THE CONSEQUENCES OF BANK REPORTING FAILURE FOR LIQUIDITY CREATION: EVIDENCE FROM ACCOUNTING RESTATEMENTS

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ABSTRACT

This paper examines the effect of bank accounting restatements on bank liquidity creation. Banks play a central role in creating liquidity in the economy by financing relatively illiquid assets, such as business loans, with relatively liquid liabilities, such as demand deposits. Theory predicts that bank restatements can impede liquidity creation by impairing banks' access to external funding sources, weakening bank-customer relationships, and triggering the unravelling of risk overhangs that banks accumulate when misreporting. I find that bank liquidity creation declines significantly following restatements for small banks, but not for large banks. Moreover, the decline in bank liquidity creation occurs predominantly through changes in banks' holdings of illiquid assets, liquid liabilities and liquid assets. I also find the liquidity creation effects to be more pronounced when a bank restatement identifies severe reporting issues and when confidence in the banking system as a whole is relatively low. Further analyses show that restating banks increase deposit interest rates to retain their deposit base. Overall, the results inform the ongoing discourse on the implications of financial reporting transparency for bank stability and, more broadly, for the allocation of economic resources.

1. INTRODUCTION

Banks play a pivotal role in facilitating resource allocations in the economy. At the heart of banks' resource allocation function is their ability to create liquidity by financing relatively illiquid assets, such as commercial loans, with relatively liquid liabilities, such as demand deposits (Diamond and Dybvig 1983; DeAngelo and Stulz 2015). The drying up of liquidity in the banking system during the recent financial crisis, coupled with the economic importance of bank liquidity creation, has renewed interests among policy makers and academic researchers in exploring forces shaping bank liquidity creation. While existing studies have linked bank liquidity creation to changes in monetary policy (Kashyap and Stein 2000), bank capital strength (Berger and Bouwman 2009), and liquidity risk management by banks (Cornett, McNutt, Strahan, and Tehranian 2011), to date there is limited systematic evidence on the consequences of bank reporting failure for liquidity creation. In this study I investigate whether and how bank accounting restatements affect the amount of liquidity created by banks.

I focus on accounting restatements because restatements serve as an explicit, *ex-post* indicator of financial reporting failure and can cause significant economic consequences for firms (Palmrose, Richardson, and Scholz 2004; Srinivasan 2005; Hennes, Leone, and Miller 2008). Bank restatements can be characterized as an acknowledgement that prior financial statements did not reflect banks' risk exposures and relevant economic conditions in an accurate or unbiased manner, such that the issuance of a restatement diminishes the credibility of bank accounting information.

There are several reasons why accounting restatements can lead to a decline in bank liquidity creation. First, to the extent that restatements diminish the credibility of bank accounting information, the perceived information asymmetry between banks and fund suppliers (e.g., depositors and short-term creditors) regarding banks' true financial condition could increase after a restatement. Such an increase in information asymmetry can impair banks' access to external sources of funds, which, in turn, impedes banks' ability to engage in asset-side activities conducive to liquidity creation. For example, depositors with retirement savings at a restating bank may worry that the bank's underlying solvency risk could adversely affect their own financial well-being, and thus have strong incentives to reallocate savings to

institutions with more reliable financial reporting (Beatty and Liao 2014; Acharya and Mora 2015).[1] Anecdotal evidence is consistent with bank reporting failure influencing depositor behavior. In December 2000, Hamilton Bancorp announced that it would restate its earnings to recognize excessive loan losses from exposure to emerging markets which the bank had failed to recognize previously (Department of the Treasury 2002). The bank's deposit balances, including those that are fully insured, declined by nearly 30% over the year following the restatement (Davenport and McDill 2006).[2] Other short-term creditors may react to bank reporting failure by refusing to roll over maturing debt or demanding higher interest rates upon debt renewal.[3] The heightened funding stress, all else equal, could hamper banks' ability to sustain lending and other liquidity-enhancing activities.

Second, the reputational damage inflicted by a restatement can strain bank-customer relationships, an important source of bank liquidity creation. Existing research shows that a strong customer relationship enables banks to provide various intermediary services to a customer through economies of scale in information production and, for the most part, is based on mutual trust between the bank and the customer (Boot 2000; Osili and Paulson 2014). Revelations of misreporting at the bank can prompt customers to question the trustworthiness of bank management and, consequently, its commitment to customers' interests. Bank clients could fear that if a bank abuses its discretion in accounting practices, then such a bank may have the distorted incentive to take advantage of its own customers by, for example, exploiting the information monopoly gained over the course of lending to extract excessive loans rates from captive

[1] Despite the insurance coverage provided by the Federal Deposit Insurance Corporation (FDIC), a fairly large portion of deposits in the United States are uninsured. According to Acharya and Mora (2015), over 60% of deposits at the onset of the recent financial crisis were uninsured. Withdrawals by even fully insured depositors are possible if depositors worry that the FDIC might temporarily freeze their accounts, or depositors do not want to deal with the uncertainty associated with reclaiming funds (Iyer and Puri 2012; He and Manela 2016). For example. Davenport and McDill (2006) and Brown, Guin, and Morkoetter (2014) provide evidence that fully insured depositors withdraw funds from distressed banks.

[2] Between March 2001 and January 2002, total deposits at Hamilton fell from $1.5 billion to $1.1 billion, or 27%. Notably, while 50% of uninsured deposit balances left Hamilton, 25% of fully insured deposits were also withdrawn over the same period.

[3] Because many alternative non-deposit funding sources such as interbank lending or repurchase agreements (repos) do not receive explicit government protection, the accessibility and the cost of these sources are likely to be even more sensitive to restatement-induced uncertainty over bank insolvency than traditional deposit funds (Gorton and Metrick 2012; Liu 2016).

borrowers (Sharpe 1990; Santos and Winton 2008), or cross-sell unprofitable banking products and services to grow revenues (Fang, Ivashina, and Lerner 2013).[4] To the extent that accounting restatements lead to a loss of trust in the bank and weaken its client relationships, the bank's liquidity creation is likely to fall.

Third, Kedia and Philippon (2009) show that managers of firms with low productivity not only manage earnings but also hire and invest excessively to avoid detection of earnings management. Analogously when a bank misreports, the bank is likely to distort its normal business model by taking on expansionary but overly risky activities (e.g., lending to low-credit-quality borrowers), so that the bank can (appear to) operate in a way that is consistent with the inflated profits. In doing so however, the misreporting bank will accumulate, perhaps unwittingly, substantial overhangs from its risk exposure to problem loans and other 'toxic' securities (Acharya and Ryan 2016). When the bank is forced to restate and hence to wind down its expansionary activities, the risk overhangs from past transactions can catch up to the bank, reducing the additional amount of risk exposure the bank is willing to take on for liquidity creation purpose (Gron and Winton 2001). Based on the above three arguments, I predict bank liquidity creation to decrease following a restatement.[5]

To test my prediction, I identify 235 accounting restatements by bank holding companies from 2000 to 2014, and compare bank liquidity creation before and after the restatement announcement. Following Berger and Bouwman (2009), I develop comprehensive measures of bank liquidity creation that incorporate banks' asset-side, liability-side, and off-balance sheet activities, and analyze bank liquidity creation at both the aggregate bank level and the individual banking activity level. The aggregate measure is the weighted sum of all banking activities, whereby each activity is assigned a weight based on whether

[4] A recent example of the impact of reputational damage on bank-customer relationships is the Wells Fargo's fake account scandal. In September 2016, Wells Fargo was fined $185 million by regulators over assertions that bank employees had opened over two million unauthorized customer accounts to meet cross-selling targets. Customer visits to branches declined 10 percent year-over-year in the month following the scandal. New deposit and checking accounts as well as credit card applications also fell. See the *American Banker*, December 16, 2016 "How Wells Fargo's Aggressive Sales Culture Took Root", and "Wells' Sales Slump Continued in November."

[5] Given the reputational and economic losses associated with restatements, banks are expected to take remedial actions to repair the damaged client relationships (Srinivasan 2005; Chakravarthy, deHaan, and Rajgopal 2014). Provided that banks' corrective actions are successful, reductions in liquidity creation after the restatement might be so short-lived and small in magnitude that even if they occur, they would be hard to detect empirically. If this is the case, it would work against finding results supporting my prediction.

the activity creates, maintains, or destroys liquidity. The basic idea underlying the measure is that liquidity is created (destroyed) when banks use liquid (illiquid) liabilities to finance illiquid (liquid) assets.

I find that for small banks (i.e., banks with gross total assets below $1 billion as of the restatement quarter), liquidity creation declines significantly following restatements. This post-restatement decline in bank liquidity creation occurs predominantly through a decrease in illiquid assets (mostly commercial loans), a decrease in liquid liabilities (e.g., savings deposits), and an increase in liquid assets (e.g., cash) held by the bank. The results are robust to controlling for bank- and time-fixed effects as well as time-varying bank characteristics, and to the use of a difference-in-differences regression design that matches restating banks with non-restating banks. The real effect of restatements on bank liquidity creation is also economically meaningful. Specifically, liquidity creation falls by an average of 9 percent after the restatement, which represents a sizeable $10 million loss of total liquidity created by a small bank. In contrast, for large banks, I find that restatements have no discernable effect on bank liquidity creation. The differential effects of restatements on liquidity creation for small versus large banks are consistent with the notion that small banks suffer from a higher degree of information asymmetry than large banks, and that small banks rely more extensively on relationship-based banking which can be sensitive to changing perceptions of a bank's trustworthiness.[6]

I extend my investigation by analyzing how the relation between bank accounting restatements and liquidity creation varies cross-sectionally and over time. I find that the decline in bank liquidity creation is most evident for severe restatements. Specifically, the effect of a restatement on liquidity creation is magnified when the restatement announcement elicits a more negative stock price reaction, and when the bank misreported for a relatively long period of time. The decline in liquidity creation is also greater for restatements triggered by bank regulators' periodic examinations, and for restatements accompanied by disclosures of material internal control weaknesses. Moreover, I find that the effect of accounting

[6] Another plausible explanation is that small banks can be viewed as less insulated from failure vis-à-vis large banks which are more likely to receive government backstop in the case of financial distress (Gorton and Huang 2006).

restatement on bank liquidity creation is exacerbated during crisis periods, defined as periods of high TED spread and the financial crisis of 2007-2009, suggesting that reporting failure can have disproportionately larger effects on bank stability during episodes of economic and financial stress.

To further shed light on the mechanisms through which restatements influence bank liquidity creation, I perform two additional sets of analyses. First, I find that banks' holdings of savings deposits fall significantly after restatements, consistent with restatements prompting depositors to place their savings with other more reliable institutions. Further analysis shows that in response to the weakening deposit funding position, banks appear to increase interest rates as a means to attract depositors and to raise the funds necessary for liquidity creation. Taken together, these findings suggest that the market discipline exercised by depositors can be a crucial mechanism in penalizing imprudent banks (Peria and Schmukler 2001; Acharya and Mora 2015). Second, I find that the decline in liquidity creation post-restatement is more pronounced when banks relaxed their lending standards to attract low-quality borrowers and aggressively pursued noninterest sources of income during the period of misreporting. This finding lends support for the argument that the liquidity creation impact of restatement stems, at least partly, from the unravelling of risk overhangs that banks accumulated when misreporting.

Lastly, I evaluate an alternative explanation that it could be the bank's deteriorating underlying fundamentals rather than the *restatement* per se that drive the observed declines in liquidity creation. Specifically, I perform a falsification test in which for each bank restatement, I compare liquidity creation during the misreporting period with liquidity creation before the misreporting period. If the bank's deteriorating fundamentals were driving the reported results, then I would expect liquidity creation to start decreasing in the misreporting period relative to the pre-misreporting period, because the misreporting period is arguably the period when bank fundamentals begin to worsen. The falsification test indicates that there is no observable difference in liquidity creation between the misreporting period and the pre-misreporting period, thus providing assurance that restatements, not worsening bank fundamentals, drive the results.

This study makes several contributions to the literature. First, it contributes to the growing literature on the relation between financial reporting transparency and bank stability.[7] Much of this literature focuses on a specific bank accounting choice, such as provisioning for loan losses (Beatty and Liao 2011; Bushman and Williams 2012, 2015), fair value accounting (Laux and Leuz 2010; Badertscher, Burks, and Easton 2012; Xie 2016), and accounting for securitizations (Chen, Liu and Ryan 2008), and examines whether the accounting choice could increase or decrease bank stability. This paper departs from prior literature by studying the liquidity creation impact of bank restatements, which not only cover a broad range of bank accounting issues subject to managerial discretion but also serve as an externally-verified, visible indicator of bank reporting failure (Palmrose et al. 2004; Beatty and Liao 2014). The finding that only liquidity creation at small banks is harmed by restatements can be of particular interest to bank regulators in that it identifies a subset of banks that can be highly vulnerable to reporting failure. By documenting that the effect of bank restatements on liquidity creation is exacerbated during crisis periods, this study underscores the disruptive influence of reporting failure on bank stability especially during episodes of economic and financial stress.

Second, the paper speaks to the literature on the real effects of financial reporting quality (Biddle, Hilary, and Verdi 2009; Balakrishnan, Core, and Verdi 2014). Liquidity creation is fundamental in facilitating resource allocations and propelling real-sector growth. My results indicate that financial reporting failure can have direct consequences for bank liquidity creation, which can potentially induce a spillover effect on real economic activity and growth. I also provide evidence that banks increase deposit interest rates in the face of liquidity constraints induced by restatements. To the best of my knowledge, this study is among the first to directly link bank reporting quality to bank deposit interest rates. In doing so, I answer the call from Beatty and Liao (2014, pg. 340) for more research on how bank accounting information affects bank depositors' information problem.

[7] Acharya and Ryan (2016, pg. 278) defines stability as "the consistent ability for firms with positive net present value projects to obtain financing for those projects across the phases of the business or credit cycle."

Third, the paper extends the literature on the consequences of restatements, which has focused largely on non-financial firms or public firms in general. Existing studies have shown that restatements are associated with negative stock market reactions (Palmrose et al. 2004), increased cost of financing (Graham, Li, and Qiu 2008; Hribar and Jenkins 2004), lower information content of earnings (Wilson 2008; Chen, Cheng, and Lo 2014), and governance overhauls (Srinivasan 2005). This study focuses on restatement in a specific industry and investigates its effect on the unique, economically important service provided by that industry. The results indicate that restatements by banks can have far-reaching distortionary effects on bank liquidity creation.

Next, Section II reviews related literature and develops testable hypotheses. Section III discusses sample selection and research design. Section IV presents descriptive statistics and results testing the hypotheses. Section V reports additional tests. Section VI concludes.

2. RELATED LITERATURE AND PREDICTIONS

Bank Liquidity Creation

Liquidity creation is a central function of banks (Diamond and Dybvig 1983; Holmstrom and Tirole 1998; Diamond and Rajan 2001). Banks create liquidity by holding on behalf of the general public relatively illiquid assets, such as informationally opaque loans that are hard to resell, and converting them into relatively liquid liabilities, such as demand deposits that can be withdrawn by depositors on short notice. In this spirit, a bank serves as a bridge that permits flow of funds from savers to borrowers, thereby facilitating resource allocations in the economy and spurring real-sector growth (Bryant 1980, Diamond and Dybvig 1983). Apart from on-balance sheet liquidity creation, banks also provide liquidity off the balance sheet by extending loan commitments (e.g., lines of credit) and credit guarantees (e.g., letters of credit) so that customers can gain access to funds in the future should unexpected liquidity demands arise (Kashyap, Rajan, and Stein 2002; Gatev, Schuermann, and Strahan 2009). Banks' ability to create liquidity for the economy makes them 'special' compared to non-banking institutions (Fama 1985).

A growing body of literature has examined factors shaping bank liquidity creation. Many studies focus on the transmission of monetary policy on bank lending – lending is a critical, but not the only, aspect of liquidity creation (Bernanke and Blinder 1992; Kashyap and Stein 2000). These studies posit that a tightening of monetary policy can constrain banks' access to insured deposits and thus force banks to tap into the market for uninsured funding sources. If banks are unable to raise sufficient uninsured funds to make up for the loss of insured deposits, then they will be forced to reduce loan supply. Kashyap and Stein (2000) find that lending by banks with less liquid balance sheets and smaller banks is most vulnerable to contractionary monetary shocks. More recently, Berger and Bouwman (2009) link bank capital strength to liquidity creation, and find that bank capital impedes liquidity creation for small banks, but increases liquidity creation for large banks. Jiang, Levin, and Lin (2016) examine the impact of bank competition on liquidity creation, and show that intensification of competition induced by interstate bank deregulations decreases bank liquidity creation. Missing from the literature, however, is systematic evidence on the

interactions between bank financial reporting and liquidity creation. This paper seeks to fill the gap in the literature by investigating the impact of bank accounting restatements on liquidity creation.

Bank Restatements

Accounting restatements are *de facto* admission by management that information in prior financial reports was misleading and, therefore, serve as a visible signal of financial reporting failure (Palmrose and Scholz 2004; Gleason, Jenkins, and Johnson 2008; DeFond and Zhang 2014). Restatements correcting intentional misreporting or egregious accounting malpractices could also shake investors' confidence in managerial competence and integrity, prompting investors to question other aspects of the firm. Prior studies show that restatement announcements elicit a negative stock market reaction, and that such a reaction is more pronounced when the restatement involves more serious misreporting (Anderson and Yohn 2002; Palmrose et al. 2004; Hennes et al. 2008). Relatedly, several recent studies show that the information content of earnings declines after restatements, suggestive of increasing skepticism among investors about the veracity of information conveyed in restatement firms' earnings reports (Wilson 2008; Chen et al. 2014).

Distinct from extant literature which generally uses restatements filed by all public firms, this study focuses exclusively on restatements by banking firms. The restatements in this study cover a broad range of accounting issues including, among others, loan loss provisions, securitization, and fair value accounting, many of which are susceptible to managerial discretion (Bushman and Williams 2012; Chen, Liu, and Ryan 2008; Huizinga and Laeven 2012). Another unique feature of bank restatement is that a nontrivial portion of bank restatements are triggered by bank regulators – the FDIC, the Office of the Comptroller of the Currency (OCC), and the Federal Reserve Bank.[8] Bank regulators conduct periodic "safety and soundness" on-site examinations to evaluate banks' financial health and the accuracy of bank accounting information in portraying banks' financial condition (Federal Reserve Board of Governors 1999; Agarwal, Lucca, Seru, and Trebbi 2014). Restatements uncovered by bank regulators likely send a particularly adverse signal of

[8] Commercial banks in the United States can choose between a national and a state charter. Only federal regulators, in particular, the OCC, supervise nationally chartered banks. State-chartered banks are supervised both by state banking departments and federal regulators, where state regulators and federal regulators alternately examine banks based on a pre-determined rotation schedule (Agarwal et al. 2014).

financial reporting quality relative to other restatements, because they reflect bank regulators' belief that the misreporting, if left uncorrected, can inflict damages on bank stakeholders and ultimately the local economy (Costello, Granja, and Weber 2016). To give the reader a flavor of the scope and severity of bank restatements examined in this study, I provide a brief description of two restatement cases in Appendix A.

Hypotheses Development

Bank restatements can affect liquidity creation in several ways. First, reductions in bank reporting credibility due to restatements exacerbate the perceived information asymmetry between banks and external fund suppliers (such as depositors and short-term creditors). External fund suppliers have imperfect information regarding the bank's true financial condition, and rely mainly on bank-provided accounting information to evaluate the bank's asset quality as well as solvency risk (Holod and Peek 2007; Beatty and Liao 2014). Revelations of misreporting can cause external fund suppliers to be concerned about the true financial condition of the bank and hence the bank's ability to repay the debt, prompting fund suppliers to cut their exposure to the bank. The impaired access to external funding sources will, in turn, impede the bank's ability to engage in liquidity-creating activities such as making business loans.

To illustrate, consider an individual depositor who is choosing between a bank that just restated its financial reports and a non-restating, but otherwise comparable, bank to place her retirement savings. Because the depositor believes that she can be better informed about the non-restating bank's financial condition, and about the safety of her retirement savings, she will rationally choose to entrust her nest egg with the non-restating bank. Similarly, business owners with deposit accounts for payroll and transactional purposes at the restating bank can be concerned about the bank's financial health, given that bank insolvency may disrupt the daily operations of the business. The diminished ability of banks to attract deposits can induce a shortfall in the banks' funding position, thereby reducing lending activities.

While in principle insured deposits should remain intact regardless of the bank's financial condition, in practice insured depositors are sensitive to uncertainty over bank solvency. Anecdotally, in August 2008 uncertainty over Washington Mutual Bank (WaMu)'s solvency escalated due to the earlier demise of Lehman Brothers, leading to a massive withdrawal from the bank by worried depositors. Over

half of the depositors that withdrew money from WaMu were, in fact, fully covered by FDIC Insurance (He and Manela 2016).[9] Other short-term creditors, such as interbank lenders and investors in repurchase agreements, could also be wary of the increased uncertainty regarding banks' financial health as a result of the restatement. These creditors might refuse to roll over maturing debt or demand higher interest rates to compensate for bearing the heightened risk. To the extent that banks encounter additional frictions in accessing external funds following a restatement, liquidity creation will decrease.

Second, the loss of reputation triggered by a restatement can erode the bank's ability to build relationships with customers. Relationship banking is an important source of bank liquidity creation since it enables the bank to secure both current and future businesses with a client due to informational economies of scale resulting from the bank's repeated interactions with the client (Diamond 1984; Drucker and Puri 2005). The establishment of a bank-customer relationship depends, to a large extent, on mutual trust between the bank and the customer (Boot 2000; Dinc 2000): when customers mistrust a bank, they decrease interactions with and demand fewer services from that bank. This view builds on existing literature that emphasizes the importance of trust for financial decisions in general (Guiso, Sapienza, and Zingales 2008; Bottazzi, Da Rin, and Hellmann 2016), and is consistent with recent empirical evidence that individuals with lower levels of trust or faith in financial institutions are less likely to use banks (Osili and Paulson 2014).

While bank relationships have potential benefits for clients in terms of reducing information problems (Petersen and Rajan 1994), empirical evidence suggests that banks may take advantage of the close ties to their customers by engaging in activities that benefit themselves at the expense of customers. For example, a group of studies have provided evidence that banks exploit their information monopoly power generated from lending activities to charge borrowers excessive interest rates for loans (Rajan 1992;

[9] Brown et al. (2014) analyze deposit withdrawals by retail customers in Switzerland during the recent financial crisis and find that households reallocated their deposits from distressed banks to non-distressed banks. Moreover, the withdrawal of deposits from distressed banks occurred in spite of deposit insurance coverage. Insured depositors would leave their banks if they worry the deposit insurer might temporarily freeze their accounts (Peria and Schmukler 2001; He and Manela 2016), or as one depositor in the WaMu case explained, they "just don't want to deal with it."

Houston and James 1996; Santos and Winton 2008).[10] Additionally, banks have incentives to cross-sell unprofitable products and services to customers to capture additional revenues (Fang et al. 2013; Tayan 2016). To the extent that accounting restatements raise questions over the trustworthiness of bank management, customers' perceived likelihood of being mistreated by the bank will increase, and in a competitive banking market, customers lacking trust in the bank are likely to switch to other more credible institutions. This weakening in bank-customer relationships, in turn, harms the bank's liquidity creation.

Third, restatements can result in the unravelling of risk overhangs that banks accumulated when misreporting. Kedia and Philippon (2009) argue that when firm managers try to conceal true productivity from outsiders, they not only manage earnings but also engage in distortionary real activities that yield outputs that are consistent with the inflated earnings. Building on a similar intuition, I posit that when a bank manager observes poor productivity (e.g., declines in lending volume), he could attempt to hide it from investors by misreporting the bank's accounting information. Simultaneously to prevent the detection of misreporting, the bank manager is likely to expand aggressively the normal line of banking business by engaging in excessively risky transactions. Banks can seek out low-credit-quality borrowers to boost lending volume, or invest in "toxic" assets such as asset-backed securities and collateralized debt obligations to gamble for higher returns.

An unintended consequence of these risky transactions is that the bank can accumulate a great deal of risk overhangs (Acharya and Ryan 2016). The bank probably will not be affected by the overhangs as long as it can keep misreporting and revving up real activities. But, when the bank is caught and forced to restate, the bank loses its ability to continue to distort real activities and thus will be stuck with the overhangs from past risk exposure. To the extent that risks from past transactions cannot be easily diversified or hedged, overhangs from past transactions increase existing risk exposure and, thus, constrain

[10] Borrowers might also fear that the bank could sell or securitize information-intensive, relationship-based loans to outsiders. While loan sales or securitizations benefit the bank by insulating the bank from the borrower's financial condition and reducing monitoring costs (Keys, Seru, and Vig 2012), loan sales could harm the borrower because 1) loans are sold typically piecewise to multiple lenders, making it difficult for the borrower to renegotiate loan contract terms due to coordination problems among outside lenders, and 2) loan sales convey to the market that the selling bank possesses some private, negative information about the borrower (Guner 2006).

the bank's ability to take on additional risks for liquidity creation (Gron and Winton 2001). For example, following restatement a bank can be stuck with large quantities of inferior-quality loans that it issued during the period of misreporting and be forced to cut back on new loan supply, which leads to a reduction in liquidity creation after restatement.

The above discussion leads to the following hypothesis (stated in the alternative form):

H1: Bank liquidity creation declines following bank restatements, *ceteris paribus*.

Bank restatements could affect liquidity creation differently for small and large banks for several reasons. First, relative to small banks, large banks suffer from less acute information asymmetry problems, and hence accounting restatements are less likely to shake external fund suppliers' confidence in the solvency of large banks (Kashyap and Stein 2000; Lo 2015). Kashyap and Stein (2000), for example, find that the adverse effects of contractionary monetary policies on lending activities arise mainly among small banks because these banks encounter greater frictions in raising uninsured finance due to information problems. Second, it is widely recognized that small banks specialize in relationship-based lending to local borrowers while large banks engage in more transaction lending that is less information intensive (Stein 2002). Thus, the adverse impact of restatements on relationship banking can be particularly detrimental to small banks' liquidity creation. Third, market participants likely view large banks as almost immune to failure as these banks have large financial resources to absorb liquidity shocks and, even in the case of financial distress, may benefit from the government backstop due to their systemic importance (Gorton and Huang 2006). Therefore, the impact of accounting restatements on liquidity creation is expected to be greater for small banks than for large banks, which leads to the following hypothesis (stated in the alternative form):

H2: The effect of restatements on bank liquidity creation is more pronounced for small banks than for large banks, *ceteris paribus*.

3. RESEARCH DESIGN AND SAMPLE

Liquidity Creation Measure

Despite the essential role of banks in providing liquidity and the vast theoretical literature on financial intermediation, empirical measures of bank liquidity creation have been sparse. Berger and Bouwman (2009) are among the first in the literature to develop comprehensive measures of bank liquidity creation by incorporating a broad range of bank asset-side, liability-side, equity-side, and off-balance sheet activities. The basic intuition of their measures is that liquidity is created when banks obtain illiquid items from the nonbank public and give the public liquid items, and conversely, liquidity is destroyed when banks take liquid items from the nonbank public and give the public illiquid items. Berger and Bouwman (2009) find that US banks create substantial amounts of liquidity – the banking industry creates on average over $4 of liquidity per $1 of equity capital.

I take the exact same three-step procedure adopted in Berger and Bouwman (2009) to construct measures of bank liquidity creation, the only departure being that I calculate liquidity creation at the aggregate bank holding company level while Berger and Bouwman measure liquidity at the commercial bank level. This distinction is relevant here for two reasons. First, restatements are issued at the holding company, not the commercial banking subsidiary, level. And second, it is commonly believed that bank holding companies have an active internal capital market such that if one banking subsidiary becomes liquidity constrained, the parent bank holding company can allocate resources from other affiliated banking subsidiaries to replenish liquidity at that subsidiary (Houston, James, and Marcus 1997; Campello 2002; Cetorelli and Goldberg 2012).

In step 1, I classify all bank activities – assets, liabilities, equity, and off-balance sheet activities – as liquid, semi-liquid, or illiquid following Berger and Bouwman's (2009) classification scheme. Assets are classified based on the difficulty and cost for banks to dispose of (or liquidate) obligations to obtain liquid funds to meet customers' demand. For example, commercial real estate loans and business loans are illiquid from a bank's standpoint because they cannot be easily securitized or sold without incurring a major loss (Diamond and Rajan 2001; Garmaise and Moskowitz 2004). Trading assets sit at the other end of the

liquidity spectrum in that these assets can be quickly converted into cash to cover a bank's liquidity needs. Residential mortgage can be securitized or sold more easily relative to business loans but are less liquid than trading assets, so residential mortgages are viewed as semi-liquid.

Similarly, liabilities are classified based on the difficulty and cost for creditors to obtain liquid funds from the bank. For example, transaction deposits and savings deposits are liquid liabilities because they can be withdrawn on a moment's notice without inflicting any penalties on the depositors. Equity is illiquid to a bank because equity providers generally cannot demand funds at will from the bank and equity tends to be long term in nature. Off-balance sheet activities are categorized in accordance with their functionally similar on-balance sheet activities. For instance, undrawn loan commitments are illiquid to the bank because they perform essentially the same function as on-balance sheet loans. Appendix B details how Berger and Bouwman (2009) define each on- and off-balance sheet item as liquid, semi-liquid, and illiquid.

In step 2, all bank activities are assigned a weight based on the classification in step 1. Specifically, a weight of 1/2 is assigned to all *liquidity-increasing* activities – illiquid assets, liquid liabilities, and illiquid off-balance sheet activities. A weight of -1/2 is assigned to all *liquidity-decreasing* activities – liquid assets, illiquid liabilities, equity, and liquid off-balance sheet activities. An intermediate weight of 0 is applied to semi-liquid assets, liabilities, and off-balance sheet activities that arguably do not change liquidity creation.[11] In step 3, I combine the activities as classified in Step 1 and as weighted in Step 2 to construct two liquidity creation measures, *LIQUIDCRE*, and *LIQUIDCRE_OB*. The difference between the two measures is that while *LIQUIDCRE* includes both on- and off-balance sheet activities, *LIQUIDCRE_OB* only takes into account on-balance sheet activities. Both liquidity creation measures are scaled by the gross total assets (*GTA*) of the bank, defined as total assets plus the allowance for loan and lease losses and the

[11] As stressed by Berger and Bouwman (2009), the weight choice is based on dollar-for-dollar adding-up constraints such that only $1 of liquidity will be created when banks convert $1 of illiquid items into $1 of liquid items, and analogously only $1 of liquidity is destroyed when banks convert $1 of liquid items into $1 illiquid items. For robustness, I also use alternative weights to measure liquidity creation and obtain similar inferences.

allocated transfer risk reserve (Berger and Bouwman 2009). Using these two measures jointly allows me to assess the effects of restatement on liquidity created both on- and off-bank balance sheet.

Research Design

To test my hypotheses, I conduct a within-sample analysis in which for each bank restatement, I compare bank liquidity creation in the eight quarters after the restatement (quarter 0 to quarter 7) relative to the eight quarters before the restatement (quarter -8 to quarter -1). The choice of the 16-quarter event window is based on prior research which finds that remedial actions taken by restatement firms do not fully restore investors' confidence until, on average, two to three years after the restatement (Srinivasan 2005; Cheng and Farber 2008). Focusing exclusively on restating banks alleviates the concern that banks' decision to misreport – and hence the issuance of a restatement – is not random and some underlying bank characteristics could determine both the incidence of a bank restatement and the ability of the bank to create liquidity. To further isolate the effects of restatements on bank liquidity creation from the effects of other confounding factors, I include bank fixed effects and year-quarter fixed effects in the regression analyses. Bank fixed effects control for unobserved sources of bank heterogeneity and solve problems in which unobserved time-invariant bank characteristics simultaneously determine both bank liquidity creation and bank restatement. Year-quarter fixed effects sweep out time trends or macroeconomic-related fluctuations in bank liquidity creation. Standard errors are clustered at the bank level to account for potential serial correlations within a bank. As robustness, I conduct a difference-in-differences test in which I match each restating bank to a non-restating bank according to bank gross total assets and equity capital, and results are inferentially the same as the within-sample analysis.

To test H1, I estimate the following multivariate regression model:

$$LIQUIDCRE\ (LIQUIDCRE\_OB) = \alpha + \beta_1\ POST + \beta_2\ \text{Bank characteristics} + \text{Bank fixed effects} + \text{Year-quarter fixed effects} + \varepsilon \quad (1)$$

The dependent variables are the two liquidity creation measures, *LIQUIDCRE* and *LIQUICRE_OB,* for each bank quarter. The test variable *POST* is an indicator variable equal to one for the eight quarters following the restatement (including the restatement quarter), and zero for the eight quarters preceding the

restatement. A negative and significant coefficient of β_1 implies that bank liquidity creation decreases following restatement.

To test H2, I estimate equation (1) separately for small and large banks and assess whether accounting restatements affect liquidity creation differently for the two subsets of banks. I segregate banks into small and large banks based on bank gross total assets (*GTA*) at the time of the restatement: small banks are those with *GTA* below $1 billion, and large banks are those with *GTA* above $1 billion (measured in real 2014 dollars). The size cutoff at $1 billion follows Federal Deposit Insurance and Federal Reserve guidelines, and is consistent with the approach in many prior studies (e.g., Cornett et al. 2011).

Control Variables

Along with the test variable, I control for a broad set of time-varying bank characteristics that might affect bank liquidity creation. I include a bank's tier1 capital ratio (*TIER1CAP*) to account for the effects of bank capital strength on liquidity creation. To the extent that bank capital absorbs risks and that liquidity creation entails risk taking, a higher capital ratio allows banks to create more liquidity (Bhattacharya and Thakor 1993; Coval and Thakor 2005). Alternatively, bank capital can impede liquidity creation by crowding out bank's deposit funding (Diamond and Rajan 2000; Gorton and Winton 2014). I control for bank size (*SIZE*), which is measured as the logarithm of a bank's gross total assets (*GTA*). While bank asset size likely relates to liquidity creation, it can proxy for many other sources of heterogeneity and thus I refrain from interpreting its effect. I further include bank's return on assets (*ROA*) to control for the effects of bank financial performance on liquidity creation.

NPL is the fraction of non-performing loans in a bank's loan portfolio. Deterioration in the quality of a bank's loan portfolio could directly undermine the bank's ability to engage in new lending activity. I also include provision for loan losses (*LLP*) because it is a key accounting mechanism through which bank managers can manipulate earnings (Liu and Ryan 1995; Beatty and Liao 2011, 2014; Bushman and Williams 2012), and because delayed recognition of loan losses in current provisions build up risk overhangs that could impede the bank's ability to create liquidity during economic bad times (Acharya and Ryan 2016). *CHARGEOFF* refers to write-off of loans deemed uncollectible by the bank, which reflects

banks' historical loan loss experience (Beck and Narayanamoorthy 2013). I include *CHARGEOFF* together with *LLP* because prior research has shown that bank managers use the two items jointly to smooth earnings which, in turn, could affect bank's liquidity creation (Liu and Ryan 2006).

I include bank *ZSCORE* to capture the bank's distance to default. Following the banking literature, I measure *ZSCORE* as the natural logarithm of return on assets plus the capital asset ratio divided by the standard deviation of asset returns (e.g., Laeven and Levine 2009), so that a higher value of *ZSCORE* indicates healthier financial condition. To control for the effects of deposit maturity structure and bank leverage on bank liquidity creation, I include the ratio of large time deposits maturing in less than a year to total large time deposits (*LARGETIMEDEP*) and the ratio of total debt to *GTA* (*LEV*). Finally, I control for concentration of the bank's loan portfolio (*LOANHHI*), since banks with concentrated loan portfolios are less able to diversify and withstand risks associated with deterioration in loan quality. Appendix C provides detailed definitions for all variables used in the regression analyses in the paper.

Sample Selection

To compile my sample, I start by collecting bank holding company accounting information from the Federal Reserve Y-9C reports. The Y-9C reports are filed quarterly by all bank holding companies – both publicly listed and private banks – with total consolidated assets of at least $500 million. Apart from information on the balance sheet and income statement, the FR Y-9C reports provide a detailed breakdown of loan portfolios, deposit holdings, and regulatory risk capital, as well as a broad range of off-balance sheet activities (e.g., loan commitments, letters of credit). I exclude banks that have missing information on deposits, have zero or negative equity capital, or have no commercial real estate or business loans outstanding. This step is intended to filter out banks that are not qualified as commercial banks which are the primary liquidity providers to the economy. Definitions of variables in the FR Y-9C reports can change over time, so I carefully reference the Micro Data Reference Manual provided by Federal Reserve Board when constructing variables to ensure time-series consistency.

The restatement data come from the Non-Reliance Restatements dataset of Audit Analytics. To identify bank restatements, I keep restatements by depository institutions (2-digit SIC code of 60) because

these banks perform the traditional function of creating liquidity by taking liquid deposits from savers and extending illiquid loans to borrowers (Diamond and Dybvig 1983). The initial sample of bank restatements consists of 579 individual restatements from 2000 to 2014. I then manually match restatement banks in the Audit Analytics to banks in the Y-9C database using bank names. This process leaves me with 391 bank restatements. For banks that have issued multiple restatements during the sample period, I require the announcement date of each restatement to be at least 16 quarters apart so that no restatement event windows overlap with each other, therefore mitigating the potentially confounding effects of past restatements.[12] In the case where two adjacent restatements occur within 16 quarters, I keep only the first restatement. After excluding banks without the financial information for the control variables in the main regressions, I am left with a final sample of 3,343 bank-quarter observations associated with 235 bank restatements from 2000 to 2014.

To identify restatement characteristics, I read the SEC filings that announced the restatements (e.g., 8-Ks, 10-Qs, and 10-Ks) and hand-collected information including the restated accounting item(s), the party that triggers the restatement (e.g., bank regulators, audit committees, management), the length of misreporting period, and whether the restatement announcement is accompanied by disclosures of internal control weaknesses. To calculate market reactions to restatement announcements, I obtain stock price data from CRSP and use the PERMNO-RSSD file provided by the Federal Reserve to merge CRSP data with restatement banks in my sample.

Table 1 presents summary information on the 235 bank restatements in my final sample. Panel A reports the party that triggers the restatement. Over half of the restatements are prompted by management, and 13.6 percent of the restatements are initiated by board of directors including the audit committee and the disclosure committee. Restatements due to investigations by bank regulators – the FDIC, the Federal Reserve Bank, or the OCC – account for roughly 13 percent of the sample restatements. Around 7 percent

[12] Results are robust to including only first-time restatements.

of restatements are attributed to the SEC which mainly identifies bank misstatements through comment letter communications with the bank.

Panel B provides a breakout of the restated accounting items. Banks restate their financials for a variety of reasons. Issues involving improper accounting for loan impairments (e.g., loan loss provisioning, allowance for loan losses) account for about 20 percent of the restatement cases. Loans are by far the largest asset category on a bank's balance sheet, and numerous studies have shown that loan loss provisioning is a key accounting mechanism through which bank managers manipulate earnings (e.g., Beatty and Liao 2011). Restatements related to compensation and employee benefits-related issues account for 9 percent of the cases. About 8 percent of restatements relate to improper accounting for tax expense, most notably valuation allowance for deferred tax assets & liabilities, echoing prior evidence that bank managers use the valuation allowance as a potential earnings and capital management tool (Schrand and Wong 2003). About 7 percent and 5 percent of the restatements are due to improper derivative accounting (e.g., SFAS 133) and fair value accounting (e.g. SFAS 157) respectively, consistent with the widespread concern that firms in general, and banks in particular, exercise significant discretion in the interpretation and application of these two accounting areas (Chang, Donohoe, and Sougiannis 2015; Laux and Leuz 2010). About 3 percent of the restatements are frauds committed by management or employees.

Panel C shows that 30 percent of the restatements are accompanied by disclosures of material internal control weaknesses (ICW). While the occurrence of a restatement, in principle, is due to potential deficiencies in a firm's internal control environment, in practice not all restatements result in ICW disclosures. All else equal, restatements coupled with ICW disclosures likely will send a more negative signal on bank's reporting quality than the restatements alone. ICW disclosures heighten market participants' concern that the restatement is the outcome of structural deficiencies in the bank's entire information production system. Panel D reports the distribution of the bank restatements over the sample period. Restatements are fairly evenly distributed over the sample, with 2006 witnessing the highest number of bank restatements at 23.

4. DESCRIPTIVE STATISTICS AND EMPIRICAL RESULTS

Descriptive Statistics

Table 2, Panel A presents descriptive statistics of the variables used in the regression analyses. The mean (median) value of *LIQUIDCRE* is 0.223 (0.229), indicating that the mean (median) amount of liquidity created from a bank's on- and off-balance sheet activities combined amounts to 22.3 percent (22.9 percent) of the bank's gross total assets (*GTA*). In other words, a bank creates on average about 22.3 cents of liquidity for every dollar in *GTA*. The mean (median) value of *LIQUIDCRE_OB* is 0.140 (0.150), indicating that the mean (median) liquidity created from a bank's on-balance sheet activities alone equals 14 percent (15 percent) of *GTA*. A comparison of *LIQUIDCRE* and *LIQUIDCRE_OB* indicates that while on-balance sheet activities are the main contributor to bank's overall liquidity creation, a nontrivial portion of liquidity is created from a bank's off-balance sheet activities such as loan commitments.

Panel A also reports descriptive statistics for individual components of the liquidity creation measures – assets, liabilities, equity, and off-balance sheet items classified into liquid, semi-liquid, and illiquid groups. Illiquid assets constitute about one fifth (mean *ILLIQUID_ASSETS* is 0.209) of a bank's *GTA*, and liquid liabilities equals about 45 percent of *GTA* (mean *LIQUID_LIABILITY* is 0.445), confirming the pivotal roles that banks play in issuing liquid debt claims to creditors while at the same time holding illiquid assets. Banks' holdings of illiquid liabilities are relatively small, representing about 11 percent of *GTA*. Illiquid guarantees, including off-balance sheet loan commitments and letters of credit, equal 18 percent of *GTA*.

With respect to bank characteristics, several findings are noteworthy. The average *TIER1CAP* of the restating banks in my sample is 0.124, well above the regulatory minimum.[13] The mean (median) *ROA* is 0.003 (0.004), indicating that sample banks are profitable on average. Non-performing loans make up 2.6 percent of the bank's total loans, while the means of *NPL* and C*HARGEOFF* are 0.005 and 0.006,

[13] Existing literature offers several explanations for why banks hold capitals in excess of the regulatory minimum; banks hold high levels of capital to share risk with depositors (Gale 2003), buffer against shocks to asset values (Diamond and Rajan 2000), commit to greater monitoring of loans (Allen, Carletti and Marquez 2011), and ensure that regulatory constraints are not violated (Bolton and Freixas 2006).

respectively. About 73 percent of a bank's large time deposits has a maturity of less than a year, and, consistent with the well-accepted notion that banks have highly leveraged capital structures (DeAngelo and Stulz 2015), the sample banks have an average leverage ratio of 0.897.

Table 2 Panel B presents the univariate comparisons of bank liquidity creation before and after the restatement. While the mean (median) *LIQUIDCRE* is 0.228 (0.231) in the pre-restatement period, the mean (median) *LIQUIDCRE* is 0.217 (0.228) in the post-restatement period. Both the mean and median differences are statistically significant, indicating that bank liquidity creation in aggregate decreases after restatement. Results for liquidity creation from on-balance sheet activities convey a similar message. While the mean *LIQUIDCRE_OB* is 0.145 in the pre-restatement period, the mean *LIQUIDCRE_OB* in the post-restatement period is significantly lower at 0.134. I further assess the changes in the individual components of liquidity creation around restatement. The mean *ILLIQUID_ASSET* decreases significantly from pre-restatement (mean = 0.212) to post-restatement (mean = 0.206), which implies that banks' ability to issue illiquid assets, most notably business loans, declines after the restatement. Meanwhile, the mean *LIQUID_ASSET* increases significantly from pre-restatement (mean = 0.256) to post-restatement (mean = 0.273), potentially as a result of banks hoarding liquid assets, such as cash, in the face of funding constraints induced by restatements. I examine the effects of accounting restatements on these individual components of liquidity creation more closely in a subsequent multivariate regression analysis.

Results of Testing Hypotheses 1 and 2

Table 3 reports estimates of equation (1). I begin the analysis by using the aggregate liquidity creation measure, *LIQUIDCRE*, as the dependent variable in column (1), (2), and (3). Column (1) presents the results for the full sample of restatement banks. The coefficient on the variable of interest *POST* is negative but statistically insignificant (coefficient = -0.004, p-value = 0.513), which suggests that, on average, bank restatements do not have an adverse impact on banks' ability to create liquidity. Column (2) and (3) report the results for small and large banks, respectively. In Column (2), the coefficient on *POST* is negative and significant (coefficient = -0.02, p-value = 0.003), suggesting that restatements trigger a reduction in small banks' liquidity creation. In contrast, restatements do not have discernable effects on

liquidity created by large banks, as reflected in the negative but insignificant coefficient on *POST* (coefficient = -0.001, p-value = 0.889) in Column (3). An F-test (untabulated) of the statistical difference in the coefficient estimate across the two subsamples yields a p-value less than 0.01, confirming that the effect of restatements on liquidity creation is more pronounced for small banks than for large banks.

I then replace *LIQUIDCRE* with *LIQUICRE_OB* as the dependent variable, and present the results in Column (4), (5), and (6). The results are largely similar. While restatement does not affect large banks' liquidity creation, it has a significant adverse effect on small banks' liquidity creation.[14] Note that for small banks, the coefficient on *POST* when *LIQUIDCRE* is the dependent variable is almost identical to that when *LIQUIDCRE_OB* is the dependent variable, suggesting that the reduction in liquidity creation following restatement arises almost entirely from contractions in small banks' on-balance sheet activities.[15]

The effect of restatements on bank liquidity creation is economically meaningful. To interpret the economic magnitude of the decline in liquidity creation following restatement, I focus on the regression results in Column (2) and (5) for small banks, because these are the banks that are most adversely affected by restatements. Given that the sample mean of *LIQUIDCRE* (*LIQUIDCRE_OB*) is 0.223 (0.140), the coefficient of -0.02 on *POST* translates into a 9 percent (14 percent) drop in overall liquidity creation (on-balance sheet liquidity creation) following a bank restatement. In dollar terms, the average *GTA* for small banks in my sample is $575,579,000, so the coefficient of - 0.02 on *POST* implies that, holding everything else constant, a restating bank experiences a $10 (575,579,000 * 0.02) million decline in liquidity creation after the restatement.

Turning to bank-level controls, I find that bank capital level is negatively correlated with liquidity creation. The negative effects of bank capital on liquidity creation are consistent with arguments put forth

[14] An F-test (untabulated) of the statistical difference in the coefficient on *POST* between the small and large bank subsamples yields a p-value less than 0.01.

[15] Supplemental tests (untabulated) show that the contraction in small banks' liquidity creation following restatement is mitigated for banks in healthier financial condition, defined as banks with higher tier1 capital ratio and higher franchise value. In contrast, even large banks with relatively weaker financial condition do not experience significant contractions in liquidity creation following restatements. Franchise value is defined as the sum of the market value of equity and the book value of liabilities, scaled by the difference between the book value of assets and goodwill.

by recent studies that higher capital levels crowd out bank deposits and impede bank's ability to produce liquid financial claims (Gorton and Winton 2014; DeAngelo and Stulz 2015). Bank size in general is not significantly associated with overall liquidity creation, but is negatively associated with on-balance sheet liquidity creation for small banks. Liquidity creation is also negatively associated with banks' nonperforming loans and loan charge-offs. This relation is to be expected because deterioration in loan quality reduces banks' lending capacity and, naturally, decreases bank's liquidity creation. Collectively, the results suggest that bank liquidity creation decreases significantly following restatement for small banks, but not for large banks. Moreover, the decline in liquidity creation following restatement occurs predominantly through changes in banks' on-balance sheet activities.

Figure 1 provides graphical evidence on the change in bank liquidity creation around restatements. Panel A presents the graphs for *LIQUICRE*. As shown, liquidity creation at small banks remains relatively flat over the eight quarters before the restatement, drops sharply in the restatement quarter (i.e., quarter 0) and troughs by the end of the second quarter following restatement (i.e., quarter 2). Liquidity creation appears to bounce back gradually starting from quarter 3, presumably due to corrective actions taken by the banks, but never quite recovers to the level of liquidity creation before the restatement. In contrast, liquidity creation at large banks exhibits a declining trend leading up to the restatement, but remains relatively steady in the periods after the restatement. Panel B presents the graphs for *LIQUIDCRE_OB*. Again for small banks, there is a marked drop in liquidity creation at the restatement quarter, and the plummet in liquidity creation persists until the end of quarter 3, after which there appears to be a modest and transitory rebound in liquidity creation. *LIQUIDCRE_OB* remains visibly lower throughout the post-restatement period than the pre-restatement period.

Results of Using Disaggregated Components of Liquidity Creation

In this section, I take a closer look at how restatement affects individual components of bank liquidity creation by re-estimating equation (1) with individual components of the liquidity creation measures as the new dependent variables.

Table 4 Panel A reports the results for small banks. The dependent variables in Column (1) and (2) are the two liquidity-enhancing components from on-balance sheet activities, illiquid assets (*ILLIQUID_AT)* and liquid liabilities (*LIQUID_LIAB)*. The coefficients on *POST* are negative and significant in both regressions (Coefficient = -0.008, p-value = 0.006; Coefficient = -0.023, p-value = 0.014), suggesting that small banks' holdings of illiquid assets and liquid liabilities decrease following restatement. Given that illiquid assets consist mainly of business loans, the results unveil the negative lending implications of bank restatements.[16] Column (3) and (4) use *LIQUID_AT* and *ILLIQUID_LIAB*, the two liquidity-destroying components from on-balance sheet activities, as the dependent variables. In Column (3), the coefficient on *POST* is positive and significant (Coefficient = 0.008, p-value = 0.087), implying that banks hold more liquid assets following bank restatements, presumably to buffer the adverse liquidity impact of restatements. Interestingly, restating banks do not experience any increase in illiquid liabilities, as reflected by the insignificant coefficient on *POST* in Column (4). Column (5) and (6) report the results for *ILLIQUID_GA* and *LIQUID_GA*, respectively. In line with the earlier finding that contractions in liquidity creation following bank restatements occur mainly through on-balance sheet activities, I find no evidence that restatement has a significant impact on the two individual off-balance sheet components of liquidity creation.[17]

Results of Cross-sectional and Time-series Tests

In this section, I examine whether and how the decline in bank liquidity creation following restatements varies cross-sectionally with the characteristics of bank restatements. I also investigate whether there is a time-series variation in the liquidity creation impact of restatements, specifically, whether restatements affect liquidity creation differentially during economic bad times versus normal times.

[16] Commercial real estate loans (CRE) and commercial and industrial loans (C&I) collectively comprise over 50 percent of the total illiquid assets held by the sample banks.

[17] Panel B reports the results for large banks. The results show that large banks experience an increase in both liquid liabilities and liquid assets following restatement.

The Effect of Severity of Restatements

Not all restatements are the same. Some restatements identify more serious reporting failure than others. To the extent that market participants impose harsher penalties on restatements related to more serious reporting issues (Palmrose et al. 2004; Hennes et al. 2008), the decline in liquidity creation is expected to be more pronounced in the case of more severe restatements.

To test this conjecture, I employ several measures to capture the severity of restatements. It is well documented in the literature that more severe restatements elicit a larger stock price decline at the restatement announcement date (Palmrose et al. 2004; Hennes et al. 2008), As such, my first proxy is the stock price reaction to restatement announcements. *CAR_RESTATE* is the quartile rank of the 2-day cumulative abnormal returns (adjusted for CRSP value-weighted market return) to restatement announcements (day 0 and day 1) multiplied by negative one, so that higher values of *CAR_RESTATE* indicate more serious restatements. The average 2-day cumulative abnormal returns are -2.9 percent for small restating banks, and -1.7 percent for large restating banks. One drawback of using stock price reaction to restatement announcement, however, is that it can be a noisy measure if 1) the market anticipated the restatement announcement through other channels such as corporate disclosures, and 2) concurrent corporate events are affecting the market response. To address this possibility, I rely on three additional non-market-based variables to capture the severity of restatements.

Restatements coupled with disclosures of material internal control weaknesses (ICW) raise concerns that the restatements could be caused by pervasive, structural deficiencies in the banks' information production and internal control system (Altamuro and Beatty 2010). Such deficiencies could be difficult and costly to remediate especially in the short-run, which can hamper banks' ability to create liquidity. It follows then that restatements accompanied by ICW disclosures should have a more adverse effect on liquidity creation. To test this prediction, I create an indicator variable *ICW* equal to one if the restatement banks also disclose ICW, and zero otherwise. I also expect the impact of restatements on liquidity creation to be stronger when banks misreported for a relatively long period. The intuition is that market participants will have lower confidence in the bank's reporting integrity, and consequently the true

financial standing of the bank, the longer the bank's accounting information was compromised. The variable *PERSISTENCE* is thus defined as the number of fiscal quarters for which financial reports need to be restated.

Finally, restatements triggered by bank regulators likely send a particularly negative signal about the reporting quality of the bank. Prior research suggests that regulatory oversight plays a key role in enforcing bank reporting quality and detecting material accounting errors that could trigger bank fragility (Costello et al. 2016; Nicoletti 2016). As such, I expect the decline in liquidity creation to be greater for restatements prompted by bank regulators. I create an indicator variable *REGULATOR* that takes the value of one if the restatement results from examinations by bank regulators including the FDIC, the Federal Reserve, and the OCC, and zero otherwise. In conducting the above cross-sectional analyses, I re-estimate equation (1) by adding, one at a time, the interaction between the variables of restatement characteristics and the test variable *POST*.

Table 5 presents the results, where Column (1) – (4) use *LIQUIDCRE* as the dependent variable and Column (5) – (8) use *LIQUIDCRE_OB* as the dependent variable. Panel A reports the results for small banks, and Panel B for large banks. Results indicate that the decline in liquidity creation after restatement is more acute for more severe restatements. In Panel A, the coefficients on *POST*CAR_RESTATE* and *POST*PERSISTENCE* are negative and significant for both dependent variables. This suggests that restatements have an even stronger adverse effect on liquidity creation when restatement announcements elicit large stock price declines and when misreporting persisted for a long period of time. The coefficients on *POST*ICW* and *POST*REGULATOR* are also negative and significant, but only when *LIQUIDCRE_OB* is the dependent variable, suggesting that the decline in (on-balance sheet) liquidity creation is greater when restatement firms also disclose ICW and when the restatements result from bank regulators' examinations.[18] Not surprisingly, none of the interaction terms and the standalone *POST* variable loads significant in

[18] In an alternative test, I include restatements initiated by other regulators including the SEC (15 restatements in the sample are initiated by the SEC) and the IRS (one restatement in the sample is prompted by the IRS) in the definition of *REGULATOR*, and find inferentially similar results.

regressions for large banks, as shown in Panel B. Taken together, the cross-sectional analyses provide additional evidence on the causal link between bank restatements and liquidity creation by showing that the negative effects of restatements on liquidity creation are greatest precisely when restatements are expected to matter the most.

The Differential Effects of Crisis Periods

During market downturns, confidence in the solvency of the banking sector as a whole can be relatively low. Acharya and Mora (2015) find that until the government interventions in the fall of 2008, the banking system in aggregate experienced substantial deposit funding pressure as worried depositors shifted their funds to other institutions with more explicit government guarantees. A warning signal about a bank's reporting quality during episodes of market stress is likely to aggravate uncertainty about the bank's financial condition and, therefore, have disproportionately larger effects on bank liquidity creation. Further, risk overhangs from exposure to troubled assets can inhibit banks' liquidity creation to an even larger extent during market downturns due to depressed asset prices. Therefore, I predict that the effect of restatements on liquidity creation is more profound in crisis periods than in normal times.

I use two measures to capture macroeconomic conditions. The TED Spread is the quarterly average of the daily spread between the three-month London Inter Bank Offered Rate (LIBOR) and the three-month US Treasury rate, and fluctuates with changes in macroeconomic conditions. It reflects the risk of default on interbank loans such that a widening in TED spread indicates that lenders believe the risk of default (counterparty risk) on interbank loans – and thus the insolvency risk of the banking system in general – is increasing (Gorton and Metrick 2012).[19] In addition to TED spread, I create an indicator variable, *CRISIS*, to proxy for the recent financial crisis. *CRISIS* is equal to one from 2007Q3 through 2009Q2. I re-estimate equation (1) by adding the interactions between *POST* and *TEDSPREAD* or *CRISIS*.

[19] For instance, the TED spread rose dramatically in 2008 when investors became alert about the worsening condition of banks' vast holdings of mortgage-backed securities, peaked at the collapse of Lehman Brothers and AIG bailout, and subsided only when the government stepped in and provided (partial) support to the banking system.

Table 6, Panel A presents the results for small banks. Neither of the two interaction terms is significant in Column (1) and (2) when *LIQUIDCRE* is the dependent variable, although the coefficients on the main test variable *POST* continue to be negative and significant. However, both the coefficient on *POST*TEDSPREAD* and the coefficient on *POST*CRISIS* are negative and significant (coefficient = -0.024, p-value = 0.050, coefficient = -0.034, p-value = 0.034) in Column (3) and (4) where *LIQUIDCRE_OB* is the dependent variable. Taken together, these results suggest that the adverse effect of restatements on bank liquidity creation is amplified during crisis periods relative to normal times.[20] Panel B reports the results for large banks, and shows that bank liquidity creation does not appear to be affected by restatements even during economic downturns, as reflected by the insignificant coefficients on the two interaction terms.

[20] I also use the recession dates from the National Bureau of Economic Research (http://www.nber.org/cycles.html) to distinguish between crisis periods and normal times, and obtain similar results.

5. ADDITIONAL TESTS

The Effects of Restatement on Deposit Funding and Deposit Interest Rates

My next set of analyses investigates whether the decline in bank liquidity creation following restatements arises at least in part from contractions in bank deposit funding and if so, whether restating banks increase interest rates in order to attract deposits. To the extent that an accounting restatement acts as a warning sign of bank reporting failure, depositors face increased uncertainty about the true financial condition of the bank and hence the safety of their deposits. Consequently, restating banks may lose deposits as worried depositors switch to other more reliable institutions. One way restating banks can retain their deposit base and to alleviate funding stress is by increasing deposit interest rates. Acharya and Mora (2015), for example, find that during the recent financial crisis, banks exposed to liquidity tension due to undrawn loan commitments scrambled for deposits by raising deposit interest rates.

I focus on two key sources of demandable deposits, transaction deposits and savings deposits. *SAVINGSDEPOSIT* (*TRANSDEPOSIT*) is the ratio of savings deposits (transaction deposits) to bank *GTA*. Because information on bank deposit interest rates is not available in the Y-9C reports, I follow prior research (e.g., Acharya and Mora 2015) and construct an implicit measure of deposit interest rates, *DEPOSIT_RATE*, which is defined as interest expenses on deposits divided by the quarterly average of interest-bearing deposits, multiplied by 100. I then re-estimate equation (1) using the three deposit-related variables as the dependent variables, and report the results in Table 7.

Table 7 Panel A presents the regression results for small banks. The coefficient on *POST* is negative and significant (coefficient = -0.026, p-value = 0.092) in Column (1) where *SAVINGSDEPOSIT* is the dependent variable, suggesting that banks suffer an outflow of savings deposits following restatements. In contrast, there is little change in the amount of transaction deposits held by banks, as the coefficient on *POST* is insignificant in Column (2) where *TRANSADEPOSIT* is the dependent variable (coefficient = 0.001, p-value = 0.818). The coefficient on *POST* is positive and significant in Column (3) where *DEPOSIT_RATE* is the dependent variable (coefficient = 0.078, p-value = 0.016). As expected, restating banks increase deposit interest rates in an effort to alleviate the (savings) deposit funding stress. Panel B

reports the results for large banks. I find that following a restatement, large banks experience a decline in transaction deposits and a modest increase in deposit interest rates. Overall, the results in Table 7 suggest that depositors are less willing to entrust their money with banks after a restatement and, in an effort to retain deposit base, restating banks increase deposit interest rates.

The Impact of Restatements on Banks' Information Environment

A key premise in this paper is that restatements exacerbate information asymmetry between banks and external fund suppliers as well as other stakeholders. The results thus far line up well with this argument. In this section, I directly investigate the impact of restatements on banks' information environment. I use two measures to gauge the degree of information asymmetry restatement banks encounter. The first measure is the stock return volatility (*RETVOL*), defined as the natural logarithm of the standard deviation of daily stock returns over a quarter. Higher volatility in stock returns indicates that market participants are uncertain about the quality of publicly available information in reflecting banks' asset values. The second measure is the bid-ask spread on bank shares (*BIDASK*), defined as the natural log of average daily bid-ask spread over a quarter. A wider bid-ask spread reflects disagreements among investors about the inherent value of the bank, which points to the poor information environment of the bank. As in the main analyses, I contrast stock return volatility and bid-ask spread in the eight quarters after the restatements with those in the eight quarters before the restatements. Empirically, I re-estimate equation (1) with the two information environment measures as the new dependent variables. The results (untabulated) show that the coefficients on *POST* are positive and significant for both *RETVOL* and *BIDASK* regressions, and for both small banks and large banks. In summary, these results reinforce the view that bank restatements lead to deteriorations in banks' information environment, which, in turn, impedes banks' real activities.

Bank Risk Taking and Post-restatement Liquidity Creation

As discussed earlier, banks can have an incentive to undertake expansionary yet overly risky activities to avoid detection of misreporting, potentially giving rise to the accumulation of risk overhangs. When the misreporting is detected, such overhangs could erode banks' ability and willingness to take on

additional risks necessary for liquidity creation. To further explore this channel, I investigate the link between banks' risk-taking during the period of misreporting and the decline in liquidity creation following restatement.

If banks aggressively seek out low-quality borrowers to boost lending volume while misreporting, then after restatement such banks are likely to experience a large decline in loan portfolio performance and have disproportionately higher charge-offs. To the extent that banks cannot easily offload loans of inferior quality, banks would be forced to reduce new loan supply. Thus, the decline in bank liquidity creation should be most severe for banks that face a sharper deterioration in loan performance after the restatement. To test this conjecture, I compute the change in loan performance around bank restatement, Δ*CHARGEOFF*, as the average loan charge-offs over quarters in the post-restatement period minus the average loan charge-offs over quarters in the pre-restatement period.

Prior research documents a positive correlation between banks' pursuit of noninterest income-generating activities and risk taking (Demirguc-Kunt and Huizinga 2010; Bushman, Hendricks, and Williams 2016). Demirguc-Kunt and Huizinga (2010) show that banking strategies that rely more on noninterest sources of income generally increase bank risk. Accordingly, banks that venture into noninterest income-generating activities when misreporting could end up accumulating substantial risk overhangs, which in turn may trigger a steeper decline in bank liquidity creation after restatement. I measure the intensity of banks' pursuit of noninterest income sources, *NONINTREV*, as the average percentage change in the ratio of noninterest fee income to total interest revenue over quarters in the pre-restatement period.[21]

Lastly, I examine whether the liquidity creation impact of bank restatements is exacerbated when the bank had more volatile net interest margins during the misreporting period. Prior research suggests that more volatile net interest margin can be an indicator of increased bank risk taking (Houston, Lin, Lin, and

[21] I exclude trading activities in calculating banks' noninterest fee income share. The reason is twofold. First, prior research suggests that while trading activities have diversification benefits to banks, non-trading, noninterest activities increase bank risks without concomitant diversification benefits (Demirguc-Kunt and Huizinga 2010). Second, trading activities are reported at fair values on banks' financial reports (Laux and Leuz 2010), so it is difficult to identify whether the increase in reported bank trading activities is due to an increase in the fair value of the underlying instruments or an increase in banks' trading intensity.

Ma 2010). *INTMARGIN_VOL* is the standard deviation of bank net interest margin (defined as interest income minus interest expense scaled by interest-bearing assets) over quarters during the pre-restatement period.

In conducting the analyses, I construct three indicator variables, *HIGH_ΔCHARGEOFF*, *HIGH_NONINTREV*, and *HIGH_INTMARGIN_VOL*, which equal one if the corresponding risk-taking measures are above the sample medians. I then re-estimate equation (1) by adding, one at a time, the interaction term between the indicator variables and *POST*. Table 8 presents the results, with Panel A reporting the results for small banks and Panel B for large banks. For small banks, all three interaction terms exhibit negative and significant coefficients when *LIQUIDCRE* is the dependent variable. Thus, the liquidity creation impact of accounting restatements is greater when banks relaxed their lending standards to make low-quality loans, aggressively pursued noninterest sources of income, and had more volatile net interest margins during the period of misreporting. Results for *LIQUIDCRE_OB* are largely similar. Turning to large banks, not surprisingly none of the coefficients on the interaction terms are significant, which again echoes the main finding that large banks seem unaffected by restatements. Taken together, the results indicate that the adverse consequences of bank restatements for liquidity creation can be attributed, at least partly, to the risk overhangs that banks accumulated when misreporting.

Are Deteriorating Bank Fundamentals Driving the Results?

It is possible that the decline in bank liquidity creation following restatement can be an artifact of deteriorating bank fundamentals that coincidentally trigger restatements. To see this, consider a bank with worsening performance. The bank likely has an incentive to misreport in order to hide the deteriorating performance from the public. But as long as bank fundamentals keep deteriorating and there is an upper limit to the scope of misreporting allowed, the bank eventually will have to reveal the true financial condition and be forced to restate accounting information. Given that banks with weak fundamentals, other things equal, are less able to create liquidity, I would observe a decline in liquidity creation following bank restatements even though the decline is entirely driven by the worsening bank condition and has nothing to with the restatement. While it is implausible to completely separate bank fundamentals from bank

restatement since accounting restatement arises at least partially from managers' intent to conceal bad performance, it is important to show that accounting restatements have an incremental effect on bank liquidity creation, above and beyond the effect of bank fundamentals. The main regression analyses control for bank and time fixed effects as well as a broad range of time-varying bank characteristics, which can help isolate the effects of restatements from those of bank fundamentals. To provide additional evidence on the incremental effect of bank restatements, I conduct a falsification test in which for each restatement, I compare liquidity creation during the misreporting period and liquidity creation before the misreporting period. If the alternative scenario were to hold true, then I would expect liquidity creation to start decreasing in the misreporting period relative to the pre-misreporting period, because the misreporting period is arguably the period where bank fundamentals begin to worsen and the manager misreports.

Table 9 reports the results. The variable of interest is the indicator variable *MISSTATINGPERIOD* which equals one for the misstating period, and zero for the eight quarters before the misstating period. All the other variables in the regression are the same as in equation (1). As shown, none of the coefficients on *MISSTATINGPERIOD* is significant across the two liquidity creation measures and the three sample partitions, indicating that liquidity creation does not change during the misreporting period relative to the pre-misreporting period. The falsification results provide additional assurance that restatements, rather than bank fundamentals, are the key driver of the decline in bank liquidity creation.

Robustness Checks

Results of Difference-in-differences Analyses

It is possible that unobservable time-series changes – such as changes in macroeconomic conditions or changes in regulation – contemporaneous with bank restatements could affect banks' ability to provide liquidity. The year-quarter fixed effects in the main regressions are intended to filter out such time-related changes. To provide additional evidence on the causal effect of restatements on liquidity creation, I employ a difference-in-differences (DID) research design that compares changes in liquidity creation for restating banks versus non-restating control banks around restatements.

For each restatement bank (i.e., the treatment sample), I first identify all banks that never restated during the sample period and were in the same size group as the restatement bank – based on the $1 billion cutoff of *GTA* – in the restatement quarter. Then within each size group, I pair the restatement bank with a non-restatement control bank with the closest Tier1 capital ratio (*TIER1CAP*). To facilitate a direct comparison of the change in liquidity creation between treatment and control banks, for each non-restatement control bank I create an event window of the same length as the matched restatement bank; that is, I look at a control bank's liquidity creation during the eight quarters before and after the matched treatment bank's restatement announcement date. The difference-in-differences regression takes the following form:

$$LIQUIDCRE\ (LIQUIDCRE\_OB) = \alpha + \beta_1\ POST + \beta_2\ TREAT + \beta_3\ POST*TREAT + \beta_4\ \text{Bank characteristics} + \text{Bank fixed effects} + \text{Year-quarter fixed effects} + \varepsilon \quad (2)$$

where *POST* is an indicator variable that equals one for the post-restatement period (quarter 0 to quarter 7), and zero for the pre-restatement period. *TREAT* is an indicator variable that equals one for restatement banks, and zero for non-restatement control banks. Because I include bank fixed effects in the regression, the standalone term *TREAT* will be subsumed. The variable of interest is the interaction term, *POST*TREAT*, which captures the difference of changes in liquidity creation around restatements between restatement banks and non-restatement banks.

Table 10 reports the results. For small banks, the coefficient on *POST*TREAT* is negative and significant in both the *LIQUIDCRE* regression (coefficient = -0.019, p-value = 0.046) and the *LIQUIDCRE_OB* regression (coefficient = -0.017, p-value = 0.040). However for large banks, the coefficient on *POST*TREAT* is not significant in either of the regression specifications. In summary, the DID results corroborate the main analyses, showing that restatement banks experience significantly larger declines in liquidity creation following restatement compared to non-restatement banks.

Results Using a Finer Partition of Bank Size

While the $1 billion size cutoff employed in this paper is consistent with the approach in prior banking literature, one potential concern is that partitioning banks into just two size bins could cloud

importation variations in bank liquidity creation among different sized banks. To address this issue, I further segregate the sample of large banks into three subgroups: (1) banks with *GTA* between $1 and $3 billion, (2) banks with *GTA* between $3 and $10 billion, and (3) banks with *GTA* above $10B. I then re-estimate equation (1) for the new subsamples, and tabulate the results in Table 11. The coefficient on *POST* is still not significant in any of the subsamples of large banks across both dependent variables, indicating that the insignificant results for large banks in the main analyses are not attributed to the size cutoffs of the sample banks.

6. CONCLUSION

At the very core of financial intermediation is the role that banks play in creating liquidity by financing relatively illiquid financial claims, such as business loans, with relatively liquid financial claims, such as demand deposits. Of particular concern to bank regulators and academic researchers is whether and how bank financial reporting affects banks' ability to create liquidity. This paper sheds light on this issue by investigating the effect of bank accounting restatements on liquidity creation. The use of accounting restatements builds on the well-accepted notion that restatements are *de-facto* admission that accounting information reported in prior financial reports was misleading and, therefore, serve as a visible indicator of financial reporting failure.

Theory predicts that accounting restatements can negatively affect bank liquidity creation by impairing banks' access to external sources of funds, straining bank-customer relationships, and triggering the unravelling of risk overhangs banks accumulate when they misreport. Using comprehensive measures of bank liquidity creation developed in Berger and Bouwman (2009), I show that bank liquidity creation declines significantly following restatement for small banks, but not for large banks. In terms of economic significance, bank aggregate (including both on- and off-balance sheet) liquidity creation declines by an average of 9 percent – and on-balance sheet liquidity creation declines by an average of 14 percent – in the eight quarters after the restatement compared to the eight quarters before the restatement. By decomposing aggregate liquidity creation into individual bank activities, I show that following restatements, banks reduce holdings of illiquid assets (e.g., commercial and industrial loans) and liquid liabilities (e.g., savings deposits), but increase holdings of liquid assets (e.g., cash).

I also find that the impact of restatements on liquidity creation is greatest in the case of more severe restatements and during episodes of market stress. Further analyses show that restatements trigger a contraction in savings deposits and that banks increase deposit interest rates to reduce such a shortfall in deposit funding. Moreover, the liquidity creation impact of bank restatements is more pronounced for banks that engaged in more risk taking during the misreporting period. Overall, my findings help inform the ongoing discussion among policy makers and academic researchers about the implications of financial

reporting transparency for bank stability, by documenting significant adverse effects of bank restatements on liquidity creation. More broadly, my study speaks to the real effects of reporting transparency on the allocation of economic resources.

APPENDIX

1. Examples of Bank Restatement Cases

Case One: On December 21, 2010, Mercantile Bancorp – an Illinois-based bank holding company with consolidated total assets of around $980 million – filed a restatement via Form 8-K to correct the 10-Q report for the period ended September 30, 2010. The restatement results from an under-reporting of loan loss provisions by $6.2 million. The bank states in its Form 8-K that:

> The Company determined that it needed to make the additional noncash loan loss provision of $6.2 million based on the results of a recent regularly scheduled safety and soundness examination conducted jointly by the Federal Deposit Insurance Corporation and the Illinois Division of Financial Institutions and completed in December. Due to the determination to record additional loan loss provision in the third quarter of 2010, the Company's capital ratios will be reduced and the Company re-evaluated the adequacy of the valuation allowance established for its deferred tax assets.

Mercantile Bancorp's restatement was also accompanied by an acknowledgement from the management and the external auditor that there were material weaknesses in the bank's internal control over financial reporting.

Case Two: On May 15, 2008, First Banks Inc. – a bank holding company with consolidated total assets of $10 billion– announced through a press release the need to restate its 10-Q report for the quarter ended March 31, 2008 and 10-K reports from 2003 to 2007. This restatement was prompted by the audit committee of the bank and related to improper revenue recognitions of certain mortgage transactions. In the 8-K filing, First Banks stated that:

> The restatement is being made to properly reflect certain transactions that were entered into the Company's mortgage banking division but were improperly recorded in the Company's consolidated financial statements due to the circumvention of established internal controls. The Company's preliminary analysis indicates the improper recognition of the transactions in the company's consolidated financial statements resulted in an understatement of a repurchase agreement obligation, including the related interest expense thereon, and an overstatement of mortgage banking revenues for the year ended December 31, 2007, 2006, 2005 and 2004. The Audit committee has commissioned an investigation into the circumstances and possible irregularities that led to the improper recording of the transactions in the company's consolidated financial statements.

2. Liquidity Classification of Bank Activities

Assets	*Illiquid assets (weight = 1/2)*	Commercial real estate loans (CRE)
		Loans to finance agricultural production
		Commercial and industrial loans (C&I)
		Other loans and lease financing receivables
		Other real estate owned
		Customers' liability on bankers acceptances
		Investment in unconsolidated subsidiaries
		Premises
		Other assets
	Semiliquid assets (weight = 0)	Residential real estate loans (RRE)
		Consumer loans
		Loans to depository institutions
		Loans to state and local governments
		Loans to foreign governments
	Liquid assets (weight = -1/2)	Cash and due from other institutions
		All securities (regardless of maturity)
		Trading assets
		Fed funds sold
Liabilities plus equity	*Liquid liabilities (weight = 1/2)*	Transaction deposits
		Savings deposits
		Overnight federal funds purchased and repurchase agreements
		Trading liabilities
	Semiliquid liabilities (weight = 0)	Time deposits
		Other borrowed money
	Illiquid liabilities plus equity (weight = -1/2)	Bank's liability on bankers acceptances
		Subordinated debt
		Other liabilities
		Equity
Off-balance sheet guarantees & derivatives	*Illiquid guarantees (weight = 1/2)*	Unused commitments
		Net standby letters of credit
		Commercial and similar letters of credit
		All other off-balance sheet liabilities
	Semiliquid guarantees (weight = 0)	Net credit derivatives
		Net securities lent
	Liquid guarantees (weight = -1/2)	Net participations acquired
		Interest rate derivatives
		Foreign exchange derivatives
		Equity and commodity derivatives

3. Variable Definitions

Panel A: Variables in Main Regressions

Variable	Definitions
LIQUIDCRE	Bank liquidity creation based on Berger and Bouwman (2009). The construction of this measure follows a three-step procedure. First, all bank balance sheet and off-balance sheet activities are classified as liquid, semiliquid, or illiquid, according to whether the activities enhance, maintain, or destroy bank liquidity creation. Second, a weight of 1/2 is assigned to illiquid assets, liquid liabilities, and illiquid off-balance sheet guarantees. A weight of -1/2 is assigned to liquid assets, illiquid liabilities and equity, and off-balance sheet liquid guarantees and liquid derivatives. A weight of 0 is assigned to semiliquid assets, semiliquid liabilities, and semiliquid off-balance sheet guarantees. *LIQUIDCRE* is scaled by gross total assets (*GTA*), which are defined as total assets plus the allowance for loan and lease losses and the allocated transfer risk reserve (a reserve for certain foreign loans).
LIQUIDCRE_OB	This measure excludes off-balance sheet activities from bank liquidity creation. Specifically, only on-balance sheet activities are classified as liquid, semiliquid, or illiquid. Then, a weight of 1/2 is assigned to illiquid assets and liquid liabilities. A weight of -1/2 is assigned to liquid assets and illiquid liabilities plus equity. A weight of 0 is assigned to semiliquid assets and semiliquid liabilities. *LIQUIDCRE_OB* is scaled by gross total assets (*GTA*).
POST	An indicator variable equal to one for the eight quarters following the restatement including the restatement quarter, and zero otherwise.
TIER1CAP	Tier1 risk-adjusted capital ratio.
SIZE	The natural logarithm of gross total assets (*GTA*).
ROA	Income (loss) before extraordinary items divided by total assets.
NPL	Loans past due 90 days or more and nonaccrual loans divided by total loans.
LLP	Provisions for loan losses divided by total loans.
CHARGEOFF	Charge-offs on allowance for loan losses divided by total loans.
ZSCORE	Distance to default, defined as the natural logarithm of bank's return on assets plus the equity capital/*GTA* ratio divided by the standard deviation of the return on assets.
LARGETIMEDEP	Large time deposits ($100,000 or more) with a remaining maturity of one year or less divided by total large time deposits.
LEV	Total liabilities divided by *GTA*.
LOANHHI	The Herfindahl index of shares of loan categories in the bank's loan portfolio, defined as the sum of the squares of the amount of each loan category (commercial real estate loans, loans to finance agricultural production, commercial and industrial loans, residential real estate loans, consumer loans, and all other loans) as a percentage of total loan amount.

Panel B: Variables in Cross-sectional and Time-series Tests

CAR_RESTATE	The quartile rank of the 2-day cumulative abnormal returns (adjusted for CRSP value-weighted market return) to restatement announcements (day 0 and day 1) multiplied by negative one.
ICW	An indicator variable equal to one if the restatement announcement is accompanied by disclosure of material internal control weaknesses, and zero otherwise.

PERSISTENCE	The number of fiscal quarters that need to be restated.
REGULATOR	An indicator variable equal to one if the restatement is triggered by examinations from bank regulators including the FDIC, the Federal Reserve, and the OCC, and zero otherwise.
TEDSPREAD	The quarterly average of the daily spread between the three-month London Interbank Offered Rate (LIBOR) and the three-month Treasury rate.
CRISIS	An indicator variable equal to one from 2007Q3 through 2009Q2, and zero otherwise.

Panel C: Variables in Additional Tests

SAVINGSDEPOSIT	The ratio of savings deposits to *GTA*.
TRANSADEPOSIT	The ratio of transaction deposits to *GTA*.
DEPOSIT_RATE	Interest expenses on deposits divided by the quarterly average of interest-bearing deposits, multiplied by 100.
RETVOL	The natural logarithm of the standard deviation of daily stock returns over the quarter.
BIDASK	The natural logarithm of average daily bid ask spread over the quarter.
Δ*CHARGEOFF*	The average loan charge-offs over quarters in the post-restatement period minus the average loan charge-offs over quarters in the pre-restatement period.
NONINTREV	The average percentage change in the ratio of bank noninterest income (minus deposit service charges and trading revenue) to interest revenue over quarters in the pre-restatement period.
INTMARGIN_VOL	Standard deviation of net interest margin over quarters in the pre-restatement period. Net interest margin is defined as interest income minus interest expense scaled by interest-bearing assets.

REFERENCES

Acharya, V., and N. Mora. 2015. A crisis of banks as liquidity providers. *Journal of Finance* 70: 1-43.

Acharya, V., and S. Ryan. 2016. Banks' financial reporting and financial system stability. *Journal of Accounting Research* 54: 277-340.

Agarwal, S., D. Lucca, A. Seru, and F. Trebbi. 2014. Inconsistent regulators: Evidence from banking. *The Quarterly Journal of Economics* 129: 889-938.

Allen, F., E. Carletti, and R. Marquez. 2011. Credit market competition and capital regulation. *Review of Financial Studies* 24: 983-1018.

Altamuro, J., and A. Beatty. 2010. How does internal control regulation affect financial reporting? *Journal of Accounting and Economics* 49: 58-74.

Anderson, K., and T. Yohn. 2002. The effect of 10-K restatements on firm value, information asymmetries, and investors' reliance on earnings. Working paper.

Badertscher, B., J. Burks, and P. Easton. 2012. A convenient scapegoat: Fair value accounting by commercial banks during the financial crisis. *The Accounting Review* 87: 59-90.

Balakrishnan, K., J. Core, and R. Verdi. 2014. The relation between reporting quality and financing and investment: Evidence from changes in financing capacity. *Journal of Accounting Research* 52: 1-36.

Beatty, A., and S. Liao. 2011. Do delays in expected loss recognition affect banks' willingness to lend? *Journal of Accounting and Economics* 52: 1-20.

Beatty, A., and S. Liao. 2014. Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics* 58: 339-383.

Beck, P., and G. Narayanamoorthy. 2013. Did the SEC impact banks' loan loss reserve policies and their informativeness? *Journal of Accounting and Economics* 56: 42-65.

Berger, A., and C. Bouwman. 2009. Bank liquidity creation. *Review of Financial Studies* 22: 3779 – 3837.

Bernanke, B., and A. Blinder. 1992. The federal funds rate and the channels of monetary transmission. *The American Economic Review* 82: 901-921.

Bhattacharya, S., and A. Thakor. 1993. Contemporary Banking Theory. *Journal of Financial Intermediation* 3: 2-50.

Biddle, G., G. Hilary, and R. Verdi. 2009. How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics* 48: 112-131.

Bolton, P., and X. Freixas. 2006. Corporate finance and the monetary transmission mechanism. *Review of Financial Studies* 19: 829-870.

Boot, A. 2000. Relationship banking: What do we know? *Journal of Financial Intermediation* 9: 7-25.

Bottazzi, L., M. Da Rin, and T. Hellmann. 2016. The importance of trust for investment: Evidence from venture capital. *Review of Financial Studies* 29: 2283-2318.

Brown, M., B. Guin, and S. Morkoetter. 2014. Switching costs, deposit insurance and deposit withdrawals from distressed banks. Working paper.

Bryan, J. 1980. A model of reserves, bank runs, and deposit insurance. *Journal of Banking and Finance* 4: 335-344.

Bushman, R., B. Hendricks, and C. Williams. 2016. Bank competition: Measurement, decision-making, and risk-taking. *Journal of Accounting Research* 54: 777-826.

Bushman, R., and C. Williams. 2012. Accounting discretion, loan loss provisioning, and discipline of banks' risk-taking. *Journal of Accounting and Economics* 54: 1-18.

Bushman, R., and C. Williams. 2015. Delayed expected loss recognition and the risk profile of banks. *Journal of Accounting Research* 53: 511-553.

Calomiris, C., and C. Kahn. 1991. The role of demandable debt in structuring optimal banking arrangements. *The American Economic Review* 81: 497-513.

Campello, M. 2002. Internal capital markets in financial conglomerates: Evidence from small bank responses to monetary policy. *Journal of Finance* 57: 2773-2805.

Cetorelli, N., and L. Goldberg. 2012. Banking globalization and monetary transmission. *Journal of Finance* 67: 1811-1843.

Chakravarthy, J., E. deHaan, and S. Rajgopal. 2014. Reputation repair after a serious restatement. *The Accounting Review* 89: 1329-1363.

Chang, H., M. Donohoe, and T. Sougiannis. 2015. Do analysts understand the economic and reporting complexities of derivatives? *Journal of Accounting and Economics* 61: 584-604.

Chen, X., Q. Cheng, and A. Lo. 2014. Is the decline in the information content of earnings following restatements short-lived? *The Accounting Review* 89: 177-207.

Chen, W., C. Liu, and S. Ryan. 2008. Characteristics of securitizations that determine issuers' retention of the risks of the securitized assets. *The Accounting Review* 83: 1181-1215.

Cheng, Q., and D. Farber. 2008. Earnings restatements, changes in CEO compensation, and firm performance. *The Accounting Review* 83: 1217-1250.

Cornett, M., J. McNutt, P. Strahan, and H. Tehranian. 2011. Liquidity risk management and credit supply in the financial crisis. *Journal of Financial Economics* 101: 297-312.

Costello, A., J. Granja, and J. Weber. 2016. Do strict regulators increase the transparency of the banking system? Working paper.

Coval, J., and A. Thakor. 2005. Financial intermediation as a beliefs-bridge between optimists and pessimists. *Journal of Financial Economics* 75: 535-569.

Davenport, A., and K. McDill. 2006. The depositor behind the discipline: A micro-level case study of Hamilton Bank. *Journal of Financial Services Research* 30: 93-109.

DeAngelo, H., and R. Stulz. 2015. Liquid-claim production, risk management, and bank capital structure: Why high leverage is optimal for banks. *Journal of Financial Economics* 116: 219-236.

DeFond, M., and J. Zhang. 2014. A review of archival auditing research. *Journal of Accounting and Economics* 58: 275-326.

Demirguc-Kunt, A., and H. Huizinga. 2010. Bank activity and funding strategies: the impact on risk and returns. *Journal of Financial Economics* 98: 626-650.

Diamond, D. 1984. Financial intermediation and delegated monitoring. *The Review of Economic Studies* 51: 393-414.

Diamond, D., and P. Dybvig. 1983. Bank runs, deposit insurance, and liquidity. *Journal of Political Economy* 91: 401-419.

Diamond, D., and R. Rajan. 2000. A theory of bank capital. *Journal of Finance* 55: 2431-2465.

Diamond, D., and R. Rajan. 2001. Liquidity risk, liquidity creation, and financial fragility: A theory of banking. *Journal of Political Economy* 109: 287-327.

Dinc, S. 2000. Bank reputation, bank commitment, and the effects of competition in credit markets. *Review of Financial Studies* 13: 781-812.

Drucker, S., and M. Puri. 2005. On the benefits of concurrent lending and underwriting. *Journal of Finance* 60: 2763-2799.

Fama, E. 1985. What's different about banks? *Journal of Monetary Economics* 15: 29-39.

Fang, L., V. Ivashina, and J. Lerner. 2013. Combining banking with private equity investing. *Review of Financial Studies* 26: 2139-2173.

Federal Reserve Board of Governors (FRBOG). 1999. Allowance for loan and lease losses. Commercial Bank Examination Manual (November). Washington, DC: Publications Fulfillment.

Gale, D. 2003. Financial regulations in a changing environment. In T. Courchene and E. Neave (eds.), *Framing financial structure in an information environment*. Kingston, Ontario, Canada: John Deutsch Institute for the Study of Economic Policy, Queen's University.

Garmaise, M., and T. Moskowitz. 2004. Confronting information asymmetries: Evidence from real estate markets. *Review of Financial Studies* 17: 405-437.

Gatev, E., T. Schuermann, and P. Strahan. 2009. Managing bank liquidity risk: How deposit-loan synergies vary with market conditions. *Review of Financial Studies* 22: 995-1020.

Gleason, C., N. Jenkins, and W. Johnson. 2008. The contagion effects of accounting restatements. *The Accounting Review* 83: 83-110.

Gorton, G., and L. Huang. 2006. Bank panics and the endogeneity of central banking. *Journal of Monetary Economics* 53: 1613-1629.

Gorton, G., A. Metrick. 2012. Securitized banking and the run on repo. *Journal of Financial Economics* 104: 425-451.

Gorton, G., and A. Winton. 2014. Liquidity provision, bank capital, and the macroeconomy. Working paper.

Graham, J., S. Li, and J. Qiu. 2008. Corporate misreporting and bank loan contracting. *Journal of Financial Economics* 89: 44-61.

Gron, A., and A. Winton. 2001. Risk overhang and the market behavior. *Journal of Business* 74: 591-612.

Guiso, L., P. Sapienza, and L. Zingales. 2008. Trusting the stock market. *Journal of Finance* 63: 2557-2600.

Guner, A. 2006. Loan sales and the cost of corporate borrowing. *Review of Financial Studies* 19: 687-716.

He, Z., and A. Manela. 2016. Information acquisition in rumor-based bank runs. *Journal of Finance* 71: 1113-1158.

Hennes, K., A. Leone, and B. Miller. 2008. The importance of distinguishing errors from irregularities in restatement research: The case of restatements and CEO/CFO turnover. *The Accounting Review* 83: 1487-1519.

Holmstrom, B., and J. Tirole. 1998. Private and public supply of liquidity. *Journal of Political Economy* 106: 1-40.

Holod, D., and J. Peek. 2007. Asymmetric information and liquidity constraints: A new test. *Journal of Banking and Finance* 31: 2425-2451.

Houston, J., and C. James. 1996. Bank information monopolies and the mix of private and public debt claims. *Journal of Finance* 51: 1863-1889.

Houston, J., C. James, and D. Marcus. 1997. Capital market frictions and the role of internal capital markets in banking. *Journal of Financial Economics* 46: 135-164.

Houston, J., C. Lin, P. Lin, and Y. Ma. 2010. Creditor rights, information sharing, and bank risk taking. *Journal of Financial Economics* 96: 485-512.

Hribar, P., and N. Jenkins. 2004. The effect of accounting restatements on earnings revisions and the estimated cost of capital. *Review of Accounting Studies* 9: 337-356.

Huizinga, H., and L. Laeven. 2012. Bank valuation and accounting discretion during a financial crisis. *Journal of Financial Economics* 106: 614-634.

Iyer, R., and M. Puri. 2012. Understanding bank runs: The importance of depositor-bank relationships and networks. *American Economic Review* 102: 1414-1445.

Jiang, L., R. Levine, and C. Lin. 2016. Competition and bank liquidity creation. Working paper.

Kashyap, A., R. Rajan, and J. Stein. 2002. Banks as liquidity providers: an explanation for the coexistence of lending and deposit-taking. *Journal of Finance* 57: 33-73.

Kashyap, A., and J. Stein. 2000. What do a million observations on banks say about the transmission of monetary policy? *American Economic Review* 90: 407-428.

Kedia, S., and T. Philippon. 2009. The economics of fraudulent accounting. *Review of Financial Studies* 22: 2169-2199.

Keys, B., A. Seru, and V. Vig. 2012. Lender screening and the role of securitization: Evidence from prime and subprime mortgage markets. *Review of Financial Studies* 25: 2071-2108.

Laeven, L., and R. Levine. 2009. Bank governance, regulation, and risk taking. *Journal of Financial Economics* 93: 259-275.

Laux, C., and C. Leuz. 2010. Did fair-value accounting contribute to the financial crisis? *Journal of Economic perspectives* 24: 93-118.

Liu, X. 2016. Interbank market freezes and creditor runs. *Review of Financial Studies* 29: 1860-1910.

Liu, C., and S. Ryan. 1995. The effect of bank loan portfolio composition on the market reaction to and anticipation of loan loss provisions. *Journal of Accounting Research* 33: 77-94.

Liu, C., and S. Ryan. 2006. Income smoothing over the business cycle: Changes in banks' coordinated management of provisions for loan losses and loan charge-offs from the pre-1990 bust to the 1990s boom. *The Accounting Review* 81: 421-441.

Lo, A., 2015. Accounting credibility and liquidity constraints: Evidence from reactions of small banks to monetary tightening. *The Accounting Review* 90: 1079-1113.

Nicoletti, A. 2016. The effects of auditors and regulators on bank financial reporting: Evidence from loan loss provisions. Working paper.

Office of the Inspector General. *Material Loss Review of Hamilton Bank, N.A.* OIC-03-032. U.S. Department of the Treasury (December 17, 2002).

Osili, U., and A. Paulson. 2014. Crises and confidence: Systemic banking crises and depositor behavior. *Journal of Financial Economics* 111: 646-660.

Palmrose, Z.-V., V. Richardson, and S. Scholz. 2004. Determinants of market reactions to restatement announcements. *Journal of Accounting and Economics* 37: 59-89.

Palmrose, Z.-V., and S. Scholz. 2004. The accounting causes and legal consequences of non-GAAP reporting: Evidence from restatements. *Contemporary Accounting Research* 21: 139-180.

Peria, M., and S. Schmukler. 2001. Do depositors punish banks for bad behavior? Market discipline, deposit insurance, and banking crises. *Journal of Finance* 56: 1029-1051.

Petersen, M., and R. Rajan. 1994. The benefits of lending relationships: Evidence from small business data. *Journal of Finance* 49: 3-37.

Rajan, R. 1992. Insiders and outsiders: The choice between informed and arm's length debt. *Journal of Finance* 47: 1367-1400.

Santos, J., and A. Winton. 2008. Bank loans, bonds, and information monopolies across the business cycle. *Journal of Finance* 63: 1315-1359.

Schrand, C., and M. Wong. 2003. Earnings management using the valuation allowance for deferred tax assets under SFAS No. 109. *Contemporary Accounting Research* 20: 579-611.

Sharpe, S. 1990. Asymmetric information, bank lending and implicit contracts: A stylized model of customer relationships. *Journal of Finance* 55: 1069-1087.

Srinivasan, S. 2005. Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. *Journal of Accounting Research* 43: 291-334.

Stein, J. 2002. Information production and capital allocation: Decentralized versus hierarchical firms. *Journal of Finance* 57: 1891-1921.

Tayan, B. 2016. The Wells Fargo cross-selling scandal. Rock Center for Corporate Governance at Stanford University Stanford Closer Look Series: Topics, Issues and Controversies in Corporate Governance No. CGRP-62.

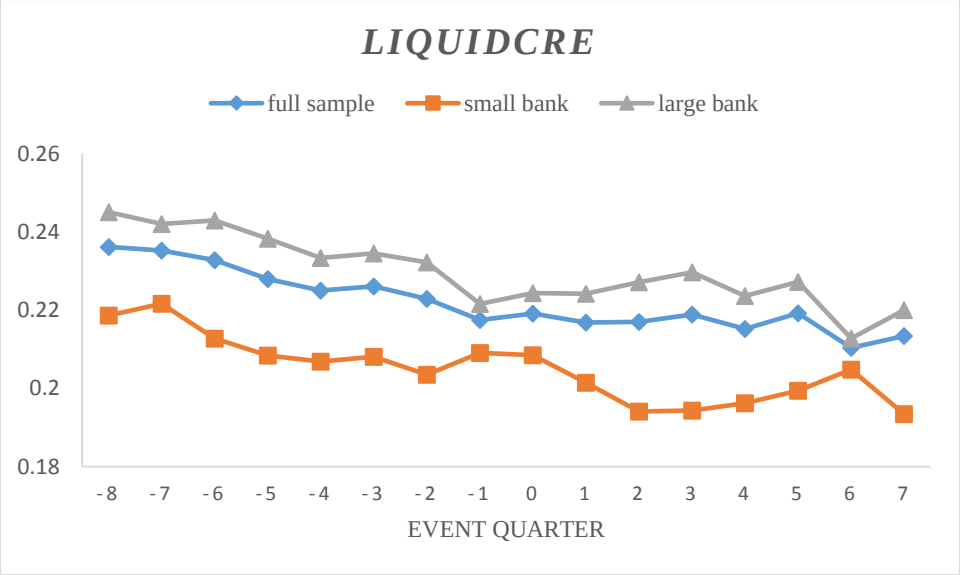
Wilson, W. 2008. An empirical analysis of the decline in the information content of earnings following restatements. *The Accounting Review* 83: 519-548.

Xie, B. 2016. Does fair value accounting exacerbate the pro-cyclicality of bank lending? *Journal of Accounting Research* 54: 235-274.

FIGURE 1

Liquidity Creation around Restatements

Panel A: Liquidity Creation Including Both On- and Off-balance Sheet Activities



Panel B: Liquidity Creation Including Only On-balance Sheet Activities

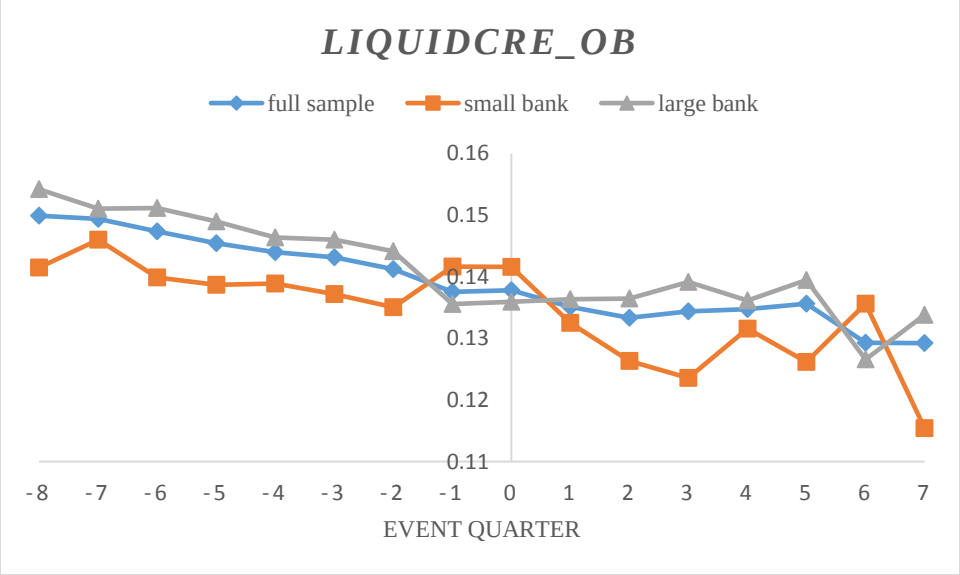


TABLE 1

Restatement Classifications

Panel A: Restatement Attribution

	Frequency	Percentage
Management	123	52.34
Board of directors (Audit committee, Disclosure Committee, Risk Management Committee)	32	13.62
Bank Regulators (FDIC, Federal Reserve Bank, and OCC)	30	12.77
SEC	15	6.38
External auditor	9	3.83
IRS	1	0.43
Actuary	1	0.43
Unidentified	24	10.21
Total	235	100

Panel B: Major Restatement Items

Item	Frequency	Percent	Item	Frequency	Percent
Loan impairment (e.g., Loan loss provisioning)	47	20.00	Real estate owned (e.g., OREO)	6	2.55
Compensation and employee benefits	21	8.94	Noninterest income & expense	4	1.70
Loans and leases	20	8.51	Trading assets & liabilities	3	1.28
Tax expense (e.g., valuation allowance for deferred tax assets & liabilities)	19	8.09	Deposits	3	1.28
Derivatives (e.g., SFAS 133)	16	6.81	Securitization	3	1.28
Equity capital	15	6.38	Other liabilities	3	1.28
Fair value accounting and measurement (Fair value option, SFAS 157)	12	5.11	Risk-based capital ratio calculation	2	0.85
Gains or losses on loan sales	12	5.11	Securities gains or losses	2	0.85
Cash flow statement	10	4.26	Expenses of premises and fixed assets	1	0.43
Fraud	8	3.40	Securities	1	0.43
Amortization and goodwill impairment	7	2.98	Others (e.g., VIE, cash and balances due)	14	5.96
Interest income & expense	6	2.55			

Panel C: Internal Control Weakness

	Number	Percentage
Restatement with ICW	71	30.21
Restatement without ICW	164	69.79
Total	235	100

Panel D: Number of Bank Restatements by Calendar Year

Year	Number	Percentage
2000	5	2.13
2001	6	2.55
2002	12	5.11
2003	15	6.38
2004	14	5.96
2005	21	8.94
2006	23	9.79
2007	21	8.94
2008	18	7.66
2009	19	8.09
2010	20	8.51
2011	17	7.23
2012	19	8.09
2013	14	5.96
2014	11	4.68
Total	235	100

TABLE 2

Descriptive Statistics and Univariate Comparisons

Panel A presents descriptive statistics for the variables used in the main regressions. Panel B presents univariate comparisons of liquidity creation as well as individual components of liquidity creation pre- and post-restatements. I use ***, **, and * to denote that the means (t-test) and medians (Mood's median test) for the two subsamples are significantly different from each other at the 1%, 5%, and 10% level, respectively.

Panel A: Descriptive Statistics

Variable	N	Mean	Std Dev	25th Pctl	Median	75th Pctl
Liquidity creation						
LIQUIDCRE	3,343	0.223	0.157	0.133	0.229	0.316
LIQUIDCRE_OB	3,343	0.140	0.117	0.074	0.150	0.213
Individual components of liquidity creation						
ILLIQUID_ASSET	3,343	0.209	0.094	0.142	0.193	0.262
LIQUID_LIABILITY	3,343	0.445	0.163	0.360	0.455	0.547
ILLIQUID_GUARANTEE	3,343	0.178	0.129	0.103	0.155	0.215
LIQUID_ASSET	3,343	0.264	0.131	0.175	0.241	0.322
ILLIQUID_LIABILITY	3,343	0.110	0.050	0.087	0.105	0.127
LIQUID_GUARANTEE & DERIV	3,343	0.013	0.111	0.000	0.000	0.001
SEMILIQUID_ASSET	3,343	0.233	0.120	0.148	0.225	0.305
SEMILIQUID_LIABILITY	3,343	0.375	0.157	0.266	0.392	0.486
SEMILIQUID_GUARANTEE	3,343	0.002	0.019	0.000	0.000	0.000
Bank characteristics						
TIER1CAP	3,343	0.124	0.061	0.097	0.115	0.138
SIZE	3,343	14.576	1.686	13.490	14.110	15.481
ROA	3,343	0.003	0.009	0.001	0.004	0.007
NPL	3,343	0.026	0.031	0.006	0.014	0.034
LLP	3,343	0.005	0.009	0.001	0.002	0.006
CHARGEOFF	3,343	0.006	0.009	0.001	0.002	0.006
ZSCORE	3,343	3.171	0.909	2.967	3.357	3.669
LARGETIMEDEP	3,343	0.730	0.187	0.630	0.762	0.871
LEV	3,343	0.897	0.038	0.883	0.901	0.915
LOANHHI	3,343	0.494	0.144	0.390	0.467	0.572

Panel B: Univariate Comparisons

	Pre-restatement (1)			Post-restatement (2)			Difference in Mean	Difference in Median
	Obs	Mean	Median	Obs	Mean	Median	(2) – (1)	(2) – (1)
Liquidity creation								
LIQUIDCRE	1,705	0.228	0.231	1,638	0.217	0.228	-0.012**	-0.003*
LIQUIDCRE_OB	1,705	0.145	0.150	1,638	0.134	0.150	-0.011***	0.000
Individual components of liquidity creation								
ILLIQUID_ASSET	1,705	0.212	0.193	1,638	0.206	0.193	-0.006*	0.000**
LIQUID_LIABILITY	1,705	0.444	0.454	1,638	0.445	0.458	0.001	0.004***
ILLIQUID_GUARANTEE	1,705	0.180	0.155	1,638	0.176	0.155	-0.004	0.000
LIQUID_ASSET	1,705	0.256	0.233	1,638	0.273	0.248	0.017***	0.015***
ILLIQUID_LIABILITY	1,705	0.110	0.105	1,638	0.110	0.105	0.000	0.000
LIQUID_GUARANTEE & DERIV	1,705	0.014	0.000	1,638	0.012	0.000	-0.002	0.000
SEMILIQUID_ASSET	1,705	0.234	0.228	1,638	0.231	0.223	-0.003	-0.005
SEMILIQUID_LIABILITY	1,705	0.387	0.397	1,638	0.363	0.383	-0.023***	-0.014**
SEMILIQUID_GUARANTEE	1,705	0.002	0.000	1,638	0.002	0.000	0.000	0.000

TABLE 3

The Effect of Restatements on Liquidity Creation

This table presents the regression results of testing the effect of restatements on liquidity creation. The dependent variables are *LIQUIDCRE* and *LIQUIDCRE_OB*. *LIQUIDCRE* is the comprehensive liquidity creation measure accounting for both on- and off-balance sheet activities, while *LIQUIDCRE_OB* is the comprehensive liquidity creation measure excluding off-balance sheet activities. Both variables are normalized by gross total assets (*GTA*). *GTA* equals total assets plus the allowance for loan and lease losses and the allocated transfer risk reserve (a reserve for certain foreign loans). The regression utilizes a quarterly panel dataset of all US bank holding companies that had at least one restatement over the period 2000 through 2014. Bank holding company data are from Y-9C reports accessed via the Federal Reserve Bank of Chicago. The test variable *POST* is an indicator variable equal to one for the eight quarters following the restatement announcement (including the restatement announcement quarter), and zero for the eight quarters preceding the restatement announcement. Small banks are those with *GTA* up to $1 billion as of the restatement quarter, and large banks are those with *GTA* greater than $1 billion. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

	LIQUIDCRE			*LIQUIDCRE_OB*		
	All banks	Small banks	Large banks	All banks	Small banks	Large banks
POST	-0.004	-0.020***	-0.001	-0.007	-0.020***	-0.006
	(0.513)	(0.003)	(0.889)	(0.205)	(0.003)	(0.308)
TIER1CAP	-0.916***	-1.128***	-0.938***	-0.788***	-1.050***	-0.796***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SIZE	-0.019	-0.044	-0.018	-0.013	-0.064***	-0.007
	(0.514)	(0.221)	(0.602)	(0.548)	(0.001)	(0.781)
ROA	-0.812*	-0.198	-0.961*	-0.912**	-0.573	-0.914*
	(0.093)	(0.793)	(0.073)	(0.036)	(0.361)	(0.063)
NPL	-0.112	-0.413**	0.121	0.105	-0.188	0.302
	(0.513)	(0.049)	(0.571)	(0.478)	(0.273)	(0.112)
LLP	0.243	0.767	0.163	-0.117	0.500	-0.112
	(0.716)	(0.536)	(0.746)	(0.842)	(0.659)	(0.809)
CHARGEOFF	-1.224*	-2.222*	-0.941**	-0.846*	-1.868*	-0.630*
	(0.055)	(0.085)	(0.029)	(0.097)	(0.089)	(0.060)
ZSCORE	0.006	-0.001	0.011	0.006	0.001	0.012*
	(0.351)	(0.907)	(0.210)	(0.280)	(0.784)	(0.094)
LARGETIMEDEP	0.013	0.022	0.004	0.013	0.015	0.011
	(0.390)	(0.275)	(0.869)	(0.292)	(0.395)	(0.509)
LEV	-0.522*	-0.677	-0.463	-0.346	-0.592	-0.145
	(0.095)	(0.146)	(0.233)	(0.216)	(0.157)	(0.658)
LOANHHI	-0.091*	-0.053	-0.115*	-0.059	-0.062	-0.064
	(0.091)	(0.542)	(0.081)	(0.235)	(0.374)	(0.299)
Intercept	1.060*	1.497*	1.015	0.710	1.594***	0.424
	(0.069)	(0.054)	(0.162)	(0.107)	(0.003)	(0.429)
Time fixed effects	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES
Observations	3,343	1,164	2,179	3,343	1,164	2,179
Adj. R-squared	0.178	0.179	0.196	0.133	0.177	0.168

TABLE 4

Individual Components of Liquidity Creation

This table presents the regression results of testing the effect of restatements on disaggregated components of liquidity creation. In Column (1), the dependent variable *ILLIQUID_AT* represents illiquid assets divided by gross total assets (*GTA*). In Column (2), the dependent variable *LIQUID_LIAB* represents liquid liabilities divided by *GTA*. In Column (3), the dependent variable *LIQUID_AT* is liquid assets divided by *GTA*. In column (4), the dependent variable *ILLIQUID_LIAB* is illiquid liabilities divided by *GTA*. In Column (5), the dependent variable *ILLIQUID_GA* is illiquid off-balance sheet guarantees divided by *GTA*. In Column (6), the dependent variable *LIQUID_GA* is liquid off-balance sheet guarantees plus liquid derivatives divided by *GTA*. Appendix A provides detailed descriptions of individual components of liquidity creation measures. The regression utilizes a quarterly panel dataset of all US bank holding companies that had at least one restatement over the period 2000 through 2014. Bank holding company data are from Y-9C reports accessed via the Federal Reserve Bank of Chicago. The test variable *POST* is an indicator variable equal to one for the eight quarters following the restatement announcement (including the restatement announcement quarter), and zero for the eight quarters preceding the restatement announcement. Panel A presents the results for small banks, and Panel B presents the results for large banks. Small banks are those *GTA* up to $1 billion as of the restatement quarter, and large banks are those GTA greater than $1 billion as of the restatement quarter. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Small Banks

	Dependent variable =					
	(1) ILLIQUID_AT	*(2) LIQUID_LIAB*	*(3) LIQUID_AT*	*(4) ILLIQUID_LIAB*	*(5) ILLIQUID_GA*	*(6) LIQUID_GA*
POST	-0.008***	-0.023**	0.008*	0.001	-0.000	0.000
	(0.006)	(0.014)	(0.087)	(0.253)	(0.967)	(0.475)
TIER1CAP	-0.471***	-0.166	1.374***	0.088***	-0.162	-0.000
	(0.000)	(0.578)	(0.000)	(0.006)	(0.492)	(0.225)
SIZE	-0.023*	-0.056*	0.045**	0.003	0.040	-0.000
	(0.059)	(0.092)	(0.031)	(0.440)	(0.473)	(0.402)
ROA	-0.261	0.304	1.011*	0.178**	0.755	0.000
	(0.378)	(0.726)	(0.087)	(0.025)	(0.342)	(0.412)
NPL	0.122	-0.151	0.395**	-0.049***	-0.448***	0.000
	(0.207)	(0.481)	(0.010)	(0.001)	(0.006)	(0.586)
LLP	0.356	1.122	0.737	-0.261***	0.520	0.000
	(0.634)	(0.265)	(0.406)	(0.003)	(0.239)	(0.421)
CHARGEOFF	-1.207	-1.474	0.737	0.318***	-0.695	-0.000
	(0.235)	(0.108)	(0.194)	(0.000)	(0.160)	(0.723)
ZSCORE	-0.000	-0.001	-0.004	0.001	-0.003	0.000
	(0.960)	(0.930)	(0.270)	(0.187)	(0.327)	(0.232)
LARGETIMEDEP	-0.004	0.037	0.007	-0.003	0.016	-0.000
	(0.599)	(0.180)	(0.621)	(0.251)	(0.166)	(0.351)
LEV	-0.412*	-0.087	1.494***	-0.809***	-0.161	0.000
	(0.055)	(0.901)	(0.000)	(0.000)	(0.655)	(0.485)
LOANHHI	-0.173***	0.010	-0.031	-0.008	0.018	-0.000
	(0.000)	(0.940)	(0.541)	(0.309)	(0.786)	(0.217)
Intercept	0.974***	1.177	-1.822***	0.785***	-0.212	0.000
	(0.001)	(0.151)	(0.000)	(0.000)	(0.837)	(0.699)
Time fixed effects	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES
Observations	1,164	1,164	1,164	1,164	1,164	1,164
Adj. R-squared	0.255	0.085	0.334	0.797	0.207	-0.014

Panel B: Large Banks

	Dependent variable =					
	(1) ILLIQUID_AT	*(2) LIQUID_LIAB*	*(3) LIQUID_AT*	*(4) ILLIQUID_LIAB*	*(5) ILLIQUID_GA*	*(6) LIQUID_GA*
POST	-0.008	0.018*	0.022***	-0.001	0.001	0.000
	(0.124)	(0.069)	(0.004)	(0.144)	(0.908)	(0.314)
TIER1CAP	-0.423***	0.112	1.227***	0.058***	-0.256**	0.002
	(0.001)	(0.543)	(0.000)	(0.003)	(0.034)	(0.328)
SIZE	-0.011	0.035	0.045	-0.005	-0.016	0.000
	(0.575)	(0.354)	(0.198)	(0.243)	(0.480)	(0.360)
ROA	0.090	-1.309*	0.611	0.066	0.041	0.007
	(0.724)	(0.095)	(0.116)	(0.280)	(0.891)	(0.325)
NPL	0.430**	-0.385	-0.360	-0.069*	-0.450***	0.001
	(0.019)	(0.197)	(0.263)	(0.059)	(0.003)	(0.375)
LLP	0.492**	-1.703**	-0.736*	-0.235***	0.383	0.005
	(0.043)	(0.028)	(0.088)	(0.000)	(0.276)	(0.343)
CHARGEOFF	-0.368*	0.492	1.158***	0.168***	-0.332	0.001
	(0.088)	(0.381)	(0.001)	(0.005)	(0.271)	(0.692)
ZSCORE	-0.000	0.014	-0.010	0.001	0.000	0.000
	(0.956)	(0.228)	(0.172)	(0.175)	(0.963)	(0.500)
LARGETIMEDEP	0.003	-0.014	-0.025	-0.003	-0.022	-0.000
	(0.759)	(0.582)	(0.257)	(0.293)	(0.102)	(0.325)
LEV	-0.727***	1.114**	1.695***	-0.880***	-0.501**	0.001
	(0.000)	(0.043)	(0.000)	(0.000)	(0.037)	(0.749)
LOANHHI	-0.115***	-0.024	0.005	0.005	-0.095*	0.002
	(0.001)	(0.823)	(0.897)	(0.711)	(0.055)	(0.353)
Intercept	1.156***	-1.137	-1.984***	0.973***	0.964**	-0.005
	(0.000)	(0.186)	(0.002)	(0.000)	(0.042)	(0.380)
Time fixed effects	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES
Observations	2,179	2,179	2,179	2,179	2,179	2,179
Adj. R-squared	0.254	0.161	0.399	0.713	0.287	0.019

TABLE 5

Severity of Restatements

This table presents the regression results of testing the effect of the severity of restatements on liquidity creation. The dependent variable is *LIQUIDCRE* and *LIQUIDCRE_OB*. *LIQUIDCRE* is the comprehensive liquidity creation measure accounting for both on- and off-balance sheet activities, while *LIQUIDCRE_OB* is the comprehensive liquidity creation measure excluding off-balance sheet activities. Both variables are normalized by gross total assets (*GTA*). *CAR_RESTATE* is the inverse quartile rank (quartile rank multiplied by negative one) of 2-day cumulative abnormal returns following the announcement of restatement, adjusted for CRSP value-weighted market return. *ICW* is an indicator variable equal to one if the restatement announcement is accompanied by disclosure of material internal control weaknesses, and zero otherwise. *PERSISTENCE* is the number of quarters for which financial reports need to be restated. *REGULATOR* is an indicator variable equal to one if the restatement is triggered by bank regulators including the FDIC, the Federal Reserve Bank, and the OCC, and zero otherwise. Panel A presents the results for small banks, and Panel B presents the results for large banks. Small banks are those with *GTA* up to $1 billion as of the restatement quarter, and large banks are those with *GTA* greater than $1 billion. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Small Banks

	Dependent variable = *LIQUIDCRE*				Dependent variable = *LIQUIDCRE_OB*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST	-0.044***	-0.010*	-0.011*	-0.019***	-0.035***	-0.005	-0.014***	-0.017***
	(0.000)	(0.056)	(0.053)	(0.000)	(0.000)	(0.267)	(0.003)	(0.000)
*POST * CAR_RESTATE*	-0.014**				-0.010**			
	(0.013)				(0.020)			
*POST * ICW*		-0.012				-0.015**		
		(0.171)				(0.037)		
*POST * PERSISTENCE*			-0.005**				-0.003*	
			(0.012)				(0.091)	
*POST * REGULATOR*				-0.004				-0.014*
				(0.631)				(0.080)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	524	1,164	1,164	1,164	527	1,164	1,164	1,164
Adj. R-squared	0.110	0.121	0.120	0.113	0.222	0.144	0.131	-0.012

Panel B: Large Banks

	Dependent variable = *LIQUIDCRE*				Dependent variable = *LIQUIDCRE_OB*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POST	-0.002	-0.002	0.002	-0.002	-0.010	-0.008	-0.003	-0.007
	(0.886)	(0.891)	(0.591)	(0.880)	(0.358)	(0.346)	(0.435)	(0.270)
*POST * CAR_RESTATE*	0.003				0.001			
	(0.648)				(0.850)			
*POST * ICW*		-0.001				0.004		
		(0.932)				(0.753)		
*POST * PERSISTENCE*			-0.003				-0.002	
			(0.112)				(0.214)	
*POST * REGULATOR*				-0.003				0.008
				(0.832)				(0.493)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,871	2,179	2,171	2,179	1,871	2,179	2,171	2,179
Adj. R-squared	0.206	0.190	0.141	0.189	0.182	0.172	0.111	0.166

TABLE 6
The Effect of Crisis

This table presents the regression results of testing the effect of crisis on the post-restatement liquidity creation. The dependent variables are *LIQUIDCRE* and *LIQUIDCRE_OB*. *LIQUIDCRE* is the comprehensive liquidity creation measure accounting for both on- and off-balance sheet activities, while *LIQUIDCRE_OB* is the comprehensive liquidity creation measure excluding off-balance sheet activities. Both variables are normalized by gross total assets (*GTA*). *TEDSPREAD* is the quarterly average of the daily spread between the three-month London Interbank Offered Rate (LIBOR) and the three-month Treasury rate. *CRISIS* is an indicator variable equal to one from 2007Q3 through 2009Q2, and zero otherwise. The test variable *POST* is an indicator variable equal to one for the eight quarters following the restatement announcement (including the restatement announcement quarter), and zero for the eight quarters preceding the restatement announcement. Small banks are those with *GTA* up to $1 billion as of the restatement quarter, and large banks are those with *GTA* greater than $1 billion. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Small Banks

Dependent variable	*(1) LIQUIDCRE*		*(2) LIQUIDCRE_OB*	
POST	-0.016**	-0.022***	-0.015**	-0.022***
	(0.033)	(0.001)	(0.025)	(0.000)
*POST * TEDSPREAD*	-0.019		-0.024**	
	(0.151)		(0.050)	
*POST * CRISIS*		-0.029		-0.034**
		(0.114)		(0.034)
Control variables	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES
Observations	1,164	1,164	1,164	1,164
Adj. R-squared	0.146	0.147	0.172	0.173

Panel B: Large Banks

Dependent variable	*(1) LIQUIDCRE*		*(2) LIQUIDCRE_OB*	
POST	0.000	0.002	0.001	-0.000
	(0.962)	(0.844)	(0.936)	(0.978)
*POST * TEDSPREAD*	0.001		-0.005	
	(0.950)		(0.539)	
*POST * CRISIS*		-0.005		-0.011
		(0.728)		(0.249)
Control variables	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES
Observations	2,179	2,179	2,179	2,179
Adj. R-squared	0.229	0.229	0.185	0.186

TABLE 7

Bank Deposits and Deposit Interest Rates

This table presents the regression results of testing the effects of restatements on bank deposits and deposit interest rates. In column (1) the dependent variable *SAVINGSDEPOSIT* is the total amount of savings deposits scaled by gross total assets (*GTA*). In Column (2) the dependent variable *TRANSADEPOSIT* is the total amount of transaction deposits scaled by *GTA*. In Column (3) the dependent variable *DEPOSIT_RATE* is the implicit measure of deposit interest rates, defined as the ratio of deposit interest expenses to average interest-bearing deposits during the quarter, multiplied by 100. The test variable *POST* is an indicator variable equal to one for the eight quarters following the restatement announcement (including the restatement announcement quarter), and zero for the eight quarters preceding the restatement announcement. Panel A presents the results for small banks, and Panel B presents the results for large banks. Small banks are those with *GTA* up to $1 billion as of the restatement quarter, and large banks are those with *GTA* greater than $1 billion. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Small Banks

	Dependent variable =		
	(1) *SAVINGSDEPOSIT*	(2) *TRANSADEPOSIT*	(3) *DEPOSIT_RATE*
POST	-0.026*	0.001	0.078**
	(0.092)	(0.818)	(0.016)
TIER1CAP	-0.156	0.056	0.462
	(0.685)	(0.747)	(0.566)
SIZE	-0.037	-0.002	0.365***
	(0.396)	(0.848)	(0.000)
ROA	0.792	-0.372	-8.846***
	(0.394)	(0.253)	(0.006)
NPL	-0.428*	0.038	-0.352
	(0.071)	(0.523)	(0.587)
LLP	0.940	-0.028	-6.442
	(0.304)	(0.936)	(0.106)
CHARGEOFF	-1.455***	0.137	4.869
	(0.006)	(0.658)	(0.233)
ZSCORE	-0.006	0.005	0.006
	(0.474)	(0.113)	(0.722)
LARGETIMEDEP	0.006	0.024*	-0.001
	(0.829)	(0.087)	(0.990)
LEV	-0.373	0.310	-0.423
	(0.514)	(0.201)	(0.742)
LOANHHI	-0.021	0.022	0.137
	(0.896)	(0.561)	(0.577)
Intercept	0.965	-0.183	-3.046
	(0.181)	(0.570)	(0.157)
Time fixed effects	YES	YES	YES
Bank fixed effects	YES	YES	YES
Observations	1,164	1,164	1,122
Adj. R-squared	0.163	0.105	0.943

Panel B: Large Banks

	Dependent variable =		
	(1) *SAVINGSDEPOSIT*	(2) *TRANSADEPOSIT*	(3) *DEPOSIT_RATE*
POST	0.007	-0.005**	0.033*
	(0.289)	(0.047)	(0.074)
TIER1CAP	-0.315**	0.038	1.388***
	(0.010)	(0.606)	(0.004)
SIZE	-0.024*	-0.013	0.172***
	(0.097)	(0.226)	(0.007)
ROA	-0.004	-0.017	-5.439
	(0.989)	(0.909)	(0.134)
NPL	-0.152	0.061	-0.847
	(0.317)	(0.459)	(0.129)
LLP	-0.700*	0.156	3.174
	(0.092)	(0.522)	(0.314)
CHARGEOFF	-0.062	-0.007	1.868
	(0.838)	(0.968)	(0.314)
ZSCORE	-0.004	0.002	-0.004
	(0.518)	(0.455)	(0.850)
LARGETIMEDEP	0.001	-0.000	0.034
	(0.925)	(0.956)	(0.674)
LEV	-0.287	0.065	1.461
	(0.217)	(0.550)	(0.100)
LOANHHI	-0.044	-0.006	-0.539***
	(0.307)	(0.823)	(0.002)
Intercept	0.887***	0.166	-2.758*
	(0.004)	(0.335)	(0.056)
Time fixed effects	YES	YES	YES
Bank fixed effects	YES	YES	YES
Observations	2,179	2,179	2,075
Adj. R-squared	0.154	0.154	0.936

Table 8

Bank Risk Taking and Post-restatement Liquidity Creation

This table presents the regression results of testing the linkage between bank risk taking in the misreporting period and post-restatement liquidity creation decline. Δ*CHARGEOFF* is defined as the average loan charge-offs over quarters in the post-restatement period minus the average loan charge-offs over quarters in the pre-restatement period. *NONINTREV* is defined as the average percentage change in the ratio of bank noninterest fee income (minus deposit service charges and trading revenue) to total interest revenue over quarters in the pre-restatement period. *INTMARGIN_VOL* is the volatility of net interest margin, defined as the standard deviation of net interest margin over quarters in the misreporting period; net interest margin is measured as the interest income minus interest expense scaled by interest-bearing assets. *HIGH_*Δ*CHARGEOFF*, *HIGH_NONINTREV*, and *HIGH_INTMARGIN_VOL* are indicator variables equal to one if the corresponding risk-taking measures are above the sample medians. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Small Banks

	LIQUIDCRE			*LIQUIDCRE_OB*		
	(1)	(2)	(3)	(4)	(5)	(6)
POST	-0.001	-0.006	-0.008	-0.008	-0.008	-0.014***
	(0.895)	(0.488)	(0.125)	(0.263)	(0.323)	(0.006)
*POST * HIGH_*Δ*CHARGEOFF*	-0.035**			-0.021*		
	(0.010)			(0.059)		
*POST * HIGH_NONINTREV*		-0.023*			-0.020**	
		(0.050)			(0.049)	
*POST * HIGH_INTMARGIN_VOL*			-0.010*			-0.007
			(0.089)			(0.217)
Control variables	YES	YES	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES
Observations	1,164	1,151	1,120	1,164	1,151	1,120
Adj. R-squared	0.199	0.189	0.171	0.187	0.191	0.107

Panel B: Large Banks

	LIQUIDCRE			*LIQUIDCRE_OB*		
	(1)	(2)	(3)	(4)	(5)	(6)
POST	-0.001	-0.010	0.010	0.000	-0.013	0.004
	(0.895)	(0.492)	(0.435)	(0.988)	(0.140)	(0.674)
*POST * HIGH_*Δ*CHARGEOFF*	0.000			-0.012		
	(0.988)			(0.279)		
*POST * HIGH_NONINTREV*		0.016			0.013	
		(0.263)			(0.237)	
*POST * HIGH_INTMARGIN_VOL*			-0.021			-0.019
			(0.169)			(0.158)
Control variables	YES	YES	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES
Observations	2,179	2,179	2,121	2,179	2,179	2,121
Adj. R-squared	0.196	0.199	0.200	0.170	0.171	0.178

TABLE 9

Comparing Misstating Period versus Pre-misstating Period

This table presents the results of comparing liquidity creation during the misstating periods and the pre-misstating periods. The dependent variables are *LIQUIDCRE* and *LIQUIDCRE_OB*. The test variable *MISSTATINGPERIOD* is an indicator variable equal to one for the misstating period as indicated in the restatement announcement, and zero for the eight quarters before the misstating period. *LIQUIDCRE* is the comprehensive liquidity creation measure accounting for both on- and off-balance sheet activities, while *LIQUIDCRE_OB* is the comprehensive liquidity creation measure excluding off-balance sheet activities. Both variables are normalized by gross total assets (*GTA*). The regression utilizes a quarterly panel dataset of all US bank holding companies that had at least one restatement over the period 2000 through 2014. Bank holding company data are from Y-9C reports accessed via the Federal Reserve Bank of Chicago. Small banks are those with *GTA* up to $1 billion as of the restatement quarter, and large banks are those with *GTA* greater than $1 billion. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

	LIQUIDCRE			*LIQUIDCRE_OB*		
	All banks	Small banks	Large banks	All banks	Small banks	Large banks
MISSTATINGPERIOD	-0.002	-0.003	0.001	-0.001	-0.006	0.001
	(0.793)	(0.619)	(0.914)	(0.804)	(0.327)	(0.847)
TIER1CAP	-0.849***	-0.783***	-0.779**	-0.614***	-0.668***	-0.521**
	(0.000)	(0.000)	(0.012)	(0.000)	(0.000)	(0.021)
SIZE	-0.037**	-0.041	-0.033	-0.027*	-0.040	-0.025
	(0.020)	(0.343)	(0.117)	(0.068)	(0.302)	(0.183)
ROA	0.180	0.198	0.275	0.187	0.032	0.215
	(0.670)	(0.567)	(0.652)	(0.584)	(0.910)	(0.690)
NPL	-0.290*	0.084	-0.380*	-0.036	0.115	-0.049
	(0.084)	(0.582)	(0.098)	(0.776)	(0.365)	(0.793)
LLP	0.711*	0.668	0.907	0.788**	0.531	0.918
	(0.088)	(0.193)	(0.185)	(0.033)	(0.229)	(0.112)
CHARGEOFF	-1.099**	-1.122*	-1.183	-0.608*	-0.769	-0.558
	(0.023)	(0.096)	(0.194)	(0.070)	(0.259)	(0.251)
ZSCORE	0.003	0.006	0.003	0.008**	0.007	0.011*
	(0.718)	(0.283)	(0.849)	(0.047)	(0.119)	(0.085)
LARGETIMEDEP	-0.006	-0.003	-0.010	0.003	-0.009	0.005
	(0.636)	(0.882)	(0.524)	(0.811)	(0.648)	(0.682)
LEV	-0.305	-0.125	-0.316	0.106	-0.070	0.222
	(0.409)	(0.659)	(0.562)	(0.601)	(0.790)	(0.394)
Intercept	1.094**	0.901	1.073*	0.454*	0.746	0.310
	(0.017)	(0.161)	(0.090)	(0.090)	(0.157)	(0.370)
Time fixed effects	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES
Observations	2,345	718	1,627	2,345	718	1,627
Adj. R-squared	0.228	0.387	0.160	0.217	0.369	0.126

TABLE 10
Difference-in-differences Analyses

This table presents the results of using a difference-in-differences research design. Each restatement bank is matched, at the restatement quarter, with a bank that did not restate during the sample period, based on gross total assets (*GTA*) and tier1 capital ratio. The dependent variables are *LIQUIDCRE* and *LIQUIDCRE_OB*. *LIQUIDCRE* is the comprehensive liquidity creation measure accounting for both on and off-balance sheet activities, while *LIQUIDCRE_OB* is the comprehensive liquidity creation measure excluding off-balance sheet activities. Both variables are normalized by *GTA*. *POST* is an indicator variable equal to one for the eight quarters following the restatement announcement (including the restatement announcement quarter), and zero for the eight quarters preceding the restatement announcement. *TREAT* is an indicator variable equal to one for restatement banks, and zero for non-restatement banks. Small banks are those with *GTA* up to $1 billion as of the restatement quarter, and large banks are those with *GTA* greater than $1 billion. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

	LIQUIDCRE			*LIQUIDCRE_OB*		
	All banks	Small banks	Large banks	All banks	Small banks	Large banks
POST	0.008	-0.001	0.008	0.005	-0.004	0.006
	(0.233)	(0.798)	(0.302)	(0.255)	(0.417)	(0.294)
*POST*TREAT*	-0.011	-0.019**	-0.008	-0.009	-0.017**	-0.007
	(0.157)	(0.046)	(0.413)	(0.126)	(0.040)	(0.337)
TIER1CAP	-1.042***	-0.925***	-1.116***	-0.875***	-0.806***	-0.906***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SIZE	-0.054**	-0.017	-0.062**	-0.035**	-0.040**	-0.031
	(0.016)	(0.552)	(0.036)	(0.033)	(0.031)	(0.142)
ROA	-0.106	0.777**	-0.163	-0.257*	0.443*	-0.320*
	(0.603)	(0.013)	(0.564)	(0.079)	(0.094)	(0.083)
NPL	-0.515**	-0.207	-0.663**	-0.080	-0.056	-0.070
	(0.016)	(0.170)	(0.041)	(0.484)	(0.665)	(0.661)
LLP	0.789	1.236**	0.664	0.402	1.067*	0.231
	(0.118)	(0.047)	(0.198)	(0.281)	(0.072)	(0.433)
CHARGEOFF	-1.197**	-1.385*	-0.870	-0.613	-1.304*	-0.250
	(0.035)	(0.075)	(0.116)	(0.122)	(0.058)	(0.393)
ZSCORE	0.005	0.000	0.006	0.008**	0.001	0.011**
	(0.385)	(0.974)	(0.491)	(0.029)	(0.738)	(0.037)
LARGETIMEDEP	0.010	0.002	0.012	0.016	-0.004	0.025
	(0.526)	(0.888)	(0.540)	(0.208)	(0.783)	(0.124)
LEV	-0.358	-0.746*	-0.326	-0.306	-0.611*	-0.250
	(0.193)	(0.056)	(0.298)	(0.151)	(0.096)	(0.291)
Intercept	1.401***	1.182***	1.533**	0.960***	1.256***	0.858*
	(0.004)	(0.008)	(0.012)	(0.007)	(0.000)	(0.052)
Time fixed effects	YES	YES	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES	YES	YES
Observations	6,803	2,044	4,759	6,803	2,044	4,759
Adj. R-squared	0.213	0.166	0.209	0.197	0.185	0.189

TABLE 11

Using a Finer Partition of Bank Size

This table presents the results of using a finer size partition for sample banks. Specifically, banks are grouped into four different size bins: (1) banks with gross total assets (*GTA*) greater than or equal to $10b, (2) banks with *GTA* between $3 and $10b, (3) banks with *GTA* between $1 and $3b, and (4) banks with *GTA* below or equal to $1b. The dependent variable in Panel A is *LIQUIDCRE*. The dependent variable in Panel B is *LIQUIDCRE_OB*. *LIQUIDCRE* is the comprehensive liquidity creation measure accounting for both on- and off-balance sheet activities, while *LIQUIDCRE_OB* is the comprehensive liquidity creation measure excluding off-balance sheet activities. Both variables are normalized by *GTA*. The test variable *POST* is an indicator variable equal to one for the eight quarters following the restatement announcement (including the restatement announcement quarter), and zero for the eight quarters preceding the restatement announcement. Time (year and quarter) fixed effects and bank fixed effects are included in all regressions. Standard errors, clustered at the bank level, are reported in parentheses. ***, **, * denote that the coefficients are statistically significantly different from zero at the 1%, 5%, and 10% level, respectively.

Panel A: Dependent Variable = *LIQUIDCRE*

	GTA is:			
	(1)	*(2)*	*(3)*	*(4)*
	$1B and below	$1 - $3 B	$3 - $10 B	$ 10B and above
POST	-0.020***	0.002	0.008	-0.002
	(0.003)	(0.617)	(0.342)	(0.943)
Control variables	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES
Observations	1,164	1,062	605	512
Adj. R-squared	0.179	0.193	0.233	0.273

Panel B: Dependent Variable = *LIQUIDCRE_OB*

	GTA is:			
	(1)	*(2)*	*(3)*	*(4)*
	$1B and below	$1 - $3 B	$3 - $10 B	$10B and above
POST	-0.020***	0.001	0.009	-0.014
	(0.003)	(0.838)	(0.293)	(0.307)
Control variables	YES	YES	YES	YES
Time fixed effects	YES	YES	YES	YES
Bank fixed effects	YES	YES	YES	YES
Observations	1,164	1,062	605	512
Adj. R-squared	0.177	0.144	0.233	0.173

VITA

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Wei's dissertation examines the impact of bank accounting restatements on bank liquidity creation. His study finds that banks' ability to create liquidity declines materially after restatements, and such an effect manifests itself primarily among smaller banks. His paper speaks to the ongoing discussion among policy makers and academic researchers on the implications of financial reporting transparency for bank stability, and more broadly, for the allocation of economic resources. Wei presented his dissertation paper at several prestigious academic institutions including Temple University, University at Buffalo, University of Illinois-Champaign, and Yale University. Wei will be joining Temple University in Fall 2017 as a Tenure-track Assistant Professor of Accounting.