

Timing Retail Investor Communications with Wave Theory

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Short Abstract:

When corporations increase media coverage during a retail investor stock market wave, there is a significant increase in the power of the wave. The study tests fifty stocks using wave theory to select appropriate investor waves and Kaplan-Meier survival analysis to determine the impact of increased media coverage.

Long Abstract:

The methods of investor relations (IR) are continuing to undergo change in the wake of scandals, revised government regulations and legislation, increased knowledge levels of investment community, and overall societal desires for transparency and ethical business operation. Some companies have curtailed IR programs because of fear of missteps. For others, IR programs have increased, but with a scattergun approach to institutional and retail investors. The retail segment is important, but the most difficult stakeholder group to reach.

Drawing from wave theory and selected other technical indicators for equity market analysis, we identify the particular wave segments with the greatest likelihood of retail investor strength. For a sample of 50 corporations listed on NYSE and NASDAQ, we measure the dynamics of the wave and examine the news story tracking to categorize higher and lower media campaigns. We use Kaplan-Meier survival analysis of the “retail investor” wave extended by media campaign levels.

The study finds that when corporations increase media coverage during a retail investor stock market wave, there is a significant increase in the power of the wave.

Timing Retail Investor Communications Strategies with Wave Theory

Introduction

The National Investor Relations Institute (NIRI) defines IR as “a strategic management responsibility that integrates finance, communication, marketing and securities law compliance to enable the most effective two-way communication between a company, the financial community and other constituencies, which ultimately contributes to a company's securities achieving fair valuation.” (<http://www.niri.org>)

The Public Relations Society of America (PRSA) investor relations section (currently financial communications section) stresses the professionalism of the function.

The financial communications section's mission is:

“Facilitating the exchange of ideas and information about relevant trends in financial and business media relations, reporting and product marketing communications to a broad range of publics including the consumers of financial services, shareholders and investors, the financial community and security analysts.” (<http://www.prsa.org>)

The methods of IR are continuing to undergo changes in the wake of scandals, revised government regulations and legislation, increased knowledge levels of investment community, new technology, the global investment marketplace, and overall societal desires for transparency and ethical business operation. Meanwhile, the stakes remain large. There are approximately 15,000 publicly traded corporations on the major exchanges. In the last 50 years, investors have gone from fewer than 3 million owners of publicly traded companies to more than 85 million owners. (Heffes 2003)

This paper is an exploration of extending particular periods (waves) of positive share price movement that are heavily populated with retail investors, drawing upon financial communications, investor relations, and technical analysis theory and practice.

What is Wave Theory?

Wave theory postulates price movements in the markets have impulse waves and corrective waves which can be viewed through the lens of crowd psychology – market sentiment. In short, wave theory is a detailed description of how groups of people behave. Prices are set by the collective behavior of buyers and sellers. Wave theory reveals that mass psychology swings from pessimism to optimism and back in a natural sequence, creating specific and measurable patterns. Specifically, wave analysis measures investor psychology, which is the real underlying factor behind markets. When people are optimistic about the future of a given issue, they bid the price up. (Prechter and Kendall 1996) Wave theory is one of the techniques of technical analysis, the study of how securities prices and volume behave with a goal of forecasting over some future time horizon.

Related literature includes classic writings (Prechter1994a; Prechter1994b), expansions of the theory (Prechter & Frost 2001; Neely & Hall 1990), and trading use (Prechter 2003; Walker 2001; Poser 2003)

Prices often move in five waves – three in one direction and two in the other -- caused by human behavior. Within the wave patterns, the price and volume indicate the holistic digestion of all information while the investors exhibit crowd behavior attributes.

Wave theory interprets market actions in terms of cycles composed of impulse waves and corrective waves. An impulse consists of five waves, three of them moving in the direction of the larger trend and two retracements (corrections) moving against the larger trend. Every impulse can be subdivided into a five-wave structure (1-2-3-4-5) and corrective wave can be subdivided into smaller waves (A-B-C). (see Figure 1)

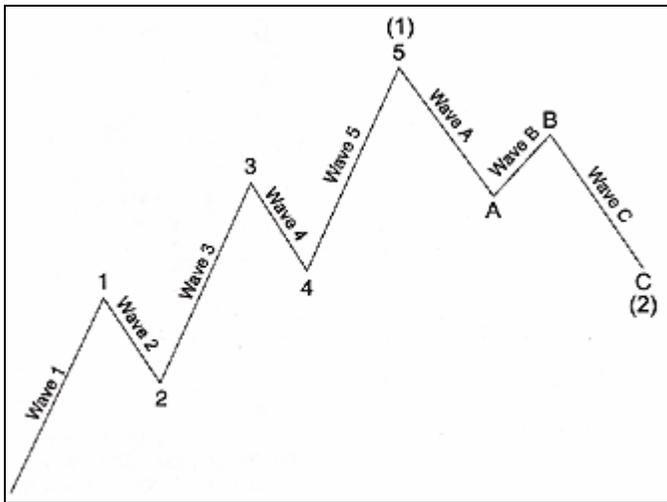


Figure 1 Impulse Wave and Corrective Wave (Dent 2004)

Importantly, waves are fractal -- market structure is built from similar patterns on a larger or smaller scale. Therefore, we can count the waves on a long-term market chart as well as shorter-term weekly, daily or hourly chart. In short, there are waves within waves.

Determining the exact impulse wave interpretation is an art as well as a science. Rules are relatively simple, but momentum is reflected with the occurrence of a variety of extensions, elongation, sub-wave overlaps and double backs. Corrective waveforms are rather complicated, but generally fall into six major forms. More detailed discussion of the patterns and interpretation of waves in technical analysis can be found at Neely & Hall (1990), Prechter (1994a), Prechter (1994b), Prechter & Frost (2001), Walker (2001), Prechter (2003), and Poser (2003).

Analysis of Stock Directions Using Wave Theory

The attractiveness of wave analysis is that the identifying of impulse waveforms and corrective waveforms keep us on top of where the market is at a particular point in time. Obviously, knowledge of market historical wave patterns and experiences in wave

count are of paramount importance. What makes it even more attractive is that much of the movement of the waves reflects market sentiment of institutional and retail investors at different points in the impulse and corrective waves.

When a stock hits a low point in the market, the general feeling among investors is of unhappiness and desperation. People are afraid to purchase. There is, however, always a small minority of people who believe that this is the time to buy. They look for the “bottom” that gives them the edge of “buy low.” They have a higher risk tolerance and are taking advantage of people’s fear and vulnerability. They may not be convinced that the price is at the lowest point, but realize the market is very low. Their action of buying at the low induces the first market rise -- creating Wave 1.

As the stock begins to rise, most investors will still be feeling negative and stay out. Those who bought “low” after the previous decline will be anxiously watching the market. Because they believe that the future equals the immediate past, they are very concerned about the short-term future. When the stock makes a short-term top and starts to decline again (Wave 2), they become very anxious and sell quickly in order to try to gain something rather than nothing. They are quick to get out.

The downward trend of Wave 2 does not go all the way down to where it was before. When people notice that it is not going down to new lows and that the price is starting to rise, they start to invest again. The market rises again on the third wave. Wave 3 has the heaviest buying of institutional investors. This wave is generally considered to be the point of recognition for retail investors. People don’t want to miss out on the opportunity to make money, especially when it hits a new high. Most profits will be made

after the middle of Wave 3. Wave 3 is generally the longest and strongest move in the pattern.

Usually Wave 4 is a high level consolidation rather than a sharp drop. Profit taking occurs for some. It can go on for quite a long time. The investors, often retail investors, who bought late during Wave 3, lose out the most.

Other retail investors, who recognized the stock in Wave 3 but didn't buy, saw the high as consolidation occurred. The downward move of Wave 4 makes the stock price look inexpensive. The "cheap" stock becomes tempting because of the heavy gains seen in Wave 3.

Then comes Wave 5. This is the wave where many retail investors start investing because everyone else seems to be making a lot of money. They don't want to miss out on "buy low and sell high." When the fifth wave forms the peak and tops out, it makes its largest and most dramatic drop yet. **The power (increase) of Wave 5 is largely dependent on the strength of retail investment confidence.** The best case for a company is for Wave 5 to be stronger than Wave 3. Sometimes, however, Wave 5 truncates or falls apart after a short rise. This occurs with weak retail investment.

Wave theory can provide timing (Wave 5) to trigger a retail investor news / information campaign. Triggering a media relations retail investor campaign could drive Wave 5. If the wave extends, additional retail investors will come into the stockholder investor pool.

Retail Investors and Wave Theory

Public corporations have different approaches to investor relations. Some view it as largely reactive with delegated people to respond to inquiries from analysts or

investors as they come in. Others implement a comprehensive and proactive investor relations approach. In today's environment, a strong proactive IR is recognized as providing significant advantages. (Conger 2004) Christopher Garland of Ketchum, Atlanta, argues the importance of IR.

IR is vital to a company's financial success, especially now that intangible assets—such as management quality, product quality, and innovativeness—comprise so much of a company's worth. ...Such non-balance sheet value resides in the Street's perception. It's not coincidence that Fortune's list of 'Most Admired' companies averaged a nearly 45 percent return, versus 18 percent for the S&P, from 1990 to 2000. Reputation adds value. (Garland 2001)

There are two broad shareholder groups – institutional investors and retail investors. Supporting each group is a variety of influential stakeholders, including analysts, brokers, financial media, etc. A retail investor, also called individual investor or small investor, is an individual who purchases small amounts of securities for his or her personal account and not for another company or organization. An institutional investor is an entity with large amounts to invest. They include investment companies, mutual funds, brokerages, insurance companies, pension funds, investment banks and endowment funds.

Importance of Retail Investors for Corporations

The primary IR program for most corporations target institutional investors. Regardless of company size or sector, however, an effective program aimed at communicating to and supporting a company's retail investors can be an important adjunct to the primary IR program targeting institutional investors. Retail investors generally provide a stable and consistent investor base. (Global Consulting Group 2004)

Over the past few decades, individual investors have acquired a major role as primary providers of capital. The rise in the scope and reach of U.S. private equity

ownership has been striking. In 2002, approximately half of U.S. households own equity, up from 19 percent in 1983. (Esser 2002) Dent (2004) projects stock investing by individual households to rise to 74 percent by 2009.

Kay Breakstone, Breakstone & Ruth International, argues that the more a company makes investors aware of its existence and business strategy, the more likely it is to increase sale of its stock. (Breakstone & Ruth 2003) Investors have a limited amount of time at their disposal. They will, therefore, invest in those companies they have heard of, are familiar with and can trust. When a company is willing to communicate, it decreases investors' sense of uncertainty and risk. (Breakstone & Ruth 2003) This is true for both institutional and retail investors. Each group has special needs and requires specific approaches and campaigns.

The retail investors tend to take a longer-term approach to ownership, providing greater stability and loyalty within the shareholder base. (Stark, 2003) Given the large market size, long term holders, low turnover, shareholder loyalty and reduction of concentration of ownership, the retail investor segment is very attractive. (Breakstone & Ruth 2003)

The average portfolio of National Association of Investors Corporation's (NAIC) 275,000 member average \$301,300. NAIC investors are on the upper end of the retail investor scale. Estimates are that retail investors maintain portfolios averaging \$62,000 in value, although the range of portfolio sizes varies greatly. (Stark 2003)

A corporation is ready for a retail program if the following criteria are met. (Breakstone & Ruth 2003)

- The liquidity is low for the institutional market.
- They have maximized the institutional route.

- They want to tap all sources of demand.
- Their ownership is too concentrated.
- They want more shareholders.

There are negatives for a retail investor relations program. (Breakstone & Ruth 2003)

- Cost of marketing.
- Cost of servicing.
- Time required to attract a significant holding.
- Geographically diversified market.
- Hard to reach a concentration of real investors.

Despite the difficulties with current ways of targeting and reaching retail investors, IR professionals realize its importance. Moira Conlon, Executive VP, FRB/Weber Shandwick says, “Companies still need to do institutional outreach, but some are now seeing a lot of reasons to focus on retail investors. Targeting retail investors calls for a less scientific approach, but those companies that do so now could clean up.” (Stock 2003) Leo Hinkley, VP of IR and Corporate Communications, BankAtlantic Bancorp VP of IR and Corporate Communications Leo Hinkley says, “Individual investors are probably the most ignored demographic -- companies typically court analysts at primaries and institutional investors. But the buying power of retail investors is as strong, if not stronger.” (Stock 2003)

Relationship of news/information and share prices/volume

Many argue that media relations are critical in IR. Metz (1999) argues that an investor relations program without a media relations component is shaky at best. The majority of public companies are unknown to the greatest percentage of investors. There simply is not enough space in newspapers to carry their news. For more than 90% of institutional investors, the Wall Street Journal is by far the medium of choice. Barron’s

follows, which reaches two-thirds of institutional investors. (Mertz 1999) Most public company announcements, even financial announcements, do not appear in the Journal or Barron's. This results in a level of obscurity that results in low volume and potentially lagging share prices.

New places have emerged for financial media relations. The surge of online trading and a new web sites with online news and information media for individual investors are new venues for the latest news for companies of all sizes. Companies can use media relations to reach enough individual investors to create efficient markets in their shares. Financial media relations can help companies reach the individual investor community that is so important to them.

Generally, the literature supports that there is an under-reaction of price to news/information release, but potential impact on volume of shares traded.

Most of the research on share returns after specific news items supports the idea of under-reaction relating to price. Many studies look at the issue of news/information and price – generally, but without consensus, pointing to limited reaction of price direction to news. Michaely, Thaler and Womack (1995) found evidence of under-reaction of signaling events including dividends (initiations and omissions) and scheduled news releases. Stock splits were examined Ikenberry and Ramnath (2002), with the same conclusions. Scheduled news releases -- including earnings announcements – showed drift after earnings surprises for up to 12 months. (Bernard and Thomas 1990) Womack (1996) and Michaely and Womack (1999) found a lag in response to changes in analyst recommendations. Lakonishok and Lee (2001) found that the impact of insider trade reports was restricted to buys in smaller stocks. Cutler, Poterba and Summers (1989)

looked at the relations between extreme market-wide returns and major business stories from the *New York Times*. They conclude that neither economic variables nor news stories can fully explain extreme aggregate price movements. Mitchell and Mulherin (1994) show that while news moves the market, the relationship is not very strong.

There is not a consensus, however. Barber and Lyon (1997), Kothari and Warner (1997), Fama (1998) argue that the statistical tests and methodology tend to understate possible relationships. Loughran and Ritter (2000) have an opposite interpretation based on the same fact.

Various theories seek to explain why news/information does not have a greater effect on price. Daniel (1998) models investor behavior with a model of overconfidence and biased self-attribution. The result is that investors hold too strongly to their own information and discount public signals. Barberis (1998) relies on conservatism and the representativeness heuristic. They hypothesize that investors change sentiment about future company earnings based on the past stream of realizations. Hong and Stein (1999) and Hong, Lim and Stein (2000) work with a model not tied to specific psychological biases, with two classes of traders. One group ignores the news, but reacts to prices. The result is initial under-reaction and subsequent overreaction.

Karpoff (1987) theorizes that differences in expectations for individual investors and the market drive the volume changes. Some investors may want to buy a stock and others may want to sell it, the result being an increase in trading volume. Because the market as a whole reacts only to new information, however, there would be little or no change in stock price. Chaney, Devinney, and Winer (1991) point out that stock price reactions to events may be non-significant but volume effects may be significant.

Other research looked at financial relations advertising. Bobinski and Ramirez (1994) used a time-series approach to study the effect of financial-relations advertising on stock trading volume and stock price. They found increases in trading volume at the initial appearance of the financial-relations advertisement, but not during subsequent runs of the ad. No support was found for the view that this type of advertising positively affects stock prices, at least in the short run.

Research Question

Drawing upon previous research about media and stock relationships, we ask whether a retail investor relations media campaign expand the retail investor wave cycle. What is the survival likelihood of the retail investor wave depending upon media campaign levels?

H1: Cases with higher media coverage will maintain a quality retail investor wave significantly longer than those with lower media coverage.

H0: There will be no significant difference in the survival functions of the two groups.

Method

Using *eSignal* end-of-day data for November 24th, the database of 11,389 entries was screened for optionable corporations with a share price of \$20 or greater and an average volume of 300,000 or greater. The resulting 2402 listed companies was subjected to wave analysis of its daily chart to find stocks at or recently completing wave 5 activity in a bullish direction. These represent stocks having completed their heavy retail investor wave activity. The analysis found 206 of the stocks qualifying. A sample of 50 stocks was drawn.

We previously developed a metric (EM), combining the number of days of the wave and technical indicators into a proprietary algorithm, to represent the intensity, mass and extent of the retail investor wave.

Each stock was coded for wave 5 starting and ending dates and data to construct the proprietary EM metric. Additionally, the Lexus-Nexus database of stories for each company was analyzed for release pattern during the retail investor wave period.

Primary analysis utilized survival analysis. As the name implies, survival analysis is typically used to examine the period an individual survives or until a part fails. It is widely used in medical research to analyze how long a treatment group lives versus the control group? It is also used in some engineering fault analysis to analyze how long a part last with a new maintenance procedure versus a part maintained with the traditional procedure.

We chose survival analysis as the analytical procedure to determine how powerfully the retail investor wave would continue, given different “treatments” of media release volume.

We chose the Kaplan-Meier product-limit estimation. Kaplan-Meier is a useful technique when the number of cases is small but representative and the exact survival times are known. The Kaplan-Meier estimation uses variable interval, allowing us to use the EM metric that goes beyond simple time measure to factor in qualities of the wave. An analogous situation in medical treatment demonstrates the importance. Using Kaplan-Meier, a survival metric for a cancer treatment could be based on months of survival factored with quality of life measures. Living is more than the number of months before

death. Power of an investor wave is more than number of days before ending. Using Kaplan-Meier allows the EM metric to represent the survival of the power of the wave.

The Kaplan-Meier survival analysis also does not require eliminating cases that have not terminated at the conclusion of the study period. The traditional life table analysis requirement of fixed length survival times requires dismissing cases that continue to survive (censored cases) and labeling them as “missing cases.” The censored cases, however, add valuable information to the analysis. If excluded from the study, the survival probabilities will be underestimated. In short, we do not want to exclude cases that survive even longer than the length of our study. With the Kaplan-Meier estimation, we add a code for each case, indicating that the terminal event occurred (uncensored case) or not occurred (censored case). (Kaplan and Meier, 1958)

Findings and Discussion

Is the EM metric a good indicator for the retail investor wave?

Yes. We developed the metric (EM) to combine the number of days of the wave and technical indicators into a proprietary formula to represent the intensity, mass and extent of the retail investor wave. For the 50 case sample, EM correlates with volume (.820; sig. .000), media levels (.562; sig. .000), and price (.324; sig. .022).

Will an increased media level during the retail investor wave increase the likelihood of the wave’s survival?

Yes. We use wave theory to calculate the beginning and end points of the investor wave. Once we know the appropriate timings, we use Kaplan-Meier survival analysis to estimate a survivor function, based on the EM until the end of the investor wave occurs.

Since EM represents intensity, mass, and extent of the wave, it not only incorporates the number of days the wave exists, but also includes other positive qualities of the wave.

First, cases with higher media levels are more likely to have a surviving retail investor wave at the conclusion of the test. For higher levels of media, out of 25 cases, 17 are terminal and 8 (32 percent) survive (“censored” in the terminology of survival analysis). For lower levels of media, out of 25 cases, 5 (20 percent) survive. Overall, 13 of the 50 survive (26 percent). Table 1 shows the number of uncensored and censored cases for the two levels of media coverage.

Table 1: Survival of Retail Investor Wave as a Function of Media Coverage

Coverage	Status		Totals	% Censored
	Uncensored	Censored		
Higher Media	17	8	25	32.0
Lower Media	20	5	25	20.0
Totals	37	13	50	26.0

Second, higher media coverage cases have substantially higher mean and median.

Table 2: Mean and Median as a Function of Media Coverage

	EM Survival	Standard Error	90% Confidence Interval	
Higher Media				
Mean	20838.11	4139.39	12724.91	28951.31
Median	16758.23	8045.68	988.71	32527.75
Lower Media				
Mean	2277.04	1008.82	299.75	4254.34
Median	354.68	152.39	56.01	653.36

Third, individual cases demonstrate greater likelihood of EM survival with higher media coverage. Table 3 shows the Kaplan-Meier survival table for each case.

Table 3: Kaplan-Meier Survival Analysis for EM

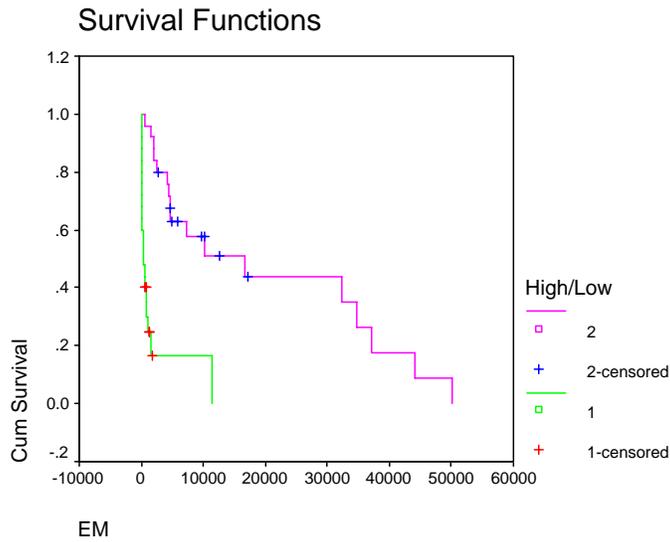
Factor LEVEL = 1 Lower Media					
EM/Time	Status	Cumulative Survival	Standard Error	Cumulative Events	Number Remaining
2.55	1	.9600	.0392	1	24
9.89	1	.9200	.0543	2	23
19.87	1	.8800	.0650	3	22
23.67	1	.8400	.0733	4	21
40.78	1	.8000	.0800	5	20
51.73	1	.7600	.0854	6	19
53.34	1	.7200	.0898	7	18
101.00	1	.6800	.0933	8	17
107.36	1	.6400	.0960	9	16
123.53	1	.6000	.0980	10	15
284.64	1	.5600	.0993	11	14
307.17	1	.5200	.0999	12	13
354.68	1	.4800	.0999	13	12
467.65	1	.4400	.0993	14	11
496.14	1	.4000	.0980	15	10
655.38	2			15	9
731.93	2			15	8
787.75	1	.3500	.0977	16	7
856.02	1	.3000	.0957	17	6
1034.60	1	.2500	.0919	18	5
1255.18	2			18	4
1386.28	2			18	3
1616.77	1	.1667	.0915	19	2
1818.89	2			19	1
11463.80	1	.0000	.0000	20	0

Factor LEVEL = 2 Higher Media					
EM/Time	Status	Cumulative Survival	Standard Error	Cumulative Events	Number Remaining
696.04	1	.9600	.0392	1	24
1540.96	1	.9200	.0543	2	23
1966.24	1	.8800	.0650	3	22
2124.71	1	.8400	.0733	4	21
2497.78	1	.8000	.0800	5	20
2745.86	2			5	19
4132.80	1	.7579	.0862	6	18
4332.43	1	.7158	.0911	7	17
4644.60	1	.6737	.0950	8	16
4662.59	2			8	15
4769.87	1	.6288	.0987	9	14
4872.04	2			9	13
5959.75	2			9	12
7248.68	1	.5764	.1034	10	11
9743.36	2			10	10
10314.28	2			10	9
10320.57	1	.5123	.1100	11	8
12554.45	2			11	7
16758.23	1	.4391	.1161	12	6
17257.32	2			12	5
32281.24	1	.3513	.1217	13	4
34860.60	1	.2635	.1188	14	3
37267.27	1	.1757	.1068	15	2
44099.68	1	.0878	.0819	16	1
50191.71	1	.0000	.0000	17	0

Fourth, the average EM survival is substantially greater with higher media levels.

Figure 2 graphs EM survival.

Figure 2: Survival Functions as a Function of Media Coverage



Fifth, the samples reflecting higher and lower media coverage were tested for significance. Kaplan-Meier survival analysis uses three different significance tests, Mantel-Haenszel test, generalized Wilcoxon test, and Tarone-Ware test. Using SPSS, the formula for all tests is: $U = \sum w_i (D_i - E_i)$ Values within the formula are: w_i = weight; D_i = Number of terminal events observed; E_i = Number of terminal events expected: number at risk cases & terminations (t). The variation in the tests is the weighting of cases (w_i). The Log-Rank Test (Mantel-Haenszel Test) is the least conservative with all cases weighted equally. The Breslow test is the most conservative, with earlier events weighted more heavily than later events. The Tarone-Ware test is mid-conservative because it weights earlier cases less heavily than the Breslow test does.

Based on all three statistical measures, the difference in survival is significant. (see Table 3)

Table 3: Significance of the Difference in Survival as a Function of Media Levels

Test	Statistic	df	Significance
Log-Rank (Mantel-Haenszel Test)	28.30	1	.000
Breslow (Generalized Wilcoxon Test)	26.83	1	.000
Tarone-Ware Test	27.90	1	.000

Conclusions

The null hypothesis is rejected. There is a significant difference between the survival functions of the media coverage and the dynamics of the retail investor wave.

The results are very positive. We can use wave theory to determine the start and ending points of a retail investor wave. The survival analysis demonstrates that with higher levels of media coverage, the life and quality of the wave can be extended – increasing the likelihood of additional retail investors. Based on this analysis, the retail investor wave with higher media coverage had a survival level of 5 times greater than with lower media coverage.

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