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Earnings Management, Financial Leverage, and Cash Flow Volatility: An Analysis by Industry

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Abstract: In this paper, we examine the effect of cash flow volatility and leverage on earnings management across industries. We examine 489 firms between the period of 1990 and 2009 and the results indicate that both financial leverage and cash flow volatility impact the degrees to which firms manage their earnings. Furthermore, we find that depending of which industry a firm belongs to, their degree and extent of managed earnings varies, where consumer staples and consumer cyclical are the most manipulated industries and transportation and utilities industries are the least manipulated.

Key words: earnings management; leverage; volatility; industry

JEL codes: G3, G30

1. Introduction

Since Jones (1991) seminal article showing the existence of earnings management, several authors have examined the issue. For instance, Healy and Wahlen (1999) and Dechow and Skinner (2000) indicate the practice of earnings management occurs because of the availability of different accounting accrual choices in the determination of income. Also, authors find firms manage their earnings prior to corporate events such as management buyouts (Perry & Williams, 1994), initial public offerings (Teoh, Welch, & Wong, 1998a), seasoned public offerings (Teoh, Welch, & Wong, 1998b; Shivakumar, 2000), and stock-for-merger (Erickson & Wang, 1999; Louis, 2004).

Sloan (1996) and Xie (2001) show that long-term abnormal returns are negatively associated with accruals and Gong, Louis, and Sun (2008) finds that post repurchases abnormal returns and reported improvements in operating performance are driven by downward earnings management. More recently, Jiang, Petroni, and Wang (2010) find that the magnitude of accruals and the likelihood of beating analyst forecasts are more sensitive to firms CFOs equity incentives than to those of CEOs.

Although the extended literature on earnings management, two issues are still pending of investigation. One of these issues is the effect of cash flow volatility and leverage on earnings management. Another issue to

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investigate is the distribution of earnings management across industries. The goal of this paper is to examine these issues. More precisely, we will examine if the levels of cash flow volatility and leverage affect the process of earnings management. We expect that in companies with high level of leverage and cash flow volatility, managers will have a large incentive to manipulate earnings; therefore, we expect to find a positive relationship between these variables and earnings management. Also, we will examine if earnings manipulation is a common factor across industries or concentrated in specific industries.

To attain these goals, we examine the largest 1,000 firms based on market capitalization published in the *Wall Street Journal*. After eliminating financial and utility firms, as well as firms with incomplete information, our final sample was 489 firms and the period examined include from 1990 to 2009. Then, these firms were sorted by industry following the SIC classification.

We find that both leverage and cash flow volatility impact the degree to which firms manage their earnings. However, our expected relationship did not hold in both variables. While the association was positive between cash flow volatility and earnings management. The association between leverage and earnings management was negative, suggesting that low leveraged firms manage their earnings more.

As such, our evidence on the impact of leverage on earnings management supports the control hypothesis by Jensen (1986). The hypothesis suggests that opportunistic behavior of managers is reduced by debt creation. Thus, highly leveraged positions may restrict its manager's ability to manage earnings.

In addition, we find that firms which their business cycle falls in the period of economic drought are more likely to manage earnings. On distinguishing the industry effect on managed earnings, we find a very heterogeneous behavior on industries propensity to manage earnings. Specifically, we find that consumer staples and consumer cyclical industry firms manage their earnings the most and transportation and utilities industries manage their earnings the least. The findings of this study are consistent regardless of the methodology used in the analysis.

We believe the results of this investigation could be relevant to both academicians and practitioners such as portfolio managers. Portfolio managers may find important the results in the determination of their trading strategies, just as academicians may find interesting the new finding in earnings management.

The remainder of the study is organized as follows. In Section 2, we describe the data, variable construction, and methodology. In Section 3, we describe the results and robustness tests. In Section 4, we conclude and summarize the paper.

2. Data, Variable Construction, and Methodology

We start our investigation by examining the largest 1,000 firms based on market capitalization as compiled by the Wall Street Journal. We eliminate from these sample all financial and regulated firms (SIC codes 6000-6999 and 4900-4999). Then, we extract financial information of these firms from the Compustat database. We obtained information from 489 firms from the period 1990 to 2009. Thus, we have a total of 9,780 firm years of financial data.

2.1 Earnings Management

Earnings management is represented by the discretionary accruals of the firm which is distilled from the total accruals. We estimated total accrual using the models developed by Jones (1991), the modified Jones (1991), and Dechow and Sloan (1991). According to Bartov, Gul and Tsui (2000), the modified Jones (1991) is the most powerful model detecting earning management. More specifically, the notation of these models is the following:

Equation 1: Jones 1991 Model

$$\frac{TA_{it}}{Assets_{it-1}} = \alpha_0 \frac{1}{Assets_{it-1}} + \beta_1 \frac{\Delta Sales_{it}}{Assets_{it-1}} + \beta_2 \frac{PPE_{it}}{Assets_{it-1}} + \varepsilon_{it}$$

where: $\Delta Sales_{it}$ = sales in firm (i) at year (t) less sales in year (t-1) for firm (i) scaled by total assets at (t-1); PPE_{it} = gross property plant and equipment in year (t) for firm (i) scaled by total assets at (t-1).

Equation 2: Modified Jones (1991) Model

$$DiscAcc_{it} = \frac{TA_{it}}{Asset_{it-1}} - (\hat{\alpha}_0 \frac{1}{Assets_{it-1}} + \hat{\beta}_1 \frac{\Delta Sales_{it} - \Delta \mathrm{Re} cievables_{it}}{Assets_{it-1}} + \hat{\beta}_2 \frac{PPE_{it}}{Assets_{it-1}}$$

Equation 3: Dechow and Sloan (1991) Model

$$NDA_t = \gamma_1 + \gamma_2 median_i(TA_t)$$

where: $Median_i(TA_t)$ = the median value of total accruals scaled by lagged assets for all non-sample firms in the same 2-digit SIC code.

To reduce the heteroskedastic nature of the regression, we deflate each variable in the model by the book value of the total assets from the prior year following Chung et al. (2005).

Total Accruals (TAC) is assumed to be the sum of both discretionary and non-discretionary components. To generate the discretionary accruals we extracted the residuals from the Jones (1991) model and the Dechow and Sloan (1991) model and the fitted value from the modified Jones (1991) model.

Table 1 Summary Statistics on Discretionary Accruals

	Models		
	Jones	Modified Jones	Dechow and Sloan
Mean	1.65e-10	2.32e-10	3.19e-10
Standard Deviation	0.677	0.677	0.636
Skewness	-34.046	-33.877	-32.767
Kurtosis	1687.374	1676.796	1605.389
25% Quartile	-0.071	-0.071	-0.068
Median	0.025	0.025	0.022
75% Quartile	0.106	0.106	0.101
Min	-38.6322	-38.6074	-36.1075
Max	12.7829	12.9207	12.3918

In Table 1, we report the summary statistics for the Jones (1991) model; henceforth known as “EM1”, the modified Jones (1991); henceforth known as “EM2”, and Dechow and Sloan (1991) henceforth known as “EM3”. The mean of all the models were different from zero.

We found that there is a wide range between each models minimum and maximum, therefore, we include two other earnings management models. These two models are the studentized forms of Jones (1991) and Dechow et al. (1995) model. The studentized form fits outliers in the dataset by eliminating the assumption of similitude standard deviation across the board for each data point. As such, Jones (1991) studentized form is dubbed EM4, and Dechow et al. (1995) studentized form is dubbed EM5.

2.2 Proxies and Variable Construction

The variables used in this study include financial leverage, debt capacity and cash flow volatility. We measure financial leverage as total debt divided by total assets (book leverage). Using book values may be

justified by a recent survey by Graham and Harvey (2001) who report that managers focus on book values when setting financial structure. Furthermore, Barclay et al. (2006) show how book leverage is theoretically preferable in regressions of financial leverage, arguing that using market values in the denominator might spuriously correlate with explanatory variables such as Tobin's q. We run the regressions using book leverage definition by Almazan et al. (2010). Almazan et al. (2010) defines book leverage as book debt divided by the total assets.

To measure debt capacity, we use the Standard and Poor's (S&P) quality ranking which we then codify into a binary. The quality ranking by S&P which we also pulled from COMPUSTAT is an indicator that appraises the past performances of a stock's earnings and dividends and the stock's relative standing during the current fiscal year. The quality rank of firm should be based on an underlying characteristic that higher quality rank should suggest higher likelihood to access the public market. Lemmon and Zender (2009) indicated firms which can access the bond market have cash flows that are sufficiently stable, sufficiently large pools of existing collateral, and sufficient informational transparency to allow access to relatively large amounts of arms-length debt. To measure risk, we use the standard deviation of net operating cash flow divided by total assets. We use fixed-capital stock (net property, plant and equipment, in millions of dollars) divided by the number of employees as a proxy for capital intensity (the capital-labor ratio, KIL). Profitability is defined by earnings before interest expense and taxes (EBIT) (data item 13 minus 14) divided by total assets. Following Barclay et al. (2006), we control for the investment opportunity set with Tobin's q or market to book ratio.

2.3 Industry and Business Cycle Variables

We employ the economic code categorization by COMPUSTAT to classify firms into groups. By using the economic codes, we conjecture that some industry may be prone to manipulate their financials than others. Also, by introducing business cycles, we control the possibility that firm performance may be influenced by market behavior. The data set for business cycle is acquired from the National Bureau of Economic Research (NBER). Business cycle is captured as a binary variable, where 1 suggests economic recessionary period and 0 otherwise.

2.4 Regression Model Specification

The ranges of regression include robust pooled regression and industry specific regressions. For robustness check, we run simultaneous-equation regressions where financial leverage and cash-flow volatility instruments are generated to address any case of endogeneity. Since these two variables are the main variables of interest in this study, we intend to eliminate any form of bias that may be related to their coefficient values. We include the measures of quality ranking and business cycles as dummy variables. To ensure these measures of industry position do not simply reflect static trade-off and pecking-order theories, we also include standard control variables such as profitability, firm size and Tobin's q.

Therefore, the regression models are:

$$\text{EM}= f\begin{pmatrix} bookleverage, cashflow\ volatitlity, ratings, cycle, tangibility, \\ torbin's\ q, profitability, and\ Dummy \end{pmatrix}$$

where: EM represents earnings management models; Book Leverage, Cash flow Volatility are the main variables; Ratings and Cycle are conditioned for what theories holds through; Tangibility, Torbin's Q, Profitability, and Dummy are control variables.

For robustness, our identification strategy reflects two objectives, namely, to control for firm fixed effects and to address endogeneity bias. Whited (1992) shows how both of these objectives can be achieved in the context of generalized method of moment (GMM) estimation with panel data. Specifically, we use year-to-year changes in the variables (first differences) rather than the levels of the variables to control for firm fixed effects. Using

year-to-year changes rather than regular firm fixed effects enables us to use twice and more lagged levels of the same variables as instruments. We also adjust the variables for interacted industry-year fixed effects in order to isolate intra-industry variation. We estimate the following system of simultaneous equations using GMM:

$$\Delta EM = f\begin{pmatrix}\Delta bookleverage, \Delta cashflow\ volatitlity, ratings, cycle, \Delta controls, \\ fixed\ effects\end{pmatrix} + \mu$$

where Δ is the first-difference operator, μ is random error terms, and the endogenous right-hand side variables (financial leverage, or cash-flow volatility, and business cycle dummies, age dummies, profitability, size, and Tobin's q) are instrumented using their twice and thrice lagged values as instruments for control for endogeneity and simultaneity.

3. Results

We begin by producing the summary statistics of our variables. Then, we proceed with the pooled OLS regression and the Industry marginal effects. Finally, we check the robustness of the pooled regression. Regression results for each industry are not shown rather we disclose the economic effect of discretionary earnings on the behavior of these firms in their economic or industry group. Specifically, the industrial analyses attempts to capture the marginal effects of the main variables within each industry.

Table 2 Summary Statistics of Independent Variables

	Mean	Std. Dev.	Min	Max
Book Leverage	0.5132	0.2123	-2.6207	2.2993
Volatility	7.4605	92.1232	0.0047	3773.767
Ratings	0.8265	0.3787	0	1
Cycle	0.8964	0.3047	0	1
Tangibility	0.3801	0.2477	0	0.9535
Market to Book	2.0061	1.5064	0	39.8133
Profitability	0.3969	19.6517	-1.8161	1941.215
LagAsset	15396.82	39003.23	0	797769
Sales	11913.86	26975.9	0	425071

Note: The sample includes Annual Compustat firms which exclude financial and regulated utilities firms with SIC 6000-6999 and 4900-4999 respectively. The sample period is 1990 to 2009. Book Leverage is calculated as book debt over total asset. Volatility is calculated as the standard deviation of cash flow from operation over total asset. Ratings—Standard and Poor's Quality rankings for Common/Ordinary Stock—this is the appraisal of past performance of a stock's earnings and dividends and the stock's relative to standing as of a company's current fiscal year. Cycle equals one if the firm fiscal year is reported in the period of economic recession (drought) and zero otherwise. Tangibility is net property, plant and equipment over total assets. Market-to-Book ratio is market value over total assets. Profitability is EBITDA over lagged total assets. Lag Asset is Asset of firms lagged one year. Sales are total annual revenue of firms.

In Table 2, we see that most variables have a low standard deviation compared to its average, as such inferring that samples for each variable are close to its mean.[1]

3.1 Pooled Regression

The pooled regression is published in Table 3. The results in Table 3 are from five robust OLS regression

[1] A preliminary test to assess the correlative properties of each independent variable against one another was performed. Although we do not report it, none of the variables reported in Table 2 were highly collinear, except for lagged assets-to-total sales which had a correlative index of 68.27%.

models. Each regression uses a different explained variable measure connoting as EM1 to EM5. From Table 2, both leverage and cash flow volatility are statistically significant and their directionality remained the same in all regressions. Book leverage had an impact of about two percent across all regressions. Thus, firms with lower book leverage may be more likely to manage their earnings

Bartov et al. (2000) and Dechow et al. (1995) concurred the modified Jones (1991) model was more reliable and effective in positing the relationship between managed earnings and its subjected independent variables. Likewise, the results in Table 3 concur to their supposition. Another inclusion in the pooled regression is a dummy variable used to capture the effect of financial measures from the year 2000 and onward. In the regressions, it is dubbed as G2000. This variable was significant and does have a substantive economic contribution of about three percent. The directionality is inversely correlated portending that financial statement of firms on and after the year 2000 were less manipulated as compared to prior years in our datasets. Table 3 also shows that the variable business cycle was statistically significant. Its economic contribution is at about four percent at its one standard deviation.

Table 3 Regression: Discretionary Earnings, Leverage, Cash Flow, and Business Cycle

	EM1		EM2		EM3		EM4		EM5	
	coef	Se	Coef	se	coef	se	coef	se	coef	se
Book Leverage	-0.0772**	0.032	-0.0785**	0.032	-0.0768**	0.030	-0.1103**	0.058	-0.1194**	0.059
Volatility	0.0001***	0.000	0.0001***	0.000	0.0001***	0.000	0.0002***	0.000	0.0002***	0.000
Ratings	0.0001	0.012	0.0003	0.012	0.0009	0.012	-0.0088	0.022	-0.0073	0.022
Cycle	*0.0971***	*0.047*	*0.0979***	*0.047*	*0.0926***	*0.044*	*0.1781**	*0.098*	*0.1792***	*0.097*
Tangibility	-0.4511***	0.041	-0.4505***	0.041	-0.4219***	0.039	-0.6845***	0.088	-0.6818***	0.086
Market to Book	0.0134***	0.003	0.0135***	0.003	0.0131***	0.003	0.0186***	0.006	0.0197***	0.006
Profitability	0.0003	0.002	0.0003	0.002	0.0003	0.001	0.1183***	0.004	0.1094***	0.003
LagAsset	0.0000***	0.000	0.0000***	0.000	0.0000***	0.000	0.0000***	0.000	0.0000***	0.000
Sales	-0.0000***	0.000	-0.0000***	0.000	-0.0000***	0.000	-0.0000***	0.000	-0.0000***	0.000
G2000	-0.0387***	0.014	-0.0384***	0.014	-0.0345***	0.013	-0.0733**	0.029	-0.0700**	0.029
Cons	0.1185***	0.043	0.1178***	0.043	0.1090***	0.041	0.1364*	0.074	0.1362*	0.075
N	9775		9775		9775		9775		9775	
R Squared	0.0349		0.0351		0.0349		0.7387		0.7122	
Adjusted R Squared	0.0339		0.0341		0.0341		0.7384		0.7119	

Note: The sample includes S&P Economic Code Classification of firms into industry code from Annual Compustat firms and excludes financial firms and regulated industries with SIC 6000-6999 and 4900-4999. The sample period is 1990-2009. Explained Variable is Earnings Management which has five variations. Model 1 earnings management is calculated using Jones (1991) model. Model 2 earnings management is calculated using the modified Jones (1991) model. Model 3 earnings management is calculated using Dechow et al. (1995) Model. Model 4 is the studentized earnings management of Model 1 and Model 5 is the studentized earnings management of Model 3. Book leverage is calculated as book debt over total asset. Volatility is calculated as the standard deviation of cash flow from operation over total asset. Ratings—Standard and Poor's Quality rankings for Common/Ordinary Stock—this is the appraisal of past performance of a stock's earnings and dividends and the stock's relative to standing as of a company's current fiscal year-end. Cycle equals one if the firm fiscal year is reported in the period of economic recession (drought) and zero otherwise. Tangibility is net property, plant, and equipment over total assets. Market to Book ratio is market value over total assets. Profitability is EBITDA over lagged total assets. LagAsset is Asset of firms lagged one year. Sales are total annual revenue of firms. G2000 is a dummy variable which equals to one for firm fiscal year from the year 2000 to 2010. Robust Ordinary least squares regressions of Earnings Management are reported. Significance at 0.01, 0.05, and 0.10 is denoted with ***, **, and *, respectively.

3.2 Industry

To examine the degree of variability of earnings management within each industry, we run pooled regression for each industry group. We run separate robust regressions for each industry and an ex-post analysis for each regression considering the marginal effects of the main explanatory variables. In this section, we use the modified Jones model transforming the earnings into absolute terms. The modified Jones model is the most appropriated because it is the most linear among the three models.

We use the economic coding for each firm under the Standard and Poor's economic code. The economic codes for the remaining firms after eliminating the financial and regulated codes are transportation, utilities, health care, capital goods, energy, technology, basic materials, communication services, consumer cyclical and consumer staples which are assigned 600, 700, 905, 925, 935, 940, 970, 974, 976 and 978 respectively. Table 4 shows two structure of discretionary earnings management within each industry. The first is earnings management values for each economic group at the raw state labeled as original. The second is earnings management value transformed to an absolute value, which is labeled as absolute.

Table 4 shows the disparity of discretionary earnings among industries from the original structure. Consumer staples have the largest negative discretionary earnings -73.64 and consumer cyclical has the largest positive discretionary earnings 57.16 among the groups. These suggest that on average, firms in these two industry classes have a higher propensity to manage the earnings downward and upward the most. The absolute values are consistent with the original structure values.

The gap among each economic group is showed in Figure 1. Figure 1 uses the actual values to show the disparity of discretionary earnings among groups. The horizontal values from 1 to 10 represents the economic group code as 1 equates to 600 which is transportation and 10 equates to 978 which is consumer staples respectively. Figure 1 show that transportation and utilities groups have the smallest gap between negative and positive discretionary earnings suggesting the possibility that firms within the two groups manages their earnings the least. The gap widens for capital goods (industry tagged 4) and the largest gap shown in group 9 and 10 is for consumer cyclical and staples groups. The positive discretionary management is the highest for consumer cyclical, capital goods, and technology suggesting that managers within these firms positively manipulate their earnings the most to present a healthy financial position. This finding is consistent with those presented by Haley and Wahlen (1999), Teoh et al. (1998s) and Xie (2001).

Table 4 Discretionary Earnings Descriptive Structures for Economic Group

	Original				Absolute			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Inustries-								
600	1.78E-11	0.11474	-1.26774	0.43345	0.0559	0.10012	0.00002	1.26773
700	-3.38E-10	0.17169	-1.47076	2.94823	0.07268	0.15553	0.00008	2.94823
905	-2.07E-10	0.75455	-14.75764	12.03331	0.14269	0.74092	0.00001	14.75765
925	3.49E-09	1.75887	-44.09564	35.34742	0.26235	1.73918	0.00044	44.09564
935	2.67E-10	0.92087	-21.31149	14.98873	0.13279	0.91124	0.00005	21.31149
940	-3.81E-10	0.95711	-22.33352	22.21427	0.12661	0.94868	0.00009	22.33352
970	-1.80E-10	0.32731	-2.96592	7.53871	0.10686	0.30935	0.00031	7.53871
974	-1.30E-09	0.38821	-4.4418	4.02836	0.11011	0.37222	0.00013	4.4418
976	-1.43E-09	2.01707	-31.70136	57.16589	0.39746	1.97751	0.00003	57.16589
978	-2.10E-10	2.21877	-73.64439	9.07266	0.21341	2.20842	0.0001	73.64439

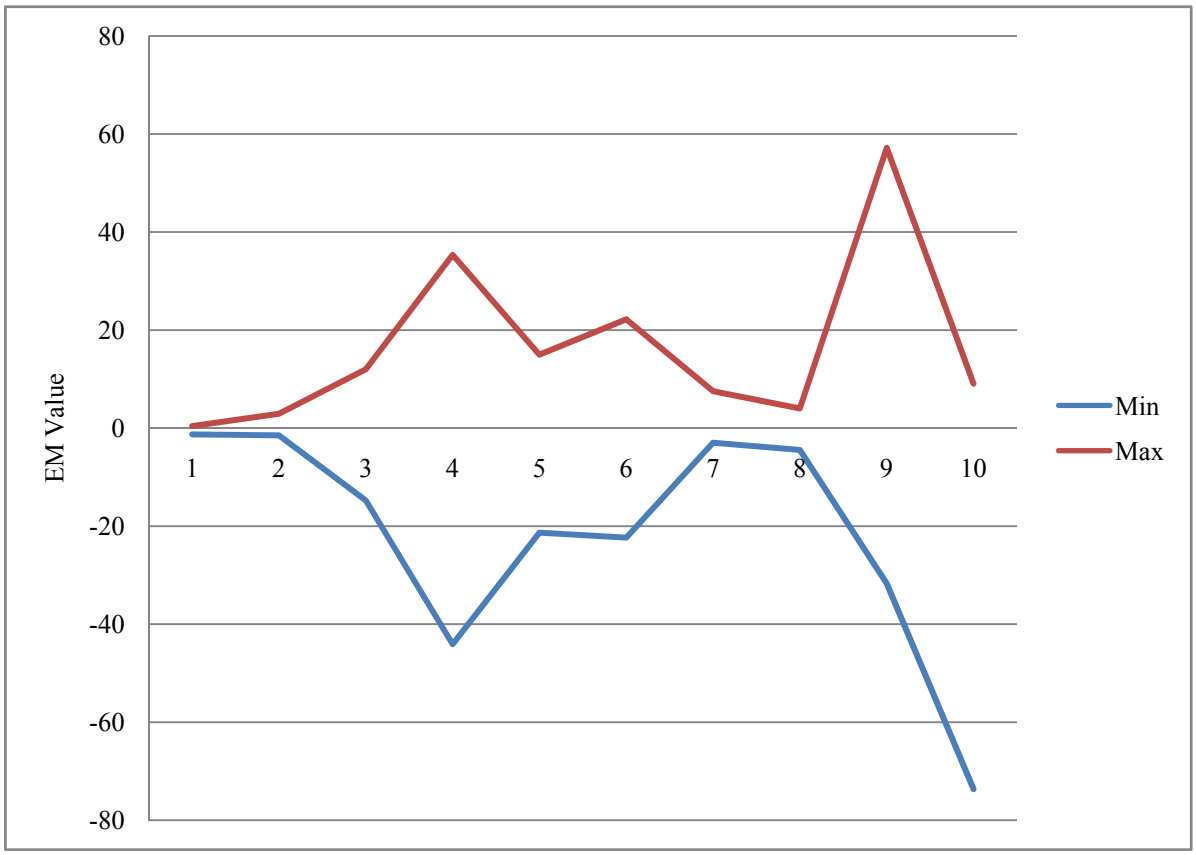

Figure 1 Industry Gap in Earnings Management

Table 5 highlights the marginal effect of each variable on discretionary accruals. We report the fitted values of earnings management as well. The marginal effect results are from the pooled regression including all conditional and controlling variables. Cash flow volatility is most significant across all industries compared to the rest explanatory variables, with its significance greatest at Consumer Staples. Also, the directionality of elasticity remained constant for Cash flow volatility as it remained elastic in all industries. Business cycle had the most marginal effect among the four independent variables across all economic groups.

3.3 Robustness Check

To test the robustness of our results, we run a generalized method of moments (GMM) regressions for the entire pooled sample using the same five measures of earnings management. We expect the importance and significance of each variable to remain the same.

The GMM regressions are reported in Table 6. Here we use year-to-year changes in the variables rather than the levels of the variables to control for the firm fixed effects following MacKay and Phillips (2005). To control for endogeneity, we use second and third year lag for book leverage and cash flow volatility. The Hansen J test for over-identification reports that our instrument variables were appropriate and uncorrelated to the disturbance process in the first stages regression for each model. Consistent with the robust pooled OLS regression models reported in Table 4, the explanatory variables in the GMM models retained their directionality and statistically significance in all the models.

Table 5 Discretionary Earnings and Explanatory Variables: Marginal Effects for Industries

Explained Variable: Earnings Management										
Industries -	600	700	905	925	935	940	970	974	976	978
Explanatory Variables:										
Book-Leverage	0.0349	*-0.5501*	0.3394	-0.3401	-0.4731	0.2721	*0.4481*	0.0401	-0.3285	-0.0593
Cash Flow Volatility	*0.4405*	0.0023	*0.1747*	*0.0345*	*0.4255*	0.0633	0.0322	*0.2684*	*0.0649*	*0.7072*
Ratings	0.2271	-0.2003	*-0.4902*	0.5738	0.7516	0.2936	0.1218	0.1118	0.1757	0.2669
Cycle	*-0.5813*	*-1.091*	-1.012	-0.6628	0.7094	*-1.5611*	-0.3761	0.0523	-0.145	0.5196
EM Fitted Values	0.0559	0.0722	0.1427	0.2615	0.1328	0.1266	0.1068	0.1088	0.3975	0.2141

Note: The sample includes S&P Economic Code Classification of firms into industry code from Annual Compustat firms and excludes financial firms and regulated industries with SIC 6000–6999 and 4900–4999. The Industrial Code stated below is the Economic code used by S&P classification representing transportation, utilities, health care, capital goods, energy, technology, basic materials, communication services, consumer cyclical and consumer staples respectively. The sample period is 1990-2010. Explained Variable is Earnings Management which has five variations. Model 1 earnings management is calculated using Jones (1991) model. Model 2 earnings management is calculated using the modified Jones (1991) model. Model 3 earnings management is calculated using Dechow et al. (1995) model. Model 4 is the studentized earnings management of Model 1 and Model 5 is the studentized earnings management of Model 3. Book leverage is calculated as book debt over total asset. Volatility is calculated as the standard deviation of cash flow from operation over total asset. Ratings—Standard and Poor's Quality rankings for Common/Ordinary Stock—this is the appraisal of past performance of a stock's earnings and dividends and the stock's relative to standing as of a company's current fiscal year-end. Cycle equals one if the firm fiscal year is reported in the period of economic recession (drought) and zero if firm's fiscal year is otherwise. *Significance at 0.05 is highlighted after running pooled robust OLS included are the control variables (those not highlighted are significant at 0.10).*

Table 6 Robustness Check: Discretionary Earnings, Leverage, Cash Flow, and Business Cycle

	GMM1		GMM2		GMM3		GMM4		GMM5	
	coef	se	coef	se	coef	se	coef	se	coef	se
Book Leverage	-0.0888***	0.021	-0.0900***	0.021	-0.0828***	0.021	-0.1530***	0.040	-0.1529***	0.043
Volatility	0.0000	0.000	0.0000	0.000	0.0000	0.000	-0.0000	0.000	-0.0000	0.000
Ratings	0.0017	0.005	0.0017	0.005	0.0020	0.004	-0.0010	0.008	-0.0006	0.008
Cycle	0.0515*	0.029	0.0523*	0.029	0.0488*	0.028	0.0901*	0.057	0.0935	0.058
Tangibility	-0.4274***	0.026	-0.4268***	0.026	-0.3981***	0.025	-0.6508***	0.052	-0.6479***	0.053
Market to Book	0.0203***	0.005	0.0204***	0.005	0.0194***	0.005	0.0354***	0.010	0.0357***	0.010
Profitability	-0.4977***	0.127	-0.4961***	0.127	-0.4553***	0.123	-0.9750***	0.271	-0.9486***	0.283
Lag Asset	0.0000	0.000	0.0000	0.000	0.0000	0.000	-0.0000	0.000	0.0000	0.000
Sales	-0.0000	0.000	-0.0000	0.000	-0.0000	0.000	-0.0000	0.000	-0.0000	0.000
G2000	-0.0286***	0.004	-0.0286***	0.004	-0.0276***	0.004	-0.0464***	0.008	-0.0478***	0.009
Cons	0.2367***	0.031	0.2360***	0.031	0.2183***	0.031	0.3905***	0.064	0.3822***	0.067
N	8357		8357		8357		8357		8357	
R Squared	0.6991		0.6954		0.6716		0.6521		0.6176	
Adjusted R Squared	0.6988		0.6951		0.6712		0.6517		0.6173	

Note: The sample includes S&P Economic Code Classification of firms into industry code from Annual Compustat firms and excludes financial firms and regulated industries with SIC 6000-6999 and 4900-4999. The sample period is 1990-2010. Explained Variable is Earnings Management which has five variations. Model 1 earnings management is calculated using Jones (1991) model. Model 2 earnings management is calculated using the modified Jones (1991) model. Model 3 earnings management is calculated using Dechow et al. (1995) Model. Model 4 is the studentized earnings management of Model 1 and Model 5 is the studentized earnings management of Model 3. Book leverage is calculated as book debt over total asset. Volatility is calculated as the standard deviation of cash flow from operation over total asset. Ratings—Standard and Poor's Quality rankings for Common/Ordinary Stock—this is the appraisal of past performance of a stock's earnings and dividends and the stock's relative to standing as of a company's current fiscal year-end. Cycle equals one if the firm fiscal year is reported in the period of economic recession (drought) and zero if firm's fiscal year is otherwise. Tangibility is net property, plant, and equipment over total assets. Market to Book ratio is market value over total assets. Profitability is EBITDA over lagged total assets. LagAsset is Asset of firms lagged one year. Sales are total annual revenue of firms. G2000 is a dummy variable which equals to one for firm fiscal year from the year 2000 to 2010. Robust Ordinary least squares regressions of Earnings Management are reported. Significance at 0.01, 0.05, and 0.10 is denoted with ***, **, and *, respectively.

These findings provide assurance that our main results are robust. Although not reported, prior to testing with GMM method, we perform a two stage least square regression. The statistical findings of the two stage least square regression were significant even at the variables first differencing stage, thus, our statistical findings are sturdy.

4. Conclusion

In this paper we examine two issues affecting earnings management. The first issue examined the effect of cash flow volatility and leverage on earnings management. The second issue investigated is the distribution of earnings management across industries. More precisely, we examine if the level of cash flow volatility and leverage affect the level or earnings manipulation. We expected that in companies with high level of leverage and cash flow volatility, managers will have a large incentive to manipulate earnings. Also we examine if earnings manipulation is a common factor across industries or it is a factor concentrated in specific industries.

To attain these goals we examine 489 firms published in the *Wall Street Journal* during the period 1990-2009, and thus, we examine a total of 9,780 firm years of financial data. These firms are sort by industry following the SIC classification.

The results of these studies indicate that both financial leverage and cash flow volatility impact the degrees to which firms manage their earnings. The results also show that the business cycle affect firm's earnings management. Furthermore, we find that depending of what economic group or industry a firm belongs to, their degree and extent of managed earnings varies, where consumer staples and consumer cyclical are the most manipulated industries and transportation and utilities industries are the least manipulated. The findings of this paper are also robust from the simple regressions to the refined instrument variable regression models.

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