

Reason for report:

EARNINGS

SAGE THERAPEUTICS, INC.

3Q14 Recap: Positive '547 Data Sets Stage for Pivotal Trials in 2015

• **Bottom Line:** We are updating our model to reflect 3Q14 results. EPS of (\$0.50) was below our estimate of (\$0.32) due to greater than expected operating expenses and a lower share count factoring in average shares outstanding before/after the company's recent IPO. **Reiterate OP on SAGE and \$46 Price Target.**

• **SAGE recently announced that SAGE-547 met the primary efficacy and safety endpoints in its phase I/II Super Refractory Status Epilepticus (SRSE) study** which the company expects will precipitate the advancement into pivotal studies in 2015. In the Phase I/II SAGE-547 was able to cure SRSE in 73% of patients which is well above the ~30% success rate achieved by the SRSE standard-of-care. The mean duration of status epilepticus prior to treatment with SAGE-547 was 11 days, so individuals treated with '547 already failed benzodiazepenes, anti-epileptics, and anesthesia. Thus, at >2x the success rate of the standard-of-care, we believe the data announced this morning could be sufficient for SAGE to attain breakthrough therapy status. Patients were administered SAGE-547 intravenously for five days while weaning from anesthesia was attempted and treatment was found to be safe, allowing SAGE to study higher doses in newly recruited patients.

• **SAGE recently initiated a SAGE-547 study in patients with essential tremor**, sales from which currently present upside to our \$46 Price Target. SAGE recently began patient enrollment in an exploratory, single-center Phase IIa clinical trial of SAGE-547 in patients with essential tremor, a debilitating neurological disorder that causes involuntary, rhythmic shaking with no known cause. This trial is designed to evaluate the safety, tolerability, pharmacokinetics and activity of SAGE-547, and the company plans to use data from this exploratory study to help guide the design of a second-generation molecule for the chronic treatment of this disease.

• **Pipeline continuing to advance.** SAGE plans to next advance SAGE-217 which in a preclinical setting showed an improved clinical profile over first-generation neuroactive steroids. Based on the non-clinical data and pharmacokinetic profile observed with SAGE-217, combined with the potential for multiple routes of administration, SAGE has elected to prioritize the development of SAGE-217 as its second clinical candidate. The company intends to file an IND for SAGE-217 in late 2015 and initiate Phase I development thereafter, which would be followed by clinical development of SAGE-689. We believe SAGE's pipeline is more de-risked than most early stage compounds given that '217 and '689's mechanisms are well-understood and proven.

Key Stats:

(NASDAQ:SAGE)

S&P 600 Health Care Index:	1,359.95
Price:	\$35.44
Price Target:	\$46.00
Methodology:	DCF analysis with 12% discount rate
52 Week High:	\$41.01
52 Week Low:	\$24.25
Shares Outstanding (mil):	27.6
Market Capitalization (mil):	\$978.1
Book Value/Share:	\$2.69
Cash Per Share:	\$4.95
Dividend (ann):	\$0.00
Dividend Yield:	0.0%

General: Cash/diluted shares 3Q14 Fully diluted shares outstanding estimated as of YE14



Dec Yr	1Q	2Q	3Q	4Q	FY Rev	1Q	2Q	3Q	4Q	FY EPS	P/E
2013A	--	--	--	--	0.0	--	--	--	--	(\$1.92)	NM
2014E - New	0.0A	0.0A	0.0A	0.0	0.0	(\$3.71)A	(\$4.57)A	(\$0.50)A	(\$0.43)	(\$2.86)	NM
2014E - Old	0.0A	0.0A	0.0A	0.0	0.0	(\$3.71)A	(\$4.57)A	(\$0.32)	(\$0.33)	(\$1.42)	NM
2015E - New	0.0	0.0	0.0	0.0	0.0	(\$0.51)	(\$0.55)	(\$0.59)	(\$0.65)	(\$2.30)	NM
2015E - Old	0.0	0.0	0.0	0.0	0.0	(\$0.43)	(\$0.51)	(\$0.56)	(\$0.61)	(\$2.11)	NM

Source: Company Information and Leerink Partners LLC Research
GAAP EPS.

INVESTMENT THESIS

We rate SAGE Shares Outperform. SAGE Therapeutics (NASDAQ: SAGE) is a neuroscience company started by an experienced team of R&D leaders, CNS specialists, and investors focused on developing medicines to treat life-threatening, rare CNS disorders. SAGE's lead product, SAGE-547, is in clinical development for super-refractory status epilepticus (SRSE) and is the first of many compounds the company is developing in its epilepsy portfolio. SAGE-547 is a potent positive allosteric modulator of both synaptic and extra-synaptic GABA_A receptors that rapidly advanced into Phase I/II clinical development in early 2014. The robust clinical potential of '547 was demonstrated under an emergency Investigational New Drug (IND) program in which 5 out of 7 SAGE-547-treated SRSE patients (each of whom had spent over 30 days in the ICU) were successfully weaned out of a medically induced coma. Preliminary results from the ongoing proof-of-concept study are equally encouraging, as thus far 8 out of 11 SAGE-547-treated SRSE patients have been weaned off anesthesia while on '547 therapy. Beyond '547, SAGE is developing a seizure franchise of advanced next generation compounds of novel GABA_A allosteric modulators for the treatment of SE and other forms of seizure and epilepsy. SAGE-689 is currently in preclinical development for neuroanesthesia and status epilepticus and is expected to enter a Phase I trial in 2015. In addition, SAGE-217 is being developed as an intravenous therapy, as well as an oral step-down therapy for status epilepticus and other seizure disorders such as Dravet syndrome. With top-line Phase I/II '547 SRSE data expected before the end of 2014 and two additional compounds advancing into the clinic soon after, we believe SAGE shares are poised to appreciate as de-risking clinical catalysts are realized for the company's lead product and allosteric modulation platform.

VALUATION

We derive a \$46 price target for SAGE shares based on a 12% discount rate and a 3% terminal growth rate. Our base case assumption assumes ~\$1B in peak-risk adjusted 2023E sales based on a 75% probability of approval for SAGE-547, and assumes ~\$270MM in peak revenues in 2027E for SAGE-689 and SAGE-217.

RISKS TO VALUATION

Risks to our valuation include disappointing clinical data, regulatory setbacks, and commercial shortfalls. Because SAGE has only one product currently being examined in patients, the occurrence of any of these could impact the stock significantly.

SAGE P&L (\$MM) GAAP	2013	1Q14	2Q14	3Q14E	4Q14E	2014E	1Q15E	2Q15E	3Q15E	4Q15E	2015E	2016E	2017E	2018E
SAGE-547	-	-	-	-	-	-	-	-	-	-	-	-	19.1	72.9
SAGE-689	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAGE-217	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue (p/w)	-	-	-	-	-	-	-	-	-	-	-	-	19.1	72.9
COGS	-	-	-	-	-	-	-	-	-	-	-	-	1.9	7.3
R&D	14.4	4.2	4.4	6.6	8.0	23.2	10.0	11.0	12.0	13.0	46.0	59.8	65.8	72.4
SG&A	3.9	1.6	1.8	2.9	3.0	9.3	3.1	3.2	3.4	4.0	13.7	24.7	44.4	54.7
Operating Expenses	18.3	5.8	6.2	9.5	11.0	32.4	13.1	14.2	15.4	17.0	59.7	84.5	112.1	134.3
Operating Income	(18.3)	(5.8)	(6.2)	(9.5)	(11.0)	(32.4)	(13.1)	(14.2)	(15.4)	(17.0)	(59.7)	(84.5)	(93.0)	(61.4)
Interest Income (Expense)	0.0	-	0.0	0.0	-	0.0	-	-	-	-	-	-	-	-
Other Income (expense)	(0.0)	-	(0.0)	(0.0)	-	(0.0)	-	-	-	-	-	-	-	-
EBT	(18.3)	(5.8)	(6.2)	(9.5)	(11.0)	(32.5)	(13.1)	(14.2)	(15.4)	(17.0)	(59.7)	(84.5)	(93.0)	(61.4)
Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Income (Loss)	(18.3)	(6.1)	(7.8)	(9.9)	(11.0)	(34.7)	(13.1)	(14.2)	(15.4)	(17.0)	(59.7)	(84.5)	(93.0)	(61.4)
Diluted EPS	\$ (1.92)	\$ (3.71)	\$ (4.57)	\$ (0.50)	\$ (0.43)	\$ (2.86)	\$ (0.51)	\$ (0.55)	\$ (0.59)	\$ (0.65)	\$ (2.30)	\$ (2.92)	\$ (3.10)	\$ (1.98)
Basic Shares Outstanding	9.5	1.6	1.7	19.6	25.7	12.1	25.8	25.9	26.0	26.1	26.0	29.0	30.0	31.0
Diluted Shares Outstanding	9.5	1.6	1.7	19.6	25.7	12.1	25.8	25.9	26.0	26.1	26.0	29.0	30.0	31.0

Source: SEC Filings and Leerink Partners Research

SAGE BS & CFS (\$MM) GAAP	2013	1Q14	2Q14E	3Q14E	4Q14E	2014E	1Q15E	2Q15E	3Q15E	4Q15E	2015E	2016E	2017E	2018E
Net Cash	8.1	55.2	49.1	136.7	126.3	126.3	114.0	100.7	86.2	70.2	70.2	142.3	59.9	10.6
Cash & Equivalents	8.1	55.2	49.1	136.7	126.3	126.3	114.0	100.7	86.2	70.2	70.2	142.3	59.9	10.6
Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in Cash	5.3	47.4	(6.1)	81.4	(10.3)	112.3	(12.3)	(13.4)	(14.5)	(16.0)	(56.1)	72.1	(82.4)	(49.3)
Operating Cash Flow	(17.5)	(5.6)	(6.1)	(12.6)	(10.3)	(34.6)	(12.3)	(13.3)	(14.5)	(16.0)	(56.1)	(76.9)	(80.4)	(46.3)
Net Income (Loss)	(18.3)	(5.8)	(7.8)	(9.9)	(11.0)	(34.4)	(13.1)	(14.2)	(15.4)	(17.0)	(59.7)	(84.5)	(93.0)	(61.4)
SOE	0.1	0.2	0.4	0.6	0.7	1.8	0.8	0.9	0.9	1.0	3.6	6.8	11.0	12.7
D&A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.6	2.4
Other	0.7	0.0	1.3	(3.3)	-	(2.0)	-	-	-	-	-	-	-	-
Investing Cash Flow	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(1.0)	(2.0)	(3.0)
CapEx	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(1.0)	(2.0)	(3.0)
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Financing Cash flow	22.8	53.0	-	94.0	-	147.0	-	-	-	-	-	150.0	-	-
Equity Issuance (Buyback)	22.8	53.0	-	94.0	-	147.0	-	-	-	-	-	150.0	-	-
Debt Issuance (Retirement)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: SEC Filings and Leerink Partners Research

SAGE DCF Analysis	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	TV
Cash Flow From Operations (\$MM)	(35)	(56)	(77)	(80)	(46)	40	184	287	397	528	469	443	439	316	207	139	77	
Cash Flow From Investing (\$MM)	(0)	(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	
Net Borrowing (Repayment) (\$MM)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Free Cash Flow (\$MM)	(35)	(56)	(78)	(82)	(49)	36	179	281	390	520	460	434	430	307	198	130	68	783
Discount Periods	-	0.25	1.25	2.25	3.25	4.25	5.25	6.25	7.25	8.25	9.25	10.25	11.25	12.25	13.25	14.25	15.25	
NPV FCF (\$MM)	(9)	(55)	(68)	(64)	(34)	22	99	139	172	204	161	136	120	77	44	26	12	139

Sum NPV FCF (\$MM)	1122
Net Cash 3Q14	137
Implied SAGE Mkt Cap (\$MM)	\$ 1,259
SAGE Per Share Value	\$ 45.62

Cost of Equity	12.0%
TG Rate	3.0%
Diluted Shares Outstanding YE14	27.6

Source: Leerink Partners Research

SAGE-547 SRSE Revenue Model	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
US Status Epilepticus Patients	150,000	151,350	152,712	154,087	155,473	156,873	158,284	159,709	161,146	162,597	164,060	165,537	167,026	168,530	170,046	171,577	173,121
% refractory to benzodiazepines	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
Second-Line Status Epilepticus Patients	50,000	50,450	50,904	51,362	51,824	52,291	52,761	53,236	53,715	54,199	54,687	55,179	55,675	56,177	56,682	57,192	57,707
% refractory to AEDs	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Refractory Status Epilepticus (RSE) Patients	35,000	35,315	35,633	35,954	36,277	36,604	36,933	37,265	37,601	37,939	38,281	38,625	38,973	39,324	39,678	40,035	40,395
% super refractory - 1 failed wean attempt	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%
Super RSE Patients	25,000	25,225	25,452	25,681	25,912	26,145	26,381	26,618	26,858	27,099	27,343	27,589	27,838	28,088	28,341	28,596	28,854
%RSE treated with SAGE-547	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
%SRSE treated with SAGE-547	0.0%	0.0%	0.0%	1.5%	5.0%	10.0%	20.0%	30.0%	40.0%	50.0%	30.0%	18.0%	10.8%	5.0%	3.0%	2.0%	2.0%
Patients on SAGE-547	-	-	-	385	1,296	2,615	5,276	7,985	10,743	13,550	8,203	4,966	3,006	1,404	850	572	577
Annual Cost of Therapy	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
US Gross Revenues (\$MM)	0	0	0.0	23.1	77.7	156.9	316.6	479.1	644.6	813.0	492.2	298.0	180.4	84.3	51.0	34.3	34.6
Approval Probability	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
US Probability-Weighted Revenues (\$MM)	0	0	0.0	17.3	58.3	117.7	237.4	359.3	483.4	609.7	369.1	223.5	135.3	63.2	38.3	25.7	26.0
ROW as % of US	0%	0%	0%	10%	25%	35%	45%	55%	60%	65%	129%	245%	457%	587%	582%	519%	308%
SAGE-547 ROW Gross Revenues (\$MM)	-	-	-	2	19	55	142	264	387	528	634	729	824	494	297	178	107
SAGE-547 ROW p(w) Revenues (\$MM)	0	0	0	1.7	14.6	41.2	106.8	197.6	290.1	396.3	475.6	546.9	618.0	370.8	222.5	133.5	80.1
y/y Growth Rate						283%	259%	185%	147%	137%	20.0%	15.0%	13.0%	-40.0%	-40.0%	-40.0%	-40.0%
	-	-	-	25.4	97.2	211.8	459.0	742.6	1,031.3	1,341.4	1,126.3	1,027.2	1,004.4	578.7	347.7	212.3	141.4
SAGE-547 WW P(w) Revenues	0	0	0	19.1	72.9	158.8	344.3	557.0	773.5	1006.1	844.7	770.4	753.3	434.0	260.8	159.2	106.1

Assumptions	
Annual Cost	\$60,000
Probability of Approval	75%

Source: Leerink Partners Research

Product	Event	Timing
SAGE-547	Top-line Phase I/II Data	4Q14
SAGE-547	Initiate Pivotal Trials	2015
SAGE-547	Phase II Tremor Data	
SAGE-217	Initiate Phase I Studies	2015
SAGE-689	Initiate Phase I Studies	2015

Source: SEC Filings and Leerink Partners Research

Disclosures Appendix

Analyst Certification

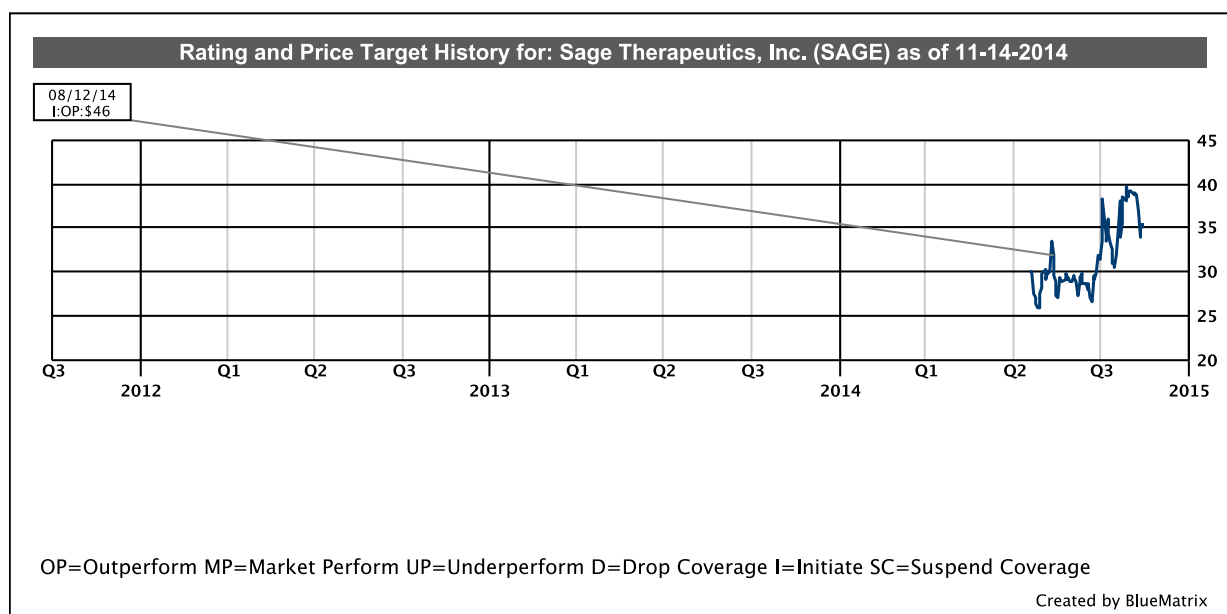
I, Joseph P. Schwartz, certify that the views expressed in this report accurately reflect my views and that no part of my compensation was, is, or will be directly related to the specific recommendation or views contained in this report.

Valuation

We derive a \$46 price target for SAGE shares based on a 12% discount rate and a 3% terminal growth rate. Our base case assumption assumes ~\$1B in peak-risk adjusted 2023E sales based on a 75% probability of approval for SAGE-547, and assumes ~\$270MM in peak revenues in 2027E for SAGE-689 and SAGE-217.

Risks to Valuation

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Distribution of Ratings/Investment Banking Services (IB) as of 09/30/14				
Rating	Count	Percent	IB Serv./Past 12 Mos.	
			Count	Percent
BUY [OP]	138	69.30	51	37.00
HOLD [MP]	61	30.70	2	3.30
SELL [UP]	0	0.00	0	0.00

Explanation of Ratings

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

Market Perform (Hold/Neutral): We expect this stock to perform in line with its benchmark over the next 12 months.

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.

Important Disclosures

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In the past 12 months, the Firm has received compensation for providing investment banking services to Sage Therapeutics, Inc. .

Leerink Partners LLC makes a market in Sage Therapeutics, Inc.

Leerink Partners LLC has acted as the manager for a public offering of Sage Therapeutics, Inc. in the past 12 months.

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