Does Managerial Sentiment Affect Accrual Estimates? Evidence from the Banking Industry

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ABSTRACT:

Defining managerial sentiment as managers' beliefs about future firm outcomes that are unjustified by the information available to them, we hypothesize and find that managerial sentiment is associated with unintentional errors in accrual estimates. Using a sample of public banks, we find that: (1) managerial sentiment is negatively correlated with loan loss provision estimates; (2) loan loss provision estimates made in periods of higher (lower) sentiment are associated with more (less) future charge-offs; and (3) the effects of sentiment are greater for firms with more "uncertain" or more "difficult-to-predict" charge-offs. We find the same results using a sample of private banks, suggesting that the bias in the provision estimates is unintentional, as opposed to strategic. These results are robust to firm-level determinants of loan loss provisions, macroeconomic variables found to affect either loan loss provisions or measures of sentiment, and multiple proxies for managerial sentiment. We contribute to the literature by documenting evidence on how unintentional biases linked with managerial sentiment influence financial reporting decisions.

Keywords: Sentiment, earnings quality, accruals, loan loss provisions, banking industry

1. Introduction

A growing body of research considers the effects of psychological biases on corporate decision-making. Baker and Wurgler (2012) note that studies within this literature generally follow one of two approaches. The first approach assumes investor behavior is less than fully rational, limits to arbitrage allow for market mispricing, and rational managers are able to identify and exploit, or cater to, the mispricing. The second approach assumes managers are subject to psychological biases and exhibit less than fully rational behavior, and corporate governance mechanisms are limited in their ability to eliminate the effects of these biases.[1]

Within the financial reporting literature, several studies provide evidence consistent with managers identifying and responding to mispricing generated by less than fully rational investors. For example, Bergman and Roychowdhury (2008) and Brown et al. (2012) find evidence consistent with managers strategically responding to investor sentiment in their disclosures of earnings forecasts and pro forma earnings, respectively. In addition, Simpson (2013) hypothesizes and finds evidence that investor sentiment is associated with the strategic management of accruals. Although the evidence in these studies suggests that managers recognize and strategically respond to investor sentiment, evidence in other settings (e.g., Ben-David et al. 2013) suggests that, ex-ante, it is equally likely that managers, too, might be overly optimistic (pessimistic) in periods of high (low) investor sentiment for non-strategic reasons.

In this study, we allow for the possibility that managers are susceptible to sentiment, and that this managerial sentiment can result in unintentional errors in their accrual estimates. Relying on the definition of investor sentiment put forth by Baker and Wurgler (2007), we define managerial sentiment as mangers' beliefs about future firm outcomes that are *not justified by the information available to them*. We test whether managers' accrual estimates are unintentionally

[1] Baker and Wurgler (2012) discuss these approaches in the context of behavioral research in corporate governance.

biased upward (downward) when managers are unjustifiably optimistic (pessimistic). While numerous studies in accounting have considered the determinants of the intentional manipulation of accruals, our study adds to the surprisingly few studies that examine determinants of unintentional errors in accruals.

There is good reason to believe that managerial sentiment could generate unintentional errors in accruals estimates. Recent studies suggest that other sophisticated individuals such as analysts (e.g., Clement et al., 2011; and Hribar and McInnis, 2012) and institutional investors (Cornell et al., 2012) are subject to sentiment. In fact, several studies provide evidence consistent with managerial sentiment affecting managers' decisions in other settings, including pro forma disclosures (Brown et al., 2012) and investment behavior (Ben-David et al., 2013). Second, the efficacy of governance and auditing mechanisms eliminating all unintentional errors in accrual estimates is likely limited (Dhaliwal et al., 2010).

To examine our research question, we focus on banks' estimates of loan loss provisions. Bank estimates of loan loss provisions are particularly well suited for our study for several reasons. First, consistent with arguments in prior research, using loan loss provisions allows us to estimate an account-specific accrual model, which mitigates measurement issues related to broad discretionary accrual proxies (e.g., McNichols and Wilson, 1988; Guidry et al., 1999; McNichols, 2000; and Leone and Rock, 2002). Second, as Beatty and Liao (2014) note, the loan loss provision is a significant and economically meaningful accrual. Because it reflects an economically meaningful decision made under uncertainty, it increases the likelihood of detecting an effect of sentiment on accrual estimates, should one exist. Third, available data on loan accounts allow us to observe the economic realization (i.e., charge-offs) to which the provision relates and thus, evaluate the accuracy of loan loss provision estimates. Finally, the

banking industry allows us to validate our analysis using a sample of private banks, and more directly address concerns and competing explanations related to managers' capital market incentives.

To examine whether managerial sentiment impairs accrual estimates, we test several hypotheses. First, we predict that managerial sentiment is negatively associated with banks' loan loss provisions. If managerial sentiment affects the loan loss provision, then variation in the loan loss provision will be associated with variation in managerial sentiment, after controlling for other known determinants the provision. Second, we predict that loan loss provision estimates made in periods of higher (lower) sentiment will be associated with more (less) future charge-offs. The test of this hypothesis is intended to detect whether the accrual estimate made in periods of high (low) sentiment is too low (high) by examining the future realization of the accrual. If the relation between sentiment and loan loss provisions is not justified by economic conditions, then loan loss provisions estimated in periods of high (low) sentiment should result in higher (lower) future charge-offs relative to the provision that was estimated during the high (low) sentiment period. Third, we predict that the association between managerial sentiment and provision estimates is most pronounced in settings with the greatest uncertainty, consistent with theory suggesting that the effects of sentiment and other unintentional biases are greater when individuals face greater uncertainty (Hirschleifer, 2001; Daniel et al., 1998 and 2002).

Our final tests distinguish between strategic and unintentional biases in the accrual estimates. Evidence supporting our predictions above is consistent with managers unintentionally biasing accrual estimates; but this evidence is also consistent with managers strategically biasing

accruals to exploit prevailing investor sentiment.[2] To help distinguish between these two explanations, we reexamine the above hypotheses using a sample of private banks. Because private bank managers do not have the same incentives or ability to induce short-term stock price increases by manipulating accruals (Beatty et al., 2002), corroborating results using a sample of private banks would suggest that managerial sentiment leads to unintentional, as opposed to strategic, bias in accrual estimates.

Our primary tests use a measure of managerial sentiment derived from the Duke University/*CFO Magazine* Business Outlook Survey, which surveys managers' levels of optimism about their firms' future prospects. We regress the quarterly measure of average managerial optimism from the survey on an inclusive set of macroeconomic variables posited by prior research to affect either loan loss provisions or managers' rational expectations about future economic outcomes.[3] Because we define managerial sentiment as managers' beliefs that are unjustified by fundamentals, we use the residual from this regression as our measure of sentiment.

Using quarterly data from 2002 to 2012 for all publicly traded commercial banks, we test and find support for all four hypotheses. First, we find that managerial sentiment is negatively associated with loan loss provisions. When quarter *t* sentiment is higher, ceteris paribus, the loan loss provision estimated in quarter *t* is lower. Second, consistent with a sentiment-based explanation for this result, we find that managerial sentiment in quarter *t* is associated with a lower-magnitude relation between the quarter *t* provision and one quarter- and one year-ahead

[2] This assumes that managerial sentiment, which we measure in our paper, is positively correlated with general investor sentiment studied elsewhere (e.g. Baker and Wurgler, 2007). Empirically we find this to be true for both the unadjusted measures and the measures that control for macroeconomic factors.

[3] This set includes economic growth, the change in the unemployment rate, the return on the S&P/Case-Shiller U.S. National Home Price Index, the three month Treasury yield, the difference between Baa- and Aaa-rated bond yields, the consumer price index inflation rate, personal consumption expenditures, labor income, the dividend yield on the CRSP value-weighted index, and the consumption-to-wealth ratio (Lemmon and Portniaguina, 2006).

charge-offs. This result provides corroborating evidence that managerial sentiment biases accrual estimates and mitigates concerns that the result from the test of our first hypothesis simply reflects managers' rational responses to private or public information that is correlated with our measure of sentiment. Third, we find that the sentiment-induced misestimation of loan loss provisions is greater when there is higher uncertainty about the realization of future charge-offs. Specifically, we find that the negative relation between managerial sentiment and loan loss provisions is more pronounced for firms with greater volatility in charge-offs and changes in non-performing assets. Finally, when we repeat our tests of the first three hypotheses using our sample of private banks, we find the results are consistent with the public bank results, indicating that the bias in loan loss provisions is unlikely to be attributable to strategic accrual manipulation driven by capital market incentives.

Our study makes several contributions. First, the results add to the growing literature considering the effects of psychological biases on financial reporting. We respond to calls for research examining settings in which psychological biases potentially influence corporate activities (Baker and Wurgler, 2012) by providing evidence that managerial sentiment affects the estimation of accruals. This complements prior studies which assert that managers observe and cater to investor sentiment (e.g., Bergman and Roychowdhury, 2006; Brown et al., 2012; Simpson, 2013) by providing evidence that managers, like other sophisticated individuals (e.g., Hribar and McInnis, 2012; Cornell et al., 2012), are subject to biases that affect their financial reporting choices.

Moreover, this study contributes to the literature on earnings quality by providing evidence that managerial sentiment lowers earnings quality by generating unintentional bias in accrual estimates. We believe the results of this study will be of interest to investors, creditors,

standard setters, auditors, and regulators, given the central role that earnings quality plays in valuation and contracting decisions (e.g., Penman and Sougiannis, 1998; Watts and Zimmerman, 1978; Lambert, 2001).

Finally, this study adds to the research that identifies determinants of loan loss provisions and informs the standing debate over the accounting for credit losses (Bushman and Williams 2012; Bikker and Metzemakers, 2005; Bouvatier and Lepetit, 2012; Beatty and Liao, 2011). Under FAS 114, current loan loss accounting is applied based on an incurred loss model which specifies that in order to be accruable, the loss must have occurred by the date of the financial statements. However, there is still significant judgment applied by managers in estimating the losses that have been incurred up through the date of the financial statements.[4] While permitting managers to use more forward-looking models in provisioning for loan losses could be beneficial, these models require increased judgment and estimation from managers, which allows for greater unintentional estimation errors.

The remainder of the paper is organized as follows. The next section reviews prior literature and develops hypotheses. Section 3 describes the sample and research design and Section 4 presents descriptive statistics and results of our main tests. Section 5 discusses additional analyses and Section 6 concludes.

2. Background and hypothesis development

Considerable research in accounting examines the determinants and consequences of the intentional manipulation of accruals, which is generally assumed to reduce earnings quality (e.g., Dechow et al., 2010). This research provides evidence consistent with firm-level attributes (e.g.,

[4] See "Allowance for loan and lease losses (ALLL) adjustment factors," by Grant Thronton LLP located at: http://www.grantthornton.com/staticfiles/GTCom/Financial%20services/Allowance%20for%20loan%20and%20lease%20losses/Allowance_for_loan_and_lease_lossess_ALLL.pdf.

Dichev et al., 2013; Francis et al., 2005), managerial incentives (Armstong et al., 2010), capital market incentives (e.g., Ayers et al., 2006; Graham et al., 2005; Burgstahler and Dichev, 1997), and constraints—including governance features, auditors, regulators, and other external parties—affecting accrual manipulation decisions.

In contrast, relatively few studies consider the determinants and consequences of non-strategic errors in accrual estimates. Examples of previously documented unintentional errors include objective difficulties in projecting future outcomes due to environmental uncertainty, management lapses, and clerical errors (Francis et al., 2005; Hennes et al., 2008; and Lev et al., 2010). Errors from these types of factors can generate noise in accruals. Other possible sources of unintentional errors in accrual estimates are psychological biases. While the evidence in social psychology on individual decision-making is vast, surprisingly little research considers whether these same forces generate unintentional bias in accrual estimates.

One possible source of unintentional errors that could result in biased accrual estimates is managerial sentiment. Similar to the definition of investor sentiment used in prior literature (DeLong et al., 1990; Morck et al., 1990; Chan and Fong, 2004; Baker and Wurgler, 2006, 2007; Sabherwal et al., 2011; Simpson, 2013), we define managerial sentiment as beliefs about future firm outcomes that are not justified by the information available to managers. Although our definition of managerial sentiment is similar to the definition of investor sentiment used in prior literature, the two constructs are distinct, as investor sentiment is defined as investors' unjustified beliefs about firm value.

Two conditions are necessary for managerial sentiment to impair accrual estimates. First, managers must be subject to sentiment; that is, at times, managers hold beliefs about future firm outcomes that are unjustified by the information available to them. Second, the financial

reporting process must provide sufficient latitude for accrual estimates to reflect managers' inaccurate beliefs.

A priori, it is unclear whether accrual estimates are affected by managerial sentiment. On one hand, several studies suggest that managers are sophisticated individuals who are able to identify and exploit the incorrect beliefs of investors. For example, prior research finds managers are able to identify and exploit investor sentiment in equity issuances (Baker and Wurgler, 2002), dividend payouts (Baker and Wurgler, 2004; and Li and Lie, 2006), investment (Gilchrist et al., 2005; Polk and Sapienza, 2009), and disclosures (e.g., Bergman and Roychowdhury, 2008; Brown et al., 2012). Simpson (2013) suggests that managers cater to investor sentiment via accrual manipulation and Hribar and Quinn (2013) use managers' trading patterns to provide evidence that managers trade against and exploit investor sentiment for personal gain. Taken together, these studies depict managers as sophisticated individuals who, rather than exhibiting incorrect beliefs themselves, recognize and take advantage of the incorrect beliefs of unsophisticated investors.

On the other hand, several recent studies suggest that sophisticated individuals are subject to sentiment. Hribar and McInnis (2012) document a positive relation between sentiment and analyst forecasts for "difficult-to-value" firms, consistent with analysts being subject to sentiment. Walther and Willis (2013) provide further evidence that analyst forecasts are affected by sentiment and Cornell et al. (2013) find that when investor sentiment is high, institutional investors increase their holding in "difficult-to-value" firms with low-quality accounting information and sell-side stock analysts issue more favorable recommendations for the same firms.

Of particular importance to our paper are several studies that provide evidence consistent with managerial sentiment influencing managers' decisions in some settings. Brown et al. (2012) study the effects of investor sentiment on the disclosure of pro forma earnings and find that managers release higher pro forma earnings when sentiment is high. Although they find evidence that managers identify periods of high investor sentiment and opportunistically report pro forma earnings to take advantage of investor sentiment, they also find some evidence suggesting that managers themselves are affected by sentiment. In addition, Ben-David et al. (2013) find that CFOs are, on average, severely miscalibrated. The authors show that their miscalibration measure based on CFO forecasts of S&P 500 returns is highly correlated with their miscalibration measure based on CFOs' own-firm projected returns. They argue that their results shed new light on the biases in corporate forecasts and beliefs.

To investigate whether managerial sentiment is associated with accrual estimates, we consider the effect of sentiment on banks' loan loss provisions. We avoid using common measures of discretionary accruals in our study for two reasons. First, many accruals are not estimates. For example, there are changes in working capital accounts that constitute a substantial component of aggregate accruals, but reflect no managerial estimates. Thus, using a measure of discretionary aggregate accruals would reduce the power of our tests. Moreover, by disaggregating total accruals and focusing on a specific accrual estimate, we can test our hypotheses using an account specific model of the accrual estimate, thereby avoiding some of the measurement issues associated with models of aggregated accruals (McNichols, 2000; McNichols and Wilson, 2008; Guidry et al., 1999; Leone and Rock, 2002).

We use banks' loan loss provisions as our specific accrual estimate of interest for several reasons. First, by definition, loan loss provisions represent managers' estimates of incurred

losses associated with banks' loan assets. Second, banks' loan loss provisions are very important in terms of economic magnitude relative to other accruals. Using a sample of banks from 2005 to 2012, Beatty and Liao (2014) find that the mean of the absolute value of the loan loss provision is 56 percent of the mean of the absolute value of total accruals. Third, loan loss provisions are managers' estimates of future loan charge-offs. Because banks are required to report loan charge-offs, we can use this data to evaluate the accuracy of managers' estimates. Also, because federal banking laws require private banks to provide financial statements, we are able to examine the accrual estimates of these banks in order to assess the extent to which any association between sentiment and loan loss provisions is attributable to capital market incentives (as suggested by Simpson (2013)). Finally, the banking industry consists of a relatively homogeneous group of firms with respect to the types of claims firms hold as well as the structure of their liabilities (Beaver et al., 1997). Given our focus on how managers' accrual estimates vary with sentiment, using a relatively homogeneous set of firms allays concerns that the results of our tests reflect effects of sentiment associated with factors that could influence a variety of firm features related to the quality of accrual estimates.

Accounting for the loan loss provision is similar to the accounting for bad debt expense. The loan loss reserve (or allowance) account is a "contra-asset" account, which serves to reduce banks' recognizable receivables by the amount of receivables bank managers expect to be unable to collect due to incurred loss events. Managers increase the loan loss reserves through the loan loss provision with net loan charge-offs reducing the reserves as loans become uncollectible. U.S. GAAP requires banks to reserve for loan losses using the "incurred loss model" which dictates that a loss in quarter *t* can only be provisioned for when (1) information is available prior to the issuance of the quarter *t* financial statements that the asset (receivable) has been impaired,

and (2) the amount of the loss is reasonable estimable. Due to the nature of banks' loan portfolios, many loss-causing events may not be observed until well after the events have occurred (e.g., consider the loss of employment by a borrower). Therefore, managers use loss-estimation methodologies to infer the amount of loans that have likely been impaired. The SEC (see Staff Accounting Bulletin No. 102, "Selected Loan Loss Allowance Methodology and Documentation Issues") and bank regulatory agencies recommend that managers' loss estimation methodologies incorporate numerous factors such as prevailing industry conditions, national and local economic and business trends, competition, legal and regulatory requirements, and the effects of changes in credit concentrations.[5] The practice of incorporating these adjustment factors in the estimation process allows for sentiment to have an effect on managers' estimates of incurred losses and therefore loan loss provisions.

We develop several hypotheses to test and provide evidence on whether manager sentiment affects managers' estimates of loan loss provisions. First, if managerial sentiment affects estimates of the loan loss provision, then when managerial sentiment is high (low) (i.e., managers hold unjustifiably positive (negative) beliefs about expectations of future firm prospects), managers will under (over) provision for future charge-offs, resulting in a loan loss provision that is lower (higher) than what is justified by the information available to the manager. Therefore, we expect the contemporaneous correlation between loan loss provisions and sentiment to be negative. We propose our first hypothesis as follows (stated in the alternative form):

H1: The contemporaneous association between loan loss provisions and managerial sentiment is negative.

[5] See "Allowance for loan and lease losses (ALLL) adjustment factors," by Grant Thronton LLP located at: http://www.grantthornton.com/staticfiles/GTCom/Financial%20services/Allowance%20for%20loan%20and%20lease%20losses/Allowance_for_loan_and_lease_lossess_ALLL.pdf.

If managerial sentiment impairs estimates of the loan loss provision, then during periods of high (low) sentiment, loan loss provisions will be lower (higher) than what is justified by managers' information. In general, a manager increases a bank's loan loss provision when there is an increase in the amount of loans that are likely impaired. However, if managerial sentiment impairs managers' accrual estimates, then in periods of high sentiment, we expect managers' estimates of the amount of loans that are likely impaired to be lower per dollar of realized future charge-offs, as compared to loan loss provisions estimated in periods of low sentiment. Hence, we expect that in periods of high sentiment, managers anticipate fewer future charge-offs and, therefore, accrue less provision per dollar of future *realized* charge-offs, as compared to accruals made in periods of low sentiment. As a result, we expect that the positive association between loan loss provisions and future charge-offs will be lower when loan loss provisions are estimated during periods of high sentiment than when estimated during periods of low sentiment.

To better illustrate this idea, consider the following (simplified) model:

$$Loan\ Loss\ Provision_{i,t} = \alpha + \beta \times Charge\text{-}offs_{i,t+1} + error_{i,t}$$

where the period t loan loss provision estimated for bank i ($LLP_{i,t}$) is related to its period $t+1$ charge-offs. If there is no manager sentiment in period t when the provision is estimated, then we expect β to reflect some "normal" positive association between the provision and future charge-offs, say γ. However, if the provision is estimated during a period of high (low) sentiment, then we expect the association between the provision and future charge-offs to be $\gamma - \theta$ ($\gamma + \theta$), where θ is greater than zero. Figure 1 illustrates this point.

[Insert Figure 1 about here]

When there is no managerial sentiment in period t, a dollar increase in future charge-offs corresponds to an increase in $LLP_{i,t}$ of γ. When managerial sentiment is high (low) in period t, a

dollar increase in future charge-off corresponds to an increase in the loan loss provision that is less than (greater than) γ, consistent with managers under (over) provisioning for future charge-offs. Therefore, if managerial sentiment affects estimates of loan loss provisions, we expect the magnitude of the relation between period *t* provisions and future charge-offs to vary positively with managerial sentiment. If, however, managerial sentiment does not affect provision estimates (or our measure of sentiment simply proxies for some macroeconomic factor that affects estimates of loan loss provision), then the magnitude of the relation between period *t* sentiment and future charge-offs should not vary with sentiment. Given the arguments above, our next hypothesis is the following (also in the alternative form):

H2: The magnitude of the relation between loan loss provisions estimated in periods of high managerial sentiment and future charge-offs is lower than the magnitude of the relation when provisions are estimated in periods low sentiment.

Our third hypothesis is based on theoretical and empirical results from prior literature that suggests the effects of sentiment should be more pronounced in settings of greater uncertainty. Hirshleifer (2001) and Daniel et al. (1998, 2002) develop models indicating that the impact of psychological biases increases with the degree of uncertainty facing the decision maker. Empirical findings from studies of investor sentiment support this claim. For example, Baker and Wurgler (2006) find that investor sentiment has larger effects on stocks whose valuations are more subjective and difficult to estimate, and Hribar and McInnis (2012) find that the effects of sentiment on analyst forecasts are greatest for "hard-to-value" firms. If managers are subject to sentiment, then we expect the effects of manager sentiment on the estimation of loan loss provision to be greater for banks whose future charge-offs are more difficult to estimate. Hence, our final hypothesis (in the alternative form) is the following:

H3: The posited negative and contemporaneous association between loan loss provisions and managerial sentiment is more negative for banks with difficult-to-predict charge-offs.

Simpson (2013) posits that managers use discretionary accruals to exploit investors' incorrect beliefs about firm value in order to maximize short-term stock prices. Consistent with the findings in Ali and Gurun (2009), Simpson argues that there is a "greater price effect per unit of accruals in high-sentiment periods than in low-sentiment periods, which probably heightens incentives for managers seeking a short-term boost to stock prices to inflate accruals during high sentiment periods relative to low-sentiment periods" (Simpson, 2013, 873). She finds a positive relation between investor sentiment in quarter *t*-1 and discretionary accruals in quarter *t*, and contends that managers are able to identify periods of mispricing (caused by investor sentiment) for their own firm, then opportunistically manage earnings to increase stock price. Although Simpson (2013) documents a positive relation between current accruals and *lagged* investor sentiment, if measures of investor sentiment are correlated with measures of managerial sentiment and both measures are autocorrelated, it is possible that this catering theory could explain a negative relation between loan loss provisions and *contemporaneous* managerial sentiment.

If investor sentiment is correlated with managerial sentiment, it is also possible a negative relation between loan loss provisions and measures of manager sentiment could result from managers manipulating earnings in response to optimistic bias in analyst forecasts, which have been shown to be affected by investor sentiment. Bergman and Roychowdhury (2008) and Hribar and McInnis (2012) find that the optimistic bias in analyst forecasts increases with investor sentiment and prior research suggests that managers face strong incentives to meet analysts' expectations (Brown and Caylor 2005; Graham et al., 2005). If managers influence

earnings through accrual estimates to achieve earnings expectations set by analysts who are affected by investor sentiment, and if measures of investor sentiment are correlated with measures of manager sentiment, this behavior could explain a negative relation between loan loss provisions and manager sentiment.

One way to distinguish between our main hypothesis and the catering hypothesis is to test for a relation between accrual estimates and manager sentiment in a setting in which managers do not have the opportunities and incentives to cater to investor sentiment. If the posited relation between managerial sentiment and contemporaneous loan loss provisions is a reflection of managers catering to investor sentiment, the relation should not exist in such a setting. However, if managerial sentiment affects estimates of the loan loss provision, then the hypothesized negative relation should exist even for bank managers with lower catering incentives.

While Beatty and Harris (1999) find evidence that both public and private banks engage in earnings management, they also predict and find that public banks manage earnings to a greater extent than private banks. In addition, Beatty et al. (2002) note that private firms have concentrated ownership structures with a relatively small number of shareholders, a large portion of which participate in managing the firm. Shares of private companies are thinly traded, and given the make-up of existing and potential shareholders, it is unlikely that managers have the ability and incentives to exploit variation in the sentiment of unsophisticated investors by intentionally manipulating accrual estimates, leading to short-term boosts in stock price (i.e., cater to investor sentiment). Thus, evidence of a relation between accrual estimates and manager sentiment in a sample of private banks suggests that the relation is not the result of earnings management. Consistent with this discussion, we state our final hypotheses as H4a, H4b, and H4c (stated in the alternative form):

H4a: The contemporaneous association between loan loss provisions of private banks and managerial sentiment is negative.

H4b: The magnitude of the relation between loan loss provisions of private banks estimated in periods of high managerial sentiment and future charge-offs is lower than the magnitude of the relation when provisions are estimated in periods low sentiment.

H4c: The posited negative and contemporaneous association between loan loss provisions of private banks and managerial sentiment is more negative for private banks with difficult-to-predict charge-offs.

3. Methodology and sample

3.1 Measuring managerial sentiment

Consistent with Brown et al. (2012) and Ben-David et al. (2013), our primary measure of managerial sentiment is derived from the Duke University/*CFO Magazine* Business Outlook Survey. Other measures of sentiment include the Michigan Consumer Sentiment Index (e.g., Lemmon and Portniaguina, 2006; Simpson, 2013) and the Baker and Wurgler (2006) measure of sentiment (e.g., Hribar and McInnis, 2012), both of which have been used as proxies for investor sentiment. To our knowledge, only the Duke University/*CFO Magazine* Business Outlook Survey (e.g., Brown et al., 2012) has been used as a measure of managerial sentiment and we believe this measure provides the most direct measure of managerial beliefs. For each quarter, the survey aggregates the individual responses of hundreds of CFOs from both public and private companies in many different industries. Survey questions are designed to capture inter-temporal changes in such things as corporate optimism, growth expectations, and capital investment plans.[6] To construct our sentiment measure, we begin with the median response, each quarter, to the following question: "Rate your optimism about the financial prospects of your own company

[6] See www.cfosurvey.org for additional information about the survey.

on a scale of 0-100, with 0 being the least optimistic and 100 being the most optimistic," which we label $BELIEFS_t$.

One concern with using $BELIEFS_t$ as a measure of sentiment is that managers' beliefs are undoubtedly driven by information about macroeconomic conditions, which justifiably affect managers' estimates of loan loss provisions. Because we define managerial sentiment as beliefs *unjustified* by information available to managers, it is critical in our empirical analysis that we control for any macroeconomic factors that could affect both $LLP_{i,t}$ and $BELIEFS_t$. We control for a broad range of factors that prior research posits as being associated with either $LLP_{i,t}$ or $BELIEFS_t$. These include the change in GDP (ΔGDP_t), the return on the S&P/Case-Shiller U.S. National Home Price Index ($CSRET_t$), and the change in the unemployment rate ($\Delta UNEMP_t$), as prior studies find these factors to be associated with loan loss provisions (Beatty and Liao, 2014; Beatty and Liao, 2011; Bushman and Williams, 2012). We also include a broad set of macro-variables posited by Lemmon and Portniaguina (2006) to be associated with investor sentiment. These variables include the yield on the three-month Treasury bill ($TBILL_t$), the difference between Baa- and Aaa-rated bond yields (DEF_t), the consumer price index inflation rate ($CPIR_t$), personal consumption expenditures (PCE_t), labor income ($LABOR_t$), the dividend yield on the CRSP value-weighted index (DIV_t), and the consumption-to-wealth ratio (CAY_t).[7]

We construct our measure of managerial sentiment as the component of $BELIEFS_t$ that is orthogonal to, or unexplained by the macroeconomic factors identified above. To obtain this component, we use OLS to estimate the following model:

$$BELIEFS_t = \beta_0 + \beta_1 \Delta GDP_t + \beta_2 \Delta UNEMP_t + \beta_3 CSRET_t + \beta_4 TBILL_t + \beta_5 DEF_{i,t} + \beta_6 CPIR_t + \beta_7 CPE_t + \beta_8 LABOR_t + \beta_9 DIV_t + \beta_{10} CAY_t + \varepsilon_t \quad (1)$$

[7] See Appendix A for precise variable definitions.

where the residual, ε_t , represents the component of managers' beliefs unjustified by macroeconomic conditions. We label the residual from model (1) $SENTIMENT_t$ and use this as our primary measure of managerial sentiment throughout the study.

3.2 Empirical design

H1 suggests that the contemporaneous association between managerial sentiment and loan loss provisions is negative. To test H1, we estimate the following pooled OLS model:

$$\begin{aligned} LLP_{i,t} = {} & \beta_0 + \beta_1 SENTIMENT_t + \beta_2 SENTIMENT_{t-1} + \beta_3 LLP_{t-1} + \beta_4 \Delta NPA_{i,t+1} \\ & + \beta_5 \Delta NPA_{i,t} + \beta_6 \Delta NPA_{i,t-1} + \beta_7 \Delta NPA_{i,t-2} + \beta_8 \mathrm{SIZE}_{i,t-1} + \beta_9 \Delta LOAN_{i,t} \\ & + \beta_{10} EBP_{i,t} + \beta_{11} CAPR1_{i,t-1} + \beta_{12} CO_{i,t} + \beta_{13} ALW_{i,t-1} + \beta_{14} \Delta GDP_t \\ & + \beta_{15} \Delta UNEMP_t + \beta_{16} CSRET_t + \text{Fixed Year Effects} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where $LLP_{i,t}$ is the loan loss provision estimated for bank *i* in quarter *t* and $SENTIMENT_t$ is the quarter *t* residual obtained by estimating Eq. (1) above.[8] Our interest in Eq. (2) centers on β_1. If managerial sentiment affects estimates of the loan loss provision, then when sentiment is higher (lower), we expect the estimated provision to be lower (higher) such that β_1 should be negative; if sentiment does not affect estimates of the loan loss provision, then β_1 should be statistically indistinguishable from zero.

In Eq. (2) we control for numerous bank-level variables shown to affect loan loss provisions. Consistent with prior literature (Beatty and Liao, 2014; Bushman and Williams, 2012; Liu and Ryan, 2006), we include $\Delta NPA_{i,t+1}$ and $\Delta NPA_{i,t}$ in the model to reflect the possibility that some banks use current and forward-looking information on non-performing loans in estimating loan loss provisions. We include $\Delta NPA_{i,t-1}$ and $\Delta NPA_{i,t-2}$ to capture the fact that banks use historical information about non-performing loans to estimate loan loss provisions. We control for bank size ($SIZE_{i,t-1}$) given that potentially differences in regulatory

[8] We winsorize all bank-level variables at the 1st and 99th percentiles. Appendix A provides definitions and data sources for all variables used throughout our tests.

scrutiny or monitoring for banks of different size. We control for loan growth ($\Delta LOAN_{i,t}$), as loan loss provisions may be higher when the bank extends credit to more clients with lower credit. We also follow prior research and include the lagged loan loss allowance ($ALW_{i,t-1}$) (see Beaver and Engel, 1996; Beck and Narayanmoorthy, 2013). If a bank has recognized relatively high provisions in prior quarters, then a lower current provision may be justified as the prior quarter loan loss allowance may be sufficient to account for expected uncollectibles. Because the amount of charge-offs is related to the level of the allowance, which in turn affects provisions, we follow prior research and include net charge-offs (CO_t) in the model (Wahlen, 1994; Collins et al., 1995; Beatty et al., 1995). We add controls for pre-provision profitability ($EBP_{i,t}$) and tier 1 capital ratio ($CAPR1_t$) to control for regulatory capital requirements (Beatty and Liao, 2014). We control for lagged sentiment and lagged loan loss provisions to address potential concerns related to autocorrelation in the time-series of $LLP_{i,t}$ and $SENTIMENT_t$. Finally, we include ΔGDP_t, $CSRET_t$, and $\Delta UNEMP_t$ from Eq. (1), as prior literature identifies these as determinants of loan loss provisions. All firm-level variables are scaled by total loans in quarter *t*-1.

H2 predicts that the magnitude of the relation between loan loss provisions estimated in quarter *t* and future charge-offs is decreasing in the level of quarter *t* sentiment. We test this hypothesis by estimating the following pooled OLS model:

$$\begin{aligned} LLP_{i,t} = {} & \beta_0 + \beta_1 SENTIMENT_t \times CO_{i,t+1} + \beta_2 CO_{i,t+1} + \beta_3 SENTIMENT_t + \\ & \beta_4 SENTIMENT_{t-1} + \beta_5 LLP_{t-1} + \beta_6 \Delta NPA_{i,t+1} + \beta_7 \Delta NPA_{i,t} + \\ & \beta_8 \Delta NPA_{i,t-1} + \beta_9 \Delta NPA_{i,t-2} + \beta_{10} \mathrm{SIZE}_{i,t-1} + \beta_{11} \Delta LOAN_{i,t} + \beta_{12} EBP_{i,t} + \\ & \beta_{13} CAPR1_{i,t-1} + \beta_{14} CO_{i,t} + \beta_{15} ALW_{i,t-1} + \beta_{16} \Delta GDP_t + \beta_{17} \Delta UNEMP_t + \\ & \beta_{18} CSRET_t + \text{Fixed Year Effects} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

If sentiment affects loan loss provisions then we expect β_1, the coefficient on the interaction between sentiment in quarter *t* ($SENTIMENT_t$) and charge-offs in quarter *t*+1 ($CO_{i,t+1}$), to be

negative and significant. A negative coefficient indicates that a unit increase in charge-offs in quarter t+1 is associated with less of an increase in the quarter t provision when managers exhibit positive (or high) sentiment in quarter t as compared to quarters when managers exhibit negative (or low) sentiment. This association is consistent with managers under (over) provisioning for loan losses due to unjustified optimism (pessimism) about the future collection of receivables. If managerial sentiment is not associated with estimates of the loan loss provision, we expect that the loan loss provision reflects only economic fundamentals, and the magnitude of the relation between $LLP_{i,t}$ and $CO_{i,t+1}$ should not be affected by sentiment (i.e., β_1 in Eq. (3) should be statistically indistinguishable from zero).

As an additional test of H2, we modify Eq. (3) by replacing $CO_{i,+1}$ with $CO_{i,t+1234}$, which is the sum of charge-offs for quarters t+1, t+2, t+3, and t+4. Under the incurred loss model the timing difference between provisioning for loan losses and charging off actual loans can vary, but guidance from bank regulators suggests that banks provision for charge-offs expected to occur within a relatively short time horizon such as one year (Ryan and Ronen, 2009).

We test our third hypothesis that sentiment has a greater effect on loan loss provisions for banks with more difficult-to-predict charge offs by estimating an augmented version of Eq. (2). Specifically, we add to the model an indicator variable ($HIGH\_UNCERTAINTY_i$) identifying banks with more difficult-to-predict charge-offs and the interaction of this variable with $SENTIMENT_t$. We use two different proxies for uncertainty in predicting future charge-offs. The first is the standard deviation of banks' charge-offs, calculated over the entire sample period. Banks with a standard deviation above the sample median are labeled as high-uncertainty banks. The second proxy is the standard deviation of banks' changes in non-performing assets, and banks with a standard deviation above the median are classified as high-uncertainty banks. We

argue that managers of banks with more volatile charge-offs (changes in non-performing assets) face greater uncertainty about future charge-offs with. If manager sentiment influences loan loss provisions, we expect that the estimated coefficient on the interaction between $SENTIMENT_t$ and $HIGH\_UNCERTAINTY_i$ will be negative and statistically significant.

To test H4 we conduct the tests outlined previously using a sample of private banks (details on the construction of this sample are provided in the next section). While managers of public banks face capital market pressures and incentives to meet or beat analyst expectations, private banks are not subject to these same incentives (Beatty et al., 2002). Thus, arguments suggesting that a relation between measures of sentiment and loan loss provisions reflect managers exploiting investor sentiment through accruals management should not apply in this setting.

3.2. Sample

Our primary sample comprises COMPUSTAT bank-year observations with the necessary data to construct our model variables for the period 2002:3 to 2012:3. The resulting data set includes 20,215 bank-quarter observations. We construct our measure of sentiment using data from the Duke/*CFO Magazine* Business Outlook Survey available at www.cfosurvey.org. Market returns are obtained from CRSP. We obtain macro variables from COMPUSTAT, when available, or from the Federal Reserve Bank of St. Louis (FRED).[9]

In constructing our sample of private banks, we use call report data from SNL Financial. We identify public ownership using data from the Federal Reserve Bank of New York and from SNL Financial. Specifically, we determine whether a bank (or its parent) has ever been publicly traded. Then, we restrict our private bank sample to banks that are private or that have private

[9] We obtain consumption-to-wealth ratio data from Sydey Ludvigson, available at http://www.econ.nyu.edu/user/ludvigsons/.

parents and for which all variables used in our regression model are available. Finally, consistent with Ng and Roychowdhury (2013), who suggest that S-corporations potentially have different loss provisioning processes, we remove all S-corps from the sample. Our final private bank sample consists of 94,031 private bank-quarters over the period 2005 to 2012.

4. Results

4.1. Sentiment and macroeconomic factors

As discussed in Section 3, our measure of managerial sentiment is the component of managers' beliefs about future firm prospects (captured by CFO survey responses) that is unjustified by (or orthogonal to) fundamentals. To obtain this measure, we regress our proxy for managers' beliefs ($BELIEFS_t$) on numerous macroeconomic variables (see Eq. (1)) and tabulate the results in Table 1. Model (i) of Table 1 includes as regressors the change in GDP (ΔGDP_t), the return on the S&P/Case-Shiller U.S. National Home Price Index ($CSRET_t$), and the change in the unemployment rate ($\Delta UNEMP_t$), as these have been used as determinants of loan loss provisions in prior studies (Beatty and Liao, 2014). The results of this regression indicate that these three macro variables explain about 50% of the variation in *BELIEFS* (actual R-squared of 54%). Model (ii) adds seven additional macroeconomic variables posited by Lemmon and Portniaguina (2006) to affect the Michigan Consumer Confidence Index. This model is expressed in Eq. (1). The adjusted R-squared from estimating model (ii) is 0.86, indicating that the majority of the variation in managers' beliefs is explained by macroeconomic information (the actual R-squared from the regression is 0.89).[10] We derive our primary measure of sentiment (*SENTIMENT*) as the set of residuals obtained by the estimation of model (ii). Figure 2 plots

[10] Our result is comparable with the findings in Lemmon and Portniaguina (2006). They report adjusted R-squared values between 0.8 and 0.85 depending on the confidence index used as the dependent variable.

both *BELIEFS*, and *SENTIMENT*, i.e., residual beliefs, over our sample period, and depicts the attenuated variation in *SENTIMENT*.

4.2. Descriptive statistics and correlations

Table 2 reports descriptive statistics for the key dependent and independent variables over the sample period. *LLP* has a mean of 0.002 indicating that on average, the loan loss provision is 0.2% of lagged total loans. Table 2 also indicates that the distributional statistics for charge-offs are identical to those for *LLP*; on average, charge-off are also 0.2% of total loans. This consistency is not surprising as the loan loss provision is meant to capture future charge-offs. The means (standard deviations) for *BELIEFS* and *SENTIMENT* are 0.658 (0.049) and 0.000 (0.015), respectively. These statistics further demonstrate the difference in variation between *BELIEFS* and *SENTIMENT*.

Table 3 presents both Pearson and Spearman correlations between the variables used in our analyses. Panel A tabulates the correlations among the macroeconomic variables used in the Table 1 regressions and Panel B tabulates the correlations among the variables used in the following regression analyses discussed in section 3. We report Pearson correlations above the diagonal and Spearman correlations below. We focus on the Pearson correlations in our analysis and discuss several observations. First, Panel A indicates that $BELIEFS_t$ are significantly correlated with seven of the macroeconomic variables included as independent variables in Eq. (1). The magnitudes of these correlations are substantial; of the significant correlations, the absolute magnitudes range from 0.489 to 0.853. Second, in Panel B, consistent with H1, we find that $LLP_{i,t}$ is negatively correlated with $SENTIMENT_t$ (-0.039). Third, there is a positive correlation between $LLP_{i,t}$ and each of the changes in non-performing assets ($\Delta NPA_{i,t+1}$, $\Delta NPA_{i,t}$, $\Delta NPA_{i,t-1}$, and $\Delta NPA_{i,t-2}$). Finally, the correlation between $LLP_{i,t}$ and $CO_{i,t}$ (charge-offs), 0.793, is

significantly and substantially positive, consistent with our expectation and findings from prior literature.

4.3. Results for H1

Table 4 presents the results from estimating several models derived from Eq. (2). In these models $LLP_{i,t}$ is regressed on our primary measure of sentiment, $SENTIMENT_t$ and various sets of control variables. In model (i) we include as control variables those from model (a) in Beatty and Liao (2014). This model equates to Eq. (2) minus the variables EBP_t, $CAPR1_t$, CO_t, ALW_t, LLP_{t-1}, and $SENTIMENT_{t-1}$. We estimate this model because after developing and comparing several models, Beatty and Liao (2014) identify their model (a) as the best at predicting incidents of restatements and SEC comment letters related to loan loss provisions. In model (ii), we add to model (i) EBP_t, $CAPR1_t$, CO_t, and ALW_t. In model (iii), we add LLP_{t-1} and $SENTIMENT_{t-1}$. In Table 4 (and the remaining tables), we follow the recommendation of Peterson (2009) and include year fixed effects to address concerns of cross-sectional dependence (see Liu and Ryan (2006) and Bushman and Williams (2012)) and cluster standard errors at the firm level.

Consistent with H1, the results of estimating model (i) indicate a negative relation between $LLP_{i,t}$ and $SENTIMENT_t$. More specifically, the coefficient on $SENTIMENT_t$ is -0.006 (p-value < 0.001). The signs of the estimated coefficients for the each of the firm-level variables are consistent with findings in prior literature, and the adjusted R-squared for model (i) is 0.321. Results from estimating model (ii) are similar to those from model (i). Again, consistent with our hypothesis, the coefficient on $SENTIMENT_t$ is negative (-0.004) and statistically significant (p-value < 0.001). Adding $EBP_{i,t}$, $CAPR1_{i,t}$, $CO_{i,t}$, and $ALW_{i,t}$ increases the adjusted R-squared to 0.704. As expected, the coefficient on charge-offs ($CO_{i,t}$) is positive and significant. The estimated coefficients for $SENTIMENT_t$ from models (i) and (ii) indicate that a one standard

deviation increase in managerial sentiment is associated with a decrease in the loan loss provision of 4.5 and 3 percent, respectively.

The results for model (iii) are comparable to those in models (i) and (ii) and are consistent with our main prediction. Even after controlling for LLP_{t-1} and $SENTIMENT_{t-1}$, we find evidence consistent with managerial sentiment affecting the estimation of the loan loss provision. Interestingly, with both $SENTIMENT_t$ and $SENTIMENT_{t-1}$ included in the model, the coefficient for $SENTIMENT_{t-1}$ is positive and statistically significant (p-value = 0.008). Simpson (2013) finds that investor sentiment in quarter t-1 is negatively associated with quarter t discretionary accruals, suggesting that managers observe, and then cater to investor sentiment through discretionary accruals. To the extent that our measure of managerial sentiment is correlated with measures of investor sentiment, we find no evidence in support of this behavior. We do, however, find consistent evidence of a negative and significant association between manager sentiment and loan loss provisions.

Overall, the results of Table 4 demonstrate a negative and significant contemporaneous relation between loan loss provisions and manager sentiment that is robust to the inclusion of bank-level control variables shown to be determinants of loan loss provisions, and macro-level control variables shown to influence either loan loss provisions or measures of sentiment. These results provide evidence that managers are subject to sentiment and that sentiment affects managers' accrual estimates.

4.4. Results for H2

Table 5 presents the results of our tests of H2, obtained by estimating Eq. (3). In regression model (i), we interact quarter t+1 charge-offs ($CO_{i,t+1}$) with quarter t sentiment to test our prediction that the positive relation between loan loss provisions and future charge-offs is

decreasing in the level of managerial sentiment present when the provisions are estimated. In regression model (ii), we interact quarter t+1 charge-offs ($CO_{i,t+1}$) and an indicator variable identifying quarters when $SENTIMENT_t$ is above the median ($HIGH\_SENT_t$). Consistent with our prediction that the positive association between loan loss provisions and future charge-offs is attenuated when the provision is estimated during periods of high manager sentiment, we find that the coefficient on the interaction term is negative and significant in both models. For model (i) the estimated coefficient is -1.844 (p-value = 0.008) and for model (ii) the coefficient estimate is -0.081 (p-value < 0.001). Using the results of model (ii) to interpret the coefficients, when sentiment is high in quarter t, a unit increase in quarter t+1 charge-offs corresponds to an increase in the quarter t provision that is 40% lower than the increase in the provision when quarter t sentiment is low. This finding is consistent with managers, in periods of high (low) sentiment, under (over) provisioning for future charge-offs.

In regression models (ii) and (iv), we replace the interaction of quarter t sentiment and quarter t+1 charge-offs with the interaction of quarter t sentiment and charge-offs calculated over quarters t+1, t+2, t+3, and t+4 ($CO_{i,t+1234}$). We make this adjustment to reflect that fact that the loans provisioned for in quarter t may not be charged off in quarter t+1. The results support H2 as the coefficients of interest are both negative and significant at conventional levels. Together, the results in Table 5 suggest that our measure of sentiment is not simply a proxy for macroeconomic fundamentals and are consistent with managerial sentiment affecting estimates of the loan loss provision.

4.5. Results for H3

Table 6 presents the results of tests of H3 that the negative and contemporaneous relation between loan loss provisions and managerial sentiment is more negative for banks with difficult-

to-predict charge-offs. In the first column of results $SENTIMENT_t$ is interacted with an indicator variable $HIGH\_UNCERTAINTY_i$, which identifies firms whose standard deviation of charge-offs calculated over the full sample period is above the sample median. In the second column of results the variable $HIGH\_UNCERTAINTY_i$ is derived in the same fashion except the standard deviation of the change in non-performing assets is used. The results indicate that in both specifications, the interaction term is negative and significant, consistent with H3. Specifically, the coefficient estimate (*p*-value) for the interaction of $SENTIMENT_t$ and $HIGH\_UNCERTAINTY_i$ is -0.004 (*p*-value = 0.001) when $HIGH\_UNCERTAINTY_i$ is derived using the standard deviation of charge-offs, and -0.005 (0.001) when $HIGH\_UNCERTAINTY_i$ is derived using the standard deviation of the change in non-performing assets. These findings are consistent H3 and suggest that managers' estimates of accruals are affected by managerial sentiment to a greater degree when uncertainty is higher.

4.6. Results for H4

Table 7 provides the results for H4a, H4b, and H4c. Panel A reports the results of re-estimating the models from Table 4 using the sample of private banks (H4a). To the extent that managers are subject to sentiment, we expect to find a negative relation between $LLP_{i,t}$ and $SENTIMENT_t$ even among private banks. However, if the findings in Tables 4, 5, and 6 are due to managers catering to investor sentiment (which could be correlated with our measure of managerial sentiment) or simply responding to analyst expectations (which are affected by sentiment), we should not see a significant relation between $LLP_{i,t}$ and $SENTIMENT_t$ within the sample of private banks. Consistent with managers being misled by sentiment, in each of the three models we find a negative association between loan loss provisions and manager sentiment. For example, in model (iii) the estimated coefficient for $SENTIMENT_t$ is -0.004 with a *p*-value of

0.001.

Panel B reports the results of re-estimating the models from Table 5 using the sample of private banks (H4b). Similar to Panel A, the results in Panel B are consistent with those reported for public banks. Specifically, we find that the coefficient of interest has the correct sign (negative) in each of the models and is statistically significant three of the four models (all but model (i)). Panel C reports the results of re-estimating the models from Table 5 using the private bank sample (H4c). Here again the results are consistent with those estimated for the public sample. Taken together, the results from this analysis of private banks support our hypotheses and alleviate concerns that the documented relation between LLP_t and $SENTIMENT_t$ is attributable to capital market incentives or catering behavior.

4.7. Additional tests

In additional tests, we conduct the empirical analyses tabulated in Tables 4 through 7 using two alternative measures of managerial sentiment. Brown et al. (2012) use the survey responses from the Duke University/*CFO Magazine* Business Outlook Survey to derive their measure of manager sentiment, but do not orthogonalize their measure with respect to macroeconomic fundamentals. To maintain a level of consistency with their study, we conduct all our analyses using *BELIEFS* as a measure of manager sentiment. All results using this measure are inferentially equivalent to those reported in the tables.

We also use the Michigan Consumer Sentiment Index to create an additional proxy for managerial sentiment. This index is calculated from the responses to over 500 monthly telephone interviews with consumers, and focuses on three areas: (1) how consumers view the prospects for their own financial situation, (2) how they view the prospects for the general economy over the near term, and (3) how they view the prospects for the economy over the long term. We

generate a quarterly measure of beliefs by taking a simple average of the monthly index values over the quarter. The measure of sentiment is then obtained as the set of residuals from a regression of these beliefs on macroeconomic factors, similar to the analysis in Table 3. Because the Duke University/*CFO Magazine* Business Outlook Survey sentiment measure is generated directly from the opinions of managers, it is possible that survey responses could be affected by managers' private information about their firms' abilities to collect receivables. The Michigan index, however, is a function of consumer sentiment and does not reflect managers' private information. Therefore, to the extent that (1) manager sentiment is correlated with consumer sentiment and (2) our inferences are consistent across the two measures, using the Michigan index-based measure mitigates concerns that our results are a product of simultaneity issues arising from managerial sentiment that reflects private information about their firms. Re-estimating the models in Tables 4 through 7 using the Michigan index-based measure of sentiment, we find that all the results are inferentially equivalent, except the coefficient of interest in model (i) of Table 5, which has the correct sign but is not significant at conventional levels.

As an additional robustness check, we exclude year fixed effects from our regressions. These fixed time effects are included in our main analyses to address the effects of cross-sectional dependence in the data. However, there could be concerns with including fixed time effects given that our independent variable of interest, *SENTIMENT*, exhibits only time-series variation. Dropping the fixed effects from our analyses does not alter any of the inferences in Tables 4 through 7. As an additional test, we re-estimate Eq. (1) including year dummies and find that the adjusted r-squared actually decreases. The set of macroeconomic control variables essentially remove any variation in *BELIEFS* that could be explained by year fixed effects.

5. Conclusion

We examine whether managerial sentiment results in unintentional errors in accrual estimates. Using a sample of 20,215 bank-quarter observations from 2002-2012, we examine whether managerial sentiment affects banks' loan loss provisions. Our measure of managerial sentiment is derived from the Duke University/*CFO Magazine* Business Outlook Survey, which surveys managerial optimism (Ben-David et al., 2013), and is orthogonalized with respect to numerous macroeconomic factors posited to affect either loan loss provisions or sentiment. As predicted, we find that managerial sentiment is negatively associated with loan loss provisions. Specifically, when sentiment in quarter *t* is higher, ceteris paribus, the loan loss provision for the same quarter (i.e., quarter *t*) is lower. Consistent with a sentiment-based explanation for this result, we find that managerial sentiment reduces the mapping between the quarter *t* provision and quarter *t*+1 charge-offs. This result is consistent with managers under (over) provisioning when sentiment is high (low) and mitigates concerns that we are simply documenting managers' rational response to economic news that is correlated with sentiment. Finally, we find evidence that the effects of manager sentiment are more pronounced for firms with more "uncertain" or "difficult-to-predict" charge-offs. This result is consistent with prior literature suggesting the effects of psychological biases are stronger in settings of greater uncertainty (e.g., Daniel et al., 2001; Hirshleifer, 2001).

We also find these results exist for a sample of private banks. Because managers of private banks lack the incentives and opportunities to exploit unsophisticated investors through the strategic biasing of accruals, these private-sample results are strong evidence that the bias in

provision estimates is unintentional. Taken as a whole, our results indicate that managerial sentiment generates unintentional bias in accrual estimates.

We believe our findings contribute to the literature examining the effects of psychological biases on financial reporting outcomes. We believe the results of this study will be of interest to investors, creditors, standard setters, auditors, and regulators, given the central role that financial reporting quality plays in valuation and contracting decisions (e.g., Penman and Sougiannis, 1998; Watts and Zimmerman, 1978; Lambert, 2001). Our results also inform the standing debate over loan loss accounting. As interested parties consider the optimal method to account for credit losses, our findings suggest that they should consider the effects of unintentional managerial bias in estimating future credit losses.

Appendix A. Variable definitions

$BELIEFS_t$: Sentiment index obtained from question 2b of Duke/CFO Magazine Global Business Outlook Survey for the current quarter *t* scaled by 100. For example, if the current quarter ends on March 31, 2008, $BELIEFS_t$ refers to the Duke sentiment index for released in March 2008.

$BELIEFS_{t-1}$: Sentiment index obtained from question 2b of Duke/CFO Magazine Global Business Outlook Survey for the prior quarter *t*-1 scaled by 100. For example, if the current period ends on March 31, 2008, $BELIEFS_{t-1}$ refers to the sentiment released in December 2007.

$LLP_{i,t}$: Loan loss provision (COMPUSTAT "pllq") in quarter *t* scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$LLP_{i,t-1}$: Loan loss provision (COMPUSTAT "pllq") in quarter *t*-1 scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$\Delta NPA_{i,t+1}$: Change in non-performing assets (COMPUSTAT "npatq") from quarter *t* to quarter *t*+1 scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$\Delta NPA_{i,t}$: Change in non-performing assets (COMPUSTAT "npatq") from quarter *t*-1 to quarter *t* scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$\Delta NPA_{i,t-1}$: Change in non-performing assets (COMPUSTAT "npatq") from quarter *t*-2 to quarter *t*-1 scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$\Delta NPA_{i,t-2}$: Change in non-performing assets (COMPUSTAT "npatq") from quarter *t*-3 to quarter *t*-2 scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$SIZE_{i,t}$: The natural log of total assets (COMPUSTAT "atq") in quarter *t*.

$\Delta LOAN_{i,t}$: Change in total loans (COMPUSTAT "lntalq") from quarter *t*-1 to quarter *t* scaled by total loans in quarter *t*-1.

$EBP_{i,t}$: Earnings before taxes and loan loss provisions (COMPUSTAT "piq" + "pllq") in quarter *t* scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$CAPR1_{i,t-1}$: Tier 1 risk-adjusted capital ratio (COMPUSTAT ''capr1q'') at the end of quarter *t*-1, divided by 100.

$ALW_{i,t-1}$: Loan loss allowance (COMPUSTAT "rclq") in quarter *t*-1 scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

$CO_{i,t}$: Net charge off (COMPUSTAT "ncoq") in quarter *t* scaled by total loans (COMPUSTAT "lntalq") in quarter *t*-1.

ΔGDP_t: Change in real gross domestic product (COMPUSTAT "gdpr2") from quarter t-1 to t scaled by GDP in quarter t-1.

$CSRET_t$: The return on the S&P/Case-Shiller U.S. National Home Price Index (ticker: SPCSUSA) over quarter t calculated as the change in the index level from quarter t to quarter t-1 scaled by the index level at quarter t.

$TBILL_t$: Yield on three-month Treasury bill (COMPUSTAT "tbill3m").

$\Delta UNEMP_t$: Change in unemployment rate (COMPUSTAT "unemp2") from quarter t-1 to quarter t, scaled by the unemployment rate in quarter t-1.

DEF_t: The difference between Baa- and Aaa-rated bond yields.

$CPIR_t$: The consumer price index inflation rate (COMPUSTAT "cpir").

PCE_t: 100 times the change in the natural log of personal consumption expenditures.

$LABOR_t$: 100 times the change in the natural log of labor income, measured as total personal income net of dividend income, deflated by the personal consumption expenditure deflator.

DIV_t: Dividend yield on the CRSP value-weighted index.

CAY_t: Consumption-to-wealth ratio obtained from the website of Sydey Ludvigson, Professor of Economics at NYU (http://www.econ.nyu.edu/user/ludvigsons/).

References

Armstrong, C. S., A. D. Jagolinzer, and D. F. Larcker. 2010. Chief Executive Officer Equity Incentives and Accounting Irregularities. *Journal of Accounting Research* 48 (2): 225–271.

Ayers, B. C., J. (Xuefeng) Jiang, and P. E. Yeung. 2006. Discretionary Accruals and Earnings Management: An Analysis of Pseudo Earnings Targets. *The Accounting Review* 81 (3): 617–652.

Baker, M., R. S. Ruback, and J. Wurgler. 2007. Behavioral Corporate Finance. In *Handbook of Empirical Corporate Finance SET*, 2:145–186.

Baker, M., and J. Wurgler. 2002. Market Timing and Capital Structure. *Journal of Finance* 57 (1): 1–32.

———. 2004. Appearing and Disappearing Dividends: The Link to Catering Incentives. *Journal of Financial Economics* 73 (2): 271–288.

———. 2006. Investor Sentiment and the Cross‐section of Stock Returns. *Journal of Finance* 61 (4): 1645–1680.

———. 2007. Investor Sentiment in the Stock Market. *Journal of Economic Perspectives* 21 (2): 129–151.

———. 2013. Behavioral Corporate Finance : An Updated Survey. In *Handbook of the Economics of Finance: Volume 2, Part A*, ed. G. M. Constantinides, M. Harris, and R. M. Stulz, 2:357–424. Elsevier Press.

Barberis, N., A. Shleifer, and R. Vishny. 1998. A Model of Investor Sentiment. *Journal of financial economics* 49 (1): 307–343.

Beatty, A., S. Chamberlain, and J. Magliolo. 1995. Managing financial reports of commercial banks: The influence of taxes, regulatory capital, and earnings. *Journal of Accounting Research* 33 (2): 231–261.

Beatty, A. L., B. Ke, and K. R. Petroni. 2002. Earnings Management to Avoid Declines across Publicly and Privately Held Banks. *The Accounting Review* 77 (3): 547–570.

Beatty, A., and S. Liao. 2011. Do Delays in Expected Loss Recognition Affect Banks' Willingness to Lend? *Journal of Accounting and Economics* 52 (1): 1–20.

———. 2014. Financial Accounting in the Banking Industry: A Review of the Empirical Literature. *Journal of Accounting and Economics, forthcoming*.

Beaver, W. H., and E. E. Engel. 1996. Discretionary Behavior with Respect to Alloances for Loan Losses and the Behavior of Security Prices. *Journal of Accounting and Economics* 22: 177–206.

Beaver, W. H., M. L. McAnally, and C. H. Stinson. 1997. The Information Content of Earnings and prices: A Simultaneous Equations Approach. *Journal of Accounting and Economics* 23 (1): 53–81.

Beck, P. J., and G. S. Narayanamoorthy. 2013. Did the SEC Impact Banks' Loan Loss Reserve Policies and Their Informativeness? *Journal of Accounting and Economics* 56 (2-3): 42–65.

Ben-David, I., J. Graham, and C. Harvey. 2013. Managerial Miscalibration. *The Quarterly Journal of Economics*: 1547–1584.

Bergman, N. K., and S. Roychowdhury. 2008. Investor Sentiment and Corporate Disclosure. *Journal of Accounting Research* 46 (5): 1057–1083.

Bikker, J. a., and P. a. J. Metzemakers. 2005. Bank Provisioning Behaviour and Procyclicality. *Journal of International Financial Markets, Institutions and Money* 15 (2): 141–157.

Bouvatier, V., and L. Lepetit. 2012. Provisioning Rules and Bank Lending: A Theoretical Model. *Journal of Financial Stability* 8 (1): 25–31.

Brown, L. D., and M. L. Caylor. 2005. A Temporal Analysis of Quarterly Earnings Thresholds: Propensities and Valuation Consequences. *The Accounting Review* 80 (2): 423–440.

Brown, N. C., T. E. Christensen, W. B. Elliott, and R. D. Mergenthaler. 2012. Investor Sentiment and Pro Forma Earnings Disclosures. *Journal of Accounting Research* 50 (1): 1–40.

Burgstalher, D., and I. Dichev. 1997. Earnings Management to Avoid Earnings Decreases and Losses. *Journal of Accounting and Economics* 24: 99–126.

Bushman, R. M., and C. D. Williams. 2012. Accounting Discretion , Loan Loss Provisioning, and Discipline of Banks' Risk-taking. *Journal of Accounting and Economics* 54 (1): 1–18.

Chan, S. Y., and W.-M. Fong. 2004. Individual Investors' Sentiment and Temporary Stock Price Pressure. *Journal of Business Finance & Accounting* 31 (5&6): 823–836.

Clement, M. B., J. Hales, and Y. Xue. 2011. Understanding Analysts' Use of Stock Returns and Other Analysts' Revisions when Forecasting Earnings. *Journal of Accounting and Economics* 51 (3): 279–299.

Collins, J. H., D. A. Shackelford, and J. M. Wahlen. 1995. Bank Differences in the Coordination of Regulatory Capital, Earnings, and Taxes. *Journal of Accounting Research* 33 (1): 263–291.

Cornell, B., W. R. Landsman, and S. R. Stubben. 2011. Do Institutional Investors and Security Analysts Mitigate the Effects of Investor Sentiment? *Working Paper*.

Daniel, K., D. Hirshleifer, and A. Subrahmanyam. 1998. Investor Psychology and Security Market Under- and Overreactions. *Journal of Finance* 53 (6): 1839–1885.

Daniel, K., D. Hirshleifer, and S. Teoh. 2002. Investor Psychology in Capital Markets: Evidence and Policy Implications. *Journal of Monetary Economics* 49 (2002): 139–209.

Dechow, P., W. Ge, and C. Schrand. 2010. Understanding Earnings Quality: A Review of the Proxies, Their Determinants and Their Consequences. *Journal of Accounting and Economics* 50 (2-3): 344–401.

DeLong, J. B., A. Shleifer, L. H. Summers, and R. J. Waldmann. 1990. Positive Feedback Investment Strategies and Destabilizing Rational Speculation. *Journal of Finance* 45 (2): 379–395.

Dhaliwal, D., V. Naiker, and F. Navissi. 2010. The Association Between Accruals Quality and the Characteristics of Accounting Experts and Mix of Expertise on Audit Committees*. *Contemporary Accounting Research* 27 (3): 787–827.

Dichev, I. D., J. Graham, and C. R. Harvey. 2013. Earnings Quality: Evidence from the Field. *Working Paper*.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. 2005. The Market Pricing of Accruals Quality. *Journal of Accounting and Economics* 39 (2): 295–327.

Gilchrist, S., C. P. Himmelberg, and G. Huberman. 2005. Do Stock Price Bubbles Influence Corporate Investment? *Journal of Monetary Economics* 52 (4): 805–827.

Graham, J. R., C. R. Harvey, and S. Rajgopal. 2005. The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics* 40 (1-3): 3–73.

Guidry, F., A. J. Leone, and S. Rock. 1999. Earnings-Based Bonus Plans and Earnings Management by Business-Unit Managers. *Journal of Accounting and Economics* 26 (1-3): 113–142.

Hennes, K. M., A. J. Leone, and B. P. Miller. 2008. *The Importance of Distinguishing Errors from Irregularities in Restatement Research: The Case of Restatements and CEO/CFO Turnover*. *The Accounting Review*. Vol. 83.

Hirshleifer, D. 2001. Investor Psychology and Asset Pricing. *Journal of Finance* 61 (4): 493–494.

Hribar, P., and J. McInnis. 2012. Investor Sentiment and Analysts' Earnings Forecast Errors. *Management Science* 58 (2): 293–307.

Hribar, P., and P. Quinn. 2013. Managers and Investor Sentiment. *Working Paper, University of Iowa*.

Lambert, R. 2001. Contracting Theory and Accounting. *Journal of Accounting and Economics* 32 (January): 3–87.

Lemmon, M., and E. Portniaguina. 2006. Consumer Confidence and Asset Prices: Some Empirical Evidence. *Review of Financial Studies* 19 (4): 1499–1529.

Leone, A. J., and S. Rock. 2002. Empirical Tests of Budget Ratcheting and Its Effect on Managers' Discretionary Accrual Choices. *Journal of Accounting and Economics* 33 (1): 43–67.

Lev, B., S. Li, and T. Sougiannis. 2010. The Usefulness of Accounting Estimates for Predicting Cash Flows and Earnings. *Review of Accounting Studies* 15 (4): 779–807.

Li, W., and E. Lie. 2006. Dividend Changes and Catering Incentives. *Journal of Financial Economics* 80 (2): 293–308.

Liu, C.-C., and S. G. Ryan. 2006. Income Smoothing over the Business Cycle: Changes in Banks' Coordinated Management of Provisions for Loan Losses and Loan Charge-Offs from the Pre-1990 Bust to the 1990s Boom. *The Accounting Review* 81 (2): 421–441.

McNichols, M. F. 2000. Research design issues in earnings management studies. *Journal of Accounting and Public Policy* 19 (4-5): 313–345.

McNichols, M. F., and G. P. Wilson. 1988. Evidence of Earnings Management from the Provision for Bad Debts. *Journal of Accounting Research* 26 (1): 1–31.

Morck, R., A. Shleifer, and R. W. Vishny. 1990. Do Managerial Objectives Drive Bad Acquisitions? *Journal of Finance* 45 (1): 31–49.

Ng, J., and S. Roychowdhury. 2013. Do Loan Loss Reserves Behave like Capital? Evidence from Recent Bank Failures. *Working paper, Boston College*.

Payne, J., and S. Robb. 2000. Earnings Management: The Effect of Ex Ante Earnings Expectations. *Journal of Accounting, Auditing & Finance* 15 (1): 371–392.

Penman, S. H., and T. Sougiannis. 1998. A Comparison of Dividend, Cash Flow, and Earnings Approaches to Equity Valuation. *Contemporary Accounting Research* 15 (3): 343–383.

Polk, C., and P. Sapienza. 2008. The Stock Market and Corporate Investment: A Test of Catering Theory. *Review of Financial Studies* 22 (1): 187–217.

Ronen, J., and S. Ryan. 2009. Insurance Industry. In *Banks' Loan Loss Reserving*, ed. V. Acharya, T. Cooley, M. Richardson, and I. Walter, 96–97. The NYU Stern Working Group on Financial Reform.

Sabherwal, S., S. K. Sarkar, and Y. Zhang. 2011. Do Internet Stock Message Boards Influence Trading? Evidence from Heavily Discussed Stocks with No Fundamental News. *Journal of Business Finance & Accounting* 38 (9-10): 1209–1237.

Simpson, A. 2013. Does Investor Sentiment Affect Earnings Management? *Journal of Business Finance & Accounting* 40 (7-8): 869–900.

Wahlen, J. M. 1994. The Nature of Information Bank Loan in Commercial Loss Disclosures. *The Accounting Review* 69 (3): 455–478.

Walther, B. R., and R. H. Willis. 2012. Do Investor Expectations Affect Sell-Side Analysts' Forecast Bias and Forecast Accuracy? *Review of Accounting Studies* 18 (1): 207–227.

Watts, R., and J. Zimmerman. 1978. Towards a positive theory of the determination of accounting standards. *The Accounting Review* 53: 112–134.

Figure 1

$SENTIMENT_t$	LLP_t	CO_{t+1}	β
High	$100 \times (\gamma - \theta)$	100	$(\gamma - \theta)$
None	$100 \times \gamma$	100	γ
Low	$100 \times (\gamma + \theta)$	100	$(\gamma + \theta)$

Figure 2

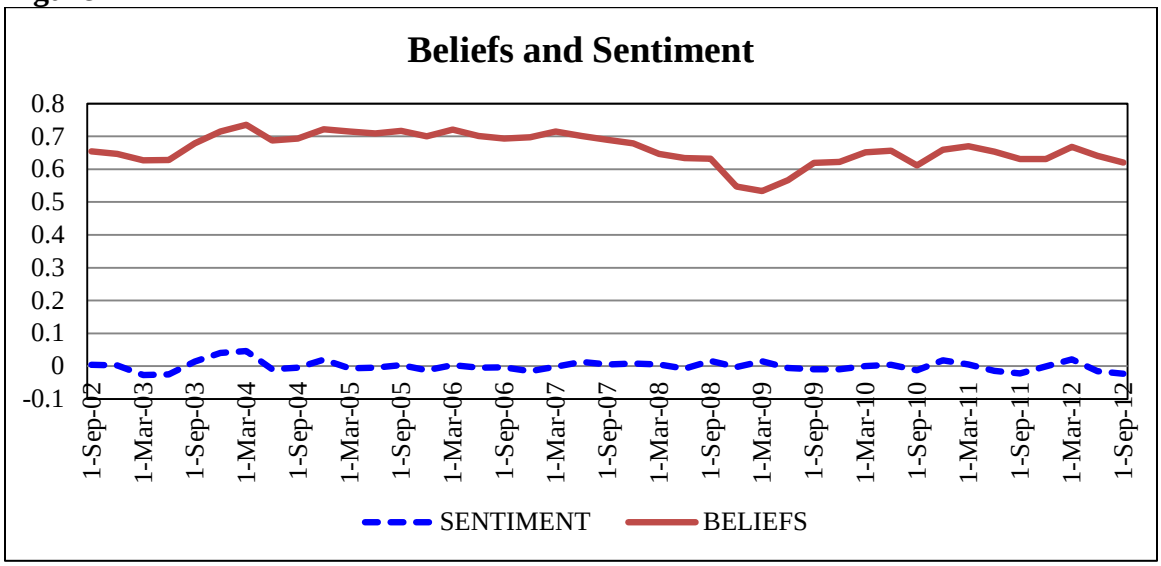

Table 1

Macroeconomic Determinants of Beliefs

$$BELIEFS_t = \alpha + \beta_1 \Delta GDP_t + \beta_2 \Delta UNEMP_t + \beta_3 CSRET_t + \beta_4 TBILL_t + \beta_5 DEF_t + \beta_6 CPIR_t + \beta_7 LABOR_t + \beta_8 DIV_t + \beta_9 CAY_t + \varepsilon_t \quad (1)$$

Variables	$BELIEFS_t$			
	(i)		(ii)	
	Coeffic.	*p*-value	Coeffic.	*p*-value
ΔGDP_t	0.585	0.546	-0.211	0.705
$\Delta UNEMP_t$	-0.496	< 0.001	-0.013	0.901
$CSRET_t$	0.210	0.449	0.580	0.002
$TBILL_t$			0.009	< 0.001
DEF_t			-0.037	0.012
$CPIR_t$			0.008	0.005
PCE_t			-0.003	0.649
$LABOR_t$			0.000	0.870
DIV_t			-3.193	0.537
CAY_t			-0.528	0.129
Constant	0.663	< 0.001	0.679	< 0.001
Adjusted R-squared	0.498		0.855	
Observations	41		41	

See Appendix A for variable definitions and measurements. *p*-values are computed using heterskedasticity-robust standard errors.

Table 2

Descriptive Statistics

Variable	N	Mean	Std. Dev.	Q1	Median	Q3
$LLP_{i,t}$	20,215	0.002	0.003	0.000	0.001	0.002
$\Delta NPA_{i,t+1}$	20,215	0.001	0.007	-0.001	0.000	0.002
$\Delta NPA_{i,t}$	20,215	0.001	0.007	-0.001	0.000	0.002
$\Delta NPA_{i,t-1}$	20,215	0.001	0.007	-0.001	0.000	0.002
$\Delta NPA_{i,t-2}$	20,215	0.001	0.006	-0.001	0.000	0.002
SIZEt-1	20,215	7.394	1.501	6.358	7.064	8.102
$\Delta LOAN_{i,t}$	20,215	0.018	0.049	-0.009	0.011	0.035
$EBP_{i,t}$	20,215	0.006	0.005	0.004	0.006	0.008
$CAPR1_{i,t-1}$	20,215	0.117	0.033	0.095	0.112	0.132
$CO_{i,t}$	20,215	0.002	0.003	0.000	0.001	0.002
$ALW_{i,t-1}$	20,215	0.016	0.008	0.011	0.014	0.018
$BELIEFS_t$	20,215	0.660	0.047	0.631	0.659	0.701
$SENTIMENT_t$	20,215	0.000	0.015	-0.010	-0.002	0.005
ΔGDP_t	20,215	0.004	0.007	0.003	0.006	0.008
$\Delta UNEMP_t$	20,215	0.011	0.056	-0.023	0.000	0.031
$CSRET_t$	20,215	0.001	0.028	-0.019	0.006	0.027
$TBILL_t$	20,215	1.659	1.743	0.120	0.930	3.290
DEF_t	20,215	1.191	0.523	0.890	1.010	1.300
$CPIR_t$	20,215	2.445	1.138	2.075	2.871	3.222
PCE_t	20,215	0.461	0.507	0.367	0.521	0.737
$LABOR_t$	20,215	0.455	3.100	-1.499	-0.696	2.720
DIV_t	20,215	0.005	0.001	0.005	0.005	0.006
CAY_t	20,215	-0.021	0.012	-0.030	-0.022	-0.017

This table provides descriptive statistics for variables used in our regression analysis. All firm-specific variables have been winsorized at the 1st and 99th percentile of the distributions. See Appendix A for variable definisions and measurements.

Table 3

Correlations Between Manager Beliefs and Macroeconomic Variables

Pearson (Spearman) Correlation is Above (Below) the Diagonal

Panel A	1	2	3	4	5	6	7	8	9	10	11				
1 *BELIEFS$_t$*	1	**0.583**	**-0.720**	**0.528**	**0.647**	**-0.853**	**0.489**	0.004	-0.082	**-0.545**	-0.200	-	-	-	-
2 *ΔGDP$_t$*	*0.372*	1	**-0.719**	**0.618**	0.148	**-0.732**	0.009	0.251	-0.219	-0.201	-0.220	-	-	-	-
3 *ΔUNEMP$_t$*	**-0.541**	**-0.500**	1	**-0.598**	-0.222	**0.816**	-0.296	-0.224	0.075	**0.411**	0.269	-	-	-	-
4 *CSRET$_t$*	**0.507**	**0.492**	**-0.498**	1	0.059	**-0.509**	-0.127	**0.640**	0.015	-0.274	0.102	-	-	-	-
5 *TBILL$_t$*	**0.670**	-0.004	-0.067	0.164	1	**-0.421**	**0.463**	*-0.316*	-0.071	*-0.354*	-0.067	-	-	-	-
6 *DEF$_t$*	**-0.811**	*-0.372*	**0.469**	**-0.461**	**-0.515**	1	*-0.380*	-0.045	0.185	**0.539**	0.244	-	-	-	-
7 *CPIR$_t$*	*0.387*	-0.077	-0.110	-0.173	**0.423**	*-0.330*	1	*-0.339*	0.023	**-0.476**	0.043	-	-	-	-
8 *PCE$_t$*	0.003	0.251	-0.230	**0.637**	-0.188	-0.028	*-0.360*	1	0.080	-0.074	0.304	-	-	-	-
9 *LABOR$_t$*	-0.264	-0.239	0.083	-0.122	-0.204	*0.356*	-0.020	0.079	1	-0.194	-0.025	-	-	-	-
10 *DIV$_t$*	**-0.468**	-0.053	0.253	*-0.315*	**-0.399**	**0.496**	*-0.340*	-0.206	-0.099	1	-0.259	-	-	-	-
11 *CAY$_t$*	-0.062	-0.119	0.198	0.167	0.126	0.142	0.186	0.289	-0.073	-0.305	1	-	-	-	-

Panel B	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 *LLP$_t$*	1	**-0.038**	**0.146**	**0.262**	**0.262**	**0.287**	**0.103**	**-0.237**	**-0.243**	**-0.087**	**0.793**	**0.421**	**-0.176**	**0.248**	**-0.197**
2 *SENTIMENT$_t$*	**-0.021**	1	**0.035**	**0.030**	**0.035**	-0.007	-0.006	**0.034**	0.001	**-0.033**	**-0.045**	**-0.066**	*-0.016*	**0.019**	**-0.022**
3 *ΔNPA$_{t+1}$*	**0.081**	**0.063**	1	**0.182**	**0.191**	**0.114**	*-0.015*	**0.029**	**-0.077**	**-0.048**	*0.015*	**-0.124**	**-0.221**	**0.289**	**-0.235**
4 *ΔNPA$_t$*	**0.169**	**0.060**	**0.159**	1	**0.160**	**0.181**	**-0.018**	**0.024**	**-0.113**	**-0.055**	**0.050**	**-0.061**	**-0.216**	**0.273**	**-0.208**
5 *ΔNPA$_{t-1}$*	**0.196**	**0.053**	**0.170**	**0.143**	1	**0.140**	*-0.014*	**-0.082**	**-0.122**	**-0.067**	**0.193**	**0.029**	**-0.185**	**0.251**	**-0.165**
6 *ΔNPA$_{t-2}$*	**0.215**	*0.014*	**0.129**	**0.160**	**0.125**	1	*-0.016*	**-0.111**	**-0.136**	**-0.073**	**0.227**	**0.080**	**-0.133**	**0.198**	**-0.128**
7 *SIZE$_{t-1}$*	**0.152**	-0.007	0.010	*0.014*	**0.022**	**0.022**	1	**-0.026**	**0.300**	**-0.188**	**0.117**	**0.121**	-0.001	0.008	-0.013
8 *ΔLOAN$_t$*	**-0.234**	**0.020**	**0.048**	0.013	**-0.080**	**-0.113**	**-0.034**	1	**0.212**	**0.093**	**-0.309**	**-0.296**	**0.080**	**-0.084**	**0.119**
9 *EBP$_t$*	**-0.110**	**-0.031**	**-0.068**	**-0.086**	**-0.106**	**-0.105**	**0.321**	**0.243**	1	**0.146**	**-0.224**	**-0.109**	**0.188**	**-0.197**	**0.244**
10 *CAPR1$_{t-1}$*	**-0.084**	**-0.041**	**-0.089**	**-0.093**	**-0.096**	**-0.088**	**-0.161**	**0.049**	**0.157**	1	**-0.081**	*0.016*	**0.068**	**-0.099**	**0.045**
11 *CO$_t$*	**0.702**	**-0.031**	**-0.025**	0.002	**0.123**	**0.151**	**0.252**	**-0.389**	**-0.117**	**-0.072**	1	**0.590**	**-0.081**	**0.127**	**-0.132**
12 *ALW$_{t-1}$*	**0.405**	**-0.070**	**-0.153**	**-0.100**	**-0.028**	**0.022**	**0.143**	**-0.315**	0.004	**0.083**	**0.540**	1	**0.051**	**-0.069**	0.013
13 *ΔGDP$_t$*	**-0.141**	0.007	**-0.198**	**-0.200**	**-0.170**	**-0.142**	-0.007	**0.085**	**0.165**	**0.071**	**-0.072**	**0.071**	1	**-0.726**	**0.624**
14 *ΔUNEMP$_t$*	**0.240**	**-0.037**	**0.284**	**0.266**	**0.267**	**0.221**	*0.014*	**-0.090**	**-0.176**	**-0.116**	**0.140**	**-0.076**	**-0.513**	1	**-0.600**
15 *CSRET$_t$*	**-0.260**	**-0.097**	**-0.228**	**-0.218**	**-0.188**	**-0.169**	**-0.028**	**0.185**	**0.294**	**0.041**	**-0.201**	*0.017*	**0.501**	**-0.501**	1

This table provides both Pearson and Spearman correlation for variables used in our regression analysis. All firm-specific variables have been winsorized at the 1st and 99th percentile of the distributions. Bold typeface indicates significance at the 1% level and italic typeface indicates significance at the 5% level. See Appendix A for variable definitions and measurements.

Table 4

Test of H1: Management's Estimate of LLP and Sentiment

$$LLP_{i,t} = \beta_0 + \beta_1 SENTIMENT_t + \beta_2 SENTIMENT_{t-1} + \beta_3 LLP_{t-1} + \beta_4 \Delta NPA_{i,t+1} + \beta_5 \Delta NPA_{i,t} + \beta_6 \Delta NPA_{i,t-1} + \beta_7 \Delta NPA_{i,t-2} + \beta_8 SIZE_{i,t-1} + \beta_9 \Delta LOAN_{i,t} + \beta_{10} EBP_{i,t} + \beta_{11} CAPR1_{i,t-1} + \beta_{12} CO_{i,t} + \beta_{13} ALW_{i,t-1} + \beta_{14} \Delta GDP_t + \beta_{15} \Delta UNEMP_t + \beta_{16} CSRET_t + \text{Year Fixed Effects} + \varepsilon_{i,t} \quad (2)$$

Variables	$LLP_{i,t}$					
	(i)		(ii)		(iii)	
	Coeffic.	*p*-value	Coeffic.	*p*-value	Coeffic.	*p*-value
$SENTIMENT_t$	-0.006	< 0.001	-0.004	< 0.001	-0.005	< 0.001
$SENTIMENT_{t-1}$					0.002	0.008
$LLP_{i,t-1}$					0.127	< 0.001
$\Delta NPA_{i,t+1}$	0.025	< 0.001	0.031	< 0.001	0.029	< 0.001
$\Delta NPA_{i,t}$	0.081	< 0.001	0.082	< 0.001	0.077	< 0.001
$\Delta NPA_{i,t-1}$	0.080	< 0.001	0.025	< 0.001	0.019	< 0.001
$\Delta NPA_{i,t-2}$	0.099	< 0.001	0.030	< 0.001	0.022	< 0.001
$SIZE_{i,t-1}$	0.000	< 0.001	0.000	< 0.001	0.000	< 0.001
$\Delta LOAN_{i,t}$	-0.008	< 0.001	0.001	0.013	0.001	0.009
$EBP_{i,t}$			-0.031	< 0.001	-0.028	< 0.001
$CAPR1_{i,t-1}$			0.001	0.147	0.002	0.01
$CO_{i,t}$			0.831	< 0.001	0.793	< 0.001
$ALW_{i,t-1}$			-0.008	0.079	-0.025	< 0.001
ΔGDP_t	0.002	0.694	-0.012	0.001	-0.004	0.331
$\Delta UNEMP_t$	-0.001	0.455	-0.001	0.252	0.000	0.548
$CSRET_t$	0.007	< 0.001	0.004	0.001	0.004	< 0.001
Constant	0.000	0.176	0.000	0.625	0.000	0.575
Year Fixed Effects	Yes		Yes		Yes	
Adjusted R-squared	0.305		0.704		0.711	
Observations	20,215		20,215		19,795	

See Appendix A for variable definitions and measurements. *p*-values are computed using standard errors clustered by firm.

Table 5

Test of H2: Future Charge-offs and Sentiment

$$LLPi,t = \beta_0 + \beta_1 SENTIMENT_t \times CO_{i,t+1} + \beta_2 CO_{i,t+1} + \beta_3 SENTIMENT_t + \beta_4 SENTIMENT_{t-1} + \beta_5 LLP_{t-1} + \beta_6 \Delta NPA_{i,t+1} + \beta_7 \Delta NPA_{i,t} + \beta_8 \Delta NPA_{i,t-1} + \beta_9 \Delta NPA_{i,t-2} + \beta_{10} SIZE_{i,t-1} + \beta_{11} \Delta LOAN_{i,t} + \beta_{12} EBP_{i,t} + \beta_{13} CAPR1_{i,t-1} + \beta_{14} CO_{i,t} + \beta_{15} ALW_{i,t-1} + \beta_{16} \Delta GDP_t + \beta_{17} \Delta UNEMP_t + \beta_{18} CSRET_t + \text{Year Fixed Effects} + \varepsilon_{i,t} \quad (3)$$

Variables	$LLP_{i,t}$							
	(i)		(ii)		(iii)		(iv)	
	Coeffic.	*p*-value	Coeffic.	*p*-value	Coeffic.	*p*-value	Coeffic.	*p*-value
$SENTIMENT_t \times CO_{i,t+1}$	-1.844	0.008						
$HIGH\_SENT_t \times CO_{i,t+1}$			-0.081	< 0.001				
$SENTIMENT_t \times CO_{i,t+1234}$					-0.622	0.003		
$HIGH\_SENT_t \times CO_{i,t+1234}$							-0.028	< 0.001
$CO_{i,t+1}$	0.164	< 0.001	0.205	< 0.001				
$CO_{i,t+1234}$					0.071	< 0.001	0.086	< 0.001
$SENTIMENT_t$	-0.002	0.076			-0.001	0.314		
$HIGH\_SENT_t$			-0.000	0.041			0.000	0.699
$SENTIMENT_{t-1}$	0.002	0.018	0.001	0.494	0.000	0.773	-0.001	0.114
$LLP_{i,t-1}$	0.095	< 0.001	0.098	< 0.001	0.079	< 0.001	0.083	< 0.001
$\Delta NPA_{i,t+1}$	0.030	< 0.001	0.030	< 0.001	0.012	0.002	0.012	0.001
$\Delta NPA_{i,t}$	0.068	< 0.001	0.067	< 0.001	0.057	< 0.001	0.056	< 0.001
$\Delta NPA_{i,t-1}$	0.013	< 0.001	0.014	0.001	0.011	0.007	0.011	0.006
$\Delta NPA_{i,t-2}$	0.014	< 0.001	0.014	< 0.001	0.011	0.004	0.011	0.005
$SIZE_{i,t-1}$	0.000	< 0.001	0.000	< 0.001	0.000	0.014	0.000	0.020
$\Delta LOAN_{i,t}$	0.001	0.001	0.001	0.001	0.002	< 0.001	0.002	< 0.001
$EBP_{i,t}$	-0.023	0.001	-0.022	0.002	-0.017	0.016	-0.016	0.023
$CAPR1_{i,t-1}$	0.002	0.001	0.002	0.001	0.003	< 0.001	0.003	< 0.001
$CO_{i,t}$	0.769	< 0.001	0.766	< 0.001	0.749	< 0.001	0.744	< 0.001
$ALW_{i,t-1}$	-0.042	< 0.001	-0.041	< 0.001	-0.050	< 0.001	-0.050	< 0.001
ΔGDP_t	-0.005	0.152	-0.007	0.041	-0.008	0.024	-0.011	0.003
$\Delta UNEMP_t$	0.000	0.604	0.000	0.760	0.000	0.466	0.000	0.841
$CSRET_t$	0.004	< 0.001	0.004	< 0.001	0.005	< 0.001	0.005	< 0.001
Constant	0.000	0.080	0.000	0.013	0.000	0.009	0.000	0.001
Year Fixed Effects	Yes		Yes		Yes		Yes	
Adjusted R-squared	0.729		0.731		0.727		0.728	
Observations	19,625		19,625		18,429		18,429	

See Appendix A for variable definitions and measurements. *p*-values are computed using standard errors clustered by firm.

Table 6

Test of H3: High Uncertainty

$$LLP_{i,t} = \beta_0 + \beta_1 SENTIMENT_t \times HIGH\_UNCERTAINTY_i + \beta_2 HIGH\_UNCERTAINTY_i + \beta_3 SENTIMENT_t + \beta_4 SENTIMENT_{t-1} + \beta_5 LLP_{t-1} + \beta_6 \Delta NPA_{i,t+1} + \beta_7 \Delta NPA_{i,t} + \beta_8 \Delta NPA_{i,t-1} + \beta_9 \Delta NPA_{i,t-2} + \beta_{10} SIZE_{i,t-1} + \beta_{11} \Delta LOAN_{i,t} + \beta_{12} EBP_{i,t} + \beta_{13} CAPR1_{i,t-1} + \beta_{14} CO_{i,t} + \beta_{15} ALW_{i,t-1} + \beta_{16} \Delta GDP_t + \beta_{17} \Delta UNEMP_t + \beta_{18} CSRET_t + \text{Year Fixed Effects} + \varepsilon_{i,t}$$

Variables	$LLP_{i,t}$			
	St. Dev. of CO		*St. Dev. of ΔNPA*	
	Coeffic.	*p*-value	Coeffic.	*p*-value
$SENTIMENT_t \times HIGH\_UNCERTAINTY_i$	-0.004	0.001	-0.005	< 0.001
$HIGH\_UNCERTAINTY_i$	0.000	< 0.001	0.000	< 0.001
$SENTIMENT_t$	-0.003	< 0.001	-0.003	< 0.001
$SENTIMENT_{t-1}$	0.002	0.009	0.002	0.009
$LLP_{i,t-1}$	0.124	< 0.001	0.126	< 0.001
$\Delta NPA_{i,t+1}$	0.028	< 0.001	0.028	< 0.001
$\Delta NPA_{i,t}$	0.076	< 0.001	0.076	< 0.001
$\Delta NPA_{i,t-1}$	0.018	< 0.001	0.017	< 0.001
$\Delta NPA_{i,t-2}$	0.019	< 0.001	0.019	< 0.001
$SIZE_{i,t-1}$	0.000	< 0.001	0.000	< 0.001
$\Delta LOAN_{i,t}$	0.001	0.009	0.001	0.005
$EBP_{i,t}$	-0.028	< 0.001	-0.028	< 0.001
$CAPR1_{i,t-1}$	0.002	0.003	0.002	0.005
$CO_{i,t}$	0.788	< 0.001	0.791	< 0.001
$ALW_{i,t-1}$	-0.030	< 0.001	-0.028	< 0.001
ΔGDP_t	-0.004	0.279	-0.004	0.288
$\Delta UNEMP_t$	0.000	0.582	0.000	0.527
$CSRET_t$	0.004	< 0.001	0.004	< 0.001
Constant	0.000	0.284	-0.000	0.069
Year Fixed Effects	Yes		Yes	
Adjusted R-squared	0.714		0.713	
Observations	19,759		19,759	

p-values are computed using standard errors clustered by firm.

Table 7

Panel A: Test of H4a

$$LLP_{i,t} = \beta_0 + \beta_1 SENTIMENT_t + \beta_2 SENTIMENT_{t-1} + \beta_3 LLP_{t-1} + \beta_4 \Delta NPA_{i,t+1} + \beta_5 \Delta NPA_{i,t} + \beta_6 \Delta NPA_{i,t-1} + \beta_7 \Delta NPA_{i,t-2} + \beta_8 SIZE_{i,t-1} + \beta_9 \Delta LOAN_{i,t} + \beta_{10} EBP_{i,t} + \beta_{11} CAPR1_{i,t-1} + \beta_{12} CO_{i,t} + \beta_{13} ALW_{i,t-1} + \beta_{14} \Delta GDP_t + \beta_{15} \Delta UNEMP_t + \beta_{16} CSRET_t + \text{Year Fixed Effects} + \varepsilon_{i,t} \quad (1)$$

Variables	$LLP_{i,t}$					
	(i)		(ii)		(iii)	
	Coeffic.	*p*-value	Coeffic.	*p*-value	Coeffic.	*p*-value
$SENTIMENT_t$	-0.010	< 0.001	-0.002	0.002	-0.004	< 0.001
$SENTIMENT_{t-1}$					-0.001	0.386
$LLP_{i,t-1}$					0.080	< 0.001
$\Delta NPA_{i,t+1}$	0.020	< 0.001	0.019	< 0.001	0.019	< 0.001
$\Delta NPA_{i,t}$	0.045	< 0.001	0.050	< 0.001	0.048	< 0.001
$\Delta NPA_{i,t-1}$	0.050	< 0.001	0.019	< 0.001	0.017	< 0.001
$\Delta NPA_{i,t-2}$	0.052	< 0.001	0.018	< 0.001	0.016	< 0.001
$SIZE_{i,t-1}$	0.000	< 0.001	0.000	< 0.001	0.000	< 0.001
$\Delta LOAN_{i,t}$	-0.001	< 0.001	0.004	< 0.001	0.004	< 0.001
$EBP_{i,t}$			-0.038	< 0.001	-0.034	< 0.001
$CAPR1_{i,t-1}$			0.000	0.274	0.149	0.191
$CO_{i,t}$			0.702	< 0.001	0.675	< 0.001
$ALW_{i,t-1}$			0.000	0.690	0.000	0.124
ΔGDP_t	0.004	0.098	-0.008	< 0.001	-0.003	0.087
$\Delta UNEMP_t$	-0.001	0.055	-0.001	< 0.001	-0.001	0.043
$CSRET_t$	0.002	0.003	0.003	< 0.001	0.003	< 0.001
Constant	-0.000	0.001	-0.000	< 0.001	-0.000	< 0.001
Year Fixed Effects	Yes		Yes		Yes	
Adjusted R-squared	0.144		0.543		0.548	
Observations	94,031		94,031		94,031	

p-values are computed using standard errors clustered by firm.

Table 7 Continued

Panel B: Test of H4b

$$LLPi,t = \beta_0 + \beta_1 SENTIMENT_t \times CO_{i,t+1} + \beta_2 CO_{i,t+1} + \beta_3 SENTIMENT_t + \beta_4 SENTIMENT_{t-1} + \beta_5 LLPt\text{-}1 + \beta_6 \Delta NPA_{i,t+1} + \beta_7 \Delta NPA_{i,t} + \beta_8 \Delta NPA_{i,t-1} + \beta_9 \Delta NPA_{i,t-2} + \beta_{10} SIZE_{i,t-1} + \beta_{11} \Delta LOAN_{i,t} + \beta_{12} EBP_{i,t} + \beta_{13} CAPR1_{i,t-1} + \beta_{14} CO_{i,t} + \beta_{15} ALW_{i,t-1} + \beta_{16} \Delta GDP_t + \beta_{17} \Delta UNEMP_t + \beta_{18} CSRET_t + \text{Year Fixed Effects} + \varepsilon_{i,t}$$

Variables	$LLP_{i,t}$							
	(i)		(ii)		(iii)		(iv)	
	Coeffic.	*p*-value	Coeffic.	*p*-value	Coeffic.	*p*-value	Coeffic.	*p*-value
$SENTIMENT_t \times CO_{i,t+1}$	-0.047	0.458						
$HIGH\_SENT_t \times CO_{i,t+1}$			-0.026	0.007				
$SENTIMENT_t \times CO_{i,t+1234}$					-0.468	0.001		
$HIGH\_SENT_t \times CO_{i,t+1234}$							-0.024	< 0.001
$CO_{i,t+1}$	0.123	< 0.001	0.135	< 0.001				
$CO_{i,t+1234}$					0.054	< 0.001	0.066	< 0.001
$SENTIMENT_t$	-0.002	0.007			0.000	0.951		
$HIGH\_SENT_t$			-0.000	< 0.001			-0.000	0.042
$SENTIMENT_{t-1}$	-0.001	0.302	-0.003	< 0.001	-0.002	0.002	-0.004	< 0.001
$LLP_{i,t-1}$	0.051	< 0.001	0.054	< 0.001	0.041	< 0.001	0.045	< 0.001
$\Delta NPA_{i,t+1}$	0.020	< 0.001	0.020	< 0.001	0.012	< 0.001	0.012	< 0.001
$\Delta NPA_{i,t}$	0.043	< 0.001	0.043	< 0.001	0.037	< 0.001	0.037	< 0.001
$\Delta NPA_{i,t-1}$	0.013	< 0.001	0.013	< 0.001	0.010	< 0.001	0.010	< 0.001
$\Delta NPA_{i,t-2}$	0.013	< 0.001	0.013	< 0.001	0.012	< 0.001	0.012	< 0.001
$SIZE_{i,t-1}$	0.000	< 0.001	0.000	< 0.001	0.000	< 0.001	0.000	< 0.001
$\Delta LOAN_{i,t}$	0.005	< 0.001	0.005	< 0.001	0.005	< 0.001	0.005	< 0.001
$EBP_{i,t}$	-0.033	0.001	-0.033	< 0.001	-0.029	< 0.001	-0.028	< 0.001
$CAPR1_{i,t-1}$	0.000	0.073	0.000	0.075	0.000	0.018	0.000	0.021
$CO_{i,t}$	0.647	< 0.001	0.645	< 0.001	0.621	< 0.001	0.617	< 0.001
$ALW_{i,t-1}$	-0.000	0.001	-0.000	0.001	-0.000	< 0.001	0.000	0.021
ΔGDP_t	-0.005	0.005	-0.007	< 0.001	-0.005	0.008	-0.007	< 0.001
$\Delta UNEMP_t$	-0.001	0.002	-0.001	0.001	-0.001	0.001	-0.001	< 0.001
$CSRET_t$	0.003	< 0.001	0.003	< 0.001	0.003	< 0.001	0.002	0.001
Constant	-0.001	< 0.001	-0.000	< 0.001	-0.001	< 0.001	-0.000	< 0.001
Year Fixed Effects	Yes		Yes		Yes		Yes	
Adjusted R-squared	0.559		0.559		0.558		0.560	
Observations	94,031		94,031		91,519		91,519	

See Appendix A for variable definitions and measurements. *p*-values are computed using standard errors clustered by firm.

Table 7 Continued

Panel C: Test of H4c

$$LLP_{i,t} = \beta_0 + \beta_1 SENTIMENT_t \times HIGH\_UNCERTAINTY_i + \beta_2 HIGH\_UNCERTAINTY_i + \beta_3 SENTIMENT_t + \beta_4 SENTIMENT_{t-1} + \beta_5 LLP_{t-1} + \beta_6 \Delta NPA_{i,t+1} + \beta_7 \Delta NPA_{i,t} + \beta_8 \Delta NPA_{i,t-1} + \beta_9 \Delta NPA_{i,t-2} + \beta_{10} SIZE_{i,t-1} + \beta_{11} \Delta LOAN_{i,t} + \beta_{12} EBP_{i,t} + \beta_{13} CAPR1_{i,t-1} + \beta_{14} CO_{i,t} + \beta_{15} ALW_{i,t-1} + \beta_{16} \Delta GDP_t + \beta_{17} \Delta UNEMP_t + \beta_{18} CSRET_t + \text{Year Fixed Effects} + \varepsilon_{i,t}$$

Variables	$LLP_{i,t}$			
	St. Dev. of CO		*St. Dev. of ΔNPA*	
	Coeffic.	*p*-value	Coeffic.	*p*-value
$SENTIMENT_t \times HIGH\_UNCERTAINTY_i$	-0.003	0.019	-0.002	0.082
$HIGH\_UNCERTAINTY_i$	0.000	< 0.001	0.000	< 0.001
$SENTIMENT_t$	-0.003	< 0.001	-0.003	< 0.001
$SENTIMENT_{t-1}$	-0.001	0.343	-0.001	0.375
$LLP_{i,t-1}$	0.073	< 0.001	0.076	< 0.001
$\Delta NPA_{i,t+1}$	0.018	< 0.001	0.018	< 0.001
$\Delta NPA_{i,t}$	0.047	< 0.001	0.047	< 0.001
$\Delta NPA_{i,t-1}$	0.016	< 0.001	0.016	< 0.001
$\Delta NPA_{i,t-2}$	0.016	< 0.001	0.015	< 0.001
$SIZE_{i,t-1}$	0.000	< 0.001	0.000	< 0.001
$\Delta LOAN_{i,t}$	0.004	< 0.001	0.004	< 0.001
$EBP_{i,t}$	-0.032	< 0.001	-0.032	< 0.001
$CAPR1_{i,t-1}$	0.000	0.048	0.000	0.071
$CO_{i,t}$	0.666	< 0.001	0.671	< 0.001
$ALW_{i,t-1}$	-0.000	0.080	-0.000	0.180
ΔGDP_t	-0.004	0.050	-0.004	0.061
$\Delta UNEMP_t$	-0.001	0.031	-0.001	0.037
$CSRET_t$	0.003	< 0.001	0.003	< 0.001
Constant	-0.001	< 0.001	-0.001	< 0.001
Year Fixed Effects	Yes		Yes	
Adjusted R-squared	0.550		0.549	
Observations	94,009		94,009	

p-values are computed using standard errors clustered by firm.