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THE EFFECT OF INVESTOR SENTIMENT ON THE MEANS OF EARNINGS MANAGEMENT

Abstract

Prior research has shown that a firm's tendency to meet or beat earning targets is greater during bad economic times than good times. The paper extends this line of research by investigating which means of earnings management is used in different states of economy. A sample of non-financial companies listed on Korea Securities Market from 2003 to 2011 is used for empirical tests. The findings of this study are summarized as follows. The magnitude of discretionary accruals is negatively related to investment sentiment, indicating that firms tend to use positive discretionary accruals to manipulate reported income upward when the sentiment is pessimistic. However, the real activity based earnings management is not significantly associated with the state of economy. Collectively, this study contributes to behavioral finance and accounting literature by suggesting that managers use discretionary portion of accruals, but do not change their real operating activities, in order to meet or beat earnings targets in economic downturn.

INTRODUCTION

There is voluminous accounting research on earnings management, which is defined as "the purposeful intervention in the external financial reporting process with the intent of obtaining some private gain (Schipper, 1989). Prior research (e.g., Graham et al., 2005) has shown that firms tend to inflate earnings to a greater extent during the bad state of economy in order to distinguish themselves from others in the market by boosting stock prices in bad times. In Korea, Park (2015) also documents that firms' tendency to meet or beat earning targets is greater during pessimistic sentiment period.

The literature has detected two major means of earnings management: accrual-based and real-based earnings management. First, many prior studies find that accruals are used at managerial discretion to report more favorable income. For instance, Song et al. (2004) document the empirical results of firms with net income that is slightly below zero or with big loss manipulating earnings upward using accruals, suggesting that accrual-based earnings management is common in Korea. Second, firms may manipulate upward or smooth earnings by involving in abnormal management practices, which are reflected as abnormal operating cash flows, discretionary expenditures and production costs (Roychowdhury, 2006; Kim et al., 2008).

The choice of earnings management appears to vary with firm-specific characteristics and circumstances. For example, Zang (2012) shows

that managers adjust the level of accrual manipulation according to the level of real activities manipulation realized, suggesting that managers trade off two methods of earnings management based on their relative costs. Also, Cohen and Zarowin (2010) find that firms' choice between real- and accrual-based earnings management around seasoned equity offerings is a function of firms' ability to use accrual management and the costs of doing so. However, little is known about how equity market sentiment affects the trade-off between real- and accrual-based earnings management. Hence, this paper examines the effect of investor sentiment on accrual-based and real-based earnings management.

The empirical tests of this paper are based on investor sentiment (Baker & Wurgler, 2007) and the level of stock market (Conrad et al., 2002). Using a sample of public companies listed on Korea Securities Market from 2003 to 2011, the paper documents the following empirical test results. First, the magnitude of discretionary accruals is negatively associated with investment sentiment. This implies that firms tend to use positive discretionary accruals to manipulate earnings upward when the sentiment is pessimistic. Second, on the other hand, the real-based earnings management (i.e., operating activities, discretionary R&D expenditures and production activities)is not significantly related to investor sentiment. In sum, these findings suggest that firms do not depend on real activity manipulation, but rather inflate discretionary accruals to report favorable income in bad economic times. Such conclusion is consistent with Graham et al. (2005) arguing that managers are likely to boost earnings in recessions based on their expectation of reversal of intrinsic earnings in economy recovery.

These findings contribute to accounting and behavioral finance research on the relation between macroeconomic condition and financial reporting behavior. Behavioral research presumes that capital market participants including investors and managers are not completely rational in pricing stocks and processing information because they cannot be free from emotions. This study adds new evidence that managers do not manipulate operating activities to boost reported income in bad times, but they tend to rely on discretionary accruals, indicating that accrual quality is affected by sentiment.

The rest of the paper is organized as follows. Section 1 describes the research methods and sample selection. Section 2 reports the empirical test results and last section concludes this study.

1. RESEARCH METHODOLOGIES

1.1. Variable measurement

1.1.1. Investor sentiment

Investor sentiment is defined as the degree of optimism or pessimism about stocks that is not justified by fundamental information (Baker & Wurgler, 2006, 2007). The empirical tests are based on three alternative measures of investor sentiment: $KSENT$, $KBSENT$, and $DIFFPE$.

$KSENT$ and $KBSENT$ are investor sentiment indices that are formed by Kim and Byun (2010), as in Baker and Wurgler (2006, 2007). Baker and Wurgler (2006, 2007) combine several imperfect sentiment proxies such as trading volume, divi-

dend premium, closed-end fund discount, the number of initial price offerings, the first-day returns on IPOs, and the equity share in new issues to construct the comprehensive measure of investor sentiment. Since only trading volume and equity share in new issues are available and economically significant in Korea, Kim and Byun (2010) form the investor sentiment index by combining four additional variables (i.e., retail investor trading, stock fund flows, customer expectation index, customer's deposit for stock investment).

$KSENT$ is the first principal component of the correlation matrix of six variables $(BSI, FUND, CEI, CD, TURN,$ and $SR)$. Principal components analysis is performed to isolate the common sentiment components among these six variables from idiosyncratic non-sentiment-related components. Next, KBSENT is the investor sentiment index after controlling for the

business cycle. Each of the above six proxies is regressed on the six business-cycle-related variables (i.e., the growth of industrial production, durables sales, semi-durables sales, non-durables sales, service production, and coincident composite index for business cycle changes). Then, the residuals from these regressions are used as the sentiment index controlled for business cycle.

$DIFFPE$ is the estimate of the overall level of equity market following Conrad et al. (2002). It is based on the difference between the market price-to-earnings (P/E) ratio in the current month and the average market P/E over the previous 12 months. Greater $DIFFPE$ indicates that the sentiment in the current month is higher than that in the prior year.

1.1.2. Discretionary accruals

Accrual-based earnings management is measured by the discretionary portion of accruals. The study estimates the discretionary accruals by using the modified Jones model (Dechow et al., 1995; Kothari et al., 2005). The modified Jones model is based on the following regression equation:

$$TAC_{it} = \beta_0 + \beta_1 \cdot \Delta Rev_{it} + \beta_2 \cdot PPE_{it} + \beta_3 \cdot ROA_{i,\,t-1} + \varepsilon_{it}, \quad (1)$$

where, TAC_1, TAC_2 – total accruals (net income minus operating cash flows, operating income minus operating cash flows) for firm i during year t, scaled by the total assets at the beginning of year t, Rev – sales revenue for firm i in year t, scaled by the total assets at the beginning of year t, PPE – property, plant and equipment for firm i at the end of year t, scaled by the total assets at the beginning of year t, and ROA – return on total assets for firm i in year $t-1$.

Then, the discretionary accruals $(DA_1,\, DA_2)$ are calculated as the difference between total accruals and non-discretionary accruals (i.e., the residuals from the regression equation 1).

1.1.3. Real activity-based earnings management

Following Roychowdhury (2006), the following cross-sectional industry-level annual regressions are used to estimate the normal level of operating cash flows, production costs, and discretionary expenses.

$$\left(\frac{CFO_t}{A_{t-1}}\right) = \alpha_0 + \alpha_1 \cdot \left(\frac{1}{A_{t-1}}\right) + \beta_1 \cdot \left(\frac{S_t}{A_{t-1}}\right) + \beta_2 \cdot \left(\frac{\Delta S_t}{A_{t-1}}\right) + e_t, \quad (2)$$

$$\left(\frac{PROD_t}{A_{t-1}}\right) = \alpha_0 + \alpha_1 \cdot \left(\frac{1}{A_{t-1}}\right) + \beta_1 \cdot \left(\frac{S_t}{A_{t-1}}\right) + \beta_2 \cdot \left(\frac{\Delta S_t}{A_{t-1}}\right) + \beta_3 \left(\frac{\Delta S_{t-1}}{A_{t-1}}\right) + e_t, \quad (3)$$

$$\left(\frac{DISX_t}{A_{t-1}}\right) = \alpha_0 + \alpha_1 \cdot \left(\frac{1}{A_{t-1}}\right) + \beta_1 \cdot \left(\frac{S_{t-1}}{A_{t-1}}\right) + e_t, \quad (4)$$

where, CFO – operating cash flows during year t, S – the sales revenue for year t, A – the total assets at the beginning of year t, $PROD$ – the production cost for year $t (= \mathrm{COGS} + \Delta INV)$, and $DISX$ – selling and general expense–Taxes–Depreciation–Rent expenses–Insurance expense during year t.

The residuals of regression (2), (3) and (4) represent the abnormal $CFOs$, abnormal production costs, and abnormal discretionary expenses, respectively. Finally, real-based earnings management measures are defined as follows for simplicity:

$$ACFO = \text{abnormal } CFO \cdot (-1),$$

$$APROD = \text{abnormal } PROD,$$

$$ADISX = \text{abnormal } DISX \cdot (-1), \text{ and}$$

$$REM = ACFO + APROD + ADISX.$$

1.2. Empirical test model

The following regression model is estimated to examine the research question:

$$EM = \alpha + \beta_1 SENT + \beta_2 Size + \beta_3 Leverage + \beta_4 ROA + \beta_5 MTB + \beta_6 Following + \beta_7 Big4 + \varepsilon. \quad (5)$$

EM is an earnings management variable: discretionary accruals $(DA_1,\, DA_2)$ or real-activity manipulation $(ACFO,\, APROD,\, ADISX,\, REM)$.

SENT is an investor sentiment proxy: *KSENT*, *KBSENT* or *DIFFPE*. The model includes several control variables that are related to earnings management: *Size* (natural logarithm of market capitalization), *Leverage* (debt-to-equity ratio), *ROA* (net income divided by beginning total assets), *MTB* (market-to-book ratio), *Following* (a dummy variable of analyst following), and *Big*4 (a dummy that is set to 1 if a firm is audited by *Big*4 auditors). Also, industry fixed effects are included to control for industry-specific effect on earnings management. All variables are winsorized at top 99% and bottom 1%.

1.3. Data and sample

I collect the financial variables used in the empirical tests from the TS2000 database, which is similar to Compustat in the U.S. The sample consists of non-financial firms listed on the Korea Stock Exchange and KOSDAQ from 2003 to 2011.

The sample period ends in 2011 in which Korean International Financial Reporting Standard (K-IFRS) was adopted. Also, I delete firms with non-December fiscal year-end, impaired capital, negative total assets or negative book equity in order to ensure comparability in the sample. The final sample contains 10,723 firm-year observations (489 distinct firms).

2. TEST RESULTS

2.1. Descriptive statistics

Table 1 describes the industry composition of sample firms. Out of 489 distinct firms, about 22% belongs to manufacture of chemicals and chemical products; except pharmaceuticals and medicinal chemicals (KSIC 20) and professional services (KSIC 71). Next largest groups are evenly distributed over manufacture of food products (KSIC

Table 1. Sample firms' industry composition

KSIC	Description	No. of firms
10	Manufacture of food products	28
13	Manufacture of textiles, except apparel	9
14	Manufacture of wearing apparel, clothing accessories and fur articles	12
17	Manufacture of pulp, paper and paper products	18
20	Manufacture of chemicals and chemical products; except pharmaceuticals and medicinal chemicals	55
21	Manufacture of pharmaceuticals, medicinal chemical and botanical products	29
22	Manufacture of rubber and plastics products	15
23	Manufacture of other non-metallic mineral products	17
24	Manufacture of basic metals	35
25	Manufacture of fabricated metal products, except machinery and furniture	6
26	Manufacture of electronic components, computer; visual, sounding and communication equipment	34
27	Manufacture of medical, precision and optical instruments, watches and clocks	3
28	Manufacture of electrical equipment	14
29	Manufacture of other machinery and equipment	24
30	Manufacture of motor vehicles, trailers and semitrailers	32
35	Electricity, gas, steam and air conditioning supply	9
41	General construction	28
42	Specialized construction activities	2
46	Wholesale trade on own account or on a fee or contract basis	33
47	Retail trade, except motor vehicles and motorcycles	7
49	Land transport and transport via pipelines	9
58	Publishing activities	4
59	Motion picture, video and television programme production, sound recording and music publishing activities	3
62	Computer programming, consultancy and related activities	6
63	Information service activities	1
71	Professional services	52
75	Business support services	4
Sum		489

Table 2. Descriptive statistics

Variable	N	Mean	STDEV	MIN	P25	Median	P75	MAX
DA1	10.723	0.0092	0.0666	−0.1771	−0.0294	0.0065	0.0440	0.2181
DA2	10.723	0.0043	0.0767	−0.2364	−0.0368	0.0046	0.0455	0.2343
REM	10.723	0.0032	0.1942	−0.7376	−0.0952	0.0188	0.1143	0.4742
ACFO	10.723	−0.0004	0.0690	−0.1957	−0.0419	0.0000	0.0408	0.1918
ADISC	10.723	0.0009	0.0793	−0.3321	−0.0274	0.0105	0.0426	0.1747
APROD	10.723	0.0027	0.0988	−0.3568	−0.0456	0.0073	0.0573	0.2840
KSENT	10.723	−0.0922	0.6211	−1.3074	−0.3052	−0.0001	0.2487	1.7127
KBSENT	10.723	−0.0608	0.6318	−0.9205	−0.6975	−0.0343	0.1824	1.1539
DIFFPE	10.723	0.0803	0.7367	−1.2371	−0.3519	−0.0496	0.8520	1.0766
SIZE	10.723	12.8250	1.4248	10.2422	11.7754	12.5774	13.7093	17.0018
LEV	10.723	0.4402	0.1902	0.0563	0.3023	0.4468	0.5793	0.8933
MTB	10.723	0.2154	0.4530	0.0012	0.0196	0.0671	0.2027	3.0702
ROA	10.723	0.0387	0.0764	−0.2660	0.0112	0.0409	0.0786	0.2220
Following	10.723	0.4302	0.4951	0	0	0	1	1
Big 4	10.723	0.6429	0.4792	0	0	1	1	1

10), manufacture of pharmaceuticals, medicinal chemical and botanical products (KSIC 21), manufacture of basic metals (KSIC 24), manufacture of electronic components, computer; visual, sounding and communication equipment (KSIC 26), manufacture of motor vehicles, trailers and semi-trailers (KSIC 30), general construction (KSIC 41), wholesale trade on own account or on a fee or contract basis (KSIC 46).

Table 2 provides the summary statistics of test variables. The means of discretionary accruals and real-based earnings management measures (DA_1, DA_2, REM) are 0.0092, 0.0043, and 0.0032, respectively. Sample firms have average size of 12.8250, debt ratio of 0.4402, market-to-book ratio of 0.2154, and ROA of 0.0387. Also, 43% and 64% of sample firms are followed by analysts and audited by $Big4$ firms.

2.2. Main test results

2.2.1. Effect of investor sentiment on discretionary accruals

Table 3 exhibits the test results on the relationship between investor sentiment and accrual-based earnings management. Panel A and B are based on the OLS regression analyses using DA_1 and DA_2 as the dependent variable, respective-

ly. In both tables, all investor sentiment proxies $(KSENT, KBSENT, DIFFPE)$ are negatively associated with discretionary accruals. Also, these negative correlations are statistically significant at the 1% level. This indicates that firms tend to manipulate earnings upward using positive discretionary accruals when the investor sentiment is pessimistic.

2.2.2. Effect of investor sentiment on real-based earnings management

Table 4 exhibits the test results on the relationship between investor sentiment and real activity-based earnings management. Panel A, B, C and D are based on the OLS regression analyses using $ACFO$, $ADISX$, $APROD$ and REM as the dependent variable, respectively. In all panels, all investor sentiment proxies $(KSENT, KBSENT, DIFFPE)$ are not significantly related to the measures of real-based earnings management.

Collectively, these findings suggest that firms do not appear to rely on changing their real operating activities such as timing of sales, R&D and production to report favorable earnings. Rather, firms tend to use discretionary accruals to boost reported income in bad times. Hence, the means of earnings management appear to vary with investor sentiment.

Table 3. Investor sentiment and discretionary accruals

Variable	Predicted sign	Parameter	t-value		Parameter	t-value		Parameter	t-value	
Panel A: Dependent variable = DA1										
Intercept	–	0.032	4.74	***	0.033	4.95	***	0.037	5.10	***
KSENT	–	–0.008	–8.48	***	–	–	–	–	–	–
KBSENT	–	–	–	–	–0.005	–4.98	***	–	–	–
DIFFPE	–	–	–	–	–	–	–	–0.007	–8.51	***
Size	–	–0.004	–7.16	***	–0.004	–7.32	***	–0.004	–7.11	***
Leverage	+	0.064	17.88	***	0.064	17.70	***	0.066	17.23	***
MTB	+	–0.001	–0.42	–	–0.001	–0.67	–	–0.001	–0.42	–
ROA	–	0.119	13.74	***	0.114	13.16	***	0.115	12.51	***
Following	+	0.003	1.77	*	0.003	2.13	*	0.003	1.92	*
Big4	–	–0.003	–2.41	**	–0.003	–1.95	*	–0.003	–2.17	**
Industry fixed effect		Included			Included			Included		
F value		23.58			22.02			23.45		
Adj R-sq		0.0579			0.0541			0.06		
Panel B: Dependent variable = DA2										
Intercept	–	0.057	7.78	***	0.058	7.92	***	0.060	7.77	***
KSENT	–	–0.008	–7.16	***	–	–	–	–	–	–
KBSENT	–	–	–	–	–0.003	–3.38	***	–	–	–
DIFFPE	–	–	–	–	–	–	–	–0.004	–4.04	***
Size	–	–0.006	–9.99	***	–0.006	–10.08	***	–0.006	–9.53	***
Leverage	+	0.036	9.35	***	0.036	9.16	***	0.035	8.6	***
MTB	+	–0.002	–1.67	*	–0.003	–1.89	*	–0.002	–1.52	
ROA	–	0.454	48.26	***	0.449	47.77	***	0.452	45.35	***
Following	+	–0.012	–7.4	***	–0.012	–7.08	***	–0.012	–7.07	***
Big4	–	–0.002	–1.22		–0.001	–0.79	–	–0.002	–1.12	–
Industry fixed effect		Included			Included			Included		
F value		80.95			79.44			72.23		
Adj R-sq		0.1787			0.1759			0.1753		

Note: All t-values are based on two-tailed t-tests. ***, **, and * indicate the statistical significance at 1%, 5%, and 10% levels, respectively.

Table 4. Investor sentiment and real-based earnings management

Variable	Predicted sign	Parameter	t-value		Parameter	t-value		Parameter	t-value	
Panel A: Dependent variable = ACFO										
Intercept	–	0.067	10.08	***	0.048	7.23	***	0.066	9.09	***
KSENT	–	0.000	0.43	–	–	–	–	–	–	–
KBSENT	–	–	–	–	0.001	1.11	–	–	–	–
DIFFPE	–	–	–	–	–	–	–	0.000	-0.32	–
Size	–	–0.005	–9.41	***	–0.003	–6.09	***	–0.006	–9.78	***
Leverage	+	0.047	13.36	***	0.099	20.83	***	0.067	18.55	***
MTB	+	–0.004	–3.24	***	–0.003	–1.93	**	–0.001	–1.62	*
ROA	–	–0.268	–31.24	***	–0.256	–30.69	***	–0.100	–18.99	***
Following	+	–0.004	–2.97	***	–0.003	–1.82	*	–0.011	–6.95	***
Big4	–	–0.001	–0.47	–	0.000	0.26	–	–0.003	–2.18	**
Industry fixed effect		Included			Included			Included		
F value		67.56			76.84			44.94		
Adj R-sq		0.1534			0.1711			0.1159		

Table 4 (cont). Investor sentiment and real-based earnings management

Variable	Predicted sign	Parameter	t-value		Parameter	t-value		Parameter	t-value	
Panel B: Dependent variable = ADISX										
Intercept	–	0.010	1.29	–	0.009	1.13		0.001	0.12	–
KSENT	–	0.000	-0.35	–	–	–	–	–	–	
KBSENT	–	–	–	–	-0.001	-0.59	–	–	–	
DIFFPE	–	–	–	–	–	–	–	0.002	1.37	–
Size	–	0.001	2.28	**	0.001	1.38		0.002	2.61	**
Leverage	+	–0.020	–4.68	***	0.004	0.68		–0.019	–4.01	***
MTB	+	–0.011	–6.52	***	–0.012	–7.63	***	–0.001	–2.37	**
ROA	–	–0.042	–4	***	–0.024	–2.37	**	0.011	1.58	–
Following	+	–0.011	–5.91	***	–0.010	–5.58	***	–0.017	–7.88	***
Big4	–	–0.006	–3.88	***	–0.006	–3.63	***	–0.008	–3.98	***
Industry fixed effect		Included			Included			Included		
F value		12.38			11.69			12.29		
Adj R-sq		0.03			0.0283			0.0326		
Panel C: Dependent variable = APROD										
Intercept	–	0.028	2.84	**	0.021	2.14	**	0.002	0.2	–
KSENT	–	0.002	1.46	–	–	–	–	–	–	
KBSENT	–	–	–	–	0.002	1.59	–	–	–	
DIFFPE	–	–	–	–	–	–	–	0.002	1.48	–
Size	–	0.000	0.26	–	0.001	1.16		0.001	0.94	–
Leverage	+	0.017	3.23	***	0.032	4.56	***	0.034	5.57	***
MTB	+	–0.013	–6.34	***	–0.012	–6.07	***	–0.001	–1.42	
ROA	–	–0.313	–24.8	***	–0.310	–24.97	***	–0.113	–12.91	***
Following	+	–0.009	–4.26	***	–0.009	–4.07	***	–0.023	–8.62	***
Big4	–	–0.004	–2.02	**	–0.004	–1.92	**	–0.007	–2.92	**
Industry fixed effect		Included			Included			Included		
F value		34.1			34.44			16.67		
Adj R-sq		0.0827			0.0834			0.0447		
Panel D: Dependent variable = REM										
Intercept	–	0.107	5.61	***	0.080	4.16	***	0.070	3.07	***
KSENT	-	0.002	0.61	–	–	–	–	–	–	
KBSENT	–	–	–	–	0.002	0.82	–	–	–	
DIFFPE	–	–	–	–	–	–	–	0.003	1.26	–
Size	–	–0.004	–2.31	**	–0.002	–1.06	–	–0.003	–1.56	–
Leverage	+	0.044	4.3	***	0.137	9.96	***	0.082	7.27	***
MTB	+	–0.028	–7.22	***	–0.027	–7.13	***	–0.003	–2.26	**
ROA	–	–0.626	–25.38	***	–0.592	–24.52	***	–0.202	–12.34	***
Following	+	–0.024	–5.68	***	–0.022	–5.04	***	–0.051	–10.09	***
Big4	–	–0.011	–2.86	**	–0.009	–2.45	**	–0.018	–3.9	***
Industry fixed effect		Included			Included			Included		
F value		40.78			43.56			21.98		
Adj R-sq		0.0977			0.1038			0.0589		

Note: All t-values are based on two-tailed t-tests. ***, **, and * indicate the statistical significance at 1%, 5%, and 10% levels, respectively.

CONCLUSION

Using a sample of public companies on Korea Securities Market from 2003 to 2011, this paper show that firms do not rely on real activity manipulation rather they tend to inflate earnings using discretionary accruals in bad economic times. Consistent with Graham et al. (2005), managers tend to use positive discretionary accruals in recessions because intrinsic earnings will increase when the economy recovers which leads to the reversal or catch-up.

These results add new evidence to accounting literature that managers do not manipulate operating activities to boost reported income in bad times, but they tend to rely on accrual-based manipulation. Also,the paper has marginal contribution by showing that accrual quality is affected by investor sentiment, but real-based managementis relatively free from such bias.

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