

Window Dressing of Short-Term Borrowings[◇]

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Abstract

We investigate bank holding companies' window dressing of quarter-end short-term borrowings. We find evidence of downward window dressing of short-term borrowings through repo and federal funds that appears material for a large fraction of the sample. Such downward window dressing is more pronounced at banks with higher leverage, lower capital adequacy ratios, and greater management compensation sensitivity to ROA and ROE. Consistent with this downward window dressing being a net detriment to equity holders, we document a negative equity market reaction to the release of regulatory filings that indicate unexpected downward window dressing in these accounts. Finally, we find evidence of window dressing of short-term borrowings within private banks, suggesting that non-equity market considerations provide key window dressing incentives. The potential implications of our findings go beyond bank holding companies and the financial industry, and bear relevance to recent SEC deliberations regarding short-term borrowing disclosure regulation.

JEL Classification: G14; G21; G28; M40

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1. Introduction

The recent financial crisis brought into focus financial institutions' risk-taking behavior, and raised concerns about whether their *end-of-quarter* balance sheets are accurate depictions of their risk levels *during the quarter*.¹ Even though the spotlight has been on the financial industry, similar incentives to mask true risk levels and the tools to achieve such objectives can exist in other industries as well. In response to these concerns the Securities and Exchange Commission (SEC) unanimously voted on September 17, 2010 to propose rules requiring both financial and non-financial public companies to provide enhanced disclosure of short-term borrowings such as repurchase agreements (repos), federal funds purchased, and commercial paper.²

At present, only commercial banks and bank holding companies (BHCs) are required to disclose quarterly averages of certain financial variables. Appendix A summarizes the current disclosure requirements for BHCs from the Federal Reserve and the SEC as well as the SEC's proposed rule. The SEC believes that "leverage and liquidity continue to be significant areas of focus for investors." The SEC is particularly concerned with disclosures related to short-term borrowings, as the levels of such borrowings can vary significantly during a reporting period, potentially making end-of-period balances less representative of activities during the period.

In this study, we investigate BHCs' window dressing of quarter-end short-term borrowings, where we define window dressing as a short-term deviation around quarter-end reporting dates of a financial variable from its quarterly average level.³ In so doing, this study

¹ For example, a *Wall Street Journal* article on April 9, 2010 titled "Big banks mask risk levels" reports that during 2009 a group of 18 large banks in aggregate substantially lowered their quarter-end repo liabilities compared to the levels during the quarter.

² SEC Release Nos. 33-9143 and 34-62932 (Sept. 17, 2010); File No. S7-22-10 (to be codified at 17 C.F.R Parts 229 and 249).

³ We describe our empirical measure of window dressing in detail in Section 4.1. As is standard in the literature, we refer to cases where the quarter-end value is less than (greater than) its quarterly average level as downward (upward) window dressing.

provides the first empirical evidence on the window dressing of short-term borrowings and the stock market reaction to the public release of regulatory filings (i.e., Y-9C filings) from which window dressing may be detected. Even though our analysis is based on Y-9C filings by BHCs, the implications are broader and may extend to other industries.

Incentives for managers to downward window dress short-term borrowings can come from several sources. First, downward window dressing of short-term borrowings lowers quarter-end reported financial leverage. Managers may thus engage in downward window dressing in an attempt to mask the true risk level of the firm in hopes of obtaining higher valuations for the firms' securities and better transaction terms with transaction counterparties. Second, regulatory capital ratios may be affected by window dressing of short-term borrowings. Downward window dressing of short-term borrowings tends to reduce a bank's asset base at quarter end and thus improve the appearance of its capital adequacy. Third, window dressing incentives may arise from explicit and implicit contracts. By taking on additional borrowing during the quarter, a bank expands its balance sheet and the base from which earnings are produced. The shrinking of the balance sheet at quarter end masks the true asset base and risk exposure. If managers and other employees are compensated based on earnings relative to the end-of-quarter asset base and risk levels, downward window dressing can inflate their compensation. Furthermore, the existence of debt contracts, where covenants are typically written on end-of-the-quarter financials, can provide an additional window dressing motive.

Using a sample of publicly traded BHCs, we find evidence of significant downward window dressing of short-term borrowings, in particular, repo and federal funds liability accounts, causing understatements in quarter-end financial leverage that appear material in a

substantial fraction of firm-quarter observations, particularly among the largest BHCs.⁴ We find that BHCs with higher financial leverage in the previous quarter (i.e., those that likely have greater incentives to mask their risk levels) downward window dress repo and federal funds liabilities to a greater extent in the current quarter. In addition, we find evidence that the extent of window dressing is related to regulatory capital adequacy ratios. We further document that window dressing is more pronounced the greater is the sensitivity of CEO total compensation to performance measures that are improved by downward window dressing, i.e., return on assets (ROA) and return on equity (ROE). Finally, we provide some evidence that downward window dressing of leverage is more pronounced for firms that borrow in the private debt market.

To gain more insight into underlying window dressing incentives, we conduct an analysis that includes BHCs without publicly traded equity, and find that after controlling for size effects, the extent of window dressing of short-term borrowings is not statistically different for private and public BHCs. This suggests that non-equity market considerations provide significant motives for downward window dressing of short-term borrowings.

We assess the stock market reaction around the public release of BHC quarterly Y-9C filings, from which potential window dressing can be detected. We find that unexpected downward window dressing in repo and federal funds liabilities is associated with significantly lower Y-9C announcement period stock returns, which suggests that such window dressing induces negative updates in investor beliefs regarding true risk levels, earnings performance, and/or management quality. Using a subsample of BHCs for which we can obtain data on the composition of the board of directors, we find that firms with more independent boards exhibit

⁴ When the repo and federal funds liability accounts are understated at quarter end, balance sheet duality implies that the firm's asset level is understated by an equal amount. This "shrinking" of the balance sheet leads to a decrease in financial leverage defined either as total assets/shareholders' equity (definition used in this paper) or total liabilities/total assets.

less downward window dressing, suggesting that this dimension of governance serves to curb such behavior. Although this finding reinforces the inference from the market tests that equity holders view downward window dressing negatively, we interpret this finding with caution, as board structure is likely endogenous.

To assess the robustness of our results, we examine the difference between quarter-end and quarterly average amounts for two other liability categories for which the Y-9C provides necessary data - customer deposits and "other borrowed money." Fluctuations in deposits are unlikely to be attributable to bank discretion. "Other borrowed money" consists primarily of long-term borrowings. Therefore, neither deposits nor "other borrowed money" are ideal candidates for quarter-end window dressing. Consistent with our expectations, quarter-end differences in these liabilities are not associated with either bank leverage or the equity market response to Y-9C filings.

We cannot rule out the possibility that BHCs' counterparties in the repo and federal funds markets (i.e., the repo and federal funds *lenders*) themselves may face greater funding needs for operations around quarter ends, and therefore temporarily reduce their supply of funds. However, one would not expect *lender-driven* declines in repo and federal funds activities around quarter ends to be systematically associated with the financial leverage of the borrower. Alternatively, it is possible that banks' customers who received loans from the banks may have incentives to pay back a portion of their loans around quarter ends in order to window dress their own balance sheets. The extra funding provided by the repayments of the loans may in turn allow BHCs to reduce borrowing around quarter ends. However, one would not expect these *customer-driven* activities to be systematically associated with the financial leverage of the banks, absent the

banks' own incentives to mask risks.⁵ Our evidence that downward window dressing intensifies for highly levered BHCs is therefore difficult to explain from a counterparty perspective, and is more consistent with BHC-initiated changes in repo and federal funds borrowings. We consider several other alternative explanations for our findings, including window dressing of risky assets, reserve requirement measurement periods, and repo and federal funds *lending* activities. We conclude that these factors are unlikely to account for our findings.

We stress that our evidence on window dressing is not necessarily indicative of accounting improprieties such as those that allegedly occurred with Lehman Brothers' "Repo 105" transactions (Valukas, 2010), which involve recording repo borrowings as security sales rather than liabilities. Such practices, if present in our sample, would only be captured by our window dressing measure if they are strategically timed around quarter end. It is more likely that our measure reflects window dressing behavior where BHCs unwind a portion of their within-quarter repo and federal funds borrowings before quarter end, and then resume borrowing early in the following quarter. Such activities involve changes in real borrowing activities and are not illegal or in violation of any current accounting standards. Nevertheless, such actions understate the average borrowings during the quarter.

We make several contributions to the literature. Our study is the first to provide empirical evidence of window dressing of short-term borrowings, an issue that has received heightened media and regulatory attention. Our findings confirm anecdotal evidence on the existence of such behavior and validate the concerns behind the new proposed SEC rule on "Short-Term Borrowing Disclosure." We provide insights into the incentives behind such window dressing

⁵ We compare quarterly averages of loans with the quarter-end loan balances and find no evidence that loan balances are systematically lower at quarter ends, in fact, they tend to be higher. This is inconsistent with systematic repayments of loans around quarter ends. This result is based on a small sample of observations because information on quarterly averages of loans was not available prior to 2010 and thus should be interpreted with caution.

behavior and how it varies across firms and over time. Our market test suggests that downward window dressing of short-term borrowings has negative consequences for shareholder wealth. The result also indicates that investors react to information on quarterly averages in short-term borrowing accounts such as repo and federal funds, which suggests that investors will likely benefit from the new SEC proposed “Short-Term Borrowing Disclosure” rule for firms that are not currently subject to such disclosure requirements. On the other hand, because the findings imply that investors are able to extract information from Y-9C reports presently filed by BHCs, the new SEC requirements may not be as incrementally beneficial in their application to banks.⁶ Finally, we note that window dressing of short-term borrowings may be related to window dressing of risky assets and current disclosures of quarterly averages on the asset side in the Y-9C report do not allow clear inferences regarding risky asset window dressing.

The remainder of the paper is organized as follows. Section 2 discusses related literature and provides background on Y-9C filings by bank holding companies and the repo and federal funds markets. Section 3 develops the paper’s predictions. Section 4 outlines the research design. Section 5 describes our sample selection and summary statistics, and Section 6 presents our empirical results. Section 7 concludes.

2. Background

2.1. Related literature

Window dressing is often characterized as an action taken by an agent that "improves the agent's performance measure but contributes little or nothing to the principal's gross payoff" (Feltham and Xie, 1994). Extant literature has examined window dressing in various settings. One stream of research documents that fund managers and institutional investors dress up their

⁶ Our analysis does not address whether the new SEC proposed rule will be *on net* beneficial or costly. Such an assessment requires a comprehensive analysis of the potential benefits as well as costs of the new regulation, which is beyond the scope of this study.

quarter-end or year-end portfolio holdings by selling losing stocks and buying winning stocks (e.g., Lakonishok et al., 1991; Musto, 1999; He et al., 2004; Ng and Wang, 2004). Dechow and Shakespeare (2009) find that managers time securitization transactions towards the end of the quarter to increase earnings, improve efficiency ratios, and reduce leverage.

Two papers of note have looked at window dressing in the banking sector, where both studies point out that differences between a bank's quarter-end and within-quarter levels of financial variables may be initiated either by the bank itself ("active" window dressing) or by parties external to the bank, such as customers ("passive" window dressing). Allen and Saunders (1992) find evidence of upward window dressing of bank total assets, which they attribute to managers' incentives to inflate bank size in order to be viewed as "too-big-to-fail" and/or to enhance managerial compensation and non-pecuniary reputational benefits. Kotomin and Winters (2006), on the other hand, argue that the upward window dressing of bank total assets is more likely customer-driven rather than a reflection of bank discretion. Both studies focus on the rationales behind *upward* window dressing of bank *total assets* and do not look specifically at possible downward window dressing in short-term borrowings. In addition, both studies examine commercial banks rather than BHCs, where they obtain data from commercial bank Call Reports and H.8 releases, respectively.⁷ However, many of the financial institutions where window dressing of short-term borrowings is a concern are not pure commercial banks. Moreover, an important objective of our paper is to assess the market reaction to such window dressing. Therefore, a focus on BHCs is more appropriate for purposes of our study. Furthermore, whereas the sample periods in Allen and Saunders (1992) and Kotomin and Winters (2006) are 1978-

⁷ Unlike the Y-9C, the Call Report does not provide quarterly averages of shareholders' equity, which prevents the calculation of quarterly average financial leverage. The H.8 data has the disadvantage of being at the aggregate level instead of firm-specific.

1986 and 1994-2002, respectively, our sample period of 2001-2010 is more pertinent to recent economic events.

2.2. *FR Y-9C reporting by bank holding companies*

At the end of 2009, there were 5,634 U.S. BHCs in operation, which controlled 5,710 commercial banks and held approximately 99% of all insured commercial bank assets in the U.S. (Board of Governors of the Federal Reserve Annual Report, 2009).⁸ Domestic BHCs with total consolidated assets of \$500 million or more are required under Federal Reserve Board Regulation Y and the Bank Holding Company Act of 1956 (as amended) to file form FR Y-9C with the Federal Reserve as of the last day of each calendar quarter.⁹ Form Y-9C contains detailed information on BHCs' consolidated financial statements and regulatory capital, including numerous supporting schedules. Schedule HC-K contains disclosures of quarterly averages for select balance sheet items calculated on a daily or weekly basis, thus facilitating detection of window dressing by comparison to quarter-end values of corresponding financial items found elsewhere in the Y-9C.¹⁰ BHCs are required to disclose quarterly averages for three types of liability accounts: i) deposits, ii) repo and federal funds purchased, and iii) "other borrowed money." For our sample, about 80% of the balance in repo and federal funds purchased reflects repo transactions. "Other borrowed money" consists of commercial paper, other short-

⁸ The Bank Holding Company Act of 1956 defines a bank holding company as any company (including a commercial bank) that has direct or indirect control of a commercial bank. "Control" means ownership, control, or power to vote 25 percent or more of the outstanding shares of any class of voting securities of the bank, or control in any manner over the election of a majority of the directors, trustees, or general partners of the bank, or the power to exercise a controlling influence over the management or policies of the bank.

⁹ The reporting size threshold was \$150 million prior to 2006. Furthermore, only the top-tier BHC within a BHC hierarchy is required to file Y-9C post-2006. Previously, all BHCs that satisfy the size threshold must file.

¹⁰ Interestingly, extant literature suggests that bank regulators and the SEC have neither devoted large amounts of resources to monitor window dressing activities revealed in bank regulatory filings, nor imposed severe penalties when such activities are detected (Allen and Saunders, 1992). Internal statistics from the Federal Reserve are consistent with window dressing-related enforcement actions against banks being infrequent and bearing relatively minor consequences. For example, in 2009 the Federal Reserve completed 191 formal enforcement actions and assessed a total of \$249,570 in civil penalties against the entire set of banking organizations it supervises for all categories of unsound practices and/or regulatory violations combined (BOG of the Fed Annual Report, 2009).

term borrowed money, and other long-term borrowed money. The long-term component makes up the majority, roughly 80%, of “other borrowed money.” Liability accounts for which quarterly averages are not provided in the Y-9C include trading liabilities, subordinated notes and debentures, and other liabilities (e.g., deferred taxes). BHCs are required to disclose quarterly averages for six asset categories: i) securities, ii) repo and federal funds sold, iii) total loans and leases, iv) trading assets, v) other earning assets, and vi) total consolidated assets. Finally, banks must disclose quarterly average total equity capital. BHCs are required to file Form Y-9C within 40 days after quarter end for the first three calendar quarters and within 45 days after the fourth calendar quarter end. Y-9C reports are generally publicly available 42 days after the end of the first three calendar quarters, and 47 days after the fourth calendar quarter end on the Federal Reserve National Information Center website.¹¹

2.3. *Repo and federal funds markets*

Repo and federal funds liabilities are likely to be the most convenient vehicles for short-term borrowing window dressing for most BHCs. A repo, also known as sale and repurchase agreement, is essentially a collateralized loan. The borrower receives cash from the lender and transfers to the lender securities as collateral. It is agreed up front that the securities will be transferred back to the borrower at a future date when it repays the borrowed cash plus interest. The value of the collateralized securities may be higher than the amount of borrowing, with the difference referred to as the repo “haircut.” Although repo contracts have highly customizable durations, they are commonly done on an overnight basis. Securities used as collateral are typically highly liquid, including Treasuries, securities issued by other government agencies, corporate bonds, asset-backed securities, and collateralized debt obligations. The attractiveness

¹¹ <http://www.ffiec.gov/nicpubweb/nicweb/nichome.aspx>.

of repo borrowing comes from the large repo market size (according to Hördahl and King, 2008, the U.S. repo market reached \$10 trillion in 2007), low borrowing rates (due to collateralization with liquid securities), and maturities that can be tailored to needs. The major net borrowers in the repo market include dealers of government securities and large banks. The net lenders tend to be mutual funds, pension funds, and corporations. The repo market in the U.S. went through major disruptions during the recent financial crisis. Gorton and Metrick (2011) report that repo haircuts increased from close to zero (e.g., a \$100 loan is secured with \$100 worth of securities) in early 2007 to nearly 50% (e.g., a \$100 loan requires \$150 of collateral) in late 2008. Furthermore, at the height of the crisis lenders refused to accept anything but the safest of collateral, causing segments of the repo market other than Treasuries to dry up.

Federal funds are unsecured loans among depository institutions of their excess reserve balances at Federal Reserve Banks. Federal funds transactions typically have overnight duration, and are referred to as federal funds purchased (sold) for the borrowing (lending) bank. Large national and regional banks tend to be net borrowers in the federal funds market and smaller banks net lenders, with various federal agencies also lending out idle funds in the market (Stigum, 2007). In this market, banks can borrow more than what is needed to meet their reserve requirements, and frequently do so. Afonso et al. (2011) report that the federal funds market did not contract significantly during the financial crisis; however, there is evidence of more restricted lending to riskier banks (e.g., those with large loan losses).

3. Predictions

Incentives to window dress short-term borrowings may come from several sources. First, window dressing of short-term borrowings lowers quarter-end reported financial leverage, which may suggest that a bank is taking less risk than was actually the case during the quarter.

Moreover, because repo and federal funds liabilities are often used to boost banks' securities trading power, the extent to which banks use these particular instruments can be viewed as a more general indicator of bank risk-taking. Managers may therefore engage in downward window dressing of short-term borrowings in an attempt to mask the true risk level of the firm in hopes of obtaining higher valuations for the firms' securities and better transaction terms with transaction counterparties. It is likely that firms with higher leverage are more sensitive to the outside perception of their risk levels and therefore engage in more downward window dressing of short-term borrowings.

Regulatory compliance can also provide a motive for window dressing. BHCs report three different regulatory capital ratios within the Y-9C: Tier 1 leverage ratio, Tier 1 risk-based capital ratio, and total risk-based capital ratio. In Appendix B we provide the definitions of these ratios and discuss how they may be affected by window dressing of short-term borrowings. Through balance sheet duality we know that quarter-end downward window dressing of short-term borrowings will translate into lower quarter-end bank assets. The appearance of a lower asset base results in higher capital adequacy ratios. Moreover, if banks systematically reduce riskier assets relative to less risky assets at quarter end, their risk-based capital ratios will be higher. We therefore expect to observe more downward window dressing of short-term borrowings at banks with lower capital adequacy ratios.¹²

Window dressing may also result from compensation-related motives. By taking on additional borrowing during a quarter relative to quarter end, a bank expands its asset base and its ability to generate earnings. Stated differently, temporary end-of-quarter reductions of liabilities masks the true scale of operations from which earnings are generated, as well as the

¹² Frequent trading and window dressing of risky assets are likely to take place in trading assets. Ideally, we would also like to examine window dressing of risky trading assets. However, the current Y-9C HC-K disclosure allows only the calculation of window dressing of *total* trading assets, not its risky components.

true level of risk borne by the shareholders. This incentive is a reflection of the agency conflict between managers and shareholders because shareholders ultimately bear the costs of the extra compensation and the greater risk exposure. If for compensation purposes performance is evaluated in reference to the risk exposure and asset or equity balances (e.g., ROA or ROE) reported at quarter end, downward window dressing can lead to greater compensation to managers and other employees. We expect to see greater downward window dressing of short-term borrowings at firms where management compensation is more tightly linked to ROA and ROE.

Finally, window dressing incentives can arise from borrowing via private debt contracts. Leverage ratios and other financial variables that are widely used in affirmative financial covenants are often calculated based on reported GAAP numbers at period end (Dichev and Skinner, 2002) and thus may be enhanced by window dressing. Accordingly, we predict greater downward window dressing of short-term borrowings at banks which have outstanding loans in which they are the borrower.

In addition to repo and federal funds liabilities, Y-9C filings allow the comparison of quarter-end with quarterly average amounts for two other liability accounts: deposits and “other borrowed money.” In contrast to repo and federal funds, these accounts are unlikely to be candidates for use in window dressing. Deposits are highly sensitive to customer behavior and are difficult for banks to control with precision around quarter ends. Most of the balances in “other borrowed money” are long-term borrowings, making it unsuitable for short-term window dressing. We therefore do not expect quarter-end deviations in these liability accounts to vary with the window dressing incentives we discuss above.

We include several other variables in the analysis but do not offer predictions. First, we include size because larger firms likely have greater access to the repo and federal funds markets, allowing them to engage in more downward window dressing (e.g., Allen et al. 1989, Stigum 2007). On the other hand, large firms are more likely to have sophisticated institutional investors and face greater scrutiny from investors and regulators, potentially curbing window dressing behavior. Second, we include an indicator variable for the time period of the financial crisis (2007 Q4 through 2009 Q2), when the U.S. economy was in recession as defined by the National Bureau of Economic Research. As discussed in Section 2.3., the repo market underwent major disruptions during this period that may have curtailed banks' access to it. At the same time, the intense focus on risk-taking at major banks during the financial crisis may have provided them with greater incentives to mask true risk levels. Finally, we include a variable that captures loan losses, as banks with large loan losses may be viewed as poor risks and have limited access to the repo and federal funds markets (Afonso et al., 2011).

Under the assumption that some market participants process the information contained within public Y-9C filings that can be used to infer window dressing, we expect the stock market reaction to unexpected downward window dressing of short-term borrowings to reflect the net effect of several factors. First, downward window dressing suggests that a firm took on more risk during the quarter than implied by their quarter-end financial data. This may cause investors to revise upward their risk assessment of the firm involved, and revise downward their assessment of the same quarter's earnings performance upon realizing that a larger asset base was required to produce earnings than previously thought. Furthermore, because leverage window dressing via repo and federal funds liabilities implies that managers are actively attempting to alter perceived firm risk, investors may revise downward their assessment of the quality or integrity of

management. These factors may lead to negative abnormal stock price reactions to unexpected downward leverage window dressing. On the other hand, window dressing activity that is in line with shareholders' interest, e.g., to gain advantages in debt contracts, may lead to a positive equity market reaction. The observed stock price reaction to unexpected leverage window dressing at the time of Y-9C publication reflects the net impact of the above factors.

4. Research Design

4.1. Window dressing measures

In concept, window dressing reflects a short-term deviation of a financial variable from its longer-term level. Given the limited literature that examines this behavior, relatively few empirical measures of window dressing have been developed. The primary empirical measure used in Allen and Saunders (1992) indicates upward window dressing of assets whenever end-of-quarter assets are greater than quarterly average assets.¹³ However, an upward growth trend in assets in the absence of asset window dressing would give the appearance of upward window dressing using that measure.¹⁴ Kotomin and Winters (2006) analyze changes in weekly aggregate assets and liabilities for a group of weekly reporting banks and examine whether the changes are consistent with window dressing. However, that study does not attempt to define an empirical measure of window dressing, per se. Our empirical measure of window dressing is motivated by logic used by the Federal Deposit Insurance Corporation to scrutinize banks' quarterly average financial values as reported on quarterly Call Reports. In particular, when the FDIC receives a

¹³ Constrained by data availability from the Call Report during their sample period, Allen and Saunders (1992) use the average of a financial variable over the last month of the calendar quarter as a proxy for its quarterly average level.

¹⁴ In a robustness test, Allen and Saunders (1992) recognize that their primary measure of window dressing may be affected by growth trends in the financial variables and make a trend-cycle adjustment to the measure.

Call Report, it compares the average of the current and prior quarter-end values of a variable to the quarterly average value of the variable as measured throughout the current quarter.¹⁵

We are able to compute a measure of window dressing for any asset or liability account disclosed on the Schedule HC-K by comparing the quarterly average value to the corresponding average of the beginning and end of quarter levels.¹⁶ For purposes of illustration, we will focus on computation of the window dressing measure for repo and federal funds liabilities. To compute our repo and federal funds liability window dressing measure ($WD_RFL_{i,t}$) for BHC i in quarter t , we obtain the *quarter-end* repo and federal funds liability data for quarter t and $t-1$ from BHC i 's Y-9C reports. Next, we obtain the *quarterly average* repo and federal funds liability data for quarter t from BHC i 's Y-9C Schedule HC-K, where the quarterly average is computed based on either daily or weekly realizations throughout the quarter. Our measure of window dressing is computed as follows:

$$WD_RFL_{i,t} = \frac{[(RFL_{i,t} + RFL_{i,t-1}) / 2] - HCK_RFL_{i,t}}{HCK_TA_{i,t}}, \quad (1)$$

where RFL_t and RFL_{t-1} are the end-of-quarter repo and federal funds liabilities for the current and prior quarters, respectively, and HCK_RFL_t is the quarterly average repo and federal funds liabilities reported in Schedule HC-K for the current quarter. HCK_TA_t is quarter t average total assets from Schedule HC-K. Detailed variable definitions are provided in Appendix C. A negative realization of the measure WD_RFL reflects downward window dressing, as the average

¹⁵ The FDIC system alerts an examiner if this ratio is lower than 25% or greater than 125%. This alert rule suggests that the FDIC is more concerned about upward window dressing than downward window dressing.

¹⁶ We match Schedule HC-K items with their corresponding quarter-end values by following the “Line Item Instructions for Quarterly Averages: Schedule HC-K” in the Y-9C instructions file available at http://www.federalreserve.gov/reportforms/forms/FR_Y-9C20110331_i.pdf. The same instructions file also requires that “For bank holding companies that file financial statements with the Securities and Exchange Commission (SEC), major classifications including total assets, total liabilities, total equity capital and net income should generally be the same between the FR Y-9C report filed with the Federal Reserve and the financial statements filed with the SEC.”

quarter-end reporting date level is lower than the within-quarter average level, as illustrated in Fig. (1). A useful byproduct of this measure is that it naturally accounts for the effects of secular trends (i.e., positive or negative growth) in financial variables. We compute measures of the quarter-end deviation of certain other financial variables from their quarterly average levels in similar fashion, and likewise refer to such measures as "window dressing," denoted with the *WD_* prefix, for expositional convenience.

[Insert Fig. 1 here]

4.2. *Window dressing determinants*

As discussed in Section 3, a key prediction is that there will be a greater degree of downward window dressing of repo and federal funds liabilities the larger is a bank's prior period leverage. To test this prediction, we estimate the following model using ordinary least squares:

$$WD_RFL_{i,t} = \beta_0 + \beta_1 HCK_LEV_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 CRISIS_t + \beta_4 LLR_{i,t-1} + \varepsilon_{i,t}. \quad (2)$$

HCK_LEV_{i,t-1} is prior quarter financial leverage, defined as total assets over shareholders' equity, again based on quarterly averages from Schedule HC-K. We include *SIZE_{t-1}*, the natural log of quarter *t-1* average total assets from Schedule HC-K, to control for potentially different incentives and ability to window dress for large versus small bank holding companies. We include a *CRISIS* indicator to control for differential bank incentives and ability to window dress during the 2007-2009 financial crisis. Allen and Saunders (1992) document a positive relation between extreme window dressing and the ratio of loan loss reserves to loan balances, and suggest that both variables reflect risky operations. Therefore, we include *LLR_{t-1}*, loan loss provisions in quarter *t-1* divided by the gross loan balance at the end of quarter *t-1*, to further control for bank operating risk. If highly levered banks indeed engage in more downward window dressing using repo and federal funds liabilities, we expect $\beta_1 < 0$.

Next, we estimate Eq. (2) after replacing WD_RFL with window dressing measures for "other borrowed money" (WD_OBR) and deposits (WD_DPT) to examine whether financial leverage is related to window dressing in these alternative liability accounts. As we discuss in Section 3, we do not view deposits or other borrowed funds as likely window dressing candidates from the bank's perspective. In additional tests, we employ slight modifications to Eq. (2) to examine effects related to capital adequacy ratios, compensation and debt-contract related incentives and board independence. We discuss these specific model alterations when we present the associated results in Section 6.¹⁷

To buttress the interpretation of our findings, we also estimate the following logistic regression model:

$$\Pr(DWD_RFL_{i,t} = 1) = \frac{1}{1 + e^{-z}}, \quad (3)$$

$$z = \beta_0 + \beta_1 HCK_LEV_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 CRISIS_t + \beta_4 LLR_{i,t-1} + \varepsilon_{i,t},$$

where DWD_RFL is an indicator that equals one if WD_RFL is in the first sample quartile (i.e., less than -0.0024) and equals zero otherwise. Intuitively, $DWD_RFL = 1$ captures observations with a relatively large magnitude of downward window dressing. In this logistic model, we expect leverage to increase the probability of observing large downward window dressing, i.e., $\beta_1 > 0$. We similarly construct indicator variables for the first quartile of WD_OBR and WD_DPT , denoted DWD_OBR and DWD_DPT , respectively.

4.3. Stock market reaction tests

The public disclosure of a bank's Y-9C is generally the first disclosure of data that would allow capital market participants to infer whether a bank engaged in window dressing in a

¹⁷ We employ two-way clustered standard errors along the firm and calendar quarter-year dimensions in all regression analyses (Petersen, 2009).

particular quarter. To examine the stock market reaction to this disclosure, we conduct a short window event study surrounding the public release date of bank holding company Y-9Cs. There exists no publicly available machine readable data that discloses the publication date of a given Y-9C. However, we can exploit knowledge of the systematic procedures followed by the Federal Reserve in making these reports public to estimate the publication date. Our conversations with personnel at the Federal Reserve indicate that Y-9C filings tend to be clustered immediately before the filing deadline of 40 (45) days for the first three calendar quarters (fourth calendar quarter) and generally become publicly available two days later.¹⁸ Therefore, we code the Y-9C publication date as 42 (47) calendar days after the quarter-end date for the first three calendar quarters (fourth calendar quarter) of a year, and measure stock returns in a five-trading-day window centered on the estimated publication date of the Y-9C.

We estimate the following model using ordinary least squares to assess the market reaction to repo and federal funds liability window dressing:

$$CAR_{i,t} = \alpha_0 + \alpha_1 \Delta WD_RFL_{i,t} + \alpha_2 \Delta WD_OBR_{i,t} + \alpha_3 \Delta WD_DPT_{i,t} + \alpha_4 \Delta ROE_{i,t} + \alpha_5 \Delta HCK_LEV_{i,t} + \alpha_6 HCK_LEV_{i,t} + \alpha_7 SIZE_{i,t} + \alpha_8 MB_{i,t} + v_{i,t}, \quad (4)$$

where $CAR_{i,t}$ is firm i 's five-trading-day cumulative abnormal stock return centered on the estimated publication date of its quarter t Y-9C. To facilitate interpretation of our market reaction tests, we impose the condition that the estimated quarter t Y-9C publication date is at least five days after the earnings announcement date for quarter t . We consider six different measures of daily expected return in our abnormal return calculation: value-weighted market return, equally-weighted market return, CRSP size decile return, expected return from both a

¹⁸ This timing is further supported by documentation on the Fed's National Information Center website. To the extent some Y-9C filings are made public before or after our estimated publication window, our ability to find announcement period stock reactions to our window dressing measure is diminished.

value-weighted and equally-weighted market model and expected return from a Fama-French three-factor model (Fama and French, 1993). As discussed below, our inferences are unaltered across these six different abnormal return proxies.

The variable $\Delta WD_RFL_{i,t}$ is the change in WD_RFL relative to the prior quarter, where $WD_RFL_{i,t-1}$ proxies for the market's expectation of the current quarter's window dressing activity. We also include analogous measures for deposits and "other borrowed money," $\Delta WD_DPT_{i,t}$ and $\Delta WD_OBR_{i,t}$ (detailed variable definitions are in Appendix C). If investors react more negatively to greater unexpected downward window dressing in repo and federal funds liabilities, we expect $\alpha_1 > 0$. On the other hand, because "window dressing" of deposits or "other borrowed money" is unlikely to be the result of attempts to window dress short-term borrowings, we do not expect to see price reactions to changes in these measures. In addition, we control for seasonal changes in accounting performance and leverage ($\Delta ROE_{i,t}$ and $\Delta HCK_LEV_{i,t}$). Because the estimated Y-9C publication date occurs after the same quarter's earnings announcement, these accounting variables may not elicit price reactions at the release of the Y-9C filing. We further examine whether there are longer term market effects related to such window dressing by estimating a variant of Eq. (4) where we replace $CAR_{i,t}$ with $POSTCAR_{i,t}$, where $POSTCAR_{i,t}$ is firm i 's cumulative abnormal return over the trading-day window [+3, +30] relative to the estimated quarter t Y-9C publication date.¹⁹

¹⁹ Given that the publication date of the Y9-C is 42 or 47 calendar days after the end of calendar quarter t , this post window effectively ends at the close of calendar quarter $t+1$, which by construction is prior to firm i 's quarter $t+1$ earnings announcement date, and therefore avoids confounding effects from the earnings announcement for quarter $t+1$.

5. Data and descriptive statistics

5.1. Sample selection

Our primary sample is comprised of bank holding companies with publicly traded equity. We begin our sample with BHC financial data from Y-9C reports spanning calendar quarters 2001 Q1 to 2010 Q2 made publicly available for both public and private BHCs by the Federal Reserve Bank of Chicago.²⁰ From this file, we identify observations for public BHCs using a publicly available file from the Federal Reserve that links BHC regulatory entity codes with CRSP PERMCOs. Through the construction of this linking file, the Federal Reserve identifies all publicly traded BHCs and obtains the associated CRSP match through December 2007.²¹

Prior to 2006, BHCs had to file a quarterly Y-9C if total consolidated assets as of the previous June exceeded \$150 million. Effective with the March 2006 calendar quarter, this Y-9C filing threshold was raised to \$500 million. Therefore, to keep consistent sample composition, we limit the pre-2005 sample to BHCs with prior-June total consolidated assets of greater than \$500 million in 2005 dollars, where we conduct the dollar conversion using historical consumer price index data from the Bureau of Labor Statistics.²² We keep only observations for top-tier BHCs, or lower-tier BHCs where the parent does not report a separate Y-9C (i.e., Y-9C variable *BHCK9802* = 1 or 3, respectively) to avoid double counting. As discussed earlier, we require the

²⁰ Data are available at http://www.chicagofed.org/webpages/banking/financial_institution_reports/bhc_data.cfm. BHCs may submit revisions to previously filed Y-9Cs. When a revision is received, the Federal Reserve replaces the original Y-9C with the revised Y-9C. Therefore, a data entry in the dataset can reflect a subsequent restatement instead of the original submission. We note that there are 2,287 variables contained in the Y-9C dataset, and a revision of any of the variables can cause a revised submission of the entire filing. Accordingly, the likelihood that the repo and federal funds liability quarter-end balance or quarterly average is revised for a given bank-quarter is small. Moreover, to the extent it occurs, it works against our finding significant market reactions around the initial public release date to the window dressing measure. As confirmed by personnel at the Federal Reserve, there exists no data source that preserves the initial Y-9C publication dates, as revision dates overwrite previous filing dates.

²¹ File is available at http://www.newyorkfed.org/research/banking_research/datasets.html. The file contains links between 885 unique IDRSSD and 863 unique PERMCOs. Because the link file ends in 2007, our sample excludes BHCs that first became public after December 2007.

²² Data are available at <ftp://ftp.bls.gov/pub/special.requests/cpi/cpiiai.txt>.

estimated quarter t Y-9C publication date to be at least five days after the earnings announcement date for quarter t , where we obtain the earnings announcement date from COMPUSTAT (rdq).

Finally, we truncate the top and bottom 1% of all continuous variables used in our analyses to remove outliers and data errors. This yields our primary sample of 8,916 BHC-quarter observations across 430 unique publicly traded bank holding companies. In supplemental analyses our sample size varies based on analysis-specific variable requirements.

5.2. Descriptive statistics

Table 1 presents a common-size balance sheet for selected accounting variables of the sample BHC-quarters, where the common size reference item is total consolidated assets. Gross loans ($GLOANS$) make up 68% of assets, and deposit liabilities (DPT) are 67% of assets. These data suggest that commercial banking operations are the dominant business line of our sample bank holding companies. Repo and federal funds liabilities (RFL) are the third largest component of the sample bank liability structure, at just over 4% of assets, whereas repo and federal funds assets (RFA) are 1% of assets, suggesting our sample BHCs are primarily borrowers instead of lenders in these markets.

[Insert Table 1 here]

Table 2 presents descriptive statistics for variables we use in our analyses, as well as several other variables of descriptive interest. Mean repo and federal funds liabilities window dressing (WD_RFL) is significantly negative (-0.0009), suggesting downward window dressing on average. BHCs report their regulatory capital ratios in the Y-9C filings. The sample mean Tier 1 capital ratio ($TIER1LEV$) of 8.8 suggests that the sample BHCs are well-capitalized, on

average.²³ We report bank size as the natural log of quarterly average total assets. In non-log terms, the sample mean (median) size is \$30 billion (\$2 billion) in assets, with the largest banks reaching \$2.5 trillion. The descriptive statistics for total asset "window dressing" (*WD_TA*) are very similar to those for total liability "window dressing" (*WD_TL*), consistent with balance sheet duality (i.e., if a bank window dresses liabilities down, assets also must come down by an equivalent amount). The positive sign for mean *WD_TA* is consistent with Allen and Saunders (1992) and suggests that quarter-end total assets tend to be higher than the quarterly averages. However, it is unclear to what extent this can be attributable to bank discretion. We note that on the liability side, mean "window dressing" in deposits (*WD_DPT*) is significantly positive (0.0331), which likely reflects customer behavior (e.g., more deposits than withdrawals at quarter ends). This contributes to the positive "window dressing" in total liabilities, which in turn affects total assets through balance sheet duality. Table 2 also reveals that repo assets make up a relatively small proportion of aggregated repo and federal funds assets (*R_RFA*) at 15%, whereas repo liabilities comprise the majority of the aggregated repo and federal funds liabilities (*R_RFL*) at 78%.

[Insert Table 2 here]

Table 3 presents Pearson and Spearman correlations between key variables. Focusing on Pearson correlations for discussion, the correlation between *WD_TA* and *WD_TL* is 0.98, which is again consistent with balance sheet duality. There is a significant negative correlation (−0.04) between a bank's prior period average leverage (*HCK_LEV*) and *WD_RFL*, which suggests that banks with higher leverage engage in more downward window dressing of leverage using repo and federal funds liabilities. The significant negative correlation between *WD_RFL* and bank

²³ The Board of Governors of the Federal Reserve System has established a minimum tier 1 capital ratio of 3.0 for strong bank holding companies, and 4.0 for all others.

size (−0.21) suggests that the extent of downward window dressing of repo and federal funds liabilities is more pronounced for larger BHCs.

[Insert Table 3 here]

Fig. 2 plots the quarterly sample mean values of WD_RFL . Several features of the graph are worth noting. First, the quarterly means are negative throughout our sample period, suggesting downward window dressing of repo and federal funds. Second, this behavior is more pronounced among the largest BHCs (top 25 in terms of total consolidated assets in each quarter).²⁴ For the entire sample, the quarter-end balances in repo and federal funds liabilities are lower than the quarterly average levels by on average \$34 million, or 0.09% of bank total assets and 1.0% of total shareholders' equity. For the top 25 BHCs, the understatement in quarter-end repo and federal fund liabilities is on average \$287 billion, or 0.5% of bank total assets and 5.6% of total shareholders' equity.

To evaluate the materiality of the understatements of bank financial leverage, we note that according to Lehman Brothers' bankruptcy court examiner's report *'audit walk 'through papers prepared by Lehman's outside auditor, Ernst & Young, regarding the process for reopening or adjusting a closed balance sheet stated: "Materiality is usually defined as any item individually, or in the aggregate, that moves net leverage by 0.1 or more"'* (Valukas, 2010). Lehman Brothers defined leverage as assets/equity, which is equivalent to our definition of financial leverage. A movement of 0.1 in this ratio represents a change in total assets (as well as total liabilities due to balance sheet duality) that is 10% of shareholders' equity. Based on this threshold (which admittedly comes from only one audit firm and for one particular client), 9% of our sample firm-quarters, and 22% of the firm-quarters among the top 25 BHCs, experience an

²⁴ There are 70 unique bank holding companies that appear in the top 25 subsample at some point during the sample period.

understatement in repo and federal funds liabilities that is material. Furthermore, 46% of the sample banks, and 41% of the top 25 BHCs, have a material understatement in repo and federal funds liabilities sometime during our sample period. Taken together, these proportions suggest that leverage window dressing is more concentrated among certain top banks that engage in this activity intensely. Finally, Fig. 2 shows a general upward shift of the window dressing measure during the financial crisis for both the whole sample and the top 25 BHCs. As discussed earlier, this could be due to the seize-up of large fractions of the repo market during the crisis, limiting access to this tool for window dressing. We also observe much subdued window dressing activities in the last couple of quarters of the sample. However, it is difficult to know whether this reflects a permanent shift or a short-term aberration without the analysis of future data.

[Insert Fig. 2 here]

6. Empirical results

6.1. Window dressing of short-term borrowings and financial leverage

Column (1) in Table 4 reports results from estimating Eq. (2). As predicted, there is a significant negative relation between current quarter window dressing using repo and federal funds liabilities (WD_RFL) and the average leverage in the prior quarter (coefficient of -0.0001 with a t-statistic of -2.24). Holding all independent variables at their mean values, a one standard deviation increase in the value of $HCK_LEV_{i,t-1}$ results in a 37% decrease (i.e., from -0.1% to -0.13% of total assets) in WD_RFL . Because negative realizations of WD_RFL indicate downward (i.e., leverage reducing) window dressing, this result is consistent with more highly levered BHCs engaging in greater downward window dressing.

Bank holding company size is highly significant. Specifically, size is negatively related to the window dressing measure (coefficient of -0.0010 with a t-statistic of -4.79). Holding all

independent variables at their mean values, a one standard deviation increase in the value of $SIZE_{i,t-1}$ results in a 150% decrease (i.e., from -0.1% to -0.25% of total assets) in WD_RFL . These results indicate that the extent of downward window dressing of repo and federal funds liabilities is positively related to bank size, consistent with the evidence presented in Fig. 2. This implies that greater access to these tools for large banks dominates any greater scrutiny they may face.

[Insert Table 4 here]

There is a significantly positive relation between WD_RFL and the crisis period indicator (coefficient of 0.0007 with a t-statistic of 3.45), implying that BHCs engaged in less downward window dressing during the financial crisis of 2007-2009, consistent with Fig. 2. Although many competing incentives likely exist during the crisis, this result is consistent with BHCs having less access to repurchase agreements and federal funds during the crisis, thereby mitigating their ability to use these tools for downward window dressing.

As discussed above, repo and federal funds liabilities are a relatively low cost and accessible window dressing tool, and we therefore expect window dressing to be more prevalent within repo and federal funds liabilities relative to other liability categories. To examine this prediction, we estimate Eq. (2) after replacing WD_RFL with “window dressing” measures for the two other liability categories for which we can compare quarter-end and quarterly average amounts: interest-bearing deposits (WD_DPT) and “other borrowed money” (WD_OBR). As presented in columns (2) and (3) of Table 4 respectively, there is no relation between “window dressing” of deposits or “other borrowed money” and prior quarter leverage.

Columns (4), (5) and (6) present results from estimating Eq. (3). Our key inferences are unchanged in the logistic regression. Specifically, higher leverage in the prior quarter increases

the probability of observing large downward window dressing in repo and federal funds liabilities (coefficient of 0.0475 with a t-statistic of 2.34), but is unrelated to the probability of observing large downward window dressing in other borrowed funds or deposits.

6.2. *Stock market reaction to window dressing of short-term borrowings*

Table 5 presents the results of estimating Eq. (4). Column (1) reports results wherein expected return is the value-weighted market return, and column (2) reports results wherein expected return is computed from the Fama and French three-factor model (Fama and French, 1993) estimated using daily returns over the trading day window $[-45, -6] \cup [+6, +45]$. As reported in both models, there is a significant positive relation between the abnormal return surrounding the estimated publication date of a BHC's Y-9C and the unexpected window dressing of repo and fed funds liabilities (coefficient of 0.2026 with a t-statistic of 2.07 and coefficient of 0.1744 with a t-statistic of 2.05 in columns (1) and (2), respectively).²⁵ Because a negative realization of $\Delta WD_RFL_{i,t}$ implies greater unexpected downward window dressing, this finding reveals that the equity market responds negatively to downward window dressing. This finding suggests that at least some market participants incorporate the window dressing information that is revealed in BHC's Y-9C regulatory filings, and that they react in a manner consistent with negative implications of downward window dressing dominating any beneficial effects to shareholders. In untabulated analysis, we include in the return regression $CRISIS_t$ and its interaction with $\Delta WD_RFL_{i,t}$, along with the interaction of $SIZE$ and $\Delta WD_RFL_{i,t}$. We find insignificant coefficients on $CRISIS_t$ and the interactive terms, while the main effect on $\Delta WD_RFL_{i,t}$ remains positive and significant. Therefore, we find no evidence that the return reaction to $\Delta WD_RFL_{i,t}$ varies systematically with bank size or during the recent financial crisis.

²⁵ Inferences are unaltered if we measure expected returns using equally-weighted market returns, expected returns from a market model estimated using value-weighted or equally-weighted market returns, or CRSP size-decile returns.

[Insert Table 5 here]

As noted in Section 4.3, our estimated publication date is based on the assumption that Y-9C filings are clustered immediately before the filing deadlines and are released to the public two days later. To alleviate the concern that our event window does not capture the true public release dates of the Y-9C reports, and that the significant coefficient of 0.2026 on $\Delta WD_RFL_{i,t}$ in Table 5 column (1) is therefore obtained by chance, we conduct randomization tests of the event dates. Specifically, for each bank-quarter we randomly select a pseudo-Y-9C publication date somewhere between five days after the quarter t earnings announcement date and the end of quarter $t+1$. We then calculate the five-day abnormal return around the pseudo-publication dates, and estimate Eq. (4) to obtain a coefficient on $\Delta WD_RFL_{i,t}$. We repeat this process 1,000 times to generate an empirical distribution of the coefficient on $\Delta WD_RFL_{i,t}$, which we plot in Fig. 3. The frequency distribution resembles the shape of a normal distribution, with our coefficient estimate of 0.2026 being larger than all but the one most extreme observation in the right tail of the 1,000 coefficient estimates (0.205). Therefore, the likelihood of observing a 0.2026 coefficient on $\Delta WD_RFL_{i,t}$ by chance is near zero. This suggests that our estimated publication dates are reasonable proxies for the true public release dates, and that the market reacts to unexpected downward window dressing in repo and federal funds liabilities around these dates.

[Insert Fig. 3 here]

Column (1) of Table 5 reports a significant positive coefficient on a measure of unexpected earnings ($\Delta ROE_{i,t}$), which is somewhat puzzling given that we ensure via our sample construction procedures that no observations have overlapping earnings announcement and Y-9C publication date windows. However, the timing of the Y-9C publication relative to the corresponding quarter t earnings announcement places the Y-9C window within the period

during which extant literature has documented post-earnings-announcement drift effects (e.g., Ball and Brown, 1968). Therefore, one potential explanation is that the positive coefficient on $\Delta ROE_{i,t}$ is an artifact of post-earnings-announcement drift.

Finally, in columns (3) and (4) of Table 5 we estimate Eq. (4) after replacing CAR with BHC abnormal return over the window beginning three trading days after the Y-9C publication date and ending 30 trading days after the Y-9C publication date (CAR_POST) for both the value-weighted abnormal returns and the Fama-French three-factor model abnormal returns, respectively. As indicated by the insignificant coefficient estimates on $\Delta WD_RFL_{i,t}$, there is no evidence of under- or overreaction to the Y-9C window dressing information.

6.3. *Window dressing of short-term borrowings and capital adequacy ratios*

To test our conjecture that capital adequacy ratios provide banks with window dressing incentives, we estimate Eqs. (2) and (3) after alternately replacing HCK_LEV with the prior quarter's Tier 1 leverage ratio ($TIERILEV$), Tier 1 risk-based capital ratio ($TIERICAP$), and total risk-based capital ratio ($TOTALCAP$). We present the results in Table 6, where columns (1), (2) and (3) report results from estimation of the OLS model of Eq. (2), and columns (4), (5) and (6) report corresponding results from estimation of the logistic model of Eq. (3).

There is consistent evidence across both specifications that lower prior quarter's Tier 1 leverage ratio is associated with a greater degree of downward window dressing in repo and federal funds liabilities. Specifically, focusing on the logistic specification for discussion, a higher Tier 1 leverage ratio (i.e., a ratio that implies less risk) decreases the probability of observing large downward window dressing of short-term borrowings (coefficient estimate of -0.0905 with a t-statistic of -2.93). There is only weak evidence of an association between the

risk-based capital ratios and window dressing of short-term borrowings, with the only significant (one-tailed) result appearing in column (5) with respect to the Tier 1 capital ratio.

[Insert Table 6 here]

6.4. *Window dressing of short-term borrowings and management compensation*

As discussed in Section 3, compensation can be another incentive for window dressing short-term borrowings. Frequently used performance measures such as ROA and ROE have earnings in the numerators and total assets and shareholders' equity, respectively, in the denominators. Downward window dressing of short-term borrowings, which reduces a bank's quarter-end asset base, likely inflates these ratios if the denominators are computed using period-end values that do not reflect the expanded balance sheet during the quarter from which earnings are generated. If BHC managers' compensation is a positive function of ROA or ROE, then compensation contracts may provide a direct window dressing incentive. To precisely determine which performance measures are used in compensation contracts, how they are computed, and which components of compensation they are tied to, we would need access to the actual contracts, which we are not privy to. Instead, we empirically estimate the strength of the correlation between CEO compensation and ROA (and ROE) and link the correlation to window dressing. Our logic is that if compensation provides window dressing incentives, window dressing will be more pronounced for firms where there exists a relatively high correlation between measured performance (i.e., ROE and ROA) and CEO total compensation.

We merge our BHC sample with Execucomp and compute measures of correlation between CEO total compensation and firm performance.²⁶ Specifically, we compute $ROA_COMP_{i,m,y}$ ($ROE_COMP_{i,m,y}$) as the correlation between the annual change in firm i 's return

²⁶ Because Execucomp only covers relatively large public firms, our sample size is greatly reduced for this analysis. In particular, for this analysis we have 1,278 BHC-quarter observations across 99 distinct bank holding companies.

on assets (return on equity) and the change in the log of CEO m 's total compensation using a minimum of three but no more than five years of data ending the year immediately prior to the year of quarter t , where total compensation includes salary and bonus and the value of stock option grants and restricted stock grants (refer to Appendix C for additional details).

We re-estimate Eqs. (2) and (3) after including ROA_COMP (ROE_COMP) as an additional explanatory variable. If CEO compensation structure provides window-dressing incentives, we expect a negative coefficient on ROA_COMP (ROE_COMP) in columns (1) and (2). As reported in Table 7, there is indeed a significant negative coefficient of -0.0021 (t-statistic of -1.94) on ROA_COMP (column 1) and a significant (one-tailed) negative coefficient of -0.0013 (t-statistic of -1.32) on ROE_COMP (column 2), suggesting greater downward window dressing when CEO compensation is more sensitive to ROA and ROE. Results from the logistic models are significant only for ROA_COMP (coefficient estimate of 0.4719 with a t-statistic of 2.17). That is, a close correlation between ROA and CEO total compensation increases the probability of observing substantial downward window dressing in repo and federal funds liabilities. In total, this evidence is consistent with compensation considerations providing incentives for window dressing of short-term borrowings.

[Insert Table 7 here]

6.5. *Window dressing of short-term borrowings and debt markets*

It is possible that ongoing participation as a borrower in the private debt market can give a BHC an incentive to downward window dress short-term borrowings to minimize the likelihood of financial covenant violation. In contrast, because *public* debt issues rarely contain affirmative financial-ratio-based covenants (Barclay and Smith, 1995), we expect that ongoing

borrowing in public debt markets provides weak incentives to window dress relative to private debt market incentives.

To test for evidence of private debt market incentives, we merge our BHC sample with Dealscan, a comprehensive database of private loan contracts. We define an indicator variable $LOAN_{i,t}$ that equals one if firm i is the borrower in a loan contract that spans the quarter t end date, and equals zero otherwise. From our sample of 8,916 firm-quarter observations, 636 firm-quarters, comprised of 64 distinct BHCs, have $LOAN_{i,t} = 1$. To examine whether participation as a borrower in the public debt market provides incentives to window dress, we merge our BHC sample with the NASD's TRACE database, which consists of substantially all over-the-counter transactions in the corporate bond market. We construct an indicator variable $BOND_{i,t}$ that equals one if firm i has a bond issue that has an executed trade on the OTC market both before and after the quarter t end date, and equals zero otherwise. From our sample of 8,916 firm-quarter observations, 410 firm-quarters, comprised of 51 distinct BHCs, have $BOND_{i,t} = 1$. We then re-estimate Eqs. (2) and (3) after alternately including $LOAN_{i,t}$ and $BOND_{i,t}$ as an additional explanatory variable.

Table 8 presents the results of the debt market test, where columns (1) and (2) report results from Eq. (2), and columns (3) and (4) report results from Eq. (3). Although our proxy for borrowing in private debt markets is admittedly noisy and we have relatively few observations where banks are themselves borrowers, there is a marginally significant positive coefficient on $LOAN$ in the logistic specification of column (3) (coefficient estimate of 0.1997 with a t-statistic of 1.33), which provides weak evidence that borrowing in private debt markets increases the probability of observing large downward repo and federal funds liability window dressing. Although the Eq. (2) specification reported in column (1) provides a directionally consistent

inference (coefficient estimate of -0.0009), the effect is not statistically significant. Consistent with our expectation, we find no evidence that window dressing incentives arise from participation as a borrower in the public debt market in either specification.

[Insert Table 8 here]

6.6. *Window dressing of short-term borrowings at private bank holding companies*

Our focus thus far has been on public bank holding companies, which are of primary interest to investors and the SEC and for which we are able to conduct stock return-based tests. We now turn our attention to private bank holding companies, which account for a large fraction of the population of BHCs (there are 16,759 bank-quarter observations across 1,260 private BHCs in our sample period) and are subject to the same Y-9C filing requirements as public BHCs. Private BHCs may face weaker incentives than public BHCs to downward window dress short-term borrowings because they lack public equity investors as a potential audience. On the other hand, if the incentives to window dress do exist, private banks may have greater latitude to engage in such behavior due to less scrutiny from investors and the SEC.

In untabulated univariate statistics we find evidence that private BHCs indeed downward window dress repo and fed funds liabilities (mean WD_RFL of -0.0002 , which is statistically different from zero). Although this degree of downward window dressing is substantially smaller than that for public BHCs (-0.0009 , as reported in Table 2), private bank holding companies are smaller than their public counterparts, and we know from our previous results that there is a size effect in window dressing. Therefore, we repeat the multivariate analysis of Eqs. (2) and (3) using a sample that combines our public BHC sample with private BHCs, after adding an indicator variable ($PRIVATE$) that equals one if bank i has no publicly traded equity and equals zero otherwise.

Table 9 reports our findings. In both the OLS and logistic specifications, HCK_LEV_{t-1} retains its significant association with downward window dressing in repo and federal funds liabilities. However, after controlling for bank size, there is no difference in the extent of downward repo and federal funds liability window dressing in public and private BHCs, as indicated by the statistically insignificant coefficient on $PRIVATE$ in both models. This provides evidence that non-equity market considerations serve as important incentives for window dressing of short-term borrowings.

[Insert Table 9 here]

6.7. Board independence

The negative market response to unexpected downward window dressing of short-term borrowings that we document in Table 5 suggests that BHC equity holders view such downward window dressing as net value-reducing. Although not the focus of our study, this finding raises a natural question concerning whether strong corporate governance mitigates BHC downward window dressing. We obtain data on the independence of BHC boards of directors from RiskMetrics, and compute the percentage of firm i 's directors in year y that are independent.²⁷ We define an indicator variable $INDEP_{i,t}$ that equals one if firm i 's board is comprised of at least 90% independent directors in the year of quarter t , and equals zero otherwise. We then re-estimate Eqs. (2) and (3) after including $INDEP_{i,t}$ as an additional explanatory variable. If independent boards curtail the above documented window-dressing behavior of banks, we expect a positive coefficient on $INDEP_{i,t}$ when added to Eq. (2) and a negative coefficient on $INDEP_{i,t}$ when added to the logistic specification of Eq. (3). As reported in Table 9, there is indeed a significant positive coefficient of 0.0023 (t-statistic of 1.98) on $INDEP_{i,t}$ in column (1) and a

²⁷ Because RiskMetrics only covers relatively large public firms, our sample size is greatly reduced for this analysis. In particular, for this analysis we have 1,341 BHC-quarter observations across 86 distinct bank holding companies.

significant negative coefficient of -0.9621 (t-statistic of -2.74) on $INDEP_{i,t}$ in column (2). Focusing on column (2) for discussion, this provides evidence that having a substantial fraction of independent directors decreases the probability of observing large downward window dressing of repo and federal funds liabilities.

We note that the significant effects from *INDEP* are only observed when the percentage of independent directors is at 90% or higher. This is consistent with extant literature that provides evidence that positive governance benefits may manifest only at very high levels of board independence (Warner and Wu, 2011). Although we acknowledge that the endogenous nature of any governance-related variable presents interpretational challenges, these findings are consistent with independent boards curtailing downward window dressing of short-term borrowings.

[Insert Table 10 here]

6.8. *Additional considerations*

6.8.1. *Trading assets*

It is possible that bank management has incentives to systematically reduce holdings of riskier asset classes at quarter end to project a lower risk profile and to increase its risk-based capital adequacy ratios. If such asset window dressing occurs, and the assets that are window dressed are funded by repo and federal funds liabilities, it is possible that observed window dressing of short-term borrowings is a byproduct of risky asset window dressing. However, with the current Y-9C disclosures of asset account quarterly averages, it is impossible for us to empirically examine the existence of window dressing of end-of-quarter holdings of risky assets. One account where such risky asset window dressing may occur is trading assets. The Y-9C reports only the quarterly average of *total* trading assets, not the quarterly averages of the

subcategories of trading assets with different risk levels. With the limited data, we do find that the window dressing measure of *total* trading assets is not significantly different from zero. Furthermore, short-term borrowing window dressing in repo and federal funds is not associated with the existence of more risky trading assets at the prior quarter end. Based on this evidence, it is unlikely that the short-term borrowings window dressing we document is simply a byproduct of window dressing of risky assets.

6.8.2. *Net repo and federal funds*

As previously discussed, in addition to being borrowers in the repo and federal funds markets, bank holding companies can be *lenders* in these markets, where such transactions create repo and federal funds *assets*. Our analysis thus far has not considered whether banks alter their lending in the repo and federal funds markets around quarter end, because doing so will have no effect on the bank's liability structure or financial leverage (lending in the repo and federal funds markets simply involves the exchange of cash assets for receivable assets). However, for completeness, we repeat our main tests with a measure of *net* repo and federal funds liability window dressing, constructed by subtracting repo and federal funds asset window dressing components from the corresponding liability components. Our inferences are unaltered when using the net repo and federal funds liability window dressing measure.

6.8.3. *Reserve maintenance periods*

Banks may use repo and federal funds borrowings to manage their reserve balance requirements (e.g., Furfine, 2000). A natural question that follows is whether the repo and federal funds liability window dressing we observe is partially driven by activities related to reserve maintenance. We do not believe that reserve maintenance affects our results for several reasons. First, this concern arises only if the end of a bank's reserve accounting period overlaps

with the quarter-end date over which we compute window dressing. Most large banks are on a *weekly* reserve calculation and reporting cycle, so there is not a concentrated incentive related to reserve balances at quarter end. Second, since 1998 reserve requirements are computed on a lagged basis, such that banks clearly know their reserve requirements well in advance of the end of the maintenance period associated with each weekly report. Therefore, reserve requirement surprises which would drive an immediate need for borrowing do not likely exist, in contrast to the dynamics that existed under the reserve accounting regime prior to 1998. Third, reserve requirements are satisfied based on average balances over the reserve maintenance period, rather than on period-end balances. Again, this diminishes the likelihood of concentrated incentives at the end of reserve accounting periods. Finally, setting the above points aside, if banks indeed use repo and federal funds borrowings to meet reserve requirements, that would suggest an *increase* in repo and federal funds borrowings, and would therefore work against our finding of *downward* window dressing.

7. Conclusion

This study provides the first empirical evidence on the window dressing of short-term borrowings through repo and federal funds liability accounts and the stock market's reaction to the public release of information that can be used to infer such window dressing. We find evidence of significant downward window dressing in these accounts by bank holding companies, resulting in understatements of quarter-end financial leverage that appear material in a substantial fraction of firm-quarter observations, particularly among the largest bank holding companies.

We find that firms with higher financial leverage, lower capital adequacy ratios, and greater management compensation sensitivity to ROA and ROE are more likely to engage in

downward window dressing of short-term borrowings. In addition, we show that the stock market reacts negatively to information indicating greater downward window dressing in repo and federal funds borrowings, consistent with the negative implications of such window dressing. In a supplemental analysis, we find that firms with more independent boards of directors have less downward window dressing, suggesting strong governance serves to curb such behavior. Finally, we find evidence of window dressing of short-term borrowings within private banks, which suggests that non-equity market considerations provide key window dressing incentives.

The potential implications of our findings go beyond bank holding companies and the financial industry. For firms that currently are not subject to quarterly averages disclosures (i.e., non-banks), window dressing is difficult, if not impossible, to detect, potentially giving strong incentives for such behavior. These results speak to the new SEC proposed “Short-Term Borrowing Disclosure” rule. In particular, our market tests suggest that investors of firms that are not currently subject to quarterly average disclosure requirements will likely find the new disclosure under the proposed rule useful. On the other hand, the findings also show that investors are able to extract information from the Y-9C reports presently filed by BHCs, thus the new SEC requirements may not be as incrementally beneficial in their application to banks. Moreover, our analysis suggests that to gain a deeper understanding of the forces behind window dressing of short-term borrowings, additional disclosures such as within-quarter risk-based asset category balances may prove useful.

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Appendix A

Disclosure requirements for within-quarter information on balance sheet liability accounts

Authority	The Federal Reserve	The SEC Current rule SEC Industry Guide 3	The SEC Proposed rule Release Nos. 33-9143; 34-62932
Apply to	Bank Holding Companies	Bank Holding Companies	All companies that provide MD&A, financial or otherwise
Frequency	Quarterly Y-9C, Schedule HC-K	Annual 10-K disclosure	Quarterly (10-Qs) and Annually (10-Ks)
Financial industry requirements	Averages (daily or weekly basis) of the following accounts-- * Deposits * Federal funds purchased and securities sold under agreements to repurchase * Other borrowed money	Averages (daily or weekly basis) and maximum month-end amounts of the following short-term borrowing accounts-- * Federal funds purchased and securities sold under agreements to repurchase * Commercial paper * Other borrowed money	Averages (daily basis) and maximum daily amounts of the following accounts-- * Federal funds purchased and securities sold under agreements to repurchase * Commercial paper * Borrowings from banks * Borrowings from other financial institutions * Other short-term borrowing
Nonfinancial industry requirements	None	None	Averages (at the minimum on a monthly basis) and maximum month-end amounts of the above short-term borrowing accounts.

Appendix B

The effect on regulatory capital ratios from window dressing of repo and federal funds liabilities (i.e., liabilities are incurred during the quarter and paid off with cash at quarter end).

Through balance sheet duality, reductions in short-term borrowings at quarter end translate into reductions in banks assets.

	Numerator	Denominator
Tier 1 leverage ratio	<p>Shareholders' equity, excluding certain items in accumulated other comprehensive income (e.g., unrealized gains/losses on available-for-sale securities and cash flow hedges) and certain intangibles.</p> <p><u>Effect from Window Dressing</u> No effect on equity as both assets and liabilities are reduced by equal amount.</p>	<p>Average total assets as reported in Schedule HC-K.</p> <p><u>Effect from Window Dressing</u> The quarterly averages are calculated on a daily or weekly basis during the quarter. All else equal, reductions in total assets at or near quarter end will reduce the quarterly average total assets</p>
Tier 1 risk-based capital ratio	<p>Shareholders' equity, excluding certain items in accumulated other comprehensive income (e.g., unrealized gains/losses on available-for-sale securities and cash flow hedges) and certain intangibles.</p> <p><u>Effect from Window Dressing</u> No effect on equity as both assets and liabilities are reduced by equal amount.</p>	<p>Total risk-weighted assets.</p> <p><u>Effect from Window Dressing</u> If the cash used to pay down short-term borrowings at quarter end are from selling risky assets, total risk-weighted assets will be reduced.</p>
Total risk-based capital ratio	<p>Total risk based capital, including Tier 1 capital and certain accumulated other comprehensive income, and certain subordinated debt and preferred stock.</p> <p><u>Effect from Window Dressing</u> No effect on equity as both assets and liabilities are reduced by equal amount. No effect on the subordinated debt in total capital, which have original maturities of at least two years.</p>	<p>Total risk-weighted assets.</p> <p><u>Effect from Window Dressing</u> If the cash used to pay down short-term borrowings at quarter end are from selling risky assets, total risk-weighted assets will be reduced.</p>

Appendix C Variable Definitions

Italicized variable names beginning with "BH" in the descriptions refer to the mnemonic data identifiers of raw data items obtained from the Federal Reserve Bank Holding Company data set at http://www.chicagofed.org/webpages/banking/financial_institution_reports/bhc_data.cfm. Referenced "Schedules" are from Form Y-9C. Schedule HC is the "Consolidated Balance Sheet." Schedule HC-B is "Securities." Schedule HC-E is "Deposit Liabilities." Schedule HC-K is "Quarterly Averages." Schedule HC-R is "Regulatory Capital." Schedule HI is the "Consolidated Income Statement."

<i>BOND_{i,t}</i>	An indicator that = 1 if firm <i>i</i> has a bond issue (as reported in TRACE) that has an executed trade on the OTC market both before and after the quarter <i>t</i> end date, and = 0 otherwise.
<i>CAR_FF_{i,t}</i>	Five-trading-day cumulative abnormal return centered on the estimated date that firm <i>i</i> 's quarter <i>t</i> Y-9C report was made public, i.e., trading days [-2, +2]. Abnormal return is computed as firm return less the expected return from a daily Fama-French three-factor model estimated over the [-45, -6] and [+6, +45] trading day windows.
<i>CAR_VW_{i,t}</i>	Five-trading-day cumulative abnormal return centered on the estimated date that firm <i>i</i> 's quarter <i>t</i> Y-9C report was made public, i.e., trading days [-2, +2]. Abnormal return is computed as firm return less CRSP value-weighted market return.
<i>CARPOST_FF_{i,t}</i>	Cumulative abnormal return over the [+3, +30] trading day window relative to the estimated date that firm <i>i</i> 's quarter <i>t</i> Y-9C report was made public. Abnormal return is computed as firm return less the expected return from a daily Fama-French three-factor model estimated over the [-45, -6] and [+6, +45] trading day windows.
<i>CARPOST_VW_{i,t}</i>	Cumulative abnormal return over the [+3, +30] trading day window relative to the estimated date that firm <i>i</i> 's quarter <i>t</i> Y-9C report was made public. Abnormal return is computed as firm return less CRSP value-weighted market return.
<i>CASH_{i,t}</i>	End of quarter cash and balances due from depository institutions from firm <i>i</i> 's quarter <i>t</i> Schedule HC (<i>BHCK0081</i> + <i>BHCK0395</i> + <i>BHCK0397</i>).
<i>CRISIS_t</i>	An indicator that = 1 if quarter <i>t</i> was a calendar quarter ending between 2007 Q4 and 2009 Q2, inclusive, and = 0 otherwise.
<i>DEBT_{i,t}</i>	End of quarter debt, including subordinated notes and debentures, from firm <i>i</i> 's quarter <i>t</i> Schedule HC (<i>BHCK4062</i> + <i>BHCKC699</i>).
<i>DPT_{i,t}</i>	End of quarter domestic and foreign deposits from firm <i>i</i> 's quarter <i>t</i> Schedules HC-E and HC (<i>BHCB3187</i> + <i>BHCB2389</i> + <i>BHCB6648</i> + <i>BHCB2604</i> + <i>BHOD3187</i> + <i>BHOD2389</i> + <i>BHOD6648</i> + <i>BHOD2604</i> + <i>BHFN6636</i>).

<i>DWD_DPT_{i,t}</i>	An indicator that =1 if <i>WD_DPT_{i,t}</i> is in the first sample quartile (i.e., less than -0.0028), and = 0 otherwise.
<i>DWD_OBR_{i,t}</i>	An indicator that =1 if <i>WD_OBR_{i,t}</i> is in the first sample quartile (i.e., less than -0.0063), and = 0 otherwise.
<i>DWD_RFL_{i,t}</i>	An indicator that =1 if <i>WD_RFL_{i,t}</i> is in the first sample quartile (i.e., less than -0.0024), and = 0 otherwise.
<i>EQUITY_{i,t}</i>	End of quarter total bank holding company equity capital from firm <i>i</i> 's quarter <i>t</i> Schedule HC (<i>BHCK3210</i>).
<i>FIXED_{i,t}</i>	End of quarter premises and fixed assets from firm <i>i</i> 's quarter <i>t</i> Schedule HC (<i>BHCK2145</i>).
<i>GLOANS_{i,t}</i>	End of quarter gross loans (<i>NLOANS</i> + <i>LLA</i>).
<i>HCK_DPT_{i,t}</i>	Sum of quarterly average domestic and foreign interest bearing deposits from firm <i>i</i> 's quarter <i>t</i> Schedule HC-K (<i>BHCK3517</i> + <i>BHCK3404</i>).
<i>HCK_EQ_{i,t}</i>	Quarterly average total equity capital from firm <i>i</i> 's quarter <i>t</i> Schedule HC-K (<i>BHCK3519</i>).
<i>HCK_LEV_{i,t}</i>	<i>HCK_TA/HCK_EQ</i> .
$\Delta HCK_LEV_{i,t}$	<i>HCK_LEV_{i,t}</i> - <i>HCK_LEV_{i,t-1}</i> .
<i>HCK_RFA_{i,t}</i>	Quarterly average federal funds sold and securities purchased under agreements to resell from firm <i>i</i> 's quarter <i>t</i> Schedule HC-K (<i>BHCK3365</i>).
<i>HCK_RFL_{i,t}</i>	Quarterly average federal funds purchased and securities sold under agreements to repurchase from firm <i>i</i> 's quarter <i>t</i> Schedule HC-K (<i>BHCK3353</i>).
<i>HCK_OBR_{i,t}</i>	Quarterly average "all other borrowed funds" (including commercial paper, other short-term borrowed money, and other long-term borrowed money) from firm <i>i</i> 's quarter <i>t</i> Schedule HC-K (<i>BHCK2635</i>).
<i>HCK_TA_{i,t}</i>	Quarterly average total consolidated assets from firm <i>i</i> 's quarter <i>t</i> Schedule HC-K (<i>BHCK3368</i>).
<i>HCK_TL_{i,t}</i>	Quarterly average assets less quarterly average equity (<i>HCK_TA</i> - <i>HCK_EQ</i>).
<i>HCK_TDAST_{i,t}</i>	Quarterly average trading assets from firm <i>i</i> 's quarter <i>t</i> Schedule HC-K (<i>BHCK3401</i>).
<i>INDEP_{i,t}</i>	An indicator that = 1 if $\geq 90\%$ of firm <i>i</i> 's board members are independent in the year of quarter <i>t</i> , and = 0 otherwise, where we obtain board data from RiskMetrics.
<i>INTANG_{i,t}</i>	End of quarter intangible assets from firm <i>i</i> 's quarter <i>t</i> Schedule HC (<i>BHCK3163</i> + <i>BHCK0426</i>).
<i>LLA_{i,t}</i>	End of quarter allowance for loan losses from firm <i>i</i> 's quarter <i>t</i> Schedule HC (<i>BHCK3123</i>).

$LLP_{i,t}$	Provision for loan losses during firm i 's quarter t from Schedule HI ($BHCK4230$ -adjusted to remove amounts from prior calendar year quarters).
$LLR_{i,t}$	$LLP/GLOANS$.
$LOAN_{i,t}$	An indicator that = 1 if firm i is the borrower in a private loan contract (as reported in LPC's Dealscan) that spans the quarter t end date, and = 0 otherwise.
$MB_{i,t}$	Market-to-book ratio, computed as share price times number of common shares outstanding ($ PRC * SHROUT$ from the CRSP daily file) as of the Y-9C publication date, divided by book value of equity from the Y-9C ($BHCK3210$).
$NLOANS_{i,t}$	End of quarter loans, net of the allowance for loan losses from firm i 's quarter t schedule HC ($BHCKB529$).
$OTHAST_{i,t}$	End of quarter "other assets" from firm i 's quarter t Schedule HC ($BHCK2160$).
$OBR_{i,t}$	End of quarter "other borrowed money" from firm i 's quarter t Schedule HC ($BHCK3190$).
$OTHLIAB_{i,t}$	End of quarter "other liabilities" from firm i 's quarter t Schedule HC ($BHCK2750$).
$PRIVATE_{i,t}$	An indicator that = 0 if a firm i was identified as having a CRSP PERMCO match in quarter t through a publicly available Federal Reserve linking table, and = 1 otherwise.
$ROA_COMP_{i,m,y}$	Correlation between annual change in firm i 's return on assets (ROA) and change in the log of CEO m 's total compensation, computed using a minimum of three years but no more than five years of data ending in the year immediately prior to the year of quarter t . ROA is computed as net income (Compustat ni) divided by beginning of year total assets (Compustat at). CEO total compensation is Execucomp $TDC1$.
$ROE_{i,t}$	Return on equity during firm i 's quarter t , computed as net income ($BHCK4340$ -adjusted to remove amounts from prior calendar year quarters) divided by HCK_EQ .
$\Delta ROE_{i,t}$	$ROE_{i,t} - ROE_{i,t-4}$.
$ROE_COMP_{i,m,y}$	Correlation between annual change in firm i 's return on equity (ROE) and change in the log of CEO m 's total compensation, computed using a minimum of three years but no more than five years of data ending in the year immediately prior to the year of quarter t . ROE is computed as net income (Compustat ni) divided by beginning of year market value of equity (Compustat $prcc * csho$). CEO total compensation is Execucomp $TDC1$.
$RFA_{i,t}$	End of quarter federal funds sold and securities purchased under agreements to resell from firm i 's quarter t Schedule HC ($BHDMB987 + BHCKB989$).

$RFL_{i,t}$	End of quarter federal funds purchased and securities sold under agreements to repurchase from firm i 's quarter t Schedule HC ($BHDMB993 + BHCKB995$).
$R_RFA_{i,t}$	Percentage of RFA that is securities purchased under agreements to resell; computed as $BHCKB989/RFA$.
$R_RFL_{i,t}$	Percentage of RFL that is securities sold under agreements to repurchase; computed as $BHCKB995/RFL$.
$SECURITIES_{i,t}$	End of quarter held-to-maturity plus available-for-sale securities from firm i 's quarter t Schedules HC and HC-B ($BHCK1754 + BHCK1172$).
$SIZE_{i,t}$	Natural logarithm of HCK_TA .
$TA_{i,t}$	End of quarter total consolidated assets from firm i 's quarter t Schedule HC ($BHCK2170$).
$TIER1LEV_{i,t}$	Tier 1 leverage ratio from firm i 's quarter t schedule HC-R ($BHCK7204$), defined as shareholders' equity with adjustments to exclude certain other comprehensive income and intangibles divided by average total assets as reported in Schedule HC-K.
$TIER1CAP_{i,t}$	Tier 1 risk-based capital ratio from firm i 's quarter t schedule HC-R ($BHCK7206$).
$TL_{i,t}$	End of quarter assets less end of quarter equity ($TA - EQ$).
$TOTALCAP_{i,t}$	Total risk-based capital ratio from firm i 's quarter t schedule HC-R ($BHCK7205$).
$TDAST_{i,t}$	End of quarter trading assets from firm i 's quarter t Schedule HC ($BHCK3545$).
$WD_DPT_{i,t}$	Firm i 's quarter t "window dressing" of deposits, calculated as $[\{(DPT_t + DPT_{t-1})/2\} - HCK_DPT_t]/HCK_TA_t$.
$\Delta WD_DPT_{i,t}$	$WD_DPT_{i,t} - WD_DPT_{i,t-1}$.
$WD_OBR_{i,t}$	Firm i 's quarter t "window dressing" of other borrowed money, $[\{(OBR_t + OBR_{t-1})/2\} - HCK_OBR_t]/HCK_TA_t$.
$\Delta WD_OBR_{i,t}$	$WD_OBR_{i,t} - WD_OBR_{i,t-1}$.
$WD_RFA_{i,t}$	Firm i 's quarter t window dressing of federal funds sold and securities purchased under agreements to resell; calculated as $[\{(RFA_t + RFA_{t-1})/2\} - HCK_RFA_t]/HCK_TA_t$.
$WD_RFL_{i,t}$	Firm i 's quarter t window dressing of federal funds purchased and securities sold under agreements to repurchase; calculated as $[\{(RFL_t + RFL_{t-1})/2\} - HCK_RFL_t]/HCK_TA_t$.
$\Delta WD_RFL_{i,t}$	$WD_RFL_{i,t} - WD_RFL_{i,t-1}$.
$WD_TA_{i,t}$	Firm i 's quarter t "window dressing" of total assets, calculated as $[\{(TA_t + TA_{t-1})/2\} - HCK_TA_t]/HCK_TA_t$.
$WD_TL_{i,t}$	Firm i 's quarter t "window dressing" of total liabilities, calculated as $[\{(TL_t + TL_{t-1})/2\} - HCK_TL_t]/HCK_TA_t$.
WD_TDAST	Firm i 's quarter t "window dressing" of trading assets, calculated as $[\{(TDAST_t + TDAST_{t-1})/2\} - HCK_TDAST_t]/HCK_TA_t$.

Figure 1
Illustration of repo and federal funds liability window dressing measure (WD_RFL)

Figure 1 provides illustrations of scenarios that would result in our window dressing measure reflecting no window dressing ($WD_RFL = 0$) and downward window dressing ($WD_RFL < 0$), respectively, where WD_RFL is computed as in Eq. (1).

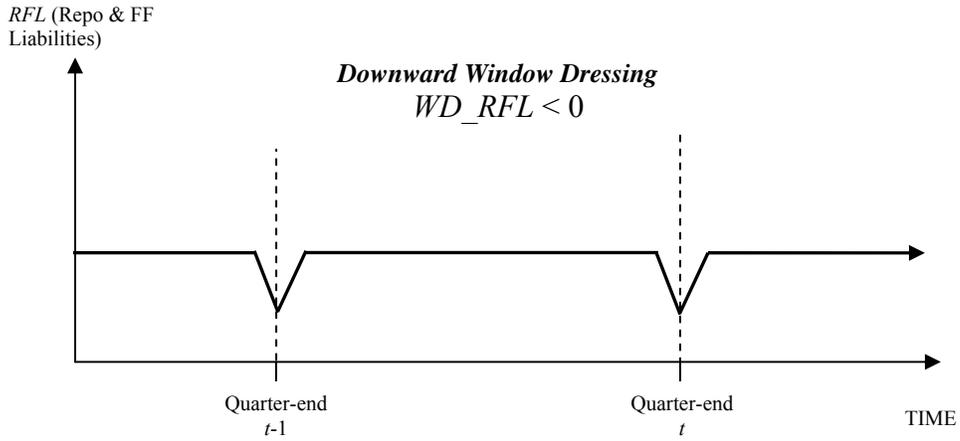
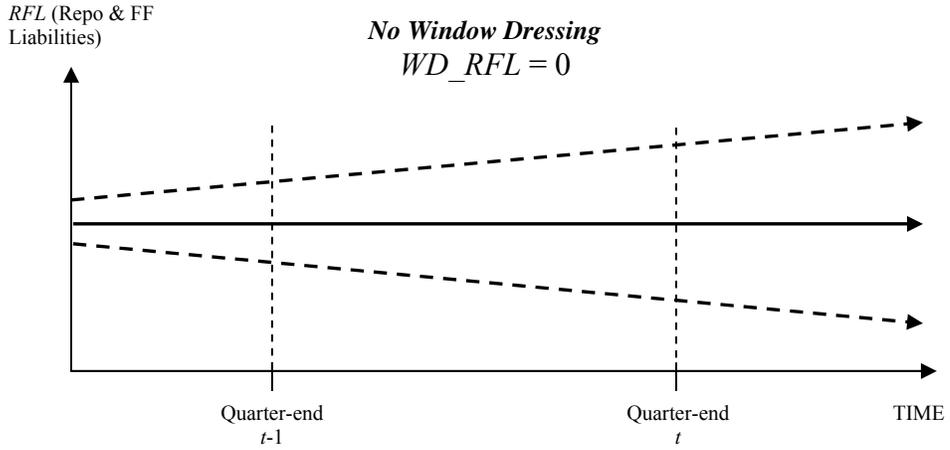


Figure 2
Repo and federal funds liability window dressing

Figure 2 presents the quarterly sample mean values of WD_RFL (i.e., repo and federal funds liability window dressing), as defined in Appendix C, for both the full sample and the top 25 bank holding company observations each quarter based on total consolidated assets.

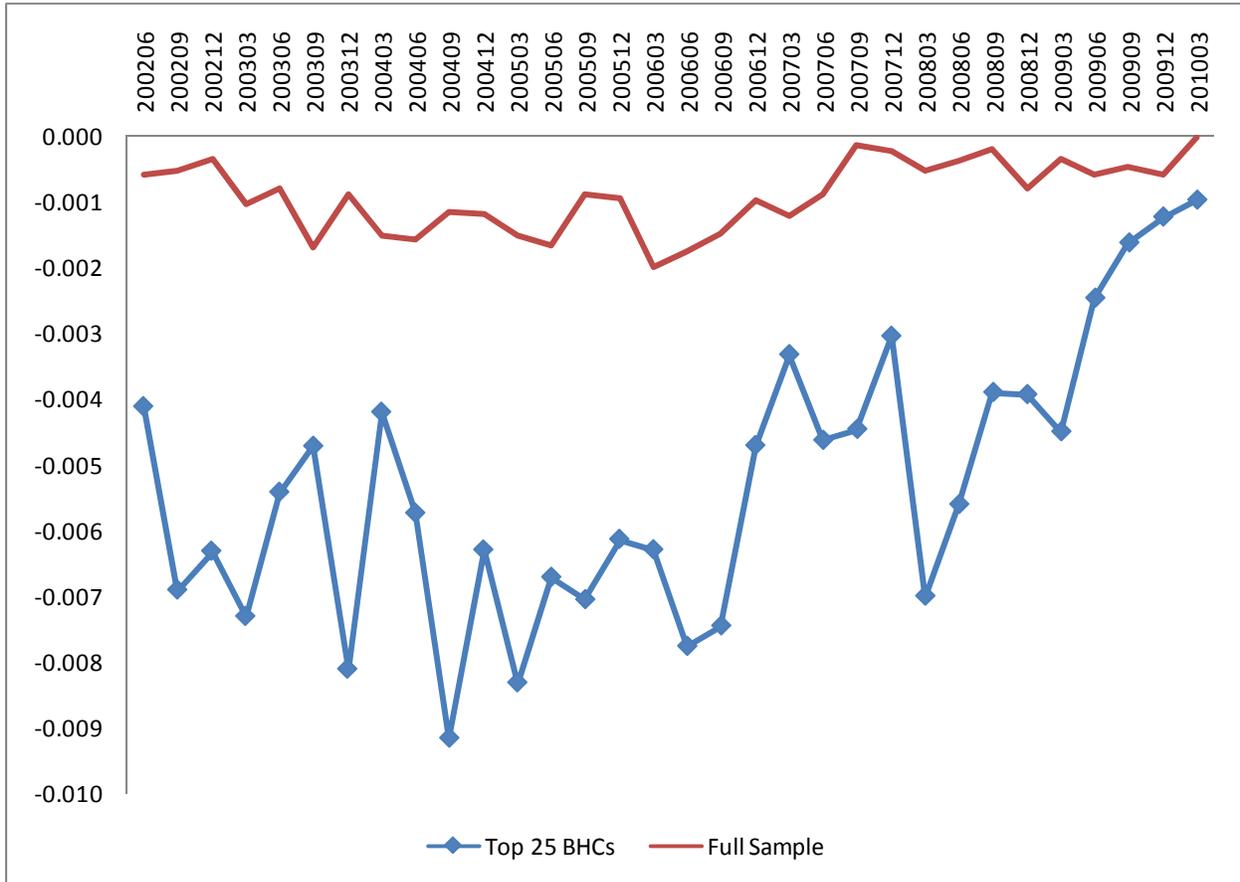


Figure 3
Empirical distribution of randomization-based repo and federal funds window dressing coefficient estimates in the market test

Figure 3 presents the empirical distribution of the estimated coefficients on ΔWD_RFL obtained by 1,000 iterations of estimating Eq. (4) where the abnormal return dependent variable is computed based on randomly assigned Y-9C publication dates between the quarter's earnings announcement window and the end of the calendar quarter. Figure 3 also plots the coefficient estimate on ΔWD_RFL (0.2026) obtained by estimating Eq. (4) using our coded Y-9C publication date of 42 (47) days after the "as-of" date for the first three (last) calendar quarters, as reported in Table 5 column (1).

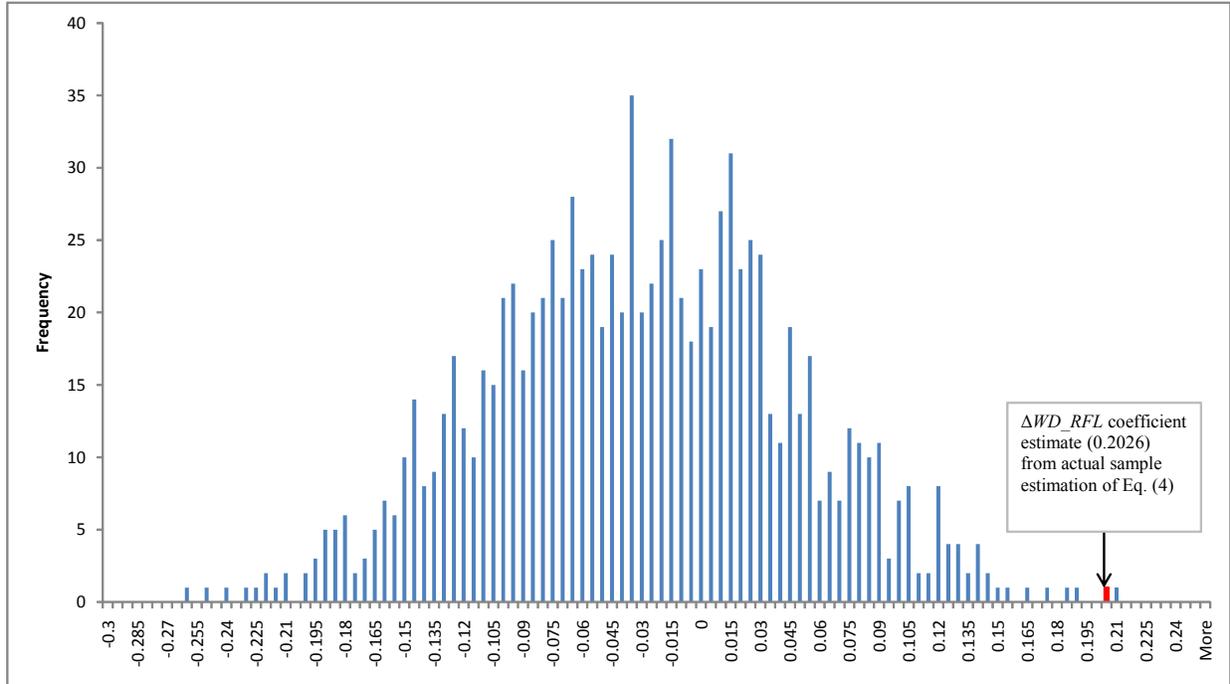


Table 1
Partial common-size balance sheet

Table 1 presents selected end-of-quarter financial variables scaled by end-of-quarter total consolidated assets from firm *i*'s quarter *t* Schedule HC (*BHCK2170*). The column "Avg. on HC-K?" indicates whether each financial metric has a corresponding quarterly average value available on the Y-9C Schedule HC-K. *GLOANS* is gross loans. *RFA* is federal funds sold and securities purchased under agreements to resell. *TDAST* is trading assets. *INTANG* is intangible assets. *FIXED* is premises and fixed assets. *RFL* is federal funds purchased and securities sold under agreements to repurchase. *OBR* is "other borrowed money". *TL* is total liabilities. All variables are further defined in Appendix C.

<i>Common-size</i>	N	Mean	Std. Dev.	Median	Avg. on HC-K?
<i>Assets</i>					
<i>GLOANS</i>	8,916	0.679	0.123	0.693	Y
<i>SECURITIES</i>	8,916	0.203	0.107	0.186	Y
<i>RFA</i>	8,914	0.014	0.029	0.003	Y
<i>TDAST</i>	8,906	0.004	0.023	0.000	Y
<i>CASH</i>	8,916	0.035	0.029	0.029	N
<i>INTANG</i>	8,916	0.018	0.019	0.013	N
<i>FIXED</i>	8,916	0.016	0.009	0.014	N
<i>OTHAST</i>	8,916	0.037	0.026	0.034	N
<i>Liabilities & Equity</i>					
<i>DPT</i>	8,916	0.666	0.103	0.675	Y
<i>RFL</i>	8,916	0.042	0.045	0.030	Y
<i>OBR</i>	8,916	0.087	0.066	0.076	Y
<i>DEBT</i>	8,905	0.014	0.014	0.013	N
<i>OTHLIAB</i>	8,916	0.021	0.064	0.010	N
<i>TL</i>	8,916	0.910	0.021	0.912	Y
<i>EQUITY</i>	8,916	0.090	0.021	0.088	Y

Table 2
Sample descriptive statistics

Table 2 presents sample descriptive statistics for firm-quarter variables used in our analyses. *WD_RFL* is the repo and fed funds window dressing measure. *HCK_LEV* is quarterly average total assets divided by shareholders' equity. All variables are further defined in Appendix C. *, **, and *** indicate that the mean is significantly different from zero at the 10%, 5%, and 1% levels, respectively.

	N	Mean	Std	P25	Median	P75
<i>WD_RFL</i>	8,916	-0.0009 ***	0.0072	-0.0024	0.0000	0.0016
<i>WD_DPT</i>	8,714	0.0331 ***	0.0524	-0.0028	0.0107	0.0686
<i>WD_OBR</i>	8,730	-0.0023 ***	0.0112	-0.0063	0.0000	0.0025
<i>WD_RFA</i>	8,821	-0.0003 ***	0.0077	-0.0019	0.0000	0.0015
<i>WD_TDAST</i>	8,654	0.0000	0.0006	0.0000	0.0000	0.0000
<i>WD_TA</i>	8,807	0.0041 ***	0.0158	-0.0021	0.0040	0.0108
<i>WD_TL</i>	8,811	0.0043 ***	0.0156	-0.0018	0.0042	0.0109
<i>HCK_LEV_{t-1}</i>	8,916	11.6278 ***	2.5927	9.9146	11.3335	13.0759
<i>TIERILEV_{t-1}</i>	8,916	8.7884 ***	1.6587	7.7400	8.6100	9.6700
<i>TIERICAP_{t-1}</i>	8,913	11.4535 ***	2.5580	9.8500	11.0100	12.5600
<i>TOTALCAP_{t-1}</i>	8,915	13.0972 ***	2.3963	11.5100	12.5500	14.0800
<i>SIZE_{t-1}</i>	8,916	14.8950 ***	1.5708	13.7442	14.5026	15.5698
<i>LLR_{t-1}</i>	8,916	0.0017 ***	0.0028	0.0004	0.0008	0.0016
<i>R_RFA</i>	6,065	0.1472 ***	0.3215	0.0000	0.0000	0.0000
<i>R_RFL</i>	7,457	0.7761 ***	0.3125	0.6314	0.9582	1.0000
<i>CAR_VW</i>	8,837	0.0001	0.0436	-0.0207	-0.0018	0.0198
<i>CAR_FF</i>	8,781	0.0042 ***	0.0531	-0.0178	0.0015	0.0231
<i>CARPOST_VW</i>	8,795	-0.0092 ***	0.0924	-0.0508	-0.0101	0.0314
<i>CARPOST_FF</i>	8,781	-0.0113 ***	0.0959	-0.0471	-0.0076	0.0289
Δ <i>WD_RFL</i>	8,516	0.0000	0.0073	-0.0024	0.0000	0.0024
Δ <i>ROE</i>	8,565	-0.0052 ***	0.0304	-0.0081	-0.0018	0.0025
Δ <i>HCK_LEV</i>	8,912	-0.0216 **	0.8550	-0.2469	-0.0077	0.2308
Δ <i>WD_DPT</i>	8,617	0.0005	0.0291	-0.0078	0.0004	0.0086
Δ <i>WD_OBR</i>	8,585	0.0000	0.0106	-0.0040	0.0000	0.0039
<i>ROE</i>	8,846	0.0239 ***	0.0321	0.0185	0.0296	0.0380
<i>MB</i>	8,916	1.7554 ***	0.9316	1.1992	1.7213	2.2076

Table3
Correlation matrix

Table 3 presents Pearson (Spearman) correlations above (below) the diagonal among variables used in our analyses. Correlations that are significant at the 0.10 level or better are reported in bold italics. The second row of each cell reports the number of firm-quarter observations that contribute to the correlation computation. Variable definitions are presented in Appendix C.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>WD_RFL</i> (1)		-0.059 8,714	-0.130 8,730	0.059 8,821	0.064 8,654	0.176 8,807	0.183 8,811	-0.038 8,916	0.089 8,916	0.057 8,913	-0.007 8,915	-0.213 8,916
<i>WD_DPT</i> (2)	-0.064 8,714		-0.014 8,534	0.059 8,632	-0.017 8,457	0.078 8,621	0.087 8,624	-0.060 8,714	-0.025 8,714	-0.070 8,711	-0.024 8,713	0.133 8,714
<i>WD_OBR</i> (3)	-0.103 8,730	-0.039 8,534		0.008 8,646	-0.005 8,481	0.140 8,643	0.139 8,647	0.024 8,730	-0.001 8,730	0.028 8,727	0.022 8,729	-0.020 8,730
<i>WD_RFA</i> (4)	-0.015 8,821	0.058 8,632	-0.005 8,646		0.037 8,567	0.336 8,727	0.337 8,733	0.007 8,821	0.023 8,821	-0.030 8,818	-0.033 8,820	-0.027 8,821
<i>WD_TDAST</i> (5)	-0.012 8,654	0.011 8,457	0.006 8,481	0.015 8,567		0.042 8,553	0.044 8,558	-0.020 8,654	0.015 8,654	0.003 8,651	0.003 8,653	-0.028 8,654
<i>WD_TA</i> (6)	0.144 8,807	0.098 8,621	0.150 8,643	0.304 8,727	0.026 8,553		0.980 8,798	0.000 8,807	0.032 8,807	-0.013 8,804	-0.014 8,806	-0.020 8,807
<i>WD_TL</i> (7)	0.148 8,811	0.109 8,624	0.151 8,647	0.304 8,733	0.023 8,558	0.968 8,798		-0.013 8,811	0.041 8,811	-0.016 8,808	-0.017 8,810	-0.018 8,811
<i>HCK_LEV_{t-1}</i> (8)	-0.023 8,916	-0.042 8,714	0.031 8,730	0.013 8,821	-0.011 8,654	0.009 8,807	-0.013 8,811		-0.548 8,916	-0.335 8,913	-0.322 8,915	-0.056 8,916
<i>TIERILEV_{t-1}</i> (9)	0.053 8,916	-0.040 8,714	-0.010 8,730	0.018 8,821	-0.027 8,654	0.001 8,807	0.015 8,811	-0.513 8,916		0.651 8,913	0.601 8,915	-0.296 8,916
<i>TIERICAP_{t-1}</i> (10)	0.050 8,913	-0.091 8,711	0.004 8,727	-0.033 8,818	-0.020 8,651	-0.038 8,804	-0.040 8,808	-0.314 8,913	0.650 8,913		0.926 8,913	-0.294 8,913
<i>TOTALCAP_{t-1}</i> (11)	-0.014 8,915	-0.037 8,713	0.003 8,729	-0.028 8,820	0.017 8,653	-0.044 8,806	-0.047 8,810	-0.313 8,915	0.561 8,915	0.870 8,913		-0.080 8,915
<i>SIZE_{t-1}</i> (12)	-0.112 8,916	0.118 8,714	-0.041 8,730	-0.005 8,821	0.056 8,654	0.032 8,807	0.037 8,811	-0.084 8,916	-0.282 8,916	-0.301 8,913	-0.080 8,915	

Table 4
Window dressing of repo and federal funds liabilities and financial leverage

Table 4 presents regression results of window dressing in several liability accounts on a set of bank-quarter determinants using a sample of publicly traded bank holding companies. Columns (1), (2) and (3) are estimated using ordinary least squares, and Columns (4), (5) and (6) are estimated using logistic regression. *WD_RFL* is the repo and fed funds liability window dressing measure. *WD_OBR* is the other borrowed funds "window dressing" measure. *WD_DPT* is the deposit "window dressing" measure. *DWD_RFL*, *DWD_OBR* and *DWD_DPT* are indicator variables = 1 if *WD_RFL*, *WD_OBR* and *WD_DPT*, respectively, are in the most negative sample quartile (which indicates a high magnitude of downward window dressing), and = 0 otherwise. *HCK_LEV* is quarterly average total assets divided by shareholders' equity. *SIZE* is the natural logarithm of quarterly average total assets. *CRISIS* is an indicator that = 1 if quarter *t* was a calendar quarter ending between 2007 Q4 and 2009 Q2, inclusive, and = 0 otherwise. *LLR* is loan loss provision as a percentage of gross loans. All variables are further defined in Appendix C. Robust t-statistics based on two-way clustered standard errors at the bank and calendar quarter-year levels are reported in parentheses. *, **, and *** indicate significance (two-sided) at the 10%, 5%, and 1% levels, respectively. R^2 refers to adjusted- R^2 in Columns (1), (2) and (3), and pseudo- R^2 in Columns (4), (5) and (6).

Dep. Var.:	<i>WD_RFL</i>	<i>WD_OBR</i>	<i>WD_DPT</i>	<i>DWD_RFL</i>	<i>DWD_OBR</i>	<i>DWD_DPT</i>
Column:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Intercept</i>	0.0154 *** (4.55)	-0.0017 (-0.59)	-0.0209 (-0.91)	-6.8057 *** (-9.22)	-1.7668 ** (-2.53)	1.3930 * (1.81)
<i>HCK_LEV_{t-1}</i>	-0.0001 ** (-2.24)	0.0001 (0.95)	-0.0010 (-1.57)	0.0475 ** (2.34)	0.0108 (0.46)	-0.0014 (-0.06)
<i>SIZE_{t-1}</i>	-0.0010 *** (-4.79)	-0.0001 (-0.67)	0.0044 *** (3.01)	0.3502 *** (8.38)	0.0339 (0.86)	-0.1685 *** (-3.38)
<i>CRISIS</i>	0.0007 *** (3.45)	0.0004 (0.69)	0.0038 ** (2.15)	-0.0260 (-0.35)	0.0962 (0.96)	-0.0891 (-1.06)
<i>LLR_{t-1}</i>	0.0427 (1.16)	-0.0403 (-0.62)	-0.2769 (-0.71)	-63.8379 *** (-3.57)	8.5783 (0.71)	24.1977 * (1.96)
N	8,916	8,730	8,714	8,916	8,730	8,714
Adj. R^2	0.050	0.001	0.021	0.054	0.001	0.010

Table 5
Stock market reaction to repo and federal funds liability window dressing

Table 5 presents ordinary least squares regression results of the market reaction during and subsequent to the public release of bank holding company Y-9C data on a set of bank-quarter determinants using a sample of publicly traded bank holding companies. *CAR* is the five-day cumulative abnormal return centered on the Y-9C publication date. *CARPOST* is the cumulative abnormal return over the [+3, +30] trading day window relative to the Y-9C publication date. Subscript *_VW* indicates that expected return is the corresponding daily value-weighted market return. Subscript *_FF* indicates that expected return is computed from a Fama-French three-factor model estimated using firm i's daily returns over the [-45, -6] and [+6, +45] trading day window relative to the Y-9C publication date. *WD_RFL* is the repo and fed funds liability window dressing measure. *WD_DPT* is the deposit "window dressing" measure. *WD_OBR* is the other borrowed funds "window dressing" measure. *ROE* is net income over equity. *HCK_LEV* is quarterly average total assets divided by shareholders' equity. All variables are further defined in Appendix C. Robust t-statistics based on two-way clustered standard errors at the bank and calendar quarter-year levels are reported in parentheses. *, **, and *** indicate significance (two-sided) at the 10%, 5%, and 1% levels, respectively.

Dep. Var.:	<i>CAR_VW</i>	<i>CAR_FF</i>	<i>CARPOST_VW</i>	<i>CARPOST_FF</i>
Column:	(1)	(2)	(3)	(4)
<i>Intercept</i>	0.0263 *	0.0088	-0.0162	-0.0259
	(1.794)	(0.884)	(-0.680)	(-1.110)
Δ <i>WD_RFL</i>	0.2026 **	0.1744 **	-0.1680	-0.1330
	(2.065)	(2.051)	(-1.144)	(-1.251)
Δ <i>WD_OBR</i>	0.0710	0.0577	0.0126	-0.0028
	(0.770)	(0.959)	(0.079)	(-0.025)
Δ <i>WD_DPT</i>	0.0064	-0.0252	-0.0196	0.0040
	(0.400)	(-1.420)	(-0.575)	(0.108)
Δ <i>ROE</i>	0.1225 **	-0.0170	0.2443 *	0.0077
	(2.429)	(-0.292)	(1.802)	(0.060)
Δ <i>HCK_LEV</i>	0.0005	-0.0008	-0.0030	-0.0055
	(0.380)	(-0.594)	(-0.967)	(-1.324)
<i>HCK_LEV</i>	-0.0008 *	-0.0008	-0.0006	-0.0013
	(-1.924)	(-1.206)	(-0.882)	(-1.598)
<i>SIZE</i>	-0.0013	0.0004	0.0001	0.0014
	(-1.205)	(0.495)	(0.063)	(0.945)
<i>MB</i>	0.0028	-0.0013	0.0060	0.0056
	(1.263)	(-0.606)	(1.096)	(1.313)
N	7,522	7,552	7,522	7,552
Adj.- <i>R</i> ²	0.014	0.003	0.011	0.006

Table 6
Window dressing of repo and federal funds liabilities and capital adequacy ratios

Table 6 presents regression results of window dressing in repo and federal funds liabilities on a set of bank-quarter determinants using a sample of publicly traded bank holding companies. Columns (1), (2) and (3) are estimated using ordinary least squares, and Columns (4), (5) and (6) are estimated using logistic regression. *WD_RFL* is the repo and fed funds liability window dressing measure. *DWD_RFL* is an indicator variables = 1 if *WD_RFL* is in the most negative sample quartile (which indicates a high magnitude of downward window dressing), and = 0 otherwise. *TIER1LEV* is the tier 1 leverage ratio. *TIER1CAP* is the tier 1 risk-weighted asset capital ratio. *TOTALCAP* is the total risk-weighted asset capital ratio. *SIZE* is the natural logarithm of quarterly average total assets. *CRISIS* is an indicator that = 1 if quarter *t* was a calendar quarter ending between 2007 Q4 and 2009 Q2, inclusive, and = 0 otherwise. *LLR* is loan loss provision as a percentage of gross loans. All variables are further defined in Appendix C. Robust t-statistics based on two-way clustered standard errors at the bank and calendar quarter-year levels are reported in parentheses. *, **, and *** indicate significance (two-sided) at the 10%, 5%, and 1% levels, respectively. # indicates significance (one-sided) at the 10% level. R^2 refers to adjusted- R^2 in Columns (1), (2) and (3), and pseudo- R^2 in Columns (4), (5) and (6).

Dep. Var.:	<i>WD_RFL</i>	<i>WD_RFL</i>	<i>WD_RFL</i>	<i>DWD_RFL</i>	<i>DWD_RFL</i>	<i>DWD_RFL</i>
Column:	(1)	(2)	(3)	(4)	(5)	(6)
<i>Intercept</i>	0.0122 *** (4.21)	0.0138 *** (4.33)	0.0146 *** (4.68)	-4.9562 *** (-7.65)	-5.6150 *** (-8.69)	-5.9515 *** (-9.86)
<i>TIER1LEV_{t-1}</i>	0.0001 # (1.36)			-0.0905 *** (-2.93)		
<i>TIER1CAP_{t-1}</i>		-0.0000 (-0.06)			-0.0301 # (-1.54)	
<i>TOTALCAP_{t-1}</i>			-0.0001 (-1.17)			-0.0147 (-0.71)
<i>SIZE_{t-1}</i>	-0.0010 *** (-4.74)	-0.0010 *** (-4.73)	-0.0010 *** (-4.78)	0.3160 *** (8.05)	0.3312 *** (8.38)	0.3435 *** (8.71)
<i>CRISIS</i>	0.0007 *** (3.63)	0.0008 *** (3.71)	0.0007 *** (3.55)	-0.0409 (-0.57)	-0.0677 (-0.95)	-0.0618 (-0.85)
<i>LLR_{t-1}</i>	0.0391 (1.04)	0.0436 (1.16)	0.0446 (1.19)	-58.5243 *** (-3.34)	-64.0400 *** (-3.58)	-63.6807 *** (-3.56)
N	8,916	8,913	8,915	8,916	8,913	8,915
R^2	0.048	0.047	0.048	0.055	0.053	0.052

Table 7
Window dressing of repo and federal funds liabilities and management compensation

Table 7 presents regression results of window dressing in repo and federal funds liabilities on a set of bank-quarter determinants using a sample of publicly traded bank holding companies. Columns (1) and (2) are estimated using ordinary least squares, and Columns (3) and (4) are estimated using logistic regression. *WD_RFL* is the repo and fed funds liability window dressing measure. *DWD_RFL* is an indicator variables = 1 if *WD_RFL* is in the most negative sample quartile (which indicates a high magnitude of downward window dressing), and = 0 otherwise. *HCK_LEV* is quarterly average total assets divided by shareholders' equity. *ROA_COMP* is the sensitivity of CEO total compensation to return on assets, measured as the correlation between the annual change in ROA and the annual change in log total compensation. *ROE_COMP* is the sensitivity of CEO total compensation to return on equity, measured as the correlation between the annual change in ROE and the annual change in log total compensation. *SIZE* is the natural logarithm of quarterly average total assets. *CRISIS* is an indicator that = 1 if quarter *t* was a calendar quarter ending between 2007 Q4 and 2009 Q2, inclusive, and = 0 otherwise. *LLR* is loan loss provision as a percentage of gross loans. All variables are further defined in Appendix C. Robust t-statistics based on two-way clustered standard errors at the bank and calendar quarter-year levels are reported in parentheses. *, **, and *** indicate significance (two-sided) at the 10%, 5%, and 1% levels, respectively. # indicates significance (one-sided) at the 10% level. R^2 refers to adjusted- R^2 in Columns (1) and (2), and pseudo- R^2 in Columns (3) and (4).

Dep. Var.:	<i>WD_RFL</i>	<i>WD_RFL</i>	<i>DWD_RFL</i>	<i>DWD_RFL</i>
Column:	(1)	(2)	(3)	(4)
<i>Intercept</i>	0.0287 *** (3.02)	0.0297 *** (3.03)	-6.7585 *** (-4.14)	-6.9030 *** (-3.92)
<i>HCK_LEV_{t-1}</i>	-0.0003 * (-1.66)	-0.0003 ** (-2.11)	0.0226 (0.71)	0.0373 (1.18)
<i>ROA_COMP_{t-1}</i>	-0.0021 * (-1.94)		0.4719 ** (2.17)	
<i>ROE_COMP_{t-1}</i>		-0.0013 # (-1.32)		0.0873 (0.47)
<i>SIZE_{t-1}</i>	-0.0017 *** (-2.97)	-0.0017 *** (-2.94)	0.3725 *** (3.88)	0.3769 *** (3.61)
<i>CRISIS</i>	0.0002 (0.24)	0.0002 (0.37)	-0.1285 (-0.74)	-0.1496 (-0.90)
<i>LLR_{t-1}</i>	0.1242 (1.49)	0.1074 (1.17)	-114.8001 *** (-3.48)	-109.6856 *** (-3.21)
N	1,278	1,278	1,278	1,278
R^2	0.092	0.084	0.077	0.067

Table 8
Window dressing of repo and federal funds liabilities and debt market incentives

Table 8 presents regression results of window dressing in repo and federal funds liabilities on a set of bank-quarter determinants using a sample of publicly traded bank holding companies. Columns (1) and (2) are estimated using ordinary least squares, and Columns (3) and (4) are estimated using logistic regression. *WD_RFL* is the repo and fed funds liability window dressing measure. *DWD_RFL* is an indicator variables = 1 if *WD_RFL* is in the most negative sample quartile (which indicates a high magnitude of downward window dressing), and = 0 otherwise. *HCK_LEV* is quarterly average total assets divided by shareholders' equity. *LOAN* is an indicator that = 1 if there was a private loan contract outstanding at the end of quarter *t*, and =0 otherwise. *BOND* is an indicator that =1 if there exists a public bond issue that is publicly traded at the end of quarter *t*. *SIZE* is the natural logarithm of quarterly average total assets. *CRISIS* is an indicator that = 1 if quarter *t* was a calendar quarter ending between 2007 Q4 and 2009 Q2, inclusive, and = 0 otherwise. *LLR* is loan loss provision as a percentage of gross loans. All variables are further defined in Appendix C. Robust t-statistics based on two-way clustered standard errors at the bank and calendar quarter-year levels are reported in parentheses. *, **, and *** indicate significance (two-sided) at the 10%, 5%, and 1% levels, respectively. # indicates significance (one-sided) at the 10% level. R^2 refers to adjusted- R^2 in Columns (1) and (2), and pseudo- R^2 in Columns (3) and (4).

Dep. Var.:	<i>WD_RFL</i>	<i>WD_RFL</i>	<i>DWD_RFL</i>	<i>DWD_RFL</i>
Column:	(1)	(2)	(3)	(4)
<i>Intercept</i>	0.0150 *** (4.62)	0.0147 *** (4.71)	-6.7284 *** (-9.17)	-6.7068 *** (-10.02)
<i>HCK_LEV_{t-1}</i>	-0.0001 ** (-2.17)	-0.0001 ** (-2.23)	0.0466 ** (2.31)	0.0478 ** (2.32)
<i>LOAN</i>	-0.0009 (-1.03)		0.1997 # (1.33)	
<i>BOND</i>		-0.0010 (-0.71)		0.1304 (0.45)
<i>SIZE_{t-1}</i>	-0.0010 *** (-4.91)	-0.0010 *** (-4.94)	0.3445 *** (8.28)	0.3429 *** (9.04)
<i>CRISIS</i>	0.0007 *** (3.39)	0.0007 *** (3.48)	-0.0234 (-0.31)	-0.0277 (-0.38)
<i>LLR_{t-1}</i>	0.0401 (1.08)	0.0419 (1.13)	-62.9366 *** (-3.55)	-63.7503 *** (-3.58)
N	8,916	8,916	8,916	8,916
R^2	0.050	0.050	0.055	0.055

Table 9
Private bank holding companies and window dressing of repo and federal funds liabilities

Table 9 presents regression results of window dressing of liability categories on a set of bank-quarter determinants using a sample of public and private bank holding companies. Column (1) is estimated using ordinary least squares, and Column (2) is estimated using logistic regression. *WD_RFL* is the repo and fed funds liability window dressing measure. *PRIVATE* is an indicator = 1 if bank *i* does not have publicly traded equity in quarter *t*, and = 0 otherwise. *HCK_LEV* is quarterly average total assets divided by shareholders' equity. *SIZE* is the natural logarithm of quarterly average total assets. *CRISIS* is an indicator that = 1 if quarter *t* was a calendar quarter ending between 2007 Q4 and 2009 Q2, inclusive, and = 0 otherwise. *LLR* is loan loss provision as a percentage of gross loans. All variables are further defined in Appendix C. Robust t-statistics based on two-way clustered standard errors at the bank and calendar quarter-year levels are reported in parentheses. *, **, and *** indicate significance (two-sided) at the 10%, 5%, and 1% levels, respectively. # indicates significance (one-sided) at the 10% level. R^2 refers to adjusted- R^2 in Column (1), and pseudo- R^2 in Column (2).

Dep. Var.:	<i>WD_RFL</i>	<i>DWD_RFL</i>
Column:	(1)	(2)
<i>Intercept</i>	0.0117 *** (5.168)	-5.8957 *** (-12.392)
<i>PRIVATE</i>	-0.0002 (-0.857)	-0.0256 (-0.272)
<i>HCK_LEV_{t-1}</i>	-0.00003 # (-1.521)	0.0131 # (1.402)
<i>SIZE_{t-1}</i>	-0.0008 *** (-5.506)	0.3151 *** (10.476)
<i>CRISIS</i>	0.0004 *** (3.101)	0.0489 (0.594)
<i>LLR_{t-1}</i>	0.0314 # (1.583)	-59.4940 *** (-4.798)
N	25,675	25,675
R^2	0.029	0.033

Table 10
Window dressing of repo and federal funds liabilities and board independence

Table 10 presents regression results of window dressing in repo and federal funds liabilities on a set of bank-quarter determinants using a sample of publicly traded bank holding companies. Column (1) is estimated using ordinary least squares, and Column (2) is estimated using logistic regression. *WD_RFL* is the repo and fed funds liability window dressing measure. *DWD_RFL* is an indicator variables = 1 if *WD_RFL* is in the most negative sample quartile (which indicates a high magnitude of downward window dressing), and = 0 otherwise. *HCK_LEV* is quarterly average total assets divided by shareholders' equity. *INDEP* is an indicator that = 1 if $\geq 90\%$ of firm *i*'s board members are independent in the year of quarter *t*, and = 0 otherwise. *SIZE* is the natural logarithm of quarterly average total assets. *CRISIS* is an indicator that = 1 if quarter *t* was a calendar quarter ending between 2007 Q4 and 2009 Q2, inclusive, and = 0 otherwise. *LLR* is loan loss provision as a percentage of gross loans. All variables are further defined in Appendix C. Robust t-statistics based on two-way clustered standard errors at the bank and calendar quarter-year levels are reported in parentheses. *, **, and *** indicate significance (two-sided) at the 10%, 5%, and 1% levels, respectively. R^2 refers to adjusted- R^2 in Column (1), and pseudo- R^2 in Column (2).

Dep. Var.:	<i>WD_RFL</i>	<i>DWD_RFL</i>
Column:	(1)	(2)
<i>Intercept</i>	0.0189 *	-5.1393 **
	(1.93)	(-2.49)
<i>HCK_LEV_{t-1}</i>	-0.0004 *	0.0493
	(-1.61)	(0.77)
<i>INDEP</i>	0.0023 **	-0.9621 ***
	(1.98)	(-2.74)
<i>SIZE_{t-1}</i>	-0.0011 *	0.2563 **
	(-1.95)	(2.41)
<i>CRISIS</i>	-0.0001	-0.0838
	(-0.08)	(-0.48)
<i>LLR_{t-1}</i>	0.0553	-40.4578
	(0.80)	(-1.27)
N	1,341	1,341
R^2	0.053	0.048