Does the Current Expected Credit Loss Approach Decrease the Procyclicality of Banks' Lending?

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April 2022

We benefited from the comments of Sudipta Basu, Sudarshan Jayaraman, David Swanson, Wei Wang, Joanna Wu, Jason Xiao, and seminar participants at Shanghai University of Finance and Economics, Temple University, University of Connecticut, University of International Business and Economics, and University of Rochester.

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Abstract
Prior research finds that banks reduce loan originations during recessions to mitigate the potential for their regulatory capital to become inadequate. In the wake of the financial crisis, policymakers expressed the concern that banks' use of the incurred loss model exacerbates their lending procyclicality by delaying the recognition of loan losses to recessions when the losses become incurred, probable, and reasonably estimable. Responding to this concern, the FASB issued Accounting Standards Update 2016-13, which requires large public (small public and private) banks to accrue for loan losses using the current expected credit loss (CECL) approach starting in 2020 (2023). Contrary to this concern, we hypothesize and find that banks that adopted CECL prior to the COVID-19 pandemic reduced loan growth during the accompanying recession more than other banks. We further predict and find that this effect is stronger (weaker) for adopting banks with low regulatory capital (with low heterogenous loans or that recorded large increases in credit loss allowances upon their initial adoption of CECL). We also find that adopting banks increased their loan loss provisions during the recession more than other banks. Our results are consistent with the CECL approach increasing banks' lending procyclicality.

Keywords: Current expected credit loss (CECL) approach, loan loss provisions, lending, procyclicality, COVID-19, recession, regulatory capital.

JEL Classifications: E32, G21, G28, M41, M48

1. Introduction

In the wake of the 2007–2009 financial crisis, policymakers expressed the concern that the incurred loss model (ILM) of FAS 5 (1975, Accounting Standards Codification [ASC] 450 since 2009) exacerbates the procyclicality of banks' lending (Dugan 2009; Financial Stability Forum 2009).[1] Under the ILM, a bank records a loan loss allowance (LLA) only for the portion of current expected credit losses on outstanding loans that is incurred, probable, and can be reasonably estimated as of the end of the accounting period. Relatedly, the bank records a loan loss provision (LLP) only for the portion of the current expected credit losses that becomes incurred, probable, and reasonably estimable during the period. The use of the ILM thus delays the recognition of a sizeable portion of current expected loan losses to subsequent recessions (or other periods of economic stress) when the losses first meet these three conditions. Prior research suggests that this delayed loan loss recognition induces banks to reduce their loan originations during recessions to mitigate the potential for their regulatory capital to become inadequate.

Responding to this concern, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2016-13 (ASC 326). ASU 2016-13 requires large public (small public and private) banks to accrue for loan losses using the current expected credit loss (CECL) approach starting at the beginning of the 2020 (2023) fiscal year. Under this approach, a bank recognizes a LLA equal to the current expected credit losses on outstanding loans over their entire remaining lives. Hence, the CECL approach front-loads the recognition of loan losses relative to the ILM. Proponents of the CECL approach claim that this front-loaded recognition of loan losses decreases banks' lending procyclicality. However, reflecting the recent effective date

[1] For example, Dugan (2009) states: "When the turn finally did come, and the tidal wave of losses began hitting shore, banks have had to recognize losses through a sudden series of increased provisions to the loan loss reserve, which in turn has more than offset earnings and eaten into precious capital…loan loss provisioning has become decidedly pro-cyclical, magnifying the impact of the downturn."

of ASU 2016-13 for large public banks, there has been little systematic examination of this claim to date. We conduct such an examination in this paper.

We expect banks' use of the CECL approach rather than the ILM to have three primary effects on the procyclicality of their loan loss provisions and thereby their lending. First, for loans that are originated during the current accounting period, we expect banks record larger LLPs in that period under CECL than under the ILM. This is particularly the case for heterogeneous (e.g., commercial) loans, for which banks primarily evaluate credit losses on a loan-by-loan basis, making it difficult to meet the ILM's conditions for loss recognition prior to the loans evidencing significant post-origination deterioration in creditworthiness. In contrast, banks primarily evaluate credit losses on homogeneous (e.g., credit card) loans at the portfolio level, making it easier to meet these conditions. Under bank regulatory guidance regarding the application of the ILM, banks typically record LLPs on homogeneous loans at the amount of expected loan charge-offs over the next 12 months or another suitable "loss emergence period."[2] The difference between the LLPs for newly originated loans under CECL versus the ILM increases during recessions, when lifetime credit loss rates increase more than losses over a shorter loss emergence period. Thus, the CECL approach yields more procyclical LLPs for newly originated loans than does the ILM.

Second, for loans originated in prior accounting periods, under the CECL approach, banks record LLPs in the current period equal to the change in expected lifetime credit losses during that period. Under the ILM, banks accrue for credit losses differently for loans that are deemed impaired, which typically occurs when the loans become severely delinquent or subject to troubled debt restructurings, than for unimpaired loans. For impaired loans, banks accrue for

[2] See Ryan (2011, Section 3.1) for detailed discussion of the aspects of banks' accruals for loan losses under the ILM mentioned in this paragraph and elsewhere in this paper.

lifetime credit losses under the ILM. For preexisting loans that become impaired during the current period, banks record larger LLPs under the ILM—because they must accrue for lifetime losses on the loans for the first time—than under CECL. This effect is concentrated during recessions, when the frequency of loan impairments rises sharply. Thus, the CECL approach yields less procyclical LLPs for preexisting loans that become impaired during the current period than does the ILM. This is the effect that CECL proponents emphasize.

Third, for unimpaired preexisting loans, credit loss rates increase during recessions. These increases naturally are larger for losses measured over the entire remaining lives of loans, as required by the CECL approach, than for losses measured over shorter periods, such as the typical 12-month loss emergence period used for unimpaired homogeneous loans under bank regulatory guidance regarding the ILM. Thus, banks record larger LLPs for unimpaired preexisting loans during recessions under CECL than under the ILM. As such, the CECL approach yields more procyclical LLPs for preexisting unimpaired loans than does the ILM.

While only the first effect arises from loans originated during the current period, all three effects influence banks' regulatory capital adequacy and thus their loan originations. We refer to the first and third effects, both of which stem from the longer horizon over which banks accrue for loan losses under CECL than the ILM, collectively as the "horizon effect." We refer to the second effect as the "preemption effect," because the earlier accrual of loan losses under CECL than the ILM preempts some or all of the losses on loans that become impaired during the current period. The strength of the horizon effect on a standalone basis and relative to the preemption effect increases with banks' inability to forecast future economic conditions affecting loan losses. Because extant macroeconomic models have little power to predict turns in the business cycle (Covas and Nelson 2018), we expect that the horizon effect typically dominates

the preemption effect, and hypothesize that banks increase LLPs and reduce loan growth more during recessions under CECL than under the ILM.

We test this hypothesis using data for all US bank holding companies ("banks") for the 13 quarters from 2018Q1 to 2021Q1 that we obtain from the banks' FR Y9-C filings. Our final sample includes 221 public banks (2,809 bank quarters) and 123 private banks (1,579 bank-quarters). While ASU 2016-13 requires large public banks to accrue for loan losses using the CECL approach at the beginning of their 2020 fiscal years, the Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020, as modified by the Consolidated Appropriations Act (CAA) of 2021, allows these banks to delay their CECL implementation until the earlier of January 1, 2022 or when the president declares the national emergency over (which has not yet occurred). Hence, not all large public banks adopt CECL during our sample period. Moreover, a few small public and private banks early adopt CECL during our sample period rather than waiting until the beginning of the 2023 fiscal year as required by ASU 2016-13.

We manually collect banks' CECL status and initial adoption impacts from Form 10-K filings for public banks and FR Y-9C filings for private banks. We find that 151 (37) of the public banks and 4 (2) of the private banks in the sample adopted CECL at the beginning of 2020Q1 (during 2020Q3-2021Q1). On average, these initial adoptions increase banks' LLAs by 39.6 percent. The remaining public and private banks continue to use the ILM at the end of our sample period (2021Q1). Following the NBER's classification of the COVID-19 recession and prior research examining earlier recessions, we treat the quarter immediately after the effective onset of the COVID-19 pandemic in the US, 2020Q2, as the associated recession.

As hypothesized, we find that banks that adopted CECL at the beginning of 2020Q1 experience a greater reduction in loan growth (44 percent of its standard deviation) during the

COVID-19 recession than non-adopting banks. We obtain this result after controlling for a battery of bank characteristics, participation in the Paycheck Protection Program, and bank and year-quarter fixed effects. The result is robust to replacing the COVID-19 recession indicator with two continuous measures of the national business cycle: growth of the Coincident Index and GDP. To mitigate the concern that CECL adopters and non-adopters may experience different local economic shocks, we show that our inferences are unaffected by the use of the growth of the State Coincident Index; by limiting the sample to banks operating in a single state, for which the state-level measure is most relevant; and by replacing year-quarter fixed effects with state-year-quarter fixed effects. These results are consistent with the CECL approach exacerbating banks' lending procyclicality.

We conduct three cross-sectional tests using proxies for banks' regulatory capital adequacy and the relative importance of the horizon and preemption effects. First, we predict and find a greater positive association between CECL adoption and lending procyclicality for banks with lower regulatory capital adequacy as measured by their Tier 1 risk-based capital ratios. Second, we predict that the horizon effect is stronger for heterogeneous loans than for homogeneous loans, and consistent with this prediction we find that CECL adopters that hold a higher percentage of heterogeneous loans to exhibit a greater increase in their lending procyclicality upon the adoption of CECL. Third, using banks' initial CECL adoption impacts to proxy for the strength of the preemption effect, we predict and find that the increase in lending procyclicality is weaker for CECL adopters with larger initial increases in their LLAs.

To mitigate the concern that differences in bank size or listing status drive our our results, we also conduct our analysis on a size-matched sample using only public banks. In this sample, treatment banks that adopted CECL before the COVID-19 pandemic exhibit similar total assets

and other bank characteristics as non-adopting control banks. Our results are robust to the use of this matched sample. Lastly, we predict and find that CECL adopters record more procyclical LLPs than non-adopters.

This paper informs the ongoing and pitched debate regarding whether the CECL approach reduces lending procyclicality. In the wake of the financial crisis, the Financial Stability Forum (2009) posited that "[e]arlier recognition of loan losses could have dampened cyclical moves in the current crisis." In contrast, the American Bankers Association expressed the concern that "banks and other financial companies are finding—through the testing of their estimation models—that CECL would actually increase procyclicality and perhaps significantly. By increasing procyclicality into the banking system, CECL will cause economic downturns to be more severe and to last longer."[3] Our results provide support for this concern.

Our paper contributes to understanding how banks' financial reporting influences financial system stability (Beatty and Liao 2014; Acharya and Ryan 2016; Bischof et al. 2021). We provide evidence that CECL exacerbates banks' lending procyclicality, and that regulatory capital inadequacy is one channel through which this occurs. We also articulate and provide evidence that the countervailing horizon and preemption effects influence how CECL affects lending procyclicality.

Finally, we add to the emerging literature on the economic consequences of the COVID-19 pandemic (see NBER's website for a list of over 600 pandemic-related working papers). Compared to more frequently occurring financial crises, this once-in-a-century global health

[3] https://www.aba.com/advocacy/our-issues/cecl-implementation-challenges.

crisis has even more difficult-to-forecast impacts on banks' loan losses (Ryan et al. 2020).[4] Our paper highlights how loan loss accounting influenced the pandemic's adverse economic effects.

2. Background, Related Research, and Hypothesis Development

2.1 Institutional Background

The ILM (ASC 450) requires three conditions to be met for firms to accrue for loan losses and other loss contingencies. First, loan losses must be rooted in the present ("incurred") in the sense that there is "an existing condition, situation, or set of circumstances involving uncertainty as to possible…loss… to an enterprise." No accrual should be made for losses that are not currently incurred, even if the losses are expected or even certain to occur in the future. For example, this condition prohibits accruing for losses on loans that are not yet outstanding. Second, the occurrence of loan losses must be "probable." GAAP defines "probable" as "likely to occur" and "a higher level of likelihood than more likely than not." In practice, "probable" typically means a relatively high probability threshold such as 70 or 80 percent. This condition is difficult to meet at the individual loan level (i.e., for heterogeneous loans such as commercial loans) until loans are close to default, but it is easy to satisfy at the portfolio level (i.e., for homogeneous loans such as residential mortgages, credit card loans, and auto loans). Third, the amount of loss must be capable of reasonable estimation based on historical data or other evidence. This condition is also much easier to satisfy at the portfolio level than at the individual loan level.

[4] For example, the 2007−2009 financial crisis was driven by a housing market collapse and excessive leverage. Based on their prior experience of such events, banks were in a reasonably good position to understand and model the effects of the crisis on loan losses. In contrast, to forecast the effects of the essentially unique COVID-19 pandemic on loan losses, banks had to first forecast the pandemic's impacts on public health, then estimate how the forecasted impacts would affect key economic variables (e.g., unemployment) and thereby the collectability of loans.

While the events that give rise to incurred losses generally are observable for impaired loans, for unimpaired loans incurred losses may arise from unobservable events (e.g., borrowers' job losses or ill health). As a practical expedient to estimate incurred losses for unimpaired homogeneous loans, banks commonly use loss emergence periods that stretch from the balance sheet date into the future, and they estimate incurred, probable, and reliably estimable losses as the net loan charge-offs expected to occur within the loss emergence period. Bank regulatory guidance allows banks to use a 12-month loss emergence period for unimpaired homogeneous loans (OCC 1998). In contrast, this guidance requires banks to estimate incurred losses on impaired loans as the expected net charge-offs over the loans' entire remaining lives under the ILM.

ASC 326 requires banks (and other firms) to transition from the ILM to the CECL approach to accrue for credit losses on financial assets measured at amortized cost (e.g., loans and held-to-maturity securities) and off-balance sheet exposures with similar credit risks (e.g., most loan commitments). Under CECL, banks record LLPs at the inception (i.e., origination or purchase) of loans equal to the current expected credit losses on the loans over their entire lives. After loan inception, banks record LLPs whenever current expected credit losses on loans change. Banks estimate current expected credit losses using historical loan performance (e.g., loss rates), current economic conditions, and reasonable and supportable forecasts of future economic conditions. Beyond the period for which reasonable and supportable forecasts are feasible, banks may revert to historical loan performance on a rational and systematic basis.

The CECL approach exhibits three main differences from the ILM. First, CECL eliminates the probable condition. Under CECL, banks record future loan losses that they expect to occur with any probability, no matter how low. Second, CECL substantially weakens the

incurred and can be reasonably estimated conditions. It does so partly by requiring the accrual of expected lifetime credit losses for all loans at inception and partly by requiring banks to incorporate reasonable and supportable forecasts of future economic conditions into their estimates of expected credit losses.

CECL has considerable conceptual attractiveness due to its more complete use of current information than the ILM.[5] However, CECL fits poorly, both on a standalone basis and relative to ILM, with the preexisting accounting rules for gross loans outstanding and interest revenue. Under these preexisting rules, at loan inception gross loan outstanding equals the amount lent. The effective interest rate is calculated as the internal rate of return that equates the amount lent to the present value of the promised (not expected) principal and interest payments. Interest revenue is recognized over the life of loans. Under CECL, current expected credit losses are reflected in their entirety in the LLP at loan inception. In contrast, under the ILM, only a portion of these expected losses are reflected in the LLP at loan inception. As such, there is worse matching of interest revenue and LLPs over the lives of loans under CECL than under the ILM.[6] This worse income statement matching typically yields more procyclical effects on banks' income and capital under CECL than under the ILM, as discussed in detail in Section 2.3.

The implementation of the CECL approach has been delayed for both financial and regulatory reporting purposes. ASU 2016-2013 initially became effective for fiscal years beginning after December 15, 2019 for public entities that are SEC filers, and for fiscal years

[5] We note that the more complete use of information in the CECL approach may yield more internal and external discipline on CECL-adopting banks (see Ryan 2018), and that this discipline could reduce the banks' lending procyclicality. We do not focus on this possibility in this paper, primarily because we believe it is of second-order importance relative to the first-order mismatching of interest revenue and LLPs discussed in the remainder of the paragraph.

[6] This is not to say that the matching of interest revenue and LLP under the ILM is good; see Ryan (2011, 226) for the limitations of this matching under the ILM.

beginning after December 15, 2020 for public entities that are not SEC filers. In November 2019, the FASB postponed the effective date to December 15, 2022 for public entities that are smaller reporting companies (SRCs) or emerging growth companies (EGCs) and private entities.[7] On March 27, 2020, after the onset of the COVID-19 pandemic in the US, the CARES Act permitted banks to delay their CECL implementation until the earlier of December 31, 2020 or when the US president declares the national emergency to be over. The CAA, which was enacted on December 27, 2020, extends the first of these dates to January 1, 2022. As of this writing, the US president has not yet declared the national emergency to be over (with the last formal extension of the emergency occurring on February 18, 2022), but the January 1, 2022 date is past, so all large public banks should have adopted CECL.

Many banks expressed the concern that CECL would reduce their regulatory capital adequacy and thereby impair their ability to lend. In February 2019, bank regulators issued a final rule that allows CECL adopters to record 25 percent of the initial CECL adoption effect on their regulatory capital in 2020, and to spread the rest of the adoption effect over the subsequent three years. On March 26, 2020, bank regulators issued an interim final rule that permits banks that adopted CECL in 2020 to defer the entire initial adoption effect in regulatory capital for two years and then to spread the adoption effect over the subsequent four years.

2.2 Related Research

Prior research provides evidence that banks that record timelier LLPs under the ILM reduce loan growth less during recessions, that is, exhibit lower lending procyclicality (Beatty and Liao 2011; Bhat et al. 2019; Wheeler 2019). This research also shows that these banks

[7] A smaller reporting company has either (1) public float of less than $250 million or (2) both less than $100 million in annual revenues and public float of less than $700 million. An emerging growth company has total annual gross revenues less than $1 billion.

exhibit lower systemic risk (Bushman and Williams 2012, 2014) and lending corruption (Akins et al. 2017), factors that likely are associated with banks' lending procyclicality.[8] Jayaraman et al. (2018) provide evidence that banks that smooth income more using LLPs under the ILM may exhibit higher or lower lending procyclicality, depending on whether the smoothing is opportunistic or not, respectively. While providing important insights into the association of banks' accruals for loan losses with their lending procyclicality and related risk attributes, this prior research has at best unclear implications for our examination of the effects of banks' adoption of CECL on their lending procyclicality. In particular, banks that record timelier loan losses under the ILM (or any other given GAAP) likely exhibit more favorable managerial and financial characteristics (Acharya and Ryan 2016), whereas ASC 326 imposed CECL on all large public banks at the beginning of their 2020 fiscal years regardless of their characteristics.[9]

Three recent strands of research have somewhat more direct, but still unclear, implications for the effects of CECL on lending procyclicality. In the first strand, researchers employ real or simulated data produced under the ILM in analytical models to estimate the effects of CECL adoption, obtaining mixed findings. Some studies estimate that CECL adoption yields less procyclical LLPs and lending (Cohen and Edwards 2017; DeRitis and Zandi 2018; Chae et al. 2018; Loudis and Ranish 2019; Huber 2021), while other studies generate opposing estimates (Abad and Suarez 2018; Covas and Nelson 2018; Kruger et al. 2018; Buesa et al. 2019). These mixed results arise from the studies' use of different datasets and modeling assumptions. Our paper differs from these studies by examining CECL-adopting banks' recorded

[8] Somewhat (less) related prior studies using data under the ILM develop measures of banks' expected credit losses (Harris et al. 2018; Beatty and Liao 2021; Wheeler 2021; Lu and Nikolaev 2022).

[9] See also Basu et al. (2020) and Beatty and Liao (2020) for discussion of issues regarding the measurement of delayed loan loss recognition under the incurred loss model and the implications of these issues for the evaluation of lending procyclicality.

(i.e., not estimated) LLPs and actual loan growth during the COVID-19 pandemic and accompanying recession compared to non-adopting banks.

In the second strand, researchers empirically analyze LLPs by international banks that began to accrue for loan losses under IFRS 9's expected credit loss (ECL) model in 2018. Lopez-Espinosa et al. (2021) and Kim et al. (2021) document that the adoption of ECL renders these banks' LLPs more predictive of their future bank risk, and that this effect is more pronounced when credit conditions deteriorate. Ertan (2021) shows that banks more affected by ECL reduce their credit supply to small and medium-sized enterprises. The findings of these studies have little or no implications for our examination of the effects of CECL on lending procyclicality for the following reasons. First, the studies do not directly examine lending procyclicality; in particular, Ertan (2021) examines the level, not the procyclicality, of lending. Second, ECL differs from CECL in several key ways—most notably, ECL specifies the use of a 12-month loss emergence period for "Stage 1" assets that have not experienced a significant increase in default risk since inception—and thus has different implications on banks' procyclical behavior (European Systemic Risk Board 2019; Deloitte 2020). For example, Buesa et al. (2019) show using simulation data and analytical models that LLPs exhibit lower procyclicality under CECL than under ECL. Third, non-trivial differences exist in banking regulation and other relevant institutions between the United States and other countries. These differences include the application of the ILM in the pre-period (e.g., given the extensive bank regulatory guidance in the United States) and the implementations of the new standards in the post-period (e.g., more stringent enforcement in the United States).

In the final strand, Ballew et al. (2021) investigate the effect of banks' participation in the Paycheck Protection Program (PPP) on their risk-taking outside of the program, and whether

banks' adoption of CECL moderates this effect. The PPP is a government-funded stimulus program administered through banks intended to provide relief to small businesses and their employees during the COVID-19 pandemic. PPP loans are guaranteed by the US government through the Small Business Administration, making the loans effectively credit risk-free to banks. Banks' recording of outstanding PPP loans as assets on their balance sheets mechanically lowers their asset risk ratios, thereby increasing their perceived risk-bearing capacity. Using data from 2020Q2-Q3, Ballew et al. (2021) find that the extent of a bank's PPP participation is associated with an increase in risk-weighted assets excluding PPP loans, and that this association is concentrated for non-adopters of CECL. Our study differs from Ballew et al. (2021) by examining the effect of CECL on loan growth rather than loan risk, and by examining (a broader sample of) banks regardless of their participation in the PPP. Gee et al. (2022) find that the CECL day-1 impacts improve the value relevance and predictive power of LLAs on the adoption date. They do not however examine banks' lending and LLPs through the COVID-19 recession. While these two papers' findings suggest that CECL yields benefits in terms of constraining banks' risk-taking and improved usefulness of LLAs, our findings point to the costs of CECL in exacerbating lending procyclicality. Together the three studies offer a more comprehensive and balanced view of the economic consequences of CECL.

2.3 Hypothesis Development

Extensive banking research documents that banks actively manage their capital ratios towards target levels substantially above the regulatory thresholds to be deemed well-capitalized, in order to build capital cushions sufficient to absorb most future adverse shocks (Berger et al. 2008; Kashyap et al. 2010). A reduction in a bank's capital ratios (say due to a larger LLP), even if the ratios remain above the well-capitalized thresholds, usually triggers banks to make

adjustments to return to the target levels. Since banks generally consider equity raising to be prohibitively costly, these adjustments typically include cutting lending and using the funds to repay liabilities (Stein 1998). This behavior is more pronounced during economic downturns (Adrian and Shin 2011), yielding lending procyclicality.

We expect banks' use of CECL rather than the ILM to accrue for loan losses affects their lending procyclicality for two primary sets of reasons with counteracting effects. The first set of reasons pertains to the longer horizon over which banks accrue for credit losses under the CECL approach than under the ILM. We thus refer to this set of reasons as the "horizon effect." The horizon effect is always in play, primarily for newly originated and preexisting unimpaired loans.

For newly originated loans, the CECL approach requires banks to record LLPs equal to the expected credit losses over the loans' entire lives. For preexisting unimpaired loans, CECL requires banks to record LLPs equal to changes in the expected credit losses over the loans' entire lives. The requirements for newly originated and preexisting unimpaired loans under the ILM and related bank regulatory guidance differ depending on whether these loans are homogeneous or heterogeneous.

When the loans are homogeneous, bank regulatory guidance indicates that it is generally acceptable for a bank to record an LLP equal to expected net loan charge-offs over a 12-month loss emergence period. Depending on their type, homogeneous loans' entire lives typically are somewhat (e.g., credit card and automobile loans) to considerably (e.g., mortgages and student loans) longer than this 12-month period. For newly originated and preexisting unimpaired heterogeneous loans, no similar bank regulatory guidance exists regarding the appropriate loss emergence period. However, given the greater difficulties involved in meeting the ILM's conditions for accrual for these loans, and all else being equal, we expect that banks typically

accrue even less under the ILM for newly originated and preexisting unimpaired heterogeneous loans than for analogous homogeneous loans.

During recessions, expected credit loss rates on newly originated and preexisting unimpaired loans increase. These increases naturally are larger for credit losses measured over the entire remaining life of these loans under the CECL approach than over any shorter period under the ILM model. As such, during recessions we expect banks to record larger LLPs under CECL than under the ILM for newly originated and preexisting unimpaired loans. This is the case for preexisting unimpaired loans despite the fact that CECL requires banks to record larger LLPs at the prior originations of these loans.[10]

The second set of reasons pertains to the fact that larger loss accruals earlier in the life of a loan imply lower loss accruals later in the life of the loan, all else being equal. We thus refer to this set of reasons as the "preemption effect." This effect is also always in play, but it is particularly evident for loans that become impaired after origination. At this time, the CECL approach requires banks to record LLPs only for the increase in the lifetime credit loss rates above the previous expectations for these rates. In contrast, the ILM requires banks to accrue LLPs for the differences between the lifetime credit loss rates required for impaired loans and the lower credit loss rates previously used for preexisting unimpaired loans (e.g., based on 12-month loss emergence periods for homogeneous loans). Hence, all else being equal, banks record larger LLPs at the time loans become impaired under the ILM than under CECL. Loans become impaired more frequently during recessions, enhancing the preemption effect at those times.

[10] To illustrate, assume that at loan inception a bank estimates a five percent annual credit loss rate for a five-year homogeneous loan with an initial principal of $10,000. For simplicity, ignore loan amortization and interest revenue. The initial LLP based on the lifetime loss rate ($2,262 = $10,000 × [1-(1-5%)^5]) is larger than the LLP based on the 12-month loss rate ($500 = $10,000 × 5%). After one year, the bank revises its estimate of the annual loss rate from five to ten percent. The additional LLP based on the revised lifetime loss rate ($1,177 = $10,000 × [1-(1-10%)^4] - $2,262) is again larger than the LLP based on the revised 12-month loss rate ($500 = $10,000 × 10% - $500).

Based on the discussion above, if only the horizon effect were in play, we would expect banks to record larger LLPs for new loans and prexisting unimpaired loans during recessions under CECL than under the ILM. If only the preemption effect were in play, we would expect banks to record larger LLPs in recessions under the ILM than under CECL. However, both effects are in play, and our expectations depend upon their relative strength, particularly during recessions. Regardless of which effect is stronger, we expect that larger LLPs during recessions render banks more likely to be capital constrained or concerned about their future adequacy at those times, reducing banks' willingness and ability to lend, thereby exacerbating lending procyclicality.

The relative strength of the horizon and preemption effects depends on the extent to which banks accurately forecast the economy (Ryan 2019; Wall 2019). If banks had perfect foresight of future credit losses, then they would make minimal if any revisions of lifetime credit loss rates during recessions under the CECL approach, but they would still record large LLPs when large numbers of loans become impaired during recessions under the ILM. Hence, we would expect the preemption effect to dominate, and banks to have lower lending procyclicality under CECL than under the ILM. However, even state-of-the-art macroeconomic models are generally unable to predict turning points in the business cycle (Covas and Nelson 2018).[11] This prediction difficulty is particularly acute for the essentially unique COVID-19 pandemic and accompanying recession. Hence, we expect banks have relatively poor foresight about future credit losses, so that the horizon effect typically dominates the preemption effect. We thus

[11] Covas and Nelson (2018) argue: "Most of the time, models predict that economic conditions in the future will be similar to the present while gradually reverting to the mean. Thus, when times are good, these models generally project economic conditions to remain buoyant. Similarly, when times are bad, models generally expect economic conditions to remain depressed, at least for a while." Ryan (2008, 2016) observes a similar pattern of macroeconomic forecasts throughout the 2007−2009 financial crisis. This gradual mean reversion of macroeconomic forecasts exacerbates the horizon effect.

hypothesize that banks that adopted CECL prior to the onset of the COVID-19 pandemic reduce their loan growth more than non-adopting banks during the accompanying recession.

3. Sample and Research Design

3.1 Sample Construction

Table 1 summarizes our sample selection. We start with all bank-quarter observations available on the FR Y-9C filings from 2018Q1 to 2021Q1. This period includes eight quarters before large public banks' initial CECL adoption at the beginning of 2020, and five quarters afterward. After requiring that total assets, equity, and net income be non-missing and banks be headquartered in one of the 50 US states, 5,123 bank-quarter observations remain. Following prior literature (Beatty and Liao 2011; Lo 2015), we proxy for the extent of bank lending using the quarterly growth rate in loans excluding PPP loans, because the US Small Business Administration guarantees these loans (Ballew et al. 2021; Granja et al. 2021). Including PPP loans in the calculation of the loan growth rate does not affect our primary inferences. We require bank-quarters to have non-missing loan growth rates. Finally, if a bank has missing data in either 2019Q4 or 2020Q1, making it difficult to determine their CECL adoption impacts, we exclude all of the bank's quarterly observations. The final sample consists of 4,388 bank-quarter observations representing 344 unique banks. Using the PERMCO-RSSD link table from the Federal Reserve Bank of New York to identify the banks' listing status, we identify 221 public banks (with PERMCOs) and 123 private banks (without PERMCOs).

The various delays in the mandatory implementation of CECL discussed in Section 2.1 necessitates that we carefully identify the CECL adoption dates for our sample banks. We manually collect each public (private) bank's CECL adoption date and the adoption impact on its

LLA from its Form 10-K (FR Y-9C) filings for 2020−2021.[12] Table 2 reports the number of initial adopters for the 221 (123) public (private) banks by calendar quarter. One hundred and fifty-one public banks adopted CECL at the beginning of 2020Q1. Three of them are EGCs that chose to early adopt CECL (e.g., FB Financial Corporation).[13] Twenty-seven public banks adopted in 2020Q4−2021Q1 by electing the delay allowed by the CARES Act (e.g., Cathay General Bancorp). Ten public banks adopted CECL during 2020Q3−2020Q4 due to their non-December fiscal year ends (e.g., Raymond James Financial's fiscal year end is September 30). We also identify six private banks that early adopted CECL during our sample period (four at the beginning of 2020Q1 and two during 2020Q4−2021Q1). The remaining 33 public banks and 117 private banks in the sample continue to use the ILM at the end of our sample period in 2021Q1. Of the 33 non-adopting public banks, 24 are SRCs/EGCs, and 9 elected the delay allowed by the CARES Act.[14]

Table 3 Panel A presents summary statistics of the initial CECL adoption impacts for the 194 adopting banks. On average, the adoption of CECL increases banks' LLAs by an economically significant $173.9 million or 39.6 percent of their immediately pre-CECL adoption LLAs. These increases are entirely attributable to the accounting rule change.

[12] Item BHCKJJ26 of FR Y-9C filings reports the effect of CECL adoptions for all adopters. For all banks, we identified the adoption quarter when this item first becomes non-missing. For public banks, we cross-checked their identified CECL adoptions from their FR Y-9C filings against the identified adoptions from their Form 10-K filings, and vice-versa. For the 188 public banks adopting CECL based on their Form 10-K filings, their FR Y-9C filings correctly identify only 134 cases. In contrast, public banks' Form 10-K filings capture all of their CECL adoptions indicated in their FR Y-9C filings. For this reason, we use public banks' CECL adoptions as indicated in their Form 10-K filings.

[13] All three EGCs have "elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act" on the first page of their 10-K filings.

[14] Among the 24 SRCs/EGCs, 14 are just SRCs, 6 are just EGCs, and 4 are both SRCs and EGCs.

During our sample period, the NBER identifies one recession, from February 2020–April 2020.[15] The bulk of the decline in gross domestic product occurred in April 2020 (Wheelock 2020). Hence, consistent with prior research examining earlier recessions (e.g., Beatty and Liao 2011), we classify 2020Q2 as the recession accompanying the COVID-19 pandemic. We collect data on the US GDP and Coincident Index from the Federal Reserve Bank of Philadelphia. The Coincident Index is a comprehensive measure of economic activities based on models with four inputs: nonfarm payroll employment, unemployment rate, average hours worked in manufacturing, and wage and salary disbursements deflated by the consumer price index (Khan and Ozel 2016). We compute the negative of the quarterly growth rates in the US GDP and Coincident Index. Figure 1 plots these rates along with the average loan growth rate for our sample banks. The identified recession period 2020Q2 exhibits significant declines in the growth rates of GDP, the Coincident Index, and loan growth relative to other quarters. The decline in loan growth is consistent with our sample banks exhibiting lending procyclicality.

3.2 Lending Model

We test our hypothesis by estimating the following lending model:

$$\begin{aligned} Loan\ growth_{i,q} = {} & \theta_1 + \theta_2 CECLAdopt_{i,q} + \theta_3 CECLAdopt_{i,q} \times Recession_q \\ & + \sum \theta_j Control_{j,i,q\text{-}1} + b_i + d_q + v_{i,q}\,, \end{aligned} \tag{1}$$

where *i* indexes banks, *q* indexes year-quarters, and *j* indexes control variables. *Loan growth* is the quarterly change in total (excluding PPP) loans divided by total loans at the beginning of the quarter. *CECLAdopt* is an indicator set to one for the quarters after the bank adopted CECL, and

[15] The NBER's Business Cycle Dating Committee consists of renowned macroeconomists. The committee maintains a timeline of the dates of the peak and trough months of US business cycles based on various measures of monthly aggregate real economic activity published by the federal statistical agencies. The NBER defines a recession as a period lasting more than a few months during which aggregate economic activity declines significantly. See https://www.nber.org/research/business-cycle-dating for details.

zero otherwise. *Recession* is set to one for 2020Q2 and zero otherwise. The independent variable of primary interest is *CECLAdopt* × *Recession*. A negative coefficient θ_3 on this variable indicates that CECL adopters reduced their lending more during the COVID-19 recession than non-adopters, consistent with our hypothesis that CECL exacerbates banks' lending procyclicality. The coefficient θ_2 on $CECLAdopt_{i,q}$ reflects the average effect of CECL adoption on banks' lending during the non-recession portion of the sample period. While all 194 CECL adopters are reflected in the estimate of θ_2, only 155 of these banks adopted CECL before the one-quarter recession 2020Q2 and thus are reflected in the estimate of θ_3 (given θ_2).

We control for the following variables following recent prior research (Dou et al. 2018; Ballew et al. 2021; Dou 2021): (1) PPP loans divided by total loans (*PPP*); (2) the natural logarithm of total assets in thousands of dollars (*Assets*); (3) total equity divided by total assets (*Equity*); (4) net income before the LLP divided by total assets (*Cash flow*); (5) total deposits divided by total assets (*Deposit*); (6) the sum of loans over 90 days past due and nonaccrual loans divided by total loans (*Nonperforming loan*); (7) commercial and industrial loans divided by total assets (*Commercial loan*); (8) real estate loans divided by total assets (*Real estate loan*); and (9) consumer loans divided by total assets (*Consumer loan*). All control variables are lagged by one quarter to ensure that they are not affected by banks' lending activities during the quarter. The appendix provides detailed variable definitions. To control for time-invariant heterogeneity across banks and bank-invariant heterogeneity across time, we include bank fixed effects, b_i, and year-quarter fixed effects, d_q, respectively. The main effect of *Recession* is absorbed by the year-quarter fixed effects. We cluster the residual standard errors by bank to account for each bank's residual serial correlation.

Table 3 Panel B reports summary statistics for the equation (1) variables. Consistent with statistics reported in prior literature (Dou et al. 2018; Ballew et al. 2021; Dou 2021; Bhat et al. 2021), the average bank exhibits a quarterly loan growth rate of 1.6 percent, PPP loans equal to 2.0 percent of total loans, non-performing loans equal to 0.8 percent of total loans, total assets of \$9 billion ($e^{15.997}$), an equity-to-assets ratio of 0.116, a cash flow-to-assets ratio of 0.009, and a deposit-to-assets ratio of 0.754. Commercial, real estate, and consumer loans constitute 44.6, 12.2, and 3.8 percent of total assets, respectively. Banks use the CECL approach in 825 (4,388 × 0.188) bank-quarters. The COVID-19 recession constitutes 338 (4,388 × 0.077) bank-quarters.

4. Results

4.1 CECL Adoption and Lending Procyclicality

Column (1) of Table 4 reports the estimation of a nested version of equation (1) without bank and year-quarter fixed effects, so that the main effect of *Recession* can be estimated. The coefficient on *Recession* is significantly negative (-0.009, *p*-value < 0.01), indicating that banks that did not adopt CECL before 2020Q2 reduce their loan growth by about one percent during the COVID-19 recession relative to the non-recession portions of our sample period. The coefficient on *CECLAdopt* is insignificant, suggesting that the CECL adoption does not influence bank lending outside of the COVID-19 recession portion of our sample period. Importantly, the coefficient on *CECLAdopt* × *Recession* is significantly negative (-0.014, *p*-value < 0.01), consistent with our hypothesis that CECL adopters reduce their lending more than non-adopters during the COVID-19 recession.

Column (2) of Table 4 reports coefficients and *t*-statistics from the estimation of equation (1) with bank and year-quarter fixed effects. We continue to observe a significant negative coefficient on *CECLAdopt* × *Recession* (-0.018, *p*-value < 0.01) and an insignificant coefficient

on *CECLAdopt*.[16] The former coefficient implies that, relative to non-adopters, CECL adopters reduced loan growth by 1.8 percent, which equals 44 percent of its standard deviation, during the COVID-19 recession, an economically meaningful effect.

As discussed above, we use Form 10-K and FR Y-9C filings to identify CECL adoptions for public and private banks, respectively. When we instead use only FR Y-9C filings to identify these adoptions for both types of banks, we again obtain a significant negative coefficient on *CECLAdopt* × *Recession* (-0.013, *p*-value < 0.05). The magnitude of the coefficient is lower than that in column (2) of Table 4, consistent with public banks' CECL adoption data collected from their Form 10-K filings being less noisy than the corresponding data from their FR Y-9C filings.

We believe that banks' incentives to adopt CECL do not explain our findings for several reasons. First, as discussed above, only the 155 banks that adopted CECL before the one-quarter recession in 2020Q2 contribute to the coefficient on *CECLAdopt* × *Recession*. Of these banks, 148 are large public and thus mandatory adopters. A significant negative coefficient on *CECLAdopt* × *Recession* (-0.018, *p*-value < 0.01) still obtains when we drop the three public early adopters and the four private early adopters. Second, it is unlikely that banks foresaw the onset of the COVID-19 pandemic in the US at the beginning of 2020Q1. Even if they did, weaker banks would be more likely to delay their CECL adoptions by electing the CARES Act exemption, and these banks should cut lending more during the 2020Q2 recession, biasing against our findings. Third, we control for a host of bank characteristics that likely capture banks' incentives to adopt CECL.

[16] If we compute *Loan growth* including PPP loans, the coefficient on *Recession* in column (1) becomes significantly positive (0.060, *p*-value < 0.01), consistent with the intent of the PPP being to stimulate lending during the COVID-19 pandemic. Nevertheless, the coefficient on *CECLAdopt* × *Recession* remains significantly negative (-0.021, *p*-value < 0.01). Hence, PPP-induced loan growth does not affect our inferences, perhaps because the PPP affects CECL adopters and non-adopters similarly.

The signs of the coefficients on the control variables are as expected. For example, the coefficient on *Nonperforming loan* is significantly negative, suggesting that banks with poorly performing loans reduce loan growth. We also observe a significantly negative coefficient on *Assets*, suggesting that larger banks experience lower loan growth.

4.2 Cross-sectional Tests

We perform three cross-sectional tests to capture how banks' capital adequacy and the relative importance of the horizon and preemption effects influence our results. First, we expect CECL-adopters with low capital adequacy to exhibit more lending procyclicality, and thus lower lending growth during the COVID-19 recession, relative to non-adopters. We measure low capital adequacy using the indicator *Low tier 1 capital*, which takes a value of one when banks' beginning-of-quarter Tier 1 risk-based capital ratio is in the lowest quintile for the year, and zero otherwise. The upper bound of this quintile ranges from 11.05 to 11.33 across our sample years. We obtain banks' Tier 1 risk-based capital ratios, which incorporate the regulatory capital relief they receive upon the adoption of CECL, from their FR Y-9C filings.[17] We add *Low tier 1 capital* and its interactions with *CECLAdopt*, *Recession*, and *CECLAdopt* × *Recession* to equation (1) and re-estimate the equation. Table 5, Panel A reports that the coefficient on the three-way interaction, *CECLAdopt* × *Recession* × *Low tier 1 capital*, is significantly negative (-0.021, *p*-value < 0.1). Thus, as expected, CECL adopters with low Tier 1 risk-based capital ratios reduce lending more relative to non-adopters during the COVID-19 recession. This finding suggests that concerns about future regulatory capital inadequacy is one channel through which banks' CECL adoptions affect their lending.

[17] We lose 158 bank-quarter observations associated with qualifying banks with assets below $10 billion that adopt the Community Bank Leverage Ratio (CBLR) framework, which allows the banks to opt out of risk-weighted asset reporting as of January 1, 2020. Nevertheless, including these observations in the sample does not affect our inferences.

Second, as discussed above, we expect the horizon effect to be stronger for heterogeneous loans than for homogeneous loans, and thus CECL adopters with lower heterogeneous loans to exhibit less lending procyclicality relative to non-adopters. The indicator *Low hetero loan* takes a value of one when the ratio of commercial and industrial loans to total loans at the beginning of the quarter is in the bottom annual quintile, and zero otherwise. The upper bound of this quintile ranges from 0.08 to 0.13 across our sample years. We add *Low hetero loan* and its interactions with *CECLAdopt*, *Recession*, and *CECLAdopt* × *Recession* to equation (1) and re-estimate the equation. Table 5, Panel B reports that the coefficient on the three-way interaction, *CECLAdopt* × *Recession* × *Low hetero loan*, is significantly positive (0.031, *p*-value < 0.05). Thus, as expected, CECL adopters with a low proportion of heterogeneous loans reduce lending less relative to non-adopters during the COVID-19 recession, consistent with the horizon effect.

Third, we proxy for the strength of the preemption effect using banks' initial CECL adoption impacts on the LLA. The larger the initial impact, the more CECL preempts loss recognition for loans that subsequently become impaired. We expect that CECL adopters with larger initial adoption impacts exhibit less lending procyclicality relative to non-adopters. The indicator *High initial CECL impact* takes a value of one when banks' initial CECL adoption impacts divided by their pre-CECL LLAs is in the top quintile, and zero otherwise. The lower bound of this quintile is 0.597. We add *High initial CECL impact* and its interactions with *CECLAdopt*, *Recession*, and *CECLAdopt* × *Recession* to equation (1) and re-estimate the equation. Since *High initial CECL impact* is bank-specific, its main effect is absorbed by bank fixed effects. Table 5 Panel C reports that the coefficient on the three-way interaction, *CECLAdopt* × *Recession* × *High initial CECL impact*, is significantly positive (0.030, *p*-value <

0.05). Thus, as expected, CECL adopters with a high CECL adoption impact reduce lending less relative to non-adopters during the COVID-19 recession, consistent with the preemption effect. We emphasize that this does not obviate our primary finding reported in Table 4, that the horizon effect dominates the preemption effect for the average CECL adopter.

This finding reported in Table 5 Panel C that CECL adopters with larger initial impacts reduce their loan growth less during the COVID-19 recession relative to non-adopters helps rule out an alternative explanation for our primary finding reported in Table 4. This alternative is that CECL adopters reduce lending more than non-adopters during the COVID-19 recession because the adopters smooth the initial CECL adoption impacts into the following quarter (i.e., 2020Q2). This alternative explanation predicts that CECL adopters with larger initial impacts should reduce their loan growth more during the COVID-19 recession than non-adopters, inconsistent with the result in Table 5 Panel C.

5. Additional Analyses

5.1 Alternative Specifications

While *Recession* captures the only significant downturn during our sample period, it ignores other fluctuations in the business cycle during this period. We check the robustness of our results by replacing *Recession* with three continuous measures of economic downturns, two at the national level and one at the state level. The nationwide measures are the negative of the US GDP quarterly growth rate (*Neg GDP growth*) and the negative of the growth rate in the US Coincident Index from the last month of the previous quarter to the last month of the current quarter (*Neg coindex growth*). As reported in columns (1) and (2) of Table 6, our results are robust to the use of these alternative measures of national economic downturns.

To mitigate the concern that CECL adopters and non-adopters may experience different local economic shocks, we instead replace *Recession* with the negative of the growth rate in Coincident Index for the state where the bank is headquartered (*Neg state coindex growth*). We also replace the year-quarter fixed effects with state-year-quarter fixed effects to remove the effects of any state-level economic and regulatory changes. This specification essentially holds local credit demand or other economic conditions constant by comparing the lending within the same state-quarter across CECL adopters and non-adopters. As reported in column (3) of Table 6, our results are robust to the use of this measure of state-level economic downturns and the inclusion of state-year-quarter fixed effects.

Since banks may have out-of-state branches and thus be exposed to business cycles in other states, we also conduct this analysis using the subset of banks that collect deposits in only one state. Consistent with the state-level Coincident Index being a more relevant measure of economic activity for one-state banks, Table 6 column (4) reports that the coefficient on *CECLAdopt* × *Recession* for these banks (-0.108, *p*-value < 0.05) is almost twice as large as the coefficient for all banks (-0.057, *p*-value < 0.03) reported in column (3).

5.2 A Matched Sample

CECL adopters are typically large public banks, whereas non-adopters are more likely to be smaller public banks or private banks. Hence, our findings may be explained by differences between adopting and non-adopting banks such as bank size and listing status.[18] To mitigate this concern, we construct a size-matched sample using only public banks. Following Asker et al.

[18] It is priori unclear whether large (public) banks should cut lending more during recessions than small (private) banks. Large banks are less financially constrained but subject to more systematic risk than small banks. Compared with private banks, public banks have better access to equity capital but face more market pressure. As a result, differences between adopting and non-adopting banks in bank size and listing status can bias toward or against our findings.

(2015), we use a caliper-based nearest-neighbor match adapted to a panel data setting. Starting in 2018Q1, for each treatment bank with total assets below $10 billion that adopted CECL at the beginning of 2020Q1, we select a control bank with the closest total assets, requiring the maximum of the treatment and control banks' total assets divided by the minimum of their total assets to be less than two. If no match is identified, we discard the observation and find a match in the next year. Once a match is identified, it is retained in subsequent quarters to ensure a balanced panel structure. The final sample consists of 56 unique treatment banks and an equal number of control banks.

Table 7 Panel A reports the means of bank characteristics for the treatment and control banks in the quarter immediately before the treatment banks adopted CECL (i.e., 2019Q4). It also reports the *p*-values for the differences in these means. We find that the matched treatment and control banks exhibit similar total assets and all other bank characteristics except for *Equity* (the equity-to-assets ratio), suggesting that the treatment and control samples are well matched. Moreover, while the treatment banks exhibit higher *Equity* than the control banks, this difference should bias against finding that the treatment banks reduce lending more than the control banks during the COVID-19 recession. Regardless, we control for *Equity* and all of the other bank characteristics in our prior models.

As reported in Panel B of Table 7, the coefficient on *CECLAdopt* × *Recession* remains significantly negative (-0.015, *p*-value < 0.05) using this matched sample. The magnitude of the coefficient is similar to the coefficient of -0.018 in the full sample analysis reported in Table 4. The result suggests that our primary findings are attributable to CECL adoption rather than to bank size and listing differences between CECL-adopting and non-adopting banks.

5.3 CECL Adoption and Procyclical LLP

Our hypothesis is based on the premise that CECL adoption increases the procyclicality of banks' LLPs. We validate this premise by testing whether CECL adopters increase their LLPs more than non-adopters during the COVID-19 recession. We modify equation (1) by replacing the dependent variable *Loan growth* with the LLP in the quarter divided by total loans at the beginning of the quarter (*LLP*):

$$LLP_{i,q} = \theta_1 + \theta_2 CECLAdopt_{i,q} + \theta_3 CECLAdopt_{i,q} \times Recession_q + \sum \theta_j Control_{j,i,q\text{-}1} + b_i + d_q + v_{i,q} . \quad (2)$$

Table 3 reports summary statistics for *LLP*. The mean of *LLP* is 0.3 percent.

Column (1) of Table 8 reports the estimation of a nested version of equation (2) without bank and year-quarter fixed effects, so that the main effect of *Recession* can be estimated. The coefficient on *Recession* is significantly positive (0.002, *p*-value < 0.01), consistent with non-adopting banks increasing *LLP* by 0.2 percent during the COVID-19 recession relative to the non-recession sample periods. Importantly, coefficient on *CECLAdopt* × *Recession* is significantly positive (0.001, *p*-value < 0.01). Column (2) of Table 8 the estimation of equation (2) with bank and year-quarter fixed effects. The coefficient on *CECLAdopt* × *Recession* remains significantly positive (0.002, *p*-value < 0.01), consistent with CECL adopters increasing their LLPs by 0.2 percent more than non-adopters during the COVID-19 recession. That is, CECL adopters exhibit more procyclical LLPs than non-adopters. The economic magnitude of this effect is commensurate with that for lending. Specifically, CECL adopters increase LLPs more than non-adopters during the COVID-19 recession by 50 percent of the standard deviation of *LLP* (0.002/0.004).

6. Conclusion

Prior research finds that banks reduce lending during economic downturns to mitigate the potential for their capital to subsequently become inadequate. Policymakers argue that the incurred loss model exacerbates this lending procyclicality by delaying the recognition of loan losses to recessions. In response, the FASB issued Accounting Standards Update 2016-13, which requires banks to transition from the incurred loss model to the CECL approach in recording their loan losses. Contrary to policymakers' expectations, we hypothesize and find that CECL adopters exhibit greater reductions in loan growth during the COVID-19 recession than non-adopters. We further predict and find that this effect is stronger for adopting banks with low regulatory capital, and weaker for adopting banks with low heterogenous loans (an inverse proxy for the strength of the horizon effect) and with large initial CECL adoption impacts (a proxy for the strength of the preemption effect). Our results are robust to using a host of alternative specifications and a matched sample of public treatment and control banks that exhibit indistinguishable total assets. Lastly, we find that CECL-adopting banks record higher LLPs during the COVID-19 recession. Our results suggest that the CECL approach exacerbates rather than decrease lending procyclicality. The evidence should be of interest to policymakers, regulators, bank managers, and academics.

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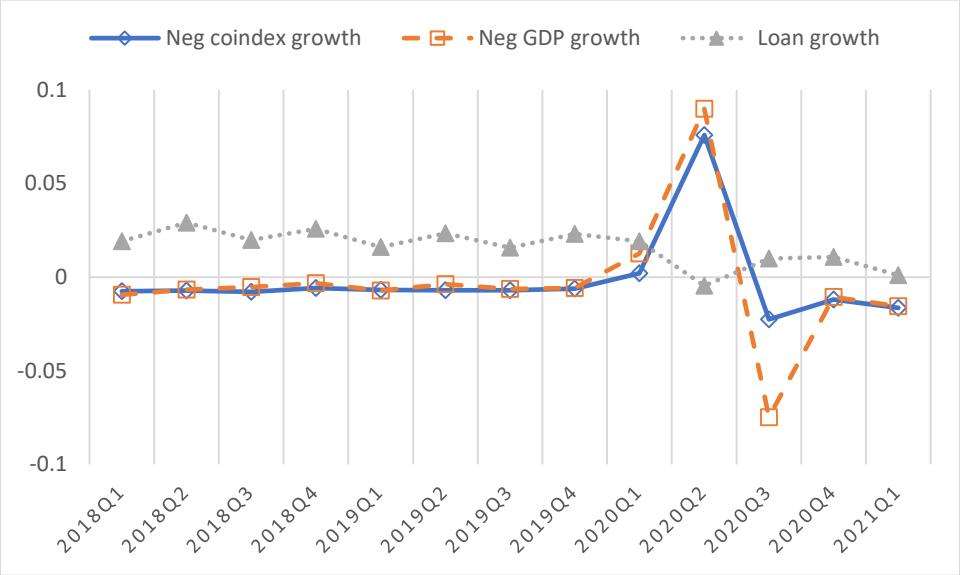
Appendix: Variable Definitions

Variable	Definition	Source
Loan growth	The quarterly change in total loans (BHCKB529) divided by total loans at the beginning of the quarter. From 2020Q2 to 2021Q1, we subtract the Paycheck Protection Program (PPP) loans (BHCKLG27) from total loans to calculate this variable.	FR Y-9C
CECLAdopt	An indicator set to one for quarters after the bank adopted CECL, and zero otherwise. It equals zero for all private bank-quarters.	FR Y-9C/Form 10-K
Recession	An indicator set to one for 2020Q2, and zero otherwise.	NBER
PPP	Paycheck Protection Program (PPP) loans (BHCKLG27) divided by total loans (BHCKB529) at the beginning of the quarter.	
Assets	Log of total assets in thousands of dollars (BHCK2170) at the beginning of the quarter.	FR Y-9C
Equity	Total equity (BHCK3210) divided by total assets (BHCK2170) at the beginning of the quarter.	FR Y-9C
Cash flow	Net income (BHCK4300) before loan loss provisions (BHCK4230) in the prior quarter, divided by total assets (BHCK2170) at the beginning of the quarter.	FR Y-9C
Deposit	Total deposits divided by total assets (BHCK2170) at the beginning of the quarter. Total deposits equal the sum of interest-bearing deposits in domestic offices (BHDM6631), non-interest-bearing deposits in domestic offices (BHDM6636), interest-bearing deposits in foreign offices (BHFN6631), and non-interest-bearing deposits in foreign offices (BHFN6636).	FR Y-9C
Nonperforming loan	Nonperforming loans divided by total loans (BHCKB529) at the beginning of the quarter. Nonperforming loans equal loans over 90 days past due (BHCK5526, or BHCK1407 from 2018Q1 onward) plus nonaccrual loans (BHCK5525, or BHCK1403 from 2018Q1 onward).	FR Y-9C
Commercial loan	Commercial and industrial loans (BHCK1766) divided by total assets (BHCK2170) at the beginning of the quarter.	FR Y-9C
Real estate loan	Real estate loans (BHCK1410) divided by total assets (BHCK2170) at the beginning of the quarter.	FR Y-9C
Consumer loan	Consumer loans divided by total assets (BHCK2170) at the beginning of the quarter. Consumer loans are loans to individuals for household, family, and other personal expenditures (BHCKB538+BHCKB539+BHCKK137+BHCKK207).	FR Y-9C
Low tier 1 capital	An indicator set to one when the Tier 1 risk-based capital ratio (BHCA7206) at the beginning of the quarter is in the bottom annual quintile, and zero otherwise.	FR Y-9C
Low hetero loan	An indicator set to one when commercial and industrial loans (BHCK1766) divided by total loans (BHCKB529) at the beginning of the quarter are in the bottom annual quintile, and zero otherwise.	FR Y-9C

High initial CECL impact	An indicator set to one if the percentage change in the loan loss allowance (LLA) due to CECL adoption is in the top quintile of adopting banks, and zero otherwise. The change in LLA is collected from the 10-K filings when the bank adopted CECL. This time-invariant variable is defined for adopters only and equals zero for non-adopters.	FR Y-9C/Form 10-K
LLP	Provisions for loan and lease losses (BHCK4230) in the quarter divided by total loans (BHCKB529) at the beginning of the quarter.	FR Y-9C

Figure 1 Business Cycle and Loan Growth



This figure depicts the negative of the US Coincident Index growth rate, the negative of the US GDP growth rate, and the average loan growth rate across our sample banks in each quarter from 2018Q1 to 2021Q1. Based on the NBER classification, we treat 2020Q2 as the COVID-19 recession.

Table 1 Sample Selection

	# bank-quarters	# unique banks
(1) Bank holding companies from FR Y-9C filings from 2018Q1 to 2021Q1	5,236	670
(2) Headquartered in the 50 US states with non-missing total assets, equity, and net income at the beginning of a quarter	5,123	661
(3) Require non-missing loan growth in a quarter	5,113	660
(4) Require non-missing data in 2019Q4 and 2020Q1 to check banks' CECL adoption status	**4,388**	**344**
Subsample: public banks	2,809	221
Subsample: private banks	1,579	123

This table presents the sample selection procedure. We first identify all bank hold companies ("banks") with quarterly observations from 2018Q1 to 2021Q1. We require a bank to be headquartered in the 50 US states with non-missing total assets, equity, and net income at the beginning of a quarter. We then compute and require non-missing value for loan growth in a quarter. Finally, we require that a bank has non-missing data in 2019Q4 and 2020Q1 to check their CECL adoption status in Form 10-K filings. The final sample consists of 4,388 bank-quarter observations representing 344 unique banks. For these 344 banks, we use the PERMCO-RSSD link table from the Federal Reserve Bank of New York to identify 221 public banks (i.e., banks with PERMCOs) and 123 private banks (i.e., banks without PERMCOs).

Table 2 CECL Adoption by Quarter

# of initial adopters	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1	not yet
Conventional public adopters	148	0	0	0	0	0
Non-conventional public adopters due to:						
Elect CARES Act delay	0	0	0	10	17	9
Different fiscal year end	0	0	4	6	0	0
SRC/CGC status	3	0	0	0	0	24
Early private adopters	4	0	0	1	1	117

This table reports the number of initial adopters in each quarter from 2020Q1 to 2021Q1 for 344 unique banks. The adoption status is manually collected from the Form 10-K filings for public banks and FR Y-9C filings for private banks. Conventional public adopters are public banks that adopted CECL in 2020Q1. Non-conventional public adopters are public banks that adopted CECL during or after 2020Q1 for three reasons: (1) the bank elects the CARES Act delay in the adoption of CECL; (2) the bank has a fiscal year end other than December 31; or (3) the bank is a smaller reporting company (SRC) or an emerging growth company (CGC) that chooses to adopt CECL early or not. Early private adopters are private banks that adopted CECL before 2023.

Table 3 Descriptive Statistics

Panel A: Initial CECL adoption impact on allowance for loan losses

	N	Mean	Std	P25	Median	P75
Initial CECL impact on LLA in million dollars	194	173.883	665.874	3.329	13.610	60.521
Initial CECL impact on LLA/pre-CECL LLA	194	0.396	0.583	0.084	0.278	0.515

Panel B: Summary statistics

	N	Mean	Std	P25	Median	P75
Loan growth	4,388	0.016	0.041	-0.005	0.010	0.026
CECLAdopt	4,388	0.188	0.391	0.000	0.000	0.000
Recession	4,388	0.077	0.267	0.000	0.000	0.000
PPP	4,388	0.020	0.037	0.000	0.000	0.023
Assets	4,388	15.997	1.471	15.012	15.656	16.706
Equity	4,388	0.116	0.028	0.097	0.111	0.130
Cash flow	4,388	0.009	0.005	0.004	0.008	0.012
Deposit	4,388	0.754	0.139	0.734	0.792	0.835
Nonperforming loan	4,388	0.008	0.007	0.003	0.006	0.010
Commercial loan	4,388	0.122	0.081	0.064	0.106	0.165
Real estate loan	4,388	0.446	0.197	0.337	0.475	0.590
Consumer loan	4,388	0.038	0.060	0.003	0.012	0.046
LLP	4,388	0.003	0.004	0.000	0.001	0.003

Panel A reports descriptive statistics for the initial impact of the CECL adoption on the loan loss allowance (LLA). The data are manually collected from banks' Form 10-K filings and FR Y-9C filings. Panel B reports summary statistics for variables used in regressions. *Loan growth* is the quarterly change in total loans divided by total loans at the beginning of the quarter. *CECLAdopt* is an indicator set to one for quarters after the bank adopted CECL. *Recession* is an indicator set to one for 2020Q2. *PPP* is Paycheck Protection Program loans divided by total loans at the beginning of the quarter. *Assets* is log of total assets in thousands of dollars at the beginning of the quarter. *Equity* is total equity divided by total assets at the beginning of the quarter. *Cash flow* is net income before loan loss provisions in the prior quarter divided by total assets at the beginning of the quarter. *Deposit* is total deposits divided by total assets at the beginning of the quarter. *Nonperforming loan* is loans over 90 days past due plus nonaccrual loans divided by total loans. *Commercial loan* is commercial and industrial loans divided by total assets. *Real estate loan* is loans secured by real estate divided by total assets. *Consumer loan* is loans to individuals for household, family, and other personal expenditures divided by total assets. *LLP* is provisions for loan and lease losses divided by total loans at the beginning of the quarter. Detailed variable definitions are in Appendix.

Table 4 CECL Adoption and Lending Procyclicality

	Pred. Sign	Dependent Variable: *Loan growth* (1)		(2)	
Recession		-0.009	***		
		(-2.62)			
CECLAdopt		0.002		0.004	
		(0.62)		(1.44)	
CECLAdopt × Recession	**-**	**-0.014**	*******	**-0.018**	*******
		(-2.65)		**(-3.78)**	
PPP		-0.176	***	-0.064	
		(-7.74)		(-1.24)	
Assets		-0.003	***	-0.093	***
		(-3.35)		(-8.27)	
Equity		-0.050		-0.058	
		(-1.41)		(-0.50)	
Cash flow		-0.366	**	-0.482	
		(-2.11)		(-1.29)	
Deposit		-0.010		-0.111	***
		(-1.10)		(-3.48)	
Nonperforming loan		-0.165		-0.846	***
		(-0.75)		(-2.91)	
Commercial loan		0.011		-0.048	
		(0.75)		(-1.17)	
Real estate loan		-0.014		-0.121	***
		(-1.55)		(-2.96)	
Consumer loan		-0.030	*	-0.190	**
		(-1.67)		(-2.10)	
Bank FE		No		Yes	
Year-Quarter FE		No		Yes	
Clustered by Bank		Yes		Yes	
N		4388		4388	
R^2		0.054		0.265	

This table presents coefficients and *t*-statistics in parentheses, from pooled regressions of *Loan growth* on the independent variables listed. See Appendix for variable definitions. Standard errors are clustered by bank. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5 Cross-sectional Tests

Panel A: The effect of low tier 1 risk-based capital ratios on the relation between CECL adoption and lending procyclicality

	Pred. Sign	Dependent variable: *Loan growth*	
CECLAdopt		0.003	
		(0.90)	
CECLAdopt × Recession	**-**	**-0.013**	****
		(-2.25)	
Low tier 1 capital		-0.005	
		(-1.63)	
CECLAdopt × Low tier 1 capital		0.006	
		(1.38)	
Recession × Low tier 1 capital		0.007	
		(0.74)	
CECLAdopt × Recession × Low tier 1 capital	**-**	**-0.021**	*****
		(-1.67)	
PPP		-0.039	
		(-0.79)	
Assets		-0.102	***
		(-9.24)	
Equity		-0.113	
		(-0.91)	
Cash flow		-0.296	
		(-0.73)	
Deposit		-0.118	***
		(-3.30)	
Nonperforming loan		-0.940	***
		(-3.09)	
Commercial loan		-0.035	
		(-0.82)	
Real estate loan		-0.120	***
		(-2.62)	
Consumer loan		-0.233	**
		(-2.38)	
Bank FE		Yes	
Year-Quarter FE		Yes	
Clustered by Bank		Yes	
N		4230	
R^2		0.268	

Panel B: The effect of low heterogeneous loans on the relation between CECL adoption and lending procyclicality

	Pred. Sign	Dependent variable: *Loan growth*	
CECLAdopt		0.004	
		(1.43)	
CECLAdopt × Recession	**-**	**-0.023**	*******
		(-4.28)	
Low hetero loan		0.003	
		(0.65)	
CECLAdopt × Low hetero loan		0.000	
		(0.04)	
Recession × Low hetero loan		0.004	
		(0.59)	
CECLAdopt × Recession × Low hetero loan	**+**	**0.031**	******
		(2.20)	
PPP		-0.047	
		(-1.00)	
Assets		-0.093	***
		(-8.11)	
Equity		-0.049	
		(-0.43)	
Cash flow		-0.500	
		(-1.36)	
Deposit		-0.109	***
		(-3.47)	
Nonperforming loan		-0.839	***
		(-2.91)	
Commercial loan		-0.048	
		(-1.18)	
Real estate loan		-0.122	***
		(-2.95)	
Consumer loan		-0.188	**
		(-2.13)	
Bank FE		Yes	
Year-Quarter FE		Yes	
Clustered by Bank		Yes	
N		4388	
R^2		0.269	

Panel C: The effect of the initial LLA impact on the relation between CECL adoption and lending procyclicality

	Pred. Sign	Dependent variable: *Loan growth*	
CECLAdopt		0.004	
		(1.43)	
CECLAdopt × Recession	-	-0.023	***
		(-4.88)	
CECLAdopt × High initial CECL impact		-0.002	
		(-0.28)	
Recession × High initial CECL impact		-0.011	
		(-1.49)	
CECLAdopt × Recession × High initial CECL impact	+	0.031	**
		(2.13)	
PPP		-0.068	
		(-1.31)	
Assets		-0.094	***
		(-7.97)	
Equity		-0.063	
		(-0.55)	
Cash flow		-0.476	
		(-1.27)	
Deposit		-0.110	***
		(-3.46)	
Nonperforming loan		-0.852	***
		(-2.95)	
Commercial loan		-0.044	
		(-1.08)	
Real estate loan		-0.120	***
		(-2.93)	
Consumer loan		-0.193	**
		(-2.12)	
Bank FE		Yes	
Year-Quarter FE		Yes	
Clustered by Bank		Yes	
N		4388	
R^2		0.267	

This table presents coefficients and *t*-statistics in parentheses, from pooled regressions of *Loan growth* on the independent variables listed. See the Appendix for variable definitions. Standard errors are clustered by bank. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6 Alternative Specifications

		Dependent variable: *Loan growth*			
		Recession =			
	Pred. Sign	*Neg coindex growth*	*Neg GDP growth*	*Neg state coindex growth*	*Neg state coindex growth (one-state banks only)*
		(1)	(2)	(3)	(4)
CECLAdopt		0.001	0.000	0.004	0.002
		(0.52)	(0.16)	(1.27)	(0.33)
CECLAdopt × Recession	-	**-0.178 *** **	**-0.096 *** **	**-0.057 ** **	**-0.108 ** **
		(-3.50)	**(-2.99)**	**(-2.19)**	**(-2.25)**
Controls		Yes	Yes	Yes	Yes
Bank FE		Yes	Yes	Yes	Yes
Year-Quarter FE		Yes	Yes	No	No
State-Year-Quarter FE		No	No	Yes	Yes
Clustered by BHC		Yes	Yes	Yes	Yes
N		4388	4388	4388	1246
R^2		0.265	0.264	0.178	0.274

This table presents coefficients and *t*-statistics in parentheses, from pooled regressions of *Loan growth* on the independent variables listed. Controls represent all control variables in Table 4. See the Appendix for variable definitions. *Neg coindex growth* is the negative of the growth rate in the US Coincident Index from the last month of the previous quarter to the last month of the current quarter. *Neg GDP growth* is the negative of the US GDP quarterly growth rate. *Neg state coindex growth* is the negative growth rate in the Coincident Index for the state where the bank is headquartered. In column (4), one-state banks are those that collect deposits from only one state according to the Summary of Deposits. Standard errors are clustered by bank. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7 A Matched Sample

Panel A: Summary statistics

	Treatment Mean	Control Mean	*p*-value for difference
Assets	15.505	15.521	0.812
Equity	0.120	0.109	0.003
Cash flow	0.010	0.010	0.932
Deposit	0.789	0.786	0.768
Nonperforming loan	0.006	0.006	0.3
Commercial loan	0.127	0.125	0.881
Real estate loan	0.528	0.551	0.451
Consumer loan	0.031	0.033	0.855

Panel B: CECL adoption and lending procyclicality

	Pred. Sign	Dependent variable: *Loan growth*	
CECLAdopt		0.008	
		(1.48)	
CECLAdopt* × *Recession	-	**-0.015**	****
		(-2.06)	
PPP		0.005	
		(0.09)	
Assets		-0.081	***
		(-4.22)	
Equity		-0.555	**
		(-2.56)	
Cash flow		0.086	
		(0.12)	
Deposit		-0.058	
		(-0.94)	
Nonperforming loan		-1.230	**
		(-2.13)	
Commercial loan		-0.102	**
		(-2.02)	
Real estate loan		-0.010	
		(-0.15)	
Consumer loan		0.045	
		(0.30)	
Bank FE		Yes	
Year-Quarter FE		Yes	
Clustered by Bank		Yes	
N		1446	
R^2		0.332	

Panel A reports the means of bank characteristics for treatment and control banks in a matched sample. Before matching, treatment banks are those that adopted CECL in 2020Q1 and have total assets below $10 billion as of 2019Q4. Control banks are public banks that did not adopt CECL in 2020Q1. We use a caliper-based nearest-neighbor match adapted to a panel setting. Starting in 2018Q1, for each treatment bank, we select a control bank with the closest total assets to the treatment bank and require the maximum of their total assets divided by the

minimum of their total assets to be less than two. If no match is identified, we discard the observation and find a match in the next year. Once a match is identified, it is retained in subsequent quarters to ensure a balanced panel structure. Panel B presents coefficients and *t*-statistics in parentheses, from pooled regressions of *Loan growth* on the independent variables listed. See Appendix for variable definitions. Standard errors are clustered by bank. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8 CECL Adoption and Loan Loss Provision Procyclicality

	Pred. Sign	Dependent variable: *LLP* (1)		(2)	
Recession		0.002	***		
		(6.21)			
CECLAdopt		0.001	***	0.001	***
		(5.76)		(5.99)	
CECLAdopt × Recession	+	**0.001**	*******	**0.002**	*******
		(4.67)		**(8.34)**	
PPP		0.015	***	0.008	***
		(5.76)		(2.69)	
Assets		0.000	*	0.000	
		(1.76)		(0.54)	
Equity		0.005		-0.026	***
		(1.00)		(-3.63)	
Cash flow		0.081	***	0.058	***
		(3.09)		(3.62)	
Deposit		-0.001		0.003	
		(-0.43)		(1.39)	
Nonperforming loan		0.103	***	0.052	***
		(4.04)		(2.76)	
Commercial loan		0.004	*	-0.010	***
		(1.77)		(-3.95)	
Real estate loan		-0.001		-0.000	
		(-1.18)		(-0.10)	
Consumer loan		0.016	***	0.005	
		(4.01)		(1.01)	
Bank FE		No		Yes	
Year-Quarter FE		Yes		Yes	
Clustered by Bank		Yes		Yes	
N		4388		4388	
R^2		0.323		0.778	

This table presents coefficients and *t*-statistics in parentheses, from pooled regressions of *LLP* on the independent variables listed. See Appendix for variable definitions. Standard errors are clustered by bank. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.