear	Base	Bull
Net income	**3.254942**	**7.018711**	**10.344894**
Quote-basis diluted financial shares (M)	252.919381	246.095002	244.825722
EPS, USD per quote-basis financial share	12.869483	28.520333	42.254116
Financial shares per listed unit	1.000000	1.000000	1.000000
EPS, USD reporting currency per listed unit	12.869483	28.520333	42.254116
FX, USD quote per USD reporting	1.000000	1.000000	1.000000
EPS, USD quote currency per listed unit	**12.869483**	**28.520333**	**42.254116**

Model conventions and constrained conclusions

The cash-retention and share-price paths are synthesis assumptions needed to convert the sealed operating forecast into annual statutory NI and diluted EPS. They are not management guidance and do not change B's product revenue or operating-profit outcomes. The model applies each scenario's interest yield to the arithmetic average of beginning and ending cash/securities, while funded-debt interest remains zero. This is more conservative and transparent than applying a terminal yield to a terminal balance for all five years. Lease obligations remain outside funded debt and are not allowed to reduce interest expense merely because Vertex is net cash.

SBC is an income-statement expense already embedded in statutory OI; the issuance schedule is therefore used only to model dilution and is not subtracted from NI a second time. Repurchase cash changes the share count and is already reflected indirectly in the post-deployment cash-retention rule; it is not deducted from NI. No dividend is forecast because the governed five-year capital-allocation history and TTM both show zero common dividends. The zero-distribution row is explicitly diagnostic and remains subject to VP's later lock.

The tax schedules apply to total pretax income, including interest and other non-operating income. No ROIC tax rate is substituted for the verified statutory forecast schedule. Net cash is not added to EPS under the P/E method and is not called terminal equity value in this appendix. Conversely, EV/NOPAT cannot treat the cash balance as an equity adjustment until a complete debt, lease, preferred, NCI and other-senior-claim perimeter is available. These count-once boundaries are essential: SBC affects OI and dilution once each for different reasons; buybacks affect shares and cash deployment but not earnings; interest reflects the modeled cash path; and cash may enter a future EV-to-equity bridge only once.

The resulting EPS cases are finite and fully statutory, but they do not imply terminal security prices. A later valuation stage may choose P/E if denominator comparability and exit evidence clear, or may choose EV/NOPAT only after completing the claim bridge. S makes no return-method preference beyond reporting those suitability facts.

5a. Return-method input bridge; method and multiples deliberately unselected

S does not choose the primary return method or any exit multiple. The table supplies the facts for the subsequent VP gate. Normalized NOPAT uses the same scenario cash tax rates as the statutory model. Terminal cash/securities follows the explicit annual path above. Gross funded debt is assumed zero under the no-new-borrowing scenario rule. The upstream package discloses long-term leases but not the complete current-plus-long-term lease claim needed for a full EV-to-equity bridge; preferred equity, minority interest, and other senior-claim perimeter fields are also not sufficiently enumerated for S to certify them as zero. Therefore EV/NOPAT is mechanically informative but not yet suitable to control without VP's complete claim-perimeter work.

Input at 2031-06-30	Bear	Base	Bull	Source / status
Statutory operating income, USD B	3.798000	7.998000	11.472000	Reviewed B Section 10
Normalized cash tax rate	20.0%	18.0%	16.0%	Data package Section 3a
Normalized NOPAT, USD B	3.038400	6.558360	9.636480	OI x one minus scenario tax
Cash and marketable securities, USD B	12.745704	19.415340	24.933176	Explicit annual retention path
Gross funded debt, USD B	0.000000	0.000000	0.000000	2026-06-30 zero; no-new-debt assumption

Input at 2031-06-30	Bear	Base	Bull	Source / status
Complete lease liabilities, USD B	Unavailable	Unavailable	Unavailable	Long-term anchor 1.9776; current component not governed
Preferred equity	Unavailable	Unavailable	Unavailable	Full claim-perimeter enumeration deferred to VP
Minority interest	Unavailable	Unavailable	Unavailable	Full claim-perimeter enumeration deferred to VP
Other senior claims	Unavailable	Unavailable	Unavailable	Full claim-perimeter enumeration deferred to VP
Separately valued non-operating assets	0 diagnostic	0 diagnostic	0 diagnostic	Securities already included in cash; no double count
Terminal diluted listed-equivalent shares (M)	252.919381	246.095002	244.825722	Section 6; unit factor 1
Cumulative distributions per share	0 diagnostic	0 diagnostic	0 diagnostic	Vertex paid no historical dividends; VP must lock treatment
Terminal equity value per share	VP pending	VP pending	VP pending	Requires selected method and exit multiple
Exit valuation multiple	VP pending	VP pending	VP pending	S has no selection authority

P/E suitability facts: statutory diluted EPS is fully reconciled through NI, shares, listed-unit factors and FX. TTM statutory EPS is USD 4.4052B / 256.303M = USD 17.1875, producing a raw current statutory P/E of 31.5166x at USD 541.69. The terminal P/E denominator is also statutory diluted EPS, so the method is mechanically available. VP must still determine whether the event-heavy acquired-IPR&D cadence requires a normalized comparable current denominator and must independently justify all exit multiples.

EV/NOPAT suitability facts: terminal NOPAT, cash/securities and funded debt have explicit paths, but the full lease and senior-claim perimeter is not complete in the reviewed package. EV/NOPAT must not control unless VP repairs that completeness with source-bound evidence. P/B-ROE is not the natural operating bridge for this non-financial company and no parent-common-equity roll-forward is built here. None of these observations selects the primary method.

P&C insurer lane: **NOT TRIGGERED — issuer is not a P&C insurer or reinsurer.** No `insurer_return_bridge.json` is created.

6. Explicit share-count path

The path begins with the quote packet's 255.2 million quote-basis diluted financial shares, not the 256.303 million day-weighted TTM earnings denominator. Buybacks use scenario cash amounts consistent with the flexible historical range and TTM USD 2.0059B pace. SBC issuance is the disclosed approximation `annual SBC expense / assumed average share price`; it is not a grant-by-grant treasury-stock model. TTM SBC was USD 0.6891B, while the historical diluted share count declined from 259.9 million in FY2021 to 255.2 million at Q2 FY2026, confirming that actual repurchases broadly offset issuance. All prices are USD per financial share because currency and unit factors are one.

Case / year	Starting shares M	Buyback USD B	Avg price USD	Shares retired M	SBC USD B	SBC issuance M	Ending shares M
Bear 2027	255.200000	1.000	500	2.000000	0.720	1.440000	254.640000
Bear 2028	254.640000	1.000	490	2.040816	0.750	1.530612	254.129796
Bear 2029	254.129796	1.000	480	2.083333	0.780	1.625000	253.671463
Bear 2030	253.671463	1.000	470	2.127660	0.810	1.723404	253.267207
Bear 2031	253.267207	1.000	460	2.173913	0.840	1.826087	252.919381
Base 2027	255.200000	2.000	560	3.571429	0.750	1.339286	252.967857
Base 2028	252.967857	2.000	600	3.333333	0.800	1.333333	250.967857
Base 2029	250.967857	2.000	640	3.125000	0.850	1.328125	249.170982
Base 2030	249.170982	2.000	680	2.941176	0.900	1.323529	247.553335
Base 2031	247.553335	2.000	720	2.777778	0.950	1.319444	246.095002
Bull 2027	255.200000	2.500	600	4.166667	0.780	1.300000	252.333333
Bull 2028	252.333333	2.500	680	3.676471	0.880	1.294118	249.950980
Bull 2029	249.950980	2.500	760	3.289474	0.980	1.289474	247.950980

Case / year	Starting shares M	Buyback USD B	Avg price USD	Shares retired M	SBC USD B	SBC issuance M	Ending shares M
Bull 2030	247.950980	2.500	840	2.976190	1.080	1.285714	246.260504
Bull 2031	246.260504	2.500	920	2.717391	1.180	1.282609	244.825722

The five-year identities hold at full precision. Bear: 255.2 + 8.145103M SBC shares – 10.425722M retired = 252.919381M. Base: 255.2 + 6.643718M – 15.748716M = 246.095002M. Bull: 255.2 + 6.451914M – 16.826192M = 244.825722M. Average repurchase prices are explicit scenario assumptions, not inferred forecasts of market value. No share path is run in ADRs or another unit.

7. Binary P/E 15 test

Required EPS at the quote packet price is USD 541.69 / 15 = USD 36.112667 per listed share. Cushion is `(EPS x 15 – 541.69) / 541.69`. This entry-price gate neither chooses nor constrains the later exit multiple.

Case	EPS at TTM+5y, USD/listed share	EPS x 15	Quote-packet price	Cushion	Pass?
Bear	12.869483	193.042238	541.690000	(64.36)%	FAIL
Base	28.520333	427.804991	541.690000	(21.02)%	FAIL
Bull	42.254116	633.811737	541.690000	17.01%	PASS

P/E 15 gate: FAIL — base cushion (21.02)%. The confident base case controls. Bull clearing the arithmetic does not rescue a base case whose USD 28.520333 EPS is USD 7.592334, or 21.02%, below the USD 36.112667 requirement.

8. Reflexivity and historical reconciliation

The TTM source build is USD 12.5872B revenue and USD 4.7771B statutory operating income. Because the sealed model has one segment, the segment sum is exactly the consolidated amount: 12.5872 / 12.5872 = 100.0000% for revenue and 4.7771 / 4.7771 = 100.0000% for statutory OI. Empty corporate and operating arrays mean no residual or plug is needed. Both are inside the required 2% reflexivity tolerance.

FY2025 provides the independent historical sanity check. Segment revenue USD 12.0013B equals consolidated revenue USD 12.0013B. The sole modeled-segment exact-basis profit USD 4.1733B equals consolidated modeled metric and statutory operating income USD 4.1733B. Below-line interest income USD 0.4776B and other expense USD 0.0077B produce pretax income USD 4.6432B; tax USD 0.6900B produces CODM/statutory net income USD 3.9532B. All five statutory residuals are zero within the packet tolerance.

At TTM, USD 4.7771B OI + USD 0.4764B interest + USD 0.0210B other income = USD 5.2745B pretax; less USD 0.8693B tax = USD 4.4052B CODM/statutory NI. Again, all five sealed residuals are zero. The forward model preserves net income as a separate endpoint and never reclassifies it into operating profit.

9. Latest interim bridge reconciliation

The cumulative interim bridge is triggered and valid. It uses identical January 1-June 30 windows and the formula `FY2025 – H1 FY2025 + H1 FY2026`. Revenue is 12.0013 – 5.7349 + 6.3208 = 12.5872B. OI is 4.1733 – 1.7812 + 2.3850 = 4.7771B. Pretax income is 4.6432 – 2.0134 + 2.6447 = 5.2745B. Net income is 3.9532 – 1.6792 + 2.1312 = 4.4052B. Day-weighted diluted shares are `(257.6x92 + 256.1x92 + 256.3x90 + 255.2x91) / 365 = 256.303M`.

The resulting period is exactly Q3 FY2025 + Q4 FY2025 + Q1 FY2026 + Q2 FY2026. The cumulative FY/H1 calculation and the four standalone quarters are alternative representations of the same non-overlapping TTM; they are not added together. No half-year overlaps a separately added quarter.

10. Base-case sensitivity

The required Segment 2 margin test is not triggered because Vertex has one governed modeled segment and no product-level profit disclosure. To retain the intended margin sensitivity, the table varies the sole segment's exact-basis statutory operating margin by 200 basis points. Revenue CAGR sensitivity shifts the base 8.1227% five-year CAGR by 200 basis points while holding the 43% terminal margin, terminal interest, tax and shares constant. All impacts are versus base EPS USD 28.520333.

Variable	Down case	Down EPS	EPS impact	Up case	Up EPS	EPS impact
Sole segment revenue CAGR	6.1227%; terminal rev 16.9422B	26.145080	(2.375253)	10.1227%; terminal rev 20.3851B	31.077985	2.557652
Segment 2 exact-basis margin	NOT TRIGGERED; one segment	n/a	n/a	NOT TRIGGERED; one segment	n/a	n/a
Sole segment statutory OI margin	41.0%	27.280811	(1.239521)	45.0%	29.759854	1.239521
Terminal diluted shares	258.399752M; +5%	27.162222	(1.358111)	233.790252M; –5%	30.021403	1.501070
Tax rate	21.0%; +300 bps	27.476906	(1.043427)	15.0%; –300 bps	29.563760	1.043427

Revenue cadence is the largest tested driver, followed by share count and exact-basis margin. Even the favorable CAGR sensitivity produces USD 31.08 EPS, still below required EPS of USD 36.11. The binary gate therefore depends on materially stronger revenue/margin execution than this bounded one-variable sensitivity, not merely a modest tax or dilution change.

11. Combined earnings summary

Probabilities are 25% Bear, 55% Base and 20% Bull, reproduced exactly from reviewed B. Base receives the largest weight because current CF and 2026 guidance are resilient, but management and moat both remain YELLOW while CASGEVY/JOURNAVX conversion, povetacicept approval/launch and long-horizon diversification are unresolved. The asymmetric 25% Bear/20% Bull tails reflect launch, pipeline and concentration risks rather than uniform weights.

Case	Revenue USD B	OI USD B	OI margin	NI USD B	EPS USD/listed share	Probability	EPS x 15	Vs USD 541.69
Bear	12.2500	3.7980	31.0%	3.254942	12.869483	25%	193.042238	(64.36)%
Base	18.6000	7.9980	43.0%	7.018711	28.520333	55%	427.804991	(21.02)%
Bull	23.9000	11.4720	48.0%	10.344894	42.254116	20%	633.811737	17.01%
Probability-weighted diagnostic	18.0725	7.6428	n.m.	6.743005	27.354377	100%	410.315652	(24.26)%

The weighted row is a probability-weighted earnings diagnostic, not a fourth coherent operating scenario and not an expected shareholder return. It equals 25% x Bear + 55% x Base + 20% x Bull for every additive field. Terminal value, distributions, exit valuation and expected-wealth IRR remain deliberately uncalculated until VP locks a primary method and multiples.

12. Tie-out checks — 11/11 passed at full precision

- **PASS — Reported-financial and statutory-bridge tie-out.** TTM segment revenue 12.5872 / consolidated revenue 12.5872 = 100.0000%; TTM exact-basis profit 4.7771 + zero corporate + zero operating bridge = statutory OI 4.7771. FY2025 revenue 12.0013 / 12.0013 = 100.0000%; exact-basis profit 4.1733 = statutory OI 4.1733. TTM and FY bridge residuals are all zero. Sources: `data_package.md` Sections 2, 3 and 3a; sealed `statutory_bridge.json`.

- **PASS — NI / shares / listed unit / FX equals EPS.** Bear: 3,254.941560M / 252.919381M x 1 x 1 = USD 12.869483. Base: 7,018.711329M / 246.095002M x 1 x 1 = USD 28.520333. Bull: 10,344.894390M / 244.825722M x 1 x 1 = USD 42.254116. Sources: Sections 5-6 and `quote_packet.json`.

- **PASS — Segment sum at horizon.** One segment means combined/summed revenue equals 12.250/12.250, 18.600/18.600, and 23.900/23.900 = 100.0000% in Bear/Base/Bull. Corporate eliminations are absent. Sources: reviewed B Sections 8 and 10; Sections 2-3 here.

- **PASS — Product-to-segment rollup.** Bear: 11.000 + 0.550 + 0.500 + 0.200 = 12.250B. Base: 14.050 + 1.350 + 1.350 + 1.850 = 18.600B. Bull: 15.800 + 2.300 + 2.800 + 3.000 = 23.900B. Zero diagnostic lines do not alter sums. Residual is zero in each case. Source: reviewed B Sections 8 and 10.

- **PASS — Weighted margin check.** The conditional multi-product profit-margin calculation is not triggered because no product profit metric is disclosed and B explicitly models one consolidated statutory expense stack. The sole segment margin directly reproduces reviewed terminal OI: 31.0% gives 3.7975B, displayed as 3.798B; 43.0% gives 7.998B; 48.0% gives 11.472B. No fabricated product margin exists. Source: reviewed B Section 9.

- **PASS — Share count and security-unit path.** Starting statement shares 255.2M x split factor 1 = quote-basis shares 255.2M; divided by depositary x class factor 1 x 1 = 255.2M listed equivalents. Five-year paths tie exactly: Bear 255.2 + 8.145103 – 10.425722 = 252.919381M; Base 255.2 + 6.643718 – 15.748716 = 246.095002M; Bull 255.2 + 6.451914 – 16.826192 = 244.825722M. Sources: `quote_packet.json`, Section 6, TTM SBC/repurchase anchors in `quant_foundation.md` P6.

- **PASS — Growth plausibility.** Base segment revenue CAGR is 8.1227%, below 1.2 x the disclosed FY2023-FY2025 consolidated CAGR of 10.3% = 12.36%. Launch-product CAGRs are not substituted for the segment test; B gives explicit regulatory, throughput and access constraints for each launch. Source: reviewed B Sections 6 and 8.

- **PASS — Historical arithmetic.** With N exactly 5: 12.5872 x (1 – 0.005405...)^5 = 12.2500B; 12.5872 x (1 + 0.0812267...)^5 = 18.6000B; 12.5872 x (1 + 0.136959...)^5 = 23.9000B. Product endpoints likewise tie to their direct TTM bases or are explicitly launch-from-zero cases. The annual product tables sum to every segment row. Source: reviewed B Section 8.

- **PASS — Recency anchor.** Base first-forward-year revenue 13.390B / TTM 12.5872B – 1 = 6.378%, within 10%. Base first-forward-year OI 5.222B / TTM 4.7771B – 1 = 9.313%, also within 10%. The comparison is June-ending TTM to June-ending forward year; it does not mislabel December FY2026 guidance. Source: reviewed B Sections 8-10 and data package Section 5.

- **PASS — Period and horizon integrity.** FY2025 – H1 FY2025 + H1 FY2026 uses matched January 1-June 30 windows for revenue, OI, pretax, NI and shares. It equals the four non-overlapping quarters Q3 FY2025 through Q2 FY2026. Every terminal CAGR spans 2026-06-30 to 2031-06-30, exactly 5.0 years. No FY2025 anchor or six-year compounding appears. Sources: `quant_foundation.md` P4 and Sections 1, 3, 8 and 9 here.

- **PASS — Valuation, unit bridge, packet hashes and probability arithmetic.** Recomputed quote-packet SHA-256 equals `10ab8065...a5c4`; statutory-bridge SHA-256 equals `e213fc6c...133d`; raw quote evidence equals `a97b6e53...5cf7d`. XNAS common share, price basis, split factor 1, depositary/class factors 1 and USD FX 1 reproduce the governed price and unit. EPS x 15 reproduces 193.042238, 427.804991 and 633.811737. Probabilities sum 25% + 55% + 20% = 100%; weighted EPS is 0.25x12.869483 + 0.55x28.520333 + 0.20x42.254116 = 27.354377. Base cushion `(427.804991 / 541.69) – 1 = –21.0240%` controls the binary FAIL. Sources: validators, packet files and Sections 1, 7 and 11.

13. Synthesis conclusion and monitoring implications

SYNTHESIS CLEARED — 11/11 TIE-OUTS PASSED. The combined model is mechanically coherent, remains on the sealed statutory-operating-income fallback basis, and preserves CODM consolidated net income only as a separate below-line endpoint. No historical or forward reconciliation plug is used. Required Markdown tables in Sections 2, 3, 4, 5, 6, 7, 10 and 11 use valid GitHub-flavored syntax.

The P/E-15 gate nevertheless fails. Base terminal revenue of USD 18.600B and a 43.0% statutory OI margin produce USD 7.998B OI, USD 7.018711B NI and USD 28.520333 EPS. Required EPS is USD 36.112667. The shortfall remains after favorable one-variable sensitivities of reasonable size. Bull clears only through the combined effect of USD 23.900B revenue, a 48.0% margin, a 16% tax rate and a smaller diluted share base; that outcome has only a 20% scenario weight.

What matters now is not a trade conclusion but the later valuation-preflight discipline. VP must lock normalized current-versus-terminal earnings comparability, choose one primary method, enumerate the complete capital-structure perimeter, and independently justify Bear/Base/Bull exit multiples. If P/E controls, it may use the fully reconciled terminal statutory EPS bridge but cannot treat the P/E-15 entry gate as an exit multiple. If EV/NOPAT is considered, the complete lease and senior-claim bridge must first be made source-bound. No return calculation should proceed from S's deliberately unselected method fields.

Appendix CS - Compounder Score

Vertex Pharmaceuticals Incorporated — Compounder Score

Ticker / listing: VRTX / Nasdaq Global Select Market (XNAS) **Analysis date:** 2026-08-30 SGT **Price anchor:** USD 541.69, completed XNAS close on 2026-08-28 **TTM endpoint / exact horizon:** 2026-06-30 to 2031-06-30, exactly 5.0 years **Primary valuation method:** P/E **Valuation preflight:** `CLEARED`; SHA-256 `3fae7b17f4be5aeaa44c76a09802efaa7faedd50018b52b0523ee923cc38bf98` **Authority:** diagnostic security research only. `trade_execution_authorized=false`; `sizing_ceiling_pct=null`.

1. Executive Verdict

The score-implied classification is **Reject**, with a **Compounder Score of 52/100**, comprising **Business Quality 49/80** and **20% Return Underwriting 3/20**. That is not a statement that Vertex is a poor company. The evidence supports a powerful current cystic-fibrosis franchise, excellent balance-sheet resilience, credible cash conversion, and a coherent scientific strategy. The evidence does not support the proposition that those strengths, bought at USD 541.69, can deliver the rubric's 20% annualized return hurdle over the governed five-year horizon.

The frozen P/E bridge is especially revealing because valuation assumptions are not inflated to make the case fail or pass. The independently selected exit P/Es are **15.0x Bear, 22.0x Base and 28.0x Bull**, all below the comparable current P/E of 31.5166x. Yet the resulting gross USD annualized returns are **-18.65% Bear, +2.98% Base and +16.91% Bull**. Probability-weighted terminal shareholder wealth is USD 629.979640 per share, producing a **+3.07% probability-weighted gross USD IRR**. It is calculated as the CAGR of weighted terminal wealth, never as an average of scenario IRRs.

The CIO overlay reaches the same conclusion after conservative costs and FX. Using a live USD/SGD entry anchor of 1.2745, a 30-basis-point entry cost, a 30-basis-point exit cost, zero distributions, and terminal USD/SGD assumptions of 1.15/1.27/1.39, net-SGD IRRs are **-20.40% Bear, +2.79% Base, +18.81% Bull and +3.44% probability-weighted**. Even Bull does not clear 20%. The current portfolio's 5.6-percentage-point healthcare underweight makes the diversification question relevant, but diversification cannot manufacture security return or acceptable downside. CIO actionability is therefore **PASS** at this price, with no ranking, displacement or sizing conclusion.

The central quality limitation is incremental return evidence. Reported five-observation median ROIC is about 22.9%, but a full R&D-capitalized invested-capital series is unavailable. Conservative ROIIC proxies are weak: roughly **-0.6% over three years**, **6.3% organic over five years**, and **4.8% acquisition-inclusive over five years**. These proxies are deliberately imperfect—they include ordinary R&D and capex as reinvestment and exclude an unavailable working-capital-complete schedule—but they correctly prevent CF's mature high margins from being mistaken for proof that Alpine, ViaCyte, CASGEVY, JOURNAVX, renal and future acquisitions have already compounded capital at attractive rates.

2. Data Source Map

The scorer used the verified ER2 chain and did not replace primary-source conclusions with cached warehouse data.

Evidence need	Governed source	Use in score
Price, security units, share count	`quote_packet.json`; `quant_foundation.md` P-Quote	USD 541.69; XNAS common share; 255.2m quote-basis diluted shares
Income statement and statutory bridge	`quant_foundation.md`; `statutory_bridge.json`; 2025 10-K; Q2 2026 10-Q	TTM revenue, operating income, tax, net income and EPS
Balance sheet and liquidity	`quant_foundation.md` P6B; `data_package.md` §8	Cash/securities, funded debt, leases and claim-perimeter limitation
Cash flow, SBC and capital returns	`quant_foundation.md` P4/P6; `data_package.md` §7	FCF conversion, SBC burden, repurchases, zero dividends
Product and forecast economics	`appendix_B_consolidated_company.md`	CF cannibalization discipline, launch cadence, terminal revenue and margins
Management and governance	`appendix_management.md`	Capital allocation, compensation, disclosure and YELLOW gate
Moat, pricing and competition	`appendix_moat.md`	Current CF advantage, 97.5% concentration and YELLOW 2046 durability

Evidence need	Governed source	Use in score
Combined earnings and shares	`appendix_synthesis.md`	Terminal EPS, terminal shares, scenario probabilities and P/E-15 gate
Method, denominators and exit multiples	`valuation_preflight.json`	Controlling P/E method; 15x/22x/28x; no method or multiple changes
Portfolio-fit context	`pulse_summary_codex_gpt55_brief.md`, SHA-256 `66bcf4cd...5009`	Healthcare underweight and diversification context only
USD/SGD entry FX	`raw/pulse-cio-20260830T120326+0800/cs/fmp_usdsgd_quote_cs.json`	Live 1.2745 quote; SHA-256 `1da49026...b0eb`

The preflight was revalidated with the installed semantic validator and evidence-file checks before any return work. It cleared all five foundations, had no blockers, and reproduced the same statutory EPS denominator across current and terminal periods. P/E controls because reconciled statutory diluted EPS is available and positive in all scenarios. EV/NOPAT remains secondary because the complete current-plus-terminal lease and senior-claim perimeter is not sealed. P/B-ROE is unsuitable for this operating biotechnology company and lacks a parent-common-equity roll-forward.

3. Key Financial and Quality Metrics

Metric	Result	Interpretation
TTM revenue	USD 12.5872B	Official FY2025 less H1 2025 plus H1 2026 construction
TTM statutory operating income	USD 4.7771B	37.95% margin on the one-segment exact basis
TTM net income / statutory diluted EPS	USD 4.4052B / USD 17.18747	EPS uses 256.303m day-weighted diluted shares
TTM operating cash flow / FCF	USD 4.2929B / USD 3.7961B	FCF equals OCF less USD 0.4968B capex
TTM CFO / NI; FCF / NI	97.5%; 86.2%	Current conversion is credible
Aggregate FY2021-FY2025 FCF / NOPAT	102.8%	Five-observation conversion survives FY2024 acquisition distortion
Five-observation median reported ROIC	22.9%	Useful, but capped because full R&D capitalization is unavailable
FY2021-FY2025 revenue / NOPAT / FCF CAGR	12.2%; 10.7%; 7.3%	Four-year CAGR across five fiscal-year observations
FY2021-FY2025 diluted-share CAGR	-0.18%	Buybacks broadly offset employee issuance
TTM SBC / revenue; SBC / FCF	5.47%; 18.15%	Real economic cost; not a trivial adjustment
Cash and marketable securities	USD 13.6415B	At 2026-06-30; funded debt was zero
FY2025 net debt / EBITDA	-2.81x	Strong balance sheet; leases remain separate
TTM FCF yield	2.75%	USD 3.7961B divided by USD 138.239B market cap
TTM net buyback yield	1.45%	USD 2.0059B repurchases over governed market cap
Dividend yield	0.00%	No historical or modeled common dividend

The five-year operating record is good but uneven. Revenue rose from USD 7.574B in FY2021 to USD 12.001B in FY2025. Statutory operating margin was 36.7%, 48.2%, 38.8%, -2.1% and 34.8% across FY2021-FY2025; FY2024 includes the Alpine acquired-IPR&D event and cannot be treated as a normal margin year. TTM margin recovered to 38.0%. The series demonstrates a profitable CF engine funding diversification, but not stable company-wide incremental returns independent of transaction timing.

4. Rubric Scorecard

Category	Score	Maximum	Evidence-based conclusion
Incremental returns on capital	12	25	Reported ROIC and cash conversion are sound; ROIIC proxies and R&D-capitalized evidence are weak
Reinvestment runway	13	20	Large disease opportunities exist, but non-CF scaling and acquired-asset returns are not proven
Durability of moat	11	15	CF moat is strong through the late 2030s; transferable company-wide moat is YELLOW

Category	Score	Maximum	Evidence-based conclusion
Accounting and financial quality	8	10	Official statements reconcile, cash supports earnings and balance sheet is strong; SBC is material
Capital allocation	5	10	Scientific coherence and flexible buybacks help; Alpine/Crinetics returns and compensation alignment are unfinished
Price and 20% underwriting	3	20	Independently justified de-rating is conservative, but every scenario misses the return/downside thresholds
Total	**52**	**100**	**Reject under this diagnostic rubric**

Within Category 1, normalized/reporting-basis ROIC receives credit, but ROIIC receives none because the measured three- and five-year proxies are below the rubric's 8% floor. Unit economics and cash conversion receive substantial credit. The score is capped because mature CF profit can make consolidated ROIC look excellent even while incremental acquisition and diversification spend has not yet earned a commercial return.

Within Category 2, Vertex receives credit for large markets in pain, renal, gene editing and diabetes; demonstrated CF serial innovation; and a coherent expansion playbook. It does not receive full credit because Base requires USD 4.55B of non-CF revenue by 2031 while current non-CF revenue is only about 2.5% of TTM sales. Growth is possible, but it must be purchased with sustained R&D, manufacturing and commercial infrastructure.

Within Category 6, three points recognize that every frozen exit P/E is independently supported and below today's comparable 31.5166x multiple. The score awards no points for the base hurdle, bear acceptability, reverse-return feasibility, price not reflecting perfection, or distributions. That is appropriately harsh: valuation discipline should not be conflated with return sufficiency.

5. ROIIC and Reinvestment Analysis

The scorer uses conservative proxies because Vertex does not publish product invested capital, product operating profit, or a working-capital-complete reinvestment ledger. Statutory NOPAT is operating income taxed at a normalized 21%. FY2020 NOPAT is approximately USD 2.256B and FY2025 NOPAT is USD 3.297B. Cumulative FY2021-FY2025 ordinary R&D plus capex is approximately USD 16.56B. The resulting organic proxy is `(3.297 - 2.256) / 16.56 = 6.3%`. Adding ViaCyte and Alpine cash consideration to the denominator lowers acquisition-inclusive ROIIC to about **4.8%**.

The three-year proxy is worse. FY2022 NOPAT was USD 3.403B versus USD 3.297B in FY2025. Dividing that negative increment by FY2023-FY2025 ordinary R&D, capex and Alpine consideration yields about **-0.6%**. This does not prove future ROIIC will remain poor; it shows that current financial evidence has not yet converted recent reinvestment into higher statutory NOPAT. Povetacicept approval and commercialization could change the numerator. It cannot be credited before it happens.

R&D capitalization would improve period matching but would not automatically improve the economic result. Ordinary R&D rose from USD 1.938B in FY2021 to USD 3.910B in FY2025, while acquired IPR&D included USD 4.628B in FY2024. Treating these flows as assets would increase invested capital and smooth expenses, reducing the apparent volatility of operating profit. It would still leave the core question: do incremental non-CF profits exceed the cumulative scientific and acquisition cost? Current disclosures cannot answer that with high confidence.

Cash conversion is the counterweight. Aggregate FY2021-FY2025 FCF was approximately USD 12.075B versus approximately USD 11.741B of normalized NOPAT, or 102.8%. TTM CFO and FCF were 97.5% and 86.2% of net income. The business is not merely reporting paper earnings. The score therefore treats ROIIC as weak/insufficient rather than alleging accounting fiction.

6. Runway Analysis

The runway is real but increasingly diversified away from the economics that made Vertex exceptional. TTM CF revenue was USD 12.2718B, approximately 97.5% of total. Base reaches USD 14.05B CF revenue by 2031, with ALYFTREK deliberately cannibalizing TRIKAFTA/KAFTRIO. That modeling discipline matters: ALYFTREK switching changes brand mix and potentially royalties; it does not create a new patient.

Base also assumes CASGEVY and JOURNAVX each reach USD 1.35B and povetacicept reaches USD 1.85B by 2031. These are plausible but unproved. CASGEVY has an integrated manufacturing and treatment-center barrier, yet its

conditioning burden, throughput and 60/40 economics with CRISPR constrain returns. JOURNAVX has broad coverage and prescription momentum, but access restrictions and gross-to-net conversion remain unresolved. Povetacicept has strong evidence and a 2026-11-30 PDUFA date, but it faces an approved BAFF/APRIL competitor.

The forecast conservatively assigns zero revenue to earlier pipeline assets and unclosed Crinetics. That avoids fabricated optionality, but it also means the price cannot be defended by casually adding pipeline values outside the statutory EPS bridge. A future closing changes the governed perimeter and requires a rerun.

7. Moat Analysis

Vertex can explain its current moat in one paragraph: deep CFTR biology, serial combination design, genotype-linked evidence, specialist adoption, payer access and global commercialization allow it to retain patients while replacing its own products. This is more durable than a single patent. It is visible in high gross margins, total CF growth and ALYFTREK migration. Pricing power is supported by higher realized U.S. net prices, although exact price/volume decomposition is not disclosed.

The company-wide moat is weaker. TRIKAFTA protection is projected through 2037 and ALYFTREK through 2039; JOURNAVX reaches 2040. All named major protection dates end before 2046. CASGEVY's manufacturing pathway is defensible, but easier conditioning or in-vivo editing could bypass it. JOURNAVX has mechanism and IP but not yet durable protocol lock-in. Renal differentiation is precommercial. Accordingly, both moat and 2046 durability remain **YELLOW**.

8. Accounting and Capital Allocation Analysis

Accounting quality is strong. Official filings control material discrepancies in provider data; the TTM statutory bridge ties revenue, operating income, pretax income, tax and net income with zero residual. FY2024's Alpine charge and FY2025 VX-264 impairment are not hidden. SBC is treated as a real operating cost and appears once in statutory operating income; future issuance appears once in the share path. Buybacks affect shares and cash deployment, not earnings. Under P/E, terminal cash, debt and leases are display-only diagnostics and are not added after EPS times P/E.

Capital allocation is mixed. Management has a coherent scientific strategy, good guidance discipline and evidence of stopping failed programs. Buybacks have modestly reduced diluted shares. However, Alpine's roughly USD 4.958B cash cost has not yet produced a commercial return, ViaCyte remains precommercial, and signed Crinetics adds another test. Compensation uses revenue and clinical milestones but lacks explicit ROIC, FCF-per-share or acquisition-return measures. That justifies the management YELLOW gate and a 5/10 capital-allocation score.

9. 20% Return Underwriting

The controlling method is P/E in every scenario, probability weighting, reverse-return diagnostic and net-SGD overlay. Terminal shareholder wealth equals statutory diluted EPS times the frozen exit P/E plus zero distributions. Terminal cash is shown only diagnostically: USD 12.746B/19.415B/24.933B Bear/Base/Bull; funded debt is zero in the standalone governed perimeter; complete terminal leases are unavailable. None is added to P/E-derived share value.

Return measure	Bear 25%	Base 55%	Bull 20%	Probability-weighted
Terminal statutory diluted EPS	USD 12.869483	USD 28.520333	USD 42.254116	Not a fourth scenario
Exit P/E	15.0x	22.0x	28.0x	Scenario weighted
Terminal equity value / share	USD 193.042245	USD 627.447326	USD 1,183.115248	USD 629.979640 expected wealth
Cumulative distributions / share	USD 0.00	USD 0.00	USD 0.00	USD 0.00
Gross USD annualized IRR	**-18.65%**	**+2.98%**	**+16.91%**	**+3.07%**
Net-SGD annualized IRR	**-20.40%**	**+2.79%**	**+18.81%**	**+3.44%**

The 20% reverse-return requirement is USD 541.69 x 1.20^5 = **USD 1,347.898061** terminal shareholder wealth. At the Base 22.0x exit P/E and zero distributions, required terminal EPS is **USD 61.268094**, versus governed Base EPS of USD 28.520333. Required EPS CAGR from current statutory EPS is approximately **28.94%**, versus the governed Base EPS CAGR of **10.66%**. The Base max-buy-price diagnostic for a 20% gross return is **USD 252.157008**. This is not a recommendation or order price; it is the algebraic price consistent with the frozen Base bridge and hurdle.

Net-SGD uses the same P/E wealth. Entry USD/SGD is 1.2745 from a live FMP forex quote timestamped 2026-08-30T04:21:17Z. Conservative terminal USD/SGD assumptions are 1.15 Bear, 1.27 Base and 1.39 Bull. A 0.30% all-in

entry friction is applied once to USD 541.69 converted at entry FX, producing SGD 692.455057 cost basis. A 0.30% exit friction is applied once to terminal value. U.S. dividend withholding is 30% only on actual distributions; distributions are explicitly zero, so withholding is zero. Probability-weighted net terminal wealth is SGD 820.209609 per share and its five-year CAGR from the entry cost basis is 3.44%.

Bear-case operating and return bridge

Bear case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 12.5872B	USD 12.2500B	-0.54%	CF saturation, access pressure and weak launch conversion offset limited non-CF growth
Operating margin	37.95%	31.00%	-6.95 pp	Mix/partner economics, AIPR&D and failed operating leverage
Operating earnings	USD 4.7771B	USD 3.7980B	-4.48%	Statutory operating income on the one-segment governed basis
Diluted share count	255.200m	252.919m	-0.18%	USD 1B annual buybacks broadly offset SBC issuance
EPS	USD 17.18747	USD 12.869483	-5.62%	Statutory net income divided by terminal diluted shares
Valuation denominator	TTM statutory EPS	Terminal statutory EPS	Comparable	Same listed common share, USD currency and statutory basis
Valuation	31.5166x	15.0x	-16.52x	Near peer floor for declining earnings and CF concentration
Share value	USD 541.69	USD 193.042245	EPS x P/E	No terminal net cash/debt addition under P/E
Annual dividend	USD 0.00	USD 0.00	0.00%	Zero-distribution diagnostic is consistent with history
Dividend yield	0.00%	0.00%	0.00 pp	No distribution
Five-year dividends	-	USD 0.00	cumulative	No distribution
Total ending value	USD 541.69	USD 193.042245	**-18.65% gross USD IRR**	Terminal share value plus zero distributions

Base-case operating and return bridge

Base case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 12.5872B	USD 18.6000B	8.12%	CF grows slowly while CASGEVY, JOURNAVX and povetacicept reach USD 4.55B
Operating margin	37.95%	43.00%	+5.05 pp	ALYFTREK royalty benefit and launch/R&D scale absorption
Operating earnings	USD 4.7771B	USD 7.9980B	10.86%	Statutory operating income on the one-segment governed basis
Diluted share count	255.200m	246.095m	-0.72%	USD 2B annual buybacks exceed modeled SBC issuance
EPS	USD 17.18747	USD 28.520333	10.66%	Statutory net income divided by terminal diluted shares
Valuation denominator	TTM statutory EPS	Terminal statutory EPS	Comparable	The impairment rolled out; routine AIPR&D is retained at both endpoints
Valuation	31.5166x	22.0x	-9.52x	Below replayed peer median and near Vertex's comparable historical low
Share value	USD 541.69	USD 627.447326	EPS x P/E	No terminal net cash/debt addition under P/E
Annual dividend	USD 0.00	USD 0.00	0.00%	Zero-distribution diagnostic
Dividend yield	0.00%	0.00%	0.00 pp	No distribution
Five-year dividends	-	USD 0.00	cumulative	No distribution

Base case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Total ending value	USD 541.69	USD 627.447326	**+2.98% gross USD IRR**	Terminal share value plus zero distributions

Bull-case operating and return bridge

Bull case	Start (2026-06-30)	Horizon (2031-06-30)	CAGR / change	Justification
Revenue	USD 12.5872B	USD 23.9000B	13.70%	CF and all three major non-CF launches outperform while earlier pipeline stays zero
Operating margin	37.95%	48.00%	+10.05 pp	Mix, commercial scale and R&D absorption all outperform
Operating earnings	USD 4.7771B	USD 11.4720B	19.16%	Statutory operating income on the one-segment governed basis
Diluted share count	255.200m	244.826m	-0.83%	USD 2.5B annual buybacks exceed modeled issuance
EPS	USD 17.18747	USD 42.254116	19.71%	Statutory net income divided by terminal diluted shares
Valuation denominator	TTM statutory EPS	Terminal statutory EPS	Comparable	Same current and terminal perimeter
Valuation	31.5166x	28.0x	-3.52x	Within Vertex history, below current P/E and below high-growth peer ARGX
Share value	USD 541.69	USD 1,183.115248	EPS x P/E	No terminal net cash/debt addition under P/E
Annual dividend	USD 0.00	USD 0.00	0.00%	Zero-distribution diagnostic
Dividend yield	0.00%	0.00%	0.00 pp	No distribution
Five-year dividends	-	USD 0.00	cumulative	No distribution
Total ending value	USD 541.69	USD 1,183.115248	**+16.91% gross USD IRR**	Terminal share value plus zero distributions

10. Hard Veto Checklist

Test	Status	Conclusion
ROIIC below cost of capital without credible improvement path	Watch	Measured proxies are weak; povetacicept and launches provide a path, not proof
ROIC is an artificially tiny-capital artifact	Watch	R&D expensing and acquisition accounting distort capital; score is capped
Growth requires persistent external financing	Pass	Net cash and strong FCF fund the standalone program
Material share growth without per-share value	Pass	Diluted shares declined modestly; SBC remains a real cost
Large acquisitions without disclosed returns	Watch	Alpine and signed Crinetics are load-bearing capital-allocation tests
Structural FCF lag versus earnings	Pass	Aggregate five-observation FCF conversion is about 103% of NOPAT
Concentration/regulation can permanently impair equity	Watch	97.5% CF concentration and patent/competition risk are material
20% case requires multiple expansion	Pass	Every exit P/E is below the comparable current P/E
Flawless execution needed to justify price	**Fail**	Base and PW returns are low; even Bull misses 20%
Moat cannot be explained clearly	Pass	CF moat is coherent; transfer beyond CF is the uncertainty
Accounting/governance impairs trust	Pass	No restatement, material weakness or governance misconduct identified
Balance sheet can wipe out equity	Pass	No funded debt and substantial cash/securities provide resilience

11. Final Decision

The evidence supports a high-quality current franchise, not an attractive 20% return setup at USD 541.69. The most important debate is not whether CF is strong; it is whether non-CF profits and post-2039 renewal can justify today's capitalization after counting R&D, acquisitions, SBC and de-rating. The governed answer is no. Base creates respectable EPS growth but only a 2.98% gross USD and 2.79% net-SGD annualized return because the current price already capitalizes much of the quality. Bear exposes 18.65% annualized USD value destruction. Bull is economically impressive and still produces only 16.91% gross USD and 18.81% net SGD.

The score-implied classification is therefore **Reject**. The CIO status is **PASS**, meaning no actionability at the governed price, not an assertion that the company should be ignored forever. A lower price, demonstrably higher acquisition-inclusive ROIIC, or evidence that non-CF launches are producing durable profit could change the underwriting. No position size, ranking, displacement or trade is authorized here.

Compounder Score note: **52/100 — meaningful CF franchise quality is overwhelmed by weak acquisition-inclusive ROIIC evidence, concentration, and a return bridge that misses 20% even in Bull.**

Business Quality Score note: **49/80 — CF economics, cash conversion and balance-sheet strength are real, but transferable moat, acquisition returns and measured incremental returns are not yet proven.**

20% Return UW Score note: **3/20 — independently justified exit P/Es all de-rate from today's comparable P/E, yet Base gross IRR is 2.98%, Bear is -18.65%, Bull is 16.91%, and probability-weighted gross IRR is 3.07%.**

12. Machine-Readable JSON

The structured artifact is `C:\Users\Admin\OneDrive\GPT\ER 2.0\Vertex Pharmaceuticals\compounder_score.json`. It preserves full-precision scenario and probability-weighted gross USD returns, full-precision net-SGD returns, the exact valuation-preflight hash, all PE bridge inputs, display-only terminal balance-sheet diagnostics, reverse-return algebra, score denominators, portfolio-fit constraints, and the immutable `trade_execution_authorized=false` and `sizing_ceiling_pct=null` boundaries.

Appendix CSA - Scoring Audit

Vertex Pharmaceuticals Incorporated — Independent Scoring and Security-Return Audit

Ticker: VRTX **Audit date:** 2026-08-30 **Audit status:** CLEARED for the next governed stage; formal red-team review remains downstream **Authority boundary:** diagnostic research only; `trade_execution_authorized=false`, no ranking or sizing authority, and `sizing_ceiling_pct=null`

1. Original vs Audited Scores

The original score is fair and is preserved. This is not a rubber stamp: the valuation gate, all three P/E bridges, the probability-weighted wealth calculation, the net-SGD overlay, the reverse-return diagnostic, and every category were replayed. The score remains low because current security returns are weak and measured incremental returns are not yet persuasive, not because the audit substituted harsher assumptions.

Item	Original	Audited	Notes
Business Quality Score / 80	49	49	Supported, but well below the 65/80 threshold
Valuation / 20% Return UW Score / 20	3	3	Only valuation-discipline credit survives; return hurdles fail
Total Score / 100	52	52	Arithmetic ties exactly: 49 + 3 = 52
Classification	Reject	Reject	Score is below 70 and hard-veto 9 fails

The audited classification is **Reject under the CompounderScorer diagnostic rubric**. CIO actionability is separately **PASS** at USD 541.69. Those labels are not contradictory: “Reject” is the diagnostic score-implied class, while “PASS” means no actionable portfolio case at the governed price. Neither label authorizes a transaction.

2. Score Reductions and Reasons

No category-level point reduction is required. The original scorer had already applied the principal caps: ROIIC below 8% received no 1B credit; acquisition-inclusive ROIIC was calculated; product-level economics were not invented; the 20% return section awarded no credit for Base return, Bear acceptability, reverse-return feasibility, price perfection, or cash distributions.

The original Markdown disclosed category totals rather than an original point-by-point subscore allocation. That is a transparency gap, so the following is the auditor's explicit reconstruction. These audited subscores sum exactly to the published category totals and expose every rubric line.

Subscore	Audited	Evidence status	Audit conclusion
1A Normalized ROIC	4/5	Partly supported	Five-observation median reported ROIC is 22.9%; full R&D capitalization is unavailable
1B ROIIC level	0/8	Supported	3-year -0.64%, 5-year organic 6.29%, acquisition-inclusive 4.77%; all below 8% floor
1C ROIIC trend	1/3	Partly supported	Positive five-year proxy is offset by a negative three-year proxy
1D Unit economics	2/3	Partly supported	CF economics are strong, but product operating profit and product cash flow are not disclosed
1E Cash conversion	3/3	Supported	FY2021-FY2025 FCF/NOPAT is 102.84%; TTM FCF/net income is 86.17%
1F ROIC not an artifact	2/3	Partly supported	Statutory bridge is clean, but R&D expensing and acquisition accounting distort invested capital
Category 1	**12/25**	**Supported**	**Weak measured incremental returns appropriately cap the category**

Subscore	Audited	Evidence status	Audit conclusion
2A Market opportunity	4/5	Partly supported	Pain, renal, gene-editing and diabetes opportunities are large but several are precommercial
2B Reinvestment at scale	2/5	Partly supported	CF serial innovation is proven; non-CF commercial returns are not
2C Organic growth	3/4	Supported	Base growth has a coherent product bridge but requires USD 4.55B of non-CF revenue
2D Repeatable expansion playbook	2/3	Partly supported	CF repeatability is strong; cross-disease repeatability is not established
2E Market structure	1/2	Partly supported	Specialist and payer infrastructure help, while competitors and access constrain launches
2F Growth without ROIC collapse	1/1	Partly supported	Forecast can grow, but acquisition-inclusive ROIIC remains unproven
Category 2	**13/20**	**Supported**	**Runway exists but its returns remain uncertain**
3A Source of advantage	4/4	Supported	CFTR biology, serial design, evidence, access and commercialization are source-bound
3B Pricing power	2/3	Partly supported	Higher realized U.S. net price is cited; exact price/volume decomposition is unavailable
3C Competitive evidence	2/3	Partly supported	CF leadership is strong; non-CF competitors and launch economics remain live risks
3D Customer stickiness	1/2	Partly supported	CF stickiness is high; newer products have not built comparable protocol lock-in
3E Stress resilience	1/2	Partly supported	Balance sheet and CF cash generation are resilient, but diversification has not been stress-tested
3F Disruption risk	1/1	Partly supported	Near-term CF risk is contained, but all named protection dates end before 2046
Category 3	**11/15**	**Supported**	**CF moat is strong; company-wide moat and 2046 durability remain YELLOW**
4A Earnings quality	1/2	Partly supported	Official statements reconcile, although event-heavy acquired IPR&D causes volatility
4B Cash supports earnings	2/2	Supported	Multi-year and TTM cash-conversion tests pass
4C SBC and dilution	1/2	Supported	SBC is counted as a cost and dilution modeled once; 5.47% of revenue remains material
4D Balance sheet	2/2	Supported	No funded debt and USD 13.6415B cash/securities at 2026-06-30
4E Disclosure	1/1	Supported	Primary-source discrepancies and true non-disclosures are explicitly identified
4F Governance/accounting flags	1/1	Supported	No accounting red flag identified; management incentives are assessed separately
Category 4	**8/10**	**Supported**	**Good accounting and financial quality, with real SBC and event volatility**
5A Reinvestment priority	1/2	Partly supported	Scientific strategy is coherent but economic outcomes remain incomplete
5B Acquisition discipline	0/2	Supported	Alpine, ViaCyte and signed Crinetics have not established acquisition returns
5C Buybacks	1/2	Partly supported	Shares declined modestly, but price-sensitive discipline is not proven

Subscore	Audited	Evidence status	Audit conclusion
5D Incentives	1/2	Partly supported	Performance compensation exists without explicit ROIC, FCF/share or acquisition-return metrics
5E Owner mentality	1/1	Partly supported	Candor and stop decisions help; CEO direct ownership is modest
5F Past decisions	1/1	Partly supported	CF stewardship is favorable, while external-innovation outcomes are unfinished
Category 5	**5/10**	**Supported**	**Management gate remains YELLOW**
6A Base IRR at least 20%	0/6	Supported	Base gross USD IRR is 2.98%
6B Conservative exit multiple	3/4	Supported	15x/22x/28x are independently anchored and all below comparable current 31.5166x; 4/4 is barred because the hurdle does not clear
6C Acceptable Bear	0/3	Supported	Bear gross USD IRR is -18.65% and net-SGD IRR is -20.40%
6D Reverse-return hurdle	0/3	Supported	Required Base terminal EPS is USD 61.268094 versus governed USD 28.520333
6E Price does not imply perfection	0/2	Supported	Low Base and weighted returns show the price capitalizes too much success
6F Cash returns	0/2	Supported	Zero-distribution diagnostic; buybacks affect shares rather than separate distributions
Category 6	**3/20**	**Supported**	**Valuation discipline cannot rescue inadequate security returns**

3. Unsupported Claims

No scored claim was found to depend on fabricated evidence. Three claims require explicit limits. First, the 22.9% ROIC series is a reported-basis diagnostic, not a complete R&D-capitalized economic return series. Second, product-level ROIIC cannot be measured because Vertex does not disclose product operating profit, product cash flow, or product invested capital. Third, current net cash is a resilience observation, not an increment to P/E-derived equity value.

The evidence does not support calling Vertex a proven cross-disease compounder. Approximately 97.5% of TTM revenue remains CF, the major non-CF products are early in their commercial lives, and the Alpine purchase has not yet produced a realized commercial return. The score correctly treats pipeline opportunity as possibility rather than current value.

4. Calculation Errors

No material calculation error was found. The preflight validator passed with evidence-file checking, and SHA-256 exactly matched `3fae7b17f4be5aeaa44c76a09802efaa7faedd50018b52b0523ee923cc38bf98`. The CS Markdown and JSON hashes also exactly matched the controlled dispatch hashes.

Independent P/E and gross-USD replay

Primary valuation method is **P/E** in Bear, Base, Bull, probability weighting, reverse-return diagnostics, and net-SGD. The exact horizon is 2026-06-30 to 2031-06-30, or 5.0 years. Price is USD 541.69 as of 2026-08-28. Distributions are zero.

Scenario	Probability	Terminal EPS	Exit P/E	Terminal value/share	Diluted shares	Terminal equity value	Gross USD IRR
Bear	25%	USD 12.869483	15.0x	USD 193.042245	252.919381m	USD 48,824.125112m	-18.6457382793%
Base	55%	USD 28.520333	22.0x	USD 627.447326	246.095002m	USD 154,411.650947m	+2.9829411428%
Bull	20%	USD 42.254116	28.0x	USD 1,183.115248	244.825722m	USD 289,657.044801m	+16.9109653791%

Each per-share value equals EPS multiplied by the locked P/E. Each terminal equity value equals per-share value multiplied by diluted shares. Cash of USD 12.745704B/19.415340B/24.933176B and zero funded debt are display-only Bear/Base/Bull diagnostics. Lease liabilities are unavailable on a complete terminal perimeter. None is added or subtracted after EPS times

P/E. The double-count check passes.

Probability-weighted terminal USD wealth is `25% x 193.042245 + 55% x 627.447326 + 20% x 1,183.115248 = USD 629.97964015`. Its five-year CAGR from USD 541.69 is **3.0659330256%**. The probability-weighted arithmetic average of scenario IRRs would be only **0.3613761345%**; that prohibited result was not used.

Independent net-SGD replay

Entry USD/SGD is 1.2745. Entry and exit costs are 0.30% each, applied once. Entry cost basis is `541.69 x 1.2745 x 1.003 = SGD 692.455056715`. With zero distributions, U.S. dividend withholding is exactly zero.

Scenario	Terminal USD/SGD	Net terminal wealth/share	Net-SGD IRR
Bear	1.15	SGD 221.332586005	**-20.40%**
Base	1.27	SGD 794.467529708	**+2.79%**
Bull	1.39	SGD 1,639.596604136	**+18.81%**
Probability-weighted wealth CAGR	Scenario-specific	SGD 820.209608668	**+3.44%**

The net overlay applies FX and exit friction to the same P/E-derived terminal wealth. Probability-weighted net-SGD return is the CAGR of weighted terminal net wealth, not an average of scenario IRRs. Exact replayed decimals are Bear -0.20396758397493364, Base 0.027866974147706447, Bull 0.18814401259166491, and weighted 0.03444320771530318.

Exit-multiple economic coherence

Current statutory diluted EPS is USD 17.1874695185 and current comparable P/E is 31.5165649846x. The Q1 FY2025 USD 379.0m impairment has rolled out; routine TTM AIPR&D is retained consistently with terminal allowances, so the current and terminal statutory EPS denominators are comparable. Bear 15.0x is anchored near BMY's replayed positive P/E floor; Base 22.0x is just below the replayed peer median and near Vertex's comparable historical low; Bull 28.0x is within Vertex's positive-year historical range and below current P/E and high-growth ARGX. No raw non-comparable multiple was used as a cap, and the selections preceded return scoring.

The excessive-optimism challenge passes because even Bull uses 28.0x, below the current 31.5166x, while requiring the forecasted earnings rather than unsourced pipeline value. The excessive-bearishness challenge passes because Bear 15.0x remains near the live positive peer floor and values a going concern rather than manufacturing zero equity. Formal RT is still pending, so its status is not pre-empted by this audit.

5. Missing Data

The most important missing evidence is a product-level profit and invested-capital ledger. A complete R&D-capitalized five-year invested-capital series and working-capital-complete reinvestment series are also unavailable. These gaps constrain ROIIC confidence and explain why Category 1 is only 12/25. The complete terminal lease and senior-claim perimeter is not sealed, which appropriately keeps EV/NOPAT secondary. The signed Crinetics transaction was unclosed at the cutoff, so no target economics, financing, purchase accounting, or synergy assumption enters the standalone model; closing requires an upstream rerun.

At scoring presentation level, original subcategory point allocations were not separately published. The independent allocation above repairs audit visibility without changing the original category totals or upstream assumptions.

6. Hard-Veto and Threshold Test Audit

All diagnostic thresholds were replayed. Total score 52 is below 80; Business Quality 49 is below 65; Return Underwriting 3 is below 15; Category 1 plus Category 2 equals 25, below 35; Base gross IRR is below 20%; Bear is far below 8%-10%; and hard-veto 9 fails because even Bull misses 20%. The no-expansion test passes because all three exit P/Es are below the comparable current P/E. This passing valuation-discipline test does not override the failed return tests.

CIO actionability **PASS** is confirmed. Base and weighted net-SGD returns are far below 8%, Bear downside is severe, and Bull remains below 20%. The portfolio's healthcare underweight may make VRTX relevant to monitor, but portfolio context cannot manufacture a security return. `sizing_ceiling_pct=null`, `approval_required=true`, and `trade_execution_authorized=false` remain mandatory.

7. Final 20% Hurdle Pass/Fail

Fail. Required five-year terminal wealth is USD 1,347.8980608 per share. At the locked Base 22.0x P/E and zero distributions, required EPS is USD 61.26809367, versus governed Base EPS of USD 28.520333. The governed Base EPS CAGR of 10.6595% is far below the 28.9450% CAGR required from current statutory EPS. Maximum buy price for a 20% gross Base return is a diagnostic USD 252.15700794, not an order or recommendation.

8. Dream Business / Dream Investment Classification

Neither. Vertex owns a dream-like CF franchise, but the consolidated company does not yet clear the dream-business standard because cross-disease moat durability and acquisition-inclusive ROIIC are unproven. It is not a dream investment at the governed price because Base and probability-weighted returns are approximately 3%, with severe Bear downside. The single biggest reason is that the price capitalizes quality faster than the governed earnings bridge creates shareholder wealth.

9. Stage 7 Scorecard Notes

- **Compounder Score note:** 52/100 — a powerful CF franchise is offset by weak measured incremental returns, concentration, and inadequate security returns.
- **Business Quality Score note:** 49/80 — cash conversion and balance-sheet resilience are real; transferable moat and acquisition returns remain unproven.
- **20% Return UW Score note:** 3/20 — independently justified de-rating still produces only 2.98% Base and 3.07% weighted gross USD returns.

10. Auditor JSON

The controlling structured audit is `C:\Users\Admin\OneDrive\GPT\ER 2.0\Vertex Pharmaceuticals\compounder_score_audit.json`. It preserves full-precision gross USD and net-SGD returns, explicit percentage fields, audited scores, source hashes, the frozen P/E method, and the immutable no-trade and no-sizing boundaries.

Appendix RT - Red Team

Vertex Pharmaceuticals Incorporated — Independent Red Team

Ticker: VRTX **As-of date:** 2026-08-30 **Governed return horizon:** 2026-06-30 to 2031-06-30, exactly 5.0 years **Authority boundary:** Research only. No trade, broker, portfolio mutation, outbound message, ranking, sizing, or BUY-queue authority. `trade_execution_authorized=false`; `sizing_ceiling_pct=null`.

Audit-perimeter check before challenge

The red team reproduced the sealed perimeter before attacking it. `valuation_preflight.json` hashes to `3fae7b17f4be5aeaa44c76a09802efaa7faedd50018b52b0523ee923cc38bf98`, exactly matching the dispatch. `compounder_score_audit.json` hashes to `6b3f94cea585ef7fc609e491ca399a2de56d979c2606f5009fc22d6a4091b89d`, also an exact match. CS and CSA used the locked P/E method, USD 541.69 price, 25%/55%/20% probabilities, 15x/22x/28x exits, zero distributions, and terminal statutory diluted EPS of USD 12.869483/USD 28.520333/USD 42.254116. The audited terminal values are USD 193.042245/USD 627.447326/USD 1,183.115248 per share. Gross USD IRRs replay to -18.645738%/2.982941%/16.910965%; probability-weighted terminal wealth is USD 629.97964015 per share and its CAGR is 3.065933%. The probability-weighted return is correctly calculated from weighted wealth, not by averaging IRRs.

Net-SGD arithmetic also replays: -20.396758%/2.786697%/18.814401%, with a weighted-wealth CAGR of 3.444321%. The entry USD/SGD rate is 1.2745, entry and exit costs are 0.30% each, and scenario terminal USD/SGD rates are 1.15/1.27/1.39. There is no dividend and therefore no withholding. No cash or debt is added after EPS times P/E. This is an economically coherent P/E bridge, not a spliced enterprise-value model.

1. The most fragile assumption

The most fragile assumption is the **USD 4.55 billion of 2031 non-CF Base revenue**, specifically USD 1.35 billion each from CASGEVY and JOURNAVX plus USD 1.85 billion of probability/timing-adjusted povetacicept revenue. It is not one launch assumption; it is three different adoption problems succeeding at the same time. CASGEVY must convert initiations into collections, conditioning and recognized infusions. JOURNAVX must convert covered lives and prescriptions into repeat paid revenue despite restrictions, hospital budgets, generic alternatives and undisclosed gross-to-net. Povetacicept must win approval, establish differentiation against an approved same-pathway competitor, secure payer sequencing and scale from zero. Base gives 55% weight to a full-company outcome in which all three contribute materially while CF also grows.

The historical gap is severe. TTM CASGEVY plus JOURNAVX revenue is only USD 315.4 million, about 2.5% of USD 12.5872 billion total revenue. Their combined Base terminal revenue is USD 2.70 billion, an 8.6-fold increase, before counting USD 1.85 billion from a drug that was still pre-approval at the cutoff. Quarterly growth rates are optically huge because the bases are tiny: Q2 FY2026 CASGEVY was USD 76.4 million and JOURNAVX USD 49.6 million. These values prove launches exist, not that paid adoption has reached the industrial scale embedded in 2031.

Stage 5 gives a direct sensitivity. Cutting the consolidated Base revenue CAGR from 8.1227% to 6.1227% lowers terminal revenue from USD 18.600 billion to USD 16.9422 billion and EPS from USD 28.520333 to USD 26.145080, a USD 2.375253 or 8.3% decline. At the locked 22x P/E, terminal wealth falls from USD 627.447326 to USD 575.191760 and gross IRR from 2.98% to 1.21%. That does not create a favorable investment; it demonstrates that even a modest launch shortfall consumes most of an already thin Base return.

2. The most-likely-to-be-optimistic Stage 5 number

The most-likely-to-be-optimistic Stage 5 number is the **43.0% Base statutory operating margin in 2031**. The TTM margin is 37.95%. Reaching 43% while launching gene therapy, pain and renal products requires R&D to decline from 32.6% of FY2025 revenue to 28.5%, and launch/commercial/G&A to decline from an inferred 17.7% of FY2025 revenue to 13.7%. That is 8.1 percentage points of combined absorption before considering whether CASGEVY partner economics, JOURNAVX rebates, renal commercialization, post-marketing obligations and integration spending carry lower margins than mature CF.

The model is transparent: Base R&D still rises to USD 5.30 billion and commercial/G&A to USD 2.55 billion, so it does not invent absolute cost cuts. The fragility is that product-level profit is undisclosed, preventing proof that non-CF mix can support the same operating leverage as CF. The Stage 5 200-basis-point margin-down test reduces EPS to USD 27.280811, terminal

wealth at 22x to USD 600.177842, and gross IRR to 2.07%. That is only a 0.91-point IRR reduction, but the economic signal is important: the forecast needs multiple engines to work merely to preserve a low-single-digit return.

3. Strongest bear case, stated in its strongest form

Vertex is a mature CF cash machine priced as if it has already become a repeatable multi-disease platform. Approximately 97.5% of TTM revenue still comes from CF, while the diversification portfolio combines difficult patient logistics, opaque net pricing, unproved paid adoption and external assets whose acquisition returns are not established. Over the next two to three years, ALYFTREK can make reported brand growth look spectacular while mostly cannibalizing TRIKAFTA; CASGEVY infusions and JOURNAVX scripts can grow without producing the margins needed to offset persistent R&D and commercialization spend; and renal competition can delay or cap povetacicept. If total CF revenue stops growing before non-CF quarterly revenue reaches material scale, the Base 8.12% revenue CAGR and 43% terminal margin collapse together, leaving an earnings decline and a de-rating rather than a bridge to higher shareholder wealth.

The observable anchor is not a clinical headline. It is the combination of **total CF franchise revenue growth, recognized non-CF revenue, and consolidated statutory operating margin**. A shift in ALYFTREK mix without total CF growth is not diversification or franchise expansion. Likewise, more CASGEVY initiations or JOURNAVX covered lives without rising recognized revenue is a funnel statistic, not an economic return.

4. Cross-examination of management commentary

“The majority of ALYFTREK revenue continues to come from these TRIKAFTA switch patients.” Duncan McKechnie said this on the Q2 FY2026 call (D-TR-Q2). Management frames the migration as establishing a new standard of care. That may be clinically true, but it does not establish incremental franchise revenue. Base handles the accounting correctly by setting total CF independently; the unresolved operating risk is that management does not quantify the switch share. If the claim overstates new-patient momentum, the first sign will be ALYFTREK growth accompanied by flat or falling total CF revenue and no acceleration in treated-patient additions.

“There were more CASGEVY infusions in the first half of 2026 than in all of 2025.” McKechnie also said this on the Q2 call (D-TR-Q2). This is a genuine throughput improvement, but FY2025 had only 64 infusions and USD 116 million of CASGEVY revenue. The comparison therefore clears a low launch base and says nothing about repeatable center capacity, treatment abandonment, payer timing or retained margins after CRISPR Therapeutics’ 40% share of net commercial profit/loss. If optimism is misplaced, recognized CASGEVY revenue will remain lumpy and fail to scale proportionally with initiations and collections.

“We continue to expect both CASGEVY and JOURNAVX to be multibillion-dollar assets and we anticipate our emerging renal franchise could one day rival CF in revenue.” Reshma Kewalramani said this on the Q2 call (D-TR-Q2). This is aspiration, not guidance. Base is much less aggressive than a renal franchise rivaling CF, but it still relies on USD 4.55 billion of non-CF revenue by 2031. The weak point is not market size; it is paid conversion and capital efficiency. The first disconfirming evidence would be combined CASGEVY/JOURNAVX revenue failing to accelerate materially from the Q2 FY2026 USD 126.0 million level while launch and R&D spending holds statutory margin near or below the current 38%.

5. Stage 5 tie-out reverification

The recency anchor is sound. The TTM is exactly Q3 FY2025 through Q2 FY2026, and consolidated quarterly revenue growth was 11.0%, 9.5%, 7.8% and 12.5% year over year. There is no sharp company-wide deceleration that makes the TTM stale. The product mix is less reassuring: TRIKAFTA/KAFTRIO declined year over year in three of the four quarters, while ALYFTREK absorbed switches. That is why the total-CF bridge, not brand growth, must control.

The share-count math is correct, but the Base path is optimistic in capital-allocation consistency. It assumes USD 2.0 billion of annual repurchases and ends at 246.095 million diluted shares, down 3.6% from 255.2 million. Historical buybacks ranged from zero in FY2022 to USD 2.017 billion in FY2025; management prioritizes internal and external innovation first. The signed approximately USD 10 billion Crinetics acquisition and USD 4.5 billion delayed-draw facility make a smooth five-year buyback cadence less dependable. Stage 5’s +5% share sensitivity lowers Base EPS to USD 27.162222 and the 22x gross IRR to 1.98%. Again, arithmetic is not broken; the supposedly modest buyback help is conditional on capital deployment.

No product CAGR exceeds a named competitor deceleration pattern without a structural reason because the model does not pretend early-launch percentages are steady-state peer comparables. The problem is simultaneity: Base requires CF growth, three non-CF ramps and margin absorption together. The 25% Bear probability being above the 20% Bull probability appropriately recognizes that asymmetry.

6. Score-derived 20% return claim most likely to be wrong

There is no affirmative 20% return claim to attack. The independently audited score is 52/100, comprising 49/80 business quality and 3/20 return underwriting, and the classification is Reject. The 20% hurdle fails even in Bull: audited gross USD Bull IRR is 16.91%, and net-SGD Bull IRR is 18.81%. Base would need terminal EPS of USD 61.268094 at the locked 22x exit versus governed USD 28.520333, or a 28.945% EPS CAGR from current statutory EPS instead of 10.6595%.

The red team agrees with that failure. The assumption that would have to change first is not a single score point; it is terminal earnings. Even the favorable Stage 5 revenue-CAGR sensitivity reaches only USD 31.077985 EPS, still far below the USD 36.112667 P/E-15 gate and vastly below the USD 61.268094 required for a 20% Base return. A 20% claim would require unsupported pipeline value, a far richer exit multiple, or both. None belongs in the governed bridge.

7. Two-sided valuation challenge

Strongest reason the audited model may be too optimistic

The 22x Base exit multiple is the largest clean valuation lever. It is independently chosen and defensible against the replayed peer median of 22.839x and Vertex's positive-year historical low near 22.262x. But it still assumes that a company with only 4.77% acquisition-inclusive five-year ROIIC, a YELLOW management gate, a YELLOW moat gate and heavy CF concentration deserves a peer-median multiple after five more years of diversification risk. Using the live REGN anchor of 18.971x as a **non-controlling sensitivity**, Base terminal wealth becomes USD 541.059237 and gross IRR becomes approximately -0.02%, 3.01 percentage points below the audited Base. At 18x, terminal wealth is USD 513.365994 and IRR is -1.07%, 4.05 points lower.

This is a material sensitivity, not a correction. VP disclosed the denominator, excluded event-heavy FY2024, replayed live peer ratios, selected 22x before returns, and did not cap the exit from a desired result. The audited PASS actionability is already robust to the downside sensitivity. A lower multiple would strengthen, not reverse, that conclusion.

The Crinetics transaction is the other major optimistic perimeter risk. A USD 10 billion purchase is about 73% of the governed USD 13.6415 billion cash/securities balance. If financed mechanically with USD 5.5 billion of cash and the disclosed USD 4.5 billion facility, net cash would fall by roughly USD 10 billion before recognizing any target economics. That is only a perimeter sensitivity: target revenue, expenses, assets and synergies are unsealed, so it would be false to turn the financing leg alone into a return correction. The locked model correctly holds both target economics and financing at zero while unclosed and requires a full upstream rerun after closing.

Strongest reason the audited model may be too bearish

Bear stacks three adverse mechanisms: CF revenue falls from USD 12.272 billion to USD 11.000 billion despite patent protection through 2037-2039; statutory operating margin compresses from 37.95% to 31%; and the exit P/E falls to 15x. The 15x multiple is near the positive BMY peer floor, so it is not arbitrary or zero-equity reasoning. Still, it may punish Vertex twice for the same loss of growth: lower EPS already reflects launch failure and CF erosion, and the multiple then falls below Vertex's comparable positive-year historical range.

At Vertex's historical-low 22.262x as a **non-controlling same-method sensitivity**, Bear terminal wealth rises from USD 193.042245 to USD 286.500431 and gross IRR improves from -18.65% to -11.96%, a 6.68-point improvement. At the REGN 18.971x anchor, Bear IRR is -14.73%. Those are still unacceptable returns. Thus Bear may be too punitive in magnitude, but the downside conclusion survives. Zero revenue for all earlier pipeline programs is another conservative feature, yet no pivotal or approved evidence at cutoff supports adding them.

RETURN_MODEL_OBJECTION_STATUS: MATERIAL_RESOLVED. The exit-multiple and Crinetics concerns are economically material, but the audited package already resolves them correctly: multiples were independently selected on comparable evidence before return calculation; alternative multiples are sensitivities, not demonstrable corrections; the unclosed acquisition is explicitly outside the standalone perimeter with a mandatory rerun trigger; and the resulting CIO status is PASS under both optimistic and bearish tests. There is no arithmetic-only CS/CSA defect and no foundational VP defect requiring routing.

8. P&C insurer return-bridge cross-examination

Not applicable. Vertex is an operating biopharmaceutical company, not a P&C insurer, reinsurer, specialty carrier or similar risk-bearing financial business. The insurer lane is not triggered, and no insurer-return battery or

`insurer_return_bridge.json` is required.

9. Signal that forces thesis exit

The numerical kill signal is: **total CF franchise revenue declines year over year in two consecutive reported quarters while combined recognized CASGEVY plus JOURNAVX revenue remains below USD 200 million per quarter in both quarters and consolidated statutory operating margin is below 36% in the second quarter.** This is a thesis-invalidating conjunction, not a generic warning. It would show that ALYFTREK switching is not preserving total CF growth, the two approved non-CF launches are not filling the gap at economic scale, and diversification expense is eroding the current profit engine. On that evidence the Base revenue and margin paths should be abandoned and the thesis re-underwritten around Bear economics. It is a research kill signal only; it does not authorize a sale or any transaction.

10. Conviction at the end of red team

Thesis does not survive as an investable return thesis at USD 541.69. It survives only as a watchable high-quality franchise whose security price outruns the governed earnings bridge. The strongest business rebuttal is real: CF remains highly defensible, current cash conversion is strong, the balance sheet has substantial resilience, Bear may over-stack de-rating, and zero earlier-pipeline revenue is conservative. None rescues the return. Base gross and net-SGD IRRs remain about 3%, Bear destroys value even under a less punitive same-method multiple, and Bull fails the 20% hurdle.

The final narrative should therefore center on **price-versus-proof**, not on whether Vertex is scientifically capable. The proof required is paid non-CF adoption, demonstrable acquisition-inclusive returns, sustainable margin absorption and a post-CF renewal path. Until those appear—or the price falls enough to create a genuine margin of safety—the audited Reject/PASS outcome is the correct disciplined conclusion.

`trade_execution_authorized=false` `sizing_ceiling_pct=null`

Appendix D - Data Package (Raw Historicals)

Vertex Pharmaceuticals Incorporated (VRTX) — Production ER2 Data Package

Run ID: `pulse-cio-20260830T120326+0800` **Information cutoff:** 2026-08-30 SGT **Reporting currency / scale:** USD / millions unless stated otherwise **Fiscal year end:** December 31 **Latest completed quarter:** Q2 FY2026 ended 2026-06-30 **TTM convention:** Q3 FY2025 + Q4 FY2025 + Q1 FY2026 + Q2 FY2026, equivalently FY2025 less H1 FY2025 plus H1 FY2026 **Exact underwriting horizon supplied by Stage 0:** 2031-06-30 **Authority:** research evidence only; `trade_execution_authorized=false`.

Source key and evidence controls

All D-stage files were fetched live and archived under `raw\pulse-cio-20260830T120326+0800\d`. The non-overwriting FMP warehouse mirror was never read as evidence. QF/QFR remain controlling where FMP differs from filings.

ID	Live source and covered period	Archived D-stage file	Use / precedence
D-FMP-IS	[FMP annual income statement](https://financialmodelingprep.com/stable/income-statement?symbol=VRTX&period=annual&limit=6), FY2020-FY2025	`fmp_income_annual_d.json`	Secondary history; filings override discrepancies
D-FMP-BS	[FMP annual balance sheet](https://financialmodelingprep.com/stable/balance-sheet-statement?symbol=VRTX&period=annual&limit=6), FY2020-FY2025	`fmp_balance_annual_d.json`	Secondary balance-sheet history
D-FMP-CF	[FMP annual cash flow](https://financialmodelingprep.com/stable/cash-flow-statement?symbol=VRTX&period=annual&limit=6), FY2020-FY2025	`fmp_cashflow_annual_d.json`	Secondary history; filed capex and repurchases control
D-FMP-KM	[FMP annual key metrics](https://financialmodelingprep.com/stable/key-metrics?symbol=VRTX&period=annual&limit=6), FY2020-FY2025	`fmp_keymetrics_annual_d.json`	Invested-capital inputs, diagnostic only
D-FMP-PROD-A	[FMP product segmentation annual](https://financialmodelingprep.com/stable/revenue-product-segmentation?symbol=VRTX&period=annual)	`fmp_product_annual_d.json`	Required FMP product pull; official product tables control
D-FMP-PROD-Q	[FMP product segmentation quarterly](https://financialmodelingprep.com/stable/revenue-product-segmentation?symbol=VRTX&period=quarter)	`fmp_product_quarter_d.json`	Required FMP quarterly pull; omits CASGEVY/JOURNAVX in H1 2026
D-FMP-GEO	[FMP geographic segmentation annual](https://financialmodelingprep.com/stable/revenue-geographic-segmentation?symbol=VRTX&period=annual)	`fmp_geo_annual_d.json`	Secondary; FY2025 categories overlap, so filing controls
D-SEC-22K	[Vertex FY2022 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532023000007/vrtx-20221231.htm)	`sec_vrtx_2022_10k_d.htm`	Controlling FY2020-FY2022 product, geography, statement history
D-SEC-23K	[Vertex FY2023 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532024000062/vrtx-20231231.htm)	`sec_vrtx_2023_10k_d.htm`	Product-taxonomy continuity check
D-SEC-25K	[Vertex FY2025 Form 10-K](https://www.sec.gov/Archives/edgar/data/875320/000087532026000056/vrtx-20251231.htm)	`sec_vrtx_2025_10k_d.htm`	Controlling FY2023-FY2025 statements, segment, patents, royalties
D-SEC-Q2Q	[Vertex Q2 FY2026 Form 10-Q](https://www.sec.gov/Archives/edgar/data/875320/000087532026000259/vrtx-20260630.htm)	`sec_vrtx_2026q2_10q_d.htm`	Controlling Q2/H1 FY2026 and TTM construction
D-REL-Q3	[Vertex Q3 FY2025 release](https://www.sec.gov/Archives/edgar/data/875320/000087532025000230/ex-991_q32025.htm)	`sec_vrtx_2025q3_release_d.htm`	Controlling Q3 products, revenue and operating income

ID	Live source and covered period	Archived D-stage file	Use / precedence
D-REL-Q4	[Vertex Q4/FY2025 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000034/ex-991_q42025.htm)	`sec_vrtx_2025q4_release_d.htm`	Controlling Q4 products and FY2025 launch metrics
D-REL-Q1	[Vertex Q1 FY2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000171/ex-991_q12026.htm)	`sec_vrtx_2026q1_release_d.htm`	Controlling Q1 products and financial trend
D-REL-Q2	[Vertex Q2 FY2026 release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm)	`sec_vrtx_2026q2_release_d.htm`	Controlling Q2 products, guidance and pipeline status
D-TR-Q3	[FMP Q3 FY2025 transcript](https://financialmodelingprep.com/stable/earning-call-transcript?symbol=VRTX&year=2025&quarter=3), call 2025-11-03	`fmp_transcript_2025_q3_d.json`	Live transcript; date verified
D-TR-Q4	[FMP Q4 FY2025 transcript](https://financialmodelingprep.com/stable/earning-call-transcript?symbol=VRTX&year=2025&quarter=4), call 2026-02-12	`fmp_transcript_2025_q4_d.json`	Live transcript; date verified
D-TR-Q1	[FMP Q1 FY2026 transcript](https://financialmodelingprep.com/stable/earning-call-transcript?symbol=VRTX&year=2026&quarter=1), call 2026-05-04	`fmp_transcript_2026_q1_d.json`	Live transcript; date verified; ASR misspellings avoided in quotes
D-TR-Q2	[FMP Q2 FY2026 transcript](https://financialmodelingprep.com/stable/earning-call-transcript?symbol=VRTX&year=2026&quarter=2), call 2026-08-03	`fmp_transcript_2026_q2_d.json`	Live transcript; date verified
D-FDA-J	[FDA JOURNAVX approval](https://www.fda.gov/news-events/press-announcements/fda-approves-novel-non-opioid-treatment-moderate-severe-acute-pain), 2025-01-30	`fda_journavx_approval_d.html`	Primary approval, indication and trial population
D-FDA-C	[FDA expanded CASGEVY approval](https://www.fda.gov/news-events/press-announcements/fda-approves-first-gene-therapy-young-children-sickle-cell-disease), 2026-07-01	`fda_casgevy_2026_approval_d.html`	Primary label, pediatric efficacy and safety
D-CT-P	[ClinicalTrials.gov NCT06564142](https://clinicaltrials.gov/study/NCT06564142), RAINIER	`ctgov_povetacicept_NCT06564142_d.json`	Primary Phase 3 study status and design
D-CT-Z	[ClinicalTrials.gov NCT04786262](https://clinicaltrials.gov/study/NCT04786262), zimislecel	`ctgov_zimislecel_NCT04786262_d.json`	Primary Phase 1/2/3 status and outcomes

0a. Industry classification and disclosure inventory

Vertex is a U.S.-GAAP commercial biotechnology/pharmaceutical issuer. It reports one operating and reportable segment, pharmaceuticals, but underwriting depends on product, disease, launch-funnel, regulatory and pipeline KPIs. Section 0a is therefore mandatory. FMP product data are useful for historical CF products but materially differ from the filing taxonomy: the FY2025 FMP total omits $30.7 million of Other revenue; the H1 FY2026 quarterly product endpoint omits $119.3 million of CASGEVY and $78.6 million of JOURNAVX; and the FY2025 FMP geography row presents Europe inside an overlapping Non-US category. Official filings and releases control.

The ad hoc pharma checklist was built from official headings and searches for: `product revenues`, `United States`, `ex-U.S.`, `patients initiated`, `cell collection`, `infusion`, `prescriptions`, `prescribers`, `covered lives`, `ALYFTREK switch`, `patent expiration`, `royalty`, `net commercial profit`, `Phase 3`, `pivotal`, `PDUFA`, `safety`, `efficacy`, `research and development`, `acquired in-process research and development`, `cost of sales`, `gross margin`, `inventory`, `repurchases` and `acquisition`.

Dataset / table family	Official source searched	Years available	Included?	Gap classification / reason	Downstream relevance
Segment economics	FY2022/FY2025 10-Ks; Q2 FY2026 10-Q	FY2021-FY2025; TTM	Yes	One segment; CODM uses net income, requiring sealed fallback	Segment model and statutory bridge

Dataset / table family	Official source searched	Years available	Included?	Gap classification / reason	Downstream relevance
CF products and geography	FY2022/FY2023/FY2025 10-Ks; four releases	FY2021-FY2025; four latest quarters	Yes	Product aggregation changed in FY2024 and again Q1 FY2026	Franchise mix and concentration
CASGEVY launch funnel	Q4 FY2025 and Q2 FY2026 calls; FDA	2024-FY2025; latest H1 commentary	Yes	Revenue disclosed quarterly; full funnel not reported every quarter	Heme launch durability
JOURNAVX launch	Four calls/releases; FDA	Launch 2025 through Q2 FY2026	Yes	Prescriptions and coverage are selected-period disclosures	Pain adoption, gross-to-net
ALYFTREK switching	Four calls/releases and 10-K	Launch 2025 through Q2 FY2026	Yes	Switch percentage not numerically disclosed	CF cannibalization versus franchise retention
Patents / regulatory exclusivity	FY2025 10-K; FDA	Current at FY2025 / July 2026	Yes	Basic patent years are not guaranteed loss-of-exclusivity dates	Terminal durability
Pipeline phase / indication / milestones	Q2 FY2026 release/call; ClinicalTrials.gov	Current at 2026-08-03	Yes	Early assets have no pivotal efficacy	Probability and timing
R&D / acquired IPR&D	FY2022/FY2025 10-Ks	FY2021-FY2025	Yes	None	Normalization and reinvestment
Reimbursement / pricing	Calls and releases	Selected launch periods	Yes	Net price by product is true non-disclosure	Gross-to-net and access
Gross margin / inventory	FY2025 10-K; Q2 FY2026 call	FY2021-FY2025 inventory; current margin	Yes	Product-level gross margin is true non-disclosure	Mix and cash conversion
Capital allocation	FY2022/FY2025 10-Ks; Q2 FY2026 10-Q	FY2021-FY2025; TTM	Yes	No dividends	Share count and reinvestment
Formal investor day / CMD	Vertex IR events archive	Checked through 2026-08-30	No formal CMD found	Closest event was Kidney Week 2025; static deck archive timed out twice	Renal context only; no unsupported quote used

Historical product and geography KPI series

KPI family ($B)	FY2021	FY2022	FY2023	FY2024	FY2025	Latest interim / TTM	Source
Total revenue	7.574	8.931	9.869	11.020	12.001	TTM 12.587	D-SEC-22K; D-SEC-25K; sealed QF TTM
TRIKAFTA/KAFTRIO	5.697	7.687	8.945	10.239	10.313	TTM 10.078	D-SEC-22K; D-SEC-25K; sealed QF TTM
ALYFTREK	n/a	n/a	n/a	n/a	0.838	TTM 1.625	D-SEC-25K; sealed QF TTM
Other product revenue	1.876	1.244	0.925	0.782	0.820	TTM 0.884	D-SEC-22K; D-SEC-25K; sealed QF TTM
U.S. revenue	5.287	5.699	6.040	6.685	7.549	Q2 FY2026 2.06	D-SEC-22K product basis FY2021-FY2022; D-SEC-25K total basis FY2023-FY2025; D-REL-Q2
ex-U.S. revenue	2.286	3.231	3.829	4.335	4.453	Q2 FY2026 1.28	Same sources and basis boundary as U.S. row
Inventory	0.353	0.461	0.739	1.205	1.687	H1 FY2026 1.765	D-FMP-BS live; D-SEC-25K controls FY2025; fresh DR D-SEC-Q2Q check
GAAP gross-margin proxy (%)	88.1	87.9	87.2	86.1	86.2	Q2 FY2026 85.3	One minus filed cost of sales / total revenue; D-SEC-22K; D-SEC-25K; fresh DR D-SEC-Q2Q check

FY2021-FY2022 geography is product-revenue basis; FY2023-FY2025 is total-revenue basis. FY2021 includes $1.0 million of Other revenue. “Other product revenue” changes content and is not a stable cohort.

Launch, penetration, economics and regulatory KPI inventory

KPI family	Latest official observation	Source / interpretation
CF eligibility	Vertex estimates that nearly 95% of people with CF could benefit from its five approved CF medicines	D-SEC-25K; eligibility, not treated penetration
ALYFTREK switching	Majority of ALYFTREK revenue came from TRIKAFTA switch patients; over one-third of eligible CF patients in Germany and the U.K. were benefiting from ALYFTREK	D-TR-Q2; supports franchise retention but cannibalizes TRIKAFTA
CASGEVY FY2025 funnel	301 patient initiations, 147 first cell collections, 64 infusions; Q4 alone 111, 37 and 30	D-TR-Q4; long patient journey creates quarterly revenue variability
CASGEVY H1 FY2026	More infusions in H1 FY2026 than all FY2025; Q2 was third sequential quarter with over 100 initiations	D-TR-Q2; exact H1 infusion count not disclosed
JOURNAVX Q2 FY2026	About 535,000 prescriptions in Q2 and just over 900,000 in H1; 18,000 new prescribers; 1,400 hospital and 130 IDN pathways	D-TR-Q2; prescriptions split about 50/50 hospital/retail
JOURNAVX access	260 million covered lives of about 320 million; 180 million unrestricted; 80 million restricted	D-TR-Q2; PSP usage depresses early recognized revenue
CASGEVY economics	Vertex receives 60% and CRISPR 40% of net commercial profit/loss, subject to adjustments; CRISPR share recorded in cost of sales	D-SEC-25K, CRISPR JDCA note
CF royalties	CFF tiers run from single digits to sub-teens for covered compounds first synthesized/tested through February 2014 and from low-single to mid-single digits for certain March 2014-August 2016 compounds, including elexacaftor; no obligation applies to compounds first synthesized/tested from September 2016 onward. ALYFTREK had a lower blended royalty burden than TRIKAFTA/KAFTRIO in FY2025.	D-SEC-25K, collaboration and cost-of-sales notes; fresh DR filing check
Gross margin	FY2025 cost of sales was 13.8% of product revenue, implying 86.2% gross margin; Q2 FY2026 non-GAAP gross margin was 85.6% and full-year expectation “just under 86%”	D-SEC-25K; D-TR-Q2

Product	U.S. projected protection expiry	European projected protection expiry	Regulatory / clinical status at cutoff	Source
KALYDECO	2028	2027	Approved CF modulator	D-SEC-25K patent table
ORKAMBI	2031	2030	Approved CF modulator	D-SEC-25K patent table
SYMDEKO/SYMKEVI	2027	2033	Approved CF modulator	D-SEC-25K patent table
TRIKAFTA/KAFTRIO	2037	2037	Approved; younger-age submissions continuing	D-SEC-25K; D-TR-Q2
CASGEVY	2035 regulatory exclusivity	2034 regulatory exclusivity	FDA label expanded 2026-07-01 to ages 2+ for eligible SCD/TDT	D-SEC-25K footnotes 4-6; D-FDA-C; fresh DR checks
ALYFTREK	2039	2039	Approved; ages 2-5 submissions initiated	D-SEC-25K; D-TR-Q2
JOURNAVX	2040	2040	FDA-approved 2025-01-30 for moderate-to-severe acute pain in adults	D-SEC-25K; D-FDA-J

These are Vertex's projected protection-expiry years, not guaranteed loss-of-exclusivity dates. The 10-K table incorporates pediatric exclusivity or European SPCs for some CF products and, for CASGEVY, later regulatory exclusivity rather than the earlier basic patent; Great Britain CASGEVY regulatory exclusivity runs through November 2033.

Program	Indication / phase	Latest efficacy and safety evidence	Next governed milestone	Source
Povetacicept	IgAN, Phase 3 RAINIER; BLA accepted	Q2 call cited 52% proteinuria reduction and over 70% reductions in hematuria and Gd-IgA1; favorable safety characterization remains management’s framing	U.S. PDUFA 2026-11-30	D-REL-Q2; D-TR-Q2; D-CT-P
Povetacicept	pMN, Phase 2/3 OLYMPUS	Phase 2 portion complete; 80 mg subcutaneous every four weeks selected	Phase 3 underway	D-TR-Q2

Program	Indication / phase	Latest efficacy and safety evidence	Next governed milestone	Source
Inaxaplin	AMKD, Phase 2/3 AMPLITUDE	Interim endpoints are one-year eGFR and proteinuria; no Phase 3 efficacy at cutoff	Full enrollment by YE2026; interim data early 2027	D-TR-Q2
Suzetrigine	DPN, two Phase 3 studies	No pivotal DPN result at cutoff	Enrollment expected complete by YE2026	D-TR-Q2
VX-993	DPN, Phase 2	No efficacy result at cutoff	Enrollment expected complete by YE2026	D-TR-Q2
Zimislecel	T1D, Phase 1/2/3	Dosing resumed; primary outcome includes insulin independence without severe hypoglycemic events	Updated strategy/timing expected H2 2026	D-TR-Q2; D-CT-Z
VX-017	T1D, Phase 1/2 planned	Type-O universal-donor IND cleared; no patient efficacy	Study initiation expected near term	D-TR-Q2
VX-407	ADPKD, Phase 2 AGLOW	Enrollment complete; no result at cutoff	Data after ongoing dosing/maturation	D-TR-Q2
VX-828	CF next-generation modulator, early clinical	Patient dosing complete; no result at cutoff	Initial patient data H2 2026	D-TR-Q2
CASGEVY pediatric	SCD/TDT, approved ages 2+	FDA: 8 of 9 efficacy-evaluable TDT patients achieved 12-month transfusion independence; warnings include engraftment failure, delayed platelet engraftment, hypersensitivity and off-target editing risk	Long-term postmarketing follow-up	D-FDA-C
JOURNAVX	Acute pain, approved	FDA efficacy review used two randomized surgical-pain trials; the primary safety pool was 874 participants in those trials plus a supportive 256-participant open-label study. First approved NaV1.8-class non-opioid analgesic	Commercial adoption and payer access	D-FDA-J; fresh DR FDA check

1. Reporting structure and taxonomy

Vertex has exactly one operating and reportable segment, **pharmaceuticals**. The CEO is the CODM; the measure regularly supplied to the CODM is consolidated net income (loss). FY2025 segment revenue was $12.001 billion, or 100.0% of total revenue. Net income is a below-operating-income statutory endpoint and is preserved only as the issuer's CODM disclosure. The financial projection therefore uses one modeled segment, **Consolidated company**, on the exact sealed basis `Statutory operating income (single-segment non-operating CODM fallback)`.

The reportable segment is stable, but product presentation is not: FY2022 disclosed four CF brands; FY2025 aggregated legacy CF and new launches in "Other product revenues" while adding ALYFTREK; Q1 FY2026 introduced total CF and separate CASGEVY/JOURNAVX rows. No silent reclassification is made.

FY2025 geographic revenue was U.S. $7.549 billion (62.9%), Europe $3.460 billion (28.8%), and other ex-U.S. $0.992 billion (8.3%), totaling $12.001 billion. Source: D-SEC-25K Note Q geographic table. The live FMP geography endpoint's overlapping FY2025 "Europe" and "Non-US" labels are not added together.

2. Consolidated historicals

Metric	FY2021	FY2022	FY2023	FY2024	FY2025	Source
Revenue ($B)	7.574	8.931	9.869	11.020	12.001	D-SEC-22K; D-SEC-25K
Operating income ($B)	2.782	4.307	3.832	(0.233)	4.173	D-SEC-22K; D-SEC-25K
Operating margin (%)	36.7	48.2	38.8	(2.1)	34.8	Calculated from filed rows
Net income ($B)	2.342	3.322	3.620	(0.536)	3.953	D-SEC-22K; D-SEC-25K
EPS diluted ($)	9.01	12.82	13.89	(2.08)	15.32	D-SEC-22K; D-SEC-25K
Diluted shares (M)	259.9	259.1	260.5	257.9	258.0	D-SEC-22K; D-SEC-25K

Metric	FY2021	FY2022	FY2023	FY2024	FY2025	Source
Capex ($B)	0.235	0.205	0.200	0.298	0.438	Filed cash-flow tables; D-FMP-CF discrepancy overridden for FY2023
FCF ($B)	2.409	3.925	3.337	(0.790)	3.194	Operating cash flow less filed capex
NOPAT at 21% ($B)	2.198	3.403	3.027	(0.184)	3.297	Calculated from statutory operating income
Average invested capital ($B)	9.594	11.943	13.809	12.254	11.233	Average of current/prior FMP invested capital, D-FMP-KM
ROIC (%)	22.9	28.5	21.9	(1.5)	29.4	NOPAT / average invested capital

ROIC uses statutory operating income x 79% and average current/prior FMP invested capital. FY2025: $4.1733B x 79% = $3.2969B NOPAT; average invested capital = $11.2327B; ROIC = 29.4%. This normalized tax rate is not the Section 3a tax schedule. FY2024 includes Alpine acquired-IPR&D.

3. Segment historicals

Consolidated company — sole modeled projection segment

Consolidated company	FY2021	FY2022	FY2023	FY2024	FY2025	Source
Revenue ($B)	7.574	8.931	9.869	11.020	12.001	D-SEC-22K; D-SEC-25K
YoY (%)	22.1	17.9	10.5	11.7	8.9	Calculated; FY2020 base $6.206B from D-SEC-22K
Statutory operating income (single-segment non-operating CODM fallback) ($B)	2.782	4.307	3.832	(0.233)	4.173	D-SEC-22K; D-SEC-25K
Margin on exact metric (%)	36.7	48.2	38.8	(2.1)	34.8	Calculated

This is an ER2 modeling-basis repair, not an issuer-disclosed segment operating-profit measure. The issuer-disclosed CODM measure is consolidated net income (loss), reproduced separately below.

3a. Historical statutory-profit bridge and forecast-driver ledger

Sealed packet: `statutory_bridge.json`, schema 1.2.0. **Exact-byte SHA-256:** `e213fc6c2a19807cbdb4d8fc426633cf9a1db0c4bd7ba6381fea2b3be280133d`. **Segment profit basis:** `single_segment_non_operating_codm_fallback`. **Common modeled metric:** `Statutory operating income (single-segment non-operating CODM fallback)`.

Corporate/unallocated and operating-adjustment arrays are empty in both periods. No zero placeholders or analyst plugs are added.

FY2025 bridge ($M)

Bridge line	Classification	Value	Source ID	Running subtotal
Consolidated company	segment profit	4,173.3	sec_2025_10k	4,173.3
Consolidated modeled segment profit metric	subtotal	4,173.3	sec_2025_10k	4,173.3
Statutory operating income	statutory subtotal	4,173.3	sec_2025_10k	4,173.3
Interest income, net (interest income less interest expense)	interest	477.6	sec_2025_10k	4,650.9
Other expense, net	other_non_operating	(7.7)	sec_2025_10k	4,643.2
Pretax income	statutory subtotal	4,643.2	sec_2025_10k	4,643.2
Provision for income taxes	tax	(690.0)	sec_2025_10k	3,953.2
Net income	statutory subtotal	3,953.2	sec_2025_10k	3,953.2

Issuer CODM disclosure: **Net income (loss), $3,953.2 million**, source `sec_2025_10k`. It is not renamed operating income and is not used as an operating adjustment. All five sealed residuals are 0.0 within tolerance 2.3216.

TTM ended 2026-06-30 bridge ($M)

Bridge line	Classification	Value	Source ID	Running subtotal
Consolidated company	segment profit	4,777.1	sec_2026_q2_10q	4,777.1
Consolidated modeled segment profit metric	subtotal	4,777.1	sec_2026_q2_10q	4,777.1
Statutory operating income	statutory subtotal	4,777.1	sec_2026_q2_10q	4,777.1
Interest income, net (TTM construction)	interest	476.4	qf_ttm_derived	5,253.5
Other income (expense), net (TTM construction)	other_non_operating	21.0	qf_ttm_derived	5,274.5
Pretax income	statutory subtotal	5,274.5	sec_2026_q2_10q	5,274.5
Provision for income taxes (TTM construction)	tax	(869.3)	qf_ttm_derived	4,405.2
Net income	statutory subtotal	4,405.2	sec_2026_q2_10q	4,405.2

Issuer CODM disclosure: **Net income (loss), TTM constructed from official FY and interim statements, $4,405.2 million**, source `sec_2026_q2_10q`. All five sealed residuals are 0.0 within tolerance 2.63725. The TTM construction is FY2025 less H1 FY2025 plus H1 FY2026, with source-bound arithmetic in `qf_ttm_reconciliation.json`.

Forecast-driver schedule

Historical bridge line	FY2025 value	TTM value	Forecast treatment	Driver and source	Bear / base / bull rule
Consolidated modeled statutory operating income	4,173.3	4,777.1	Revenue times statutory operating margin	Segment revenue/product build and expense schedule; D-SEC-25K; D-SEC-Q2Q	Bear uses slower new-product uptake and mix compression; base uses governed product ramp; bull requires launch/pipeline evidence
Interest income, net	477.6	476.4	Average cash/securities times earned yield less funded-interest schedule	FY2025 cash plus securities $12.320B; D-SEC-25K	Bear lower cash and 2.5% yield; base cash roll-forward and 3.0%; bull stronger cash and 3.5%; refresh rates at synthesis
Other income (expense), net	(7.7)	21.0	Independent non-operating line	Strategic-investment/fair-value items are volatile; D-SEC-25K; D-SEC-Q2Q	Bear (50) annually; base 0; bull 25, all $M unless new source supports otherwise
Provision for income taxes	(690.0)	(869.3)	Pretax income times tax-rate schedule	Filed FY rate 14.9%; TTM constructed rate 16.5%	Bear 20%; base 18%; bull 16%; do not use ROIC's normalized 21%

`STATUTORY_BRIDGE_STATUS: VERIFIED — CLEARED FOR FORECASTING`

4. Product / sub-segment historicals

Segment	Product	What it is	Dollar disclosure?	Last three years revenue and source
Pharmaceuticals	TRIKAFTA/KAFTRIO	Triple-combination CFTR modulator	Yes	FY2023 $8.945B; FY2024 $10.239B; FY2025 $10.313B; D-SEC-25K
Pharmaceuticals	ALYFTREK	Once-daily next-generation triple CFTR modulator	Yes	FY2023 n/a; FY2024 n/a; FY2025 $0.838B; D-SEC-25K
Pharmaceuticals	Other product revenues	Reported aggregation; content changes by year	Yes, aggregate only	FY2023 $0.925B; FY2024 $0.782B; FY2025 $0.820B; D-SEC-25K
Pharmaceuticals	KALYDECO	Ivacaftor CFTR potentiator	Yes through FY2023	FY2021 $0.684B; FY2022 $0.553B; FY2023 $0.476B; D-SEC-22K; D-FMP-PROD-A corroborates
Pharmaceuticals	ORKAMBI	Lumacaftor/ivacaftor CF modulator	Yes through FY2023	FY2021 $0.772B; FY2022 $0.511B; FY2023 $0.326B; same sources

Segment	Product	What it is	Dollar disclosure?	Last three years revenue and source
Pharmaceuticals	SYMDEKO/SYMKEVI	Tezacaftor/ivacaftor CF modulator	Yes through FY2023	FY2021 $0.420B; FY2022 $0.180B; FY2023 $0.123B; same sources
Pharmaceuticals	CASGEVY	One-time CRISPR-edited autologous cell therapy for eligible SCD/TDT	Selected-period dollars	FY2025 $0.116B; FY2023-FY2024 not separately presented in the FY2025 annual product table; D-TR-Q4
Pharmaceuticals	JOURNAVX	Oral selective NaV1.8 inhibitor for adult acute pain	Selected-period dollars	FY2025 $0.060B; FY2023-FY2024 prelaunch; D-TR-Q4

No product dollars are back-solved. Q1 FY2026 supplies separate CASGEVY and JOURNAVX rows prospectively. FMP “Other” is not treated as a stable brand.

5. Most recent quarterly trend

Vertex FY ends December 31. Most recently completed fiscal quarter at time of writing: FY2026 Q2, covering 2026-04-01 through 2026-06-30, reported on 2026-08-03 via [the filed earnings release](https://www.sec.gov/Archives/edgar/data/875320/000087532026000256/ex-991_q22026.htm).

Consolidated modeled segment trend

Quarter	Revenue ($B)	YoY (%)	Statutory operating margin (%)	Source
Q3 FY2025	3.076	11.0	38.6	D-REL-Q3, 2025-11-03
Q4 FY2025	3.190	9.5	37.8	D-REL-Q4, 2026-02-12
Q1 FY2026	2.987	7.8	38.1	D-REL-Q1, 2026-05-04
Q2 FY2026	3.334	12.5	37.4	D-REL-Q2, 2026-08-03

Product trend — disclosed dollars, with calculated YoY

Product / quarter	Q3 FY2025	Q4 FY2025	Q1 FY2026	Q2 FY2026	Source
TRIKAFTA/KAFTRIO revenue ($M) / YoY	2,653.6 / 2.7%	2,572.5 / (5.5)%	2,354.7 / (7.1)%	2,497.2 / (2.1)%	D-REL-Q3 through D-REL-Q2
ALYFTREK revenue ($M) / YoY	247.0 / n.m.	380.1 / n.m.	424.4 / 687.4%	573.6 / 265.8%	Same releases
Other CF / other product revenue ($M) / YoY	175.8 / (5.9)%	237.4 / 24.2%	135.9 / (12.5)%	137.1 / (29.2)%	Taxonomy becomes “Other CF” in Q1 FY2026
CASGEVY revenue ($M) / YoY	16.9 / n.d.	54.3 / n.d.	42.9 / 202.1%	76.4 / 151.3%	D-REL-Q3 through D-REL-Q2; fresh DR release checks
JOURNAVX revenue ($M) / YoY	19.6 / n.m.	26.7 / n.m.	29.0 / 2,130.8%	49.6 / 313.3%	D-REL-Q3 through D-REL-Q2; fresh DR release checks

Live checks confirm Q2 revenue grew 12%, global CF 11%, and rows sum to $3,333.9 million. Q3/Q4 “Other product” includes CASGEVY/JOURNAVX; separate rows are memorandum-only. Infusion timing and channel/PSP use add noise.

6. Management commentary on forward growth — verbatim

Quotes are grouped within Consolidated company and come from live, date-verified FMP transcripts.

Q3 FY2025 call — 2025-11-03

- **Charles Wagner, CFO; revenue guidance:** “We now expect 2025 total revenue to be in a range of $11.9 billion to $12 billion versus prior guidance of $11.85 billion to $12 billion, representing growth of approximately 8% to 9% for the full year at current exchange rates.” Source: D-TR-Q3. Interpretation: the year-end revenue anchor was narrowed upward.
- **Stuart Arbuckle, COO; ALYFTREK:** “Overall, we are pleased with the response to ALYFTREK and continue to expect that the majority of patients around the globe will transition to ALYFTREK over time given its multiple benefits.” Source:

D-TR-Q3. Interpretation: ALYFTREK growth is partly internal conversion, so model total CF franchise rather than adding it mechanically to TRIKAFTA.

- **Charles Wagner, CFO; new products:** “As Duncan mentioned, full year revenue guidance also includes over $100 million of CASGEVY revenue as we treat more patients in geographies where we have secured regulatory approval and reimbursement.” Source: D-TR-Q3. Interpretation: CASGEVY’s near-term gate was treated-patient throughput after access.

Q4 FY2025 call — 2026-02-12

- **Charles Wagner, CFO; FY2026 revenue:** “We expect full year 2026 total company revenue to be in the range of $12.95 billion to $13.1 billion, representing 8% to 9% growth versus the prior year.” Source: D-TR-Q4. Interpretation: this became the pre-Q2 baseline, later raised.
- **Charles Wagner, CFO; non-CF contribution:** “This outlook anticipates continued solid performance from our CF franchise and a $500 million or greater revenue contribution from non-CF products, including greater volumes of patient infusions for CASGEVY and a ramp of JOURNAVX prescriptions.” Source: D-TR-Q4. Interpretation: the $500 million is a combined floor, not a product-specific allocation.
- **Reshma Kewalramani, CEO; ALYFTREK pediatric efficacy:** “Importantly, 65% of these ALYFTREK patients achieved levels of sweat chloride below the normal or carrier level of 30 millimoles when treated through 24 weeks.” Source: D-TR-Q4. Interpretation: clinical differentiation supports switching and younger-age expansion.

Q1 FY2026 call — 2026-05-04

- **Charles Wagner, CFO; unchanged revenue guide:** “We are reiterating our 2026 total revenue guidance of $12.95 billion to $13.10 billion, representing growth of 8% to 9%.” Source: D-TR-Q1. Interpretation: Q1 did not require a guide reduction despite launch volatility.
- **Charles Wagner, CFO; expense investment:** “We are also reiterating our combined non-GAAP operating expense guidance of $5.65 billion to $5.75 billion, reflecting continued investment in our late-stage clinical pipeline, commercial infrastructure, and activities for new launches and revenue diversification.” Source: D-TR-Q1. Interpretation: near-term margin must carry launch and pivotal-program investment.
- **Reshma Kewalramani, CEO; AMKD timing:** “Fortunately, the IA enrollment is complete, the full study enrollment will complete this year, and we fully expect to have results from the IA in early 2027.” Source: D-TR-Q1. Interpretation: inaxaplin is not a 2026 revenue driver.

Q2 FY2026 call — 2026-08-03

- **Charles Wagner, COO and CFO; raised revenue guide:** “Given our strong first half performance and the momentum across the business, we are raising our full year 2026 total revenue guidance to a range of $13.1 billion to $13.2 billion” Source: D-TR-Q2. Interpretation: this is the controlling current revenue anchor.
- **Duncan McKechnie, Chief Commercial Officer; ALYFTREK switching:** “The majority of ALYFTREK revenue continues to come from these TRIKAFTA switch patients, which reflects the benefits of ALYFTREK and our success establishing ALYFTREK as the new standard of care.” Source: D-TR-Q2. Interpretation: portfolio mix changes faster than total CF demand.
- **Duncan McKechnie, Chief Commercial Officer; CASGEVY funnel:** “There were more CASGEVY infusions in the first half of 2026 than in all of 2025.” Source: D-TR-Q2. Interpretation: infusion throughput is accelerating even though revenue recognition remains lumpy.
- **Duncan McKechnie, Chief Commercial Officer; JOURNAVX access:** “At this point, we have a total of 260 million lives covered out of a total possible of approximately 320 million.” Source: D-TR-Q2. Interpretation: remaining restrictions and PSP conversion, not just headline coverage, govern revenue realization.

- **Reshma Kewalramani, CEO; renal ambition:** “We view CF as a long-duration franchise with sustained growth. We continue to expect both CASGEVY and JOURNAVX to be multibillion-dollar assets and we anticipate our emerging renal franchise could one day rival CF in revenue.” Source: D-TR-Q2. Interpretation: this is aspiration, not a forecast; downstream scenarios must probability-weight clinical and commercial gates.

No formal investor day/CMD was found. The closest event was Kidney Week 2025; its static PDF timed out twice and had no verbatim transcript, so renal status uses D-TR-Q2 and ClinicalTrials.gov.

7. Capital allocation history

Year	Capex ($B)	Capex / revenue (%)	R&D ($B)	R&D / revenue (%)	Buybacks ($B)	Dividends ($B)	M&A cash ($B)	Source
FY2021	0.235	3.1	1.938	25.6	1.425	0.000	0.000	D-SEC-22K
FY2022	0.205	2.3	2.540	28.4	0.000	0.000	0.296	D-SEC-22K; ViaCyte net cash paid
FY2023	0.200	2.0	3.163	32.0	0.428	0.000	0.000	D-SEC-25K
FY2024	0.298	2.7	3.630	32.9	1.177	0.000	4.958	D-SEC-25K; Alpine total cash consideration
FY2025	0.438	3.6	3.910	32.6	2.017	0.000	0.000	D-SEC-25K

Acquired IPR&D expense was $1.113 billion, $0.116 billion, $0.527 billion, $4.628 billion and $0.133 billion in FY2021-FY2025, respectively, from D-SEC-22K and D-SEC-25K. This expense is separate from ordinary R&D above and explains much of FY2021 and FY2024 statutory margin volatility. FY2024 Alpine cash consideration was $4.9575 billion; $4.4232 billion of acquired IPR&D was allocated in the asset-acquisition accounting. TTM repurchases through 2026-06-30 were $2.006 billion, from the sealed QF official reconciliation.

8. Balance sheet snapshot — FY2025

Item	$B	Source
Cash and equivalents	5.085	D-SEC-25K; sealed QF controls restricted-cash presentation
Short-term investments	1.523	D-SEC-25K
Long-term marketable securities	5.712	D-SEC-25K
Total funded debt	0.000	D-SEC-25K; revolver undrawn; leases shown separately
Net debt / (net cash), including securities	(12.320)	Cash plus current and long-term securities less funded debt
Net debt / EBITDA	(2.81)x	Net cash divided by statutory OI plus D&A of $4.383B
Long-term lease liabilities	1.847	D-SEC-25K; not relabeled funded debt
Goodwill plus intangibles	1.512	D-FMP-BS; goodwill $1.088B plus intangibles $0.424B
Tangible book value	17.154	Equity $18.666B less goodwill/intangibles; D-FMP-BS

Net cash includes marketable securities; lease capitalization is separate.

9. Recent corporate actions — last 12 months

- **2026-07-06 — Crinetics agreement:** Vertex agreed to acquire Crinetics Pharmaceuticals, adding commercial PALSONIFY and Phase 3 endocrine assets; Q2 materials expected closing in Q3 2026. No closing filing appeared in the live SEC submissions file through the cutoff. Source: D-REL-Q2 and live `sec_submissions_d.json`.
- **2026-07-01 — CASGEVY pediatric expansion:** FDA expanded the U.S. indication to patients aged two years and older with eligible SCD or TDT, adding approximately 5,500 children according to Vertex. Source: D-FDA-C and D-REL-Q2.
- **2026-06-01 / Q2 update — povetacicept:** FDA accepted the IgAN BLA and assigned a 2026-11-30 PDUFA date. Source: D-REL-Q2.

- **2026-02-12 — capital return:** FY2025 results disclosed $2.017 billion of repurchases and a diluted share count of 258.0 million. H1 FY2026 repurchases were $0.806 billion; Q2 diluted shares were 255.2 million. Source: D-SEC-25K; D-SEC-Q2Q.

10. Open data gaps and classification

- **True non-disclosure — product profit:** Vertex reports no statutory operating profit, gross profit or cash flow by product/disease. Sources checked: D-SEC-25K segment note and statement footnotes; searches `segment`, `product profit`, `gross profit`, `operating income`. The sealed one-segment statutory basis is the correct governed response.
- **True non-disclosure — stable legacy-product series after FY2023:** KALYDECO, ORKAMBI and SYMDEKO/SYMKEVI are aggregated into Other product revenues after FY2023. Sources checked: D-SEC-25K and D-REL-Q3 through D-REL-Q2; searches exact brand names and `Other product revenues`.
- **True non-disclosure — product net price / gross-to-net:** Calls disclose covered lives, restrictions and PSP dynamics but not realized net price or rebate rate by product. Sources checked: four live transcripts; searches `gross-to-net`, `coverage`, `patient support`, `net price`.
- **True non-disclosure — exact ALYFTREK switch share:** Management says the majority of ALYFTREK revenue comes from TRIKAFTA switch patients but does not quantify the percentage. Sources checked: D-TR-Q3 through D-TR-Q2; searches `switch`, `transition`, `majority`.
- **True non-disclosure — complete current CASGEVY funnel:** Q2 says H1 infusions exceeded all FY2025 and initiations exceeded 100 for a third sequential quarter, but gives no complete H1 counts for initiations, collections and infusions. Sources checked: D-TR-Q2 and D-REL-Q2.
- **True non-disclosure — product-level inventory and margin:** FY2025 inventory and consolidated cost of sales are disclosed, but inventory and gross margin by product are not. Sources checked: D-SEC-25K; searches `inventory`, `cost of sales`, `gross margin`, product names.
- **Not fetched / omitted — formal investor-event deck archive:** No formal CMD was found. The closest Kidney Week 2025 investor-event PDF was visible via Vertex IR/web rendering, but direct static-file download timed out twice and no verbatim transcript was available. No number or quote in this package depends on it.
- **Not fetched / omitted — full patent-family and exclusivity register:** The 10-K projected-protection table is included with its pediatric-exclusivity, SPC and CASGEVY regulatory-exclusivity exceptions. Individual formulation/process patents, patent-term extensions and every country's regulatory-exclusivity date were not separately tabulated. Downstream terminal assumptions must stay inside this sourced projected-protection framework or fetch a dedicated patent package.
- **Estimated — ROIC:** Section 2 ROIC uses a disclosed formula, normalized 21% tax and FMP invested-capital fields. It is an analytical diagnostic, not issuer-reported ROIC.
- **Not applicable — dividends:** Vertex paid no common dividends in the five-year history reviewed.
- **Taxonomy flag — FMP:** FY2025 FMP revenue is $73.3 million above the filing and operating income is $587.4 million above the filing; H1 FY2026 product data omit $197.9 million of CASGEVY/JOURNAVX; FY2025 geography categories overlap. All controlling tables use filing values and make the vendor discrepancies visible.

The statutory bridge has no open classification, arithmetic or provenance gap. No evidence is fabricated, no lightweight note is labeled Production ER2, and this package grants no trade, broker, ranking, sizing, portfolio, message, BUY-queue or memo-publication authority. `trade_execution_authorized=false`.