

Earnings Management in Recession and Recovery Periods

Yousef Jahmani
Professor of Accounting
College of Business Administration
Savannah State University

Suman Niranjani
Associate Professor of Management
College of Business Administration
Savannah State University

Susanne Toney
Assistant Professor of Economics
College of Business Administration
Savannah State University

Abstract:

This paper investigates earnings management during the recession and recovery periods for S&P 500 companies. The results suggest that these companies manage their earnings in both periods (2008 & 2013), but they manage their earnings much more in the recession period. This may attribute to the desire of these companies to avoid or mitigate the negative consequences of experiencing deep losses. The results also raise questions about the reliability of the companies' financial statements. The findings of this research are useful to the Securities and Exchange Commission and to auditors, and imply that more careful scrutinization of companies' financial statements is needed to better inform investors and creditors relying on these statements.

Introduction:

The economic recession that started in 2007 with the housing market crisis, pushed many companies to the brink of bankruptcy. Many companies laid off part of their work force, sending the national unemployment rate to double digits. Many workers have experienced cuts in hours worked, wages and salaries, and other benefits in order for companies to reduce labor costs and keep afloat. Banks withheld lending. Credit became very tight. Many families struggled to pay their bills. Many consumers defaulted on their loans, leading to an increase the number of home foreclosures. Companies' revenues declined as a result. Many giant corporations were at a high risk of bankruptcy.

The federal government took several actions to address the situation. Many large companies bankrupted, others were bailed out by the federal government. The Federal Reserve Bank reduced interest rates and encouraged financial institutions to lend. Some homeowners were given the opportunity to refinance their mortgages at a lower interest rate. Many infrastructure projects like

highways and bridges were started. Tax credits were given to middle class families in order to leave some cash on hand to spend. Beginning in 2010 the unemployment rate started to decline and the employment numbers showed an increase over time.

Companies that experienced such situations may manage their earnings to avoid negative consequences such as negative creditors, or financial analysts' expectations. The purpose of this paper is to examine whether companies manage their earnings in both periods and whether these companies manage their earnings more in the recession period than in the recovery period.

Economic Background:

Business cycles are commonly defined as variations in economic activity, usually measured by macroeconomic indicators such as real output or GDP and employment. Four phases comprise a business cycle:

The peak is a temporary maximum level of real output, this phase is followed by a contraction. The contraction, or recession, is a decline in the overall level of real GDP. This phase is followed by the trough which is the minimum level of real GDP experienced prior to an economic expansion. The expansion phase reflects increases in real GDP.

Since 1979, the National Bureau of Economic Research (NBER) Business Cycle Dating Committee has determined and dated U.S. business cycle phases. During the period of analysis, 2008-2013, the NBER recognized a peak in December of 2007, followed by an eighteen month contraction, ending in a trough in June of 2009. The U.S. economy is currently in the expansion phase, often called economic recovery.

Prior to the 2007-2009 financial crisis and recession, the U.S. had experienced 73 months of expansion, largely bolstered by inflated financial markets. Demyanyk and Van Hemert (2011) find that an overabundance of sub-prime, high risk, low quality mortgages were issued during the period 2001-2007, with an "unusually large fraction of subprime mortgages originated in 2006 and 2007 becoming delinquent or in foreclosure only months later."

Many researchers have attributed some portion of the increase in sub-prime mortgage (see for example, Thomas Sowell) loans to a 1995 revision in the 1977 Community Reinvestment Act, or CRA which encouraged banks to "increase the percentage of mortgage loans going to low-and moderate income borrowers" (Arnold, p467). Thereby "essentially imposing quotas on banks." This incentive coupled with low interest rates imposed by the Federal Reserve Bank increased demand for homes and caused home prices to rise.

During the same period, the Federal National Mortgage Association, known as Fannie Mae and Freddie Mac, the Federal Home Loan Mortgage Corporation) purchasers and guarantors of subprime mortgages relaxed their credit standards on loans purchased directly from lenders hoping to increase loan availability to minority and low-income homebuyers (Comiskey and Madhogarhia, 2009). Many of the purchases were financed by mortgage backed securities or MBSs.

Unfortunately, this bubble was bound to break. An increasing pool of homebuyers, combined with rising home prices enticed builders to increase the supply of new homes. Additionally, many of the sub-prime loans were adjustable rate mortgages or ARMs. Once the interest rates reset to much higher levels, and monthly mortgage payments increased, many homebuyers defaulted on their loans. The increase in the supply homes drove prices down. From 2006-2008 home prices dropped by 25% in metropolitan statistical areas throughout the country. (Comiskey and Madhogarhia, 2009).

The decline in home prices and the increase in foreclosures, negatively affected banks in a profound way. Many highly leveraged banks holding subprime loans and MBSs became insolvent. U.S. markets are interconnected with each other and with the global community. Thus, the financial crisis was felt globally and also impacted non-financial corporations. Santos (2011) shows how the financial crisis also affected the corporate sector. He finds that banks increased the cost of credit, resulting in fewer and smaller corporate loans. Campello (2011) finds that corporate CFOs responded by saving funds to strengthen their cash reserves. This combination of events led to decreased spending, falling prices, increasing unemployment levels, and a \$553 billion decline in real GDP.

The U.S. government responded in the form of bailouts, expansionary fiscal policy, and easy money. (Arnold 2014). Mishkin (2011) outlines the federal tools implemented to alleviate the devastating economic effects of the financial crisis and Great Recession. He explores the Troubled Asset Relief Program (TARP) which injected capital into financial institutions, the bail outs of Fannie Mae, Freddie Mac, Bear Stearns, and AIG, tax cuts and increases in government spending. The U.S. Bureau of Economic Analysis (BEA) data indicates that seasonally adjusted real GDP has increased from the business cycle trough of fourth quarter 2007 of 14991 billion to a fourth quarter 2013 expansion cycle of 15916.2 billion.

There are ongoing debates as to the timeliness and effectiveness of the strategies used by the federal government. However, economic data shows that the U.S. continues along a path of modest recovery. Positive trends in the level of real GDP, spending, investment, and employment are strong indicators that the U.S. economy remains in the expansion phase of the business cycle.

Hypotheses:

- 1- Companies manage their earnings in both recession and recovery periods.
- 2- Companies manage their earnings more in recession period.

The Model

Researchers use several models to detect earnings management. The earlier models estimate discretionary accruals by firm using time series data until year $t-1$ and predict the values of accruals for year t . This estimation assumes the stability of coefficients. Guay et al (1996) find that the Jones model and the modified Jones model are the only models that provide evidence that is consistent with opportunism and performance measure hypothesis. Defond and Jiambalvo (1994) propose the use of cross-sectional data to estimate discretionary accruals to avoid the assumption of the stability of coefficients and to reduce the likelihood of the misspecification of the model. Bartov et al. (2001) find that the cross-sectional Jones model and the cross-sectional

modified Jones model outperform time series models in detecting earnings management. Dechow et al. (1991) find that the modified Jones model outperforms the Jones model in detecting earnings management. They argue that the Jones model implicitly assumes that discretion is not exercised over revenue in either the event period or the estimation period. The modified Jones model assumes that all changes in credit sales in the event period are caused by earnings management. The main difference between the Jones model and the modified Jones model is that the modified Jones model takes into account change in receivables as a result of change in revenues. Based on the above, this research utilizes the following modified Jones model.

$$TA_t = \beta_0 + \beta_1 (1/A_{t-1}) + \beta_2 (\Delta REV_t - \Delta REC_t) + \beta_3 (PPE_t) + \varepsilon_t \dots (1)$$

Where TA is total accruals. Total accruals are calculated as the difference between net income before discontinued operation and extraordinary items and cash flows from operation. A_{t-1} denotes total assets at the beginning of the year. ΔREV_t , and ΔREC_t are change in revenues and account receivables, respectively, and PPE_t is gross property, plant, and equipment. ΔREV_t , ΔREC_t and PPE_t capture nondiscretionary accruals where the error term ε_t captures the discretionary accruals and ε_t computed as follows:

$$TA_t = DAC + NDAC \dots (2)$$

where DAC is discretionary accruals or abnormal accruals and $NDAC$ is non-discretionary accruals and represent the fitted value of equation (1)

$$DAC = \varepsilon_t = TA_t - [\beta_0 + \beta_1 (1/A_{t-1}) + \beta_2 (\Delta REV_t - \Delta REC_t) + \beta_3 (PPE_t)] \dots (3)$$

where β_0 , β_1 , β_2 , and β_3 are the ordinary least square estimators of the original coefficients. For simplicity, we denote the term $(\Delta REV_t - \Delta REC_t)$ DEF . Change in revenues, changes in account receivables, and property, plant, and equipment are scaled by lagged total assets to reduce heteroscedasticity. Following Kothari et al. (2005), we added an intercept to improve the model performance. Gross property, plant, and equipment are included in the model to control for depreciation expense that are included in non-discretionary accruals.

Sample collection:

Our sample consists of non-financial firms listed in S&P 500 for 2008 (from recession period) and 2013 (from recovery period). In order to test the earnings management for these firms during these periods, the firms must be included in the list of S&P 500 in two years 2008 and 2013. Therefore, we eliminate the firms that listed only in one year. The total number of firms listed in both years is 403. We collected data from Compustat.

Results:

Descriptive Statistics and Modified Jones Model for S&P 500 companies in 2008 and 2013

As mentioned earlier in the paper the S&P 500 companies in 2008 (recession period) and 2013 (post-recession period) were considered for the analysis of earnings management, of which 98 companies were not included due to mergers and acquisitions, some of the companies no longer

operate in 2013 in comparison to 2008, a few firms were no longer part of S&P 500, and also companies such as banks, financial institutions and insurance companies were removed from the analysis. This resulted in a sample size of 402 companies in 2008 and 2013.

Table 1 provides the correlations as well as summary statistics for *total accrual*, *1/assets*, *DEF*, and *PPE* for 402 S&P firms in the recession year 2008. The total accrual average is -0.06615, the reason we see that the total average accrual is negative is due to the fact that it is a depreciation accrual. The difference between Q1 and Q3 results in inter-quartile range (IQR), which ranges from -0.0844 to -0.0246, which seems that the data may not be widely dispersed, but we find that the standard deviation is slightly larger than the average total accrual value resulting in a coefficient of variability (CV) that's slightly larger than one, and the information ascertains the fact that the distribution of numbers for total accruals is close to normal distribution with a short long tail. Moreover the median and the mean values are not far apart suggesting an acceptable skewness (between +1 and -1, not shown in table 1) in the distribution of the total accrual and further suggesting that the distribution is close to symmetrical. The mean value of *DEF* is positive (0.0946), which suggests that the S&P 500 firms change in receivables is smaller compared to change in revenue, additionally we find that the standard deviation of *DEF* is much larger when compared to mean signifying the CV close to two and a long tail compared to normal distribution. The median is smaller than the mean values of *DEF* implying a positive skewness.

Table 1: Descriptive Statistics and Correlations for S&P firms in 2008

N=402	Mean	Median	Std. Deviation	Variance	Q1	Q3	Total Accruals	1/Assets	DEF	PPE
Total Accruals	-0.06615	-0.0511	0.0849	0.007	-0.0844	-0.0246				
1/Assets	2.068E-04	1.10E-04	3.44E-04	1.185E-07	4.04E-05	2.486E-04	-0.029			
DEF	0.0946	0.0599	0.1717	0.029	0.0185	0.1399	0.439	0.235**		
PPE	0.5525	0.4242	0.4064	0.165	0.2210	0.8131	-0.80	-0.092	0.085	

**significant at 0.01 level (two-tail)

Table 2 provides the correlations as well as summary statistics for *total accrual*, *1/assets*, *DEF*, and *PPE* for 402 S&P firms in the post-recession year 2013. The mean value of the total accrual is around -0.0499. The IQR is from -0.0714 to -0.0242, whereas the standard deviation is close to the value mean total accrual at around 0.047 suggesting that the coefficient of variability is close to one, a relatively short tail and close to normal distribution, moreover the mean value is close to median values of the total accrual suggesting symmetric distribution. Observing the average and median of *PPE* and *DEF* from table 2 we can infer a positive skewness for *PPE* and a negative skewness for *DEF*.

Table 2: Descriptive Statistics and Correlations for S&P firms in 2013

N=402	Mean	Median	Std. Deviation	Variance	Q1	Q3	Total Accruals	1/Assets	DEF	PPT
Total Accruals	-0.0499	-0.0444	0.0474	0.002	-0.0714	-0.0242				
1/Assets	1.202E-04	7.889E-05	1.304E-04	1.701E-08	3.032E-05	1.586E-04	-0.040			
DEF	0.0275	0.0204	0.1196	0.014	-0.0067	0.0583	0.064	0.220**		

PPE	0.5604	0.4349	0.4317	0.186	0.2112	0.8641	-0.422**	-0.144**	-0.087
------------	--------	--------	--------	-------	--------	--------	----------	----------	--------

When comparing descriptive statistics S&P firms in 2008 during the recession period we would anticipate that the magnitude of the total accrual to be larger in comparison to the S&P firms in 2013, signifying the fact that earnings are managed higher during the recession period in comparison to year 2013. Observing table 1 and 2 we find that the average total accrual for S&P firms in 2008 is 24.5% larger (in terms of absolute values) in comparison to S&P firms in 2013. We also find the coefficient of variability significantly larger for the average total accrual S&P firms in 2008 in comparison to the S&P firms in 2013. These results possibly indicate that the earnings are managed higher during the recession when in comparison to 2013 by the same firms.

In order to justify this stance and get additional evidence supporting the statement made earlier that earnings are managed higher during the recession period in comparison to 2013 (not just based on the mean and coefficient of variability) we use modified Jones model. Based on the modified Jones model, a multiple linear regression model with *1/assets*, *DEF* and *PPE* as independent variables and total accruals as a dependent variable is utilized. The regression model summaries of both S&P firms in 2008 and 2013 are provided in table 3, while the coefficients of the predictors are described in table 4.

Table 3: Model Summary for S&P 2008 and 2013

Model	R	R Square	Adjusted R Square	Residual	F-value
2008	0.105	0.011	0.004	2.861	1.474
2013	0.437	0.191	0.184	0.730	31.235**

**significant at 0.01 level (two-tail)

From table 3 we can see that the model that has the data from 2008 not have a significant F value for the overall model. The S&P for 2008 (recession) regression (omnibus F-test) has failed. While on the other hand we see the omnibus F-test for S&P for 2013 is significant, suggesting the fact that the overall model for S&P for 2013 is valid. Making a close observation at the coefficient of determination (R Square) one can undoubtedly see that amount of variability in the total accrual is better explained by predictors of S&P 2013 model. The R-Square value for S&P 2013 model (19.1%), since the coefficient of determination for the S&P 2008 is insignificant we cannot use it for comparison purposes. On the basis of table 3 (model summary), it can be stated that the predictors used by S&P 2013 for the modified Jones model were able to predict the total accrual a more significant manner, on the contrary for the S&P 2008 the predictors failed to explain any variability in total accrual. These results can be further reinforced by also looking at the residual (error) in the regression. We find a significant amount of higher residual in the S&P 2008 model in comparison to S&P 2013 model. Based on results in table 4 we see that all the coefficients of predictors are significant for the three out of four S&P 2013 (except *DEF*), we find no multicollinearity issues. Based on table 4 we can say that according to modified Jones model the S&P 2013 firms tend to manage their earnings less than S&P 2008.

Table 4: Regression Coefficients of S&P 2008 and S&P 2013

S&P 2008					S&P 2013				
Independent Variables	Coefficient (Beta)	T-Value	Tolerance	p-value	Independent Variables	Coefficient (Beta)	T-Value	Tolerance	p-value
(Constant)	-0.056	-7.107		0.001**	(Constant)	-0.019	-4.428		0.001**
1/Assets	-12.620	-0.991	0.932	0.322	1/Assets	-41.455	-2.445	0.936	0.015*
DEF	0.029	1.131	0.933	0.259	DEF	0.020	1.101	0.948	0.271
PPE	-0.019	-1.787	0.980	0.075	PPE	-0.048	-9.496	0.976	0.001**

**significant at 0.01 level (two-tail); * significant at 0.05 level (two-tail)

Conclusion:

The United States economy experienced a major downturn in late 2007 that lasted approximately two years. It started with the collapse of the housing sector and spread to other sectors. During this period many companies suffered sharp declines in their revenues. In early 2010, the economy showed signs of recovery that manifested in a decline in the unemployment rate and an increase the monthly employment numbers.

This research investigates the earnings management of S&P 500 firms during 2008 and 2013. The results indicate that these companies managed their earnings in both periods but they managed their earnings in the recession period much more than in the recovery period. The findings of this research are useful to the Securities and Exchange Commission and suggest that auditors scrutinize companies' financial statements more closely as investors and creditors rely on the credibility of these statements.

References

- Arnold, Roger A. *Economics, 12th Edition* (Massachusetts: Cengage Learning 2016, 2014) 456-479.
- Campello, M., Giambona, E., and Graham, J.R. 2011. "Liquidity Management and Corporate Investment During a Financial Crisis." *The Review of Financial Studies*, 24, (6): 1944-1979.
- Comiskey, M. and Madhogarhia. 2009 "Unraveling the Financial Crisis of 2008." *PS: Political Science and Politics*, 42, (2): 271-275.
- Demyanyk, Y. and Van Hemert, O. 2011. "The Academic Analysis of the 2008 Financial Crisis." *The Review of Financial Studies*, 24, (6):1848-1880.
- Guay, W. R., S. P. Kothari, and R. L. Watts. 1996. A market based evaluation of discretionary accruals models. *The Journal of Accounting Research*. 34 (supplement): 83-105.
- Mishkin, Frederic S. 2010. "Over the Cliff: From the Subprime to the Global Financial Crisis." *The Journal of Economic Perspectives*, 25, (1):49-70.

Reinhart, V. 2011. "A Year of Living Dangerously: The Management of the Financial Crisis in 2008." *The Journal of Economic Perspectives*, 25, (1):71-90.

Santos, Joao A.C. 2011. "Bank Corporate Loan Pricing Following the Subprime Crisis." *The Review of Financial Studies*, the Academic Analysis of the 2008 Financial Crisis, 24, (6): 1916-1943.

Spiegel, M. 2011. "The Academic Analysis of the 2008 Financial Crisis: Round 1." *The Review of Financial Studies*, the Academic Analysis of the 2008 Financial Crisis, 24, (6): 1773-1781.