An Empirical Examination Of The Usefulness Of The Motley Fool's "Flow Ratio"

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An item in the Motley Fool recently caught our attention. The article "Cisco vs. Lucent: The Flow Ratio Tells All" (by Matt Richey, June 6, 2000, in The Motley Fool.fool.com), introduced a new ratio that Richey claimed to be useful for measuring the investment worthiness of a company. Since our Financial Statement Analysis course covers traditional ratio analysis and since we were exploring some research ideas on measuring liquidity, the Fool Ratio seemed worthy of investigation.

In his article on the Flow Ratio, Richey stated:

But, if I had to assess a company's quality and prospects by looking at the trend of only a single financial metric, I'd choose a balance sheet metric called the Flow Ratio. I've found this simple numeric to be the most revealing metric in my analytical toolbox.

We decided to test the usefulness of the Flow Ratio as a predictor of stock price. This paper reports the results of our study. We start with the definition of the Flow Ratio and the benchmark value suggested by Richey. Then, we describe our study and analyze the results. The final section consists of concluding comments and suggestions for further relevant studies.

The Flow Ratio

Richey's article (6/6/2000) demonstrates how the Flow Ratio is computed, and then it demonstrates how the ratio is used. First, the computation is as follows:

$$\textbf{Flow Ratio} = \frac{\text{Current Assets - Cash}}{\text{Current Liabilities - Short-term Debt}}$$

The logic behind the Flow Ratio goes like this:

- It is best to see "as low a numerator as possible, since the numerator represents inventory, accounts receivable, and prepaid expense".

- Reverse your thinking for the denominator. As Richey explains, current liabilities represent goods and services which the company has already purchased and received but hasn't yet paid for. They represent a chance to get "something for nothing – for a short period of time, at least". The only "bad" type of current liability is short-term debt, because it carries interest charges. Thus, short-term debt is subtracted from the current liabilities total. We would like to see the denominator as high as possible.

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- Therefore, using the logic for both the numerator and denominator, we would like to see a low value for the Flow Ratio.

Thus far, this seemed logical, and we thought that perhaps the Flow Ratio has some value when doing a financial analysis. Initially, Richey and Gardner seemed to be proposing the ratio only as a measure of the effectiveness of managing working capital. However, the illustration that they use to demonstrate the value of the Flow Ratio, also suggested that the Flow Ratio has additional usefulness, for predicting stock price. This piqued our curiosity, since this is something analysts and investors have sought for decades.

Tom Gardner, in the early days of the Rule Maker Portfolio, invented the Flow Ratio. In 1997, Gardner ("Fool Portfolio Report", 9/4/97) suggested a cutoff for the Flow Ratio; "Any Flow Ratio below 1.00 reflects a company that appears to be very aggressively managed and whose products are in great demand. Conversely, any Flow Ratio above 2.00 reflects a company that appears to be managed sloppily and whose products aren't coveted." On 8/7/00, Richey ("Lucent vs. Cisco: Go with the Flow") stated that a Flow Ratio value below 1.25 is desirable. However, no basis for either cutoff value is given in any of the articles that we have seen from Motley Fool. In addition, there appears to have been no empirical testing of the Flow Ratio to determine either averages or suggested benchmark figures. We attempted to contact the Motley Fool to determine the basis for this cutoff, but we were referred to a chat room that shed no further light on the issue.

To illustrate the value of the Flow Ratio and its relationship to stock price Richey chose to compare Lucent with Cisco as follows:

Flow Ratio and Stock Price Lucent vs. Cisco

	Lucent		Cisco	
Date	Flow Ratio	Stock Price	Flow Ratio	Stock Price
12/97	1.47	$22.05	1.44	$10.51
03/98	1.56	$38.01	1.31	$12.21
06/98	1.57	$46.07	1.17	$15.96
09/98	1.69	$40.01	1.13	$18.84
12/98	1.89	$56.19	1.12	$27.89
03/99	2.03	$59.92	1.03	$28.52
06/99	2.18	$65.62	0.87	$31.06
09/99	2.26	$64.19	1.03	$44.59
12/99	2.67	$55.48	0.99	$54.75
03/00	2.80	$62.19	0.87	$69.33
08/00*	2.89	$42.38	N/A	$65.56
CHANGE	**90.5%**	**92.2%**	**-39.6%**	**523.8%**

*The date shown in Motley Fool was 8/04, but probably was intended to be 8/00, since the article was written in 2000.

As the above data show, both companies had a Flow Ratio near 1.45 at the end of 1997. However, the two companies have taken opposite roads since then; Cisco's Flow Ratio had declined to .87 and Lucent's Flow Ratio increased to 2.80 at March of 2000. The trend in stock price for the two companies is the reverse, Lucent's stock price almost tripled from $22.05 to $62.19 and Cisco's price has increased over six times from $10.51 on 12/97 to $69.33 on 3/00. In addition, the Lucent price fell by over 30% from 3/00 to 8/00, while the Cisco price increased almost six-fold from $10.51 to $69.33 during the same period. The data suggests that Cisco has been doing a better job of managing its working capital, since the Flow Ratio for Cisco continually declined during the period while Lucent's Flow Ratio almost doubled.

Apparently, Richey saw something more in the data, an inverse relationship between the change in the Flow Ratio and the change in stock price. Thus, Richey concluded that the declining Flow Ratio for Cisco yields an increasing stock price. In presenting the data and in his interpretation, Richey tries to draw this relationship between the Flow Ratio and stock price. He observed, "The disparity in the stock performance of the two companies sums up the importance of the Flow Ratio. Since December 1997, a $1,000 investment in Lucent has become $1,922; in Cisco, your original $1,000 is now $6,238. An eye to the Flow Ratio at any point along the way would've steered you to the better investment." Clearly, there is an implication here that better working capital management (i.e. low and declining Flow Ratio) leads to higher stock prices.

Were Richey and Gardner on to something that could predict stock price? We had hoped so, but this seemed too easy. This would be a tool of unlimited value for making stock investment decisions. After all, one could take many pairs of companies, even within the same industry, compare a selected variable (such as the Flow Ratio) with stock price and find what appears to be a causal relationship. Richey had not even conducted any statistical testing for such relationship. Thus, the implied relationship between the Flow Ratio and stock price might not really exist. In order to determine if any relationship between the Flow Ratio and stock price exits, appropriate statistical tests for a much larger number of firms need to be conducted. This leads to the specifics on our study.

Our Study

Lucent vs. Cisco

First, we decided to use the same two firms that Richey used in his illustration, Lucent and Cisco. A visual examination of the scatter graph for these variables for Lucent and Cisco suggest a relationship between the Flow Ratio and stock price. However, the nature of the relationships differs for the two firms. For Cisco there is an inverse (negative) relationship (the lower the Flow Ratio, the higher the stock price); but for Lucent there is a positive relationship (the higher the Flow Ratio, the higher the stock price). This was confirmed by the use of the appropriate statistical tests. We conducted a least squares regression test for Lucent and Cisco for the ten periods used by Richey, and we found a significant relationship between stock price and the Flow Ratio. For Lucent the F-probability score was a very low .012775, and for Cisco it was an even lower .007638. Thus, these statistical tests do show (95% confidence) that the Flow Ratio affects that stock price for these two companies. However, the negative t-statistic for Cisco denotes an inverse relationship, while the positive t-statistic denotes a positive relationship. The Adjusted R-squared statistic for the Lucent regression model was .51 while it was .56 for the Cisco model.

Because of these mixed findings for Lucent and Cisco, we decided to test for the relationship between the Flow Ratio and stock price at other companies. First, we examined a group of six manufacturing companies; second, we used a group of eight discount retail companies; and, last, we examined 183 Internet (dot.com) companies.

Manufacturing Companies

We selected a group of six manufacturing companies, where working capital management would be considered very important. We chose General Electric, General Motors, Harley Davidson, IBM, Johnson Controls, and Rockwell International. The average Flow Ratio for this group of companies was 1.97, well above the cutoff of 1.25 suggested by Richer. Four of the companies had a Flow Ratio above the cutoff. We computed the Flow Ratio for each company for the same periods (10 quarters) that Richey used for Lucent and Cisco. Then we obtained stock prices for the same quarter. We tested for a relationship between the Flow Ratio and stock price (as the dependent variable). The results of our tests are summarized below (significant items in bold print at the 95% confidence level):

Flow Ratio and Stock Price Manufacturing Companies

Firm	t-stat.	F-stat.	F-prob.	Stock Trend	Flow Trend	Flow Hi/Lo*
General Electric	- 1.763	3.109255	.11586	Up	Flat	High
General Motors	- 0.064	0.004142	.95026	Flat	Down	High
Harley Davidson	- 0.467	0.218546	.65262	Up	Flat	High
IBM	- 3.118	9.723647	**.01426**	Up	Down	High
Johnson Controls	0.450	0.202985	.66428	Down	Down	Low
Rockwell Int'l	- 0.835	0.006986	.93544	Down	Down	Low

*"Hi" indicates a Flow Ratio value above 1.25 and "lo" means below 1.25.

If Richey's observations about the relationship between the Flow Ratio and stock price were correct, then we should see a pattern that shows an "up" trend for stock price when the trend in the Flow Ratio trend is down. In addition, where the stock price trend is down the Flow Ratio trend should be up (negative). For the manufacturing firms, we see this relationship only for IBM. For Johnson Controls and Rockwell both stock price and Flow Ratio are trending downward. Of the eight firms, only Johnson Controls and Rockwell had a Flow Ratio below the suggested cutoff of 1.25.

We prepared scatter graphs for each company. A visual examination of the graphs of stock price and Flow Ratio behavior suggested no relationship between the two variables for five the six companies, and only for IBM was there an apparent relationship. More importantly, based on the statistical analysis of the results for the six companies selected, only IBM showed a significant relationship between stock price and Flow Ratio. Further evidence of this result is the Adjusted R-Squared statistic for each of the regression models: General Electric (.19), General Motors (-.12), Harley Davidson (-.10), IBM (.49), Johnson Controls (-.10) and Rockwell International (-.12). Therefore, for the manufacturing firms, we cannot conclude that the Flow Ratio determines stock prices.

Discount Retail Companies

Our study computed the Flow ratios and stock prices on a quarterly basis for eight discount retail companies. We chose this industry because these discount retailers usually operate on low profit margins and need to have good working capital management. We found that the average Flow Ratio for the retail companies was 1.687, and five of the companies had a flow ratio above the proposed cutoff of 1.25. The results were (significant items in bold print at the 95% confidence level):

Only three companies; Costco, Target and Wal-Mart had a Flow Ratio below the cutoff suggested by Motley Fool. In addition, there is an inverse relationship between the trend in stock price and the Flow Ratio for only three of the companies, Costco, T J Max and Wal-Mart. For three other companies, Dollar Tree Store, K-Mart, and Target, the trends in stock price and Flow Ratio are the same. We found only one company, Wal-Mart, which had a significant relationship between stock price and the Flow Ratio. The statistical tests for the other discount retail companies also show that stock prices for the discount retail companies are neither related to, nor dependent upon, the Flow Ratio. The Adjusted R-Squared statistic for each of the regression models supports these findings: Costco (-.12), Dollar General (.05), Dollar Tree (-.11), Family Dollar Store (-.04), K-Mart (-.09), Target (.11), TJ Max (-.12) and Wal-Mart (.74). Thus, we do not see a pattern of an inverse relationship between stock price and Flow Ratio for the discount retail firms.

Flow Ratio and Stock Price Discount Retail Companies

Firm	t-stat.	F-stat.	F-prob.	Stock Trend	Flow Trend	Flow Hi/Lo*
Costco	-0.154	0.023	0.8809	Up	Down	Low
Dollar General	1.234	1.523	0.2520	Flat	Flat	High
Dollar Tree Store	0.350	0.122	0.7349	Up	Up	High
Family Dollar Store	0.818	0.670	0.4365	Flat	Up	High
K-Mart	0.476	0.226	0.6467	Down	Down	High
Target	-1.437	2.066	0.1885	Down	Down	Low
T J Max	-0.139	0.019	0.8923	Down	Up	High
Wal-Mart	-5.114	26.155	**0.0009**	Up	Down	Low

* "Hi" indicates a Flow Ratio above 1.25 and "lo" means a value below 1.25

Dot.com Companies

Since many dot.com companies have experienced severe financial problems in recent years, we chose to look at a large number of firms in the industry. We conducted two separate tests on dot.com firms. First, we made a broad examination of firms in the dot.com industry. We computed the Flow Ratio for 183 firms in the industry. We did the Flow Ratio computations quarterly for all quarters reported from 1997 to March of 2000. For a few companies the data went back to 1996. Following is a summary of those results.

Among the 183 dot.com companies, the average Flow Ratio was .721; well below the Flow Ratio averages for the manufacturing companies and discount retail companies. In addition, we found that 99 (54%) companies had an increasing Flow Ratio, 76 (42%) companies had a decreasing Flow Ratio and 8 (4%) companies were either unchanged or had an insufficient number of quarters. Among the 183 companies included in the dot.com industry, there were 44 companies with an average Flow Ratio greater than 1.25. According to this cutoff of 1.25 proposed by Richey, these 42 companies (23% of the total) were in a danger zone with respect to working capital management:

Companies With Low (<1.25) Flow Ratio Dot.Com Companies

AltiGen Comm	FreeShop.com	Net.Bank	Retek
AutoWeb.com	Garden.com	NetObjects	S1 Corporation
BreakawaySolutions	HearMe.com	NetPerceptions	Scient
CNET	InsWeb	NextCard	Secure Computing
Cybercash	InterNAPNtwk	OpenMarket	Spyglass
Cylink	IXL Enterprises	Pets.com	Stamps.com
Drkoop.com	Jfax.com	PlanetRx.com	Tut Systems
E Loan	MarketWatch.com	PurchasePro.com	V-1
eBenX	Medscape	Quepasa.com	WorldGate
Emusic.com	Metricom	Quokka Sports	
E-Stamp	Mortgage.com	Ramp Ntwks	

We did not conduct statistical tests of significance for the 183 firms. However, we selected at random seventeen companies in the dot.com industry, and we performed statistical tests on them to measure the relationship, if any, between the Flow Ratio and stock price. In addition, we looked at the trend in the Flow Ratio over the entire period. The statistical results follow (significant items in bold print at the 95% confidence level):

Flow Ratio and Stock Price Dot.Com Companies

Firm	t-stat.	F-stat	F-prob.	Flow Ratio
America Online	-1.3120	1.721	0.2375	Low (.47), increased
CNET	-1.3661	1.866	0.3052	High (2.09) increased
Cyber Cash	-0.7648	0.584	0.5249	Low (.87), no change
Cylink	0.1379	0.019	0.9029	High (1.43), but down
E-Trade	0.4327	0.187	0.7074	Low (.95), up slightly
Infonautics	2.4086	5.801	0.1377	Low (.37), up slightly
Lycos	2.9820	8.892	0.0965	Low (.97), up slightly
Message Media	1.3912	1.935	0.2987	High (1.31) increased
Metricom	-0.9408	0.885	0.3831	Low (.20), decreasing
Newsedge	-3.4606	11.976	**0.0406**	Low (.62), up slightly
Online Resources	0.3216	0.103	0.7782	Low (.96), up slightly
Primix Solutions	0.6545	0.428	0.5800	High (1.36), increased
PSI Net	-0.6510	0.423	0.5614	Low (.83), increased
Secure Computing	-0.3608	0.130	0.7422	Low (.44), decreased
S-One	-0.5662	0.320	0.6283	Low (.68), up slightly
V-One	1.9282	3.718	0.1936	Low (.82), decreased
Yahoo	-2.7089	7.338	0.1135	Low (.34), decreased

For the 17 dot.com companies, the average Flow Ratio was .862. This was much lower that the average Flow Ratio values for the manufacturing and discount retail firms. This was quite surprising given the financial problems of the dot.com industry during the most recent few years. In addition, only four of the companies (CNET, Cylink, Message Media and Primix Solutions) had a high (above 1.25) Flow Ratio. Eleven (65%) of the 17 companies had an increasing Flow Ratio, five (29%) had a decreasing Flow Ratio and one was unchanged. Results of the statistical tests for the dot.com companies are consistent with those for the manufacturing companies and the discount retail companies. We cannot find many significant relationships between the Flow Ratio and stock prices for the industries studied. The only company of the 17 dot.com companies that showed a relationship between stock price and Flow Ratio was Newsedge with an F-Probability of .0406. This is slightly under the 5% confidence level that we set for this test. Consistent with the t-statistic results only four regression models had a positive Adjusted R-Squared above .50: Infonautics (.61), Lycos (.72), Newsedge (.73) and Yahoo (.68).

Summary For All Groups

We have found that the Flow Ratio does not correlate with stock price in any of the industry groups studied. Neither the Motley Fool (Matt Richey or Tom Gardner, who proposed the Flow Ratio) nor any other parties have computed Flow Ratios for large numbers of companies to get some averages and benchmark figures. Instead, Motley Fool has apparently set an arbitrary cutoff value of 1.25 for the Flow Ratio. We computed the average Flow Ratio value for each of the groups covered in our study as follows:

Average Flow Ratios	
- Manufacturing Companies	1.970
- Discount Retail Companies	1.687
- Dot.com (17) Companies	.862
- Dot.com (183) Companies	.721

Based on these averages, it is difficult to set a benchmark figure for the Flow Ratios. As is the case with most ratios, benchmarks should be set by industry. A benchmark of 1.25 might be too low for manufacturing and retail companies, but might be appropriate or slightly too high for the dot.com companies.

We can see that the dot.com companies have a much lower average for the Flow Ratio than do the manufacturing and discount retail companies. These low values for the dot.com industry might reflect the fact that they have very large accounts payable and/or low levels of inventory and receivables. While it is desirable to keep the non-cash current assets at low levels and non-interest-bearing payables at high levels, taking these to the extreme means that the Flow Ratio approaches a value of zero. Eventually, the payables have to be paid, reducing the denominator and increasing the numerator (because cash is reduced).

Conclusion

The Motley Fool has proposed a number of different ratios for financial analysis of companies. However, the ratio that Matt Richey touts as the most important in his analytical toolbox is the Flow Ratio. The Flow Ratio is a measure of how well a firm manages its working capital, and the logic that Richey uses to support the ratio appears sound. Firms should try to optimize their holdings in non-cash current assets and they should try to optimize their non-interest-bearing current liabilities. Thus, a low Flow Ratio is desirable.

There is an implication in Richey's statements about the Flow Ratio that there is an inverse relationship between the change in the Flow Ratio and the change in stock price. To support this contention, Richey used data for Lucent and Cisco to suggest that the firm with the lowest Flow Ratio will have higher stock prices. Since our statistical testing found mixed results regarding this relationship for Lucent and Cisco, we decided to apply the test to other companies.

In addition, until this study was conducted there has been no statistical testing for the relationship between the Flow Ratio and stock price. The findings of our study contradict the claims made regarding the value of the Flow Ratio for predicting stock price. Our study computed the quarterly Flow Ratio and stock prices for Lucent and Cisco, eight manufacturing companies, eight discount retail companies, and seventeen dot.com companies. For each

of the groups studied, we found only one case with a significant statistical relationship between the Flow Ratio and stock prices.

The Motley Fool suggests other ratio benchmarks or cutoff figures: the Cash King Margin of 10%, the Return on Invested Capita greater than 11% and cash no less than 1.5 times current liabilities. As is the case for the Flow Ratio, we find that the Motley Fool provides neither logical nor empirical bases for these benchmarks. Researchers could conduct tests to obtain averages and benchmarks for these additional measures.

We see some possibilities for additional research related to the Flow Ratio and for other ratios and benchmarks suggested by the Motley Fool. Researchers could test for differences between failed (bankrupt or liquidated) and non-bankrupt companies on the basis of the Flow Ratio. The Flow Ratio might also be compared with other measures of financial performance such as earnings or gross profits. However, given our findings we do not see the need for further study of possible relationships between the Flow Ratio and stock price. 🕮

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