

Banks' Financial Reporting and Financial System Stability

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ABSTRACT

The use of accounting measures and disclosures in banks' contracts and regulation suggests that the quality of banks' financial reporting is central to the efficacy of market discipline and non-market mechanisms in limiting banks' development of debt and risk overhangs in economic good times and in mitigating the adverse consequences of those overhangs for the stability of the financial system in downturns. This essay examines how research on banks' financial reporting, informed by the financial economics literature on banking, can generate insights about how to enhance the stability of the financial system. We begin with foundational discussion of how aspects of banks' accounting and disclosures may affect stability. We then evaluate representative papers in the empirical literature on banks' financial reporting and stability, pointing out the research design issues that empirical accounting researchers need to confront to develop well-specified tests able to generate reliably interpretable findings. To this end, we provide examples of settings amenable to addressing these issues. We conclude with considerations for accounting standard setters and financial system policymakers.

1. Introduction

The financial crisis has motivated an ongoing and many-faceted debate about the actions that policymakers can take to increase the stability of the financial system (“stability”). We define 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 (“cycle”). Two points are generally agreed upon in this debate. First, banks, as the primary backstop providers of liquidity in the economy and issuers of federally guaranteed deposits to households, are critical to stability. Second, stability is enhanced by restraining banks’ undisciplined investment financed by readily available credit in economic good times and thereby reducing the frequency and severity of their disinvestment due to restricted credit availability in downturns. In particular, deterring banks from accumulating excessive leverage (“debt overhangs”) and holdings of potentially illiquid assets (“risk overhangs”) during good times is crucial to mitigating their disinvestment in downturns. The debate pertains to the relative efficacy of alternative means by which to improve banks’ health and decision-making, individually and especially collectively, thereby promoting stability.

This essay examines the role that research on banks’ financial reporting (i.e., accounting and mandatory disclosure) can play in the debate about how policymakers can increase stability. Our focus on stability distinguishes this essay from recent surveys of the broad literature on banks’ financial reporting (Ryan [2011], Beatty and Liao [2014]). Informed by the extensive financial economics–based literature on banking, we identify researchable questions that accounting researchers should examine. We emphasize questions that address substantive debates among academics and policymakers, including the relative benefits and costs of: (1) transparency versus opacity about banks’ risk exposures; (2) the use of financial reporting versus

regulatory reporting or dynamic capital requirements as mechanisms to build countercyclical buffers in banks' regulatory capital; (3) alternative accounting measurement bases that differentially introduce volatility, anticipation of cycle turns, or discretion in banks' reported income and regulatory capital; and (4) alternative accounting approaches that record financing on- rather than off-balance sheet or that present risk-concentrated exposures gross rather than net on the balance sheet. We explain research design issues that empirical accounting researchers must confront to develop and implement well-specified tests of hypotheses that are capable of generating reliably interpretable findings regarding these questions. We also evaluate the limited success of the research to date in confronting these issues and the substantial opportunities that remain to do so. While researchers in accounting and finance are our primary intended audience, we hope that accounting standard setters and financial system policymakers will also find this essay useful.

Existing financial economics literature on bank regulation and financial crises stresses the perverse incentives of banks with debt and risk overhangs. Debt overhangs provide banks with incentives to remain under-capitalized, since the benefits of issuing equity primarily accrue to creditors, and to make investment decisions that effectively constitute gambles for resurrection (also called "risk shifting" or "asset substitution"), since their equity is an out-of-the-money call option that benefits strongly from volatility (Jensen and Meckling [1976], Dewatripont and Tirole [1993]). Debt overhangs also provide banks with disincentives to invest in positive present value projects for which the benefits primarily accrue to creditors (Myers [1977], Admati et al. [2012]). Risk overhangs limit banks' willingness to make new positive present value investments in the types of assets involved in these overhangs (Gron and Winton [2001]). Debt and risk overhangs that are highly positively correlated across banks impair stability by limiting the

opportunities for reintermediation within the banking sector and by increasing the likelihood that banks receive taxpayer-funded bailouts when they fail *en masse*.

These perverse incentives can manifest in various ways depending on the extent of banks' debt overhangs, the nature of the problem assets involved in banks' risk overhangs, and other contextual factors. Examples include banks avoiding recording provisions for loan losses by rolling over non-performing loans (as occurred with U.S. banks' lending to less-developed countries in the 1980s and with Japanese banks' lending to zombie borrowers in their prolonged banking crisis beginning in the early 1990s) or doubling up bets on illiquid securities that have experienced significant adverse price shocks (as occurred with U.S. thrifts' accumulation of junk bonds and other risky assets in the deregulatory period in the 1980s prior to the thrift crisis). Banks are especially likely to engage in such behaviors if they rationally expect central banks to step in as lenders of last resort ("LOLRs") by providing liquidity against pledged problem assets. Such interventions increase the market value of the assets without addressing the underlying reasons why they became problem and might even lead banks to increase their exposure to risky assets *ex ante*. In addition to making banks fragile, gambles for resurrection reduce banks' aggregate provision of liquidity to deserving sectors of the economy and lead to decreases in asset prices when banks fail or the gambles are otherwise unwound. Decreases in the prices of widely held illiquid assets make banks collectively fragile. Limiting banks' development of debt and risk overhangs *ex ante* and their ability to gamble for resurrection *ex post* is thus critical to ensuring stability.

A key assumption in this literature is that banks' leverage and risk are not perfectly observable (e.g., Diamond and Dybvig [1983]). Imperfect observability occurs for various reasons. For example, it is difficult to measure the value and risk of banks' exposures when the

relevant markets are illiquid. Many of these exposures are cycle-contingent (e.g., loan commitments, credit and liquidity support in securitizations, and margin calls on derivatives). While imperfect observability implies that market discipline, private contracts, and bank regulation cannot ensure that banks maintain optimal risk levels, banks' contracts and regulation still regularly employ accounting measures of their capitalization and risk exposures. These measures range from simple book measures based on bank-level bottom-line accounting numbers, such as leverage ratios, to sophisticated market or book measures based on portfolio-level modeling, such as Value at Risk. Similarly, the Basel Committee on Banking Supervision [2015] recently expanded risk disclosure requirements in order to enhance market discipline under Basel III's Pillar 3. The use of accounting measures and disclosures in banks' contracts and regulation suggests that the quality of banks' financial reporting is central to the efficacy of market discipline and non-market mechanisms in limiting the debt and risk overhang problems.¹

Little consensus currently exists among accounting researchers and policymakers as to what financial reporting approaches exacerbate or mitigate these problems. In our interpretation, this lack of consensus stems from differing views about three underlying questions that are depicted in Figure 1. First, what is the primary role of financial reporting, providing accurate information on a timely basis to market participants or facilitating contracting and regulation, given the ability of contracting parties to adjust reported accounting numbers and the existence of regulatory reporting? For example, bank regulators have proposed policies that would require or enable banks to build countercyclical regulatory capital buffers in economic good times that would cushion their capital in downturns. Some of these proposals would build these buffers through financial reporting, typically by accruing in good times for losses expected to be realized

¹ The points made in this paragraph are analogous to those made by Christensen, Nikolaev, and Wittenberg-Moerman [this issue] about the role of accounting information in promoting the efficiency of financial contracting.

in future downturns (e.g., dynamic provisioning for loan losses or recognizing fair valuation discounts for potential future market illiquidity). Such proposals generally would violate the FASB's conceptual framework and, absent disclosure of the capital buffers created, might reduce the transparency of the information available to market participants and thus market discipline. These buffers could alternatively, and in our view preferably, be built through regulatory reporting or by requiring higher regulatory capital ratios in good times than in downturns.

Second, what accounting approaches are most robust across the cycle? For example, fair value and amortized cost accounting are differentially sensitive to market illiquidity for the financial instruments being measured and prone to banks exercising discretion over these measurements. Fair value accounting could facilitate banks' gambling for resurrection by enabling "mark to myth" level 3 fair value measurements or due to distortions in market prices resulting from LOLRs providing liquidity against problem assets. Amortized cost accounting could facilitate such gambling by allowing banks to defer write-downs of impaired assets while realizing gains by selling non-problem assets that have increased in value as a result of flights to quality, thereby reducing the quality of their asset mix.

Third, do accounting approaches that yield more volatile net income, owners' equity, or regulatory capital for banks also yield more frequent or severe adverse feedback effects? Such effects can occur through various channels, such as increases in illiquidity premia if banks sell problem assets to avoid recording future losses and more frequent violations by banks of debt covenants and regulatory capital requirements. The potential for increased illiquidity premia depends on the effects of banks' incremental capital and income volatility on market participants' understanding of banks' solvency and performance, as well as on how banks' beliefs about these effects affect their decisions whether to sell illiquid problem assets. The

potential for debt covenants and regulatory capital requirements to be violated depends on whether and how contracts and regulation adjust for differences in the volatility of accounting numbers generated using different accounting approaches.

While the third question is usually framed in terms of *ex post* adverse feedback effects, financial and regulatory reporting requirements can also yield better *ex ante* decision-making by banks. For example, well-chosen risk-reporting requirements could induce banks and their regulators to better understand how potential future macroeconomic conditions, financial market illiquidity, or commonality among banks' exposures map into losses on these exposures and liquidity requirements for banks. Financial and regulatory reporting could convey this understanding, perhaps in an aggregated form, to market participants. Better *ex ante* understanding by all parties can mitigate bank opacity that arises when the cycle turns, thereby reducing the likelihood and severity of adverse feedback effects.

Overarching accounting researchers' and policymakers' differing views about the second and third questions are differing views about whether bank opacity compromises or promotes stability. Some believe that bank transparency is necessary to promote market discipline that is critical for stability. Others believe that bank opacity is necessary to suppress behaviors that compromise stability, such as bank runs.

The lack of consensus about the effects of alternative financial reporting requirements for banks on stability described above indicates the need for additional empirical research to identify these effects. For such identification to be credible, empirical researchers must employ research designs that adequately address the primary threats to valid inferences in the settings examined. These threats often arise from the occurrence of events contemporaneous with changes in

financial reporting requirements or from the association of contextual variables with firms' choices among allowed financial reporting approaches.

For example, consider a study that empirically examines the effects of the IASB's October 13, 2008 amendment of IAS 39 on stability. This amendment allows firms to reclassify financial assets out of categories for which relatively extensive forms of fair value accounting are required into categories for which less extensive forms of fair value accounting or amortized cost accounting are required; moreover, reclassifications made upon firms' initial adoption of the amendment could be retroactive to July 1, 2008. This amendment weakened fair value accounting requirements, at least in part for the purpose of regulatory forbearance. The politically charged timing of this amendment occurred on the same day as the announcement of the provision of \$2.5 trillion of European governmental guarantees of new bank debt, an instance of regulatory bailout. Large banks with sizeable trading positions accounted for using the most extensive form of fair value accounting both had the most ability to exploit this amendment and received the bulk of these guarantees. This example illustrates the general problem that the effects of a suspension or weakening of fair value accounting requirements on stability are likely to be tangled up, both theoretically and empirically, with the effects of regulatory bailout or forbearance.^{2, 3}

We briefly discuss three other broadly important research design issues here. The first two issues apply to any empirical examination of the relation between banks' financial reporting and stability, while the third applies specifically to examinations of banks' lending activities.

² See the prior draft of this paper (Acharya and Ryan [2015, Section 4], available on SSRN) for a simple model of the different effects of fair value versus amortized cost accounting on stability given the possibility of regulatory bailout or forbearance.

³ The problems identified in the last two paragraphs are analogous to those that Leuz and Wysocki [this issue, Section 5.5] identify regarding research on international financial reporting: "there is an inherent interdependency and complementarity between reporting and non-reporting institutions in each country."

First, empirical results on the association of cross-sectional variation in banks' financial reporting *choices* under existing accounting requirements with stability need not generalize to the effects of alternative financial reporting *requirements* on stability. Banks' financial reporting choices reflect their characteristics (e.g., capitalization, risk, and balance sheet composition), economic conditions (e.g., cycle phase and uncertainty about financial asset values), and other factors (e.g., contracts and regulation). Empirical researchers typically control at best partially for these contextual variables. As a consequence, extant empirical results can often be interpreted as stronger banks make both better financial reporting choices and less cyclical decisions given the context examined, rather than as better required financial reporting approaches lead to less cyclical decisions regardless of the context. This internal-validity issue results from the fact that we cannot observe the counterfactual accounting treatments holding the context constant.

Second, many financial reporting approaches intended to enhance stability would do so by suppressing banks' accounting volatility or disclosure transparency regarding the effects of changing economic conditions across the cycle. This suppression likely would cushion normal business cycles through which virtually all banks survive and prosper. However, it would also reduce the ability for financial reporting to provide early warning of changing economic conditions. This might lull banks and their regulators into false senses of security as asset price bubbles inflate or lead them to downplay the appearance of cracks in banks' business models as these bubbles begin to deflate. Severe downturns such as the 2007-2009 financial crisis tend to be accompanied by a high degree of bank opacity that motivates banks and other market participants to take self-protective, stability-impairing actions, such as racing to the exits to sell assets or withdrawing financing to other banks. Hence, it is difficult to generalize findings obtained in normal cycles to extreme cycles, and vice versa. This external-validity issue pertains

to the difficulty of generalizing documented effects of financial reporting approaches for stability obtained from analysis of samples drawn from particular contextual settings to alternative settings.

Third, the direct causal effects of banks' financial reporting approaches on stability predominantly occur through banks' ability and willingness to supply loans for borrowers' positive net present value projects, not through borrowers' loan demand. Banks' *ability* to supply loans depends on their current levels and available sources of capital and liquidity. Researchers cannot simply use banks' current levels of capital and liquidity as loan-demand-independent measures of loan supply, however, because banks' past satisfaction of loan demand reduces their capital ratios and liquidity, all else being equal. As discussed in Sections 4 and 5, the literature employs various approaches to distinguish loan supply from loan demand. These approaches include controlling for explanatory variables related to loan demand, partitioning on size or other variables primarily related to loan supply, employing loan-level data on loan applications (expressed loan demand) as well as loan originations (loan supply meeting that demand), and examining plausibly exogenous shocks to loan supply.

The need to identify the effects of banks' financial reporting approaches on loan supply raises three subsidiary but still important issues for accounting researchers to consider and, if deemed significant in the settings under examination, incorporate into their research designs. First, identifying the effect of banks' accounting treatments on their regulatory capital and thus ability to supply loans poses difficulties akin to those addressed by the sizeable theoretical and empirical literature examining the effects of monetary policy on loan supply. This "macroprudential" literature finds that the effects of macroeconomic policy on loan supply primarily obtain for smaller, less well capitalized, and less liquid banks. Accounting researchers

should either ensure that documented effects of banks' financial reporting approaches on loan supply conform to these analogous findings in the macroprudential literature or credibly explain why they do not.

Second, incremental to their *ability* to supply loans, banks' *willingness* to supply loans depends on banks' current understanding of loan risks and their comfort that this understanding will be borne out by subsequent loan performance. Banks' understanding of loan risks likely is influenced by their accounting treatments and the overall quality of their financial reporting systems. We encourage accounting researchers to think about how to identify the effects of banks' accounting treatments and systems on banks' willingness to supply loans.

Third, loan supply and demand are interrelated with each other and with the accounting for loans in ways that these constructs are not for typical economic goods. Loan supply and demand are interrelated with each other because a bank generally does not view a loan to one borrower as substitutable with a contractually identical loan to another borrower; the two borrowers may exhibit loss rates with different average levels, cyclicalities, or uncertainties. In other words, borrower attributes affect the loan potentially supplied from the bank's perspective. This is a concern for empirical researchers because banks with different attributes (e.g., locations, sizes, and risk tolerances) often lend to different types of borrowers. Loan supply is interrelated with the accounting for loans because FAS 5's incurred loss model works differently for different types of loans. Ideally, accounting researchers should conduct empirical analysis by type of loan or at least controlling for loan portfolio composition.

Although the research design issues threatening valid inferences about the relation between banks' financial reporting and stability are individually and collectively formidable, we emphasize that attention to sound empirical identification can yield credible results in individual

studies that examine this relation in specific settings using specific designs. Because individual studies cannot possibly describe such a complex relation completely, however, it is most important that the literature as a whole generates results that generalize or otherwise can be understood to cohere across alternative settings and designs. We believe researchers in individual studies can most effectively advance the literature toward this end by focusing less on controlling for the kitchen sink and more on identifying and examining the primary causal force at play in the setting examined and by applying the guidelines for valid inference developed in the philosophy of science. We mention particularly John Stuart Mill's (1843) three methods for eliminating alternative explanations for hypothesized causal relations. Mill's methods are to show the hypothesized effect is: (1) present when the hypothesized cause is present (Method of Agreement), (2) absent when the hypothesized cause is absent (Method of Difference), and (3) stronger when the hypothesized cause is stronger (Method of Concomitant Variation). As discussed in Section 4, the literature often neglects Mill's latter two methods.

Given the importance of stability for policymakers and accounting standard setters, there is a good chance that credible empirical research on the relation between banks' financial reporting and stability will influence financial reporting requirements. We have the individual and collective responsibility to ensure that our research is as reliable and interpretable as possible.

The remainder of this essay is organized as follows. Sections 2 and 3 provide foundational discussions of why and how banks' accounting and disclosure, respectively, affect stability. Section 4 evaluates extant empirical work on banks' financial reporting and stability, and Section 5 provides examples of opportunities for future empirical work on this topic. Section

6 concludes with considerations for accounting standard setters and financial system policymakers.

2. Banks' Accounting and Stability: Key Conceptual Issues and Policy Tradeoffs

In this section, we describe two general aspects of banks' accounting for financial instruments and other items that have sizeable effects on banks' financial statements and regulatory capital and so may have significant implications for stability: (1) alternative accounting measurement bases and (2) gross versus net balance sheet presentation of financial instruments with concentrated risks or that are covered by netting agreements.⁴ We discuss the key conceptual issues and policy tradeoffs that these aspects of accounting raise for stability that remain to be addressed through empirical research.

While the first aspect of banks' accounting has received more attention in the accounting literature to date, in our view the second aspect has more direct and significant implications for stability due to its greater effects on banks' regulatory capital ratios. This is especially true for the most systemically important banks that hold large amounts of risk-concentrated financial instruments, many of which are covered by netting agreements with key counterparties.

Both of these aspects of banks' accounting are accompanied by currently required disclosures in financial and regulatory reports, and they could be further illuminated through additional disclosure requirements. We discuss these disclosures in Section 3.

2.1 ALTERNATIVE ACCOUNTING MEASUREMENT BASES

Alternative accounting measurement bases for financial instruments and other items differentially introduce volatility, anticipation of cycle turns, and discretion in banks' reported

⁴ We do not describe recording financing on- rather than off-balance sheet in this section. This aspect of accounting for certain financing instruments is better understood than the risk-concentration and netting aspects that we discuss, and it raises similar conceptual issues and policy tradeoffs.

net income, owners' equity, and regulatory capital. In this section, we consider two choices that accounting standard setters face with respect to alternative accounting measurement bases for financial instruments: (1) the general choice between amortized cost and fair value accounting and (2) the specific choice of accruing for loan losses under FAS 5's current incurred loss model versus an expected loss model or dynamic loss provisioning. While strongly akin to the first choice, the second choice is of particular importance for stability and thus worthy of separate discussion for several reasons: loans are banks' dominant asset; loan loss accruals are the most significant accounting estimates for all but a few very large trading-oriented banks, and these accruals are the second most significant estimates even for these banks; and loan loss accruals are directly related to banks' lending and thus to stability. For these reasons, extant research on the relation between banks' provisioning for loan losses and stability (discussed in Section 4.1) is more focused and yields crisper conclusions than does the extant research on the relation between banks' fair value versus amortized cost accounting and stability (discussed in Section 4.2). In the remainder of this section, we briefly describe these alternative measurement bases; see Ryan [2011, Sections 3.1 and 4.1-4.3] for lengthier descriptions. We also mention deferred tax assets that may arise as a result of differences between these measurements and the corresponding measurements for tax purposes, as well as from other aspects of banks' financial accounting.

In its pure form, amortized cost accounting measures financial instruments throughout their lives using information available at the inception of the instruments. Pure amortized cost accounting suppresses all volatility associated with unrealized gains and losses, involves no anticipation of cycle turns, and limits banks' discretion to the realization of gains and losses. The U.S. GAAP rules governing most types of financial assets require firms to write down assets'

amortized cost bases when they determine the assets to be impaired. To the extent that banks record such write-downs, amortized cost accounting takes on some of the aspects of fair value accounting with respect to the recognition of bad news.

In contrast, fair value accounting measures financial instruments each period using current information about future cash flows and relevant interest rates. When the markets for the instruments involved are liquid, fair value measurement incorporates all volatility associated with unrealized gains and losses and anticipates cycle turns insofar as they are predictable based on current information. When the relevant markets are illiquid, however, limited market discipline over fair value estimates enables banks to exercise discretion over these estimates (Badia et al. [2015]). Depending on the type of financial instrument involved, the form of fair value accounting required by U.S. GAAP may require unrealized gains and losses to be recorded either in net income or in other comprehensive income. Banks' regulatory capital generally is unaffected by unrealized gains and losses recorded in other comprehensive income.⁵

FAS 5's incurred loss model requires banks to accrue for credit losses on loans only if those losses are incurred, probable of being realized, and capable of reasonable estimation ("estimable") based on current conditions. The requirement that banks meet all three of these conditions to accrue for loan losses largely restricts anticipation of cycle turns, and focuses banks' discretion on identifying and quantifying incurred, probable, and estimable losses.

In contrast, the FASB's proposed expected loss model would eliminate FAS 5's probable condition for loss recognition. This proposal would also substantially weaken the standard's incurred and estimable conditions by requiring banks to use "reasonable and supportable forecasts" of future credit losses based on "factors such as management's evaluation of the

⁵ Under Basel III as applied internationally, unrealized gains and losses recorded in other comprehensive income are now included in banks' regulatory capital. In July 2013, the U.S. bank regulators decided to require this aspect of Basel III only for the few very large U.S. banks applying Basel III's advanced methods.

current point in the economic cycle.” The proposal would not suppress much if any volatility, requires significant anticipation of cycle turns, and broadens banks’ discretion to determining when and how strongly the cycle will turn and other factors affecting future credit losses.

Absent the measurement issues associated with market illiquidity or banks’ exercise of discretion described above, fair value accounting and expected provisioning for loan losses should provide earlier warning of deterioration in economic conditions than do amortized cost accounting and provisioning for loan losses under the incurred loss model, respectively. If bank regulators and others with the power to affect bank decision-making heed this earlier warning, they can act to limit banks’ gambling for resurrection and other behaviors with adverse effects on stability.

The relevant markets may be illiquid, however, either temporarily due to a credit market dislocation or persistently due to structural market incompleteness (e.g., non-agency mortgage-backed securities rarely trade after issuance). When this is the case, fair value accounting may require banks with the ability to hold financial assets to record losses attributable to illiquidity premia that exceed the losses that they expect to realize on the assets.⁶ This requirement could impair stability if it causes banks to sell financial assets to raise capital ratios or in a race to the exits to avoid potential future fair value losses, further increasing illiquidity premia (e.g., Plantin, Sapra, and Shin [2008]). As discussed in Section 4.2.4, extant research suggests that fair value accounting did not yield such adverse feedback effects to any meaningful extent during the financial crisis. Market illiquidity also provides banks with the ability to exercise discretion over fair value measurements. Whether this discretion has more significant adverse effects on stability

⁶ To avoid losses attributable to illiquidity premia, banks must hold illiquid financial assets to the recovery of market liquidity for the assets or to maturity, whichever comes first.

than does banks' discretion over the realization of gains and losses on their instruments measured at amortized cost is arguable based on the limited extant empirical evidence.

Fair value accounting for assets may have procyclical impacts on banks' regulatory capital when market illiquidity drives down the estimated fair values of the assets (IMF [2008]).⁷ In contrast, (optional) fair value accounting for liabilities has the opposite effect due to the incorporation of banks' own credit risk. We do not discuss fair value accounting for liabilities further in this essay, due to the absence of any research of which we are aware on the relation between banks' fair value accounting for liabilities and stability and the relatively small number of banks that elect the fair value option for liabilities.⁸

At least four *a priori* strong reasons exist to believe that fair value accounting has had relatively minor effects on capital and thus stability to date. First, banks' primary types of financial instruments (loans and deposits) are measured at amortized cost, not fair value. During the financial crisis, incremental provisions for loan losses considerably exceeded unrealized fair value losses even for the largest banks with the highest proportion of fair valued assets (Shaffer [2010], Laux and Leuz [2010], Badertscher, Burks, and Easton [2012]). Second, FAS 157 defines fair value as the price that would be paid in an "orderly transaction," not a fire sale, reducing the effect of market illiquidity on fair value estimates. Third, banks' regulatory capital excludes unrealized fair value gains and losses (including the noncredit portion of other-than-temporary [OTT] impairment losses on investment securities after April 2009 under FSP FAS 115-2 and FAS 124-2) recorded in other comprehensive income. This "prudential filter" applies to unrealized gains and losses on available-for-sale (AFS) debt securities, banks' only commonly

⁷ We use "procyclicality" and "cyclicality" as antonyms for "stability," particularly in the discussion in Section 4 of the extant empirical literature, which typically refers to procyclicality.

⁸ See Barth et al. [2008] and Cedergren, Chen, and Chen [2015] for differently motivated empirical analyses of fair value accounting for liabilities.

held type of financial instrument recognized at fair value.⁹ Fourth, riskless interest rates typically rise in good times, yielding unrealized losses on low-credit-risk debt securities and loans, and fall in downturns, yielding unrealized gains on those assets. These unrealized losses and gains have counter-cyclical effects on regulatory capital (Xie [2012, 2015]).

In contrast, the FASB's proposed expected provisioning for loan losses could have sizeable effects on capital depending on how expansively banks incorporate "reasonable and supportable forecasts" of future credit losses. As discussed in Section 4.1, empirical evidence suggests that banks that record timelier provisions for loan losses under FAS 5's incurred loss model tend to make stability-enhancing decisions, such as originating more loans during recessions and issuing more capital during both recessions and non-recession periods.

Bank regulators in Spain have employed dynamic provisioning for loan losses since 2000. In its simplest form, dynamic provisioning uses historical average loss rates across one or more prior economic cycles to estimate provisions for loan losses. Dynamic provisioning for loan losses suppresses volatility associated with the current stage of the economic cycle, requires anticipation of cycle turns following the pattern of one or more recent prior cycles, and focuses banks' discretion on identifying and quantifying the relevant average loss rates. The FASB has rejected dynamic provisioning due to its inconsistency with accounting concepts, in particular, CON 6's definitions of assets and liabilities indicate as arising from past transactions or events.

Dynamic provisioning for loan losses has both attractiveness and risks as a regulatory tool. Its purpose is to smooth banks' regulatory capital across the cycle, decreasing capital in

⁹ With rare exceptions, only very large banks hold significant amounts of financial instruments, such as trading securities and derivatives, for which unrealized fair value gains and losses are recorded in net income and regulatory capital.

good times and increasing it in downturns.¹⁰ These accrual adjustments to banks' regulatory capital ("accrual capital") do not directly affect their economic capital. Accrual capital may induce banks to make decisions with counter-cyclical effects on economic capital, however, such as curtailing excessive lending and issuing additional capital on favorable terms in economic good times or promoting profitable lending and reducing the need to issue capital on unfavorable terms in downturns. Although regulators intend dynamic provisioning to look forward to the next cycle turn, it invariably does so by looking backward to prior cycles. Such backward-looking capital smoothing should promote stability as long as the current cycle turns out to be similar to or less severe or prolonged than the recent prior cycles used to estimate average loss rates. It likely will exacerbate instability, however, if the current cycle turns out to be much more severe or prolonged than these prior cycles. For example, if the additional accrual capital created by dynamic provisioning in prior economic good times induces banks to defer issuing economic capital early in what turns out to be an unexpectedly severe downturn, banks will be less able and perhaps unable to deal with the full force of that downturn. Hence, regulators employing dynamic provisioning as a tool to enhance stability need to pay vigilant attention to the severity of the current cycle as it develops.

Extant empirical research discussed in Sections 4 and 5 provides useful but still limited insights into the conceptual issues and policy tradeoffs described above. Hence, additional evidence is needed to be able to make firm policy recommendations.

Deferred tax assets arise as a result of conservative differences between financial accounting measurements of financial instruments and other pre-tax items and the corresponding measurements for tax purposes. Ignoring banks' exercise of discretion for the moment, such

¹⁰ Allowances for loan losses are included in Tier 2 capital up to a cap. Under Basel III, the cap differs for banks using the standardized versus advanced approaches.

deferred tax assets mitigate banks' downward volatility in net income and increase their owners' equity in a fashion not unlike fair value accounting for liabilities discussed above. Depending on whether and the extent to which deferred tax assets are included in regulatory capital, they may also increase banks' regulatory capital.¹¹

Extant research provides evidence that banks exercise discretion over (valuation allowances for) deferred tax assets (Schrand and Wong [2003]) and that Japanese bank regulators allowed deferred tax assets as a means to provide regulatory forbearance during the Japanese banking crisis (Skinner [2008]). These findings suggest that banks' deferred tax assets have effects on stability that are worthy of further investigation in the context of the recent financial crisis and more generally.

2.2 GROSS VERSUS NET PRESENTATION OF RISK-CONCENTRATED FINANCIAL INSTRUMENTS AND INSTRUMENTS COVERED BY NETTING AGREEMENTS

Gross presentation of risk-concentrated financial instruments and instruments covered by netting agreements has sizeable effects on banks' regulatory capital ratios, particularly simple leverage ratios that do not distinguish instruments based on their risks. Relative to net presentation, gross presentation increases banks' assets and liabilities, usually by identical amounts, thereby decreasing banks' capital ratios. In cases where gross presentation corresponds to secured borrowing accounting and net presentation corresponds to sale accounting, net presentation also increases owners' equity by any after-tax gain on sale, potentially further increasing banks' capital ratios.

¹¹ Compared to prior bank regulatory rules, Basel III includes a smaller percentage of deferred tax assets associated with expected future income in banks' regulatory capital. U.S. bank regulators have adopted Basel III only for the few very large U.S. banks that apply Basel III's advanced approaches. Prior bank regulatory rules, which continue to apply to other U.S. banks, include deferred tax assets associated with operating loss carrybacks and income over the next 12 months. Four relatively troubled southern European countries (Greece, Italy, Spain, and Portugal) continue to include banks' deferred tax assets in regulatory capital despite Basel III (Oliver [2015]).

The reduction of capital ratios that generally results from gross presentation of risk-concentrated financial instruments could put appropriate brakes on banks' accumulation of debt and risk overhangs during economic good times or curtail desirable financial intermediation during downturns. Gross presentation might also result in greater overall transparency than would net presentation, because users of financial reports can net financial instruments presented gross but cannot gross up instruments presented net. Gross presentation is most informative when accompanied by disclosures indicating the extent to which the financial instruments involved offset economically.

A risk-concentrated financial instrument generally can be viewed as a portfolio of a gross financial asset and a gross-financial liability that settles as a net asset or liability. Because the principal amounts of the gross asset and gross liability offset in whole or part, these principal amounts are often referred to as "notional." The notional amounts of risk-concentrated financial instruments typically are much larger than the fair values of the instruments.

Banks hold two general types of risk-concentrated financial instruments that tend to be accounted for differently and to have qualitatively different implications for stability. The first type includes instruments with zero or small initial fair values that expose banks to the price risk of the notional amounts of underlying positions. These instruments do not require banks in liability positions (i.e., for which the prices of the underlying positions have moved unfavorably) to purchase or fund the entire notional amounts of the underlying positions. The primary example of this type of instrument is net-cash-settled derivatives. U.S. GAAP typically requires banks to recognize this type of instrument at fair value on the balance sheet, a net presentation for a risk-concentrated instrument. These recognized fair values change with the price of the underlying positions and thus capture the expected liquidity requirements for holders of financial

liabilities. For example, a bank holding a derivative liability typically is contractually required to post collateral equal to the fair value of the liability times a percentage that rises as the bank's credit rating deteriorates.

The second type of risk-concentrated financial instrument includes option-like instruments that require, upon demand of banks' counterparties or the occurrence of specified triggering events, banks to purchase or fund the entire amount of underlying positions. Examples include loan commitments and the provision of credit and liquidity support in securitizations. U.S. GAAP often does not require or allow banks to recognize these instruments on balance sheet; for example, commitments to originate loans other than agency mortgages are largely or entirely unrecognized.¹²

The second type of risk-concentrated financial instrument likely has stronger effects on stability than does the first type for four reasons. First, the first type of instrument often is involved in hedging relationships or netting agreements. When this is the case, banks may be required to provide liquidity for a given instrument in a relationship or agreement but not for the relationship or agreement as a whole. Second, writers of the second type of instrument must purchase or fund the entire notional amount of the underlying positions when the option-like features of the instruments are exercised. Third, banks' counterparties to the second type of instrument are unlikely to exercise these option-like features in economic good times when liquidity is readily available in the market, perhaps lulling banks and their regulators into false senses of security. In contrast, these counterparties likely will exercise these features in highly

¹² The second type of risk-concentrated financial instrument may be partly or entirely recognized under the following U.S. GAAP standards. Commitments to originate loans other than agency mortgages constitute loss contingencies for which FAS 5 requires recognition of an accounting liability for incurred, probable, and estimable losses. Credit and liquidity support provided in securitizations accounted for as sales should be recognized at fair value *at inception* under FAS 140 and FAS 166. Banks' provision of credit and liquidity support to securitization or similar entities might also necessitate that the banks consolidate the entities under FIN 46(R) and FAS 167. If a bank consolidates an entity, the assets and liabilities of the entity are separately recognized on-balance sheet.

correlated fashions in downturns. For example, during the financial crisis non-financial firms made precautionary draws on loan commitments (Ivashina and Sharfstein [2010]) and sponsors of asset-backed commercial paper conduits and special investment vehicles provided both contractual and noncontractual liquidity support to those vehicles (Acharya and Schnabl [2010], Acharya, Schnabl, and Suarez [2013]). Fourth, as discussed above, the second type of instrument often is unrecognized, out of sight and mind.

Financial instruments covered by a netting agreement settle through net payments across the covered instruments. Gross (net) balance sheet presentation of financial instruments covered by standard netting agreements under IFRS (U.S. GAAP) constitutes the single largest difference between large banks' financial statements under the two accounting systems.¹³ IFRS requires gross presentation of financial instruments unless they offset in all circumstances (i.e., not just in default), which rarely occurs in practice. In contrast, U.S. GAAP allows net presentation if the instruments offset only conditional on default, as is specified in standard netting agreements. Although the default of a counterparty to a netting agreement generally is the time that offsetting of financial instruments becomes significant, the size of the gross positions between the counterparties can affect the non-defaulting counterparty's behavior both prior to (e.g., in requiring maximum collateral) and after (e.g., in opportunistically closing out positions) the default of the other counterparty. Such strategic behavior by non-defaulting counterparties occurred around the demises of both Bear Stearns and Lehman Brothers (Parsons and Mello [2013]). FDIC Vice Chairman Thomas Hoenig [2015] emphasizes that the use of gross rather than net presentation of financial instruments covered by netting agreements yields significantly lower solvency for systemically important banks at the end of 2014.

¹³ FASB January 28, 2011 news release, "IASB and FASB Propose to Align Balance Sheet Netting Requirements," http://www.fasb.org/cs/ContentServer?c=FASBContent_C&pagename=FASB/FASBContent_C/NewsPage&cid=1176158186333.

3. Banks' Disclosure and Stability: Key Conceptual Issues and Policy Tradeoffs

One of the primary channels by which banks' financial reporting can affect stability is by increasing the publicly available information about banks' exposures and relevant economic conditions. An increase in such information is most likely to affect stability when these exposures and conditions exhibit significant Knightian [1921] uncertainty (i.e., "unknown unknowns"), so that market participants and banks' contractual counterparties and regulators cannot anticipate all possible outcomes. We refer to such uncertainty simply as "bank opacity." In Section 3.1, we describe the ongoing debate in the academic literature regarding whether reducing bank opacity enhances versus impairs stability. In Section 3.2, we describe several types of bank opacity that have distinct policy-relevant implications for the relation between financial reporting and stability.

3.1. ACADEMIC DEBATE ABOUT BANK OPACITY AND STABILITY

The historically more common view in the academic literature is that bank opacity impairs stability. For example, Morgan [2002] states "the opacity of banks exposes the entire financial system to bank runs, contagion, and other strains of 'systemic' risk. Take away opacity and the whole story unravels." Nier and Bauman [2006] state that "banks are prone to engage in moral hazard behavior," but that "a bank that discloses its risk profile exposes itself to market discipline and will therefore be penalized by investors for choosing higher risk." This view is consistent with our discussion of the destabilizing effects of debt and risk overhangs in the introduction. This view is supported by Granja's [2015] findings that the imposition of disclosure regulation for the state banks operating in a state reduced the failure rate of those banks relative to the national banks operating in the same state and to the state banks operating in contiguous states. This view is also supported by Costello, Granja, and Weber's [2015] finding that more

effective bank regulators require higher bank transparency. This view is reflected in the Basel Committee's [2015] recently expanded risk disclosure requirements and in other recent proposals to expand banks' public disclosure of their risks, such as the reports of the Enhanced Disclosure Task Force [2012, 2013] established by the Financial Stability Board.

Recently, Dang et al. [2014], Holmström [2015], and others have expressed the opposing view that bank opacity enhances stability. These authors make four related arguments. First, one of banks' central roles in the financial system is the creation of highly liquid, money-like debt claims, including FDIC-guaranteed deposits.¹⁴ Second, to fulfill this role effectively, banks' debt claims must be sufficiently well collateralized to ensure that their value is "information insensitive," thereby enabling investors to purchase the claims with "no questions asked."¹⁵ Asking and answering questions take time, impairing liquidity. Third, to the extent that the collateralization of bank debt claims is insufficient, any information sensitivity should be mitigated by: (1) bank regulation and supervision that does not publicly reveal information about banks' exposures and relevant economic conditions, because such disclosure would cause the claims to become information sensitive and thus less liquid, and (2) governmental guarantees of losses borne by bank debt claimants that arise *ex post* when extreme events occur. Fourth, banks should be "secret keepers" regarding the value of the loans and other assets that collateralize their debt claims. Such nondisclosure ensures that investors remain symmetrically uninformed about the value of those claims, thereby maintaining liquidity.

¹⁴ It is clear that households and other parties demand highly liquid, money-like claims, and that banks have historically provided these claims in large amounts, particularly when alternatives such as U.S. Treasury securities are in short supply. It is arguable, however, whether the provision of these claims by banks issuing guaranteed deposits rather than governmental or non-governmental alternatives is socially desirable. For example, Krishnamurthy and Vissing-Jorgensen [2012] provide evidence that banks' mismatch of illiquid assets and liquid liabilities predicts financial crises, suggesting that this role impairs stability. We discuss related distinctions between the historically more common and recent views below.

¹⁵ Similarly, Hanson et al. [2015] say that investors can "remain 'sleepy': they do not have to pay attention to transient fluctuations in the mark-to-market value of bank assets."

These opposing views largely result from the two sets of authors focusing on distinct aspects of banks' balance sheets and roles in the financial system. The historically more common view focuses on banks' individual and collective accumulation of debt and risk overhangs, essentially the (leveraged) asset side of banks' economic balance sheets. Under this view, the primary concern is providing banks with *ex ante* incentives to invest in and finance assets in ways that do not compromise their own solvency. Bank opacity reduces market discipline, which is a primary means to provide such incentives. The recent view focuses instead on banks' issuance of highly liquid, money-like debt claims, essentially the funding liability side of their economic balance sheets. Under this view, the primary concern is preventing *ex post* stability-compromising actions by banks' claimants, such as bank runs. Bank opacity reduces the likelihood of such actions, which essentially are systemically dysfunctional forms of market discipline.

Naturally, financial intermediation involves both sides of banks' economic balance sheets, and problems with either side can impair stability. The theoretical literature examining whether banks' stress test results should be disclosed to the market emphasizes this point, showing that such disclosure entails both benefits and costs (e.g., Goldstein and Sapra [2014]). Moreover, the two sides of banks' balance sheets can interrelate in subtle ways. For example, Diamond and Rajan [2001] develop a model in which financing fragility resulting from banks' issuance of highly liquid liabilities helps resolve recontracting problems between banks and their borrowers, enabling banks to more fully finance illiquid assets. Our own views largely align with those of Shleifer [2011], who concludes that the primary problem generally is banks' accumulation of debt and risk overhangs on the asset side, and that liquidity problems arising on the liability side tend to follow from that primary problem. However, the strongly opposing

views in this debate indicate that additional empirical research is needed to determine when and how more transparent financial reporting enhances stability.

3.2. TYPES OF BANK OPACITY

We discuss three general types of bank opacity that raise distinct problems for stability. The first type is “symmetric ignorance,” in which no market participant, including banks, knows much about banks’ exposures and relevant economic conditions.¹⁶ This type of opacity may arise from Knightian uncertainty; from behavioral biases, such as the representativeness heuristic, that cause market participants to neglect certain risks (e.g., Shleifer [2011], Gennaioli, Shliefer, and Vishny [2014]); and from incentive issues that cause market participants to avoid gathering information (e.g., Rajan [2005]) or bank regulators to exercise regulatory forbearance (e.g., Gallemore [2013]). Regardless of the source, symmetric ignorance renders banks’ risk management undisciplined, for example, focusing on salient past events rather than on potential future events whose occurrence would more significantly impair bank solvency. This lack of discipline could lead individual banks to accumulate debt and risk overhangs unwittingly. Moreover, such overhangs likely would be correlated across symmetrically ignorant banks. When this type of opacity exists, stability likely would be enhanced by requiring banks to publicly disclose information about their exposures on a timely basis to enable markets to discipline banks’ individual and collective accumulation of overhangs. Arguably, this is the essential task of a financial stability monitor.¹⁷ In contrast, the provision of such information after banks have collectively developed significant overhangs could induce banks to dump assets and take other actions that impair stability, similar to the third type of opacity discussed below.

¹⁶ Our version of “symmetric ignorance,” which involves all market participants, including banks, is broader than Holmström’s [2015] version, which involves only banks’ debt claimants.

¹⁷ See Adrian, Covitz, and Liang [2015] for discussion of the various roles of a financial stability monitor.

An obvious instance of symmetric ignorance that arose prior to the financial crisis was the widespread view that house prices could not decline nationally to any significant extent, certainly not by 30 percent as occurred from July 2006 to April 2009.¹⁸ A more specific (although related) example was the view at various large securitization sponsors that the provision of liquidity and credit support to securitization entities was unlikely to yield appreciable losses. This view may explain why Citigroup's directors and regulators were unaware of Citigroup's provision of liquidity puts to special investment vehicles (SIVs), a significant failure of bank governance in retrospect.

These examples suggest that symmetric ignorance typically results from widespread misperceptions about relevant economic conditions, perhaps due to underlying behavioral or incentive issues. Assuming that any such issues are not so great as to prevent accounting standard setters from enhancing banks' disclosure requirements, such enhancements should reduce this type of bank opacity. For example, the FASB could expand FAS 140's requirement to disclose the sensitivity of the fair values of retained interests from securitizations to unfavorable changes in certain assumptions to include disclosures of the sensitivity of the fair values of these and other positions to changes in house prices or other relevant economic conditions. Similarly, the FASB could more clearly specify what FAS 167's requirement to disclose the "[t]erms of arrangements...that could require the enterprise to provide financial support (for example, liquidity arrangements and obligations to purchase assets) to" securitization entities entails for securitization sponsors that provide liquidity and credit support to those entities.

¹⁸ S&P/Case-Shiller 20-City Composite Home Price Index, <http://us.spindices.com/index-family/real-estate/sp-case-shiller>.

The second type of bank opacity arises when banks' debt claimants know less about banks' exposures and relevant economic conditions than do the banks issuing these claims. Under this type, the primary concern is that banks are or may become unable to pay their debt claimants in full. If this concern becomes sufficiently salient to a bank's debt claimants, they may run on the bank. The best approach to mitigating the adverse effects of this type of opacity on stability differs under the historically more common versus recent views discussed in Section 3.1. Under the historically more common view, this type of opacity is destabilizing and public disclosure of banks' exposures and relevant economic conditions should mitigate bank debt claimants' concerns about solvent banks; insolvent banks must be either recapitalized or resolved. Under the recent view, this type of opacity is desirable and debt claimants' concerns are best mitigated through collateralization, bank regulation and supervision, and governmental guarantees.

Banks' state-contingent and customizable margin requirements on over-the-counter (OTC) derivatives constitute a type of exposure susceptible to this type of opacity (Acharya [2014]).¹⁹ A well-known example of this type of exposure is AIG's written credit default swaps (CDS) on "super senior" referenced exposures, which over a short period of time during the depths of the financial crisis experienced massive losses and liquidity requirements. In its financial reports during the financial crisis (but not before), AIG provided three disclosures about these CDS: (1) notional amounts by broad class of referenced exposure, (2) fair values by broad class of referenced exposure, and (3) sensitivity of margin requirements to downgrades in AIG's credit rating. For example, in its 2008Q2 Form 10-Q filing on August 6, 2008, 40 days prior to

¹⁹ The International Swaps and Derivatives Association (ISDA) master agreement for OTC derivatives includes a credit support annex that specifies margin requirements. In practice, the counterparties to an agreement often customize this annex to include thresholds for posting margin and/or margin percentages that depend on the counterparties' credit ratings. McDonald and Paulson [2014] describe AIG's distinct customized margin agreements with RBS, Goldman Sachs, and Merrill Lynch.

its takeover by the federal government, AIG disclosed a \$447 billion notional amount and \$26 billion loss of fair value on its written CDS. It distinguished four primary types of referenced exposure: corporate loans (\$173 billion notional value, \$0 fair value loss); prime residential mortgages (\$133 billion notional value, \$0 fair value loss); corporate debt/collateralized loan obligations (\$54 billion notional value, \$1 billion fair value loss); and multi-sector CDOs (\$80 billion notional value, \$25 billion fair value loss). AIG disclosed that a one-notch (two-notch) downgrade by both Moody's and S&P would yield a collateral call of \$13.3 billion (\$14.5 billion). These disclosures located AIG's risk primarily in its multi-sector CDS and indicated the liquidity requirements of a credit rating downgrade. However, they scarcely enabled market participants to anticipate the reasons for and effects of S&P's two-notch downgrade of AIG's credit rating from AA minus to A minus on September 15, 2008, the day of Lehman's bankruptcy filing. This downgrade caused AIG to experience an immediate \$8.6 billion increase in collateral calls from counterparties on its written CDS on multi-sector collateralized debt obligations. These collateral calls are one of the two primary reasons for the federal government's takeover of AIG on September 16, 2008 (McDonald and Paulson [2014]).

The third type of bank opacity arises when some investors, possibly banks, have less information or learn more slowly than other investors about the value or risk of commonly held assets. Under this type of opacity, banks' primary concerns are that their assets are less valuable or riskier than current market prices suggest, and that those prices will fall if other holders of the assets receive adverse information or are able to sell on a timelier basis than are the banks. Banks and other investors that receive even slightly adverse or ambiguous news about the value or risk of assets may take individually protective behaviors, such as racing to the exits to dump the assets, with adverse consequences for stability.

Banks' counterparty risk on purchased CDS is an example of this type of bank opacity. Banks are not required to and generally do not disclose the identities of their counterparties. Although a given bank knows its bilateral exposure to a key counterparty on a given type of purchased CDS, the bank generally does not know the counterparty's aggregate exposure on that type of CDS. Hence, banks with larger or more frequently modified exposures to a key counterparty likely know more about that counterparty. The third type of opacity could be mitigated by central clearing of derivatives to the extent it yields transparency about counterparties' aggregate exposures (Acharya, Shachar, and Subramanyam [2011]).

Two standards effective in 2009, FAS 161 and FSP FAS 133-1 and FIN 45-4, mandate enhanced disclosures of derivatives. These standards likely have reduced the second and third types of bank opacity to some extent. Financial reports can only convey what banks already know or can be required to learn, however. Financial reporting requirements that promote bank learning can *enable* superior disclosure, both mandatory and voluntary. We expect such learning is most likely to occur when financial reporting rules require that banks model or otherwise measure their risks and evaluate the quality of their models and measurements in ways they otherwise would not, due to the costs involved or complacency. For example, to satisfy fair value accounting requirements when the relevant markets are insufficiently liquid to directly indicate individual exposures' fair values, banks must model the value-relevant risks of the exposures. To satisfy risk concentration disclosure requirements, banks must evaluate these risks at the bank level. To satisfy regulatory requirements to disclose backtesting and stress testing of valuation models, banks must evaluate their models' historical and potential future performance, respectively. As discussed in Section 4.1.2, Bhat, Ryan, and Vyas [2015] provide evidence that banks' credit risk modeling disclosures are positively associated with the timeliness of their

provisions for loan loss and negatively associated with their loan origination procyclicality, consistent with the banks that make these disclosures better understanding their loan credit risks.²⁰ We encourage researchers to find ways to examine whether financial reporting requirements that promote bank learning enable superior disclosure.

4. Evaluation of Extant Empirical Research on Banks' Financial Reporting and Stability

4.1 PROVISIONING FOR LOAN LOSSES

Provisioning for loan losses is the most extensively researched aspect of bank financial reporting in general and it has also been a primary focus of recent research examining how bank financial reporting affects stability. A primary motivation for this recent research is the argument, made by many bank regulators and other parties, that FAS 5's incurred loss model exacerbates the severity of economic downturns (e.g., Laeven and Majnoni [2003], Dugan [2009]). These parties argue that the incurred loss model prevents banks from recording adequate provisions for loan losses during economic good times, and thus requires banks to record excessive provisions during downturns. The latter provisions reduce banks' regulatory capital at times when it is expensive to raise capital, thereby compromising their ability to originate loans.

Responding to political pressure arising during the financial crisis, in December 2008 the FASB put the accounting for financial instruments, including credit losses on those instruments, on its agenda. As of this writing in January 2016, the FASB indicates that it is in the final stages of redeliberating its December 2012 proposed standard on accounting for credit losses on financial instruments and that it will issue a final standard in the second quarter of 2016. The proposed standard would require lenders to record impairments for "expected" credit losses over

²⁰ Similarly, Bhat and Ryan [2015] provide evidence that the banks that make (more extensive) market and credit risk modeling disclosures exhibit more returns-relevant unrealized net gains.

the remaining lives of loans and other types of financial assets. The IASB issued a similarly motivated final standard in July 2014.

In this section, we describe and evaluate in detail the most influential study examining the relation between banks' provisioning for loan losses and stability, Beatty and Liao (BL, [2011]). BL clearly states and attempts to empirically identify the critical conceptual links in this relation. As a consequence, readers may conclude that we largely understand this relation. In fact, while an admirable first attempt to formulate and empirically address a highly complex question, BL does not fully address all of the research design issues raised in the introduction. We indicate the substantial opportunities that remain for future research to address these difficult issues. We also more briefly summarize two other studies that examine other interesting aspects of this relation and offer similar research opportunities for similar reasons.

4.1.1 Beatty and Liao [2011]. BL's key finding is that banks that record timelier provisions for loan losses (relative to changes in non-performing loans) exhibit lower loan origination procyclicality (as reflected in higher loan growth during recessions).^{21, 22} Specifically, BL find that U.S. banks with assets above \$500 million, but not other banks, exhibit a stronger positive association between loan growth and regulatory capital during recessions than during non-recession periods, a phenomenon they refer to as the "capital crunch" effect. Restricting their focus to the larger banks that exhibit this effect, BL find that banks that record timelier provisions for loan losses originate more loans during recessions and that those originations are less sensitive to the banks' regulatory capital levels. BL conclude that "the capital crunch effect

²¹ BL also use the ratio of the allowance for loan losses to non-performing loans as a measure of provision for loan loss timeliness.

²² BL's key finding is somewhat akin to Laeven and Majnoni's [2003] finding that banks' provisions for loan losses (deflated by assets) are negatively associated with their loan growth. Laeven and Majnoni characterize this negative association as suggesting that banks' provisioning has procyclical (or imprudent) effects on their capital. BL's measure of loan origination procyclicality is somewhat narrower than research that examines the association of loan growth with GDP growth (e.g., Bikker and Metzmakers [2005]).

is weaker for banks” with timelier provisioning for loan losses. Extending this key result, BL partition larger banks into well- versus poorly-managed subsamples based on pre-provision profitability. BL find that both subsamples exhibit the capital crunch effect as well as mitigation of this effect by timelier provisioning for loan losses. BL find that banks that record timelier provisions for loan losses, particularly poorly managed banks in non-recession periods, issue more capital in both non-recession and recession periods. These findings nicely close the inferential loop by linking the effects of banks’ provisioning for loan losses on their accrual capital to changes in their economic capital. That is, BL demonstrate the channel through which timely loan loss provisioning affects stability: the reduction of accrual capital resulting from timelier provisioning for loan losses induces banks to issue more economic capital.

We describe four research design issues that apply to BL and also, in some form, to most other studies examining the relation between bank financial reporting and stability. Subsequent research has only begun to address these issues, each of which constitutes an opportunity for future research.

The first research design issue is that BL’s finding that the capital crunch effect is limited to larger banks appears to be at odds with the findings of prior research that the effects of macroeconomic policy on loan supply primarily obtain for smaller banks (e.g., Kashyap and Stein [2000]). BL explain their distinct findings as attributable to the samples in prior research being primarily drawn from the period prior to the issuance of the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), whereas their 1993-2009 sample is drawn after the passage of FDICIA. FDICIA reduced bank regulators’ ability to exercise forbearance for large banks (Kishan and Opiela [2006]). While it is true that FDICIA should have reduced the difference in the strength of the capital crunch effect for smaller banks versus larger banks,

there is no obvious reason why this act would *reverse* the relative strengths of this effect for the two size groups.²³ Presumably other factors correlated with bank size are also involved. We conjecture that one of these factors is loan portfolio composition, which varies considerably across larger versus smaller banks. For example, larger banks hold greater amounts of commercial and industrial loans and smaller amounts of commercial real estate loans than do smaller banks (Ryan and Keeley [2013]).

Loan portfolio composition could affect BL's results for several reasons. Prior research shows that loan portfolio composition is strongly associated with BL's measures of the timeliness of provisions for loan losses. Bhat, Lee, and Ryan [2014] find that banks record timelier provisions for loan losses (relative to changes in non-performing loans) for commercial and industrial loans than for mortgages such as commercial real estate loans. Bhat et al. also find that banks record higher allowance for loan losses (relative to the level of non-performing loans) for consumer loans than for other loan types due to the fast charge-offs of consumer loans required by the FFIEC's uniform retail credit classification policy. However, Bhat et al. find that modifying BL's measure of the timeliness of provisions for loan losses to incorporate loan portfolio composition strengthens rather than weakens BL's key finding.

Different loan types exhibit differential loan origination cyclicalities. For example, banks held a large overhang of non-agency mortgage-related assets going into the crisis and virtually ceased extending these mortgages during the crisis. Over six years after the end of the crisis, this origination freeze has only begun to thaw. The freeze may have been prolonged by governments

²³ FDICIA is a complex law with other provisions that affect large and small banks differently. For example, FDICIA created requirements that the managements of banks with assets of \$500 million or more assess and certify the banks' internal control; the FDIC raised this size threshold to \$1 billion in December 2005. It is also difficult, however, to see how FDICIA's size-related internal control and other requirements would cause larger banks to be more subject to the capital crunch effect.

providing liquidity against pledged problem assets, enabling banks to retain their overhangs of non-agency mortgage-related assets on balance sheet.

Different loan types exhibit different average pre-provision profitability, BL's measure of bank management quality. This is attributable to competition causing loan yields to vary with expected credit losses, which vary considerably across loan types (Ryan [2007, Chapter 5]).

In summary, we encourage future researchers to incorporate salient aspects of banks' loan portfolio composition, in particular, the proportions of heterogeneous versus homogeneous loans and of collateralized versus uncollateralized loans. These aspects significantly impact the timeliness and amount of banks' loan loss accruals as well as the cyclicity of loan originations.

The second research design issue is that banks that record timelier provisions for loan losses likely are better managed and have fewer financial constraints and better future prospects (e.g., Liu and Ryan [2006]). Banks' management quality includes the sophistication of their risk management systems. Banks' health may result from their loan portfolio composition, the geographical markets they serve, and other factors that are associated with loan origination procyclicality. As is typical in the literature, BL include only size as a control for banks' management quality and risk management sophistication and only size and capital as controls for banks' health. While a nontrivial task, future researchers aiming to demonstrate a causal relation between banks' financial reporting and stability should try to develop more robust sets of controls or other identification strategies to distinguish banks' economic aspects from their financial reporting.

The third research design issue is that future researchers can extend BL's research design to maximize the validity of a causal interpretation for their key finding that timelier provisions for loan losses mitigate the capital crunch effect. For example, BL do not show that the

timeliness of provisions for loan losses does not affect loan origination procyclicality for the smaller banks for which they find no capital crunch effect (Mill's Method of Difference). In addition, BL do not partition banks into multiple groups based on the timeliness of provisions for loan losses and show that the capital crunch effect is mitigated more for banks with timelier provisions (Mill's Method of Concomitant Variation).

The last research design issue is that BL attempt to distinguish loan demand from loan supply in the following limited ways. They partition on bank size to vary banks' loan supply but arguably not loan demand (Kashyap and Stein [2000]).²⁴ They include a macroeconomic variable, the change in the national unemployment rate, as a control for loan demand (Bernanke and Lown [1991]). Prior banking research provides the following general approaches to more robustly disentangle loan demand and supply that accounting researchers can apply to empirical analyses of the relation between banks' financial reporting and stability.

Additional controls can be included for loan demand, which varies by loan type and geographical region (usually defined as a state or metropolitan statistical area). Variables that researchers have used to control for demand for consumer loans include local unemployment rates, growth in personal income, and growth in population or other demographic variables (e.g., Loutskina and Strahan [2009]). Variables that researchers have used to control for demand for commercial loans include local income growth and business starts and failures, the characteristics of banks' existing commercial borrowers, and macroeconomic variables such as industrial production and interest rate levels and credit spreads (e.g., Berger and Udell [2004],

²⁴ Because borrowers receive cash up front when loans are funded, they generally do not care about the size or strength of their bank with respect to an individual funded loan, suggesting that bank size captures only loan supply. Borrowers may care about the size or strength of their bank, however, to increase the likelihoods that their current loan commitments are funded and that they receive future loans. This concern is most salient during economic downturns, when banks favor (typically commercial) borrowers with preexisting relationships in determining who will receive the limited amount of loans they are willing to originate (Fama [1985], Dell'Araccia and Marquez [2006]). Borrowers may also desire to have cost-effective access to larger banks' broader set of financial product offerings.

Ivashina and Scharfstein [2010]). Alternatively, Federal Reserve survey data on national changes in banks' credit standards for commercial loans can be used to control for commercial loan supply (e.g., Lown and Morgan [2006]).

Data on loan-level applications and originations by bank, when available, can be used to distinguish loan demand (number of loan applications to a bank) from loan supply (number or percentage of loan applications funded by that bank). Loan approval rates also capture loan demand to some extent, however; for example, higher demand in economic good times may lead lower quality borrowers to apply for loans, with corresponding effects on loan approval rates. Loutskina and Strahan [2009], Xie [2015], and Yeung [2013] examine mortgage-level data provided under the Home Mortgage Disclosure Act (HMDA). Loutskina and Strahan also examine the difference between originations of more easily securitized conforming mortgages versus non-conforming jumbo mortgages (in some analyses restricting the sample to loans with principal amounts from 50% to 250% of the maximum conforming loan amount to maintain similarity of borrower and property characteristics). They assume that variation in this difference across banks and time reflects loan supply rather than loan demand.

Two prior studies examine data on individual banks' funding of loan applications obtained from international bank regulatory sources. Puri, Rocholl, and Steffen [2011] obtain retail loan-level data for local savings banks from German regulators. Jiminez et al. [2012] obtain commercial loan-level data for essentially all banks from Spanish regulators. A notable feature of Jiminez et al.'s data is that different banks or the same bank in different time periods can be observed to lend to the same commercial borrower. This feature significantly increases the authors' ability to distinguish loan demand from loan supply. In particular, it is possible to observe different banks' decisions whether to satisfy loan applications from the same borrower at

a point in time as well as the same bank's decisions whether to satisfy loan applications from the same borrower in different periods.

Plausibly exogenous shocks to loan supply can be identified and exploited. Puri et al. [2011] use shocks to German savings banks' capital and liquidity during the financial crisis that resulted from their ownership of the Landesbank in their federal state. These shocks varied in magnitude across savings banks based on the size of their ownership of the Landesbank in their federal state and on whether that Landesbank was adversely affected by its holdings of subprime-mortgage-related assets during the crisis. Jiminez et al. [2012] use shocks to Spanish banks' capital associated with the inception of dynamic provisioning for loan losses and two subsequent revisions to dynamic provisioning guidelines. These shocks varied across banks based on the mix, growth, and performance of their loan portfolios as well as their preexisting loan loss accruals. We discuss Puri et al. and Jiminez et al. in more detail in Section 5.

4.1.2. Other Studies. We briefly discuss two other studies that examine notable aspects of the relation between banks' provisioning for loan losses and stability. We also highlight additional concerns that these studies raise for valid inferences about this relation without reiterating the general concerns discussed above in the context of BL.

Bushman and Williams [2012] examine the associations between measures of two potentially forward-looking aspects of banks' provisioning for loan losses and two measures of changes in banks' risk taking. The provision-for-loan-loss measures are: (1) the timeliness of provisions relative to changes in non-performing loans, a proxy for changes in expected future loan losses, and (2) the correlation of provisions with pre-provision earnings, an income

smoothing measure commonly used in banking research.²⁵ The risk-taking measures are: (1) the change in financial leverage and (2) the change in the value of actuarially fair deposit insurance premia. Bushman and Williams estimate the two provisioning measures at the country level for 27 different countries. In their primary analyses, Bushman and Williams estimate how these country-level provisioning measures interactively influence the associations between a measure of the change in banks' underlying risk, the change in asset volatility, and the two measures of changes in bank's risk-taking. Banks optimally should offset increases in underlying risk with decreases in risk taking, and vice versa.

Bushman and Williams [2012] provide evidence suggesting that forward-looking provisioning for loan losses is a double-edged sword with respect to banks' risk taking. When asset volatility increases, banks in countries with timelier provisions exhibit better risk-taking, as evidenced by reduced leverage and change in the value of actuarially fair deposit insurance premia. In contrast, banks in countries for which provisions more strongly smooth net income exhibit worse risk-taking, suggesting that this smoothing behavior is discretionary rather than forward-looking. Bushman and Williams further show that these positive and negative effects are stronger for banks with lower capital and profitability. The strengthened positive effect is consistent with BL's finding that the positive association of the timeliness of provisions for loan loss with capital issuance is stronger for less profitable (more poorly managed) banks.

Bushman and Williams' [2012] analysis involves two generalizable features worthy of consideration by future researchers: (1) identification and analysis of measures of both favorable (timeliness) and unfavorable (smoothing) aspects of banks' provisioning for loan losses and (2) a

²⁵ Ryan [2011, Section 3.3.1] summarizes the use of this income smoothing measure in prior research. This measure could capture either actual forward-looking provisioning for loan losses that anticipates the next cycle turn or discretionary behavior that records higher (lower) provisions when pre-provision income is higher (lower) relative to some benchmark desired by bank management. As discussed below, Bushman and Williams' [2012] results are more consistent with the latter possibility.

cross-country approach. The first feature is akin to Mill's Method of Difference. Because Bushman and Williams obtain distinct predicted results for the measures of two forward-looking aspects of provisioning for loan losses, the likelihood that unmodeled bank characteristics drive this more intricate set of results is lessened. However, Illueca, Norden, and Udell [2012] conduct similar analysis for Spanish banks around the adoption of dynamic provisioning for loan losses in Spain in 2000. They find that timelier provisions are associated with greater risk taking and provisions that smooth income more are associated with lesser risk taking. The essentially opposing results of Bushman and Williams versus Illueca et al. suggest that research design and context matter considerably in this analysis.

Bushman and Williams' [2012] cross-country approach involves trade-offs in generating valid inferences about the effects of banks' provisions for loans losses. On the plus side, different countries exhibit different bank financial reporting requirements as well as institutional features that affect how fully banks comply with those requirements and how market participants use banks' financial report information. Bushman and Williams' descriptive evidence suggests that this approach yields interesting variation in banks' provisioning for loan losses. Estimation of the timeliness and other attributes of banks' provisioning is more feasible at the country level than at the bank level. The latter benefit is substantially reduced, however, by the relative paucity of banks and bank-year observations with readily available data for many countries. For example, the U.S. and Japan together represent almost 95% of Bushman and Williams' bank-year observations, with 12 of their 27 countries having fewer than 22 banks or 100 bank-year observations (compared to 1,954 banks and 49,414 bank-year observations for the U.S.). In addition, banks' loan portfolio composition, health, and other characteristics vary considerably across countries.

Two non-mutually exclusive explanations exist for BL's and Bushman and Williams' [2012] findings. Banks that record timelier provisions for loan losses may: (1) be better capitalized or (2) better understand the credit risks of the loans that they currently or might hold. The first possibility has received the bulk of researchers' attention to date. We believe the second possibility merits further consideration by accounting researchers. The limited evidence available from existing studies suggests that the relation between banks' understanding of loan credit risks and their willingness to originate loans is a complex one that depends on banks' investment opportunity sets and other factors. For example, Bhat, Ryan, and Vyas [2015] find that the (presumably better informed) banks that provide better credit risk modeling disclosures in their financial reports exhibit lower loan origination procyclicality. These results are consistent with better informed banks being more willing to originate loans in downturns. In contrast, Abbassi et al. [forthcoming] find that the (presumably better informed) trading-oriented banks in Germany reduced loan supply more than other banks during the financial crisis, because the former banks found investments in distressed debt securities to be attractive investments.

Bhat, Ryan, and Vyas [2015] provide evidence that the timeliness of banks' provisions for loan losses reflects the attributes and quality of their internal credit risk modeling (CRM). Bhat et al. identify two primary types of CRM based on banks' financial report disclosures: (1) statistical analysis of the historical ability of loan and borrower attributes, loan statuses, and other variables to predict the probability of default and loss given default on loans (MODEL) and (2) forward-looking stress tests of future loan losses to unlikely adverse scenarios (STRESS). Bhat et al. argue that these two CRM types have complementary strengths and weaknesses. MODEL provides discipline on banks' provisions for loan losses that mitigates the tendency of FAS 5's incurred loss model to delay provisions and increases the ability of provisions to predict

future net loan charge-offs. MODEL generally works well for homogeneous loans, for which banks reserve for loan losses at the loan-pool level, and in stable periods when credit loss parameters change gradually. However, MODEL is of limited use for heterogeneous loans, for which banks reserve for loan losses at the individual-loan level, or when loan credit loss parameters change rapidly. STRESS, while highly judgmental, is essential for heterogeneous loans, which typically default at much higher rates during downturns than during stable periods, and for all loan types at sharp turns in economic cycles when credit loss parameters change rapidly. STRESS enhances banks' abilities to diagnose and respond to these turns in a timely fashion.

Reflecting the discipline that statistical analysis of historical data provides on banks' loss accruals for homogeneous loans, Bhat, Ryan, and Vyas [2015] find that MODEL is associated with provisions for homogeneous loans that: (1) are timelier during the stable portions of their 1996-2010 sample period and late in the financial crisis after banks had experienced heightened credit losses for several quarters; (2) better predict net charge-offs of homogeneous loans during the stable portions of their sample period; and (3) are associated with less procyclical homogeneous loan originations. Reflecting the improvement in banks' ability to diagnose and respond to turns in economic cycles in a timely fashion provided by forward-looking stress tests, Bhat et al. find that STRESS is associated with provisions for loan losses that: (1) are timelier for both homogeneous and heterogeneous loans during the downturn portions of their 1996-2010 sample period and early in the financial crisis, when loan credit loss parameters changed rapidly; (2) better predict net charge-offs of heterogeneous loans during the downturn portions of their sample period; and (3) are associated with less procyclical homogeneous and heterogeneous loan originations.

The primary concern with Bhat, Ryan, and Vyas' [2015] analysis is that banks generally do not describe their credit risk modeling in detail in their reports. Hence, MODEL and STRESS are noisy signals of the intensity of banks' actual CRM. Moreover, these data limitations restrict empirical researchers' ability to address the inherent endogeneity of banks' voluntary CRM disclosures. We encourage future accounting researchers to develop more robust proxies for banks' understanding of loan credit risks and to empirically demonstrate how these proxies relate to the effects of banks' provisions for loan losses on stability.

In summary, provisioning for loan losses is the aspect of banks' financial reporting whose implications for stability have been examined in the most depth by accounting researchers to date. Despite this fact, many substantive and research design issues remain to be addressed in order for researchers to attain sufficient understanding of this complex relationship to make recommendations about the desirability of alternative provisioning approaches for stability. To this end, we provide examples of opportunities for future research on this topic in Section 5.

4.2 FAIR VALUE ACCOUNTING

In this section, we discuss four areas of extant research on the relation between banks' actual or potential use of fair value accounting for financial instruments and stability. Many of the papers in these areas compare fair value accounting to amortized cost accounting along the dimensions discussed in Section 2.1. These four areas examine the effects of banks' use of fair value accounting on their: (1) risk taking, (2) loan growth procyclicality, (3) leverage procyclicality, and (4) financial asset liquidity.²⁶ While many of the same research design issues

²⁶ This is a small portion of the prior literature on banks' use of fair value accounting. The bulk of this literature focuses on the value-, returns-, and risk-relevance of fair values and unrealized gains and losses compared to amortized costs and realized gains and losses, respectively. See Ryan [2011, Sections 4.4-4.6] and Beatty and Liao [2014, Section 4.2] for recent summaries of this literature.

arise in each of these areas as in the literature on banks' provisioning for loan losses discussed in Section 4.1, to avoid repetition we focus on the incremental issues raised in these areas.

The papers in these areas generally require proxies for the extent or implications of banks' use of fair value accounting. Two types of proxies are commonly used. One is the percentage of assets recognized at fair value on the balance sheet, typically trading and AFS securities. The other is the magnitude of unrealized net gains recorded in net income or in comprehensive income under fair value accounting. Unrealized net gains that are recorded in net income (e.g., for trading securities) generally affect banks' regulatory capital. Unrealized net gains that are recorded in other comprehensive income (e.g., for AFS securities) generally do not affect regulatory capital, although bank regulators indicate they may consider these net gains in evaluating banks' capital adequacy (e.g., Office of the Comptroller of the Currency [1994]). Some papers examine fair values disclosed in footnotes (e.g., for held-to-maturity [HTM] securities) or unrealized net gains that are calculable from these disclosures. Naturally, these unrealized net gains do not affect regulatory capital, and it is unclear whether bank regulators consider them.

4.2.1. Risk taking. Analogous to Bushman and Williams' [2012] examination of the effect of banks' provisioning for loan losses on their risk taking discussed in Section 4.1.2, this research area examines the distinct effects of banks' use of fair value accounting versus amortized cost accounting on their risk taking. The papers in this area typically examine the extents to which: (1) banks' originations and purchases of (potentially) illiquid assets during economic good times are attributable to recording unrealized net gains on assets in net income or other comprehensive income and (2) banks' (fire) sales of these assets during downturns are attributable to recording unrealized net losses on assets.

The latter examination addresses the oft-stated criticism of fair value accounting that the recording unrealized losses on assets in net income or comprehensive income during downturns induces parties to take stability-compromising actions, such as fire sales of assets by banks and runs on bank deposits by depositors. This criticism is based on the assumption that banks' portfolios of assets and economic capitalization prior to recording unrealized losses on assets are insensitive to the required accounting for the assets. The literature on the real effects of financial reporting (e.g., Kanodia and Sapra [this issue]) recommends that researchers and other parties adopt the more holistic view that banks acquire, finance, and sell assets taking into consideration the required financial reporting for the assets. Under this view, fair value accounting, by *ex post* recording more volatile income on given assets than does amortized cost accounting, *ex ante* induces banks to acquire less risky portfolios of assets and to issue more economic capital. Moreover, by recognizing unrealized gains and losses as they occur rather than when they are realized, fair value accounting reduces banks' incentive to sell appreciated assets and to hold economically impaired assets, further reducing the risk of banks' assets.

Ideally, research on fair value accounting and banks' risk taking would examine banks' individual decisions to acquire, finance, and sell assets as well as the correlation of these decisions across banks. The latter examination is crucial, because the criticism leveled against fair value accounting with the potentially most adverse implications for stability is that this measurement basis induces positive correlation in banks' acquisition and disposal of (potentially) illiquid assets. Such correlated (dis)investment activity pumps up the liquidity of assets in economic good times and exacerbates illiquidity in downturns (e.g., Plantin, Sapra, and Shin [2008]).²⁷

²⁷ The literature examining the covariance of Value-at-Risk across banks, i.e., CoVaR, emphasizes this importance (e.g., Adrian and Brunnermeier [2011] and Bushman and Williams [2015]).

The papers in this area that examine the association between fair value accounting and banks' (fire) sales of securities during the financial crisis generally find that such sales and the associated realized losses were economically insignificant, particularly when compared to banks' much larger incremental provisions for loan losses during the crisis (Laux and Leuz [2010], Laux [2012], Badertscher et al. [2012]). These findings are readily explained by the fact that fair value accounting has little or no effect on regulatory capital for most banks.²⁸ These findings may also be explained by banks finding illiquid assets with depressed prices to be attractive investments. For example, Abbassi et al. [forthcoming] find that trading-oriented banks in Germany during their 2005-2012 sample period acquired securities that had experienced large price drops, with the effects being strongest for low-rated, long-term securities.

In our view, this area has the potential to provide the most direct evidence on the relation between banks' fair value accounting and stability. Accordingly, we discuss examples of extant research as well as future research possibilities in more depth than for the other three research areas.

We emphasize the research design issues that arise in this area in the context of the study that confronts these issues most directly and completely, Ellul et al. [2014], as well as a related study by Merrill et al. [2014]. Both of these studies examine insurers to exploit aspects of their economics, regulation, and statutory accounting principles (SAP) that we describe below.²⁹

Because insurers compete against banks and are subject to similarly motivated risk-based capital

²⁸ Only a few large banks hold appreciable trading portfolios or other types of assets for which unrealized gains and losses recognized under fair value accounting affect regulatory capital. Most banks hold appreciable amounts of AFS securities that are recognized at fair value. Absent OTT impairments, however, unrealized gains and losses on AFS securities are recorded in other comprehensive income and so did not affect regulatory capital during the financial crisis. Under the U.S. implementation of Basel III, this is still the case for all but the largest U.S. banks. Banks' largest asset, loans held for investment, is measured at amortized cost less an allowance for loan losses whose measurement is governed by FAS 5 and FAS 114, not fair value.

²⁹ The National Association of Insurance Commissioners (NAIC) has codified SAP for use nationally. As discussed below, Ellul et al. [2014, 2015] exploit the fact that state insurance commissioners sometimes specify deviations from this codification for the insurers they regulate.

requirements, researchers potentially can make inferences about banks' likely behavior from insurers' observed behavior.

Ellul et al. [2014] and Merrill et al. [2014] exploit two aspects of statutory reporting for AFS securities, insurers' primary type of assets. First, SAP requires insurers to disclose the carrying and fair values of each AFS security (i.e., CUSIP) that they hold, acquire, or sell during the period, as well as realized gains and losses on sales of each security. Hence, highly granular information about these securities is publicly available. Ellul et al. [Merrill et al.] obtain this information from the NAIC [Thomson Reuters EMaxx]. Second, SAP requires life and property-casualty (PC) insurers to account differently for AFS debt securities in NAIC classifications 3-5 (i.e., below-investment grade but not yet in or near default).³⁰ Specifically, SAP requires life insurers to account for these securities at amortized cost. SAP requires PC insurers to account for these securities at the lower of amortized cost or fair value, with unrealized losses recorded in statutory surplus (through the asset valuation reserve).^{31, 32}

³⁰ Until the end of 2009, the NAIC based its classifications of all types of debt securities on credit ratings. As of the beginning of 2010 (2011), the NAIC bases its classifications for residential (commercial) mortgage-backed securities on the difference between the statutory carrying values and third-party supplied measures of the intrinsic value of the security (Becker and Opp [2013]). In the discussion in the text, we assume NAIC classifications are based on credit ratings, as is the case during the bulk of Ellul et al.'s [2014] 2004-2010 sample period and the entirety of Merrill et al.'s [2014] analysis of potential fire sales by insurers from 2007Q1-2009Q3.

³¹ For economically impaired securities, lower of amortized cost or fair value accounting *de facto* becomes fair value accounting for further decreases and sufficiently small increases in fair value. Accordingly, for simplicity we refer below to lower of amortized cost or fair value accounting for economically impaired securities as fair value accounting.

³² SAP also requires insurers to evaluate their debt securities for OTT impairment each period. SAP OTT-impairment requirements differ for loan-backed and structured securities versus other debt securities and have changed over time. Prior to 2009Q3, Statement of Statutory Accounting Principles (SSAP) No. 43 specified very weak OTT impairment accounting requirements for loan-backed and structured securities; the determinations of whether a security was OTT impaired and of the amount of any OTT impairment were based on *undiscounted* cash flows. As of the effective date of SSAP No. 43R in 2009Q3, SAP OTT-impairment requirements are similar to U.S. GAAP requirements with respect to the recognition of credit losses. Specifically, if insurers have the intent and ability to hold OTT-impaired debt securities to recovery of their amortized cost bases, they measure the securities at the present value of the expected cash flows, with credit losses reducing statutory income and surplus. By strengthening SAP's OTT-impairment requirements, SSAP No. 43R reduced the difference between life and PC insurers' statutory carrying values of economically impaired securities in NAIC classifications 3-5.

To exploit this second aspect, papers in this area must develop and implement research designs that capture the fact that PC and life insurers follow different business models (Ryan [2007, Chapter 14]). PC policies typically have shorter duration and more variable claims than do life policies, so PC insurers typically bear more insurance risk and less investment risk than do life insurers. Specifically, PC insurers focus on generating underwriting income and hold more liquid securities, whereas life insurers focus on generating interest-rate spread and hold higher yielding securities. These business model differences likely affect insurers' purchases and sales of economically impaired AFS debt securities during downturns, regardless of the two types of insurers' accounting for the securities. PC insurers are more likely than life insurers to sell securities that experience losses or increased risk. Life insurers are more likely to hold onto or even purchase securities that offer above-normal yields given the securities' credit ratings and thus regulatory capital requirements; this form of regulatory arbitrage is referred to as "reaching for yield."

Ellul et al. [2014] provide evidence that PC insurers acquired lower-risk AFS debt securities and managed their holdings of these securities more actively as economic conditions deteriorated during their 2004-2010 sample period. Specifically, they show that, compared to life insurers, PC insurers: (1) tilted their holdings of AFS debt securities away from asset-backed securities and non-investment grade corporate bonds during the period immediately prior and during the financial crisis, particularly when their risk-based capital adjusted to incorporate the fair values of invested assets was lower than their reported risk-based capital; (2) were more likely to sell AFS debt securities that experienced large price drops prior to and during the crisis; (3) were less likely to acquire A to AAA-rated AFS debt securities with above-normal yields when they had experienced cumulative net unrealized losses on AFS securities; and (4)

experienced lower losses on AFS debt securities with less effect on their risk-based capital ratios during the crisis. These findings all suggest that PC insurers hold less risky AFS debt securities and manage their holdings of those securities on a timelier basis as conditions change than do life insurers. Ellul et al. do not directly link these findings to PC (life) insurers' use of fair value (amortized cost) accounting for economically impaired AFS debt securities in NAIC classifications 3-5, however.

Ellul et al. [2014] conduct the following analyses to ensure that differences in PC and life insurers' business models do not explain their results. First, they show that the portfolios of AFS debt securities held by PC insurers and life insurers contain similar percentages of securities that are non-investment grade or that experience large price drops each year. Second, they distinguish the applicability of fair value versus amortized cost accounting within each type of insurer: (1) by also examining investments in AFS equity securities, which SAP requires both types of insurers to account for at fair value, and (2) by identifying variation across states in the required adherence to NAIC-codified SAP for AFS debt securities.

Specifically, Ellul et al. [2014] find that, compared to life insurers, PC insurers are more likely to acquire AFS equity securities with high beta and low liquidity. Essentially an application of Mill's Method of Difference, Ellul et al.'s opposing results for AFS debt and equity securities heighten confidence that their findings for debt securities are attributable to the two types of insurers' differential accounting for economically impaired AFS debt securities in NAIC classifications 3-5, rather than to their distinct business models.

Ellul et al. [2014] identify states that are more versus less likely to require insurers to recognize economically impaired AFS debt securities at fair value when NAIC-codified SAP specifies amortized cost. They calculate the percentages of asset-backed securities and below-

investment grade corporate bonds securities that insurers measure at fair value, separately for the life insurers and PC insurers operating in the state. Applying Mill's Method of Concomitant Variation, Ellul et al. find that both life insurers and PC insurers are more likely to reach for yield in states with a lower average incidence of fair value accounting for these securities, consistent with fair value accounting reducing this form of regulatory arbitrage. The primary concern with this analysis is that states may vary in the intensity of their regulation in other ways that are correlated with some states' requirement that insurers recognize economically impaired debt securities at fair value when NAIC-codified SAP specifies amortized cost.

Merrill et al. [2014] examine life and PC insurers' sales of (generally senior) non-agency mortgage-backed securities during the 2007Q1-2009Q3 financial crisis period. They argue that the combination of insurers' risk-based capital requirements, which impose steeply increasing capital requirements as securities are downgraded,³³ and SAP fair value accounting for certain downgraded securities provides incentives for capital-constrained insurers to sell those securities below intrinsic value in fire sales.³⁴ Because realized losses on securities reduce insurers' regulatory capital, Merrill et al. measure capital constraints using the following instrumental variables: negative shocks to operating income for life insurers and negative shocks to underwriting income for PC insurers. Whether the use of these shocks as instrumental variables improves the identification of capital constraints is arguable. Merrill et al. provide evidence that these shocks are associated with insurers' regulatory capital, but these shocks need not yield meaningful capital constraints and may induce or otherwise affect income management by insurers.

³³ For example, life insurers must hold capital of 1.2% and 23% for NAIC classification 2 (BBB rated) and 5 (CCC rated) debt securities, respectively (Becker and Opp [2013]).

³⁴ It is more accurate to say that insurers' positive incentive to sell downgraded securities comes from regulatory capital requirements, and that SAP-required amortized cost accounting provide disincentives for insurers to sell economically impaired securities that are not present with SAP-required fair value accounting for those securities.

Merrill et al. [2014] provide evidence that capital-constrained PC insurers were more likely than other PC insurers to sell downgraded non-agency mortgage-backed securities throughout the financial crisis, but that capital-constrained life insurers were more likely than other life insurers to sell such securities only in 2009. They attribute these findings to SAP requiring PC insurers to account for economically impaired non-agency mortgage-backed securities in NAIC classifications 3-5 at fair value throughout 2007-2009 but life insurers to account for these securities at fair value beginning only in 2009. We note that Merrill et al. inaccurately characterize the nature and timing of the change in SAP accounting requirements in 2009, and as a consequence they overstate the effect of this change on life insurers in that year.³⁵ We agree, however, that Ellul et al.'s [2014] and Merrill et al.'s findings of differential pre-2009 sales by the two types of insurers are attributable in part to PC (life) insurers' use of fair value (amortized cost) accounting for economically impaired AFS debt securities in NAIC classifications 3-5 during this period.

The question remains what portion of capital-constrained PC insurers' pre-2009 sales constituted undesirable fire sales in the teeth of illiquid markets, as Merrill et al. [2014] argue based on evidence of post-sale market price increases, versus desirable disposals of risky securities as economic conditions deteriorate, as Ellul et al. [2014] suggest and is consistent with PC insurers' business model. Given the severe market dislocation and evolving fundamentals

³⁵ Merrill et al.'s [2014] characterization of SAP requirements regarding the two types of insurers' use of fair value accounting is inaccurate in two significant respects. First, the primary difference in these requirements pertains to debt securities in NAIC classifications 3-5, which life insurers account for at amortized cost and PC insurers account for at lower of amortized cost or fair value. This differential accounting treatment did not change in 2009 (or afterwards for that matter). Second, the significant change in these requirements occurring in 2009 was the effective date of SSAP 43R in the third quarter, not at the beginning, of the year. This change strengthened SAP's OTT impairment requirements for loan-backed and structured securities in a way that rendered the first difference less significant, but not insignificant, as discussed in footnote 32.

and market expectations that occurred during the financial crisis, this is a difficult question to answer, as acknowledged by Merrill et al. and discussed by Laux [2012].

Overall, Ellul et al.'s [2014] results suggest that SAP-required fair value accounting for economically impaired debt securities causes insurers to acquire less risky securities and to be more likely to dispose of securities that experience price drops. The former behavior can only enhance insurers' stability, individually and collectively, and thus the stability of the financial system. The implications of the latter behavior for stability could go either way, however. If insurers dispose of problem securities early enough in downturns, it should enhance their stability and that of the financial system. If insurers instead dispose of problem securities in the teeth of illiquid markets, as Merrill et al. [2014] argue, it likely would increase the illiquidity of the securities and reduce the stability of the financial system. We encourage future accounting researchers to further explore the insurance setting examined by these studies, and to attempt to identify analogous research than can be done in the banking setting.³⁶

4.2.2. Loan growth procyclicality. This research area examines whether the extent of banks' fair value accounting is positively associated with their loan growth. In other words, does

³⁶ Two other recent studies provide evidence that financial institutions engaged in fire sales of non-agency mortgage-backed securities during the financial crisis. First, Bhat, Frankel, and Martin [2011] find that quarterly changes in banks' non-agency mortgage-backed securities were modestly positively correlated with contemporaneous liquidity-related changes in the value of the subprime-mortgage-related ABX indices from the fourth quarter of 2006 to the first quarter of 2009. Bhat et al. chose the end of their sample period to precede the April 9, 2009 issuance of FSP FAS 115-2 and FAS 124-2, which weakened OTT-impairment accounting rules for AFS and HTM securities. Bhat et al. obtains somewhat stronger but still modest effects for subsamples of banks with high holdings of non-agency mortgage-backed securities, high non-performing loans, or low regulatory capital. It is unclear to what extent these findings are attributable to banks' desire to avoid future impairment accounting write-downs as opposed to the economic losses from holding these securities. In this regard, the issuance of the FSP coincides rather neatly with the nadir of the financial crisis. Second, using similar approaches to distinguish insurers as those used by Ellul et al. [2014] described in the text (i.e., distinguishing PC versus life insurers and distinguishing life insurers across states based on the extent to which state commissioners require fair value accounting for economically impaired securities when NAIC-codified SAP specifies amortized cost), Ellul et al. [2015] find that insurers more subject to fair value accounting were more likely to sell downgraded non-agency mortgage-backed securities during the financial crisis. They also find that insurers most negatively affected by downgrades were more likely to realize offsetting gains on other securities, especially if the insurers also were regulatory capital-constrained, and that this yielded price pressure on these securities. Lastly, they find that life insurers engaged more than PC insurers in this gains-trading behavior.

fair value accounting exacerbate banks' loan growth procyclicality? This area is analogous to BL's examination of the effect of the timeliness of banks' provisions for loan losses on their loan origination procyclicality discussed in Section 4.1.1. Hence, the research design issues discussed in that section are particularly relevant to this area.

A positive association between the extent of banks' use of fair value accounting and their loan growth would obtain most naturally if three assumptions all hold: (1) banks recognize unrealized gains (losses) primarily in good (bad) times, (2) banks' regulatory capital includes net unrealized gains, and (3) banks primarily achieve their target regulatory capital ratios by adjusting the amounts of their assets and liabilities, not equity. Adrian and Shin [2011] find that banks' equity is much stickier than their assets and liabilities, implying that the third assumption holds to a close approximation. However, because the primary type of asset measured at fair value for most banks is AFS securities, and most of these securities are near credit riskless (e.g., governmental debt securities and agency mortgage-backed securities), the first two assumptions generally do not hold. The first assumption generally does not hold because riskless interest rates typically rise (fall) in good (bad) times, yielding countercyclical losses (gains) on near riskless securities (Xie [2012, 2015]). Although credit spreads typically move in the opposite directions, yielding procyclical gains (losses) on credit risky securities, most banks do not hold enough of these securities to experience meaningful unrealized gains and losses at the bank level. The second assumption generally does not hold because regulatory capital excludes unrealized gains and losses on AFS debt securities for most banks.³⁷

Xie [2012, 2015] and Yeung [2013] are papers in this area. Xie [2012] examines the association between proxies for the extent of banks' fair value accounting and growth in loans,

³⁷ Under Basel III as applied internationally, unrealized gains and losses recorded in other comprehensive income are included in banks' regulatory capital. In July 2013, the U.S. bank regulators decided to require this aspect of Basel III only for the few large U.S. banks applying Basel III's advanced methods.

banks' primary asset. Loan growth is also BL's primary dependent variable. Xie's setting differs subtly from that of BL, however, in that loans generally are not recognized at fair value. Hence, the only plausible mechanism for banks' use of fair value accounting to affect loan growth is through the effects of fair value accounting on banks' regulatory capital. In contrast, BL's results may reflect banks that record timelier provisions for loan losses better understanding the credit risks of their loans. Xie [2012] finds that unrealized net gains on AFS and HTM securities are positively associated with loan growth. Xie [2012, 2015] find that these unrealized net gains are not procyclical, however, because these net gains primarily reflect changes in riskless rates. Riskless rates typically rise in good times, causing unrealized losses, and fall in downturns, causing unrealized gains. Xie [2012] also finds that the percentage of assets that are trading and AFS securities is positively associated (unassociated) with loan growth in non-recession (recession) periods.

Xie [2015] and Yeung [2013] examine the association between proxies for the extent of banks' fair value accounting and banks' mortgage approval rates calculated using HMDA mortgage-level applications and originations data. This loan-level approach distinguishes loan supply from loan demand, an important research design issue discussed in the introduction and Section 4.1.1. Xie separately examines: (1) her entire 1997-2012 sample period; (2) the 2003-2006 pre-financial crisis period, to capture any abnormally high loan approval during economic good times; (3) the 2008-2009 crisis period, to capture any abnormally low loan approval during downturns; and (4) small (less than \$1 billion total assets) and/or highly leveraged (lowest quartile of tier 1 leverage ratio) banks during the crisis period to capture any abnormally low loan approval during downturns by weak banks. Despite employing a loan-level approach with a very large number of observations that should exhibit high power, Xie finds no evidence that

unrealized net gains on AFS and HTM securities or the proportion of assets that are trading and AFS securities are associated with mortgage approval rates in any of her samples.

In contrast, Yeung [2013] finds that banks in the bottom tercile of the total regulatory capital ratio exhibit mortgage approval rates that fall weakly significantly with the proportion of assets that are trading and AFS securities during the 2007-2008 financial crisis period. It is unclear why Yeung's significant finding obtains given the corresponding insignificant finding in Xie [2015]. One possibility is that Yeung's significant finding is due to the very large number of loan-level observations, although this possibility seems unlikely given that he finds that a one-standard deviation increase in the proportion of fair valued assets yields an appreciable 3.4% decrease in the mortgage approval rate from a crisis sample mean of 74%. A more likely possibility is the different research designs of the two studies. Xie estimates separate models for each of her subsamples (e.g., small and highly levered banks in the crisis period is one sample), thereby allowing the coefficients on each of the test and control variables to vary across the subsamples. Yeung estimates pooled models for crisis and non-crisis subsamples interacting an indicator for high leverage with the proportion of fair valued assets but not with the control variables. Hence, Yeung's significant finding may result from a correlation between the proportion of fair valued assets and the control variables or from the omission of interactions of the control variables with the indicator for high leverage. These possibilities suggest that it is important for researchers working in this area to identify and control for variables associated with banks' use of fair value accounting using appropriately demanding (i.e., interactive) functional forms.

Overall, this research area finds minimal evidence that banks' unrealized net gains recorded under fair value accounting are positively associated with their loan growth or loan approval rates.

4.2.3. Leverage procyclicality. This research area, which is related to but distinct from the second, examines whether proxies for the extent of banks' fair value accounting are associated with their leverage procyclicality. Most of the extant literature employs Adrian and Shin's [2010] definition of leverage procyclicality as a positive association between book asset growth and book leverage growth. This definition captures the empirical regularity that banks' book assets tend to rise in good times and fall in downturns, with growth in book assets being primarily financed by debt.

Despite the seminal role of this definition in the literature, in our view it does not constitute the ideal platform for this area of accounting research, for three reasons. First, analysis of banks' book asset growth (rather than a macroeconomic or other cyclical variable such as gross domestic product [GDP] growth) is a somewhat indirect way to assess the procyclicality of banks' book leverage. For example, it is entirely possible for a bank to grow book assets in downturns and to decrease book assets in good times. Second, variation in banks' book leverage (rather than economic leverage or regulatory capital) across the cycle is not of obvious interest and needs to be explained or preferably demonstrated analytically, something that no extant paper does convincingly. In this regard, Adrian and Shin [2014] show that, unlike book leverage, market leverage is countercyclical. Adrian, Boyarchenko, and Shin [2015] explain the opposite cyclicity of book and market leverage in terms of the book-to-market ratio falling in economic good times and rising in downturns. Third, even if, despite Xie's [2012, 2015] findings discussed in Section 4.2.2, fair value accounting causes firms to record unrealized gains in good times and

losses in downturns, this could only explain why banks have more debt outstanding in good times than in downturns, not why the ratio of debt to book equity is higher in good times than in downturns. We expand on this point below.

In summary, we encourage accounting researchers either to justify why they use Adrian and Shin's [2010] definition of leverage in this research area or to develop alternative definitions. For simplicity, we omit "book" before asset(s) and leverage in the remaining discussion of this area.

Adrian and Shin [2011] provide visual evidence that commercial banks' asset growth and leverage growth exhibit a strong positive association that is close to one, but they do not directly link fair value accounting to this leverage procyclicality. Fair value accounting should yield or exacerbate leverage procyclicality only if banks exhibit large enough asset purchases (sales) after experiencing fair value gains (losses) to cause their leverage to overshoot the target or normal level (Amel-Zadeh, Barth, and Landsman [2015]). In our reading, the literature does not provide any convincing theoretical reason for why this would be the case or empirical evidence that it is the case. In contrast, the literature provides at least three credible reasons why banks' leverage procyclicality is explained by substantive economic phenomena: (1) banks' average risk weights on assets fall in good times when banks are flush with liquid assets and rise in downturns when banks sell liquid assets to deleverage or because they need cash (Amel-Zadeh et al. [2015]); (2) banks raise (lower) their target leverage ratio in good/stable (bad/unstable) times to equate equity to a potential loss construct such as Value at Risk (Adrian and Shin [2014]);³⁸ and (3) banks'

³⁸ Procyclicality of target leverage ratios is one possible manifestation of the "volatility paradox," in which banks build up risks during low volatility periods that manifest during high volatility periods. See Adrian and Ashcroft [2012] for discussion of banks' building up of tail risks through structured finance transactions during the low volatility period prior to the financial crisis. We discuss this phenomenon further in Section 4.3.

collateral and other liquidity requirements fall in good times and rise in downturns (Brunnermeier and Pedersen [2009]).

Two accounting research papers, Amel-Zadeh et al. [2015] and Laux and Rauter [2015], examine the association between the proxies for banks' use of fair value accounting and their leverage procyclicality as defined by Adrian and Shin [2010]. Amel-Zadeh et al. (Laux and Rauter) use banks' fair value components of comprehensive income (unrealized net gains on AFS securities) to proxy for their use of fair value accounting. Both studies find no evidence that banks' leverage procyclicality increases with their use of fair value accounting. The two studies identify different primary economic drivers of leverage procyclicality, however.

Under the assumption that banks' regulatory leverage capital constraints are binding, Amel-Zadeh et al. [2015] show theoretically that banks' leverage is procyclical if and only if their average risk weights of assets fall in good times and rise in downturns. Consistent with this theoretical relation, Amel-Zadeh et al. provide evidence that changes in banks' average risk weights across the cycle are a primary driver of leverage procyclicality. Specifically, they find that including the change in average risk weight of banks' assets in the empirical model yields an insignificant association between asset growth and leverage growth for banks with binding capital constraints and reduces the significant positive association for banks without binding capital constraints by about 13%.³⁹ Moreover, they find that the fair value components of comprehensive income are negatively associated with growth in leverage, inconsistent with fair value accounting driving leverage procyclicality. Finally, they find that the fair value components of comprehensive income interact negatively or insignificantly with net asset

³⁹Amel-Zadeh et al. [2015] also show that growth in lower risk-weighted assets is more positively associated with leverage growth.

purchases in explaining leverage growth. Amel-Zadeh et al.'s findings generally obtain both in up and down markets and for banks with and without binding capital constraints.

Similarly, Laux and Rauter [2015] provide evidence that unrealized net gains on AFS securities are negatively associated with leverage growth for their overall sample as well as for three subsamples of banks with different business models: savings banks, commercial banks with below 20% fair valued assets, and commercial banks with above 20% fair valued assets. They find similar results for realized net gains on sales of loans and on sales of AFS and HTM securities. These results are inconsistent with fair value accounting driving leverage procyclicality. Laux and Rauter's results are instead consistent with the direct effects of recording unrealized gains and losses in net income or comprehensive income on equity being less than fully offset by changes in liabilities.

Most interestingly, Laux and Rauter find that realized net gains on loan sales interact *positively* with asset growth in explaining leverage growth. Hence, it is banks' realized net gains that are recorded in net income under amortized cost accounting that are positively associated with their leverage procyclicality, not their unrealized net gains recorded in net income or other comprehensive income. This result is most naturally explained by banks' realization of net gains on loan sales, which mostly occurs when loan sale markets are liquid during credit booms, being associated with increased leverage.

Laux and Rauter [2015] find that changes in banks' average risk weights of assets have a much weaker average effect on banks' leverage growth than do Amel-Zadeh et al. [2015]. Laux and Rauter further find that this effect is significant only for a narrowly constructed sample: commercial banks with greater than 20% fair value assets whose balance sheets expand. Laux and Rauter instead find that leverage growth is highly associated with the change in GDP, i.e.,

the business cycle, consistent with Adrian and Shin's [2014] evidence that banks raise (lower) their target leverage ratio in good/stable (bad/unstable) times.

Laux and Rauter [2015] also distinguish the three types of banks with different business models mentioned above. They find that leverage procyclicality is strongest for savings banks.

It is unclear what differences in the research designs of Amel-Zadeh et al. [2015] and Laux and Rauter [2015] drive the studies' differing results regarding the primary economic driver of banks' leverage procyclicality. The simplest explanation is that the alternative drivers examined are correlated, making the results sensitive to sample and model specification.

4.2.4. Financial asset liquidity. This research area examines whether banks recorded unrealized losses on financial assets under fair value accounting before versus after decreases in relevant market indices during the financial crisis. The former possibility suggests that the recording of these unrealized losses exacerbated market illiquidity for the assets. The latter possibility suggests that these losses reflected deterioration of the assets' fundamentals or liquidity prior to the sales.

Determining whether unrealized losses recorded under fair value accounting lead or follow declines in asset prices raises a difficult research design issue: riskier and more affected exposures generally yield larger losses sooner. Hence, unrealized losses that appear to be recorded on a timelier basis relative to observable changes in asset prices may in fact be driven by the exposure being riskier/more adversely affected than the assets for which prices are observed. To date, this issue is best addressed by Vyas [2011], who makes a valiant attempt, given the available data, to match banks' various types of assets to observable indices such as the ABX, CMBX, and LCDX. While this matching is more feasible for some asset types than for others, Vyas' evidence suggests that changes in these indices generally led recognized fair value

losses during the financial crisis, inconsistent with fair value accounting yielding adverse feedback effects.

Laux and Leuz [2010] describe several “circuit breakers” in fair value accounting requirements and summarize a range of empirical evidence that is consistent with asset price declines leading recognized fair value losses. These circuit breakers include: (1) FAS 157 defines fair values as based on orderly transactions; (2) FSP FAS 157-4, which amended FAS 157 in April 2009, clarifies that firms should measure fair values using level 3 inputs when markets are sufficiently illiquid; and (3) FAS 115 enables firms to reclassify investment securities out of categories for which fair value accounting is required. This empirical evidence summarized includes: (1) several studies show that the market discounted banks’ recognized level 2 and level 3 fair value measurements of assets during the financial crisis and (2) several studies show that banks were reluctant to write down or disclose fair value losses for various types of assets during the crisis. For example, Huizinga and Laeven [2012] provide evidence that banks understated write-downs on mortgage-backed securities during the crisis. Moreover, Huizinga and Laeven find that banks with large holdings of these securities also understated provisions for loan losses.

4.3 SECURITIZATIONS

In this section, we discuss prior research on the effects of banks’ financial reporting for securitizations on stability. Ideally, we would also discuss analogous research on banks’ financial reporting for the other types of risk-concentrated financial instruments described in Section 2.2 (e.g., derivatives and loan commitments), but minimal such research exists.

Prior accounting research on securitizations focuses on the market’s assessment of the risk implications of banks’ volume of securitizations and retained interests in securitizations

accounted for as sales with the securitization entities unconsolidated.⁴⁰ This research generally assumes that the market possesses sufficient information and ability to evaluate these risk implications. A logical consequence of this assumption is that the market should exercise reasonable discipline over banks' securitizations. Hence, with the exception of a few studies that examine the association between securitization and information risk, this research has rather indirect implications for stability.

Accordingly, in this section we primarily discuss finance research that suggests three non-mutually exclusive channels by which banks' financial reporting for securitizations might affect stability. We encourage future accounting researchers to attempt to empirically document the extent to which these channels exist and are distinct from the channels by which banks' financial reporting for securitizations affects their regulatory capital, managerial compensation, and other arrangements. Although in practice these other channels use financial reporting numbers, in principle these channels could adjust financial reporting numbers for their uses.

The first channel is that securitizations accounted for as sales, with securitization entities unconsolidated, allow issuers to record gains on sale upon the securitization of loans instead of earning interest income over time on retained loans (Dechow and Shakespeare [2009], Dechow, Myers, and Shakespeare [2010]). This ability to front-load income may cause banks to relax their stated underwriting criteria or to apply these criteria with less discipline in order to originate more securitizable loans and thereby generate larger gains on sale. Such income-management-motivated loan origination is more likely to occur when banks believe that they can transfer more of the risks of the loans to securitization investors. While somewhat mixed, prior research evidence generally supports the idea that the loans that banks originate to securitize are riskier

⁴⁰ Prior studies have examined the association of banks' securitizations with their economic leverage, systematic and idiosyncratic equity risk, credit risk, and information risk or opacity. See Ryan [2011, Section 5.3.3] and Beatty and Liao [2014, Section 4.3] for surveys of this literature.

than the loans they originate to retain (Mian and Sufi [2009], Keys et al. [2010], Jiang, Nelson, and Vytlačil [2014], Elul [forthcoming]). In the period leading up to the financial crisis, banks were more likely to securitize subprime and lower documentation mortgages than other mortgages, and they exerted less effort to collect and evaluate soft borrower information for securitized mortgages. During the crisis, banks' securitized mortgages performed worse than their retained mortgages with similar observable underwriting criteria.⁴¹ All else being equal, lower credit quality loans are more likely to exhibit highly correlated defaults and to become illiquid during economic downturns, reducing stability.

The second channel is that banks may develop securitization structures in which they retain the downside tail risks of the securitized assets, i.e., losses that are triggered infrequently but are very large when triggered, in order to keep securitization entities off-balance sheet. Banks are most likely to accumulate tail risks during economic good times when volatility appears low, exacerbating the increase in volatility that inevitably occurs when the cycle turns (Adrian and Ashcroft [2012]). In discussing this channel, we ignore qualifying special purpose entities (QSPEs) that were exempt from consolidation prior to the effective date of FAS 166 and FAS 167, the beginning of the first fiscal year beginning after November 15, 2009.⁴²

⁴¹ Several studies find that banks' retained loans performed the same as or worse than their securitized loans during the financial crisis. These findings appear to be primarily attributable to banks being forced to retain (contractually required to buy back) loans that exhibit delinquency immediately after origination (securitization) (Jiang et al. [2014] and studies cited in footnote 2 of that paper). This evidence does not conflict with the overall evidence summarized in the text; naturally, loans that banks originally intended to securitize but ultimately determine not to be securitizable perform worse than the loans they securitize.

⁴² FAS 125, a standard governing transfers of financial instruments, created QSPEs as a distinct class of special purpose entities for accounting purposes. FAS 125 defined QSPEs as passive entities that are distinct from the transferor. QSPEs were exempted from consolidation by the transferor in a securitization and most other parties first by FAS 125, and then by its successor standard FAS 140, and finally by FIN 46(R), a standard governing variable interest entity consolidation. FAS 166 and FAS 167 eliminated the notion of a QSPE. Prior to the effective date of FAS 166 and FAS 167, when consolidation would have been required for securitizations structured using non-QSPEs, banks usually could and did structure those securitizations using QSPEs. However, some types of securitizations, such as multi-seller asset-backed commercial paper conduits, could not effectively be structured using QSPEs.

Over time, the FASB has substantially reduced the amount of risk that a bank can retain in a non-QSPE securitization entity without being required to consolidate the entity. Prior to the issuance of FIN 46, effective in February 2003, banks could avoid consolidation of non-QSPE securitization entities by retaining less than *substantially all* of the risks and rewards of the entities.⁴³ Under FIN 46 and its December 2003 amendment FIN 46(R) (collectively, “FIN 46(R)”), banks had to retain less than *a majority* of the risks and rewards of non-QSPE securitization entities to avoid consolidating these entities. This tightening of consolidation requirements appears to have been a factor contributing to sponsoring banks’ development of securitization structures in which they retained the tail risks of the securitized assets (“tail risks”) in the period leading up to the financial crisis. Tail risks generally are realized only in credit crises or downturns.

To avoid consolidation of non-QSPE securitization entities under FIN 46(R), the banks primarily involved (e.g., the sponsors or transferors) often had to induce third parties to assume first-loss interests, such as a residual security referred to as an “expected loss notes,” that bore relatively frequently triggered but capped and thus predictably small risks. Banks sized these interests to be just large enough so that the third parties bore a majority of risk and rewards of the securitized assets according to the banks’ models. The banks retained difficult-to-assess tail risks, however, through means including the provision of liquidity and credit support, implicit recourse, and representations and warranties. For example, for non-QSPE securitization entities that issued liabilities with maturity shorter than that of the securitized assets, such as asset-

⁴³ Prior to February 2003, various standards, such as EITF 90-15, governed consolidation of non-QSPE securitization entities.

backed commercial paper (ABCP) conduits, sponsoring banks typically retained tail risks through the contractual or non-contractual provision of liquidity support.⁴⁴

Finance research provides evidence that banks increasingly retained tail risks during the period over which FIN 46(R) governed consolidation of securitization entities. However, this research identifies regulatory capital requirements rather than FIN 46(R) or other aspects of financial reporting as the primary reason for this retention. For example, Acharya and Schnabl [2010] and Acharya et al. [2013] examine bank-sponsored ABCP conduits in which banks retained tail risks primarily through the provision of liquidity support. They show that the volume of outstanding ABCP almost doubled from \$624 billion in September 2004 to \$1.2 trillion in July 2007. They ascribe this rapid increase primarily to changes in regulatory capital requirements effective as of September 30, 2004 (Department of Treasury et al. 2004). These requirements treated non-QSPE ABCP conduits that sponsoring banks consolidated for financial reporting purposes under FIN 46(R) as off-balance sheet for regulatory purposes (the “ABCP exclusion”). In addition, these requirements applied a credit conversion factor of only 10% to eligible liquidity facilities with a term of less than one year provided to ABCP conduits. Hence, under these requirements banks could hold very little capital against ABCP conduits even when they consolidated the conduits for financial reporting purposes and retained tail risks through the provision of liquidity support.

⁴⁴ The following is an example of sponsoring banks’ non-consolidation of securitization entities in which they retained tail risks under FIN 46(R). SunTrust Banks did not consolidate its Three Pillars ABCP conduit from the conduit’s March 1, 2004 sale of an expected loss note to a third party to the January 1, 2010 effective date of FAS 167. Throughout the period of non-consolidation, the committed amount of the expected loss note was a very small percentage of the assets of Three Pillars, e.g., \$20 million (0.4%) of the conduit’s \$5.3 billion of assets on December 31, 2007. Moreover, this committed amount was less than one-seventh of the \$144.8 million loss that SunTrust bore from repurchasing assets from the conduit in 2007Q4 under its contractual liquidity support (see SunTrust’ 2007 Form 10-K filing, pp. 54-56). SunTrust also provided liquidity support to Three Pillars without bearing losses at several other points during the financial crisis.

Acharya and Schnabl [2010] and Acharya et al. [2013] also show that banks sponsoring ABCP conduits experienced negative stock returns in proportion to the liquidity support they provided to the conduits around the severe shock to the market liquidity of ABCP in early August 2007. Due to the losses borne by banks from their provision of liquidity support to ABCP conduits issuing short-term paper during the crisis, U.S. bank regulators eliminated the ABCP exclusion effective March 29, 2010.⁴⁵

Although banks appear to respond more to regulatory capital requirements than to financial reporting standards, regulatory reporting and thus capital requirements often are based on financial reporting standards. Regulatory reporting and capital requirements sometimes deviate from financial reporting standards to achieve policy goals, however, as occurred with the ABCP exclusion in September 2004. Regulatory capital requirements sometimes converge back toward accounting standards when those goals are not met or when unintended consequences arise, as occurred with the March 2010 elimination of that exclusion.

The third channel by which banks' financial reporting for securitizations might affect stability is that the cash flows on the banks' retained interests in securitizations are determined through complex interactions among the characteristics of the securitized assets, payment waterfalls, and economic conditions. As a practical matter, these complex interactions cannot be fully disclosed in banks' financial reports.⁴⁶ Hence, banks' retained interests in securitizations

⁴⁵ Bank regulators' elimination of the ABCP exclusion occurred shortly after the effective date of FAS 166 and FAS 167. These standards required sponsoring banks to consolidate essentially all ABCP conduits for financial reporting purposes. This primarily occurred because the sponsoring banks were deemed both to control the conduits and to bear a reasonable possibility of significant loss on their interests in the conduits. It also occurred because banks had deemed some ABCP conduits to be QSPEs prior to the effective date of FAS 167, and these conduits lost their exemption from consolidation under that standard.

⁴⁶ The SEC revised Regulation AB in August 2014, effective October 2014, to require extensive additional standardized asset-level disclosures about securitization pools in securitization prospectuses and on an ongoing basis. These additional disclosures pertain to: contractual features of the securitization that affect the payment waterfall; credit-risk-relevant attributes of the securitized assets such as geography, property value, and loan-to-value ratio; the post-securitization performance of the securitized assets; and post-securitization loss mitigation

are inherently opaque and thus likely to become illiquid during credit crises and other severe economic downturns, exacerbating instability.

Consistent with this view, Cheng, Dhaliwal, and Neamtiu [2011] provide evidence that banks that securitize loans for which it is more difficult to evaluate the degree of risk transfer (as proxied by the volume of securitizations, the credit risk of the assets securitized, and the amount of retained interests) face greater information risk as measured by larger bid-ask spreads and analyst forecast dispersion. Oz [2015] provides evidence that these effects diminished after the effective date of FAS 166 and FAS 167, due to the enhanced information about issuers' continuing involvements with securitized assets required by these standards. Moreover, she finds that this diminishment is larger for less visible banks and for U.S. banks than for European banks. Oz's comparison of U.S. and European banks is a sensible attempt to address the fact that new disclosure requirements tend to be imposed after prior disclosures have been demonstrated to be inadequate in severe economic downturns such as the financial crisis. This fact makes it difficult to distinguish the effects of new disclosures from mean reversion of economic conditions toward normal levels.

5. Opportunities for Empirical Research on Banks' Financial Reporting and Stability

In Sections 1-4, we identify issues that existing studies on the topic of banks' financial reporting and stability have addressed in limited ways. In the process, we point out various opportunities for future accounting research on this topic. To this end, in Section 5.1 we recommend five non-mutually exclusive ways to identify and exploit such opportunities. These recommendations also serve the purpose of summarizing some of the high-level takeaways from

efforts. These disclosures clearly improve the information available to investors. Due to their recency, however, the effects of these enhanced disclosure requirements on bank equity and securitization markets have not yet been empirically evaluated.

prior sections. In Sections 5.2-5.4, we discuss three settings in which accounting researchers can exploit variation in financial reporting requirements across banks, countries, regulatory environments, and other market or non-market mechanisms to reliably draw conclusions about the effects of alternative financial reporting approaches for stability. We indicate the opportunities and pitfalls these settings present. Underlying these recommendations and examples is our belief that accounting researchers should exploit their comparative advantages in understanding how the properties of banks' accounting numbers and the contexts involved affect how banks and other parties use financial report information in making decisions that affect stability.

5.1 FIVE RECOMMENDATIONS

First, identify and remedy gaps or imprecision in prior studies' specification of the logical links in the chain from (1) banks' financial reporting to (2) the decisions that banks and other parties make based on banks' financial report information and thence to (3) the effects of these decisions on stability. As discussed in Section 4.1.1, Beatty and Liao [2011] is unusually complete and precise in specifying the logical links in their setting and so constitutes a good model for studies examining other settings.

Second, determine the primary threats to sound empirical identification of the logical links from banks' financial reporting to stability in the setting under examination. Address these threats as best as possible. One way to do this is to identify settings that allow these links to be more concretely or completely identified. We discuss three such settings in Sections 5.2-5.4.

Third, incorporate how banks' accounting numbers are generated and how the parties involved make decisions based on banks' financial report information in the setting under examination. We discuss factors that affect how banks' accounting numbers are generated in

various places above. For example, in the introduction and Section 4.1.1 we discuss the importance of loan portfolio composition for banks' measurement of provisions for loan losses. We also discuss throughout this paper how various parties (e.g., bank regulators, banks' contracting counterparties, banks' competitors, and banks' depositors and other claimants) use banks' financial report information to make decisions that may affect stability.

Fourth, model or at least qualitatively characterize the differences between the economic constructs posited to affect stability and the accounting proxies used for those constructs. For example, this is a largely missed opportunity in the accounting branch of the leverage procyclicality literature discussed in Section 4.2.3. This literature employs Adrian and Shin [2010]'s definition of leverage as book leverage rather than economic leverage.

Fifth, question received wisdom about what drives accounting numbers. A good example of this is Xie [2012, 2015], who finds that unrealized net gains on AFS securities are on average counter-cyclical, being driven more by changes in riskless rates rather than by changes in credit spreads. Another example is the studies which document that during the financial crisis incremental provisions for loan losses considerably exceeded unrealized fair value losses even for the largest banks with the highest proportion of fair valued assets. The findings in these studies undermine the oft-made claim that fair value accounting played a central role in the crisis (Shaffer [2010], Laux and Leuz [2010], Badertscher, Burks, and Easton [2012]).

5.2 DYNAMIC PROVISIONING FOR LOAN LOSSES IN SPAIN

The Spanish banking setting is amenable to research on the relation between provisions for loan losses and stability for two primary reasons. First, as discussed in Section 4.1.1, Spanish bank regulators have required Spanish banks to employ dynamic provisioning for loan losses since 2000Q3. We describe the general approach used in dynamic provisioning for loan losses in

Section 2.1.⁴⁷ In brief, dynamic provisioning requires banks to add countercyclical general provisions that incorporate through-the-cycle loss rates on top of the provisions required by normal accounting requirements. Because 2000Q3 was an economically favorable time, the imposition of dynamic provisioning caused a more than two-fold increase in banks' provisions for loan losses from 1999 to 2001 (Illueca et al. [2012]). Spanish regulators twice amended dynamic provisioning requirements, generally "loosening" these requirements during good times in 2005Q1 and lowering the provisioning floor during the deep downturn in 2008Q4 (Jiminez et al. [2012]). The imposition and two amendments of dynamic provisioning constitute three plausibly exogenous shocks to *individual* banks' loan supply. These shocks manifest through banks' provisioning for loan losses and its effects on banks' net income, owners' equity, and regulatory capital. The second amendment is tied up with the regulatory response to the crisis, however, and thus likely is endogenous with respect to banks' *aggregate* loan supply (and perhaps also aggregate loan demand).

Second, prior to the financial crisis the Spanish banking industry exhibited two dominant types of banks: large commercial banks and local not-for-profit savings banks (*cajas*). The large commercial banks in Spain are similar to large banks elsewhere. The *cajas* often were captured by municipalities and exhibit other governance failures, due to the semi-political process by which their directors are elected and the absence of equity market discipline (Garcia-Cestona and Sagarra [2014]). These two types of banks differed substantially in their performance during the crisis and survival rates.

⁴⁷ Fernandez de Lis et al. [2000] and Saurina [2009] describe in detail the methods used as of 2000 and 2005, respectively, to calculate countercyclical general provisions for loan losses under dynamic provisioning in Spain. These general provisions are included in the recorded provisions for loan losses for both regulatory and financial reporting purposes. These provisions are disclosed in financial reports, however, enabling users of financial reports to undo the provisions, if desired.

As a result of dynamic provisioning, Spanish banks entered the financial crisis with robust allowances for loan losses that considerably exceeded those recognized by banks in other countries under the incurred loss model (Garcia-Herrero and Fernandez de Lis [2008], Balla and McKenna [2009]). Evidence as to whether these higher allowances contributed to the stability of the Spanish financial system prior to and during the crisis is mixed, however, depending on whether one examines variation in risk taking across banks or the aggregate level of risk taking by banks. Jiminez et al. [2012] find that banks that recorded larger provisions due to the imposition of dynamic provisioning, especially cajas with weaker governance, appear to have curtailed lending on a relative basis during the pre-crisis period. There appears to have been no appreciable effect on aggregate lending beyond a few quarters after the 2000Q3 and 2005Q1 shocks, however. This suggests that loan demand, rather than going unsatisfied, was quickly satisfied by banks less affected by the imposition of dynamic provisioning during good times. In other words, dynamic loan loss provisioning appears to have induced approximately zero-sum effects on loan supply across banks during the pre-crisis period.

Jiminez et al. [2012] examine a sample of commercial borrowers with outstanding loans from multiple banks, so their results may not generalize to borrowers with less established banking relationships. They find a persistent contraction of loan supply after the 2008Q4 shock, consistent with lender substitution being more difficult in downturns. This finding is akin to the well-documented ineffectiveness of monetary policy when nominal interest rates approach zero (e.g., Bernanke, Reinhart, and Sack [2004]). It is easier for dynamic provisioning to constrain loan supply in good times than to “push on a string” to generate loan supply in sufficiently downturns.

Despite the imposition of dynamic provisioning for loan losses, during the period leading up to the financial crisis a majority of the Spanish banking industry switched to a business model that emphasized high loan growth financed by debt rather than deposits (Martin-Oliver, Ruano, and Salas-Fumás [2014]). This accumulation of risk led to the insolvency of many Spanish banks during the crisis, particularly *cajas*. Of the 45 *cajas* that existed in 2008, only 12 *cajas* remained in 2012, and only two of those remained in their pre-crisis form (Garcia-Cestona and Segarra [2014]). The relatively poor outcomes for *cajas* appear to be largely attributable to their not-for-profit charters, which reduced their ability to raise liquidity and capital from market sources when needed during the crisis.

The features of the Spanish banking setting discussed above enable future researchers to mitigate all three of the threats to valid inferences regarding the relation between provisioning for loan losses and stability discussed in the introduction and Section 4.1.1. First, the concern that banks with more favorable characteristics record larger or timelier provisions for loan losses does not directly arise in this setting, because all Spanish banks must record dynamic provisions for loan losses calculated using specified formulas.

Second, this setting enables researchers to test whether volatility suppression mechanisms such as dynamic provisioning for loan losses lull banks into false senses of security during bubble periods or cause banks to downplay the appearance of cracks in their business models as those bubbles begin to deflate. Jiminez et al. [2012] provide preliminary evidence along these lines, showing that the imposition of dynamic provisioning reduced loan supply by certain banks but not by the banking system as a whole. Jiminez et al. do not examine, however, whether dynamic provisioning has favorable or unfavorable effects across the entire cycle. Spanish banks' high, debt-fueled growth during the pre-financial crisis period and the large number of

those banks, especially cajas, that became insolvent during the crisis suggests that these effects were unfavorable at least for some banks.

A number of important questions that have not yet been convincingly tested in the literature can be tested in this setting. For example, did Spanish banks that entered the crisis with higher loan loss allowances due to dynamic provisioning become insolvent more or less frequently as a consequence of the crisis? If more, was the relation between excess loan loss allowances and insolvency more severe for cajas, given their poorer governance and lesser ability to raise funds from market sources?

Third, this setting provides two distinct ways to separate loan supply from loan demand. The imposition and two subsequent amendments of dynamic provisioning for loan losses constitute plausibly exogenous shocks to individual banks' loan supply, not loan demand. It may be possible to obtain commercial loan-level application and origination data from bank regulators, as do Jiminez et al. [2012], and to examine loan approval rates rather than loan originations as a proxy for loan supply.

5.3 LANDESBANKEN IN GERMANY

The Landesbanken are banks operating in one or more federal states (Lander) in Germany. Each Landesbank is jointly owned by the state government(s), municipally owned savings banks, and possibly other governmental entities in the state(s) in which it operates. The states created the Landesbanken in the 19th century to raise and invest funds to support various public purposes, such as financing state infrastructure projects and providing wholesale banking services to the smaller savings banks in the state. To facilitate these purposes, each Landesbank received explicit guarantees of its debt issuances and ongoing capital adequacy from the governmental entities that directly or indirectly owned the Landesbank. The July 2001 Brussels

Agreement of the European Commission disallowed explicit guarantees of new debt issues after July 2005 (Fischer et al. [2014]). During the July 2001-July 2005 interim period, this agreement allowed the Landesbanken to continue to issue guaranteed debt maturing up to year-end 2015. Since this date has now passed, only debt issued prior to July 2001 and still outstanding remains guaranteed.

These explicit guarantees substantially lowered the Landesbanken's cost of funds, increasing their relative ability to compete for business against other banks (International Monetary Fund [2006]). Despite the public purposes motivating these guarantees, since the 1960s the Landesbanken came to operate in much the same way as other banks (International Monetary Fund [2006]). For example, in the years leading up to the financial crisis several Landesbanken acquired subprime mortgage-related assets that they financed through short-term debt on-balance sheet or that they securitized in some way (e.g., through ABCP conduits). The Landesbanken retained most of the risk of the assets by providing credit or liquidity support to the securitization entities (Puri et al. [2011]).

The Landesbanken and German banking context exhibit three features that provide opportunities for research that addresses the research design issues discussed in the introduction, as well as inherently interesting questions. The first two features are exogenous shocks that have previously been examined by finance researchers but that accounting researchers might exploit for their purposes. First, Puri et al. [2011] effectively use decreases in the value of ownership stakes in Landesbanken most adversely affected by the financial crisis as exogenous shocks to the loan supply of the savings banks that own those stakes. Unlike the imposition of dynamic provisioning for loan losses in Spain, however, these shocks are not directly related to an aspect of accounting.

Second, Fischer et al. [2014] effectively use the July 2001-July 2005 interim period as an exogenous shock to the Landesbanken's risk-taking incentives. Fischer et al. argue that the looming elimination of the explicit guarantees that had long provided the Landesbanken with competitive advantages, combined with minimal market discipline while the explicit guarantees remained outstanding, reduced the Landesbanken's franchise values. This provided the Landesbanken with incentives to issue low-cost guaranteed debt and to gamble with the proceeds. Consistent with this argument, Fischer et al. provide evidence, using a difference-in-differences research design, that the Landesbanken increased the risk of the loans they issued and their leverage compared to other banks during the July 2001-July 2005 period.⁴⁸ The expiration of most remaining debt guarantees at the end of 2015 may also constitute an event worth examining.

Third, and most importantly for accounting research, the German banking context enables banks to be sorted into groups based on whether they apply the same or different accounting principles for financial reporting versus regulatory reporting purposes and, relatedly, based on the extent to which they apply fair value accounting versus amortized cost accounting for financial instruments. As discussed by Georgescu and Laux [2013], since January 2005 German banks that are publicly traded on European Union (EU) exchanges must prepare their public financial reports using IFRS, which is similar to U.S. GAAP in the extent of requiring fair value accounting for financial instruments.⁴⁹ Other banks typically prepare their (potentially non-public) financial reports using German accounting principles (HGB). HGB primarily requires amortized cost accounting for financial instruments, although it requires lower of cost or

⁴⁸ Körner and Schnabel [2013] provide evidence of similar increases in risk taking at German savings banks associated with the Landesbanken most affected by the crisis.

⁴⁹ IFRS and U.S. GAAP differ, however, in the extent to which offsetting derivatives and other financial instruments covered by netting agreements are presented gross versus net on the balance sheet.

fair value accounting for current financial assets and reversible OTT impairment write-downs for non-current financial assets. Banks may choose to prepare their (often non-public) regulatory reports using either IFRS or HGB.

In practice, German banks fall into three groups based on their use of IFRS and HGB for financial and regulatory reporting purposes. A few publicly traded and typically large banks (e.g., Deutsche Bank and Commerzbank) use IFRS for both financial and regulatory reporting purposes. For these banks, IFRS's fair value accounting provisions affect the banks' net income, owners' equity, and regulatory capital. Other publicly traded banks typically use IFRS for financial reporting purposes and HGB for regulatory reporting purposes. For these banks, IFRS's fair value accounting provisions affect the banks' net income and owners' equity but not their regulatory capital. Non-publicly traded banks typically use HGB for both financial reporting and regulatory reporting purposes. For these banks, IFRS's fair value accounting provisions do not affect the banks' net income, owners' equity, or regulatory capital.

Georgescu and Laux [2013] exploit some of these differences in financial and regulatory reporting across banks in their case-study analyses of the failures of three large German banks during the financial crisis: Landesbank Sachsen Girozentrale (Sachsen LB), Deutsche Industriebank AG (IKB), and Hypo Real Estate Holding AG (HRE). As a non-publicly traded Landesbank, Sachsen LB applied HGB for both financial and regulatory accounting purposes. As publicly traded banks, IKB and HRE applied IFRS for financial reporting purposes but HGB for regulatory reporting purposes. Georgescu and Laux conclude that the failures of these banks were not attributable to fair value accounting for two reasons. First, regulation of these banks was based on HGB, not IFRS. Second, these failures can be directly traced to the banks financing their investments in risky assets on-balance sheet using short-term debt or off-balance

sheet through the provision of credit or liquidity support to ABCP conduits or other securitization entities.

For researchers able to obtain non-publicly traded banks' financial reports and all banks' regulatory reports,⁵⁰ the German banking context provides unusual ability to identify the distinct effects of fair value versus amortized cost accounting for financial instruments, for both financial reporting and regulatory purposes.

5.4 OCTOBER 2008 IFRS-SANCTIONED RECLASSIFICATIONS OF FINANCIAL ASSETS

During the depths of the financial crisis, the IASB experienced extreme pressure from the European Commission and the political leaders of EU countries to suspend or weaken fair value accounting requirements. With extraordinary abandonment of its normal due process, on October 13, 2008 the IASB amended IAS 39 to allow firms to reclassify financial assets from categories for which a relatively extensive form of fair value accounting is required to categories for which a less extensive form of fair value accounting or amortized cost accounting is required.⁵¹ This amendment allowed reclassifications of financial assets for fiscal periods ending on or before October 31, 2008 to be retroactive to July 1, 2008, that is, to be made with hindsight as to the actual losses experienced from July 1, 2008 to the time of the reclassification decision. Due to the dramatic acceleration of the financial crisis around Lehman's bankruptcy filing on September 15, 2008, banks' retroactively reclassified financial assets typically had experienced significant unrealized losses and/or impairment write-downs during this period. We assume this is the case in the discussion that follows.

Depending on the assets' pre- and post-reclassification categories, retroactive reclassifications of financial assets immediately increased banks' regulatory capital in two

⁵⁰ These data are commercially available on the Bureau van Dijk's Amadeus database (Gassen and Fülbier 2015).

⁵¹ See Brüggemann [2011] for extensive discussion of this political pressure and the amendment to IAS 39.

general ways. First, certain retroactive reclassifications transferred losses that banks had previously recorded in net income to other comprehensive income. Such reclassifications had no effect on banks' owners' equity but generally increased their regulatory capital, due to country-specific prudential filters excluding part or all of unrealized losses recorded in other comprehensive income. Second, other retroactive reclassifications of financial assets simply reduced the losses that banks had previously recorded in net income. Such reclassifications increased banks' owners' equity and regulatory capital.

Under the amendment of IAS 39, banks could reclassify financial assets between the following three sets of categories to reduce the extent of fair value accounting. First, banks could reclassify non-derivative trading assets to AFS assets. Trading assets are recognized at fair value on the balance sheet with periodic realized and unrealized gains and losses recorded in net income. AFS assets are also recognized at fair value on the balance sheet but only realized gains and losses (including write-downs of OTT-impaired AFS assets to fair value) are recorded in net income; unrealized gains and losses are recorded in other comprehensive income. Retroactive reclassifications of this type immediately increased banks' net income, had no effect on their owners' equity, and generally increased banks' regulatory capital.

Second, banks could reclassify non-derivative trading assets to HTM assets or (if the assets met the definition) to loans and receivables. HTM assets and loans and receivables are recognized at amortized cost on the balance sheet with realized gains and losses (including write-downs of OTT-impaired HTM assets or of impaired loans and receivables to bases typically *above* fair value) recorded in net income and with unrealized gains and losses not recorded. Retroactive reclassifications of this type immediately increased banks' net income, owners' equity, and regulatory capital.

Third, banks could reclassify AFS assets to HTM assets or (if they met the definition) to loans and receivables.⁵² If applied retroactively, this type of reclassification increased banks' net income if they had recorded OTT impairments on the securities after July 1, 2008 (but not otherwise) and increased their owners' equity and regulatory capital.

Also on October 13, 2008, the IASB amended IFRS 7 to require disclosures indicating the effects on current period financial statements of the reclassifications in the current period and cumulatively to date. If banks fully comply with these requirements, these disclosures provide essentially full transparency over banks' reclassifications.

Prior research documents that retroactive reclassifications of financial assets under the amendment of IAS 39 had substantial effects on net income and regulatory capital for many banks. For example, Fiechter [2011] reports that over one-third of his sample of European banks reclassified securities. On average, these banks increased their 2008 return on equity by 2.7% (from negative 1.4% to positive 1.3%) and their year-end 2008 Tier 1 and total risk-based capital ratios by 0.55% and 0.5%, respectively. Prior research also documents that banks did not reliably provide the complete set of disclosures of the financial statement effects of reclassifications required by IFRS 7. For example, Bischof, Brüggemann, and Daske [2014] find that only 34% of their sample of reclassifying banks provided complete disclosures in 2008.

Bischof et al. [2014] examine whether reclassifications of financial assets under the amendment of IAS 39 benefited banks by reducing their costs of complying with regulatory capital requirements or hurt them by increasing their opacity and thus cost of capital. They provide two results consistent with subsets of banks obtaining benefits from reclassifications. They find positive abnormal share returns on October 13, 2008 for the subset of banks with high

⁵² IAS 39 allowed *prospective* reclassifications of AFS assets to HTM assets prior to the October 2008 amendment of the standard.

estimated reclassification likelihood (based on banks' subsequently reported actual reclassifications, i.e., with hindsight) and need for regulatory capital. They find abnormal share returns on reclassification announcement dates that increase with the effects of banks' reclassifications on their regulatory capital only for banks with low estimated reclassification likelihood. Bischof et al. also provide one result consistent with subsets of banks being hurt by reclassifications: equity bid-ask spreads increase for reclassifying banks that do not make all of the disclosures of reclassifications required by the amendment to IFRS 7, increasing opacity.⁵³

Compared to the imposition and first amendment of dynamic provisioning for loan losses in Spain discussed in Section 5.2, the amendment of IAS 39 constitutes a messily endogenous shock to banks' regulatory capital and thus loan supply. Banks' mounting losses on financial assets prior to October 13, 2008, as well as the specter of widespread additional losses yielding insolvency across the banking system in the near term, led to the extreme political pressure that drove the IASB to amend IAS 39, as described above. The implications of this amendment and banks' reclassifications of financial assets are difficult to distinguish from numerous confounding events that occurred during the financial market free fall in 2008Q4. For example, the *Financial Times* reported on October 13, 2008 (i.e., the same day as the issuance of the amendment of IAS 39) that France, Germany, the United Kingdom, and other European countries guaranteed \$2.5 trillion of new bank debt. Most importantly, banks could choose whether or not and how to reclassify financial assets depending on their current regulatory capital status and private information about the likelihood and extent of future write-downs.

⁵³ Georgescu [2014] attempts to further identify the regulatory benefits and opacity costs of the amendment of IAS 39 by examining the distinct reactions of CDS market and equity market participants to the October 13, 2008 announcement of the amendment. Although these two types of market participants may exhibit different sensitivities to the benefits and costs of the amendment, Georgescu obtains largely "inconclusive" findings. These inconclusive findings may result from additional issues, such as risk shifting, that are raised by the comparison of CDS and equity; e.g., the incremental income resulting from newly allowed reclassifications of assets may have enabled banks to pay additional dividends.

This endogeneity makes it challenging to address the research design issues discussed in the introduction. Still, the amendment of IAS 39 provides future research opportunities for researchers who identify and exploit significant features of the international context. For example, considerable across-country variation exists in prudential filters for unrealized gains and losses on AFS assets as well as in other aspects of capital requirements.⁵⁴ This variation enables banks to be sorted into groups whose regulatory capital status is differentially affected by the amendment of IAS 39 and by different types of reclassifications. Banks in countries with less inclusive prudential filters for unrealized losses on AFS assets should be more affected by reclassifications from AFS assets to HTM assets or loans and receivables, but less affected by reclassifications from trading assets to AFS assets. Researchers could examine whether banks that classified financial assets differently before the amendment of IAS 39, and so were differently affected by that amendment, differently altered their investment holdings in the wake of the amendment. For example, did the amendment of IAS 39 disproportionately help banks that were more positively affected by the amendment maintain their holdings of downgraded structured securities and sovereign bonds during the crisis? If so, did these holdings experience subsequent losses or otherwise lead to problems for the banks?

While each of the three settings discussed in Section 5.2-5.4 exhibits its own collection of characteristics, many of these characteristics can be found in other settings. For example, dynamic provisioning for loan losses in Spain is analogous to other settings where regulators require or allow banks to record incremental provisions in good times that are eliminated in downturns. This is the case for regulatory general provisions for loan losses in Germany. We encourage researchers to identify and examine such settings.

⁵⁴ Bischof et al. [2014, Appendix I] list the prudential filters for unrealized gains separately from unrealized losses on AFS assets and the total regulatory capital requirements in each of the 39 countries in their sample.

6. Considerations for Accounting Standard Setters and Financial System Policymakers

We conclude with three suggestions for ways that financial and regulatory reporting can promote stability that accounting standard setters, bank regulators, and other financial system policymakers should consider.⁵⁵ These suggestions pose practical difficulties that we briefly discuss. Due to their more extensive expertise about the banking setting, bank regulators and other financial system policymakers are in a better position than accounting standard setters to overcome these difficulties.

First, stability is threatened when banks accumulate risk exposures that are positively correlated across banks. This is particularly likely when these correlations are not well understood by the banks involved, their regulators, or the financial markets. One reason why these correlations may not be well understood is that existing financial reporting rules typically require a bank to disclose a risk exposure only when it is reasonably possible that the exposure has significant effects on its total assets or net income. The significance of a bank-level risk exposure for stability depends on its contribution to the magnitude and correlations of the holdings of all banks. Reiterating a recommendation by Leuz [2009], we encourage accounting standard setters (bank regulators) to endeavor to make financial (regulatory) reporting rules “countercyclically transparent,” by requiring individual banks to provide more extensive disclosure of a given risk exposure as that type of exposure accumulates systemwide or in a few large banks that serve as key counterparties. Such disclosures are particularly likely to be useful when a new class of risk exposure (e.g., subprime mortgage–related assets) grows rapidly, yielding poorly understood system-wide risk exposures.

⁵⁵ This section is not intended to be comprehensive. In particular, we do not repeat the many suggestions that have been made for expanded disclosures by banks and other financial institutions about their risks (e.g., Ryan [2012]). In our view, such expanded disclosures likely would, if thoughtfully designed and faithfully implemented, enhance stability.

Difficult practical issues must be overcome to develop, and to eliminate when no longer useful, countercyclically transparent disclosure requirements on timely bases. Early warning systems must be devised that reliably identify accumulations of risk exposures systemwide, triggering disclosure, before the aggregate exposures pose serious threats to stability. This is particularly challenging for new classes of risk exposures, which bank regulators or some other party will need to continuously monitor and incorporate into financial or regulatory reporting requirements. It is also challenging for risk-concentrated and cycle-contingent exposures that have little immediate effects on banks' assets and income but whose effects can blow up under adverse circumstances.

Second, stability is threatened when banks hold exposures that are, or may become, illiquid and thus difficult to value. Recognizing this, in FAS 157 and subsequent amendments of that standard (ASC 820), the FASB requires extensive disclosures for fair value measurements based on unobservable level 3 inputs for current recognized assets and liabilities. While useful, these disclosures have limited scope in at least two ways: (1) some of banks' recognized exposures that are fair valued using observable level 2 (and possibly even level 1) inputs in normal economic conditions are more prone than other such positions to become level 3 fair valuations in stress scenarios and (2) some of banks' currently unrecognized exposures (e.g., loan commitments as well as credit and liquidity support provided to securitization entities) will require the bank to provide liquidity in stress scenarios. We suggest that accounting standard setters (bank regulators) consider requiring similarly expanded disclosures for exposures that are expected to become illiquid or to require the provision of liquidity in stress scenarios in financial (regulatory) reports.

This suggestion requires some party, probably a financial stability monitor or bank regulator, to conduct stress tests that ideally are based on banks' aggregate exposures. Conducting stress tests on banks' aggregate exposures requires individual banks to report their exposures in standardized and detailed fashions to the party conducting the stress tests. The literature shows that disclosure of banks' stress test results to the market has pros and cons that may also apply to our suggested disclosures (e.g., Goldstein and Sapra [2014]).

Third, LOLRs' provision of liquidity on pledged problem assets makes it easier for banks to keep those and other assets on-balance sheet, likely delaying the banks' recording of losses on assets or deleveraging. Hence, such liquidity provision constitutes regulatory forbearance. While such forbearance surely is intended, it poses risks to stability that bank regulators and other financial system policymakers should attempt to mitigate to the extent possible. Bank regulatory approaches to mitigating these risks include requiring banks: (1) to maintain adequate capital given the current and potential future illiquidity of the pledged assets and (2) to dispose of the pledged assets gradually following the provision of liquidity, thereby gradually recording losses and deleveraging. Financial or regulatory reporting requirements approaches to mitigate these risks include requiring counter-cyclical transparency for the banks receiving liquidity as entities, particularly regarding their holdings of pledged problem assets.

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Figure 1
Depiction of Differing Views about Bank Financial Reporting and Stability

		Preferred Attribute of Financial Reporting	
		<i>Transparency (e.g., Fair Value Accounting with Accompanying Income Volatility)</i>	<i>Opacity (e.g., Amortized Cost Accounting with Accompanying Suppression of Income Volatility)</i>
Primary Purpose of Financial Reporting	<i>Providing Information on a Timely Basis to Market Participants</i>		
	<i>Facilitating Contracting and Regulation</i>		