October 26, 2016

OUTPERFORM

Reason for report:

EARNINGS

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LEERINK

VERTEX PHARMACEUTICALS INCORPORATED

Hedging Triple Combo Bets w/ Many Shots on Goal, Uncertain Safety Limits Upside

• **Bottom Line: Yesterday afternoon Vertex reported Q3 results and, more importantly, disclosed their long anticipated phase II development plans for their "triple" combination for the treatment of cystic fibrosis (CF).** Their operating performance was just under consensus (-1%) and our estimate (-2%) for revenue and was $0.02 below consensus (-9%) and $0.01 under our estimate for earnings (-6%). These results were largely in line with expectations, which had previously been lowered following the company's disclosure in September that US Orkambi sales had faltered during the summer (Another Disclosure Fumble; Weak Orkambi Trend Could Persist but Catalysts Loom). The company maintained their guidance for the year and indicated that they have wide boundaries for revenue results for 2017 depending on the progress of reimbursement negotiations for Orkambi in many ex-US markets. The company's phase II plan disclosure was positive at first, but will have left investors with questions about the quality of the company's first couple of "shots on goal" for their triple.

• **Next Generation Corrector Safety Concerns Overhangs Phase II Triple Trials.** The company's triple development plans initially seemed straightforward and encouraging but became increasing more complicated during the conference call. Management announced that both drugs in phase Ia would advance to phase II, in both het-mins and homozygous delF508's, in similar two-part triple combination trials. In explaining why they had chosen a multi-part format for each triple drug program, management disclosed that one of the two drugs had been associated with significant GI adverse events (Vx152) at the higher doses tested in phase Ia, while the other drug was associated with significant teratogenicity risks from pre-clinical studies (Vx440), thus restricting its use in women to those on "pre-specified, non-hormonal" contraception. This compound appears to be complicated by the occurrence of liver enzyme induction, which impairs the effectiveness of hormonal contraception, and presumably also has drug-drug interaction issues with other medicines also prescribed to CF patients.

• **Two Additional Next Generation Correctors Also Announced.** Along with their announcement about the parallel phase II trials in both het-min and delF508 homozygous CF patients, management also disclosed the development of a 3rd "next gen" CF corrector (Vx659) that is being studied in a combined phase Ia/Ib trial (in a triple combination) in both healthy subjects and delF508/minimum function patients. The company described this next generation corrector as having greater *in-vitro* potency than either Vx440 or Vx152 and as being "only six months behind."

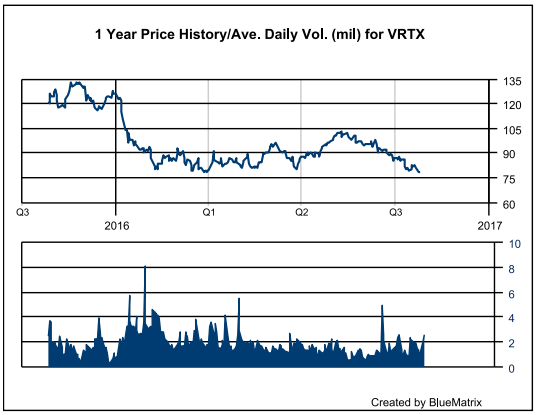
Key Stats:	**(NASDAQ :VRTX)**
Sector:	**Biotechnology**
S&P 500 Health Care Index:	**801.86**
Price :	**$78.71**
Price Target:	$111.00 from $112.00
Methodology:	Avg. of 18x '18E EPS, 7.1X '20E revs disc., DCF at 9.1% WACC and 3% TG
52 Week High:	$134.71
52 Week Low:	$75.90
Shares Outstanding (mil):	246.4
Market Capitalization (mil):	$19,394.1
Book Value/Share:	$3.78
Cash Per Share:	$4.34
Net Debt to Total Capital:	(194)%
Dividend (ann):	$0.00
Dividend Yield:	0.0%
Est LT EPS Growth:	67%
P/E to LT EPS Growth (FY17):	0.54

Completion: October 26, 2016, 6:21AM EDT.
Distribution: October 26, 2016, 6:21AM EDT.
Est LT EPS Growth: '16-'20E

Dec Yr	1Q	2Q	3Q	4Q	FY Rev	1Q	2Q	3Q	4Q	FY EPS	P/E
2015A	$135.4	$159.9	$302.3	$410.0	$1,008.0	($0.62)	($0.54)	($0.13)	$0.17	($1.11)	NM
2016E - New	**$397.2A**	**$431.5A**	**$413.5A**	**$452.9**	**$1,695.2**	**$0.09A**	**$0.24A**	**$0.16A**	**$0.40**	**$0.88**	**89.4x**
2016E - Old	$397.2A	$431.5A	$421.6	$505.0	$1,755.3	$0.09A	$0.24A	$0.17	$0.41	$0.91	NM
2017E - New	**--**	**--**	**--**	**--**	**$2,137.6**	**--**	**--**	**--**	**--**	**$2.17**	**36.3x**
2017E - Old	--	--	--	--	$2,258.5	--	--	--	--	$2.72	NM

Source: Company Information and Leerink Partners LLC Research
Revenues in millions.

• This is hard to understand given the one-year timeline required for the completion of the phase Ia trials for Vx440 and Vx152, and suggests that Vx659 might be on the "fast track" designed to catch up with Vx440 and Vx152 – presuming it has a more favorable pre-clinical profile than its predecessors. The company also announced a fourth next-generation corrector it plans to advance into clinical development in 2017.



• **2017 Should Still be Banner Year for Company & Stock.** Overall investors are likely to be relieved by the stabilization of Vertex's operating results and encouraged by the progress of their triple combinations. This enthusiasm, and the stock's reaction, is likely to be tempered by the safety and tolerability concerns, and by the company's apparent hedging against development risks with multiple 2nd generation candidates progressing. Next year is shaping up to be a momentous one for news from the company's CF pipeline, and the operating results are likely to improve significantly as well, assuming some relief from their negotiations for Orkambi reimbursement with ex-US payers. There is likely to be further disclosure about Vertex's development program and the profiles of Vx440 and Vx152 at this week's North American Cystic Fibrosis Conference (NACFC) in Orlando. Beyond this conference, the company is likely to announce the results for their ongoing phase III efficacy trial of Orkambi in children ages 6-11 in Europe, and may have incremental disclosures about the regulatory process for the loss of function mutation patients in the US, and about reimbursement in Europe for Orkambi. They are likely to disclose their financial guidance for 2017 early January, and should also provide more information about these trials, and the drugs' profiles and limitations, at that time. 1H 2017 should bring phase III results for Vx661 (now tezacaftor) which we expect to be superior to Orkambi; at this stage the company appears to be "all in" on tezacaftor, with no comparison arms to Orkambi, nor any combinations with Orkambi in the triple combination program. Any stumble for tezacaftor would now have catastrophic implications for the outlook for the triple combination, and we can only presume that Vertex has reached very high levels of conviction about the safety, efficacy and PK/PD/ADME characteristics of Vx661 to make this commitment.

• **Reducing Near-Term Performance Following Guidance; Maintaining OP Rating, Lowering PT to $111.** Based on these results, we are making several adjustments to our company and CF models. We are reducing our forecasts for Kalydeco revenue 4-9% 2016-2017 and by 3-4% 2018-2020 based on management disclosures that growth will remain flat pending an indication expansion to include residual function patients. We have similarly lowered our Orkambi forecasts 3-5% 2016-2019 but are maintaining our prior 2020 estimate. We are maintaining our risk adjustment for the tezacaftor double at 75%, but increasing our PoS for the triple from 15% to 25%. Near-term our revenue forecast declines 3-5% 2016-2019 relative to our prior projections but is +6% in 2020. We are now in-line with recent consensus (which will likely be reduced) for 2016, but are -6% in 2017, +13% in 2018, +24% in 2019, and +16% in 2020. Given management's comments, we have reduced our operating expenses 3% in 2016 but increased it 2-8% 2017-2020. Our proforma EPS declines 3% in 2016, -20% in 2017, -13% in 2018, -3% in 2019, but is +4% in 2020. We are now 8% above recent consensus in 2016, -15% in 2017, +25% in 2018, +33% in 2019, and +23% in 2020. We are lowering our target price from $112 to $111 and are reiterating our Outperform rating.

INVESTMENT THESIS

Our price target for Vertex (VRTX) is $111 and we rate the stock Outperform. Our thesis is based on our expectation of continued capture of cystic fibrosis (CF) patient sub-populations by Vertex with its successive iterations of CF modulating oral combination medicines. We expect that Vertex's CF revenue line will grow steadily from ~$1bn in 2015 to $3.5bn by 2018E. Should its development programs all succeed, revenue could be even higher after we remove our probability of success discounting. While we consider competitors in our forecasts and valuation, we believe their development path and time to market are challenging and Vertex is well positioned to partner with or acquire any that show promise. After flirting with profitability in the past, Vertex seems determined to maintain its recently recovered profitability and appears capable of growing its operating margins to ~30% by the end of 2016 and better than 40% by the end of 2017 and beyond. The company still aspires to discover and develop drugs in other categories, and large diversifying investments and associated expenses are a risk to our thesis and valuation. However, with the potential for sizable near-term growth, the stock offers strong valuation upside potential in the next 12-18 months.

VALUATION

Our price target for Vertex (VRTX) is based on a simple average of three approaches that we believe are a reasonable basis for valuing the stock today. These approaches are simple price to earnings multiples for large cap small molecule biopharmaceutical companies; price to sales multiples for mid and large cap biopharmaceutical companies, and discounted cash flow (DCF). Using an average small molecule biopharma (LLY, MRK, PFE, BIIB, CELG, MDVN) earnings multiple on 2017E EPS of 15.4x, applied to our current 2019 EPS estimate (pre-triple launch) for VRTX of $7.67, gives a value of $108 in 2017. Using a revenue multiple for biopharmaceutical companies (CELG, REGN, ALXN) of 6.6x 2017 consensus sales, applied to our 2020 revenue estimate for VRTX of $4.5bn, gives a 2017 value of $108. Lastly, our DCF valuation given a 9.1% WACC and a terminal cash flow growth rate of 3% gives a present value of $117. The average of these three methods is our current target price of $111.

RISKS TO VALUATION

The risks to our view, outlook, and valuation for Vertex include any major change in the price or reimbursement coverage, labeling, or competitive position for Kalydeco and Orkambi, the company's main products today. The other major risk is any disappointment, delay or failure in the company's development of its next generation CF corrector, Vx661, or of the company's much-anticipated dual-corrector/potentiator triple combination program. Other risks include accelerated or successful development of alternative modulators of CFTR, or alternative approaches to treating CF, such as gene therapy. Finally, the company has a history of spending much of its potential earnings, and expensive diversifying acquisitions could undermine the future expected value of the company's CF portfolio.

Opportunities for better-than-expected performance include realization of significant revenue from the company's current CF dual combination in markets outside the US, as well as accelerated clinical development of a viable triple combination regimen.

	Leerink Forecast		Consensus Mean		Reported Actual			Comparison			
								3Q 2015	YoY Growth	2Q 2016	QoQ Growth
Product Sales		YoY Growth		YoY Growth		% vs Leerink	% vs Consensus				
Kalydeco	$185	*11%*	$180	*8%*	$176	*(5%)*	*(2%)*	$166	*6%*	$180	*(2%)*
US	$102	*8%*	$102	*8%*	$101	*(1%)*	*(1%)*	$95	*7%*	$103	*(2%)*
ROW	$82	*15%*	$78	*9%*	$75	*(9%)*	*(4%)*	$71	*5%*	$77	*(3%)*
Orkambi	$233	*78%*	$239	*83%*	$234	*1%*	*(2%)*	$131	*79%*	$245	*(4%)*
US	$214	*63%*	$222	*70%*	$211	*(1%)*	*(5%)*	$131	*61%*	$229	*(8%)*
ROW	$19	*NA*	$21	*NA*	$23	*20%*	*8%*	-	*NA*	-	*NA*
Total Revenue (non-GAAP)	**$422**	***39%***	**$419**	***39%***	**$414**	***(2%)***	***(1%)***	**$302**	***37%***	**$432**	***(4%)***
Expenses											
Cost of sales (non-GAAP)	$46	39%	$47	*40%*	$54	*16%*	*15%*	$34	*61%*	$45	*20%*
Gross Margin	*89%*		*89%*		*87%*			*89%*		*90%*	
R&D (non-GAAP)	$220	9%	$215	*7%*	$214	*(3%)*	*(0%)*	$202	*6%*	$218	*(2%)*
% Sales	*52%*		*51%*		*52%*			*67%*		*50%*	
SG&A (non-GAAP)	$88	16%	$87	*15%*	$84	*(4%)*	*(4%)*	$76	*10%*	$89	*(5%)*
% Sales	*21%*		*21%*		*20%*			*25%*		*21%*	
Total Expenses	$354	*14%*	$349	*12%*	$352	*(1%)*	*1%*	$311	*13%*	$352	*0%*
Total operating income (EBIT)	$67	*(857%)*	$70	*(888%)*	$61	*(9%)*	*(13%)*	($9)	*(790%)*	$80	*(23%)*
Operating Margin	*16%*		*17%*		*15%*			*(3%)*		*19%*	
Non-GAAP interest expense, other, net	($21)	*(6%)*	($20)	*(9%)*	($20)	*(4%)*	*(0%)*	($22)	*(9%)*	($21)	*(5%)*
Pre-tax income	$46	*(248%)*	$50	*(259%)*	$41.1	*(11%)*	*(18%)*	($31)	*(231%)*	$59	*(30%)*
Taxes Paid	$3.7	*570%*	$1.5	*177%*	($1)	*(127%)*	*(166%)*	$0.6	*(283%)*	$0.6	*(263%)*
Tax Rate	*8%*		*3%*		*-2%*			*(2%)*		*1%*	
Non-GAAP Net income	**$43**	***(233%)***	**$44**	***(237%)***	**$40**	***(6%)***	***(9%)***	**($32)**	***(226%)***	**$58**	***(31%)***
Net margin	*10%*		*10%*		*10%*			*(11%)*		*13%*	
Non-GAAP Diluted EPS (basic)	$0.17	*(232%)*	*n.d.*	*N/A*		*(100%)*	*N/A*	($0.13)	*(100%)*	$0.24	*(100%)*
Non-GAAP Diluted EPS (diluted)	**$0.17**	***(230%)***	**$0.18**	***(235%)***	**$0.16**	***(6%)***	***(9%)***	**($0.13)**	***(223%)***	**$0.24**	***(31%)***
GAAP Diluted EPS	($0.06)	*(84%)*	($0.09)	*(78%)*	($0.17)	*169%*	*94%*	($0.39)	*(57%)*	($0.26)	*(35%)*
Share Count for Period Basic	245,333	*1%*	n.d.	*N/A*	244,920	*(0%)*	*N/A*	241,969	*1%*	244,482	*0%*
Share Count for Period Diluted	248,608	*3%*	246,328	*2%*	248,009	*(0%)*	*1%*	241,969	*2%*	246,426	*1%*

Source: Leerink Partners Research, Company Filings, Zack's Consensus

VRTX Guidance for 2016	Initial VRTX Guidance (1/27/16)	Updated VRTX Guidance (4/27/16)	Updated VRTX Guidance (7/27/16)	Updated VRTX Guidance (10/25/16)	Revised Leerink Partners estimate	Initial Leerink Partners estimate	Recent Consensus
Kalyedo Revenue	$670-690mm	$685-705mm	$685-705mm	$685-705mm	$703mm	$731mm	$711mm
Orkambi Revenue	n.d.	$1,000-$1,100mm	$1,000-$1,100mm	$950-$990mm	$976mm	$1,007mm	$987mm
Non-GAAP R&D	$850-880mm	--	--	--	$844mm	$879mm	$869mm
Non-GAAP SG&A	$330-350mm	--	--	--	$338mm	$354mm	$349mm
Combined Non-GAAP SG&A, R&D	$1,180-$1,230mm	$1,180-$1,230mm	$1,180-$1,230mm	$1,180-$1,230mm	$1,182mm	$1,434mm	$1,414mm

Source: Leerink Partners Research, Company Filings, Zack's Consensus

Drug	Indication	Trial	Timing for Results	Leerink Expected Outcome
Orkambi	Children homozygous delF508	Full Ph 3 data at NACFC Oct 27-29 in Florida	10/27/16-10/29/16	Neutral
Vx371 - ENaC Inhibitor	Adults heterozygous del F508 with non function second allelle	Phase II trial results	H2 2016	Uncertain
Kalydeco	Rare heterozygous class III gating mutations (1500 in US)	Rare gating mutations approval	H2 2016	Positive
Vx150	OA of the knee	Phase II trial results	H2 2016	Uncertain
Orkambi	Children (6-11) homozygous delF508	Phase III efficacy trial (for EU approval)	Q4 2016	Positive
Vx970	Triple negative breast cancer, NSCLC	Phase Ib trial resutls	Q4 2016	Uncertain
Vx440 (+ivacaftor/Vx661)	CF patients +18 yrs, 2 parts A: delF508/ minimal function B: delF508/delF508	Phase II initiation	Q4 2016	Uncertain
Vx152 (+ivacaftor/Vx661)	CF patients +18 yrs, 2 parts A: delF508/ minimal function B: delF508/delF508	Phase II initiation	Q4 2016	Uncertain
Vx659 (+ivacaftor/Vx661)	Healthy volunteers (with arm to evaluate delF508/ minimal function CF patients)	Phase I initiation	Q4 2016	Uncertain
Vx661	Patients +12 yrs, delF508/ gating	Phase III enrollment	Q1 2017	Positive
Vx661	Patients +12 yrs, homozygous delF508	Enrollment completed; Phase III trial results	H1 2017	Positive
Vx661	Patients +12 yrs, delF508/ residual function	Enrollment completed; Phase III trial results	H1 2017	Positive
Vx803	Oncology	Phase I safety trial results	H1 2017	Uncertain
Vx970	Small cell lung, peritoneal, ovarian, urothelial, head & neck	Phase II trial results	2017	Uncertain
Vx661	Multiple	NDA regulatory submission	H2 2017	Positive
Vx440 (+ivacaftor/Vx661)	CF patients +18 yrs A: delF508/ minimal function B: delF508/delF508	Phase II A & B results	H2 2017	Uncertain
Vx152 (+ivacaftor/Vx661)	CF patients +18 yrs, 2 parts A: delF508/ minimal function B: delF508/delF508	Phase II A & B results	H2 2017	Uncertain
Vx659 (+ivacaftor/Vx661)	ivacaftor/Vx661 triple in tbd CF patients	Phase II results	H2 2017	Uncertain
Vx371 + Orkambi	Homozygous del F508/het min delF508	Phase II trial results	H2 2017	Positive

Source: Leerink Partners Research, Company Reports and Presentations, clinicaltrials.gov

	2015A	2016E	2017E	2018E	2019E	2020E	CAGR
	FY	FY	FY	FY	FY	FY	'16-20
Kadyelco US Sales							
New		$398	$445	$520	$475	$400	*0%*
Old	$378	$409	$500	$560	$510	$420	*1%*
Change		($11)	($55)	($40)	($35)	($20)	
% Change		*(3%)*	*(11%)*	*(7%)*	*(7%)*	*(5%)*	
Kadyelco OUS Sales							
New		$305	$335	$410	$425	$380	*6%*
Old	$254	$322	$360	$410	$425	$380	*4%*
Change		($17)	($25)	$0	$0	$0	
% Change		*(5%)*	*(7%)*	*0%*	*0%*	*0%*	
Kadyelco Total							
New		$703	$780	$930	$900	$780	*3%*
Old	$632	$731	$860	$970	$935	$800	*2%*
Change		($28)	($80)	($40)	($35)	($20)	
% Change		*(4%)*	*(9%)*	*(4%)*	*(4%)*	*(3%)*	
Orkambi, US							
New		$900	$1,200	$1,352	$1,343	$1,215	*8%*
Old	$351	$940	$1,240	$1,437	$1,422	$1,215	*7%*
Change		($40)	($40)	($85)	($79)	$0	
% Change		*(4%)*	*(3%)*	*(6%)*	*(6%)*	*0%*	
Orkambi, OUS							
New		$76	$132	$278	$405	$551	*64%*
Old	$0	$67	$132	$278	$405	$551	*69%*
Change		$8	$0	$0	$0	$0	
% Change		*12%*	*0%*	*0%*	*0%*	*0%*	
Orkambi, Total							
New		$976	$1,332	$1,630	$1,748	$1,766	*16%*
Old	$354	$1,007	$1,372	$1,714	$1,827	$1,766	*15%*
Change		($32)	($40)	($85)	($79)	$0	
% Change		*(3%)*	*(3%)*	*(5%)*	*(4%)*	*0%*	
Vx661 Double, Total							
New		-	$0	$648	$1,791	$1,629	*NA*
Old	-	-	$0	$648	$1,791	$1,629	*NA*
Change		-	$0	$0	$0	$0	
% Change		-	-	*0%*	*0%*	*0%*	
Vx661 Triple, Total							
New		-	$0	$0	$0	$680	*NA*
Old	-	-	$0	$0	$0	$400	*NA*
Change		-	$0	$0	$0	$280	
% Change						*70%*	
Total Revenue							
New		**$1,695**	**$2,138**	**$3,220**	**$4,450**	**$4,866**	*30%*
Old	$1,008	$1,755	$2,259	$3,345	$4,565	$4,606	*27%*
Change		($60)	($121)	($125)	($114)	$260	
% Change		*(3%)*	*(5%)*	*(4%)*	*(3%)*	*6%*	
% Growth		*68%*	*26%*	*51%*	*38%*	*9%*	
Recent Consensus		$1,713	$2,276	$2,857	$3,601	$4,202	*25%*
% Difference		*(1%)*	*(6%)*	*13%*	*24%*	*16%*	

Source: Leerink Partners Research, Company Filings, Zack's and FactSet Consensus

	2015A	2016E	2017E	2018E	2019E	2020E	CAGR
	FY	FY	FY	FY	FY	FY	'16-20
COGS							
New		$203	$270	$402	$559	$608	*32%*
Old	$125	$201	$276	$411	$569	$575	*30%*
Change		$2	($6)	($9)	($10)	$33	
% Change		*1%*	*(2%)*	*(2%)*	*(2%)*	*6%*	
R&D							
New		$844	$863	$845	$979	$982	*4%*
Old	$764	$879	$811	$773	$958	$919	*1%*
Change		($35)	$51	$71	$21	$63	
% Change		*(4%)*	*6%*	*9%*	*2%*	*7%*	
SG&A							
New		$338	$337	$372	$474	$492	*10%*
Old	$295	$354	$353	$335	$445	$443	*6%*
Change		($17)	($16)	$37	$29	$49	
% Change		*(5%)*	*(5%)*	*11%*	*7%*	*11%*	
Operating Expenses							
New		$1,384	$1,469	$1,619	$2,012	$2,083	*11%*
Old	$1,185	$1,434	$1,440	$1,519	$1,972	$1,937	*8%*
Change		($50)	$29	$100	$40	$146	
% Change		*(3%)*	*2%*	*7%*	*2%*	*8%*	
EBIT							
New		$311	$669	$1,601	$2,439	$2,783	*73%*
Old	($177)	$321	$818	$1,825	$2,593	$2,669	*70%*
Change		($10)	($150)	($225)	($154)	$114	
% Change		*(3%)*	*(18%)*	*(12%)*	*(6%)*	*4%*	
EBIT Margin							
New		18.3%	31.3%	49.7%	54.8%	57.2%	*33%*
Old	(17.6%)	18.3%	36.2%	54.6%	56.8%	57.9%	*33%*
Change		0%	(5%)	(5%)	(2%)	(1%)	
Pre-Tax Income							
New		$232	$592	$1,532	$2,379	$2,735	*85%*
Old	($268)	$241	$742	$1,759	$2,537	$2,626	*82%*
Change		($9)	($150)	($227)	($158)	$109	
% Change		*(4%)*	*(20%)*	*(13%)*	*(6%)*	*4%*	
Tax Rate							
New		5.5%	8.0%	8.0%	17.1%	20.0%	*38%*
Old	0.2%	6.5%	8.0%	8.0%	20.0%	20.0%	*32%*
Change		(1%)	0%	0%	(3%)	0%	
Proforma EPS, diluted							
New		**$0.88**	**$2.17**	**$5.55**	**$7.67**	**$8.42**	*76%*
Old	($1.11)	$0.91	$2.72	$6.36	$7.88	$8.07	*73%*
Change		($0.02)	($0.55)	($0.81)	($0.21)	$0.35	
% Change		*(3%)*	*(20%)*	*(13%)*	*(3%)*	*4%*	
% Growth		*(180%)*	*145%*	*156%*	*38%*	*10%*	
Recent Consensus		$0.82	$2.55	$4.44	$5.78	$6.88	*70%*
% Difference		*8%*	*(15%)*	*25%*	*33%*	*23%*	
GAAP EPS, diluted							
New		($0.44)	$1.16	$4.48	$6.53	$7.20	*NA*
Old	($2.31)	($0.32)	$1.71	$5.29	$6.74	$6.85	*NA*
Change		($0.12)	($0.55)	($0.81)	($0.21)	$0.35	
% Change		*27%*	*(47%)*	*(18%)*	*(3%)*	*5%*	
% Growth		*(81%)*	*(366%)*	*285%*	*46%*	*10%*	
Share Count (diluted)							
New		248.0	251.1	254.1	257.0	259.7	*1%*
Old	241.3	248.2	251.5	254.6	257.4	260.2	*1%*
Change		(0.2)	(0.4)	(0.4)	(0.4)	(0.4)	

Source: Leerink Partners Research, Company Filings, Zack's and FactSet Consensus

	Late Stage Pipeline Programs Included in Current Model (POS%)	Late Stage Pipeline Programs Excluded from Current Model (Upside Options)
Phase II/III Programs Only		
Vertex	Vx661 (75%), Triple (25%)	Vx371 (Parion), Oncology Programs, Pain Programs

Source: Leerink Partners Research, Company Filings

Leerink Vertex Revenue Forecast ($ in millions)	**2015A**	**1Q16A**	**2Q16A**	**3Q16A**	**4Q16E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**
Non-Product Sales Revenue										
Non-Product Sales Revenue	19	4	7	4	3	16	14	12	11	11
Product Sales (all POS adjusted)										
Kalydeco monotherapy	632	171	180	176	177	703	780	930	900	780
Orkambi (Vx809/Kalydeco)	351	223	245	234	274	976	1,344	1,630	1,748	1,766
Combo Vx661/Kalydeco (2017 approval/2018 full year sales)	-	-	-	-	-	-	-	648	1,791	1,629
Triple Combination of Kalydeco, Vx661, second corrector (2020 full year	-	-	-	-	-	-	-	-	-	680
Total Product Sales (booked by VRTX)	988	394	425	410	450	1,679	2,124	3,208	4,439	4,855
Total Revenues (Non-GAAP)	1,008	397	432	413.5	452.9	1,695.2	2,137.6	3,220	4,450	4,866
ANNUAL GROWTH										
Non-Product Sales Revenue										
Non-Product Sales Revenue	-73%	-32%	-29%	-25%	-23%	-16%	-17%	-11%	-7%	-4%
Product Sales (all POS adjusted)										
Kalydeco monotherapy	36%	31%	16%	6%	-2%	11%	11%	19%	-3%	-13%
Orkambi	0%	0%	0%	79%	24%	178%	38%	21%	7%	1%
Combo Vx661/Kalydeco	0%	0%	0%	0%	0%	0%	0%	0%	176%	-9%
Triple Combination	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Total Product Sales (booked by VRTX)	113%	202%	174%	38%	11%	70%	27%	51%	38%	9%
Total Revenues (Non-GAAP)	88%	193%	170%	37%	10%	68%	26%	51%	38%	9%

Source: Leerink Partners Research and Company Filings

Leerink Vertex Income Statement Model										
($ in millions)	**2015A**	**1Q16A**	**2Q16A**	**3Q16A**	**4Q16E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**
Revenues:										
Product sales (direct product sales by Vertex)	$988	$394	$425	$410	$450	$1,679	$2,124	$3,208	$4,439	$4,855
Other revenue (includes royalties, milestones)	$19	$4	$7	$4	$3	$16	$14	$12	$11	$11
Total revenues	**$1,008**	**$397**	**$432**	**$414**	**$453**	**$1,695**	**$2,138**	**$3,220**	**$4,450**	**$4,866**
Expenses:										
Cost of sales	$125	$51	$45	$54	$53	$203	$270	$402	$559	$608
R&D	$764	$222	$218	$214	$190	$844	$863	$845	$979	$982
SG&A	$295	$84	$89	$84	$82	$338	$337	$372	$474	$492
Profit share	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other expenses	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total expenses	$1,185	$356	$352	$352	$325	$1,384	$1,469	$1,619	$2,012	$2,083
Operating income (EBIT)	($177)	$41	$80	$61	$128	$311	$669	$1,601	$2,439	$2,783
Nonoperating income (interest), net	($91)	($16)	($21)	($20)	($21)	($79)	($77)	($69)	($60)	($48)
Pre-tax income	($268)	$25	$59	$41	$107	$232	$592	$1,532	$2,379	$2,735
Tax (incl. NOL adjustment)	($1)	$2	$1	$1	$9	$13	$47	$123	$406	$547
Pro Forma Earnings (Excluding Options Expense):										
Net income	**($268)**	**$22**	**$58**	**$40**	**$99**	**$219**	**$544**	**$1,410**	**$1,973**	**$2,188**
Earnings per share (basic):	**($1.11)**	**$0.09**	**$0.24**	**$0.16**	**$0.40**	**$0.90**	**$2.20**	**$5.62**	**$7.78**	**$8.54**
Earnings per share (diluted, *excluding option expense*)	**($1.11)**	**$0.09**	**$0.24**	**$0.16**	**$0.40**	**$0.88**	**$2.17**	**$5.55**	**$7.67**	**$8.42**
Weighted ave. shares (basic):	241	244	244	245	246	245	248	251	254	256
Weighted ave. shares (diluted):	242					248	251	254	257	260
MARGIN ANALYSIS:										
Gross margin (1-COGS/total revenue)	88%	87%	90%	87%	88%	88%	87%	88%	87%	87%
R&D to total revenue	76%	56%	50%	52%	42%	50%	40%	26%	22%	20%
SG&A to total revenue	29%	21%	21%	20%	18%	20%	16%	12%	11%	10%
Operating margin (EBIT/total revenue)	-18%	10%	19%	15%	28%	18%	31%	50%	55%	57%
Effective tax rate	0%	10%	1%	2%	8%	5%	8%	8%	17%	20%
Net margin (net income/total revenue)	-27%	6%	13%	10%	22%	13%	25%	44%	44%	45%
ANNUAL GROWTH										
Total revenues	88%	193%	170%	37%	10%	68%	26%	51%	38%	9%
EPS (diluted)	-49%	-115%	-143%	-223%	126%	-180%	145%	156%	38%	10%

Source: Leerink Partners Research and Company Filings

Analysis of Stock Price and Leerink Target for Vertex Pharmaceuticals

Method 1 - Large* -Cap Healthcare *EPS Multiple on 2019 VRTX Normalized Earnings	
Current Average Growth **Large Cap** Growth Biopharma Multiple of 2017 EPS (ALXN, REGN, CELG, AMGN, BIIB)	15.4x
Leerink EPS for VRTX (2019)	$7.67
Implied Price for 2018 on 2019 EPS (using current consensus high growth large cap multiple of 2017	**$118**
Cost of Equity	**9.0%**
Number of Periods (2018-2017)	1
Implied One Year Target Price by approach	**$108**
Method 2 - Discounted Future Value of Normalized Revenue Using Mid and Large Cap Biotech Comparables	
Average Growth Large Cap and Mid Cap Biotech Price-to-Revenue Multiple of 2017 Sales (CELG, REGN, ALXN)	6.6x
Vertex 2019 Recurring Revenue ($mm)	$4,450
Implied Vertex Enterprise Value in 2018 on 2019 Sales Est ($mm)	$29,183
Net Cash in q1 2018	$1,248
Implied Vertex Equity Value in 2018 ($mm)	$30,431
Cost of Equity	9.0%
Number of Periods (2017)	1
Implied Vertex Value in 2017 ($mm)	$28,043
Anticipated Share Count in 2017 (mm)	249
Implied One Year Target Price by approach	**$108**
Method 3 - DCF Based on Current Products and POS Adjusted Outlook for CF Franchise Only Using 9% WACC and 3% terminal cash flow growth rate	
Present Value of Late Stage and Marketed Product Cash Flows	$28,105
Cash Net of Debt mid 2017	$1,193
Total Value	$29,298
Shares Mid 2017	251
Implied One Year Target Price	**$117**
Average of Methods	**$111**
Leerink Target Price	**$111**

Source: Leerink Partners Research and Company Filings, Factset

Disclosures Appendix

Analyst Certification

I, Geoffrey C. Porges, MBBS, certify that the views expressed in this report accurately reflect my views and that no part of my compensation was, is, or will be directly related to the specific recommendation or views contained in this report.

Distribution of Ratings/Investment Banking Services (IB) as of 09/30/16

Rating	Count	Percent	IB Serv./Past 12 Mos. Count	IB Serv./Past 12 Mos. Percent
BUY [OP]	115	66.1	26	22.6
HOLD [MP]	59	33.9	3	5.1
SELL [UP]	0	0.0	0	0.0

Explanation of Ratings

Outperform (Buy): We expect this stock to outperform its benchmark over the next 12 months.

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Underperform (Sell): We expect this stock to underperform its benchmark over the next 12 months.The degree of outperformance or underperformance required to warrant an Outperform or an Underperform rating should be commensurate with the risk profile of the company.

For the purposes of these definitions the relevant benchmark will be the S&P 600® Health Care Index for issuers with a market capitalization of less than $2 billion and the S&P 500® Health Care Index for issuers with a market capitalization over $2 billion.

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