Investors and Auditors Reaction to Risk Factors Identified by Non-Traditional Sources

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Introduction/Objective/Aim / and Benefit to Accounting

This research examines whether investors and auditors alike respond to risk factors that are addressed by third-party research companies on publicly traded firms. This is of interest since most third-party research firms do not seem to be a popular information resource. Therefore, we selected a third-party research firm entitled Muddy Waters Research Company to perform our analysis. The examination realizes if investors and auditors respond to such reports. We found that investors react, which are measured by abnormal returns, unfavorable to the issuance of Muddy Water Research Report. However, we did not find an audit reaction represented by a change in audit fees for up to two years after the issuance of Muddy Water Research Report. Our data consist of thirty observations from the duration of 2010 to 2022.

Key Words

Abnormal Returns, Auditors, Audit Fee, Investors, and Reaction

Methodologies

1. Investor Reaction

The abnormal returns are calculated utilizing the market model which is equation one (1) below.

(Equation 1)

$$AR_{j,t} = \Sigma(R_{j,t} - R_{mt})$$

(Equation 2)

$$AAR_{j,t} = \frac{\Sigma_{j,t}[Rj_t - (\alpha_j + \beta_j R_{mt} + \varepsilon_{j,t})]}{n}$$

where: $R_{j,t} = \alpha_j + \beta_j R_{mt} + \varepsilon_{j,t}$
therefore, $\varepsilon_{j,t} = R_{j,t} - (\alpha_j + \beta_j R_{mt})$

- $AR_{j,t}$ = Abnormal return for firm j, day t
- AAR_{jt} = Average Abnormal return for firm j, day t
- R_{jt} = Raw return for firm j, day t
- R_{mt} = Equally weighted mean market return for day t

The following tests are utilized to examine the abnormal return data in our sample.

- Portfolio Time-Series (CDA) t – statistic Test
- Uncorrected Patell Z Test
- Rank Test (RANKTEST)
- Jack Knife (JACKNIFE)

In addition, both the mean abnormal and the mean compound abnormal returns were calculated and included in our research. They are categorized in the following manner.

- Market Adjusted Returns – Equally Weighted Index
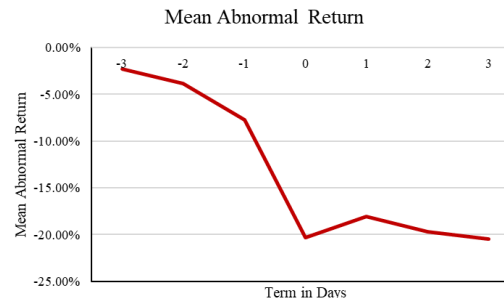- Market Model Abnormal Returns – Equally Weighted Index

2. Audit Fee

Consistent with (Simunic 1980; Francis and Wang 2005; Raghunandan and Rama 2006, Hunang et al. 2009) we utilized the following model for equation (2) below.

(Equation 3)

$$AF = a + \beta1\ AT + \beta2\ RECINV + \beta3\ SQSEG + \beta4\ FOREIGN + \beta5\ LIQ + \beta6\ DA + \beta7\ ROA + \beta8\ GC + \beta9\ Loss + \beta10\ MW + \beta11\ RESTATE + \beta12\ NAFRATIO + \beta13\ INITAIL + \beta14\ MUDDYISSUANCE + \varepsilon$$

- AF = natural logarithm of audit fees
- AT = natural logarithm of total assets
- RECINV = percentage of total assets in receivables and inventories
- SQSEG = square root of number of business segments reported on Compustat
- FOREIGN = 1 if foreign segments reported, else 0
- LIQ = current ratio; DA = debt-to-assets ratio;
- ROA = return on assets; GC = 1 if audit report is modified for going concern, else 0
- LOSS = 1 if there is a bottom-line loss, else 0
- MW = 1 if there is a material weakness in internal controls, else 0
- RESTATE = 1 if there is a restatement in the current or prior year, else 0
- NAFRATIO = ratio of nonaudit fees to audit fees
- INITIAL = 1 if initial-year audit, else 0
- MUDDYISSUANCE = The variable of interest, which is a dummy variable coded as 1 for the year in which Muddy Water release a report, 0 otherwise.

2. Results – Audit Fee

Audit Fee Regression Results using T0 and T+1

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	-1358289	3088550	-0.44	0.6785
MUDDYISSUANCE	1	-592065	873687	-0.68	0.5281
TA	1	410.52619	204.96164	2.00	0.1016
RECINV	1	14560725	8005812	1.82	0.1286
SQSEG	1	-214484	1246371	-0.17	0.8701
FOREIGN	1	1718489	2737123	0.63	0.5577
LIQ	1	243028	203306	1.20	0.2855
DA	1	-2535186	5803352	-0.44	0.6804
ROA	1	6043043	6103221	0.99	0.3676
GC	0	0	.	.	.
LOSS	1	2083015	2290093	0.91	0.4048
MW	1	-4179434	3018995	-1.38	0.2248
RESTATE	1	-4493647	3481887	-1.29	0.2533
NAFRATIO	1	-732457	780132	-0.94	0.3909
INITIAL	0	0	.	.	.

Conclusions

We found sufficient evidence indicating that the U.S. stock market reacts significantly negative to the investigative research reports provided by the Muddy Waters Research Company. However, what we found interesting is that the market seemed to predict the outcome of the investigative reports by providing significant negative returns up to three days prior (-3) to the report. In most of the results, the day after the investigative report, the market returns appear to be positive and significant. The audit fee results are negative however, insignificant.

Acknowledgements

1. Results – Investor Reaction

Day	N	Mean Abnormal Return	Positive: Negative	Portfolio Time-Series (CDA) t	P-value	Uncorrected Patell Z	P-value
Panel A							
-3	24	-2.30%***	6:18<	-3.04	0.0024	-2.81	0.005
-2	24	-1.53%**	7:17<	-2.029	0.0425	-2.469	0.0136
-1	24	-3.88%***	8:16(	-5.131	<.0001	-5.187	<.0001
0	24	-12.6%***	3:21<<<	-16.675	<.0001	-21.167	<.0001
1	24	2.21%***	15:09	2.92	0.0035	4.055	<.0001
2	24	-1.59%**	12:12	-2.11	0.0349	-1.322	0.1861
3	24	-0.78%	12:12	-1.03	0.3032	-0.757	0.4491
Panel B							
-3	24	-2.39%***	5:19<<	-3.173	0.0015	-2.974	0.0029
-2	24	-1.82%***	8:16	-2.425	0.0153	-2.802	0.0051
-1	24	-4.03%***	7:17(	-5.358	<.0001	-5.448	<.0001
0	24	-12.88%***	5:19<<	-17.123	<.0001	-21.498	<.0001
1	24	1.95%***	14:10	2.593	0.0095	3.741	0.0002
2	24	-1.68%**	11:13	-2.227	0.0259	-1.442	0.1493
3	24	-0.92%	12:12	-1.225	0.2207	-0.937	0.3488

Mean Abnormal Return