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*An Analysis of Earnings Management Practices and Value Relevance on U.S.  
Community Banks During the Global Financial Crisis*

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## **Abstract**

This study investigates whether community banks in the United States were guilty of performing creative accounting practices during the 2007-2008 global financial crisis (GFC). The focus will be on earnings management and value relevance, covering the period from 2004 to 2011. Community banks, defined by their focus on local communities, play a significant role within society. The findings indicate that community banks engaged in increased earnings management during the GFC. Additionally, larger and more profitable banks exhibited less earnings management during the GFC compared to before, while banks with higher liquidity showed the opposite trend. In terms of value relevance, this study presents evidence suggesting higher value relevance before the GFC, although these findings are not unambiguous. This study contributes to the understanding of how community banks conduct their accounting, which could potentially create greater trust between these banks and their clients, benefitting community welfare. Furthermore, it offers insights for policymakers to improve regulatory frameworks and prepare for future financial disruptions.

**Keywords:** Community banks, Earnings management, Value relevance, Global financial crisis, GFC

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## 1. Introduction

The effects of the GFC, which had worldwide impact, continued to be felt through bankruptcies, low liquidity and price volatility into 2011. The severe recession that began in 2007 and 2008 was largely attributed to abusive creative accounting. During such circumstances, more attention should be paid to financial statements and all the parties involved with them (Gherai et al., 2011).

One party to blame for the GFC is investment banks. Because of excessive mortgage lending to borrowers who would normally be unqualified for mortgages, lenders carried high risks. These lenders were willing to take these risks since they passed them on to investors in the form of financial instruments. Because of creative accounting, the fair value of these financial instruments was not accurately disclosed to investors, leading to a bubble which eventually burst (Team, 2023).

After the GFC in 2007 and 2008, creative accounting had received increased attention, with exceptional concern about the prevention and detection of earnings manipulation. Creative accounting is a practice used to influence financial indicators. This is accomplished through accounting expertise and rules that do not violate accounting policies, rules, or laws. Many institutions employ this practice to portray a desired financial position to their stakeholders (Abed et al., 2022).

Now, the question is whether smaller banks, such as community banks, were also guilty of engaging in these creative accounting practices. This research focuses solely on earnings management and value relevance. This leads to the following research question:

*Did community banks in the United States participate in earnings management and exhibit lower value relevance during the GFC?*

A community bank is defined as a bank that provides traditional services for its local communities. These banks specialise in their local community, which enables them to base credit decisions on local knowledge and long-term relationships with their customers. Due to this specialisation, they often provide loans to local businesses and individuals, even if they may not be traditionally qualified. Because they serve customers in a specific geographic area, they tend to emphasise their relationships with their customers (Kurt, 2022).

This paper relates to different types of literature. Firstly, it relates to the literature of bank failures during the GFC. A relevant finding has already discovered that a significant element playing a role in bank failures was creative accounting within the banking industry (Norton, 2012). DeYoung and Torna (2013) disclosed that the probability of bank failure in commercial banks declined with fee-based nontraditional activities, but increased with asset-based nontraditional activities. Banks that committed to risky nontraditional activities were also more likely to take risks in their traditional lines of business.

Secondly, it also adds to the literature regarding accounting standards during and after the GFC. For example, it was found that the GFC affected the scope of earnings manipulation and the relevance of financial numbers from companies that were being audited by one of the Big 4 auditors (Iatridis & Dimitras, 2013). Another study debunked the conspiracy that fair-value accounting contributed to the severity of the GFC. They discovered that there was no significant evidence supporting such an assumption, but that there could have been an overvaluation of bank assets during the GFC (Laux & Leuz, 2010).

Many papers have explored similar cases during the GFC, but primarily focussed on commercial banks (DeYoung & Torna, 2013). An investigation on community banks could contribute knowledge to the literature by examining certain events from a different, yet still relevant perspective.

This study will contribute to society since community banks play a significant role for individuals and smaller businesses. Understanding how these banks conduct their accounting could lead to more trust between them and their clients, potentially benefiting community welfare. With the results of this research, stakeholders could make more informed decisions, relying on accurate financial information provided by financial institutions. This study could also inform policymakers about potential gaps or weaknesses in current regulations. The introduction of more appropriate policies could improve consumer protection.

Additionally, it contributes to detecting the vulnerability of community banks during major financial catastrophes. It can help community banks become more prepared and cautious with their audits, potentially limiting their exposure to future recessions. This could indirectly benefit individuals and businesses, given that community banks often maintain personal relationships with their customers (Kurt, 2022).

This study will first provide a brief literature review of collected previous research similar to this topic, delving deeper into the previously mentioned literature cases. Following this, two research hypotheses will be formed, and an explanation of the data and methodology used. Subsequently, the research results will be presented, followed by a discussion of the main findings and a conclusion drawn.

## 2. Literature review

### 2.1 The GFC

When examining the beginning of the GFC, an investigation needs to be conducted into the banking system of the financial markets during that period. Before 2008, both creative accounting and failures in the banking sector were already acknowledged. Nevertheless, because the impact of the GFC was so widely spread, it could be argued that this banking crisis was considerably different from previous incidents (Norton, 2012).

Norton (2012) stated that the main reason for the GFC was the “credit crunch”. The most important causes of this credit crunch were sub-prime lending, off-balance sheet activities by banks, and inadequate risk evaluation of assets. These assets eventually turned out to be highly volatile and illiquid. All these practices occurred due to creative accounting. Since these practices are not relevant within the scope of this paper, the concepts will not be discussed further.

During the period before the GFC occurred, many banks within the financial market applied a practice called “creative accounting”. In this context, accounting standards allowed the use of complex financial instruments and funding arrangements to manipulate the strength of balance sheets. This is despite of even when banks were not able to adequately evaluate the risks of these instruments or to “stress test” trading or portfolio investment strategies. Normally, leveraging or borrowing against a highly rated balance sheet would be considered a strategic finance practice. However, once the asset being leveraged was overvalued or highly volatile, the risk of a funding crisis increased. Because regulators permitted banks to weigh the risk factors to their balance sheets through their own internal risk measurements, it was possible that the true levels of risk were not aligned with those of the market (Norton, 2012).

### 2.2 Earnings management

Miller et al. (2021) found that there was a consistent negative relationship between institutional ownership and bank earnings management. During peaceful periods, these downside risks had little bearing, but during a financial crisis like the one in 2008, these risks intensified. They approached their research by using discretionary loan loss provisions and the ability of current loan loss provisions to predict future net loan charge-offs as proxies for bank earnings management.

DeYoung and Torna (2013) tested whether the practice of non-traditional banking activities by U.S. commercial banks contributed to their failure during the GFC. They found that pure fee-based non-traditional activities, such as securities brokerage and insurance sales, decreased the probability of financial distress, whereas asset-based non-traditional activities, such as venture capital, investment banking, and asset securitization, increased these probabilities. However, this only applied if the bank

was already dealing with financial distress. Additionally, banks that engaged in risky non-traditional activities were also more likely to take risks in their traditional lines of business.

Iatridis and Dimitras (2013) investigated how the GFC affected the scope of earnings manipulation. Additionally, their study examined the relevance of reported financial numbers for companies audited by one of the Big Four auditors, focusing on Portuguese, Irish, Italian, Greek and Spanish listed companies. They found that companies in Portugal, Italy, and Greece were more likely to use earnings management to improve their profitability and liquidity. They also found that the reported financial numbers of companies in Portugal and Greece were of higher quality before the GFC occurred. Having lower quality in the reporting of financial numbers could reflect the efforts by a company to conceal their mismanagement or lack of managerial ability to influence an investor's perception and expectation. In Ireland, Italy, and Spain, companies reported more value-relevant financial numbers during the GFC. This differentiation in the effects of accounting quality between different EU countries' companies was notable. Ireland presented a lower scope of earnings manipulation, possibly due to stronger investing mechanisms in that country.

### 2.3 Value relevance

Value relevance research empirically investigates the usefulness of accounting information to stock investors. Normally, active stock investors look at financial statements to determine the fundamental value of the firms. A major objective in financial reporting is to ensure the provision of relevant information to estimate a company's value to equity investors. When there is a statistical association between the accounting information and the market values of equity, the information is marked as value relevant (Beisland, 2009).

There were arguments that fair-value accounting worsened the severity of the GFC, with the main allegations being that this method of accounting contributed to excessive leverage and write-downs. However, little evidence was found that fair-value accounting had a significant influence on the severity of the GFC. This was due to the limited role that fair values played in a bank's income statements and capital ratios, unless the bank had a large trading position. Even when banks had large trading positions, investors were more concerned about exposures to sub-prime mortgages and made their own judgements (Laux & Leuz, 2010).

Hamdi and Mejri (2017) investigated the value-relevance of bank's fair value disclosure under IFRS standards. They found that the fair value estimates for financial instruments helped explain variations in the share prices of banks. Fair value also provided incremental explanatory power over the historical costs of financial instruments. When banks had greater capital abilities, investors tended to price the fair value of financial instruments higher. Additionally, fair value pricing for assets was higher in countries with strong investor protection. Finally, they also observed that the fair values of financial instruments were significantly discounted during the GFC.

Another study focused on hundreds of different banking institutions over 38 different countries to examine how different variables affected the extent of value relevance. It was found that at a macro level, the extent of authorised accounting disclosures, differences in accounting measurement practices, and the type of legal environment had the most significant effect on the extent of value relevance of earnings and book values. At the bank-level, the variables that had the biggest impact were the organisational form and risk (Anandarajan et al., 2010).



### **3. Research hypotheses**

Certain accounting standards contributed to the failure of banks. Banks were slow in recognising their loan losses before the GFC. This delay was partly influenced by the banks' reporting incentives, as their disclosures regarding relevant risk exposures were insufficient compared to reality (Bischof et al., 2021). In contrast, community banks were found to maintain higher levels of liquidity and lower levels of capital after the GFC, compared with larger non-community banks (Fayman et al., 2021).

Bank managers generally have more incentives to engage in earnings management compared to managers in nonfinancial firms. This has several reasons. Firstly, it is crucial for banks to monitor the illiquidity of their assets. Investor confidence is crucial for the stability of a bank, which gives bank managers more reason to manage their loan loss provisions, meet their capital requirements, and prevent their earnings from becoming negative. Another reason is that bank reports were more complex and harder to understand than those from nonfinancial firms. This complexity gives bank managers stronger incentives to report earnings and signal information to the public. Lastly, banks are highly regulated, which makes managers more inclined to manage financial reports to navigate regulatory requirements (Miller et al., 2021).

Based on this information, it can be expected that community banks were better off compared to other banks, but still engaged in creative accounting practices. Therefore, the following hypotheses can be formed:

**H1. Similar to non-community banks, community banks engaged in the practice of earnings management during the GFC period.**

Another characteristic of banks was their exposure to various financial risks, such as interest rate risks, foreign exchange risks, credit risk and liquidity risk, due to their operating activities. To manage this risk exposure, banks began using derivatives, as they appeared more efficient compared to on-balance sheet strategies. Despite the extensive use of derivatives as instruments to manage financial risks, analysts and regulators expressed concerns that current financial statements do not fairly represent the underlying value of these instruments (Venkatachalam, 1996).

To summarise, banks tended to inadequately depict the underlying economics of their financial instruments while managing their financial risks. This could lead to a misrepresentation of a company's equity and thus, their value relevance. Based on this, the second hypothesis can be formed:

**H2. Community banks reported lower value relevance in the reported financial numbers during the GFC period.**

## 4. Data and methodology

### 4.1 Database

The data used in this study was extracted from Wharton Research Data Services (WRDS). WRDS is a business data research service from The Wharton School at the University of Pennsylvania. This platform serves as the interface to datasets and provides access to financial, economic, and marketing data. This database was chosen, because it stores a broad range of historical data for various banks throughout the United States. Historical data from different community banks across the United States was examined.

To conduct the research, the analysis was be divided into two parts. For the earnings management part, data from forty different community banks over the period of 2004 to 2011 was analysed. For the value relevance part, observations from 66 different banks were included, spanning over the periods 2004 to 2010. There was a difference in both the quantity of observations and the periods covered, because these two approaches required different key variables, with availability differing between banks. For both parts, a multiple linear regression was executed based on the ordinary least squares (OLS) approach.

### 4.2 Earnings management methodology

First, the impact of the GFC on bank's scope of earnings management was tested. To conduct the research, several proxies were used. To measure for earnings management, discretionary accruals were used as a proxy. This is because "discretionary accruals are the component most easily subject to successful managerial manipulation" (Jiao et al., 2013). The higher the value of discretionary accruals, the greater the degree of earnings management. The natural logarithm of the market value was used as a proxy for firm size, and the market-to-book ratio was used to proxy for the stock valuation of the firm and its growth. The model used is presented below (Iatridis & Dimitras, 2013):

$$DACC_{i,t} = \beta_0 + \beta_1 CR_{i,t} + \beta_2 OCF_{i,t} + \beta_3 \ln MV_{i,t} + \beta_4 OPM_{i,t} + \beta_5 DE_{i,t} + \beta_6 MVBV_{i,t} + \beta_7 SP_{i,t} + \beta_8 \\ CR OCF_{i,t} + \beta_9 CR \ln MV_{i,t} + \beta_{10} CR OPM_{i,t} + \beta_{11} CR DE_{i,t} + \beta_{12} CR MVBV_{i,t} + \beta_{13} CR SP_{i,t} + e_{i,t}$$

where

*DACC* = the estimated discretionary accruals from banks in millions, based on the cross-sectional Jones (1991) model

*CR* = dummy variable that takes 1 when the observation is during or after the GFC (after 2007) and 0 otherwise

- OCF = operating cash flow in millions  
 lnMV = natural logarithm of market value in millions  
 OPM = operating profit margin in millions  
 DE = debt to equity  
 MVBV = market value divided by book value  
 SP = dummy variable for small profits. Takes 1 when if the net profit scaled by total assets is in between 0 and 0.01 and 0 otherwise  
 e = the error term

There are several alternative accrual-based models for detecting earnings management. The Jones Model, proposed by Jones (1991), relaxes the assumption that non-discretionary accruals are constant and attempts to control for the effect of changes in a firm's economic circumstances on its non-discretionary accruals. In the empirical analysis, the Modified Jones Model was considered, which is a modification of the Jones Model. It was found that this model exhibits the most power in detecting earnings management. The DACCs are the residuals from the following model (Dechow et al., 1995):

$$TACC_{i,t}/A_{i,t-1} = (1/A_{i,t-1}) + (\Delta REV_{i,t} - \Delta REC_{i,t}) (1/A_{i,t-1}) + PPE_{i,t} (1/A_{i,t-1}) + e_{i,t}$$

where

- TACC = total accruals, which is computed by subtracting the cashflow from operating activities from the net income in millions  
 A = total assets in millions  
 $\Delta REV$  = annual change in revenues in millions  
 $\Delta REC$  = annual change in net receivables in millions  
 PPE = property plant and equipment in millions  
 e = the error term

Table 4.1 and Table 4.2 present the summary statistics for the earnings management analysis. Table 4.1 shows the observations before the GFC, and Table 4.2 shows the observations during and after the GFC. It can be seen that the discretionary accruals (DACC) were, on average, negative and close to zero over the years, both before and after the GFC. This indicates that the overall level of discretionary accruals was low, suggesting that very limited earnings management was executed. When examining the size of the banks (lnMV), it can be seen that it was higher before the GFC, with an average of 4.37 compared to an average of 3.976 during and after the GFC. This implies that the market values were adversely affected. The bank's growth (MVBV) also showed a decrease, going from an

average of 1.751 to 1.03.

Table 4.1 Summary statistics earnings management pre-GFC period

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
DACC	120	-.001	.012	-.044	.074
OCF	120	8.624	7.37	-20.536	29.752
lnMV	120	4.37	.765	2.522	5.744
OPM	120	.15	.068	-.146	.321
DE	120	10.568	2.563	5.828	20.07
MVBV	120	1.751	.594	.646	4.053
SP	120	.558	.499	0	1

*Note.* Table 4.1 presents summary statistics for the key variables that are used to estimate earnings management from before the GFC. There are observations from forty community banks throughout the United States. The period that is shown is 2004-2006.

Table 4.2 Summary statistics earnings management GFC period

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
DACC	200	-.001	.011	-.066	.072
OCF	200	10.156	9.501	-27.419	64.417
lnMV	200	3.976	.883	.804	5.523
OPM	200	.124	.237	-.931	2.35
DE	200	10.665	2.301	6.143	20.374
MVBV	200	1.03	.494	.189	2.905
SP	200	.685	.466	0	1

*Note.* Table 4.2 presents summary statistics for the key variables that are used to estimate earnings management from during and after the GFC. There are observations from forty community banks throughout the United States. The period that is shown is 2007-2011.

#### 4.3 Value relevance methodology

Based off the approach by Iatridis and Dimitras (2013), the value relevance of the community banks will be tested. This will be carried out by using two different multiple linear regression models, namely:

$$P_{i,t} = \beta_0 + \beta_1 BVPS_{i,t} + \beta_2 NPPSi,t + e_{i,t}$$

where

P = total market value of equity divided by the number of shares outstanding  
BVPS = total book value of equity divided by the number of shares outstanding  
NPPS = net profit divided by the number of shares outstanding  
e = the error term

and

$$NPP_{i,t} = \beta_0 + \beta_1 AR_{i,t} + e_{i,t}$$

where

NPP = net profit divided by beginning of year share price  
AR = the annual stock return at year-end  
e = the error term

To measure for value relevance, the coefficients of the independent variables will be examined. The more the independent variables have a significant effect on the dependent variables, the more value relevance is reflected. To measure this, the R-squared will also be considered. and how these statistics differ between the periods before and after the GFC will be analysed.

Table 4.3 and Table 4.4 present the descriptive statistics for the value relevance analysis. Table 4.3 reflects observations from before the GFC, whereas Table 4.4 displays observations from during and after the GFC. From these tables, it is evident that the average market value per share (P) has decreased after the GFC, going from an average of 30.93 to 21.589. Additionally, both the average book value per share (BVPS) and average net profit per share (NPPS) have shown declines, going from an average of 2.059 to 2.015 and going from an average of 1.857 to 1.296 respectively. Furthermore, the average net profit scaled by share price (NPP) and the average annual stock return (AR) have exhibited significant reductions during the GFC, going from an average of 0.349 to -2.235 and going from an average of -0.799 to -2.062 respectively.

Table 4.3 Summary statistics value relevance pre-GFC period

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
P	198	30.93	56.456	10.2	515
BVPS	198	2.059	3.405	0	20.1
NPPS	198	1.857	2.721	-.927	25.405
NPP	198	.349	.397	-.193	2.581
AR	198	-.799	12.928	-54.79	125

*Note.* Table 4.3 presents summary statistics for the key variables that are used to estimate value relevance from before the GFC. There are observations from 66 community banks throughout the United States. The period that is shown is 2004-2006.

Table 4.4 Summary statistics value relevance GFC period

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
P	264	21.589	47.444	.055	415
BVPS	264	2.015	3.478	0	20.729
NPPS	264	1.296	3.75	-11.328	28.958
NPP	264	-2.235	22.483	-257.612	3.67
AR	264	-2.062	10.077	-125	45

*Note.* Table 4.4 presents summary statistics for the key variables that are used to estimate value relevance from during and after the GFC. There are observations from 66 community banks throughout the United States. The period that is shown is 2007-2010.

## 5. Results

### 5.1 Earnings management

Table 5.1 indicates that the coefficient associated with the GFC period (CR) is zero, and the corresponding p-value indicates no statistical significance. These findings suggest that there is insufficient evidence in the sample to support the presence of a correlation between the GFC period and a bank's earnings management practices. Moreover, with an R-squared value of zero, it appears that the GFC period itself had minimal to no effect on earnings management practices.

Table 5.1 Earnings management simple linear regression results for the relationship between the GFC period and discretionary accruals

DACC	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	0	.001	-0.02	.987	-.003	.003	
Constant	-.001	.001	-0.71	.476	-.003	.001	
Mean dependent var	-0.001		SD dependent var		0.011		
R-squared	0.000		Number of obs		320		
F-test	0.000		Prob > F		0.987		
Akaike crit. (AIC)	-1968.615		Bayesian crit. (BIC)		-1961.078		

*Note.* The sample consists of forty United States community banks. The period of analysis is 2004-2011. The dependent variable is DACC. DACC is discretionary accruals estimates based on the cross-sectional Jones model (Jones, 1991). CR is a dummy variable that takes 1 when the observation is after the GFC period and 0 otherwise. \*\*\* p<.01, \*\* p<.05, \* p<.1, based on a two-tailed test.

Table 5.2 presents another linear regression model incorporating additional control and interaction variables. It reveals a positive correlation between the GFC period and earnings management, as indicated by a significant coefficient of 0.034. During the GFC period, banks with higher liquidity (CROCF) tended to exhibit higher discretionary accruals, supported by a significant coefficient of 0.001. However, it is noticeable that outside the GFC period, higher liquidity (OCF) was associated with lower discretionary accruals.

The coefficient of the variable for large-size banks (CRlnMV) shows a negative correlation with earnings management during the GFC period, with a significant coefficient of -0.006. Again, when looking outside of the GFC period, bank size (lnMV) demonstrated a positive relationship with earnings management. Similarly, banks with higher profitability (CROPm) tended to engage in less earnings management during the GFC but displayed a positive correlation outside the GFC period.

Additionally, debt-equity ratio (DE) also influenced discretionary accruals, although it did not reach statistical significance during the GFC (CRDE).

Table 5.2 Earnings management multiple linear regression results for the relationship between the GFC period and discretionary accruals

<b>DACC</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t- value</b>	<b>p- value</b>	<b>[95% Conf</b>	<b>Interval]</b>	<b>Sig</b>
CR	.034	.011	2.93	.004	.011	.056	***
OCF	-.002	0	-5.22	0	-.002	-.001	***
lnMV	.011	.002	4.68	0	.006	.015	***
OPM	.061	.017	3.64	0	.028	.095	***
DE	.001	0	2.60	.01	0	.001	***
MVBV	-.002	.002	-1.20	.232	-.006	.002	
SP	.004	.002	1.54	.126	-.001	.008	
CROCF	.001	0	2.40	.017	0	.002	**
CRlnMV	-.006	.003	-1.93	.054	-.011	0	*
CROPM	-.049	.02	-2.42	.016	-.088	-.009	**
CRDE	-.001	.001	-1.64	.103	-.002	0	
CRMVBV	.002	.003	0.64	.522	-.004	.008	
CRSP	-.001	.003	-0.30	.762	-.007	.005	
Constant	-.049	.009	-5.65	0	-.065	-.032	***
Mean dependent var	-0.001		SD dependent var		0.011		
R-squared	0.514		Number of obs		320		
F-test	7.732		Prob > F		0.000		
Akaike crit. (AIC)	-2175.494		Bayesian crit. (BIC)		-2122.738		

*Note.* The sample consists of forty United States community banks. The period of analysis is 2004-2011. The dependent variable is DACC. DACC is discretionary accruals estimates based on the cross-sectional Jones model (Jones, 1991). CR is a dummy variable that takes 1 when the observation is after the GFC period and 0 otherwise. OCF is the operating cash flow. lnMV is the natural logarithm of market value. OPM is the operating profit margin. DE is debt to equity. MVBV is market value divided by book value. SP takes 1 if net profit scaled by total assets is between 0 and 0.01 and 0 otherwise. \*\*\* p<.01, \*\* p<.05, \* p<.1, based on a two-tailed test.



## 5.2 Value relevance

### 5.2.1 First test

Table 5.3 indicates a negative coefficient for the book value of equity per share (BVPS) before the GFC period, whereas Table 5.4 shows a positive coefficient. However, the lack of significance in the p-value from both linear regressions suggests insufficient evidence in this sample to conclude a non-zero correlation. On the other hand, net profit per share (NPPS) displays a significant positive coefficient in both regressions.

Comparing the coefficients of NPPS in Table 5.3 and Table 5.4 reveals a higher coefficient before the GFC period, decreasing from 20.458 to 11.599. Furthermore, the R-squared values indicate higher explanatory power before the GFC period, declining from 0.972 to 0.832.

In summary, it appears that the reported financial metrics of community banks were of higher quality before the GFC period based on these findings.

Table 5.3 Value relevance pre-GFC period multiple linear regression results for the relationship between book value of equity per share and the average market value per share

<b>P</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t- value</b>	<b>p- value</b>	<b>[95% Conf</b>	<b>Interval]</b>	<b>Sig</b>
BVPS	-.046	.148	-0.31	.756	-.337	.245	
NPPS	20.458	.583	35.10	0	19.309	21.608	***
Constant	-6.965	1.182	-5.89	0	-9.295	-4.635	***
Mean dependent var	30.930		SD dependent var	56.456			
R-squared	0.972		Number of obs	198			
F-test	623.337		Prob > F	0.000			
Akaike crit. (AIC)	1454.390		Bayesian crit. (BIC)	1464.255			

*Note.* The sample consists of 66 United States community banks. The period of analysis is 2004-2006. The dependent variable is P. P is total market value of equity divided by number of shares outstanding. BVPS is total book value of equity divided by number of shares outstanding. NPPS is total net profit divided by number of shares outstanding. \*\*\* p<.01, \*\* p<.05, \* p<.1, based on a two-tailed test.

Table 5.4 Value relevance GFC period multiple linear regression results for the relationship between book value of equity per share and the average market value per share

<b>P</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t- value</b>	<b>p- value</b>	<b>[95% Conf</b>	<b>Interval]</b>	<b>Sig</b>
BVPS	.601	.436	1.38	.169	-.257	1.459	
NPPS	11.599	1.231	9.42	0	9.175	14.023	***
Constant	5.344	2.37	2.25	.025	.677	10.01	**
Mean dependent var	21.589		SD dependent var	47.444			
R-squared	0.832		Number of obs	264			
F-test	45.360		Prob > F	0.000			
Akaike crit. (AIC)	2321.318		Bayesian crit. (BIC)	2332.046			

*Note.* The sample consists of 66 United States community banks. The period of analysis is 2007-2010. The dependent variable is P. P is total market value of equity divided by number of shares outstanding. BVPS is total book value of equity divided by number of shares outstanding. NPPS is total net profit divided by number of shares outstanding. \*\*\* p<.01, \*\* p<.05, \* p<.1, based on a two-tailed test.

### 5.2.2 Second test

Table 5.5 reveals a significant negative coefficient for the annual stock returns (AR) variable. Conversely, in Table 5.6, the coefficient becomes positive but fails to achieve significance. The R-squared value is higher in the pre-GFC period, although very low in both periods.

Based on these results, little can be stated about the change in value relevance of community banks before and after the GFC.

Table 5.5 Value relevance GFC pre-period simple linear regression results for the relationship between annual stock returns and the net profit scaled by share price

<b>NPP</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t- value</b>	<b>p- value</b>	<b>[95% Conf</b>	<b>Interval]</b>	<b>Sig</b>
AR	-.003	.001	-2.38	.018	-.005	0	**
Constant	.347	.028	12.41	0	.292	.402	***
Mean dependent var	0.349		SD dependent var		0.397		
R-squared	0.008		Number of obs		198		
F-test	5.651		Prob > F		0.018		
Akaike crit. (AIC)	197.456		Bayesian crit. (BIC)		204.033		

*Note.* The sample consists of 66 United States community banks. The period of analysis is 2004-2006. The dependent variable is NPP. NPP is net profit divided by beginning of year share price. AR is the annual stock return at year-end. \*\*\* p<.01, \*\* p<.05, \* p<.1, based on a two-tailed test.

Table 5.6 Value relevance GFC period simple linear regression results for the relationship between annual stock returns and the net profit scaled by share price

<b>NPP</b>	<b>Coef.</b>	<b>St.Err.</b>	<b>t- value</b>	<b>p- value</b>	<b>[95% Conf</b>	<b>Interval]</b>	<b>Sig</b>
AR	.043	.047	0.90	.368	-.05	.136	
Constant	-2.147	1.359	-1.58	.115	-4.823	.529	
Mean dependent var	-2.235		SD dependent var		22.483		
R-squared	0.000		Number of obs		264		
F-test	0.814		Prob > F		0.368		
Akaike crit. (AIC)	2395.634		Bayesian crit. (BIC)		2402.786		

*Note.* The sample consists of 66 United States community banks. The period of analysis is 2007-2010. The dependent variable is NPP. NPP is net profit divided by beginning of year share price. AR is the annual stock return at year-end. \*\*\* p<.01, \*\* p<.05, \* p<.1, based on a two-tailed test.

## **6. Discussion and conclusion**

This study analyses community banks in the United States from 2004 to 2011. The focus was on the investigation how the GFC impacted earnings management and the value relevance of reported financial numbers.

Firstly, the research indicates that community banks were guilty of performing earnings management during the GFC period. Additionally, banks of larger size or higher profitability exhibited different behaviours during the GFC period, performing less earnings management compared to before the GFC. In contrast, the relationship with liquidity reversed; banks with higher liquidity engaged in less earnings management before the GFC, whereas during the GFC, higher liquidity was associated with increased earnings management. In conclusion, community banks not only increased their earnings management on average during the GFC, but also had differential behaviours in earnings management based on a bank's size, profitability and liquidity. These results support the first hypothesis that community bank engaged in earnings management during the GFC period.

Secondly, the results on value relevance were not as clear. The first result indicated some evidence of higher value relevance before the GFC, but the results of the second test were ambiguous. Based on this information, it can be suggested that the value relevance of reported financial numbers was somewhat higher before the GFC, compared to after, though this conclusion is not strong. These results align with the second hypothesis, that community banks reported lower value relevance in their financial numbers during the GFC period.

This research had some limitations that need to be addressed. For instance, the amount of data available from community banks was limited. Multiple variables lacked values, and sometimes data for entire years were missing. This led to an insufficient sample size for community banks, which may explain the ambiguous results from the second value relevance test. Another limitation of this study is that it did not investigate other variables, such as a state's GDP, the accounting standards of that time, or the regulations that applied to the banks.

Future studies could address these limitations by obtaining more observations from a larger number of banks. This approach could provide more significant and certain confirmation regarding the lack of value relevance. Additionally, future studies could examine the post-2011 period to determine if there were lingering effects of the GFC on earnings management and value relevance of banks. Finally, an analyse on the perspective of investors and whether they experienced any consequences due to the financial reports of community banks could also provide valuable insights.

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