

# An Empirical Model Examining the Performance of Equity Analyst Recommendations

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**Abstract.** This study employs an event study using the market model to examine the performance of equity analyst recommendations in Taiwan from 2007 to 2011. The empirical results reveal that investors obtain the positive pre-recommendation stock returns and negative post-recommendation stock returns. The positive wealth effects can be attributed to the fact that the information leakage and opportunistic behavior before analyst recommendations. The short-term drift after equity analysts' recommendations supports the quasi-private nature of analyst literature.

**Keywords:** Equity Analyst, Stock Recommendation, Information Content

## 1. Introduction

The objective of this study is to investigate the performance of security analysts covering stocks. An examination of 16,624 security analysts covering observations from 53 major brokerage firms in Taiwan Stock Exchange and the Gre Tai Securities Market during the period 2007 through 2011 reveals that equity analyst recommendations do provide the market with significant investment value. The results of this study provide empirical evidence that the abnormal returns during the pre-recommendation range from -0.0259% to 0.1288, yet most of the stock price impact is complete after the equity analyst recommendations (-0.0474% to -0.0173%).

The remainder of this paper is structured as follows. Section 2 lays out the sampling procedure and data. Section 3 describes research methods. Section 4 then reports the main findings. A brief conclusion follows.

## 2. Sample Selection and Data Collection

This study involves 20,137 observations of sampled data of brokerage recommendations over the period of 2007-2011. This initial list comprised all firms listed on the Taiwan Stock Exchange (TWSE) and the Gre Tai Securities Market (GTSM, formerly known as the Over-the-Counter Securities Market), but observations had inadequate data, or faced regulatory enquires (i.e., listing termination or suspension from trading), leaving 16,624 observations available for further analysis and research.

In this paper, the accounting and market information were primarily derived from the Taiwan Economic Journal (TEJ) database. This TEJ database contains industry norms and financial information on around 1,500 companies, which are listed on the TWSE, GTSM, or Emerging Stock Board.

Where the required information was not available from this data source, it was augmented by information taken from annual reports, the TWSE, the GTSM, the Infotimes database, and Compustat Global Data.

## 3. Empirical Methodology

### 3.1 Measuring Abnormal Returns

In the first stage of the analysis, this study starts with standard event study method to examine the investment value of equity analyst recommendations. This study employs the day of recommendation as the predictable event day (day 0). That is, if the market is efficient, stock prices should reflect all potential changes in the event outcomes.

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This study measures the stock price behavior by cumulating daily abnormal returns ( $AR$ ) during a specified time period. Explicitly, the current study presents empirical evidence for five different event windows surrounding the event: 2-day window  $[-1, 0]$  and  $[0, +1]$ , 3-day window  $[-1, +1]$ , 5-day window  $[-2, +2]$ , and 11-day window  $[-5, +5]$ , and for the estimation time period  $[-241, -61]$ .

The daily  $AR$  for any main bank stock is calculated as follows:

$$AR_{jt} = R_{jt} - E(\tilde{R}_{jt}) \quad (1)$$

where  $t$  is the day measured relative to the 11-day event period from day -5 to day +5,  $AR_{jt}$  is the return on stock  $j$  on event day  $t$ , and  $E(\tilde{R}_{jt})$  is the expected rate of return on stock  $j$  at event day  $t$ . Accordingly to Brown and Warner (1985),  $E(\tilde{R}_{jt})$  is calculated from the time-series of the observed return for observation  $j$  in the pre-estimation period. The  $AR$  for each observation is then estimated as the difference between the observed return and the expected return during a pre-estimation period.

The cross-sectional average  $AR$  for each event day is calculated as shown:

$$AR_t = \frac{1}{N} \sum_{j=1}^N AR_{jt} \quad (2)$$

where  $N$  is the number of observations with  $AR$ s on day  $t$ . The cumulative abnormal return ( $CAR$ ) for any observation  $j$  (for a given interval of time for  $K$  to  $L$ ) is generated using equation 3.

$$CAR_j = \sum_{t=K}^L AR_{jt} \quad (3)$$

The cross-sectional average  $CAR_{jKL}$  over the event interval is calculated as

$$CAR_{KL} = \frac{1}{N} \sum_{j=1}^N CAR_{jKL} \quad (4)$$

### 3.2 Abnormal return statistical significance

Following the methodology employed by Mikkelsen and Partch (1988), the test statistics ( $Z$ ) for the  $AR$  and  $CAR$  are shown in Equations 5 and 6.

$$Z = \frac{1}{\sqrt{N}} \sum_{j=1}^N \left[ \frac{\sum_{t=K}^L AR_{jt}}{VAR(\sum_{t=K}^L AR_{jt})} \right] \quad (5)$$

$$Var(\sum_{t=K}^L AR_{jt}) = V_j^2 \left[ T + \frac{T^2}{ED} + \frac{\sum_{t=K}^L \tilde{R}_{mt} - T(\bar{R}_m)^2}{\sum_{i=1}^{ED} (\tilde{R}_{mi} - \bar{R}_m)^2} \right] \quad (6)$$

where  $V_j^2$  = residual variance for observation  $j$  from the market model over the research estimation period,  $ED$ =number of days in the research estimation period employed to calculate the market model,  $T$ = number of days in the interval  $(L-K+1)$ ,  $R_{mi}$  = market portfolio return for the  $i$ th day of the research estimation period,  $R_{mt}$  = market portfolio return for day  $t$ ,  $\bar{R}_m$  = market portfolio average return over the research estimation period.

## 4. Empirical Results

### 4.1 The Abnormal Returns

Panel A of Table 1 indicates that to some extent the market gradually learns about the forthcoming recommendation. The average  $AR$  around the analyst recommendation day gradually drifts up in days -4 to -1. More specifically, the daily results show that the value of  $AR$  is 0.1216% on the day of recommendation (day

A0). The *ARs* during the pre-event period ranged from -0.0259% to 0.1288%. The maximum pre-event abnormal return is recorded on day -1, followed by day A-2. During the post-event period, the value of *AR* ranged from -0.0474% (day +3) to -0.0173% (day +4).

## 4.2 The Cumulative Abnormal Returns

The results of window returns are provided in Panel B of Table 1. The average *CAR* during the period of eleven days surrounding the recommendation (from day -5 to day +5) is significantly positive, with a *CAR* of 0.1584%. The positive pre-event *CAR* (from day -5 to day -1) is found in this study. However, the negative post-event *CAR* (from day 0 to day 5) is shown in this study (-0.0622%). The average of *CAR* from day -1 to day 0 is 0.2504%, which is the highest average during the research intervals. The average cumulative abnormal returns for all of the event windows are significantly different from zero. This finding implies that the signal is fully revealing around the recommendation date, this is the market do fully incorporate the information conveyed by the equity analyst recommendation.

Table 1 The performance of equity analyst recommendations

	Mean (%)	Z- statistics	% >0
Panel A: Daily returns			
-5	-0.0259	-1.379	46.414
-4	0.0145	0.778	47.406
-3	0.0272	1.450	47.759
-2	0.0760	4.023 <sup>a</sup>	48.721
-1	0.1288	6.473 <sup>a</sup>	49.805
0	0.1216	6.018 <sup>a</sup>	49.616
1	-0.0292	-1.497	46.189
2	-0.0474	-2.526 <sup>b</sup>	45.701
3	-0.0464	-2.538 <sup>b</sup>	45.927
4	-0.0173	-0.949	46.578
5	-0.0435	-2.404 <sup>b</sup>	46.268
Panel B: Window returns			
-1, 0	0.2504	8.288 <sup>a</sup>	51.291
0, 1	0.0924	3.084 <sup>a</sup>	49.087
-1, 1	0.2212	5.912 <sup>a</sup>	50.311
-2, 2	0.2498	5.313 <sup>a</sup>	51.059
-5, 5	0.1584	2.388 <sup>b</sup>	50.341

The table presents the performance of security analysts covering stocks. The “% (>0)” denotes the percentage of observations with positive values. The superscripts a and b indicate significance at 1% and 5% levels, respectively.

## 5. Conclusions

This study analyzes the market activities measured by stock returns around the publication of analysts' stock recommendations in Taiwan for a 5-year period (2007-2011). This study reveals the positive pre-event stock returns and negative post-event stock returns. More specifically, the current study documents an evident price behavior pattern of surging and receding of stock prices surrounding the analysts' stock recommendations. Positive abnormal return begins the day preceding the analysts' stock recommendations. However, the abnormal return declines dramatically right after the recommendation date and never rebounds thereafter. The positive wealth effects can be attributed to the fact that the information leakage and opportunistic behavior before analyst recommendations. The short-term drift after equity analysts' recommendations supports the quasi-private nature of analyst literature (Green, 2006).

## 6. References

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