

Date: February 4th 2013

Analyst Name: Austin Frazier

CIF Stock Recommendation Report (Spring 2013)

Company Name and Ticker: EMC Corporation (EMC)

Section (A) Summary

Recommendation Buy: Yes		Target Price: 28.58	Stop-Loss Price: 22.35
Sector: Technology (XLK)	Industry: Data Storage	Market Cap (in Billions): 53.21 Billion	# of Shrs. O/S (in Millions): 2,106.66 Million
Current Price: \$24.85	52 WK Hi: \$30.00	52 WK Low: \$22.77	EBO Valuation: \$20.80
Morningstar (MS) Fair Value Est.: \$30.00	MS FV Uncertainty: Average	MS Consider Buying: \$21.00	MS Consider Selling: \$40.50
EPS (TTM): 1.24	EPS (FY1): 1.86	EPS (FY2): 2.07	MS Star Rating: 4 Stars
Next Fiscal Yr. End "Year": 2013 "Month": December	Last Fiscal Qtr. End: Less Than 8 WK: No	If Less Than 8 WK, next Earnings Ann. Date:	Analyst Consensus Recommendation: Outperform
Forward P/E: 12.00	Mean LT Growth: 12.73	PEG: 1.14	Beta: 1.03
% Inst. Ownership: 82.48%	Inst. Ownership- Net Buy: Yes	Short Interest Ratio: 1.90	Short as % of Float: 2.10%
<u>Ratio Analysis</u>	<u>Company</u>	<u>Industry</u>	<u>Sector</u>
P/E (TTM)	20.12	21.32	23.05
P/S (TTM)	2.41	0.77	2.96
P/B (MRQ)	2.34	1.87	3.55
P/CF (TTM)	11.86	9.27	15.17
Dividend Yield	0.0	2.39	1.70
Total Debt/Equity (MRQ)	7.65	48.40	18.84
Net Profit Margin (TTM)	13.29	4.93	13.65
ROA (TTM)	7.96	6.67	14.13
ROE (TTM)	13.12	-7.04	19.00

<p><u>Investment Thesis</u></p> <ul style="list-style-type: none"> • The growth of cloud computing • If it seems a company's doing something better than them, they buy it. • In an industry that is heavily focused on the future, EMC has more resources than other most other data storage companies. • The recent partnership with Lenovo enables EMC to grab some more international revenue. • With a low beta of only 1.03 this data storage company is not as volatile as its main competitors. • With the XLK ETF is being dragged down by the performance of Apple in recent months, it is a great opportunity for the CIF to delve into the technology sector. • EMC's centralized service to its clients provides maximum storage, guidance, and protection 	<p><u>Summary</u></p> <p>Provide brief summary of your analysis in each section that follows</p>
	<p><u>Company Profile:</u></p> <p>As the leading provider in hardware, software, and services for enterprise network storage, EMC is capitalizing on a new more efficient use of cloud computing and its safety. With growing concern about protecting business's important information, EMC is the leader in the market.</p>
	<p><u>Fundamental Valuation:</u> EMC is clearly set up for long term growth, while the implied price of the stock seems to be a bit overvalued, I think EMC's multiple acquisitions have positions it for success in the industry.</p>
	<p><u>Relative Valuation:</u> With the highest mean long term growth rate of 12.73% EMC is positioned above its competitors for the long haul. The chart also indicated that best P/S ratio at 2.39, which is a good sign they are generating more revenue per share than their competitors.</p>
	<p><u>Revenue and Earnings Estimates:</u> Revenue increased by about 8% over the year. Earnings beat estimates by \$0.02, which is a huge deal, especially with a significant number of analysts grading EMC down in the past four weeks. With only six analysts providing input for their long term growth estimation, it shows difficulty of putting a specific number on this industry's future growth.</p>
	<p><u>Analyst Recommendations:</u> Overall, analysts have been fairly consistent with their reports and appear to be bullish on the stock with a mean rating of only 1.73. A majority of the estimates indicated the stock as a buy or outperform. While analysts tend to be a little optimistic, I believe this is a good investment.</p> <p><u>Institutional Ownership:</u> While there is currently no other company with >5% ownership, the percentage of shares owned by institution is 82.48%. This gives us a good idea that there is significant institutional support. Although small, the increase in net buyers is another good sign.</p>

	<p><u>Short Interest:</u> EMC's short ratio, at 1.90, is more attractive than its competitors IBM and NTAP. EMC has also made huge strides in decreasing its days to cover ratio from above seven to about two days in the past year alone.</p>
	<p><u>Stock Price Chart:</u> EMC's three months and one year price chart show a low volatility as compares to its competitors. Its five year indicates steady progressive growth over the time span. Based on the RSI of 50 indicated by the two technical analysis charts, this stock is currently neither overbought nor oversold.</p>

Section (B) Company Profile (two pages maximum)

Company Summary

EMC is the leading provider in hardware, software, and services for enterprise network storage. EMC operates in both the information infrastructure business and the virtual infrastructure business (VMware). VMware also happens to be the current leader in the virtualization market. The company has recently been focusing on its software and service segments. EMC revenue breakdown by segment is (74%) information storage, information intelligence (4%), information security (4%) and its virtual infrastructure business subsidiary, VMware (19%). Top competitors positioned in the information infrastructure business include companies such as NetApp Inc, Hitachi Data Systems, IBM and Seagate Technology PLC. However, competitors in the virtual information infrastructure business include IBM and Microsoft. The company breaks down their sales by geographic region. The company receives about \$1,351,753 or 25.61% of their earning from Europe, the Middle East and Africa each quarter. EMC's Asia pacific and Japan region quarterly generate around \$733,157 or 13.89% of the company's revenues. In Latin America, Mexico and Canada EMC sales are not quite as strong with quarterly revenue around \$307,298 and only accounting for 5.82% of their total revenue. The domestic revenue in the US usually generates the highest revenue of around \$2,885,68 per quarter, accounting for over half of their revenue at 54.68%. Recognized potential risks for EMC include: weaker demand in information technology, a recognized increase in cyber security, and recognition that because of its heavy stake in VMware at about 87%, the subsidiary's performance has a direct impact on EMC financial performance. Also, as with most infrastructure companies, EMC is involved in a few litigations of intellectual property.

Business Model, Competition, Environment and Strategy

"EMC Corporation is a global leader in enabling businesses and service providers to transform their operations and deliver IT as a service. Fundamental to this transformation is cloud computing. Through innovative products and services, EMC accelerates the journey to cloud computing, helping IT departments to store, manage, protect and analyze their most valuable asset — information — in a more agile, trusted and cost-efficient way" (EMC website).

EMC's business model is based on its organic development with the help of acquisitions. Some of the competitors include NetApp Inc, IBM, Hitachi Data systems, and Seagate Technology PLC. Rather than merely dealing with storage software, EMC differentiates itself by breaking down the term, storage software, into "document management, security and virtualization software" (Morningstar). EMC also differentiates itself with the use of its cloud system and its security system, RSA, which targets these individual threats and shapes them to

a certain organizations. This is in comparison to its competitors who focus on more hardware to store businesses data. With the growing concern of security vulnerability in the industry, EMC is clearly taking large steps in order to reinforce themselves as the primary storage infrastructure for virtual server environments. It appears as though EMC is a cyclical business that usually performs the highest from the months of December through February. EMC is also really big on gobbling up other companies in order to strengthen its market share in the industry. Last year, EMC also bought a company called Data Domain, which enables it to “store 10 TB to 30 TB of backup data on 1 TB of physical disk capacity” (EMC website). It is also important to note, the with the immergence of cloud computing, the technology sector as a whole has been less focused on their hardware products, indicating EMC’s strong position in the market.

Revenue and Earnings History

Discuss any pattern in revenue and earnings (e.g., increasing year over year; seasonal; etc.)

Revenue in Millions

Periods	2012	2011	2010
March	\$5,094.4	\$4,607.6	\$3,890.7
June	\$5,311.4	\$4,845.4	\$4,023.5
September	\$5,278.2	\$4,980.2	\$4,212.3
December	\$6,029.9	\$5,574.4	\$4,888.6
Year	\$21,713.9	\$20,007.6	\$17,015.1

Earnings per Share

Periods	2012	2011	2010
March	0.27	0.21	0.17
June	0.29	0.24	0.20
September	0.28	0.27	0.22
December	0.39	0.38	0.29
Year	1.23	1.10	0.88

EMC’s revenue has consistently increased year after year, except in Q3 of 2012. As the tables above indicate, the company seems to generate the most revenue during the last quarter of their fiscal year. The companies EPS follows a similar pattern from the beginning of 2010 to the second quarter of the fiscal year, June. However, it appears as though the EPS, like the revenue, dropped slightly in Q3 from 0.29 to 0.28. This could be because the company was using its extra cash to acquire other companies, such as Data Domain. Or it could be because

EMC just didn't have enough net income as previously expected. Either way, the fact EMC has usually been consistent in increasing both their revenue and EPS is impressive. Most recently, the company beat EPS estimates by \$0.02 and revenue by a 0.91% surprise from the estimated fourth quarter income of \$5,975.57 billion to their actual income of \$6,029.96 billion which indicates EMC strong foundation in this market. Managements future outlook for the year is light because of the uncertainty 2013 will bring to the IT market as well as the virtualization market.

In other news, EMC's subsidiary VMware cut 900 jobs but said it also plans "to hire 1,000 new workers" (Seeking Alpha). This is an indicator of change going on in the company, as seen which the transition from then CEO Paul Maritz to new CEO Pat Gelsinger. EMC recognizes the markets desire for a reliable cloud solution. An interesting note here is that Paul Maritz, who used to work on open source integration for Microsoft, "is heading up something called the "Pivotal Initiative," within EMC, combining units from both VMware and EMC including Springsource middleware, the Cloud Foundry Platform project, and Greenplum, the company's big data operation" (Seeking Alpha). Because VMware's use is intended for virtualization and is not necessarily a full cloud solution, this integration of storage, data management, and cloud infrastructure could help EMC establish a formidable piece of the cloud markets pie.

Section (C) Fundamental Valuation (EBO)

Include the following here:

Copy/paste completed Fundamental Valuation (EBO) Spreadsheet

Above normal growth period chosen: 5 Years

EBO valuation (Implied price from the spreadsheet): \$23.31

I chose a five year abnormal growth period because it seems as though this company is more oriented for long term growth, as opposed to short term growth. EMC's is positioning itself to take advantage of the cloud market in the near future. With cloud computing still in its early stages of development, EMC saw substantial increases in their price after the first few years of delving in the market. Currently the stock is trading at \$24.85, with its 52 week high of \$30.00 and 52 week low of \$22.77. My EBO valuation has the stock at 20.80. This would imply the stock could be slightly overvalued. However, it is important to note that the company does not pay dividends, which reinforces our assumption the company is geared toward long term growth.

Sensitivity Analysis

EBO valuation would be (you can include more than one scenario in each of the following):

\$27.75 if changing above normal growth period to 8 years

\$20.80 if changing growth rate from mean (consensus) to the highest estimate 15.00

\$20.80 if changing growth rate from mean (consensus) to the lowest estimate 12.00

\$18.74 if changing discount rate to 10.07%

\$20.80 if changing target ROE to 13.61%

After comparing these multiples with our base case, there is a not much change in this years or even next year implied price. This is a good indicator the company is establishing long-term growth. It is interesting to note that if we change the growth rate from the high estimate of 15% to the low estimate of 12% this year implied price of 20.80 does not change. However the implied price two years from now, 2015, changes from \$22.26 at 15% and \$21.60 at 12%. If we increase the discount rate to 10.07%, there is a significant drop in each years implied price.

Section (D) Relative Valuation

Copy/paste your completed relative valuation spreadsheet here

		Mean FY2								
		Earnings Estimate (next fiscal year)	Forward P/E	Mean LT Growth Rate	PEG	P/B (MRQ)	ROE 5 yr ave	Valuation Ratio		
Business Segment A	Mkt Cap	Current Price								
	Revenue	\$229,455.41	\$205.12	18.45	11.12	9.86%	1.13	12.17	70.96%	0.7
	EBITDA	\$12,194.11	\$33.67	5.45	6.18	-7.93%	-0.78	4.17	20.12%	0.1
	Net Income	\$27,796.62	\$5.95	54.90	0.11	-1.21%	-0.09	1.43	-4.55%	-0.1
Business Segment B	Revenue	\$12,898.22	\$36.20	2.47	14.66	11.24%	1.30	2.93	15.93%	0.1
	EBITDA									
	Net Income	\$51,844.78	\$24.85	2.07	12.00	12.73%	0.94	2.32	11.39%	0.1
	Operating Margin									
Company Overview										
Company Name			P/E		PEG	P/B		Valuation		
Business Machines Corp.			\$23.01		\$29.71	\$130.36		\$21.50		
Revenue			\$12.79		-\$20.53	\$44.67		\$21.50		
Net Income			\$0.22		-\$2.36	\$15.32		-\$3.00		
Operating Margin			\$30.34		\$34.36	\$31.38		\$21.50		
EBITDA										
Operating Margin										
Revenue			\$30.34		\$34.36	\$130.36		\$21.50		
Net Income			\$0.22		-\$20.53	\$15.32		-\$3.00		
Operating Margin			\$17.90		\$13.68	\$38.02		\$21.50		

Notes: Converted HTHIF.PK market cap of 2,572,570.00 million yen to USD of \$27,796.62 million.

From the top panel

I chose these four competitors because they operate in the largest portion of EMC's business segments, the information infrastructure portion. This portion is concerned with the

offering, consulting and supporting of their IT systems. Although IBM does compete in the virtualized infrastructure segment of the industry, they are currently more dedicated to their hardware and flash capabilities, which distinguish them from EMC.

EMC differs slightly from a few of its competitors multiples. EMC has the highest long term growth rate between all of its competitors, which is a good sign, seeing as the technology sector is very influenced by a company's long term growth. STX's and HIT's long term growth rates of -7.93% and -1.21% indicates the company's hesitation for future growth. Forward P/E ratios all seem valid except for Hitachi's value of only 0.11 which is due to the high EPS estimates in the next fiscal year. EMC, IBM and NTAP multiples appear to have a similar range for the PEG, P/S and P/CF as opposed to the values of both HIT and STX, which is most likely due to the industry transition from disk drives and hardware to consulting services and software. While IBM clearly has the highest P/B ratio, its market cap and multiple business segments are indicator of it high amount of resources this company possess. EMC and other competitor P/B ratios are consistent with one another.

All of IBM's implied prices are all much lower than their current price, indicating an overvaluation. Additional support is found in the stocks 52 week high of \$211.79 and 52 week low of \$181.85. Seagate Technology only ratio in the confines of its 52 week high and low is its value ratio which is still lower than its current price. The companies implied prices for its other valuation metrics all appear low, except for its implied P/B ratio, which tells us the stock is a bit pricey. Hitachi's implied priced from the P/E, PEG, P/S and value ratio are all extremely low. The companies P/CF is the only value that lies within the range of its 52 week high and low. In addition, its P/B ratio is almost three times the price of the stock. NetApp's implied prices seem to be the most equitable to EMC. In fact, almost all of NetApp's values are within EMC's 52 week low and 52 week high range.

From the bottom panel

Prices derived from the P/E valuation matrix have a minimal range. However, the outlier here is the low value under a dollar. This is because of Hitachi's low forward P/E value. I think it is important to not that almost all of the low implied prices come from Hitachi, signifying it is performing the worst compared to its competitors. The high price derived from the P/B ratio seems to be somewhat of an outlier, due to IBM high differential between its market value and book value. Because the P/S and PEG ratios provide the least fluctuation and closest approximation between variables, I would argue that the PEG and P/S ratio are the most significant when evaluating companies in the technology sector. This is because of the technology company's focus for growth and the fact sales are better at indicator or profitability.

Also, it is significant to note the P/S values derived are the only values that stay within the confines of EMC's 52 week high and 52 week low.

Section (E) Revenue and Earnings Estimates

Copy/Paste the "Historical Surprises" Table from *Reuters.com*, "Analysts" tab (include both revenue and earnings; make note that revenues might be in "millions")

HISTORICAL SURPRISES

Sales and Profit Figures in US Dollar (USD)
Earnings and Dividend Figures in US Dollar (USD)

Estimates vs Actual	Estimate	Actual	Difference	Surprise %
SALES (in millions)				
Quarter Ending Dec-12	5,975.57	6,029.96	54.39	0.91
Quarter Ending Sep-12	5,462.19	5,278.18	184.01	— 3.37
Quarter Ending Jun-12	5,292.19	5,311.39	19.20	0.36
Quarter Ending Mar-12	5,120.00	5,094.38	25.62	— 0.50
Quarter Ending Dec-11	5,490.30	5,574.43	84.13	1.53
Earnings (per share)				
Quarter Ending Dec-12	0.52	0.54	0.02	3.21
Quarter Ending Sep-12	0.42	0.40	0.02	— 5.01
Quarter Ending Jun-12	0.39	0.39	0.00	1.09
Quarter Ending Mar-12	0.36	0.37	0.01	1.96
Quarter Ending Dec-11	0.46	0.49	0.03	6.27

In terms of revenue, EMC certainly has a history of surprising the market after each quarter. EMC seems to have a tendency of beating analysts' estimates in December and June while also missing estimates in March and September. In terms of earning per share, EMC beat estimates by \$0.02 in December 2012, \$0.01 in March 2012 and in \$0.03 December 2011. They did however, miss estimates in September 2012 by \$0.02. EPS estimates for June 2012 were right on the actual EPS. Surprises appear to be more notable for earnings because even if the actual earnings are only one cent above the estimates, EMC's plethora of shares heavily influences that one cent and thus consensus on the stock will change. As an example, if we

look at the stocks chart in after earnings were reported in September, we can see a decline in the stock's value over the month of October. The same trend is evident after March 2012, although because revenue missed estimates and earning per share bear estimates the residual effect was not quite as long.

Copy/paste the “Consensus Estimates Analysis” Table from *Reuters.com*, “Analysts” tab (include both revenue and earnings)

CONSENSUS ESTIMATES ANALYSIS

Sales and Profit Figures in US Dollar (USD)

Earnings and Dividend Figures in US Dollar (USD)

	# of Estimates	Mean	High	Low	1 Year Ago
SALES (in millions)					
Quarter Ending Mar-13	35	5,419.55	5,527.88	5,348.00	5,655.83
Quarter Ending Jun-13	35	5,663.35	5,747.00	5,586.30	5,889.13
Year Ending Dec-13	39	23,480.60	23,761.00	23,171.00	24,461.80
Year Ending Dec-14	34	25,443.30	26,770.00	24,678.00	26,890.10
Earnings (per share)					
Quarter Ending Mar-13	37	0.39	0.44	0.36	0.42
Quarter Ending Jun-13	37	0.43	0.45	0.41	0.45
Year Ending Dec-13	41	1.87	2.00	1.81	1.97
Year Ending Dec-14	33	2.07	2.18	1.97	2.22
LT Growth Rate (%)	6	12.73	15.00	10.10	15.85

Sales (in millions)	% Difference in Low vs Mean
Quarter Ending Mar-13	-1.32%
Quarter Ending Jun-13	-1.36%
Year Ending Dec-13	-1.32%
Year Ending Dec-14	-3.01%
Earnings (per share)	
Quarter Ending Mar-13	-7.70%
Quarter Ending Jun-13	-4.65%
Year Ending Dec-13	-3.20%
Year Ending Dec-14	-4.83%
LT Growth Rate (%)	-20.66%

Sales (in millions)	% Difference in Low vs Mean
Quarter Ending Mar-13	1.99%
Quarter Ending Jun-13	1.48%
Year Ending Dec-13	1.19%
Year Ending Dec-14	5.21%
Earnings (per share)	
Quarter Ending Mar-13	12.82%
Quarter Ending Jun-13	4.65%
Year Ending Dec-13	6.95%
Year Ending Dec-14	5.31%
LT Growth Rate (%)	17.83%

There seems to be more divergence in estimations the farther the anticipated quarter is from the current quarter. As an example, we notice there is an absolute range of 8.02% for the year ending December 2014, while there is only a 2.51 absolute range for the year ending December 2013. As mentioned previously, there is much more divergence in the earnings than in revenue. This is because the EPS estimates smaller scale makes the significance of each cent gain or lost much greater. It is interesting to note there are only six analysts providing long term growth estimates whereas estimates for revenue and EPS are formed with groups ranging from 33 to 41 analysts. This substantial difference in number of analysts' estimates is important because it recognizes the difficulty of estimating long term growth.

Copy/paste the “Consensus Estimates Trend” Table from *Reuters.com*, “Analysts” tab (include both revenue and earnings)

CONSENSUS ESTIMATES TREND

Sales and Profit Figures in US Dollar (USD)
Earnings and Dividend Figures in US Dollar (USD)

	Current	1 Week Ago	1 Month Ago	2 Month Ago	1 Year Ago
SALES (in millions)					
Quarter Ending Mar-13	5,419.55	5,492.96	5,512.73	5,515.78	5,655.83
Quarter Ending Jun-13	5,663.35	5,729.38	5,750.39	5,752.80	5,889.13
Year Ending Dec-13	23,480.60	23,565.30	23,699.60	23,722.00	24,461.80
Year Ending Dec-14	25,443.30	25,836.10	26,402.00	26,554.10	26,890.10
Earnings (per share)					
Quarter Ending Mar-13	0.39	0.41	0.42	0.42	0.42
Quarter Ending Jun-13	0.43	0.44	0.45	0.45	0.45
Quarter Ending Dec-13	1.87	1.90	1.92	1.92	1.97
Quarter Ending Dec-14	2.07	2.17	2.22	2.23	2.22

According to this table, it seems the consensus estimates are trending down for both revenue and earnings per share. A year ago, the quarter ending in March 2013 was predicted to earn close to \$5,655.83 million in revenue but now revisions have decreased that estimate to \$5,419.55, which is a decreased value of 4.36%. When we compare this percentage to the decrease in estimates for the quarter ending in June 2013, we identify a 3.98% decrease. If we compare the changes analysts estimated from a year ago to today for the year ending December 2013 and December 2014, we calculate a change of -4.01% and -5.38% respectively. This indicates that while the change in the trend is more notable during our current quarter then out of quarter, it is also more notable during the FY2 as opposed to FY1. As stated earlier, EPS estimates are more notable because the change in estimates has a greater impact of a

smaller scale. Although earnings per share estimates did remain consistent until around a week ago, the decline in earnings per share is evident.

Copy/paste the “Estimates Revisions Summary” Table from *Reuters.com*, “Analysts” tab (include both revenue and earnings)

ESTIMATES REVISIONS SUMMARY

Number Of Revisions:	Last Week		Last 4 Weeks	
	Up	Down	Up	Down
Revenue				
Quarter Ending Mar-13	3	30	2	30
Quarter Ending Jun-13	4	29	2	30
Year Ending Dec-13	15	22	7	30
Year Ending Dec-14	4	11	2	11
Earnings				
Quarter Ending Mar-13	4	27	4	27
Quarter Ending Jun-13	2	27	1	27
Year Ending Dec-13	3	29	2	33
Year Ending Dec-14	2	14	1	12

Over the last four weeks, EMC’s revenue had 30 revisions down and only two up for the quarter ending March 2013 and the quarter ending June 2013. In the same time, there were 30 revenue revisions down and seven up as well as 11 revisions down and two up for the year ending December 2013 and December 2014. Last week, revenue revisions were: down 30 and up three for the quarter ending March 2013, down 29 and up four for the quarter ending June 2013, down 22 and up 15 for the year ending December 2013, down 11 and up four for the year ending December 2014. Although revisions for earnings indicated slightly more optimism than revenue did, the overall consensus for earnings over the last week was a revision down. It seems as though a majority of the revisions made to both revenue and earnings occurred last

week. While this clearly indicates analyst's hesitation in the future of the company, I think analysts are slightly influenced and pessimistic about the transition from hardware to software in the near future. Most other data storage businesses rely on silicon components to run their processors, which have proven to be reliable but costly. As Morningstar mentions, EMC has recently switched to using "standardized processors" (MorningStar). This switch not only saves EMC money from spending on expensive hardware, but also lets the company allocate those funds into their software where they should have "a better chance of delivering a differentiated product that will keep it firmly entrenched in data centers around the world" (MorningStar). This hesitation is consistent with reports from Morningstar and other sites, which tell us the outlook for the year is not as high as previous years because of the hesitation in the market as well as VMware, EMC's largest subsidiary, missing both revenue and earnings estimates. EMC's largest threat come from disruptive technology. These are new and emerging technologies that could give EMC's competitors a piece of their piece of their market share. Examples include: Deduplication, solid-state drives and scale-out network attached storage.

Section (F) Analysts' Recommendations

Copy/paste the “Analyst Recommendations and Revisions” Table from *Reuters.com*, “Analysts” tab. NOTE: Make sure you copy the entire table including the “Mean Rating” at the bottom of the table.

ANALYST RECOMMENDATIONS AND REVISIONS

1-5 Linear Scale	Current	1 Month Ago	2 Month Ago	3 Month Ago
(1) BUY	18	17	17	16
(2) OUTPERFORM	16	18	20	19
(3) HOLD	7	5	5	4
(4) UNDERPERFORM	0	0	0	0
(5) SELL	0	0	0	0
No Opinion	0	0	0	0
Mean Rating	1.73	1.70	1.71	1.69

NOTE: On a Five-point scale, Reuters assigns “1” to “Buy”, the most bullish recommendation, and “5” to “Sell”, the most bearish recommendation. **Some other online sites have opposite scale**, with their “1” being the most bearish and “5” being the most bullish recommendations.

Over the past three months, analysts have remained optimistic about the stock. While there was a slight decrease from outperforming recommendations to hold recommendations, the overall impression of the stock indicates no analyst is rating this stock as underperforming. While the recommendations of analysts are not always a great indicator of value for the stock because of personal agendas and outside business influences, I believe EMC's stock is turning faintly more bullish because of the mean rating estimation which rose from 1.69 to 1.73 over the past three months. Three months ago, EMC received analyst's recommendations of 16 buys. Since then it can consistently had 17 analysts recommend a buy, until its current update to 18. Also, during the past three months EMC had received a slight decrease in outperforming recommendations which were at 19, then rose to 20 but unfortunately fell down to 18 and then currently stands at 16 today. EMC's only other recommendation received, which is to hold the stock, was at 4 three months ago. Recommendations then proceeded to rise to 5 two months

ago, stay at 5 for a month and climb to 7 analysts currently recommending a hold. This information is consistent with morning stars rating of four stars.

Revision Date	Upgrade or Downgrade	Current Recommendation	Previous Recommendation	Firm	Last Revision
1/30/13	Upgrade	Strong Buy	Hold	Monness	4 months ago
1/8/13	Downgrade	Hold	Strong Buy	Blair	2 years ago

Section (G) Institutional Ownership

Copy/paste the completed *"CIF Institutional Ownership" spreadsheet* here.

EMC				
Ownership Activity	# of Holders	% Beg. Holders	Shares	% Shares
Shares Outstanding			2,106,658,920	100.00%
# of Holders/Tot Shares Held	1,457	99.18%	1,737,572,277	82.48%
# New Positions	22	1.50%		
# Closed Positions	34	2.31%		
# Increased Positions	208	14.16%		
# Decreased Positions	204	13.89%		
Beg. Total Inst. Positions	1,469	100.00%	1,732,778,192	82.25%
# Net Buyers/3 Mo. Net Chg	4	50.49%	4,794,085	0.23%
Ownership Information	% Outstanding			
Top 10 Institutions % Ownership	24.10%			
Mutual Fund % Ownership	1.37%			
Float %	99.91%			
> 5% Ownership				
Holder Name	% Outstanding	Report Date		

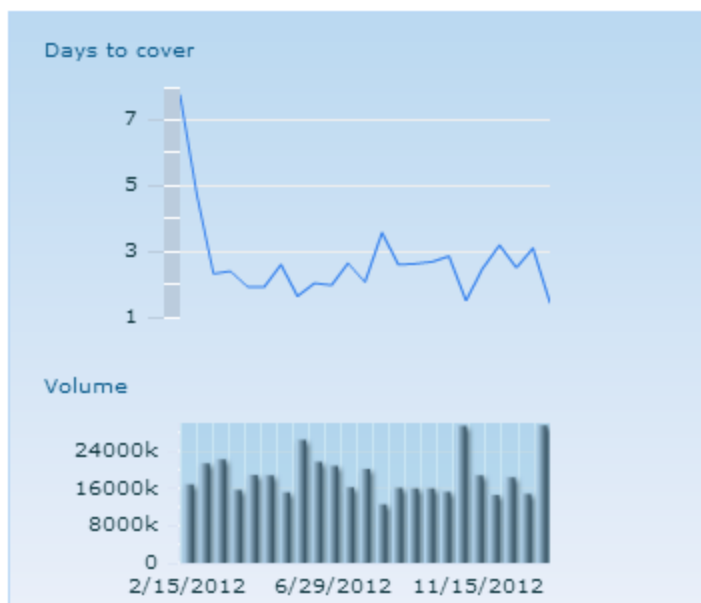
According to this data, ownership has increased on a net basis over the past 3 months, although it is not by a very large amount. Although this is a positive sign for the company, the total number of shareholder exceeds 1400, which indicates the change to be minimal. With institutions owning 82.48%, I would argue this percentage indicates a very sizeable portion of interest and support. It was however, peculiar to see there are no current owners who have more than a 5% stake in the company, especially when referencing to the percentage owned by institutions. I would argue this is a bullish indication for the stock. Support being in the large

amount of institutional ownership, the large float proportion accessible for trade and owned by the public, and the increase in net buyers over the past few months.

Section (H) Short Interest (two pages)

From <http://www.nasdaq.com/> (NASDAQ's website)

Settlement Date	Short Interest	Avg Daily Share Volume	Days To Cover
1/15/2013	42,620,040	29,468,027	1.446315
12/31/2012	45,685,416	14,756,846	3.095879
12/14/2012	46,056,797	18,328,622	2.512835
11/30/2012	46,396,066	14,508,348	3.197888
11/15/2012	46,323,817	18,753,079	2.470198
10/31/2012	44,161,744	29,359,694	1.504162
10/15/2012	43,461,205	15,188,773	2.861403
9/28/2012	42,753,446	15,931,139	2.683640
9/14/2012	42,040,541	15,961,967	2.633795
8/31/2012	41,779,330	16,100,938	2.594838
8/15/2012	44,659,782	12,495,241	3.574143
7/31/2012	41,507,293	20,088,971	2.066173
7/13/2012	42,679,267	16,164,156	2.640365
6/29/2012	41,142,830	20,787,980	1.979164
6/15/2012	43,855,605	21,583,840	2.031872
5/31/2012	42,959,433	26,320,519	1.632165
5/15/2012	39,150,766	15,075,360	2.597004
4/30/2012	35,855,555	18,744,698	1.912837
4/13/2012	36,389,095	18,879,202	1.927470
3/30/2012	37,457,090	15,598,385	2.401344
3/15/2012	51,417,912	22,155,268	2.320798
2/29/2012	100,406,089	21,269,699	4.720616
2/15/2012	130,895,136	16,836,125	7.774659



From <http://finance.yahoo.com/>

Complete the following table with information from the *“share statistics” table*.

EMC

Avg Vol (3 month)	Avg Vol (10 day)	Shares Outstanding	Float
21,921,700	38,693,500	2.11 Billion	2.10 Billion
Shares Short (1/15/13)	Short Ratio (1/15/13)	Short % of Float (1/15/13)	Shares Short (2 weeks prior)
42.62 Million	1.90	2.10%	45.69 Million

IBM

Avg Vol (3 month)	Avg Vol (10 day)	Shares Outstanding	Float
4,007,440	4,529,740	1.12 Billion	1.12 Billion
Shares Short (1/15/13)	Short Ratio (1/15/13)	Short % of Float (1/15/13)	Shares Short (2 weeks prior)
14.81 Million	3.80	1.30 %	13.41 Million

NTAP

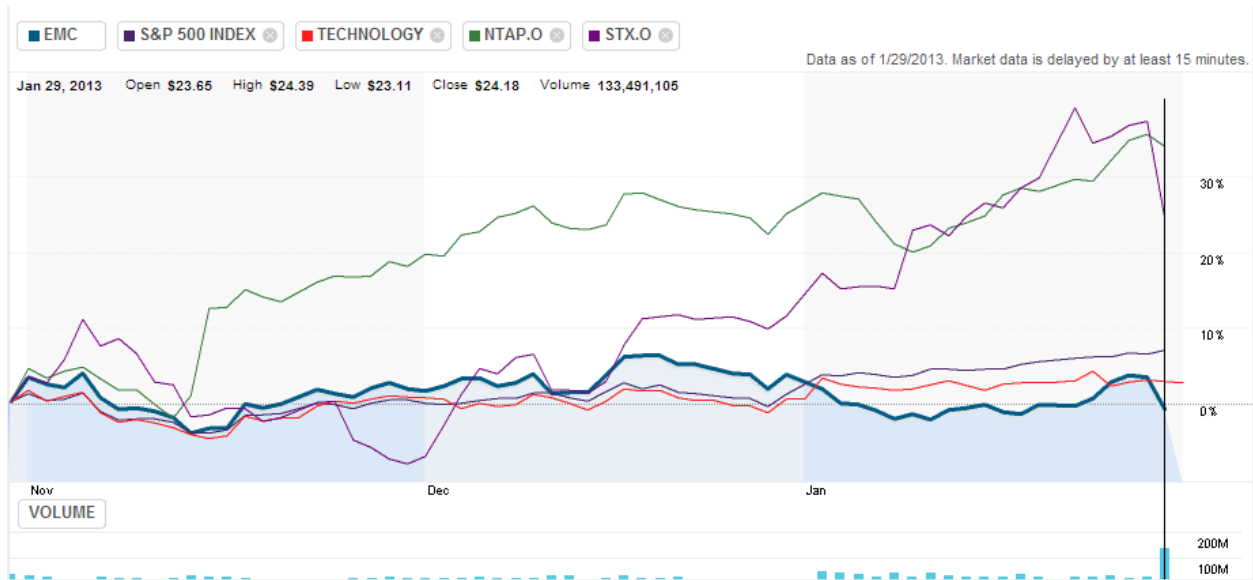
Avg Vol (3 month)	Avg Vol (10 day)	Shares Outstanding	Float
5,846,000	5,957,700	358.28 Million	355.74 Million
Shares Short (1/15/13)	Short Ratio (1/15/13)	Short % of Float (1/15/13)	Shares Short (2 weeks prior)
12.16 Million	2.50	3.30%	11.52 Million

Since last year, EMC has made huge strides in decreasing its days to cover ratio from above seven to about two days in the past year alone. The market on the stock indicates more of a bullish then bearish sentiment. EMC has the most attractive short ratio at 1.90, while NTAP and IBM have ratios of 2.50 and 3.80 respectively. This low ratio is attractive to investors because it takes EMC less time to cover the company's shares. The average volume of shares traded for EMC is much higher than both IBM and NTAP, which tells us consumers are trading frequently, another good sign for EMC. However, this could tell us EMC had a short squeeze on the 15th, although the price of the stock did not rise significantly before that time period. While there were previous months increase in short interest, the most recent decrease in short interest since 11/30/12 is another bullish sign.

Section (I) Stock Charts

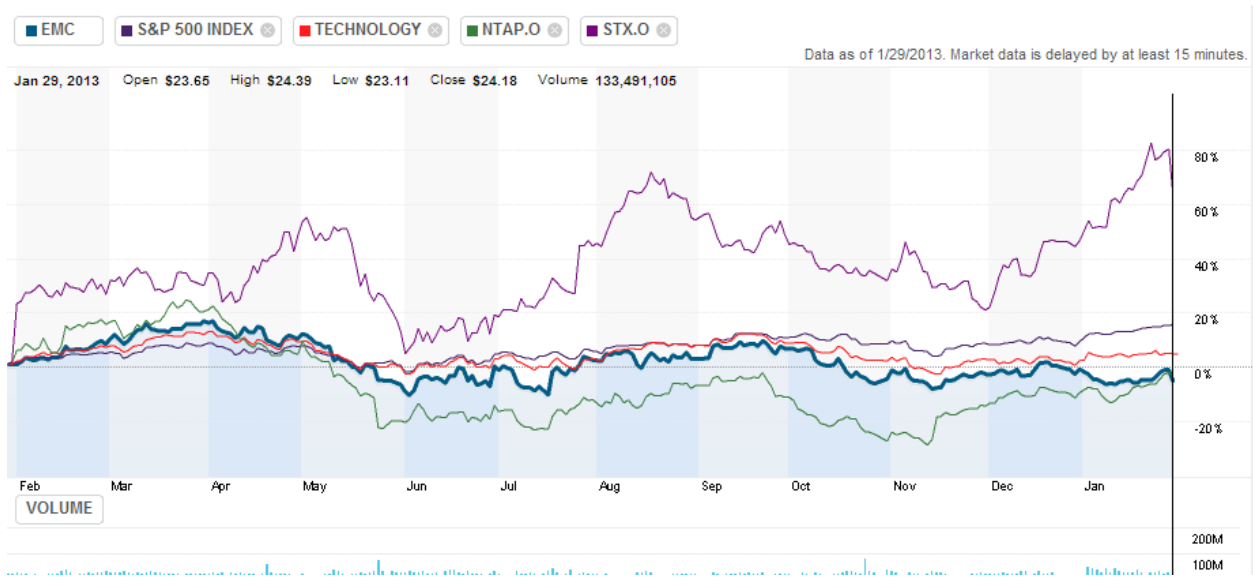
A three months price chart

Copy/paste the “3 Mos.” stock chart here



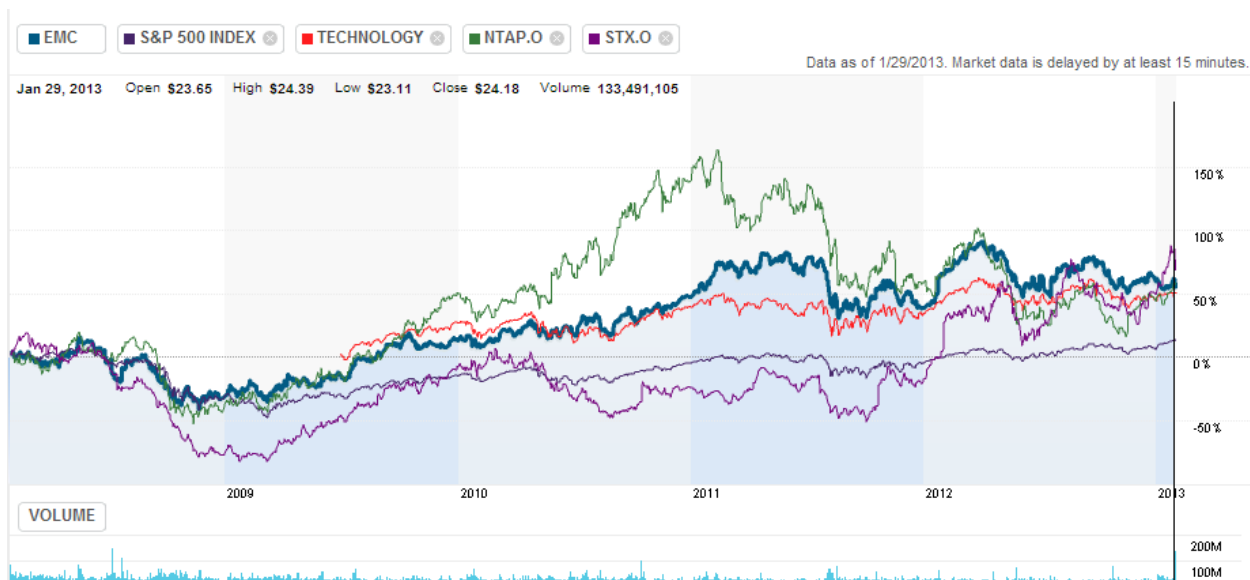
A one year price chart

Copy/paste the “1 Yr” stock chart here



A five year price chart

Copy/paste the “5 Yrs.” stock chart here



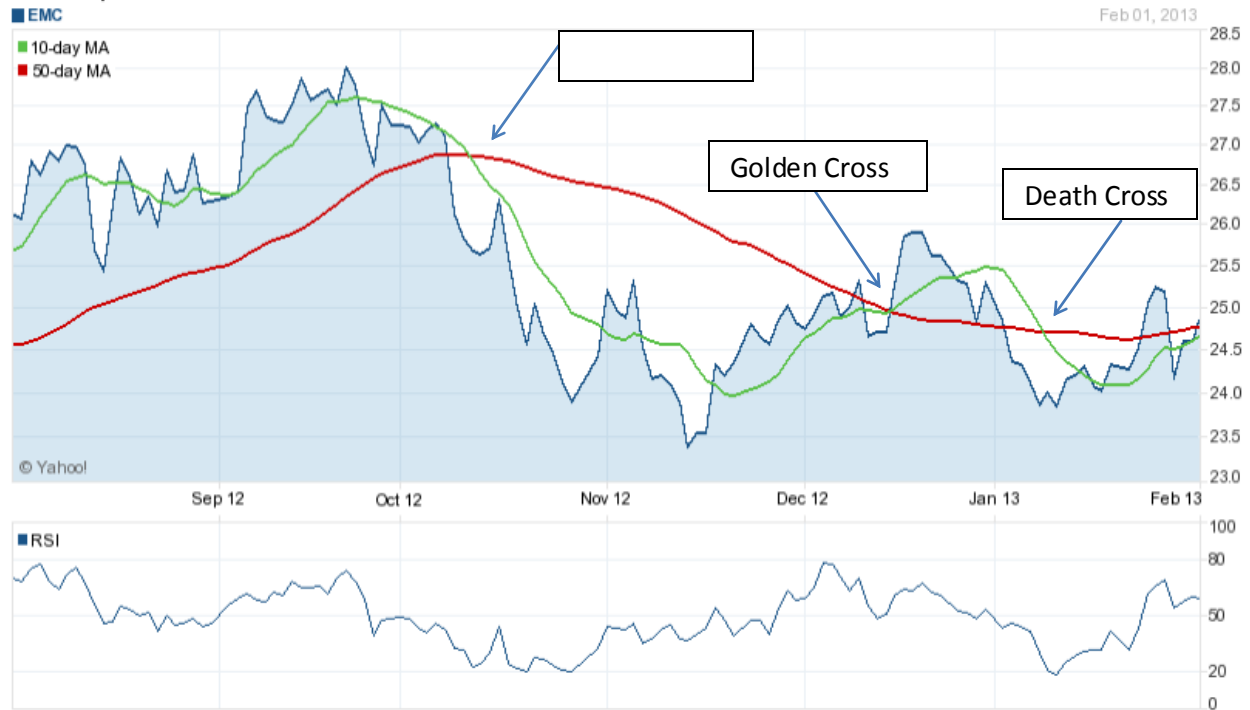
When we analyze the 3 month stock chart, it is apparent EMC has the lowest return between its competitors, the XLK sector as a whole as well as the S&P 500. However, this chart does give us an indication of EMC volatility, which is low, of this time period. When we widen our range to the one year stock chart we see a significant different in the competitor NetApp Inc. In this chart, NetApp Inc is not only lower than EMC, but it is indicating that it is performing worse than EMC, the XLK sector, Seagate technologies PLC and the S&P 500. This tells us the company did ok through the year, and then had a nice burst in the last three months. We confirm EMC's low volatility in the one year price chart as well. In the 5 year price chart, we note two important pieces of information. First, in this time span EMC as well as its competitors are outperforming the S&P 500. Second, it is important to see the dramatic volatility NetApp Inc and Seagate Technologies are displaying over this period. This volatility is an indicator of the potential risk associated with owning these stocks.

Additional price chart (Tech. Analysis)

EMC Corporation Common Stock

■ EMC

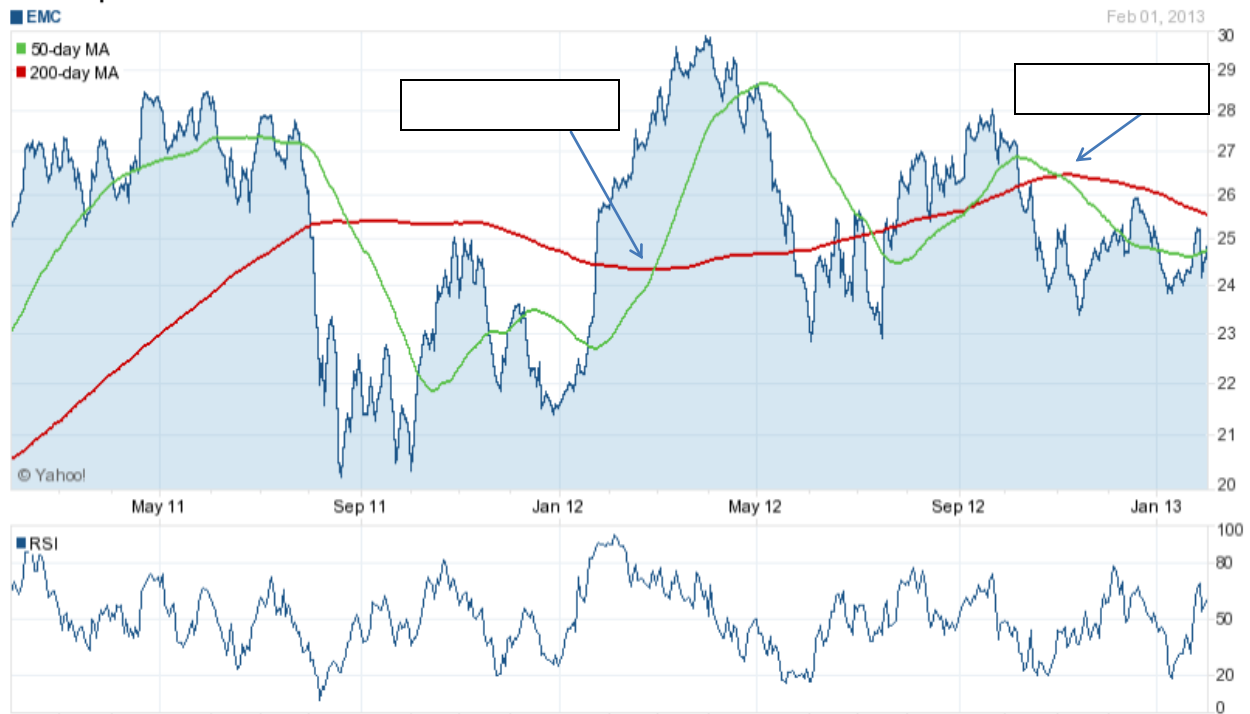
■ 10-day MA
■ 50-day MA



EMC Corporation Common Stock

■ EMC

■ 50-day MA
■ 200-day MA



According to these two charts, which hinder on technical analysis, provide information on the market timing and trend of the stock in the time span provided. In the ten to fifty day moving average chart there are two instances when the ten day moving average dives below the fifty day moving average which indicates a bearish market sentiment for the stock also known as “death cross”. However, there is one instance when the ten day moving average rises above the fifty day moving average which would point to signs of a bullish sentiment also known as a “golden cross”. In the fifty to two hundred day moving average, we can see a total of three death crosses, and two golden crosses which indicates more of a bearish then bullish trend in the market because of the loss of momentum. I think it is important to note both short term moving averages (i.e. the ten day moving average in the first chart and fifty day moving average in the second chart) are very close to rising above their respective longer moving averages which I see as a good sign for the near future. Another point too pay attention to is the relative strength index of these charts. Based on this data we conclude that EMC’s RSI for both the ten to fifty day moving average and fifty to two hundred day moving average fluctuates between an index of 20 and an index of 80, which is averaged to be 50. While the current RSI appears to be just about 50 and below 60, I think this is a good opportunity to buy stock in EMC because it is right in between the indicator of being overbought (70) and oversold (30). This relates to reports in Morningstar about the markets hesitation in Information Technology.

Works Cited

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