# Bank Transparency and Deposit Flows*

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**Abstract:** Many theories link depositors' behavior to the transparency of banks. Yet, very little is known about this relationship empirically. Analyzing US commercial banks from 1994-2013, we document that uninsured deposit flows are more sensitive to information about bank performance when the quality of the information provided by the bank is higher. We also provide evidence linking this information quality to deposit rates, banks' investments, and profitability. Our findings provide support for the view that bank transparency is a double-edged sword: While more information facilitates monitoring by depositors, it also adversely affects banks' unique role in creating stable liquid assets for depositors.

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## 1. Introduction

There is a longstanding debate about the desirability of bank transparency.[1] The debate is powered by different theories that prescribe different roles to banks. A key premise in the theories underlying both sides of the debate is that banks' transparency about the quality of their assets affects the behavior of their depositors. The main goal of this paper is to examine this premise empirically.

Two sets of theories tend to reach different conclusions on the desirability of bank transparency. On the one hand, the benefits of transparency are based on theories highlighting the value generated by banks on the asset side of their balance sheet (e.g., Diamond, 1984; Calomiris and Kahn, 1991; Diamond and Rajan, 2001). Under these theories, banks generate value by monitoring borrowers, but are subject to agency problems in relation with their external claimholders. Transparency makes it easy for the claimholders to see what banks are doing and so facilitates the banks' monitoring role.[2] On the other hand, the costs of transparency are highlighted in theories where banks create value on the liability (deposit) side. This perspective emphasizes depositors' demand for money-like safe and liquid securities whose value does not fluctuate with the underlying assets because such securities help depositors share liquidity risks and create medium of exchange without fear of adverse selection (e.g., Diamond and Dybvig, 1983; Gorton and Pennacchi, 1990; Goldstein and Pauzner, 2005). Under this view, banks can meet this demand precisely because they are able to keep information about their assets hidden (Dang et al, 2017).[3]

[1] See reviews by Landier and Thesmar (2011), Goldstein and Sapra (2014), and Acharya and Ryan (2016).
[2] Motivated by such considerations, regulators tend to demand more transparency in banks. A key component of the regulatory framework (Basel III) adopted after the 2008 crisis is to strengthen transparency. One development of financial regulation following the crisis, banks' stress tests, imposes substantial new disclosure requirements.
[3] Gorton et al. (2012) find that 35% of the economy wide financial assets take the form of safe debt and that a non-trivial component of this demand is met by the banking sector in the form of demand deposits. Similarly, evidence from Berger and Bouwman (2009) and Egan, Lewellen, and Sunderam (2017) indicate that banks with higher

Both lines of theories rely on the idea that depositors, who provide 70% of bank funding (Hanson et al., 2015), respond to bank transparency. In particular, the flow of deposits will be more sensitive to bank performance when the bank's transparency is higher. In the asset-based theories, this is good since it indicates depositors' ability to monitor bank managers. But, in the liability-based theories, this informational sensitivity is bad since it reflects lower ability of the bank to provide liquid money-like assets whose value does not fluctuate with bank assets. Despite the vast theoretical literature, the empirical literature so far has not provided any evidence that the sensitivity of deposit flows to performance is indeed related to bank transparency. This is the gap we aim to fill in this paper.

We focus on bank earnings as the summary information for bank performance. This is because earnings is the main metric investors and regulators use to assess banks' financial health, and there is considerable cross-bank variation in how informative it is about deteriorations in banks' asset quality (Ryan, 2012). We measure the informativeness (transparency) of bank earnings by the ability of its main components to predict future bank loan write-offs. This measure is the adjusted R-squared from a regression of bank loan write-offs on the various pieces of information disclosed by the bank. We create this measure for every bank at every point in time based on recent history of disclosures and realizations. We refer to our measure as the *R2* measure and relegate a detailed description of its construction to Section 2. Everything else equal, banks with higher *R2*s are more transparent as their earnings contain more information about their asset quality. For a large sample of U.S. commercial banks from 1994-2013, we find that the *R2* measure varies substantially across banks. These differences cannot be explained, by and large, by

liquidity transformation ability and deposit productivity create more value. Gorton (2014) analyzes the history of the U.S. banking and argues that opacity has been important for the U.S. banks to retain their ability to create money.

observable differences in bank characteristics such as size or asset composition, suggesting that the *R2* measure captures a distinct aspect of banks' information environment.

Our main result is a statistically significant positive relation between the *R2* measure and the sensitivity of uninsured deposit flows to bank performance, particularly for poorly performing banks. The economic magnitude is also significant: a one-standard deviation increase in *R2* is associated with nearly 17% increase in the flow-performance sensitivity. These findings suggest that uninsured depositors are alert to the information about bank health and respond more strongly to it when this information becomes more precise. They also imply that any changes in banks' fundamental volatility would be met with even stronger volatility in uninsured deposit flows at transparent banks. Indeed, we find that greater flow-performance sensitivity at high *R2* banks also manifests in unconditionally more volatile uninsured deposit flows.

We also explore the behaviors of insured depositors who should be less concerned about bank performance. Indeed, recent evidence suggests that insured deposits can substitute for the loss of uninsured deposits in poorly performing banks (Martin, Puri, and Ufier, 2018). Consistent with the substitution effect, we find that the sensitivity of insured deposit flows to bank performance is negatively related to the *R2* measure, particularly in times of poor performance. The differential response of uninsured and insured deposits mitigates concerns about omitted correlated variables. For example, one might be concerned that stickier uninsured flows at low *R2* banks may be a result of better service quality offered by such banks. To the extent that both uninsured and insured depositors are similarly affected by service quality, this analysis suggests that service quality, or other related unobserved bank characteristics, cannot explain our results.[4]

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[4] In a similar spirit, we also find that the positive effect of *R2* on the sensitivity of uninsured deposit flow to performance is significant only in banks with sufficiently large uninsured depositors. While large uninsured depositors should care more about bank performance compared to smaller uninsured depositors, to the extent that

To gain a better understanding of the results on uninsured and insured deposit flows, it is important to also examine the association between banks' deposit rates and the *R2* measure. As expected, we find that banks tend to increase deposit rates following poor performance in an attempt to keep depositors in. More interesting to our study, we find that deposit rates are more sensitive to bank performance in transparent banks. Hence, transparent banks act to substitute the outflow of uninsured deposits in times of poor performance by attracting insured deposits with higher rates. The substitution appears to be effective, as the sensitivity of total deposits to bank performance does not significantly vary by transparency. However, the substitution comes at a cost because of the higher deposit rates and insurance premium. Indeed, we find that higher *R2* is associated with higher deposit rates, suggesting that transparent banks face higher costs of deposit funding.

The results thus far establish that the basic force underlying the deposit channel of transparency, that it affects depositors' response to information about bank performance, is strongly present in the data. These results are equally consistent with the two lines of theories mentioned above. That is, the greater sensitivity of deposit flows to performance is an indication of greater monitoring but also an indication of the deterioration of the ability of banks to provide stable liquid assets to depositors. We next extend the analysis to explore other implications for banks' operations that can shed more light on the net effect of these two forces.

First, we examine the way in which transparency affects banks' ability to fund growth opportunities in illiquid assets without relying on internal equity. The two theories make opposite predictions here. According to the asset-centric monitoring view, more transparent banks can rely

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these two kinds of uninsured depositors do not differ much in their preferences for other bank attributes such as service quality, this analysis also mitigates concerns about omitted correlated variables.

more on deposits and less on internal equity when funding illiquid assets than opaque banks since their depositors can provide more reliable monitoring. On the other hand, according to the liability-centric liquidity view, greater transparency makes deposits less attractive and more expensive, forcing banks to rely more on internal equity to finance the growth in illiquid assets (Dang et al., 2017). We find results consistent with the second view: the growth in illiquid assets in transparent banks is more closely tied to the availability of internal equity financing than that in opaque banks. In contrast, and as expected, transparency has no such effect for growth in liquid assets.

Second, we find that transparency is negatively associated with bank profitability. This result holds after controlling for proxies of banks' risk and observable differences in banks' asset compositions. This result is again consistent with the idea that the net effect of transparency is to reduce banks' comparative advantage in raising cheap, stable deposits to fund higher yield illiquid loans. Hence, transparency hurts banks' (risk-adjusted) profitability. On the other hand, there is no clear way to fit this result under the monitoring view of transparency alone, as according to this view, risk-adjusted profitability should be expected to increase with greater transparency.

It should be noted that our analysis aims to evaluate the link between transparency and various banks' outcomes in equilibrium. We do not rely on a shock to transparency. A couple of recent papers looked at such shocks using changes in regulatory disclosure regimes either during the national banking era (e.g., Granja, 2018) or outside of the U.S. (e.g., Ertan, et al. 2017) to address different questions. We do not think such clear changes in regulatory regimes for a broad base of banks are available for the last few decades in the U.S., which is where the sample for our analysis on deposit flows comes from. More importantly, we think that the ability to find shocks to transparency or informativeness in the data is more generally limited, since it is not at all clear that regimes requiring more disclosure necessarily result in more informative disclosure that depositors would respond to. After all, the true informativeness of banks' disclosures is difficult to enforce and the fact that banks are forced to provide more details does not necessarily imply that the quality of their predictions improves. Hence, in our approach, we just let the data speak to whether depositors respond to the disclosure (bank earnings in our case) and examine whether the degree of response is related to the informativeness of disclosure, which we measure using the accuracy of what is actually disclosed. The relations we uncover in the data between transparency and bank outcomes are quite informative for the theories of banking, as discussed above, even without insisting on a causal interpretation.

Another important point is that we take the level of information quality as given and do not examine what economic forces determine equilibrium differences in the *R2* measure across banks. As mentioned above, usual bank characteristics do not go very far in explaining the observed differences in transparency. Our approach has little bearing on the interpretation of analysis of depositors' behavior: i.e., from the depositors' standpoint, the informativeness of a bank's disclosure is an exogenous bank characteristic that they take into account when they respond to the disclosure. Thus, regardless of the determinants of transparency, our main findings stand: depositors react more strongly to more informative signals about bank asset quality, and the resulting effects on banks' operations are economically important and need to be taken into account when evaluating policies affecting banking transparency.

Our paper relates to prior banking studies examining the extent of depositor discipline and stability. Several studies find evidence of greater deposit withdrawals in banks with poorer performance (Gorton, 1988; Goldberg and Hudgins, 1996; Saunders and Wilson, 1996; Calomiris and Mason, 1997; Martinez Peria and Schmukler, 2001) and evidence of significant fragility

(Egan, Hortacsu and Matvos; 2017).[5] At the same time, Martin, Puri, and Ufier (2018) find that banks are largely able to offset the loss of uninsured deposits through gains in insured deposits as they approach failure. Relatedly, findings in Drechsler, Savov, and Schnabl (2017, 2018) indicate that banks benefit from depositor stability, and that banks' market power over their depositors allows them to increase deposit spreads in response to fed fund rate increases. Our study contributes to this literature by providing the first large sample study linking transparency to the sensitivity of deposit flows to bank performance. Our results are consistent with the idea that banks value deposit stability and take actions to attract insured deposits to substitute for the uninsured deposits. More importantly, our results imply that the costs of achieving deposit stability are higher in more transparent banks.

Our study is closely related to prior papers that examine the monitoring benefits of transparency. These papers quantify transparency either by how timely bank managers incorporate their private information into financial reporting (Beatty and Liao, 2011; Bushman and Williams, 2012, 2015) or by changes in regulatory disclosure regimes (Granja, 2013, 2018; Ertan et al., 2017; Balakrishnan and Ertan, 2017). We focus on the information quality aspect of transparency and directly examine its effect on depositors' behaviors, which are central in the theory of banking but are absent from these papers. Our finding that better information quality heightens the response of uninsured deposit flows to bank performance provides a mechanism for how transparency can facilitate monitoring. At the same time, our analyses on the effect of transparency on bank operations and profitability also reveal that transparency can make it more costly for banks to perform their liquidity transformation role.

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[5] Some other papers examine depositor responses and the role of deposit insurance in specific bank runs: Iyer and Puri (2012); Iyer, Puri, and Ryan (2016); Iyer, Jensen, Johannesen, and Sheridan (2019); Brown, Guin, and Morkoetter (2017).

Finally, our paper relates to the broader empirical work on economic consequences of disclosure by non-financial firms in general. Prior works show that greater disclosure benefits firms by reducing information asymmetries and constraining managerial misbehavior (e.g., Leuz and Verrecchia 2000; Greenstone et al., 2006). Recent works also highlight the costs of greater disclosure in the form of distorted long-term decision making (Kraft et al., 2018; Agarwal et al., 2018), revelation of information to competitors (e.g., Bernard, 2016; Li et al., 2018), and crowding out of production of decision relevant information in stock prices (Jayaraman and Wu, 2019). As we highlight above, there are different costs for banks, given their liquidity transformation role.

## 2. Information Quality Measure and Empirical Specification

### *2.1. Information quality measure*

We measure transparency by the ability of key accounting performance measures to reveal information about banks' asset quality. This approach is consistent with the theoretical framework in Dang et al. (2017) who model transparency as the ease (or cost) with which depositors can acquire information about the future performance of bank assets. Depositors' information acquisition costs are expected to be lower when disclosures are more informative and minimize the need for any additional costly investigations.[6]

We focus on accounting disclosures because they constitute the main source of information for outside investors, particularly for private banks for which other information channels such as analyst reports, conference calls, and stock price valuations are not available.[7] We obtain accounting data from Call Reports, which all banks are required to file with the regulators.

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[6] Information acquisition costs should also be lower when depositors are more sophisticated and have greater ability to process information. We also explore this notion of transparency in additional analyses reported later and find similar inferences.

[7] Later, in Section 5, we evaluate the possibility of other information sources confounding our inferences. Several analyses reveal that this possibility is quite remote.

Specifically, our measure captures the extent of uncertainty resolved by Call Reports about future defaults on a bank's loan portfolio. To illustrate the idea, consider the decision problem at time *t* of the depositor of a bank that holds a portfolio of fixed rate loans that will mature and pay $P_{t+1}$ in the absence of defaults at $t+1$. The depositor needs to decide whether to withdraw money now at $t$ or wait till $t+1$ to receive the proceeds when the loan portfolio matures. Let random variable $\widetilde{D}_{t+1}$ denote the amount of defaults the bank will experience at $t+1$. The depositor's decision will depend on her assessment of the amount bank can collect at $t+1$ (i.e., $\tilde{V}_{t+1} = P_{t+1} - \widetilde{D}_{t+1}$). Let $\Omega_t$ be the information depositor gleans from the Call Report at time *t* about $\tilde{V}_{t+1}$. The quality/informativeness of $\Omega_t$ can be measured by the proportion of uncertainty about $\tilde{V}_{t+1}$ (or equivalently, $\widetilde{D}_{t+1}$) that it helps the depositor resolve:[8]

$$Information\ Quality \equiv \frac{Var(\tilde{V}_{t+1}) - Var(\tilde{V}_{t+1}|\Omega_{\mathrm{t}})}{Var(\tilde{V}_{t+1})} = \frac{Var(\widetilde{D}_{t+1}) - Var(\widetilde{D}_{t+1}|\Omega_{\mathrm{t}})}{Var(\widetilde{D}_{t+1})} \quad (1)$$

Empirically, we estimate this measure as the (adjusted) R-Squared from bank-specific regressions of future defaults (proxied using loan write-offs) on accounting disclosures in Call reports relevant for predicting defaults.[9] The main accounting disclosure of focus is earnings, which is the key summary performance measure available to outsiders to update views about future prospects. We decompose earnings into two components to account for their differential information content for future defaults: loan loss provisions (*LLP*) and earnings before loan loss provisions (*EBLLP*). *LLP* is the key component in bank earnings that contains information about

[8] The second equality in expression (1) reflects the idea that once banks have determined the loan portfolio composition and set contractual terms (including interest rates), the bulk of the uncertainty regarding asset payoffs relates to future defaults.
[9] In information theory, how informative a random variable Y is about X is quantified by the amount of mutual information between Y and X, i.e., I(X,Y)=H(X) – H(X|Y) where H(X) is the marginal entropy for X and H(X|Y) is the conditional entropy (Cover and Thomas, 2012). Regression R-squared corresponds to a scaled version of mutual information (Veldkamp, 2011) and has been used in prior research (e.g., Roll, 1988; Chen et al, 2007; Bai et al, 2016).

future defaults. *LLP*s for period *t* are banks' best estimate for credit losses attributable to originating and holding loans during the period, and is recorded as an expense in the income statement. The accounting rules require that *LLPs* not only include losses from certain defaults but also incorporate banks' information about uncertain future defaults.[10] A large accounting literature has shown that *LLP* is an important performance indicator for banks and there is considerable cross-bank variation in how effectively it captures current and future loan portfolio deteriorations (e.g., Wahlen, 1994, Bhat, Lee and Ryan, 2019).

The majority of *EBLLPs* relates to the interest income on bank loans, which under the US Generally Accepted Accounting Principles is recorded as interest revenue over the life of the loan using the amortized cost method. Once the loans have been granted, this item exhibits little variation as it is simply recorded over the life of the loan based on the contractually specified interest rates. However, *EBLLP* may capture information that is incremental to *LLP*. For example, an aggressive growth in revenues may indicate lowering of lending standards and, consequently, more future defaults. We include two lags of *EBLLPs* and *LLPs* after scaling them by lagged total loans.

We also include two items outside of the income statement to proxy for additional information conveyed in bank disclosures that is not fully captured by *EBLLPs* and *LLPs*: (i) two lags of changes in non-performing loans ($\Delta NPL$) and (ii) book value of equity scaled by assets (*Capital*). *NPL*s are typically defined to be loans that are 90-days past due.[11] An increase in *NPL* therefore indicates the presence of problematic loans and increased probability of default. Unlike

[10] During our sample period, banks are required to follow the incurred loss model specified under US generally accepted accounting principles (GAAP) for estimating *LLPs*. See Ryan (2012) for a detailed discussion of the incurred loss model and its application.

[11] *NPL* is defined by banking regulators and not an accounting concept defined by US GAAP. A common definition considers a loan to be non-performing when the payment is 90-days past due, although it differs across jurisdictions.

*LLP*s, which convey information about the dollar value of credit losses by taking into account both the probability of default and the amount of loss given default, *NPLs* do not incorporate information about loss given default. Furthermore, unlike *LLPs*, *NPLs* (due to its mechanical definition) do not incorporate information about future credit losses that bank managers may be aware of for loans not 90-days past due yet. We include capital ratio based on prior findings suggesting that it is an important predictor for future loan portfolio performance (Wahlen, 1994).

We measure future defaults ($\widetilde{D}_{t+1}$) using gross loan write-offs (or charge-offs), which represent the dollar amount of gross loans that are deemed to be uncollectible by banks in a period. Intuitively, write-offs can be thought of as future realization of the estimated loan-losses recorded in previous periods in the form of *LLP*s.[12] To allow for the possibility that past signals of loan quality deterioration (e.g., *LLPs* or *NPLs*) may not manifest immediately in the form of write-offs in the next future quarter, we use the cumulative write-offs over the two quarters (*t and t+1)* following the end of quarter *t-1*.[13]

To summarize, our measure of the informativeness of bank earnings is the adjusted R-squared ($R2$) from Eqn. (2) below, estimated for each bank-quarter using observations over the previous 12 quarters:

$$WriteOff_t = \alpha_0 + \sum_{k=1}^{2}(\delta_k EBLLP_{t-k} + \beta_k LLP_{t-k} + \gamma_k \Delta NPL_{t-k}) + \rho Capital_{t-1} + \varepsilon_t \quad (2)$$

[12] $LLP_t$ reduces the reported income for period t, whereas $NPL_t$ and write-offs do not. Among the three, $LLP_t$ is affected the most by accounting rules, whereas $NPL_t$ and write-offs are relatively free from accounting choices.

[13] This approach is also consistent with the regulatory guidance for consumer loans. Specifically, the guidance specifies that consumer loans must be written-off no later than the specified number of days past due: 120 days past due for closed-end consumer loans and 180 days past due for open-end consumer loans and residential mortgages (see Federal Financial Institutions Examination Council's policy dated June 12, 2000). In sensitivity tests reported later, we obtain similar inferences when we measure write-offs over the next 4 quarters.

Two features of the *R2* measure are worth emphasizing. First, a bank can have a low *R2* either because the bank holds more opaque assets whose defaults are inherently difficult to predict for bank management, or because the bank strategically chooses not to fully reveal its private information in the estimates of *LLP*. We view this to be an appealing feature of the measure because from the perspective of depositors' decision-making, it does not matter whether depositors' lack of information results from inherently opaque assets or strategic withholding of information.[14] Thus, the R-squared is a summary measure of how much depositors are in the dark about the quality of banks' assets as in Dang et al. (2017). In additional analyses discussed later, we also explore the measure from the accounting literature (Beatty and Liao, 2011; Bushman and Williams, 2012, 2015) that is designed to capture the extent to which banks reveal their private information.

Second, a low R-squared doesn't necessarily imply that banks are riskier (i.e., higher $Var(\tilde{D})$). This is because the R-squared measures the proportion of the uncertainty that depositors can resolve about banks' future loan portfolio performance (i.e., $\frac{Var(\tilde{D})-Var(\tilde{D}|\Omega_d)}{Var(\tilde{D})}$), not the unconditional uncertainty of default ($Var(\tilde{D})$) itself. Indeed, we find that R-squared and write-off volatility exhibit a relatively modest correlation of 0.10 (Table 1, Panel B). Nevertheless, we control for inherent uncertainty in bank fundamentals to ensure that our results are not driven by any mechanical relation between *R2* and the fundamental uncertainty.

*2.2 Empirical specification*

[14] The distinction becomes relevant if one wants to evaluate the effect of specific accounting and disclosure standards designed to alter the revelation of bank managers' private information. The purpose of this study, however, is to study depositor behaviors (and their resulting consequences) when depositors can obtain more information, regardless of its source.

Our investigation of the effect of *R2* on depositor behavior primarily focuses on uninsured depositors. Under asset centric theories, lack of insurance motivates these depositors to monitor bank performance; under liability centric perspective, uninsured deposits capture the ability of banks to create money like securities without the support of government backed deposit insurance. Therefore, under both theories one important channel for information quality to affect banks is by affecting the sensitivity of uninsured depositors to bank performance.[15]

Our empirical specification is motivated from a simple model of depositor behavior used in prior research (e.g., Egan et al., 2017). This model is based on the idea that a bank will experience deposit growth when it offers greater utility to depositors compared to other banks and/or when there is general increase in demand for deposits. The utility that a depositor derives from a bank depends on the bank's default risk, deposit rate offered, and service quality. Thus, deposit growth at a bank can be considered a function of four factors: (i) default risk, (ii) deposit rate, (iii) service quality, and (iv) changes in aggregate demand for deposit. As depositors periodically receive information about banks performance from Call reports, they update their views about banks' underlying asset quality, and consequently, default risk.

Under this framework, information quality of Call reports affects depositors' decision by affecting their perceptions about banks' default risk. A dollar of earnings shock at a high *R2* bank (i.e., a bank whose earnings are more predictive about future default) will lead to a larger change

[15]A potential concern is that even uninsured depositors may be implicitly insured by the government. As noted in Benston and Kaufman (1997), before the enactment of FDIC improvement act (FDICIA) in 1991, "the FDIC almost always financed the purchase and assumption of all liabilities of resolved insolvent institutions by other banks, particularly larger banks, thereby fully protecting depositors with uninsured funds at these institutions." However, Benston and Kaufamn (1997) further note that FDICA effectively ended the FDIC's policy of protecting uninsured depositors and they report evidence of increased incidence of FDIC leaving uninsured depositors unprotected in bank failures after 1991. Furthermore, even if a failed bank has enough assets to pay both insured and uninsured depositors, uninsured depositors likely have to wait longer to recover money (https://www.fdic.gov/consumers/banking/facts/payment.html) and therefore experience greater loss of liquidity. It is therefore reasonable to expect uninsured depositors to be more concerned about bank performance.

in depositors' beliefs about default risk compared to the effect of same earnings shock at a low *R2* bank. Therefore, a low (high) earnings report will lead to a larger reduction (increase) in deposits at a high *R2* bank compared to a low *R2* bank. In other words, we expect the deposit flows to be more sensitive to earnings performance at high *R2* banks.[16]

We test this prediction using the following specification:

$$\Delta Dep_{it} = \alpha_i + \beta_0 ROE_{i,t-1} + \beta_1 R2_{i,t-1} * ROE_{it-1} + \beta_2 R2_{i,t-1} + \Gamma X + \varepsilon_{i,t}, \quad (3)$$

where $\Delta Dep_{it}$ is the deposit flows measured as the changes in bank $i$'s deposit balances over period *t* scaled by the beginning of period assets; $ROE_{i,t-1}$ is bank $i$'s net income during period *t-1* scaled by book value of equity and is our measure for bank performance that depositors observe at the end of quarter $t$-$1$;[17] $R2_{i,t-1}$ is the information quality measure discussed earlier and measured at the end of quarter $t$-$1$.

The key coefficient of interest in Eqn. (3) is $\beta_1$, which measures how the sensitivity of deposit flows to bank performance varies by the informativeness of bank earnings. We focus on the flow-to-performance sensitivity because it can directly inform whether the basic force underlying both the asset-centric and liability-centric views of transparency is present in the data. From the asset-centric view, a positive sensitivity indicates that depositors discipline poorly performing banks by voting with their feet. A positive effect of transparency on the sensitivity implies that the discipline is more intense when earnings are more informative. From the liability-centric view, deposits carry value because they can be used as money-like securities whose value does not fluctuate the asset side of banks' balance sheet. A positive flow-to-performance

[16] This prediction follows directly from the Bayesian updating rule. This approach has been used in prior literature to examine how information quality affects individual behaviors (e.g., Chen et al., 2005; Chen et al., 2007).

[17] We use *ROE* as the performance measure because our *R2* measure is designed to capture how informative components of net incomes are for loan quality. In tests reported later we find our inferences to be robust to alternative performance measures.

sensitivity indicates that the expected value of aggregate depositors' claims fluctuates with the value of banks' assets. Thus, greater flow-performance sensitivity at more transparent banks would indicate that the deposit claims at these banks would have less appeal as a safe money like security.[18]

We measure deposit flows as the changes in deposit balances over the two quarter period following the end of quarter *t-1*, scaled by the beginning of the period asset value. This is to account for the fact that most banks typically file call reports with a delay of 30 days after the calendar quarter ending (Badertscher et al., 2018) and to allow sufficient time for depositors to respond.[19] In addition, we cluster standard errors at bank level, which adjusts for arbitrary forms of correlations between observations for the same bank that might result from overlapping windows for flow measurement.

We also take into account the effect of the other three factors (deposit rate, service quality, and aggregate deposit demand shifts) that affect deposit growth. We directly control for the deposit rates offered at the bank level (*Deposit Rate*). Because the Call reports do not separately report the interest expenses on insured and uninsured deposits, we use the core deposit rate to proxy the rates offered on insured deposits and the rate on large time deposit to proxy the rates on uninsured deposits. We believe this is a reasonable approximation because core (large time) deposits are most

[18] Flow-performance sensitivity can also be interpreted in the framework of Dang et al. (2017). Specifically, Dang et al. (2017) show that banks create value by facilitating intertemporal risk-sharing between depositors with consumption needs in different time periods and transparency reduces banks' risk-sharing capacity. Flow-performance sensitivity under this view captures whether banks' ability to rollover deposits from early to late consumers depends on performance fluctuations. When there is little to no flow-performance sensitivity, it indicates that late consumers are willing to rollover debt regardless of bank performance, which facilitates risk-sharing. A positive effect of transparency on flow-performance sensitivity indicates that transparent banks' ability to rollover deposits depends on bank performance, which reduces intertemporal risk-sharing among depositors between good and bad state, as predicted by Dang et al. (2017).

[19] The literature on post earnings announcement drift suggests that investors react to quarterly accounting reports with a delay of up to a quarter following the announcement (e.g., Bernard and Thomas, 1989).

likely to be insured (uninsured).[20] We measure these rates as the quarterly interest expense on the deposits divided by the average quarterly deposits over the same period.

We include bank fixed effects ($\alpha_i$), which should fully absorb any time-invariant differences in service quality across banks.[21] Following prior work (e.g., Acharya and Mora, 2015), our specifications also include a comprehensive set of controls for time-varying bank characteristics. To the extent these bank characteristics (e.g., bank size) are correlated with service quality, these controls should further mitigate concerns about the confounding effect of service quality. We control for the following bank characteristics: (i) capital ratio defined as book value of capital scaled by total assets (*Capital Ratio*), (ii) wholesale funding scaled by total assets (*Wholesale Funding*), (iii) the ratio of total unused commitments divided by the sum of total loans and unused commitments (*Unused_Commitments*), (iv) real estate loan share calculated as the amount of loans secured by real estate divided by total loans (*RealEstate_Loans)*, (v) the logarithm of asset size (*Ln(Assets)*), and (iv) the standard deviation of write-offs (measured over the same time period as the *R2* measure).[22] Because our inferences relate to the coefficient on the interaction of *R2* with *ROE*, we also include the interactions of all of these control variables with *ROE* in our regressions.

Lastly, we address the effect of shifts in aggregate demand for deposits. Aggregate demand for deposits can go up when corporates/individuals have greater aggregate wealth available for investments and/or when they allocate a larger portion of this wealth to deposits. Consistent with

[20] Until March 31, 2011, core deposits were defined in the Uniform Bank Performance Report (UBPR) User Guide as the sum of demand deposits, all NOW and automatic transfer service (ATS) accounts, money market deposit accounts (MMDAs), other savings deposits, and time deposits under $100,000. As of March 31, 2011, the definition was revised to reflect the permanent increase to FDIC deposit insurance coverage from $100,000 to $250,000 and to exclude insured brokered deposits from core deposits.

[21] An alternative approach is to replace bank fixed effects with lagged dependent variable. As shown in the Online Appendix, our main results are robust to this alternative specification.

[22] We also use the standard deviation of *ROEs* in sensitivity analysis and find similar results (not tabulated).

the latter, Dreschsler et al. (2017) and Lin (2019) find that a smaller portion of wealth is allocated to deposits when treasury securities and stock markets offer higher returns. Because our main interest is in examining how depositor behavior varies within the banking system as a function of bank specific *R2*, aggregate trends in deposits growth are unlikely to confound our inferences. Nevertheless, we include contemporaneous and lagged fed funds rates and the value-weighted market returns to control for these opportunity costs of holding bank deposits. Although not our preferred specification, we also show that our results are robust to inclusion of time dummies, which flexibly absorb any secular trends in deposit growth.[23]

As with any regression analysis, to the extent our control variables are not perfect, a potential concern relates to omitted correlated variables. For example, one may be concerned that our controls do not fully absorb time-varying dimension of service quality. To the extent service quality is correlated with *R2* (although it is not clear why this may be the case) and deposits are stickier in banks with better service quality, we may erroneously interpret the effect of *R2* as evidence of the effect of information quality.

Two features of our research design further address this concern. First, we contrast the behavior of uninsured depositors with insured depositors. Unlike uninsured depositors, insured depositors should be less sensitive to bank performance, but should still care about service quality (or other relevant bank attributes beyond default risk). Therefore, if *R2* is simply capturing the effect of such omitted correlated factors, we should find similar results for uninsured and insured deposits. Second, we conduct a similar analysis by exploiting heterogeneity across banks in the

[23] Including time dummies would preclude us from studying the depositor response to changes in bank performance that result from common macroeconomic shocks. This is problematic because of the cyclical nature of the banking industry where many of the significant performance swings result from common macroeconomic shocks. Furthermore, we are interested in the deposit response to the absolute level of a bank's performance and not just to performance relative to macro conditions. This is because uninsured depositors would withdraw from poorly performing banks regardless of whether the performance is driven by macro-factors or bank-specific factors.

nature of their uninsured depositor base as measured by the average deposit balances they hold. Because depositors with larger balances have more to lose, we expect them to be more sensitive than uninsured depositors with smaller balances. Again, there is no clear reason why these two kinds of uninsured depositors would otherwise differ in their preferences for bank attributes other than default risk. As discussed in detail later, we show that *R2* amplifies the flow-performance sensitivity of only uninsured (and not insured) depositors; furthermore, this amplification occurs only when the uninsured deposit balances are sufficiently large. These results indicate that service quality or any such omitted correlated factors are unlikely to explain our results.

## 3. Data, sample construction, and summary statistics

We obtain most of our bank-level variables from the U.S. Call Reports as disseminated by the Wharton Research Data Services (WRDS). Call reports contain quarterly data on all commercial banks' income statements and balance sheets. Our sample period is from January 1994 to December 2013. Our bank-quarter observation is at commercial bank level.[24] To avoid the impact of mergers and acquisitions, we exclude bank-quarter observations with quarterly asset growth greater than 10%. We also exclude bank quarters with total assets smaller than 100 million and winsorize all continuous variables at 1% and 99%. These sample-selection and cleaning procedures are commonly used in prior work (Gatev and Strahan, 2006; Acharya and Mora, 2015).

Table 1, Panel A presents the summary statistics.[25] Our asset transparency measure has substantial variations across banks: $R2$ has a mean of 0.22 and a standard deviation of 0.45. Bank

[24] A priori, it is not clear whether depositors make withdrawal decisions based on the health of the top bank holding company or of the subsidiary commercial bank alone. We estimate our main specifications at commercial bank level because the insured deposits data are not available from Y9-C reports filed by bank holding companies. In sensitivity analyses (results not tabulated), we aggregate banks belonging to a common holding company to their top holder level and treat them as a single entity (following Kashyap, Rajan, and Stein 2002; Archarya and Mora, 2015), and find qualitatively similar results.

[25] All variable calculations follow closely those in Acharya and Mora (2015) and are detailed in Appendix A.

performance, measured as the annualized $ROE$, has a mean of 10.3% and standard deviation of 11.5%. The average (annualized) growth in deposits (scaled by beginning assets) is 1.97% and 2.95% for uninsured and insured deposits, respectively. Table 1, Panel B presents the pairwise correlation for main variables. It shows that the correlation between uninsured deposit flows and lagged *ROE* is much higher (at 0.16) than the correlation between insured deposit flows and *ROE* (at 0.06), suggesting that uninsured deposit flows are more sensitive to bank performance.

Table 1, Panel C explores the association between *R2* and a vector of variables that capture the bank's asset size and composition, with different combinations of bank and quarter fixed effects. The results show that *R2* is higher in larger banks and banks with more real estate loans. *R2* is also negatively associated with the percentage of commercial loans and significantly so when bank fixed effects are included. These findings are consistent with how banks estimate *LLPs* in practice. Ryan (2012) notes that for individually small and homogenous loans such as consumer real estate loans, banks rely more on statistical analyses of historical data to estimate *LLPs* on a portfolio basis. The statistical approach imposes discipline on banks' estimates of *LLPs* and can improve their predictive ability for future loan losses, resulting in higher *R2* from Eqn. (2). In contrast, banks rely on input from loan officers in estimating *LLPs* on a loan-by-loan basis for heterogeneous, large loans such as commercial loans. As a result, banks often estimate no *LLPs* for this type of loan until shortly before default. This can lower the ability of *LLPs* to predict future write-offs, i.e., lower *R2* from estimating Eqn. (2).

It is worth noting that there is significant heterogeneity in bank transparency that cannot be captured by observable bank characteristics such as size and asset composition: the regression R-squared without any fixed effects in column (4) is only 0.01. Time-invariant bank-specific factors account for the largest proportion of variation in *R2*, at about 10%. These results suggest that banks that appear similar based on aggregate asset composition can still differ significantly in the inherent opacity of their loan portfolio (possibly due to differences in borrower characteristics or geographic presence) and/or in their incentives to release private information. This highlights the advantage of our *R2* measure which allows us to sort banks into different levels of information quality using a parsimonious model without access to detailed data on bank characteristics.

Figure 1 plots the summary statistics for *R2* across all banks (Panel A) and for subsamples of banks by asset sizes (Panel B) from 1994Q1 to 2013Q4. We follow Beatty and Liao (2011) and use $500 million as the cutoff for small banks as this was the cutoff FDICIA uses for independent audit requirement. We classify large banks as banks with assets above 3 billion (Berger and Bouwmann, 2009) and medium banks as those with assets between $500 million and 3 billion. All cutoffs are in real 2000 dollars. Both panels show a sharp increase in *R2* during the Financial Crisis of 2007-2008. Since *R2* is estimated with data from the preceding 12 quarters, the peak in *R2* around 2009Q3 suggests that Call reports released during the financial crisis period (2007-2009) are highly predictive of future loan write-offs. This is consistent with recent theoretical work which predicts greater information revelation about asset quality during bad times (Gorton and Ordonez, 2014; Bouvard, Chaigneau, and Motta, 2015). We later examine if our results our concentrated in the financial crisis and do not find this to be the case.

## 4. Analysis of depositor behavior and banks' interest rate response

### *4.1. Transparency and the sensitivity of deposit flows to bank performance*

Table 2, Panel A presents the results from estimating Equation (3) with different measures of deposit flows. To facilitate interpretation, we use the demeaned versions of *R2* (i.e., *R2* minus its sample mean) and other bank characteristics in the regressions. With this adjustment, the coefficient on *ROE* measures the flow-performance sensitivity for the bank with the average values for *R2* and other bank characteristics, and the coefficient on the interaction term between *R2* and *ROE* measures the change in flow-performance sensitivity as one deviates from the average *R2*.

We first present the results for uninsured (insured) deposit flows without including *R2* in column (1) (column (2)). The coefficient estimate on *ROE* in column (1) is positive and significant at 1% level (Coef = 0.086), suggesting that, on average, uninsured deposits are sensitive to earnings performance. The economic magnitude of the sensitivity is meaningful: one standard deviation decline in *ROE* is associated with a decline in deposit growth that is equivalent to half (=0.086*11.51/1.97) of the average annual growth in uninsured deposits. In contrast to uninsured, and as expected, column (2) shows that insured deposits exhibit a much lower (less than one-tenth) sensitivity to performance with a coefficient on *ROE* of 0.007.[26]

Column (3) shows the results from our main specification where we introduce *R2* and its interaction with *ROE*. To isolate the effect of *R2* from other bank characteristics, we also include interaction terms between other bank characteristics (including *Std_Writeoff*) and *ROE*. The coefficient on *ROE* continues to be positive and significant at 1% level (Coef=0.112). Most importantly, the coefficient on the interaction term between *R2* and *ROE* is positive and significant (Coef=0.043; p-value<0.01), implying that information quality amplifies the flow-performance sensitivity for uninsured deposits. The economic magnitude of the amplification is large: a one-standard-deviation increase in *R2* (at 0.45) amplifies the average sensitivity by 17%

[26] That insured depositors also exhibit some sensitivity to bank performance is commonly found in prior work. He and Manela (2016) find that around one-third of insured depositors ran on Washington Mutual Bank in 2008. Davenport and McDill (2006) examine the behavior of depositors around the failure of Hamilton Bank and find evidence of running by insured depositors although at a smaller rate than by uninsured depositors. See also Martinez Peria and Schumkler (2001) for evidence in Argentina, Chile, and Mexico and Berger and Turk-Ariss (2015) for evidence in EU countries. Possible explanations for this behavior include concerns about timing of the payment by FDIC and less than perfect trust in the credibility of the insurance system. For example, Sage (2007) notes the following responses from customers running on Countrywide Bank: *"I don't trust the FDIC insurance"* and "*Dealing with the insurance afterward and possibly losing my money didn't appeal to me*."

(=0.45*0.043/0.112). In terms of deposit volatility, the estimates imply that a one-standard deviation increase in *R2* magnifies the effect of *ROE* volatility on the volatility of deposit flows by 37% (=1.17*1.17-1).

Column (4) presents results for insured deposits. In contrast to the results for uninsured deposits, the interaction term with *R2* in this specification turns negative and significant. These results are consistent with insured deposits substituting for uninsured deposits (more so for high *R2* banks) as performance starts declining. The substitution could occur if concerned uninsured depositors split deposit balances across different banks to ensure they fall within the deposit insurance limits and/or banks offer higher interest rates to attract insured depositors to make up for the loss of uninsured depositors (e.g., Martin et al., 2018). The latter mechanism is testable and we indeed find supportive evidence, which we discuss later. Column (5) presents the estimation results for total deposit flows. It shows that the substitution between uninsured and insured deposits is quite effective as the performance sensitivity of total deposits does not vary significantly with *R2*.

In the last two columns, we present the robustness of our results to two variations in our main specification. The results in column (6) show that our inferences are robust when we drop bank fixed effects and thus fully exploit both cross-sectional and time-series variation, indicating that the effect of *R2* is also present for cross-sectional variations in sensitivities. Second, in column (7), we explore the robustness to the inclusion of time dummies. As discussed in Section 2.2, including time dummies is not our preferred approach because it precludes us from studying the depositor response to changes in bank performance that result from common macroeconomic shocks. This is problematic because of the cyclical nature of the banking industry where many of the significant performance swings result from common macroeconomic shocks. Nevertheless, as can be seen in column (7), we continue to find evidence of higher flow-performance sensitivity for uninsured deposits in high *R2* banks even in the presence of time dummies.[27]

In Panel B of Table 2, we examine if the effect of *R2* on sensitivity of uninsured depositors varies by their account size. Uninsured depositors with larger balances have more to lose and therefore would be more alert and sensitive to bank performance. Because we do not have data on individual deposit balances, we conduct this test by exploiting differences across banks in the average size of their uninsured deposit base. The average uninsured deposit balance exhibits considerable variation across banks, with a mean (median) and standard deviation of 367 (270) and 233 thousand dollars (untabulated). We estimate the flow-performance regressions for uninsured deposits separately for subsamples of observations with above and below median levels of average uninsured deposit size. It can be seen that the effect of *R2* on the flow-performance sensitivity is significant only in banks with larger uninsured depositors.

Taken together, the results from the average deposit size analysis and insured deposit analysis are quite useful in mitigating concerns about omitted correlated variables. While insured depositors and uninsured depositors with lower balances have less incentive to respond to bank performance, we expect them to still care about service quality (or any bank attributes they might value other than default risk). Therefore, if *R2* was simply capturing the effect of any such omitted and correlated bank attributes, we should have found that *R2* also amplifies flow-performance sensitivity for insured deposits and smaller uninsured depositors.

In our next analysis, we examine whether the effect of transparency on the flow-performance sensitivity is asymmetric with respect to bank performance by estimating Eqn. (3) on the subsamples partitioned by whether $ROE_{it-1}$ is above or below the sample median. Since

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[27] The Online Appendix shows that all our main results are robust to the use of time dummies.

uninsured depositors are mainly concerned about the downside risk of bank health, one would expect the effect of transparency to be stronger when banks experience poor performance. Panel C of Table 2 confirms this conjecture and shows that the effect of transparency is indeed concentrated in banks with poor performance. For uninsured deposit flows, the coefficient estimate for $R2 * ROE$ is significantly positive only in the subsample of banks with below median $ROE$ (column 1). Similarly, the negative relation between transparency and the flow-performance sensitivity of insured deposits (documented earlier) is also concentrated in the subsample with below median $ROE$ (column 2).

In our final set of analyses, we explore if our results are concentrated in a specific size group or during the 2007-2008 Financial Crisis. Panel D presents the results separately for groups of small, medium, and large banks as defined earlier. As before, across all size groups we find that banks with higher *R2* exhibit higher flow-performance sensitivity for uninsured deposits, and that there is substitution between uninsured and insured depositors. Panel E presents the results separately for the Financial Crisis period (defined as the eight quarters from 2007Q3 to 2009Q2) and non-crisis period. It can be seen that our results are not driven by the financial crisis since they are robust to excluding the crisis quarters, and in fact, they do not manifest during the crisis. This is perhaps not surprising given the prior findings in Acharya and Mora (2015) that indicate that during the financial crisis depositors lost confidence in the banking system as a whole and withdrew from it en masse prior to the government intervention. Consistent with this view, estimates in column (3) of Panel E indicate that uninsured depositors pay much less attention to bank-specific performance during the crisis (with the average sensitivity less than one third of that during the non-crisis period), and the flow-performance sensitivity is not significantly related to bank-specific *R2*.

*4.2. Transparency and deposit rate response*

In this section we examine if high *R2* banks use interest rates as a tool to mitigate fluctuations in their deposit funding in response to performance. We do so by estimating Eqn. (3) with core deposit rates and large time deposit rates as the dependent variable, both measured over the same two quarter periods as the deposit flows.[28]

Columns (1) and (2) of Table 3 present the results. In both columns the coefficients on *ROE* are significantly negative, indicating that banks raise deposit rates following poor performance. In addition, the sensitivity of rate increases to declining bank performance is stronger in banks with higher *R2*: the coefficient estimate on *R2*ROE* is -0.007 for large time deposit rate (Column 1) and is -0.005 for core deposit rate (Column 2), both are significantly negative at less than the 1% level. The economic magnitude is meaningful: compared to the bank with average asset transparency, for every interquartile decline in *ROE (15.68-6.88=8.8),* a bank with a one-standard-deviation higher *R2* offers an additional 2.77 (*=0.7*0.45*8.8)* basis points on its rates for large time deposits and *1.98* (*=0.5*0.45*8.8)* on its rates for core deposits.

A related question is if deposits produced by high and low *R2* banks command different rates on average after controlling for performance. The liability-centric perspective suggests that the relatively informationally insensitive debt produced by opaque banks would command a higher price (i.e., a lower rate) because of its greater appeal as a money like security (Dang et al., 2017).[29] In contrast, under the asset-centric view, opaque banks may need to offer higher rates to attract depositors who otherwise may not be willing to grant funds to a bank they cannot monitor easily.

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[28] Because we are modelling banks' response in the form of deposit rates, we do not control for lagged deposit rates in these regressions.

[29] Hanson, Shelifer, Vishny, and Stein (2015) find that deposits rates appear to have a significant convenience premium over 3-month treasury bills of about 0.87% over a 29-year sample from 1984 to 2012.

In columns (3) and (4) we examine this question by dropping the interactive term between *R2*ROE* and focusing instead on the coefficient on *R2* itself. We find a significantly positive coefficient estimate on *R2* in both columns, indicating that more transparent banks offer higher deposit rates on average. The estimates indicate that a one-standard deviation increase in *R2* is associated with a higher deposit rate of about 2.2 (=4.9*0.45) basis points.

*4.3. Interpretation of results*

Collectively, the analyses in Tables 2 and 3 provide a comprehensive view of how depositor behavior and banks' interest rate response vary with *R2*. The results suggest that uninsured depositors of high *R2* banks are more sensitive to performance, which these banks attempt to offset by offering higher rates in times of poor performance. While the rate increase does not eliminate uninsured deposit outflow, it attracts insured depositors. The substitution appears to be effective, as the sensitivity of total deposits to bank performance does not significantly vary by *R2*. Of course, while the substitution mitigates the fluctuations in the total deposit funding, it comes at the cost of higher interest rates and insurance premium.

Under the asset-centric perspective, the above results illustrate the disciplining benefits of higher information quality. The discipline, however, does not come from loss of total deposit funding following poor performance because banks are able to offset loss of uninsured depositors through insured depositors; rather, the discipline comes from increased costs of maintaining deposit funding in the form of higher deposit rates and insurance premiums. From a liability-centric perspective, the greater informational sensitivity of deposits of high *R2* banks reflects a cost of higher information quality because of the reduced appeal of these deposits as a money like security. This interpretation is also supported by the lower equilibrium price (i.e., higher rates) commanded by deposits of high *R2* banks.

Overall, these results indicate that the basic force underlying both the asset-centric and liability-centric views of transparency, that depositors respond strongly to bank transparency, is strongly present in the data. In our next set of analyses we explore whether these differences in depositor behavior across high and low *R2* banks also manifest in differences in lending behavior and profitability, as predicted by the two theories.

## 5. Analysis of lending behavior and overall profitability

### *5.1. Transparency and lending behavior*

The asset- and liability-centric theories yield contrasting predictions on how differences in depositor behavior would reflect in banks' lending behavior as assessed by banks' choice of funding to make these illiquid investments. Under the liability-centric view, transparency constrains banks' ability to fund illiquid assets using deposit financing because of increased costs and difficulty in raising stable deposits. Therefore, all else equal, transparent banks' ability to fund illiquid growth opportunities would depend on availability of sufficient internal funds (Dang et al., 2017). Conversely, opaque banks' decision should be less dependent on the availability of internal equity financing because of the relative ease with which they can meet internal funding shortfalls by raising stable external deposit financing.

The asset-centric view suggests that transparency facilitates bank monitoring and therefore increases external capital providers' (including equity holders and depositors) willingness to provide capital at reasonable price. This should make transparent banks less dependent on availability of internal equity to fund illiquid growth opportunities, as they can meet funding shortfalls by raising cheap deposits or external equity. Prior findings indicate that it is easier for transparent banks to obtain external financing as potential investors are better able to monitor them

(Beatty and Liao, 2011; Bushman and Williams, 2012, 2015). This suggests that transparent banks' investment decisions should not depend as much on changes in their internal equity.

We use the following regression specification to examine the effects of transparency on banks' reliance on availability of internal equity to fund asset growth:

$$AssetGrowth_{i,t} = \alpha_i + \beta_0 \Delta Internal\_Equity_{i,t-1} + \beta_1 R2_{i,t-1} * \Delta Internal\_Equity_{i,t-1} + \beta_2 R2_{i,t-1} + \Gamma X + \varepsilon_{i,t}, (6)$$

where $AssetGrowth_{i,t}$ represents the annualized growth rate in one of banks' asset classes scaled by beginning of quarter total assets, and $\Delta Internal\_Equity_{i,t-1}$ is the change in internal equity, measured as change in equity balances excluding stock issuance and adding back dividends and repurchases, scaled by total assets at the beginning of quarter.[30] Similar to our analysis of deposit flows, we measure asset growth over two quarters subsequent to quarter *t-1*. The key coefficient of interest in Eqn. (6) is $\beta_1$, which measures how *R2* affects the relation between availability of internal equity and asset investment decisions.

Table 4 presents the estimates of Eqn. (6) for growth in different asset classes. Column (1) models the effect on loan growth. The coefficient on the interaction between *R2* and $\Delta Internal\_Equity$ is 0.166 and significant at 1% level, suggesting that banks with higher *R2* are less able to fund loans without the availability of internal equity. The effect is economically large: a one-standard-deviation increase in *R2* would increase an average bank's sensitivity of funding loans to the availability of internal equity by 34% (=0.166*0.45/0.220). In untabulated analyses, we separately model growth in real estate loans and commercial loans and obtain inferences that are very similar to that for total loans.

[30] This definition of internal equity implicitly assumes that dividends are paid out from residual funds left after funding investment opportunities. In sensitivity analyses (results not reported), we find qualitatively similar results when we measure changes in equity after paying dividends.

Column (2) examines changes in the outstanding loan commitments to see if transparency also affects banks' willingness to provide liquidity in the form of credit lines. We again find that the interaction term of $R2 * \Delta Internal\_Equity$ is positive and significant at 1% level with large economic magnitudes. A one-standard-deviation increase in $R2$ amplifies banks' sensitivity of loan commitments to $\Delta Internal\_Equity$ by about 19.5% (=0.45*0.083/0.191). Not surprisingly, similar inferences are obtained when we examine total credit in column (3), which includes both loan and commitments.

Column (4) models growth in liquid assets, measured as the sum of cash, federal funds sold and reverse repos, and securities excluding MBS/ABS securities. Because liquid assets can be readily liquidated to meet any deposit withdrawals, deposit stability should be less of a concern while funding liquid assets. Therefore, we do not expect transparency to negatively affect the sensitivity of changes in liquid assets to internal equity. In fact, it is possible that compared to opaque banks, liquid investments in transparent banks exhibit lower sensitivity to the availability of internal equity. This could occur if opaque banks exploit their comparative advantage in raising stable deposits to earn higher spreads by actively targeting illiquid investment opportunities. They may invest in low-spread liquid investment when they have excess internal equity available after exhausting their opportunities to fund illiquid loans. This would manifest in opaque banks exhibiting higher sensitivity to the availability of internal equity for liquid investments relative to transparent banks. Indeed, consistent with this possibility, we find a negative coefficient on the interaction term between $R2$ and $\Delta Internal\_Equity$ for liquid investments (Coef = –0.077; p-value<0.01).

Overall, these results suggest that the funding of illiquid loans at high $R2$ banks is more tied to the availability of internal equity financing.

*5.2. Transparency and bank profitability*

Our findings thus far highlight that transparency is a double-edged sword. On the one hand availability of better information improves depositor discipline. On the other hand, opacity allows banks to produce stable deposits that not only command lower rates but also could be invested in high return illiquid loans. In this section, we attempt to assess the net impact of this cost-benefit trade-off on bank profitability.

Table 5 presents the results of this analysis in which we regress *ROA* and *ROE* on *R2* and other bank characteristics, both with and without bank fixed effects. We find that *R2* exhibits a significant negative association with *ROA* and *ROE* across both specifications. The coefficient estimates with the bank fixed effects indicate that one standard deviation increase in *R2* is associated with nearly 0.04% (0.48%) decrease in *ROA* (*ROE*).

One may be concerned that these differences in profitability may reflect differences in risk. For example, if transparent assets also tend to less risky, then the lower profitability of high *R2* banks may simply reflect the lower risk-premium commanded by their assets. Inconsistent with this explanation, however, we find that, if anything, the correlation between the volatility of profits generated by bank assets and their *R2* is positive.[31] We also note that our results obtain after controlling for bank fixed effects (which should fully absorb time-invariant differences in risk) as well as several time varying controls for bank characteristics including the standard deviation of *ROA* and *ROE* (measured over the last 12 quarters).

[31] As noted in Section 2.1, *R2* is designed to measure the proportion of uncertainty resolved by Call reports (i.e., $\frac{Var(\tilde{D}_{t+1})-Var(\tilde{D}_{t+1}|\Omega_t)}{Var(\tilde{D}_{t+1})}$) and not the underlying volatility/risk ($Var(\tilde{D}_{t+1})$) itself. As such, there is a priori no compelling reason to expect a strong correlation between *R2* and risk. We find that *R2* exhibits a relatively modest correlation of 0.10 (0.07) with the volatility of write-offs (*ROE*).

The negative association between *R2* and bank profitability is consistent with our findings so far which suggest at least two channels for this result: transparent banks pay higher rates on deposits and they perform less profitable liquidity transformation by relying less on deposits to fund higher yield illiquid assets. The deposit rate channel alone appears to explain a significant portion of the profitability difference. One standard deviation change in *R2* is associated with about 2.2 basis point difference in deposit rates (from Table 3, columns 3 and 4). Assuming deposits fund about 70% of assets, deposit rates can explain about 40% (2.2*70%/4) of the difference in ROA. In sensitivity analyses (untabulated), we also entertain the possibility of a third channel by examining whether more transparent banks create lower amount of uninsured deposits. We do not find any evidence suggesting that this is the case.

Overall, the above analysis provides robust evidence that high *R2* banks exhibit lower risk-adjusted profitability in equilibrium. The results indicate that the costs of better information quality dominate its monitoring benefits and lend support to the recent evidence (Berger and Bouwman, 2009; Egan et al., 2017) that suggests that creation of money like securities constitutes a key source of value creation by the banking business.

A natural question, as with any analysis of equilibrium differences in profitability, is that why couldn't banks with lower profitability decrease information quality, thus eliminating cross-sectional differences in profitability. This issue relates to the broader literature in economics that seeks to understand the drivers of large and persistent differences in productivity levels that have been documented across businesses. Syverson (2011) surveys this literature and provides a simple model to illustrate how within industry productivity differences can be sustained. The purpose of our profitability analysis is merely to document a source of productivity difference in the banking industry that is relevant to understanding the effects of transparency. What frictions sustain this productivity dispersion is a question we leave for future research.

## 6. Additional analyses and robustness checks

### *6.1. Can information sources other than call reports affect our inferences?*

A potential concern with our analysis is that we rely on information contained in Call reports to assess depositors' sensitivity to bank performance, but depositors are likely to have access to other information sources as well. It is possible that depositors of banks whose Call reports are not informative (i.e., exhibit low *R2*) rely more on other information sources (e.g., analyst reports, information aggregated in stock prices or perhaps the soft information revealed by bank managers in conference calls) for decision-making. To the extent that these alternative information sources sufficiently make up for the lower informativeness of Call reports in low *R2* banks, it is possible that depositors of low *R2* banks have similar total information as depositors in high *R2* banks. Consequently, it is possible that while depositors of low *R2* banks are less sensitive to information released in the Call reports, they exhibit overall stability levels that are similar to depositors of higher *R2* banks.

We first note that if deposits at low and high *R2* banks exhibit similar stability, then we should not observe our previous findings on banks' deposit rate response, reliance on internal equity to fund loans, and profitability. All of these results rest on deposits being more sensitive at high *R2* banks.

Nevertheless, we perform two additional analyses to address this concern. First, we directly test whether uninsured deposits are unconditionally more volatile at high *R2* banks and present the results in Table 6, Panel A. The dependent variable is the logarithm of the standard deviation of uninsured deposit flows calculated over the same periods as those used to estimate *R2* from

Equation (2). Estimates in both columns (1) and (2) show that asset transparency is significantly positively related to uninsured deposit flow volatility, indicating that transparency is clearly associated with fragility in deposits.

Second, we examine whether our main results hold for the subset of private banks. To the extent that depositors at private banks do not have access to other information sources and have to rely primarily on Call reports to assess performance, evidence of a positive relation between transparency and flow-performance sensitivity for private banks would further address this concern. Table 6 Panel B shows the results from estimating Equation (3) separately for the subsamples of public and private banks. We find that our main results hold equally well in both subsamples: greater asset transparency is associated with higher (lower) uninsured (insured) deposit flow-performance sensitivity for both public and private banks.

*6.2. Alternative explanation for our results*

One may be concerned that our results may be driven by banks increasing transparency following periods of poor performance, perhaps to meet additional demand for information by investors looking to more closely scrutinize banks in bad times. To the extent that uninsured deposits respond more strongly to *ROE* following periods of poor performance, this effect may be picked up by our *R2* measure. To address this concern, we first regress the *R2* on eight lags of *ROE* and find that past 8 lags of *ROE* explain only 0.8% of the variation in *R2* (results reported in the online Appendix), suggesting that the above concern is unlikely to begin with. We also re-estimate our main analyses by replacing the *R2* with the residual from this regression. Results, shown in the online Appendix, indicate that all our main results remain robust to the use of the residual *R2*.

*6.3. Alternative measures of transparency and performance*

In Table 7 we examine whether our results are robust to alternative ways of measuring transparency and bank performance. We first modify our *R2* measure by extending the window for measurement of write-offs in Eqn. (2) from two to four quarters to account for the fact that some loans may take longer than 2 quarters to be written off after becoming non-performing or part of loan loss provision (Bhat, Lee and Ryan, 2019). Results in column (1) show that our results are robust to this variation.

We also explore the transparency measure from the accounting literature examining the ability of banks' loan loss provisions (*LLP*) in reflecting future credit losses in a timely manner (Beatty and Liao, 2011; Bushman and Williams, 2012, 2015). This literature considers a bank's *LLP* to be more timely if it reveals more private information by banks about future loan performance, and often refers to banks with more timely *LLP*s as more transparent (Bushman and Williams, 2012, 2015). As we discuss in Section 2.1, from the perspective of depositors' decision-making, it does not matter whether a bank is opaque because the bank itself has less private information about the assets (perhaps because the assets are inherently opaque) or because the bank chooses to not fully reveal its private information (Huizinga and Laeven, 2012).

Our notion of transparency is broader than the timeliness of *LLP* and our *R2* measure accommodates both sources of variations in the availability of information. Nonetheless, to examine whether our main finding is unique to our transparency measure, we construct the timeliness measure following Beatty and Liao (2011), as described in detail in the Appendix. Table 1, Panel B shows that the correlation coefficient between the timeliness measure and *R2* is 0.05. Results in column (2) of Table 7 show that our inferences are robust and the *Timeliness* of *LLP* has a significantly positive effect on uninsured deposit flow-performance sensitivities.

Column (3) examines the robustness of our main result to an alternative notion of transparency, which refers to a bank as transparent when its depositors are more sophisticated and have lower costs in processing financial information. All else equal, more sophisticated depositors would be expected to extract greater information about banks' future prospects. While depositor sophistication is not directly related to policy proposals to increase transparency, it is a useful variable to capture how depositors' behaviors are affected by the information they can process. We measure depositor sophistication as the average percentage of residents with college education in the counties where a bank operates, weighted by the amount of deposits the bank draws from the counties in a given year. We retrieve the information on the percentage of adult residents with college education from the 2000 Census data, and the information on bank branch deposits on the county level from the FDIC's Summary of Deposits disclosures. Results in column (3) using *Sophistication* as the transparency measure show that *Sophistication* has a significantly positive effect on uninsured deposits' flow-performance sensitivity.

In columns (4) to (7) of Table 7, we explore the sensitivity of our results to four alternative performance measures: (i) return on assets ($ROA$), (ii) change in internal equity capital ($\Delta Internal\_Equity$), (iii) the level of loan loss provisions ($LLP$), and (iv) non-performing loans ($NPL$). It can be seen that the results using these measures are qualitatively similar to those using $ROE$. Specifically, columns (4) and (5) show that the sensitivity of uninsured deposits to $ROA$ and to change in equity capital is increasing in *R2*. Columns (6) and (7) show a negative sensitivity of uninsured deposit flows to banks' non-performing loans and to loan loss provisions and more so for more transparent banks as measured by *R2*.

## 7. Conclusion

Whether to provide depositors more information about bank performance is at the heart of the debate about bank transparency. In this study, we provide evidence on the effect of information quality on deposit flows and the resulting consequences for bank operations. Our analysis is motivated by extant banking theories, which suggest that information affects banks' operations primarily through its effect on depositor behavior. Furthermore, deposits consistently represent the largest source of funding for banks.

Using a large sample of US banks from 1994-2013 we find that uninsured depositors of more transparent banks are significantly more sensitive to their banks' performance. We also find that transparent banks offer higher deposit rates, rely more strongly on internal equity to finance illiquid assets, and exhibit lower profitability. Overall, our results suggest that while transparency helps discipline bank management by making deposit funding more sensitive to performance, it also interferes with the role of banks in liquidity creation.

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## Appendix: Variable Definition and Description

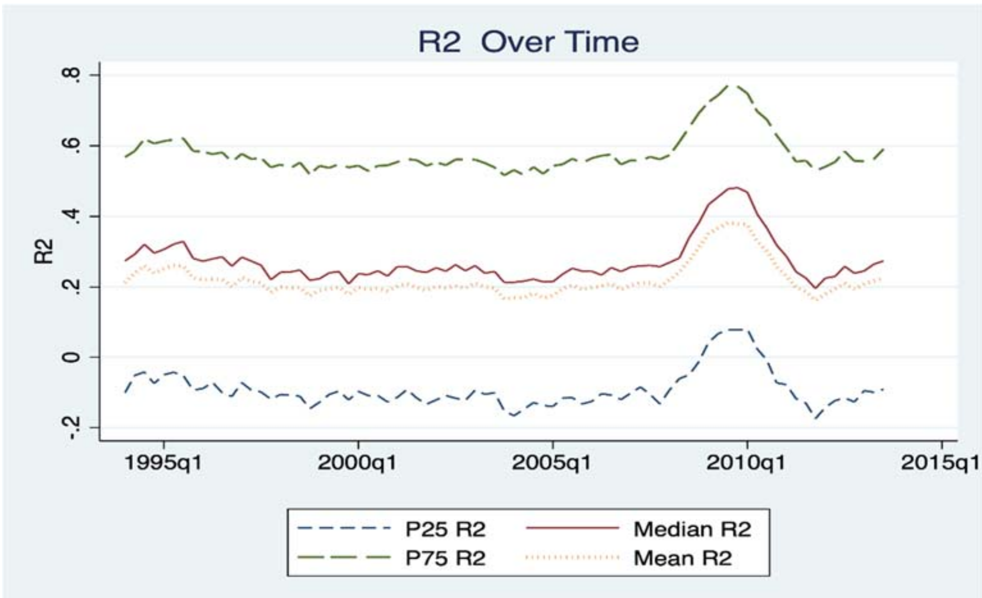
| Variable Name | Definition |
|---|---|
| $R2_{it-1}$ | Adjusted $R^2$ for each bank-quarter from the regression $WriteOff_{[t,t+1]} = \alpha_0 + \sum_{j=1}^{2}\gamma_j LLP_{t-j} + \sum_{j=1}^{2}\beta_j EBLLP_{t-j} + \rho\Delta NPL_{t-1} + \delta Capital_{t-1} + \varepsilon_t$, estimated using the bank's observations from quarter $t-12$ to quarter $t-1$. $WriteOff_{t,t+1}$ is the sum of write-off (RIAD4635) in quarters $t$ and $t+1$. $LLP_{t-j}$ is loan loss provision (RIAD4230) and $EBLLP_{t-j}$ is earnings before loan loss provision (RIAD4301+RIAD4230) in quarter $t-j$, both reported as year-to-date and converted to within-quarter. $\Delta NPL$ is change in non-performing loan (RCFD1403+RCFD1407) in quarter $t-1$ from the previous quarter, $Capital$ is capital divided by total assets (RCFD3210/RCDF2170). All variables other than capital ratio are scaled by total loan (RCFD1400). |
| $Liquid\ Assets_{i,t-1}$ | Liquid assets are the sum of cash (RCFD0010), federal funds sold & reverse repos [RCFD1350 (before 2002Q1) and RCONB987 + RCFDB989 (from 2002Q1)], and securities excluding MBS/ABS securities [before 2009Q2: RCFD1754+RCFD1773 - (RCFD8500+RCFD8504+RCFDC026+RCFD8503+RCFD8507+RCFDC027). And from 2009Q2: RCFD1754 + RCFD1773 - (RCFDG300 + RCFDG304 + RCFDG308 + RCFDG312 + RCFDG316 + RCFDG320 + RCFDG324 + RCFDG328 + RCFDC026 + RCFDG336 +RCFDG340 + RCFDG344 + RCFDG303 + RCFDG307 + RCFDG311 + RCFDG315 + RCFDG319 + RCFDG323 + RCFDG327 + RCFDG331 + RCFDC027 + RCFDG339 + RCFDG343 + RCFDG347)]. |
| $Commercial\ Loan_{i,t-1}$ | Commercial and industrial loan (RCFD1766), scaled accordingly. |
| $RealEstate\_Loans_{i,t-1}$ | Loans secured by real estate (RCFD1410), scaled accordingly. |
| $ROE_{i,t-1}$ | Annualized *ROE* (in %) in quarter t-1, calculated as net income (RIAD4300, adjust year-to-date reporting to within quarter) divided by beginning equity (RCFD3210). |
| $Std\_WriteOff_{i,t-1}$ | Standard deviation of write-offs measured over 12 rolling quarters (from Quarter $t-12$ to $t-1$). |
| $Capital\_Ratio_{i,t-1}$ | Total equity (RCFD3210) divided by total assets (RCFD2170). |
| $Wholesale\_Funding_{i,t-1}$ | Wholesale funds are the sum of following: large-time deposits (RCON2604), deposits booked in foreign offices (RCFN2200), subordinated debt and debentures (RCFD3200), gross federal funds purchased and repos [RCFD2800, or (RCONB993+RCFDB995 from 2002q1)], other borrowed money (RCFD3190). Scaled by total assets. |
| $Ln(Assets)_{i,t-1}$ | Log of total assets (RCFD2170). |
| $Unused\_Commitments_{it-1}$ | Unused commitments (RCFD3814 + RCFD3816 + RCFD3817 + RCFD3818 + RCFD6550 + RCFD3411) divided by the sum of loans (RCFD1400) and unused commitments. |
| $\Delta Internal\_Equity_{i,t-1}$ | Annualized growth rate in bank equity (RCFD3210) as a percentage of lagged assets. Dividends are added back (RIAD4460+RIAD4470), stock issuances/repurchases and treasury stock transactions are excluded (RIADB509+RIADB510, or RIAD4346 before 2001Q1), both adjusted from year-to-date to quarterly. |
| $\Delta Dep_{it}^{Total}$ | Annualized growth in total deposits (RCFD2200) in quarter t and t+1 as a percentage of lagged assets (in %): $(Deposits_{i,t+1} - Deposits_{i,t-1})/Asset_{i,t-1} * 200\%$. The deposits follow the definition in Call reports and include transaction accounts (checking, NOW, etc.) and non-transaction accounts such as money market accounts, IRA, saving accounts, and time deposits (which include CDs with maturity dates). |
| $\Delta Dep_{it}^{I}$ | Annualized growth rate in insured deposits as a percentage of lagged assets in quarter $t$ and $t+1$ (in %): $(Insured\ Deposits_{i,t+1} - Insured\ Deposits_{i,t-1})/Asset_{i,t-1} * 200\%$. Insured deposits are accounts of $100,000 or less. After 2006Q2, it includes retirement accounts of $250,000 or less. From 2009Q3, reporting thresholds on non-retirement deposits increased from $100,000 to $250,000. Insured deposits: RCON2702 (before 2006Q2); RCONF049 + RCONF045 (from 2006Q2). |

| | |
|---|---|
| $\Delta Dep_{it}^{U}$ | Annualized growth rate in uninsured deposits as a percentage of lagged assets (in %) in quarter $t$ and $t+1$. Uninsured deposit is calculated as deposits (RCFD2200) – insured deposits. |
| *ΔLoans*$_{it}$ | Annualized growth rate in total loans (RCFD1400) as a percentage of lagged assets in quarter $t$ and $t+1$ (in %): $\left(Loan_{i,t+1} - Loan_{i,t-1}\right)/Asset_{i,t-1} * 200\%$. |
| *ΔCommitments*$_{it}$ | Annualized growth rate in commitments in quarter $t$ and $t+1$ as a percentage of lagged assets: $(Commitments_{i,t+1} - Commitments_{i,t-1})/Asset_{i,t-1} * 200\%$.<br>Commitments = (RCFD3814 + RCFD3816 + RCFD3817 + RCFD3818 + RCFD6550 + RCFD3411) |
| $\Delta Credit_{it}$ | Sum of *ΔLoans*$_{it}$ *and ΔCommitments*$_{it}$. |
| $\Delta Liquid\ Assets_{it}$ | Annualized growth in liquid assets as a percentage of lagged assets in quarter $t$ and $t+1$ (in %): $(Liquid\ assets_{i,t+1} - Liquid\ Assets_{i,t-1})/Asset_{i,t-1} * 200\%$. |
| *Large Time Deposit Rate*$_{i,t}$ | Annualized average interest rate (in %) over the two quarters $t, t+1$ on large time deposits. Calculated as quarterly interest expense (RIADA517 (RIAD4174 before 1997Q1), adjusted year-to-date reporting to within quarter) divided by average balance of large time deposits (RCONA514 (RCON3345 before 1997Q1)):<br>$(large\ time\ deposit\ interest\ expense\ in\ Qtr\ t\ and\ t+1)/$<br>$(Avg.large\ time\ deposit\ balance\ in\ Qtr\ t\ and\ t+1)\ ) * 400\%$). |
| *Core Deposit Rate*$_{i,t}$ | Annualized average interest rate (in %) over the two quarters $t, t+1$ on core deposits. Core deposits are the sum of transaction deposits, saving deposits, and small time deposits.<br>The average balance items: transaction deposits: RCON3485; savings deposits: RCONB563 + (RCON3486 + RCON3487 before 2001Q1); small time deposits: RCONA529 (RCON3469 before 1997Q1).<br>The interest expense items: transaction deposits: RIAD4508; saving deposits: RIAD0093 (RIAD4509 + RIAD4511 before 2001Q1); small time deposits: RIADA518 (RIAD4512 before 1997Q1), adjusted year-to-date reporting to within quarter. |
| *Public* $_{i,t-1}$ | Indicator variable equal to 1 if in Quarter $t-1$ the commercial bank is a public company or a subsidiary of a public company. That is, if a bank's Fed ID (RSSD9001), or its bank holding company (RSSD9348) can be linked to a PERMCO. The PERMCO-RSSD link table is from the website of Federal Reserve Bank of New York. |
| *Sophistication* $_{i,t-1}$ | The average percentage of college education for adults in counties where a bank operates, weighted by the amount of deposits the bank draws from the counties in a given year. The percentage of adults with some college education or above is obtained from U.S. 2000 Census 2000 data. The information on the county-level data (bank branches and dollar deposits) is from the FDIC's Summary of Deposits disclosures. |
| *TimelinessLLP* $_{i,t-1}$ | The timeliness of LLP (LLP Timeliness) is an indicator variable that equals 1 (0) if the difference in the adjusted R-squared from the following two equations is above (below) sample median: both equations are estimated for each bank-quarter using the bank's observations from the previous 12 quarters: $LLP_t = \beta_0 + \sum_{j=-2}^{-1} \beta_j \Delta NPL_{t+j} + \gamma_1 Capital_{t-1} + \gamma_2 EBLLP_t + \varepsilon_t\ (a)$ and $LLP_t = \beta_0 + \sum_{j=-2}^{1} \beta_j \Delta NPL_{t+j} + \gamma_1 Capital_{t-1} + \gamma_2 EBLLP_t + \varepsilon_t\ \ (b)$ . |
| *Std_ROE* $_{i,t-1}$ | Standard deviation of *ROE* measured over 12 rolling quarters (from Quarter $t-12$ to $t-1$). |
| *NPL* $_{i,t-1}$ | The percentage of non-performing loan (RCFD1403+RCFD1407) in total loan. |
| *ROA* $_{i,t-1}$ | Annualized ROA (in %) in quarter t-1, calculated as net income (RIAD4300, adjust year-to-date reporting to within quarter) divided by beginning assets. |
| *StockRet* | Value weighted quarterly market return (includes distributions) retrieved from CRSP. |
| *FedFundRate* | Retrieved from Federal Reserve Bank of St. Louis website. Quarterly average of effective fed funds rate. |

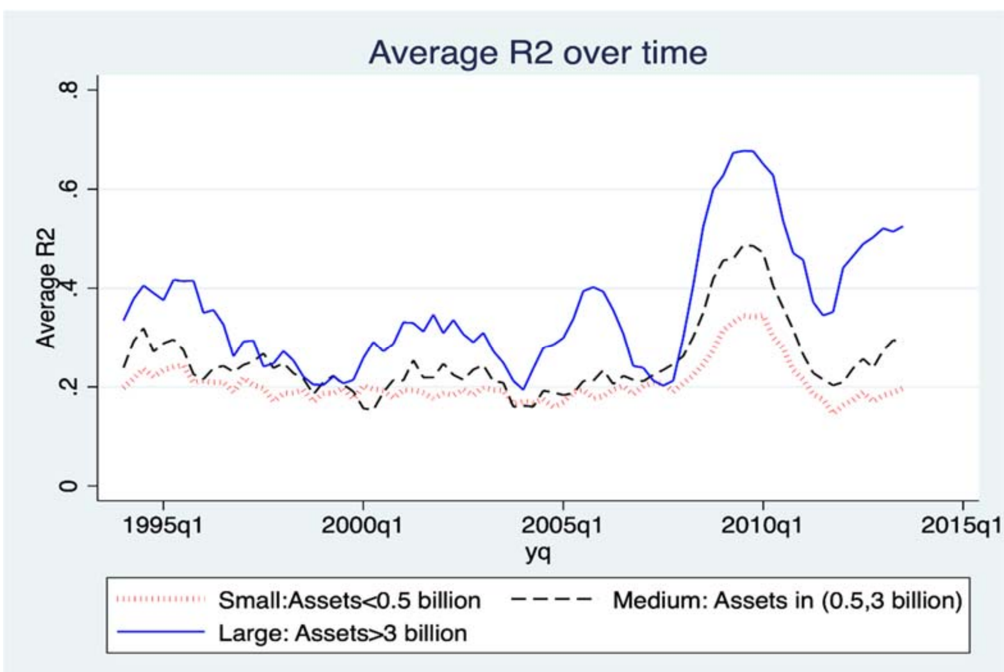
## Figure 1: *R2* Over Time

Panel A plots the summary statistics for *R2* across banks in the sample over time. Panel B plots the average *R2* for three groups of banks over time. *R2* is the adjusted *R2* from estimating Equation (2) for each bank-quarter using 12 quarters rolling window. Small banks have assets below 500 million, large banks have assets above 3 billion, medium banks have assets between 500 million and 3 billion (measured in year 2000 real dollars).

Panel A: All banks




Panel B: By bank size



## Table 1. Descriptive analyses

*Panel A: Summary statistics*

This panel presents summary statistics for the main regression variables. These statistics are calculated over the regression sample. To avoid the impact of mergers and acquisitions, we exclude bank-quarter observations with quarterly asset growth greater than 10%. We also exclude bank quarters with total assets smaller than 100 million. See the Appendix for variable definitions.

| | N | Mean | Std. Dev. | p10 | p25 | Median | p75 | p90 |
|---|---|---|---|---|---|---|---|---|
| $R2_{it-1}$ | 266375 | 0.22 | 0.45 | -0.42 | -0.09 | 0.27 | 0.58 | 0.79 |
| $ROE_{it-1}$ | 267936 | 10.29 | 11.51 | 2.21 | 6.88 | 11.25 | 15.68 | 20.46 |
| $ROA_{it-1}$ | 267936 | 0.98 | 0.96 | 0.22 | 0.69 | 1.08 | 1.44 | 1.85 |
| $\Delta Dep_{it}^{U}$ | 267936 | 1.97 | 10.00 | -7.47 | -1.92 | 2.08 | 6.65 | 12.48 |
| $\Delta Dep_{it}^{I}$ | 267936 | 2.95 | 9.46 | -4.97 | -1.57 | 1.43 | 5.23 | 11.48 |
| $\Delta Dep_{it}^{total}$ | 267936 | 4.81 | 10.56 | -6.59 | -1.32 | 3.90 | 9.92 | 17.07 |
| $Capital\_Ratio_{it-1}$ | 267936 | 0.10 | 0.03 | 0.07 | 0.08 | 0.09 | 0.11 | 0.13 |
| $Wholesale\_Funding_{it-1}$ | 267936 | 0.20 | 0.11 | 0.08 | 0.12 | 0.19 | 0.26 | 0.34 |
| $RealEstate\_Loans_{it-1}$ | 267936 | 0.70 | 0.18 | 0.45 | 0.59 | 0.72 | 0.83 | 0.91 |
| $Ln(Assets)_{it-1}$ | 267936 | 12.64 | 1.04 | 11.66 | 11.89 | 12.35 | 13.04 | 13.95 |
| $Unused\_Commitments_{it-1}$ | 267936 | 0.14 | 0.07 | 0.05 | 0.08 | 0.13 | 0.18 | 0.23 |
| $Large\ Time\ Deposit\ Rate_{it}$ | 255963 | 3.58 | 1.68 | 1.27 | 2.16 | 3.58 | 5.02 | 5.74 |
| $Core\ Deposit\ Rate_{it}$ | 256019 | 2.47 | 1.40 | 0.64 | 1.27 | 2.37 | 3.67 | 4.36 |
| $\Delta Loans_{it}$ | 267936 | 4.10 | 9.20 | -5.97 | -1.10 | 3.51 | 8.73 | 14.82 |
| $\Delta Commitments_{it}$ | 267936 | 0.97 | 4.94 | -4.09 | -1.45 | 0.53 | 3.06 | 6.55 |
| $\Delta Liquid\ Assets_{it}$ | 183761 | 1.10 | 8.84 | -9.05 | -3.89 | 0.61 | 5.76 | 11.90 |
| $\Delta Internal\_Equity_{i,t-1}$ | 262413 | 1.10 | 1.55 | -0.22 | 0.52 | 1.10 | 1.68 | 2.40 |
| $Std\_WriteOff_{it-1}$ | 267936 | 0.75 | 0.98 | 0.08 | 0.17 | 0.38 | 0.87 | 1.86 |
| $Std\_ROE_{it-1}$ | 267936 | 5.43 | 6.12 | 1.31 | 1.96 | 3.27 | 6.15 | 11.61 |
| $Std\_ROA_{it-1}$ | 251234 | 0.50 | 0.68 | 0.11 | 0.16 | 0.27 | 0.50 | 1.06 |
| $Ln(Vol(\Delta Dep_{it}^{U}))$ | 159548 | 1.87 | 0.62 | 1.07 | 1.45 | 1.87 | 2.33 | 2.68 |
| *Sophistication* | 267844 | 0.49 | 0.11 | 0.34 | 0.41 | 0.49 | 0.56 | 0.63 |
| *Public* | 267936 | 0.19 | 0.40 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| $Timeliness_{it-1}$ | 267936 | 0.50 | 0.50 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| $LLP_{it-1}$ | 267936 | 0.13 | 0.25 | 0.00 | 0.02 | 0.06 | 0.13 | 0.30 |
| $NPL_{it-1}$ | 267936 | 1.50 | 2.01 | 0.11 | 0.34 | 0.82 | 1.78 | 3.59 |

*Panel B: Pairwise correlation for main variables*

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $R2_{it-1}$ | 1.00 | | | | | | | | | | | | | | | | |
| 2 | $ROE_{it-1}$ | -0.09 | 1.00 | | | | | | | | | | | | | | | |
| 3 | $Capital\_Ratio_{it-1}$ | -0.02 | 0.03 | 1.00 | | | | | | | | | | | | | | |
| 4 | $Wholesale\_Funding_{it-1}$ | 0.04 | -0.11 | -0.19 | 1.00 | | | | | | | | | | | | | |
| 5 | $RealEstate\_Loans_{it-1}$ | 0.01 | -0.17 | -0.04 | 0.00 | 1.00 | | | | | | | | | | | | |
| 6 | $Ln(Assets)_{it-1}$ | 0.10 | 0.00 | -0.09 | 0.20 | -0.02 | 1.00 | | | | | | | | | | | |
| 7 | $Unused\_Commitments_{it-1}$ | 0.02 | 0.16 | -0.13 | -0.03 | -0.18 | 0.42 | 1.00 | | | | | | | | | | |
| 8 | $\Delta Dep_{it}^{U}$ | -0.05 | 0.16 | 0.03 | -0.05 | -0.06 | 0.01 | 0.09 | 1.00 | | | | | | | | | |
| 9 | $\Delta Dep_{it}^{I}$ | 0.03 | 0.06 | -0.02 | 0.06 | 0.00 | 0.00 | 0.03 | -0.49 | 1.00 | | | | | | | | |
| 10 | $Large\ Time\ Deposit\ Rate_{it}$ | -0.01 | 0.16 | -0.10 | 0.08 | -0.05 | -0.06 | 0.07 | 0.03 | 0.09 | 1.00 | | | | | | | |
| 11 | $Core\ Deposit\ Rate_{it}$ | -0.01 | 0.12 | -0.09 | 0.15 | -0.07 | -0.12 | -0.03 | 0.02 | 0.10 | 0.86 | 1.00 | | | | | | |
| 12 | $\Delta Loans_{it}$ | -0.06 | 0.33 | -0.01 | -0.03 | -0.06 | 0.04 | 0.23 | 0.24 | 0.21 | 0.19 | 0.17 | 1.00 | | | | | |
| 13 | $\Delta Commitments_{it}$ | -0.04 | 0.13 | 0.00 | -0.05 | -0.06 | 0.03 | -0.03 | 0.15 | 0.02 | 0.00 | -0.01 | 0.17 | 1.00 | | | | |
| 14 | $\Delta Liquid\ Assets_{it}$ | 0.01 | 0.02 | 0.04 | -0.01 | -0.03 | -0.02 | -0.04 | 0.31 | 0.22 | -0.04 | -0.03 | -0.23 | 0.05 | 1.00 | | | |
| 15 | $\Delta Internal\_Equity_{i,t-1}$ | -0.05 | 0.60 | 0.16 | -0.07 | -0.13 | 0.01 | 0.09 | 0.10 | 0.06 | 0.13 | 0.11 | 0.19 | 0.08 | 0.03 | 1.00 | | |
| 16 | $Timeliness_{i,t-1}$ | 0.05 | -0.05 | 0.00 | 0.01 | 0.01 | 0.04 | 0.01 | -0.02 | 0.02 | -0.02 | -0.02 | -0.04 | -0.02 | 0.01 | -0.02 | 1.00 | |
| 17 | $Sophistication_{i}$ | 0.05 | -0.05 | -0.13 | -0.01 | 0.06 | 0.27 | 0.36 | 0.02 | 0.00 | -0.04 | -0.10 | 0.02 | 0.02 | 0.00 | -0.02 | 0.02 | 1.00 |
| 18 | $Std\_WriteOff_{it-1}$ | 0.10 | -0.47 | -0.04 | 0.08 | 0.00 | 0.00 | -0.13 | -0.11 | -0.12 | -0.29 | -0.25 | -0.34 | -0.09 | 0.00 | -0.27 | 0.07 | 0.10 |

*Panel C: R2 and Banks' Asset Side Characteristics*

This panel presents the association between *R2* and banks' asset side characteristics. The dependent variable is the adjusted *R2* from estimating Equation (2) for each bank-quarter using a 12-quarter rolling window. *Real Estate Loan* $_{it}$ is the ratio of real estate loans to total assets. *Commercial Loan* $_{it}$ is the ratio of commercial and industrial loans to total assets. *Liquid Assets* $_{it}$ is the ratio of liquid assets to total assets. *Ln(Assets)* $_{it}$ is the log of total assets. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable | $R2_{it}$ | $R2_{it}$ | $R2_{it}$ | $R2_{it}$ |
| *RealEstateLoan* $_{it}$ | 0.081*** | 0.170*** | 0.101*** | 0.127*** |
| | (0.031) | (0.030) | (0.015) | (0.015) |
| *Commercial Loan* $_{it}$ | -0.109* | -0.102* | -0.008 | -0.003 |
| | (0.057) | (0.056) | (0.028) | (0.028) |
| *Other Loan* $_{it}$ | 0.047 | 0.063 | 0.103*** | 0.113*** |
| | (0.059) | (0.057) | (0.027) | (0.027) |
| *Ln(Assets)* $_{it}$ | 0.034*** | 0.037*** | 0.039*** | 0.040*** |
| | (0.008) | (0.006) | (0.002) | (0.002) |
| *Bank fixed effects* | Yes | Yes | No | No |
| *Quarter fixed effects* | Yes | No | Yes | No |
| Observations | 247,769 | 247,769 | 247,769 | 247,769 |
| Adjusted R-squared | 0.142 | 0.131 | 0.022 | 0.010 |

## Table 2. Transparency and Sensitivity of Deposit Flows to Bank Performance

*Panel A: Transparency and flow-performance sensitivity*

This panel presents ordinary least-squares estimates of Equation (3) over various specifications. The dependent variables are listed in Row 2. $\Delta Dep_{it}^{U}$, $\Delta Dep_{it}^{I}$, and $\Delta Dep_{it}^{Total}$ are the changes in the uninsured, insured, and total deposits, respectively, all scaled by beginning value of total assets. *R2* is measured as the deviation from sample mean. Bank fixed effect is included throughout except in column (6). Macro-control variables (contemporaneous and lagged fed fund runs and S&P stock returns) are included in all columns except column (7). Interactive terms between bank characteristics (*Std_Writeoff, Capital_Ratio, Wholesale_Funding, RealEstate_Loans, Ln(Assets) and Uninsured_Commitments, measured as the deviations from their respective sample means*) and *ROE* are included in columns (3) to (7). The Appendix contains detailed descriptions for the independent variables. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Dependent variable | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ | $\Delta Dep_{it}^{Total}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{U}$ |
| *$ROE_{it-1}$* | 0.086*** | 0.007** | 0.112*** | -0.020*** | 0.092*** | 0.100*** | 0.056*** |
| | (0.003) | (0.003) | (0.004) | (0.004) | (0.004) | (0.003) | (0.004) |
| *$R2_{it-1} \times ROE_{it-1}$* | | | 0.043*** | -0.051*** | -0.005 | 0.050*** | 0.014*** |
| | | | (0.005) | (0.006) | (0.005) | (0.005) | (0.004) |
| *$R2_{it-1}$* | | | -0.992*** | 1.134*** | 0.096 | -1.050*** | -0.210*** |
| | | | (0.080) | (0.088) | (0.083) | (0.074) | (0.066) |
| *$Std\_WriteOff_{it-1}$* | -0.306*** | -0.851*** | -0.213*** | -0.928*** | -1.141*** | -0.244*** | -0.434*** |
| | (0.044) | (0.047) | (0.046) | (0.049) | (0.055) | (0.033) | (0.039) |
| *$Capital\_Ratio_{it-1}$* | 30.375*** | 33.086*** | 31.795*** | 35.450*** | 66.264*** | 3.286*** | 34.066*** |
| | (2.197) | (2.354) | (2.333) | (2.489) | (3.104) | (1.268) | (2.045) |
| *$Wholesale\_Funding_{it-1}$* | 1.110* | 19.144*** | -0.061 | 20.176*** | 18.743*** | -1.309*** | 6.044*** |
| | (0.621) | (0.715) | (0.680) | (0.785) | (0.854) | (0.370) | (0.650) |
| *$RealEstate\_Loans_{it-1}$* | -3.905*** | 2.930*** | -4.040*** | 3.435*** | -1.011 | -0.587** | -1.264*** |
| | (0.448) | (0.473) | (0.494) | (0.534) | (0.665) | (0.230) | (0.447) |
| *$Ln(Assets)_{it-1}$* | -4.059*** | -1.837*** | -4.034*** | -1.846*** | -5.542*** | -0.226*** | -3.925*** |
| | (0.147) | (0.131) | (0.145) | (0.132) | (0.170) | (0.037) | (0.137) |
| *$Unused\_Commitments_{it-1}$* | 8.803*** | 10.062*** | 6.175*** | 14.060*** | 20.249*** | 6.576*** | 7.473*** |
| | (0.843) | (0.841) | (1.021) | (1.048) | (1.243) | (0.648) | (0.918) |
| *Large Time Deposit $Rate_{it-1}$* | -0.478*** | 0.435*** | -0.478*** | 0.435*** | -0.047* | -0.417*** | -0.029 |
| | (0.107) | (0.098) | (0.106) | (0.096) | (0.027) | (0.088) | (0.020) |
| *Core Deposit $Rate_{it-1}$* | -1.664*** | 1.932*** | -1.599*** | 1.853*** | 0.232*** | -0.677*** | 0.294*** |
| | (0.168) | (0.149) | (0.166) | (0.146) | (0.056) | (0.080) | (0.063) |
| *Bank characteristics * $ROE_{it-1}$* | No | No | Yes | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes | Yes | No | Yes |
| *Macro-variable controls* | Yes | Yes | Yes | Yes | Yes | Yes | No |
| *Quarter fixed effects* | No | No | No | No | No | No | Yes |
| *Observations* | 255,553 | 255,553 | 255,553 | 255,553 | 255,553 | 255,553 | 255,553 |
| *Adj. R-squared* | 0.114 | 0.105 | 0.117 | 0.110 | 0.168 | 0.077 | 0.308 |

*Panel B: Flow-performance sensitivity by average size of uninsured deposit accounts*

This panel present the results for deposit flow-performance sensitivity using ordinary least-squares estimates of Equation (3) separately for subsamples of bank-quarters where average uninsured deposit account is above and below sample median size (about $270,350), respectively. The Appendix contains detailed descriptions for all variables. All regressions include bank-fixed effects, demeaned bank-year specific controls and their interactive terms with *ROE*, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | Average size of uninsured deposit account > median | | Average size of uninsured deposit account < median | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Dependent variable | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ |
| $ROE_{it-1}$ | 0.102*** | -0.024*** | 0.099*** | -0.003 |
| | (0.007) | (0.007) | (0.006) | (0.006) |
| $R2_{it-1} \times ROE_{it-1}$ | 0.039*** | -0.048*** | 0.006 | -0.008 |
| | (0.007) | (0.007) | (0.009) | (0.009) |
| $R2_{it-1}$ | -0.969*** | 1.139*** | -0.421*** | 0.450*** |
| | (0.110) | (0.115) | (0.127) | (0.130) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics * ROE* $_{it-1}$ | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| Observations | 129,374 | 129,374 | 126,066 | 126,066 |
| Adj. R-squared | 0.141 | 0.149 | 0.130 | 0.136 |

*Panel C: Asymmetric effects of transparency on flow-performance sensitivity*

This panel presents the results for deposit flow-performance sensitivity using ordinary least-squares estimates of Equation (3) separately for the subsamples of bank-quarters with below and above sample median *ROE*. The Appendix contains detailed descriptions for all variables. All regressions include bank-fixed effects, demeaned bank-year specific controls and their interactive terms with *ROE*, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | $ROE_{it-1}$ < Median | | $ROE_{it-1}$ > Median | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Dependent variable | $\Delta Dep^{U}_{it}$ | $\Delta Dep^{I}_{it}$ | $\Delta Dep^{U}_{it}$ | $\Delta Dep^{I}_{it}$ |
| $ROE_{it-1}$ | 0.103*** | -0.045*** | 0.076*** | -0.008 |
| | (0.007) | (0.007) | (0.010) | (0.010) |
| $R2_{it-1} \times ROE_{it-1}$ | 0.039*** | -0.052*** | 0.005 | 0.004 |
| | (0.007) | (0.008) | (0.015) | (0.015) |
| $R2_{it-1}$ | -0.935*** | 1.045*** | -0.241 | 0.177 |
| | (0.088) | (0.094) | (0.263) | (0.250) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics * $ROE_{it-1}$* | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| Observations | 129,134 | 129,134 | 126,419 | 126,419 |
| Adj. R-squared | 0.157 | 0.163 | 0.079 | 0.084 |

*Panel D: Main results in subsamples of small, medium, and large banks*

This panel explores whether the effect of transparency on flow-performance sensitivity differs by bank asset size. Columns (1)-(2), columns (3)-(4), and columns (5) to (6) present the results for deposit flow-performance sensitivity using ordinary least-squares estimates of Equation (3) for the subsample of small, medium, and large banks, respectively. Small banks are defined as those with total assets below 500 million, large banks have assets above 3 billion, and medium banks have assets between 500 million and 3 billion (measured in 2000 real dollars). All regressions include bank-fixed effects, demeaned bank-year specific controls and their interactive terms with *ROE*, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | Small banks Assets $\in$ (100, 500 million) | | Medium banks Assets $\in$ (500 million, 3 billion) | | Large banks Assets $>$ 3 billion | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Dependent variable | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ |
| $ROE_{it-1}$ | 0.114*** | -0.017*** | 0.070*** | -0.006 | 0.082 | -0.089 |
| | (0.006) | (0.006) | (0.020) | (0.022) | (0.077) | (0.068) |
| $R2_{it-1} \times ROE_{it-1}$ | 0.036*** | -0.041*** | 0.041*** | -0.088*** | 0.041* | -0.069*** |
| | (0.006) | (0.007) | (0.013) | (0.014) | (0.023) | (0.024) |
| $R2_{it-1}$ | -0.862*** | 0.940*** | -0.998*** | 1.773*** | -1.323*** | 1.831*** |
| | (0.089) | (0.099) | (0.205) | (0.224) | (0.389) | (0.412) |
| *Bank characteristics* | Yes | Yes | Yes | Yes | Yes | Yes |
| *Bank characteristics * ROE* $_{it-1}$ | Yes | Yes | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 203,591 | 203,591 | 41,238 | 41,238 | 10,724 | 10,724 |
| Adj. R-squared | 0.119 | 0.121 | 0.172 | 0.125 | 0.108 | 0.070 |

## *Panel E: Crisis vs. non-crisis periods*

This panel presents the results for deposit flow-performance sensitivity using ordinary least-squares estimates of Equation (3) for the subsample of bank-quarters in the crisis period (from 2007Q3 to 2009Q2, inclusive) and in the non-crisis period (all other quarters). The Appendix contains detailed descriptions for all variables. All regressions include bank-fixed effects, demeaned bank-year specific controls and their interactive terms with *ROE*, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | Non-Crisis Period | | Crisis Period (2007Q3-2009Q2) | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Dependent variable | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{I}$ |
| $ROE_{it-1}$ | 0.106*** | -0.005 | 0.030** | 0.003 |
| | (0.004) | (0.005) | (0.012) | (0.011) |
| $R2_{it-1} \times ROE_{it-1}$ | 0.050*** | -0.050*** | -0.021 | 0.010 |
| | (0.005) | (0.006) | (0.017) | (0.015) |
| $R2_{it-1}$ | -0.849*** | 0.945*** | 0.006 | 0.012 |
| | (0.079) | (0.086) | (0.273) | (0.250) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics * $ROE_{it-1}$* | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| Observations | 226,127 | 226,127 | 29,426 | 29,426 |
| Adj. R-squared | 0.111 | 0.105 | 0.521 | 0.522 |

## Table 3. Transparency and Deposit Rates

This table presents ordinary least-squares estimates of Equation (3) with deposit rates as the dependent variable. Columns (1) and (3) model rates on large time deposits and columns (2) and (4) model rates on core deposits. The Appendix contains detailed descriptions for the independent variables. All regressions include bank-fixed effects, demeaned bank-year specific controls and their interactive terms with *ROE*, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| Dependent variable | (1) Large time deposit $rate_{it}$ | (2) Core deposit $rate_{it}$ | (3) Large time deposit $rate_{it}$ | (4) Core deposit $rate_{it}$ |
|---|---|---|---|---|
| $ROE_{it-1}$ | -0.005*** | -0.006*** | -0.005*** | -0.006*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| $R2_{it-1} \times ROE_{i,t-1}$ | -0.007*** | -0.005*** | | |
| | (0.000) | (0.000) | | |
| $R2_{it-1}$ | 0.118*** | 0.105*** | 0.049*** | 0.051*** |
| | (0.008) | (0.006) | (0.006) | (0.004) |
| $Std\_WriteOff_{it-1}$ | -0.085*** | -0.076*** | -0.082*** | -0.071*** |
| | (0.005) | (0.005) | (0.005) | (0.005) |
| $Capital\_Ratio_{it-1}$ | -2.831*** | -3.821*** | -2.779*** | -3.663*** |
| | (0.276) | (0.253) | (0.273) | (0.249) |
| $Wholesale\_Funding_{it-1}$ | 0.992*** | -0.029 | 1.018*** | -0.011 |
| | (0.071) | (0.067) | (0.072) | (0.068) |
| $RealEstate\_Loans_{it-1}$ | -0.737*** | -1.032*** | -0.735*** | -1.031*** |
| | (0.059) | (0.057) | (0.059) | (0.057) |
| $Ln(Assets)_{it-1}$ | -0.382*** | -0.399*** | -0.377*** | -0.395*** |
| | (0.013) | (0.014) | (0.013) | (0.014) |
| $Unused\_Commitments_{it-1}$ | -1.086*** | -2.009*** | -1.070*** | -1.973*** |
| | (0.102) | (0.096) | (0.102) | (0.096) |
| *Bank characteristics* * $ROE_{it-1}$ | Yes | Yes | No | No |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| Observations | 253,249 | 253,316 | 253,249 | 253,316 |
| Adj. R-squared | 0.857 | 0.890 | 0.856 | 0.889 |

## Table 4. Transparency and Reliance on Internal Equity to Fund Assets

This table presents ordinary least-squares estimates of Equation (6). The dependent variable is changes in the balance of total loans in column (1), the changes in the balance of total commitments in column (2), the changes in the sum of loans and commitment in column (3), and changes in the balances of liquid assets in column (4). All dependent variables are scaled by lagged total assets. The Appendix contains detailed descriptions for the independent variables. All regressions include bank-fixed effects, demeaned bank-year specific controls and their interactive terms with $\Delta Internal\_Equity$, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| Dependent variable | (1) $\Delta \text{Loan}_{\text{it}}$ | (2) $\Delta \text{Commitment}_{\text{it}}$ | (3) $\Delta \text{Credit}_{\text{it}}$ | (4) $\Delta \text{Liquid Assets}_{\text{it}}$ |
|---|---|---|---|---|
| $\Delta Internal\_Equity_{i,t-1}$ | 0.220*** | 0.191*** | 0.412*** | 0.096*** |
| | (0.017) | (0.009) | (0.022) | (0.019) |
| $R2_{\,it-1} \times \Delta \text{Internal}\_Equity_{i,t-1}$ | 0.166*** | 0.083*** | 0.247*** | -0.077** |
| | (0.032) | (0.015) | (0.039) | (0.034) |
| $R2_{\,it-1}$ | -0.533*** | -0.359*** | -0.887*** | 0.320*** |
| | (0.065) | (0.034) | (0.082) | (0.070) |
| *Std_WriteOff* $_{it-1}$ | -1.861*** | -0.581*** | -2.462*** | -0.178*** |
| | (0.054) | (0.026) | (0.065) | (0.042) |
| *Capital_Ratio* $_{it-1}$ | 10.091*** | 3.417** | 13.474*** | 47.855*** |
| | (2.732) | (1.404) | (3.257) | (2.620) |
| *Wholesale_Funding* $_{it-1}$ | -5.572*** | -0.470 | -6.022*** | 9.713*** |
| | (0.699) | (0.378) | (0.857) | (0.645) |
| *RealEstate_Loans* $_{it-1}$ | -1.589*** | -2.957*** | -4.551*** | 0.431 |
| | (0.606) | (0.304) | (0.700) | (0.622) |
| *Ln(Assets)* $_{it-1}$ | -4.303*** | -0.507*** | -4.761*** | -2.765*** |
| | (0.151) | (0.072) | (0.174) | (0.131) |
| *Unused_Commitments* $_{it-1}$ | 53.426*** | -31.390*** | 19.584*** | -20.178*** |
| | (1.313) | (0.785) | (1.423) | (1.100) |
| *Bank characteristics* * $\Delta Internal\_Equity_{i,t-1}$ | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| Observations | 259,593 | 259,593 | 259,593 | 181,552 |
| Adj. R-squared | 0.289 | 0.109 | 0.243 | 0.036 |

## Table 5. Transparency and Performance

This table explores the association between transparency and bank performance. The dependent variable is return on assets (ROA) in columns 1-2 and return on equity (*ROE*) in columns 3-4. The Appendix contains detailed descriptions for the independent variables. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| Dependent variable | (1) $ROA_{it}$ | (2) $ROA_{it}$ | (3) $ROE_{it}$ | (4) $ROE_{it}$ |
|---|---|---|---|---|
| *R2* $_{it}$ | -0.099*** | -0.116*** | -1.076*** | -1.282*** |
| | (0.005) | (0.007) | (0.061) | (0.078) |
| *Capital_Ratio* $_{it}$ | 5.843*** | 6.019*** | -10.760*** | -42.086*** |
| | (0.309) | (0.273) | (3.483) | (2.494) |
| *Wholesale_Funding* $_{it}$ | -0.549*** | -0.543*** | -5.422*** | -6.622*** |
| | (0.072) | (0.061) | (0.831) | (0.689) |
| *RealEstate_Loans* $_{it}$ | -0.158*** | -0.721*** | -2.123*** | -7.707*** |
| | (0.054) | (0.041) | (0.632) | (0.430) |
| *Ln(Assets)* $_{it}$ | -0.154*** | 0.015** | -2.047*** | 0.361*** |
| | (0.013) | (0.006) | (0.153) | (0.072) |
| *Unused_Commitments* $_{it}$ | 1.862*** | 0.402*** | 20.488*** | 6.772*** |
| | (0.099) | (0.094) | (1.165) | (1.043) |
| *Std_ROA* $_{it}$ | -0.559*** | -0.539*** | | |
| | (0.013) | (0.012) | | |
| *Std_ROE* $_{it}$ | | | -0.822*** | -0.803*** |
| | | | (0.016) | (0.014) |
| *Bank fixed effects* | Yes | No | Yes | No |
| *Macro controls* | Yes | Yes | Yes | Yes |
| Observations | 249,796 | 249,796 | 249,796 | 249,796 |
| Adj. R-squared | 0.497 | 0.270 | 0.487 | 0.280 |

## Table 6: Are the Inferences Confounded by Information Sources Other Than Call Reports?

*Panel A: Unconditional variation in uninsured deposit flows*

This panel examines how does the unconditional volatility of uninsured deposit flows varies with the level of bank transparency. The dependent variable is the logarithm of the standard deviation of uninsured deposit flows during the 12-quarter periods over which *R2* is estimated. The Appendix contains detailed descriptions for the independent variables. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| Dependent variable | $Log(\sigma(\Delta Dep^{U}))$ | |
|---|---|---|
| | (1) | (2) |
| $R2_{it}$ | 0.025*** | 0.024*** |
| | (0.006) | (0.006) |
| $Std\_ROE_{it}$ | 0.012*** | 0.014*** |
| | (0.001) | (0.001) |
| $Capital\_Ratio_{it}$ | -0.409 | -0.938*** |
| | (0.285) | (0.210) |
| $Wholesale\_Funding_{it}$ | 1.335*** | 1.189*** |
| | (0.079) | (0.053) |
| $RealEstate\_Loans_{it}$ | 0.078 | -0.319*** |
| | (0.060) | (0.034) |
| $Ln(Assets)_{it}$ | 0.095*** | -0.111*** |
| | (0.016) | (0.006) |
| $Unused\_Commitments_{it}$ | -0.115 | 1.229*** |
| | (0.094) | (0.075) |
| *Bank fixed effects* | Yes | No |
| *Macro controls* | Yes | Yes |
| Observations | 159,091 | 159,091 |
| Adj. R-squared | 0.521 | 0.223 |

### *Panel B: Exploring effects separately for public and private banks*

This panel explores the effect of transparency as measured by *R2* within the subset of private (columns 1 to 2) and public banks (columns 3-4) separately. A commercial bank is classified as public if its Fed ID (RSSD9001), or its bank holding company (RSSD9348) can be linked to a PERMCO using the PERMCO-RSSD link table from the website of Federal Reserve Bank of New York. The Appendix contains detailed descriptions for all variables. All regressions include bank-fixed effects, demeaned bank-year specific controls and their interactive terms with *ROE*, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | Private banks | | Public banks | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Dependent variable | $\Delta \mathrm{Dep}_{it}^{U}$ | $\Delta \mathrm{Dep}_{it}^{I}$ | $\Delta \mathrm{Dep}_{it}^{U}$ | $\Delta \mathrm{Dep}_{it}^{I}$ |
| | | | | |
| *ROE* $_{it-1}$ | 0.118*** | -0.023*** | 0.086*** | -0.031*** |
| | (0.005) | (0.005) | (0.011) | (0.011) |
| *R2* $_{it-1}$ × *ROE* $_{it-1}$ | 0.056*** | -0.063*** | 0.060*** | -0.081*** |
| | (0.006) | (0.007) | (0.013) | (0.014) |
| *R2* $_{it-1}$ | -1.190*** | 1.326*** | -1.414*** | 1.747*** |
| | (0.087) | (0.099) | (0.208) | (0.239) |
| | | | | |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics * ROE* | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| | | | | |
| Observations | 213,295 | 213,295 | 51,748 | 51,748 |
| Adj. R-squared | 0.105 | 0.096 | 0.104 | 0.093 |

## Table 7: Sensitivity to Alternative Transparency and Performance Measures

This panel explores the robustness of our main results to alternative transparency and performance measures. The dependent variable is uninsured deposit flows. Columns (1) to (3) use *ROE* as the performance measure with different transparency measures. *R2writeoff4* is the adjusted *R2* from estimating Equation (2) using write-off in the leading 4 quarters as the dependent variable. *Timeliness of LLP* is an indicator variable that equals 1(0) if the incremental adj. R-squared from estimating equations (a) and (b), as outlined in the Appendix, is above (below) the sample median. *Depositor sophistication* is average percentage of college education for adults in counties where a bank operates, weighted by the amount of deposits the bank draws from the counties in a given year. Columns (4) to (7) use *R2* as the transparency measure with different performance measures. The Appendix contains detailed descriptions for all variables. All regressions include bank-fixed effects, bank-year specific controls and their demeaned values interacted with *ROE*, and controls for macro conditions. Standard error estimates, reported in parentheses, are clustered at the bank level. Statistical significance (two-sided) at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Dependent variable | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{U}$ | $\Delta Dep_{it}^{U}$ |
| Performance measure | *ROE* | *ROE* | *ROE* | *ROA* | *Changes in internal equity* | *Loan Loss Provisions* | *Non-performing loans* |
| Transparency measure | *R2(4 quarters of write-off)* | *Timeliness of LLP* | *Depositor Sophistication* | *R2* | *R2* | *R2* | *R2* |
| $Perf_{it-1}$ | 0.111*** | 0.114*** | 0.114*** | 1.216*** | 0.176*** | -2.046*** | -0.621*** |
| | (0.004) | (0.004) | (0.004) | (0.047) | (0.020) | (0.180) | (0.029) |
| $Transparency_{it-1} \times Perf_{it-1}$ | 0.038*** | 0.014*** | 0.057* | 0.506*** | 0.208*** | -1.543*** | -0.331*** |
| | (0.006) | (0.005) | (0.029) | (0.062) | (0.037) | (0.239) | (0.030) |
| $Transparency_{it-1}$ | -1.166*** | -0.311*** | 11.424*** | -1.045*** | -0.872*** | -0.378*** | -0.105 |
| | (0.084) | (0.069) | (2.772) | (0.087) | (0.071) | (0.059) | (0.066) |
| *Bank characteristics* | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Bank characteristics * ROE* | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 255,747 | 256,940 | 256,851 | 255,553 | 250,716 | 255,553 | 255,553 |
| Adj. R-squared | 0.117 | 0.116 | 0.116 | 0.117 | 0.113 | 0.113 | 0.116 |

## Online Appendix

## Table A1. Robustness to use of time dummies

This panel presents the robustness of our main results to inclusion of time dummies instead of contemporaneous macro-controls. All other specifications are the same as their counterparts shown in the main draft.

*Panel A: Transparency and sensitivity of deposit flows to performance*

| | (1) | (2) | (3) |
|---|---|---|---|
| | $\Delta Dep^{U}_{it}$ | $\Delta Dep^{I}_{it}$ | $\Delta Dep^{Total}_{it}$ |
| *ROE$_{it-1}$* | 0.056*** | 0.041*** | 0.096*** |
| | (0.004) | (0.004) | (0.005) |
| *R2 $_{it-1}$ × ROE $_{it-1}$* | 0.014*** | -0.016*** | 0.000 |
| | (0.004) | (0.005) | (0.005) |
| *R2 $_{it-1}$* | -0.210*** | 0.237*** | 0.004 |
| | (0.066) | (0.068) | (0.082) |
| *Std_WriteOff $_{it-1}$* | -0.434*** | -0.752*** | -1.184*** |
| | (0.039) | (0.041) | (0.056) |
| *Capital_Ratio $_{it-1}$* | 34.066*** | 27.799*** | 61.524*** |
| | (2.045) | (2.114) | (3.134) |
| *Wholesale_Funding $_{it-1}$* | 6.044*** | 10.489*** | 15.594*** |
| | (0.650) | (0.682) | (0.894) |
| *RealEstate_Loans $_{it-1}$* | -1.264*** | -1.046** | -2.327*** |
| | (0.447) | (0.463) | (0.686) |
| *Ln(Assets) $_{it-1}$* | -3.925*** | -3.139*** | -6.508*** |
| | (0.137) | (0.139) | (0.223) |
| *Unused_Commitments $_{it-1}$* | 7.473*** | 12.078*** | 19.945*** |
| | (0.918) | (0.888) | (1.268) |
| *Large Time Deposit Rate$_{it-1}$* | -0.029 | -0.013 | -0.038 |
| | (0.020) | (0.021) | (0.029) |
| *Core Deposit Rate$_{it-1}$* | 0.294*** | 0.291*** | 0.551*** |
| | (0.063) | (0.059) | (0.075) |
| *Bank characteristics * ROE* | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes |
| *Quarter fixed effects* | Yes | Yes | Yes |
| *Observations* | 255,553 | 255,553 | 255,553 |
| *Adj. R-squared* | 0.308 | 0.345 | 0.189 |

*Panel B: Transparency and the sensitivity of deposit rates to performance*

| Dependent variable | (1)<br>Large time deposit rate$_{it}$ | (2)<br>Core deposit rate$_{it}$ |
|---|---|---|
| *ROE*$_{it-1}$ | -0.002*** | -0.003*** |
| | (0.000) | (0.000) |
| *R2* $_{it-1}$ × $ROE_{i,t-1}$ | -0.001*** | -0.001*** |
| | (0.000) | (0.000) |
| *R2* $_{it-1}$ | 0.005 | 0.015*** |
| | (0.006) | (0.004) |
| *Std_WriteOff* $_{it-1}$ | -0.021*** | -0.036*** |
| | (0.004) | (0.003) |
| *Capital_Ratio* $_{it-1}$ | -0.872*** | -1.601*** |
| | (0.223) | (0.194) |
| *Wholesale_Funding* $_{it-1}$ | 0.248*** | -0.110* |
| | (0.062) | (0.059) |
| *RealEstate_Loans* $_{it-1}$ | 0.047 | -0.090** |
| | (0.053) | (0.045) |
| *Ln(Assets)* $_{it-1}$ | 0.045*** | 0.135*** |
| | (0.014) | (0.014) |
| *Unused_Commitments* $_{it-1}$ | -0.007 | -0.362*** |
| | (0.080) | (0.077) |
| *Bank characteristics *ROE* | Yes | Yes |
| *Bank fixed effects* | Yes | Yes |
| *Quarter fixed effects* | Yes | Yes |
| Observations | 253,249 | 253,316 |
| Adj. R-squared | 0.857 | 0.890 |

*Panel C: Transparency and the sensitivity of asset growth to internal equity*

| Dependent variable | (1) $\Delta\text{Loan}_{it}$ | (2) $\Delta\text{Commitment}_{it}$ | (3) $\Delta\text{Credit}_{it}$ | (4) $\Delta\text{Liquid Assets}_{it}$ |
|---|---|---|---|---|
| $\Delta Internal\_Equity_{i,t-1}$ | 0.407*** | 0.163*** | 0.571*** | 0.027 |
| | (0.019) | (0.010) | (0.024) | (0.022) |
| *R2* $_{it-1}$ X $\Delta Internal\_Equity_{i,t-1}$ | 0.135*** | 0.046*** | 0.180*** | -0.041 |
| | (0.031) | (0.015) | (0.039) | (0.034) |
| *R2* $_{it-1}$ | -0.391*** | -0.156*** | -0.542*** | 0.144** |
| | (0.064) | (0.033) | (0.080) | (0.070) |
| *Std_WriteOff* $_{it-1}$ | -1.566*** | -0.510*** | -2.092*** | -0.406*** |
| | (0.054) | (0.027) | (0.064) | (0.043) |
| *Capital_Ratio* $_{it-1}$ | 12.147*** | -1.464 | 10.536*** | 44.034*** |
| | (2.722) | (1.407) | (3.287) | (2.607) |
| *Wholesale_Funding* $_{it-1}$ | -3.240*** | -0.660 | -3.975*** | 6.159*** |
| | (0.724) | (0.417) | (0.901) | (0.655) |
| *RealEstate_Loans* $_{it-1}$ | -0.338 | -4.159*** | -4.549*** | -1.524** |
| | (0.625) | (0.352) | (0.739) | (0.652) |
| *Ln(Assets)* $_{it-1}$ | -3.941*** | -1.424*** | -5.350*** | -3.897*** |
| | (0.191) | (0.106) | (0.231) | (0.179) |
| *Unused_Commitments* $_{it-1}$ | 48.561*** | -37.200*** | 8.709*** | -17.240*** |
| | (1.320) | (0.908) | (1.433) | (1.106) |
| *Bank characteristics** $\Delta Internal\_Equity_{i,t-1}$ | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Quarter fixed effects* | Yes | Yes | Yes | Yes |
| Observations | 259,593 | 259,593 | 259,593 | 181,552 |
| Adj. R-squared | 0.312 | 0.145 | 0.272 | 0.071 |

*Panel D: Transparency and bank performance*

| Dependent variable | (1)<br>$ROA_{it}$ | (2)<br>$ROE_{it}$ |
|---|---|---|
| *R2* $_{it}$ | -0.070*** | -0.762*** |
| | (0.005) | (0.059) |
| *Capital_Ratio* $_{it}$ | 5.870*** | -9.108*** |
| | (0.300) | (3.417) |
| *Wholesale_Funding* $_{it}$ | -0.180** | -1.085 |
| | (0.074) | (0.871) |
| *RealEstate_Loans* $_{it}$ | 0.053 | 0.419 |
| | (0.055) | (0.637) |
| *Ln(Assets)* $_{it}$ | -0.074*** | -0.988*** |
| | (0.016) | (0.198) |
| *Unused_Commitments* $_{it}$ | 1.563*** | 18.270*** |
| | (0.097) | (1.158) |
| *Std_ROA* $_{it}$ | -0.516*** | |
| | (0.013) | |
| *Std_ROE* $_{it}$ | | -0.776*** |
| | | (0.016) |
| *Bank fixed effects* | Yes | Yes |
| *Quarter fixed effects* | Yes | Yes |
| Observations | 249,796 | 249,796 |
| Adj. R-squared | 0.523 | 0.510 |

## Table A2. Robustness to Use of Lagged Dependent Variable

This table reports the robustness of our main results to a variation of our basic specification by replacing bank fixed effects with the lagged dependent variables.

*Panel A: Transparency and the sensitivities of deposit flows and rates to performance*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable | $\Delta Dep^{U}_{it}$ | $\Delta dep^{I}_{it}$ | Large time deposit $rate_{it}$ | Core deposit $rate_{it}$ |
| *$ROE_{it-1}$* | 0.074*** | 0.016*** | -0.001*** | -0.001*** |
| | (0.003) | (0.003) | (0.000) | (0.000) |
| *$R2_{it-1} \times ROE_{it-1}$* | 0.029*** | -0.027*** | -0.001*** | -0.000 |
| | (0.004) | (0.004) | (0.000) | (0.000) |
| *$R2_{it-1}$* | -0.624*** | 0.572*** | 0.012*** | 0.003* |
| | (0.059) | (0.058) | (0.003) | (0.002) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics * ROE* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | No | No | No | No |
| *Lagged dependent variable* | Yes | Yes | Yes | Yes |
| *Observations* | 239,140 | 239,140 | 234,315 | 234,421 |
| *Adj. R-squared* | 0.186 | 0.225 | 0.942 | 0.976 |

*Panel B: Transparency and the sensitivities of asset growth to internal equity*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable | $\Delta Loan_{it}$ | $\Delta Commitment_{it}$ | $\Delta Credit_{it}$ | $\Delta Liquid\ Assets_{it}$ |
| $\Delta Internal\_Equity_{i,t-1}$ | 0.074*** | 0.145*** | 0.182*** | 0.057*** |
| | (0.012) | (0.008) | (0.016) | (0.016) |
| $R2_{it-1} \times \Delta Internal\_Equity_{i,t-1}$ | 0.088*** | 0.045*** | 0.102*** | -0.086*** |
| | (0.024) | (0.013) | (0.029) | (0.031) |
| *$R2_{it-1}$* | -0.300*** | -0.200*** | -0.405*** | 0.230*** |
| | (0.039) | (0.024) | (0.048) | (0.053) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics * $\Delta Internal\_Equity_{i,t-1}$* | Yes | Yes | Yes | Yes |
| *Macro controls* | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | No | No | No | No |
| *Lagged dependent variable* | Yes | Yes | Yes | Yes |
| *Observations* | 244,061 | 244,061 | 244,061 | 169,761 |
| *Adj. R-squared* | 0.468 | 0.164 | 0.444 | 0.125 |

*Panel C: Transparency and performance*

| | (1) | (2) |
|---|---|---|
| Dependent variable | $ROA_{it}$ | $ROE_{it}$ |
| $R2_{it}$ | -0.070*** | -0.805*** |
| | (0.004) | (0.048) |
| *Bank characteristics* | Yes | Yes |
| *Macro controls* | Yes | Yes |
| *Bank fixed effects* | No | No |
| *Lagged dependent variable* | Yes | Yes |
| Observations | 233,376 | 233,376 |
| Adj. R-squared | 0.453 | 0.448 |

## Table A3. Robustness to Use of Residual *R2*

This table reports the robustness of our main results to the use of a modified version of *R2*, *Residual_R2*, which is the residual estimate from a cross-sectional regression of *R2* on lagged *ROE*s. Panel A reports the result from regressing *R2* on lagged *ROE*s. Panel B, C, and D report the robustness of our main results to use of the residual *R2*.

*Panel A: Orthogonalize R2 from past performances*

| | $R2_{it}$ |
|---|---|
| $\Delta ROE_{it-1}$ | -0.003*** |
| | (-21.141) |
| $\Delta ROE_{it-2}$ | -0.005*** |
| | (-29.999) |
| $\Delta ROE_{it-3}$ | -0.005*** |
| | (-30.112) |
| $\Delta ROE_{it-4}$ | -0.005*** |
| | (-27.698) |
| $\Delta ROE_{it-5}$ | -0.004*** |
| | (-21.469) |
| $\Delta ROE_{it-6}$ | -0.003*** |
| | (-14.899) |
| $\Delta ROE_{it-7}$ | -0.001*** |
| | (-7.179) |
| $\Delta ROE_{it-8}$ | -0.000** |
| | (-2.503) |
| Observations | 167,379 |
| R-squared | 0.008 |

*Panel B: Transparency and the sensitivities of deposit flows and rates to performance*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable | $\Delta Dep^{U}_{it}$ | $\Delta Dep^{I}_{it}$ | Large time deposit rate$_{it}$ | Core deposit rate$_{it}$ |
| *$ROE_{it-1}$* | 0.103*** | -0.022*** | -0.004*** | -0.005*** |
| | (0.005) | (0.005) | (0.000) | (0.000) |
| *Residual_R2 $_{it-1}$ × ROE $_{it-1}$* | 0.021*** | -0.037*** | -0.006*** | -0.004*** |
| | (0.006) | (0.007) | (0.001) | (0.000) |
| *Residual_R2 $_{it-1}$* | -0.482*** | 0.837*** | 0.093*** | 0.082*** |
| | (0.091) | (0.099) | (0.009) | (0.008) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics * ROE* | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Observations* | 162,532 | 162,532 | 160,919 | 161,019 |
| *Adj. R-squared* | 0.129 | 0.138 | 0.869 | 0.901 |

*Panel C: Transparency and the sensitivities of asset growth to internal equity*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent variable | $\Delta \text{Loan}_{it}$ | $\Delta \text{Commitment}_{it}$ | $\Delta \text{Credit}_{it}$ | $\Delta \text{Liquid Assets}_{it}$ |
| $\Delta Internal\_Equity_{i,t-1}$ | 0.104*** | 0.146*** | 0.249*** | 0.100*** |
| | (0.019) | (0.011) | (0.025) | (0.023) |
| *Residual_R2 $_{it-1}$* × $\Delta Internal\_Equity_{i,t-1}$ | 0.088** | 0.047** | 0.135*** | -0.090** |
| | (0.036) | (0.019) | (0.046) | (0.041) |
| *Residual_R2 $_{it-1}$* | -0.191** | -0.248*** | -0.433*** | 0.315*** |
| | (0.074) | (0.040) | (0.094) | (0.082) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank characteristics ** $\Delta Internal\_Equity_{i,t-1}$ | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | Yes | Yes | Yes |
| *Observations* | 167,379 | 167,379 | 167,379 | 119,170 |
| *Adj. R-squared* | 0.313 | 0.118 | 0.257 | 0.049 |

*Panel D: Transparency and performance*

| Dependent variable | (1)<br>$ROA_{it}$ | (2)<br>$ROA_{it}$ | (3)<br>$ROE_{it}$ | (4)<br>$ROE_{it}$ |
|---|---|---|---|---|
| *Residual_R2 $_{it}$* | -0.062*** | -0.075*** | -0.570*** | -0.648*** |
| | (0.006) | (0.008) | (0.070) | (0.089) |
| *Bank characteristics* | Yes | Yes | Yes | Yes |
| *Bank fixed effects* | Yes | No | Yes | No |
| *Macro controls* | Yes | Yes | Yes | Yes |
| Observations | 167,379 | 167,379 | 167,379 | 167,379 |
| Adj. R-squared | 0.514 | 0.285 | 0.505 | 0.291 |