Vertex Pharmaceuticals Inc. (VRTX)
Rating: Neutral

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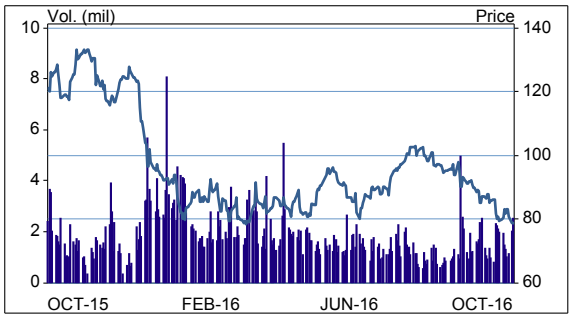
The Spaghetti's on the Wall

Stock Data	10/25/2016
Price	$78.71
Exchange	NASDAQ
Price Target	$85.00
52-Week High	$143.45
52-Week Low	$75.90
Enterprise Value (M)	$20,897
Market Cap (M)	$19,503
Public Market Float (M)	244.9
Shares Outstanding (M)	247.8
3 Month Avg Volume	1,432,260
Short Interest (M)	6.46
Balance Sheet Metrics	
Cash (M)	$1,128.44
Total Debt (M)	$820.60
Total Cash/Share	$4.55

EPS Diluted			
Full Year - Dec	2015A	2016E	2017E
1Q	(0.83)	(0.17)A	--
2Q	(0.78)	(0.26)A	--
3Q	(0.39)	(0.17)A	--
4Q	(0.31)	(0.11)	--
FY	(2.31)	(0.72)	0.82

Revenue ($M) Diluted			
Full Year - Dec	2015A	2016E	2017E
1Q	138.5	398.1A	--
2Q	166.1	431.7A	--
3Q	309.8	413.7A	--
4Q	418.0	437.2	--
FY	1,032.4	1,679.9	2,240.9



A portfolio strategy would be an easier pitch with clean second generation correctors. Yesterday, VRTX finally laid out a development plan for its triple combo, consisting of a base of 661/770 and the second generation correctors 440 and 152. Based on preclinical and early clinical data shared by management on the quarterly call, both new compounds appear to have non-negligible tox, in our view (see below). In our recent downgrade, we had warned investors that a safety discount must be applied to a triple combo just based on the polypharmacy factor. However, even we had not anticipated that the new correctors themselves could have a problematic safety profile to begin with. Additionally, the development strategy itself sounds rushed to us, with what we view as short and inadequate Phase 2 testing before the planned Phase 3 (especially in the light of the tox; see below). Overall, we are surprised that VRTX is choosing to advance either compound at all, but then again we believe that the company's options at this time are limited in the face of heated competition. With at least two other triple programs promised by competitors, and in light of the underwhelming commercial performance (Orkambi guidance lowered in September, while Kalydeco missed consensus in 3Q; see below), we believe that the only play for VRTX was to start throwing correctors towards a triple combo and see what sticks, independently of whether they are fully cooked or not. Overall, we believe that the impact factor of the announcement of the triple combo plan is diminished by the profile of the agents and the designed trials, and do not view it as a positive. If previously the advance towards a triple combo was the assumed status quo (and as such, should have not held any upside), we believe that things may have got just slightly worse. While we wait for additional granularity on the preclinical and clinical profile of the company's new agents, and clarity on the triple plans of the competition, at this time we stand by with our Neutral rating and $85 PT.

(continued on next page)

You know there's a problem when a teratogen is pitched as the agent with the wider therapeutic window. While the advance of a triple combo program was to be expected, and as such should not offer upside to shares at this time, there were disclosures on yesterday's call which we regard as very problematic. The second generation corrector 440 will require concurrent contraception (based on evidence of teratogenicity in rabbits, as per management), and its patient population should exclude the G6PD deficient (not a large fraction of CF patients, yet another sign of a suboptimal choice of compound). Meanwhile, based on the call, 152 appears to have a narrower therapeutic window, with GI symptoms such as nausea and vomiting appearing at higher doses. Importantly, we highlight that these problems at this time relate to just monotherapy with the new correctors. We do not know yet know if and how these problem may be compounded from the polypharmacy of a triple cocktail, or if new problems may emerge due to any interaction (in our downgrade we warned that a safety discount should be applied to a triple cocktail). Meanwhile, the company shared the ion transport profile of a third generation corrector 659, which outperforms 440 and 152 when added to 661/770 in assays, and it expects to move to Phase 1 in 2017. We look forward to hearing about the dose-limiting tox (DLT) of 659 in animal models, which may give hints on its future safety profile. For that matter, we also look forward to hearing about the DLT of 440 and 152 in animal models (management declined to comment on their preclinical DLT when asked on the quarterly call).

Some thoughts about the timeline and development profile of a triple combo. After yesterday, one thing is now clear: the triple will not have an 809/770 base (and it was not hard to guess this would be the case, given Orkambi's many problems). However, in light of the confirmed 661/770 base, here we highlight the following: (a) we do not now see a point in an 661/770 NDA in 2H17, which diminishes the material value of a positive 661/770 readout in 1H17 (we had guided there would be no such value; we expect 661/770 to approximate Orkambi efficacy in homozygous F508del, and we do not have high hopes for 661/770 in heterozygous F508del); (b) we do not believe that the planned 2-week and 4-week protocols of 152 and 440 will offer sufficient insight into their efficacy in order to inform an advance to Phase 3 (at least for 440, because it already sounds like 152 has a longer road ahead). It is more likely that 12-week data will be needed. In that regard, we find management's plan to move 440/661/770 to Phase 3 after a 4-week Phase 2 very bold; (c) Orkambi complicates not just the commercial present, but also the developmental future. In our view, any advanced work with the triple in homozygous F508del will have to be run against Orkambi (a placebo would be unethical), which will raise the bar slightly for the triple. It is certainly possible that VRTX is aiming to get 661/770 approved as a double following the Phase 3 next year just so that it can use it as a control against the future triple, but even then we do not see an advantage to the development program, since we expect 661 to look just like 809.

3Q update: Orkambi underwhelms, Kalydeco misses. The company reported quarterly revenue of $414M vs. consensus of $417M. Orkambi came at $234M (-5% QoQ vs. 2Q), within the quarterly guidance of $230-235M preannounced last month, while Kalydeco came at $176M vs. consensus of $179M (also, -3% QoQ vs. 2Q). The company ended the quarter with $1.13B in cash.

Valuation and Risks. Our price target of $85/share is based on an equally-weighted composite of: (a) $91/share, as a 35x multiple of taxed and diluted FY22 GAAP EPS of $7.06 discounted back to FY17 at 20%; and (b) an NPV of $79/share (discount rate 11%, terminal growth rate of 2.5%). Risks to our investment thesis and target price include: (1) the failure of Kalydeco, Orkambi, VX-371, VX-661, VX-152, and VX-440 in further combination clinical studies; (2) the failure of Kalydeco and Orkambi to achieve our peak sales revenue; and (3) product competition.

Vertex Pharmaceuticals Incorporated
Income Statement
(in $MM except per share values)

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	2013A	2014A	2015	Mar Q1:16	Jun Q2:16	Sep Q3:16	Dec Q4:16E	2016E	2017E	2018E	2019E	2020E	2021E	2022E
Total Product revenues	**837.7**	**487.9**	**1,000.4**	**394.4**	**425.7**	**409.6**	**433.1**	**1,662.0**	**2,223.1**	**2,861.5**	**3,731.3**	**4,427.6**	**4,543.3**	**4,662.6**
Growth YoY	*-37.2%*	*-41.8%*	*105.0%*	*-3.0%*	*7.9%*	*-3.8%*	*5.7%*	*66.1%*	*33.8%*	*28.7%*	*30.4%*	*18.7%*	*2.6%*	*2.6%*
Kalydeco	371.4	463.8	631.7	170.5	180.2	175.6	177.0	703.3	771.4	790.3	809.8	829.9	850.7	872.1
Growth YoY	*116.4%*	*24.9%*	*36.2%*	*-5.6%*	*5.7%*	*-2.6%*	*0.8%*	*11.3%*	*9.7%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*	*2.5%*
Orkambi			350.7	223.1	245.5	234.0	256.2	958.8	1451.7	2071.2	2921.4	3597.7	3692.6	3790.5
Growth YoY									*51.4%*	*42.7%*	*41.1%*	*23.1%*	*2.6%*	*2.7%*
Total Royalty revenues	**156.6**	**40.9**	**24.0**	**3.6**	**5.3**	**3.8**	**3.8**	**16.5**	**16.5**	**16.5**	**16.5**	**16.5**	**16.5**	**16.5**
Growth YoY	*8.6%*	*-73.9%*	*-41.5%*					*-30.9%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total Collaborative revenues	**217.7**	**51.6**	**8.1**	**0.1**	**0.7**	**0.3**	**0.3**	**1.3**	**1.2**	**1.2**	**1.2**	**1.2**	**1.1**	**1.1**
Growth YoY	*-75.0%*	*-75.0%*	*-84.4%*					*-84.3%*	*-2.0%*	*-2.0%*	*-2.0%*	*-2.0%*	*-2.0%*	*-2.0%*
Total Revenue ($MM)	**$1,212.0**	**$580.5**	**$1,032.4**	**$398.1**	**$431.7**	**$413.7**	**$437.2**	**$1,679.9**	**$2,240.9**	**$2,879.2**	**$3,749.0**	**$4,445.3**	**$4,561.0**	**$4,680.3**
Growth YoY	*-75.0%*	*-75.0%*	*77.9%*	*-4.8%*	*8.4%*	*-4.2%*	*5.7%*	*62.7%*	*33.4%*	*28.5%*	*30.2%*	*18.6%*	*2.6%*	*2.6%*
COGS	$ (89.0)	$ (39.7)	$ (105.6)	$ (49.8)	$ (44.2)	$ (53.2)	$ (52.5)	$ (199.9)	$ (268.9)	$ (316.7)	$ (374.9)	$ (444.5)	$ (456.1)	$ (468.0)
% of revenue	7.3%	6.8%	10.2%	12.5%	10.2%	12.9%	12.0%	11.9%	12.0%	11.0%	10.0%	10.0%	10.0%	10.0%
Gross Profit	**$ 1,123.0**	**$ 540.8**	**$ 926.8**	**$ 348.3**	**$ 387.5**	**$ 360.5**	**$ 384.8**	**$ 1,479.9**	**$ 1,972.0**	**$ 2,562.5**	**$ 3,374.1**	**$ 4,000.8**	**$ 4,104.9**	**$ 4,212.2**
Gross margin	92.7%	93.2%	89.8%	87.5%	89.8%	87.1%	88.0%	88.1%	88.0%	89.0%	90.0%	90.0%	90.0%	90.0%
Operating Expenses														
Royalty expenses	$ (41.3)	$ (21.3)	$ (7.4)	$ (0.9)	$ (1.1)	$ (0.9)	$ (0.9)	$ (3.7)	$ (3.7)	$ (3.7)	$ (3.7)	$ (3.7)	$ (7.3)	$ (22.0)
% of revenue	3.4%	3.7%	0.7%	0.2%	0.3%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.5%
R&D	$ (918.7)	$ (856.1)	$ (996.2)	$ (255.9)	$ (271.0)	$ (275.4)	$ (280.4)	$ (1,082.6)	$ (1,136.7)	$ (1,193.6)	$ (1,205.5)	$ (1,048.8)	$ (943.9)	$ (849.5)
% of revenue	75.8%	147.5%	96.5%	64.3%	62.8%	66.6%	64.1%	64.4%	50.7%	41.5%	32.2%	23.6%	20.7%	18.2%
SG&A	$ (362.4)	$ (305.4)	$ (377.1)	$ (105.2)	$ (111.7)	$ (106.1)	$ (111.1)	$ (434.0)	$ (438.3)	$ (442.7)	$ (447.1)	$ (451.6)	$ (456.1)	$ (460.7)
% of revenue	29.9%	52.6%	36.5%	26.4%	25.9%	25.6%	25.4%	25.8%	19.6%	15.4%	11.9%	10.2%	10.0%	9.8%
Restructuring (income) expense	$ (40.5)	$ (50.9)	$ (2.2)	$ (0.7)	$ (0.3)	$ (0.0)		$ (1.0)	$ (1.0)	$ (1.0)	$ (1.0)	$ (1.0)	$ (1.0)	$ (1.0)
Intangible asset impairment charge	$ (663.5)	$ -	$ -		$ -	$ -		$ -	$ -	$ -	$ -	$ -	$ -	$ -
Acquisition-related expenses	$ -	$ -	$ -		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses	**$ (2,026.4)**	**$ (1,233.7)**	**$ (1,382.8)**	**$ (362.6)**	**$ (384.1)**	**$ (382.3)**	**$ (392.3)**	**$ (1,521.3)**	**$ (1,579.8)**	**$ (1,641.0)**	**$ (1,657.3)**	**$ (1,505.1)**	**$ (1,408.4)**	**$ (1,333.2)**
% of revenue	167.2%	212.5%	133.9%	91.1%	89.0%	92.4%	89.7%	90.6%	70.5%	57.0%	44.2%	33.9%	30.9%	28.5%
Operating Income	**$ (903.5)**	**$ (693.0)**	**$ (456.0)**	**$ (14.3)**	**$ 3.4**	**$ (21.8)**	**$ (7.5)**	**$ (41.3)**	**$ 392.2**	**$ 921.5**	**$ 1,716.8**	**$ 2,495.7**	**$ 2,696.5**	**$ 2,879.0**
Operating margin	-74.5%	-119.4%	-44.2%	-3.6%	0.8%	-5.3%	-1.7%	-2.5%	17.5%	32.0%	45.8%	56.1%	59.1%	61.5%
Interest income	$ 4.7	$ 0.8				$ -	$ -		$ -	$ -	$ -	$ -	$ -	$ -
Interest expense	$ (77.3)	$ (72.9)	$ (84.2)	$ (20.7)	$ (20.2)	$ (20.1)	$ (20.1)	$ (81.1)	$ (78.7)	$ (76.3)	$ (74.0)	$ (71.8)	$ (69.7)	$ (67.6)
Change in fair value of derivative instruments	$ -	$ -												
Others	$ -	$ 29.9	$ (6.7)	$ 4.4	$ (1.2)	$ (0.2)	$ (1.2)	$ 1.8	$ -	$ -	$ -	$ -	$ -	$ -
Pre-tax Income	**$ (976.1)**	**$ (735.1)**	**$ (546.9)**	**$ (30.6)**	**$ (18.0)**	**$ (42.1)**	**$ (27.7)**	**$ (120.7)**	**$ 313.5**	**$ 845.2**	**$ 1,642.7**	**$ 2,423.9**	**$ 2,626.8**	**$ 2,811.4**
Taxes	$ 288.6	$ (7.0)	$ -	$ -	$ -		$ -	$ -	$ (106.6)	$ (287.4)	$ (558.5)	$ (824.1)	$ (893.1)	$ (955.9)
Tax rate (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.0%	34.0%	34.0%	34.0%	34.0%	34.0%
Minority interest	$ (52.0)		$ -					$ -	$ -	$ -	$ -	$ -	$ -	$ -
Provision for income taxes			$ (30.1)	$ (5.5)	$ (18.1)	$ (0.5)		$ (24.1)						
Loss attributable to noncontrolling interest			$ 31.7	$ (5.5)	$ (28.4)	$ 0.7		$ (33.2)						
Net Income (GAAP)	**$ (739.6)**	**$ (742.1)**	**$ (558.1)**	**$ (41.6)**	**$ (64.5)**	**$ (41.9)**	**$ (27.7)**	**$ (178.0)**	**$ 206.9**	**$ 557.8**	**$ 1,084.2**	**$ 1,599.8**	**$ 1,733.7**	**$ 1,855.5**
Net Margin	-61.0%	-127.8%	-54.1%	-10.5%	-14.9%	-10.1%	-6.3%	-10.6%	9.2%	19.4%	28.9%	36.0%	38.0%	39.6%
GAAP EPS - diluted	**$ (2.03)**	**$ (3.14)**	**$ (2.31)**	**$ (0.17)**	**$ (0.26)**	**$ (0.17)**	**$ (0.11)**	**$ (0.72)**	**$ 0.82**	**$ 2.20**	**$ 4.24**	**$ 6.20**	**$ 6.66**	**$ 7.06**
Basic Shares	231.6	235.3	241.3	243.8	244.5	244.9	245.9	244.8	250.8	253.3	255.9	258.2	260.5	262.9
Diluted Shares	**231.6**	**235.3**	**241.3**	**243.8**	**244.5**	**244.9**	**245.9**	**244.8**	**250.8**	**253.3**	**255.9**	**258.2**	**260.5**	**262.9**

Source: Company Reports, Bloomberg, H.C. Wainwright estimates.

Vertex Pharmaceuticals Incorporated
PE Multiple Valuation

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VRTX EPS

12/31/2022	Discount Rate	Discount to	Discounted EPS	PE Multiple	Multiple Step	Discount Step	Variance Step
$ 7.06	20%	7/1/2017	$ 2.59	35x	2.0	2.0%	3.0%

Implied Share Price

Discount Rate	P/E Multiples 29.0x	31.0x	33.0x	35.0x	37.0x	39.0x	41.0x
14.0%	$ 99.58	$ 106.45	$ 113.32	$ 120.18	$ 127.05	$ 133.92	$ 140.79
16.0%	90.50	96.74	102.98	109.22	115.46	121.70	127.94
18.0%	82.38	88.06	93.74	99.42	105.10	110.78	116.46
20.0%	75.10	80.28	85.46	**$ 90.64**	95.82	101.00	106.18
22.0%	68.58	73.31	78.04	82.76	87.49	92.22	96.95
24.0%	62.71	67.03	71.36	75.68	80.01	84.33	88.66
26.0%	57.43	61.39	65.35	69.31	73.27	77.23	81.19

Sensitivity to EPS Estimate

EPS Sensitivity	Implied EPS	P/E Multiples 29.0x	31.0x	33.0x	35.0x	37.0x	39.0x	41.0x
-9.0%	$ 6.42	$ 68.34	$ 73.06	$ 77.77	$ 82.48	$ 87.20	$ 91.91	$ 96.62
-6.0%	6.64	70.60	75.47	80.33	85.20	90.07	94.94	99.81
-3.0%	6.85	72.85	77.87	82.90	87.92	92.95	97.97	103.00
0.0%	**7.06**	75.10	80.28	85.46	**$ 90.64**	95.82	101.00	106.18
3.0%	7.27	77.36	82.69	88.03	93.36	98.70	104.03	109.37
6.0%	7.48	79.61	85.10	90.59	96.08	101.57	107.06	112.55
9.0%	7.69	81.86	87.51	93.15	98.80	104.45	110.09	115.74

Source: Company Reports, Bloomberg, H.C. Wainwright estimates.

Vertex Pharmaceuticals Incorporated
DCF Analysis (Cash flow values in $Ms)

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Period Ending		**2016E**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**
Unlevered FCF								
Operating Income		(41)	392	922	1,717	2,496	2,696	2,879
Depreciation & Amortization		58	70	84	101	121	133	146
Changes in Working Capital		(14)	(14)	(14)	(14)	(14)	(14)	(14)
Capital Expenditures		(32)	(29)	(26)	(23)	(21)	(19)	(17)
Taxes		-	(133)	(313)	(584)	(849)	(917)	(979)
Total Unlevered Free Cash Flow		**(29)**	**286**	**652**	**1,197**	**1,733**	**1,880**	**2,015**
Present Value (PV) Calculation:								
Period (Year)			0.50	1.50	2.50	3.50	4.50	5.50
Discounted Cash Flow		(29)	272	558	922	1,203	1,175	1,135
Total Present Value	**5,235**							

Terminal Value

Perpetuity Method:	
Unlevered FCF	2,015
Discount Rate	**11.0%**
Growth Rate	**2.5%**
Terminal Value	24,304
Present Value	13,690

DCF Total Valuation	
Total Enterprise Value	18,926
Net Cash	831
Total Equity Value	19,756
Vertex Diluted Share Count	251
Equity Value Per Share	**78.76**

Price Target	**Weight**	**PT**
DCF	50%	$79
PE Multiple	50%	$91
Weighted PT		**$85**

Source: Company Reports, Bloomberg, H.C. Wainwright estimates.

Important Disclaimers

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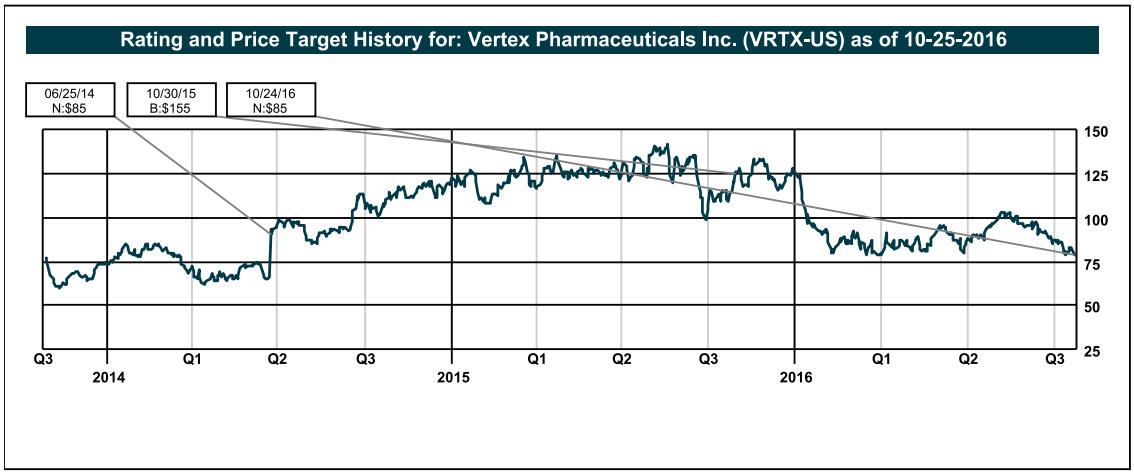
RETURN ASSESSMENT

Market Outperform (Buy): The common stock of the company is expected to outperform a passive index comprised of all the common stock of companies within the same sector.

Market Perform (Neutral): The common stock of the company is expected to mimic the performance of a passive index comprised of all the common stock of companies within the same sector.

Market Underperform (Sell): The common stock of the company is expected to underperform a passive index comprised of all the common stock of companies within the same sector.



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Distribution of Ratings Table as of October 25, 2016

			IB Service/Past 12 Months	
Ratings	Count	Percent	Count	Percent
Buy	202	95.28%	57	28.22%
Neutral	9	4.25%	2	22.22%
Sell	0	0.00%	0	0.00%
Under Review	1	0.47%	0	0.00%
Total	212	100%	59	27.83%

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