

FALL 2018

IMPACT



OF BANK REGULATION ON
BUSINESS LENDING



Restoring Small Business Lending



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The author gratefully acknowledges financial support for this project from the U.S. Chamber of Commerce. All opinions are those of the author and do not necessarily reflect those of the Chamber or Georgetown University.



EXECUTIVE SUMMARY

Small businesses are key drivers of economic growth and job creation: they employ nearly half of U.S. employees and have produced 61% of net job creation since 2010. Like all commercial enterprises, small businesses depend on access to credit to sustain daily operations and grow. Unfortunately, small business lending by depository institutions has not kept pace with the development of the economy. Small business loans less than \$1 million dropped from 2.5% of gross domestic product in 2001 to 1.7% in 2017. Such loans make up a smaller portion of total bank assets, dropping from 4.0% in 2001 to 2.1% in 2016. Small businesses, even those with low credit risk, report difficulty in raising capital. Problems in providing capital to small businesses can create a major impediment for economic growth.

Strict capital and liquidity requirements were put in place in response to the 2008 financial crisis. The unintended consequences of these changes are contributing to the decline in small business lending.

The current U.S. bank capital and liquidity regime originated in international agreements known as the Basel accords. These accords require banks to maintain various types of capital (mostly shareholders' equity) relative to their risk-weighted assets. Commercial loans are generally assigned much higher risk weights than assets such as home mortgages, meaning banks have to maintain more capital in order to make a commercial loan than a home mortgage. This makes it more expensive for banks to make commercial loans, and thus they make fewer of them.

In addition to the risk-based capital requirements, the Liquidity Coverage Ratio (LCR) requires banks to hold enough high-quality liquid assets (HQLA) to withstand a 30-day stress period. HQLA include cash, some liquid securities such as government bonds, and short-term investments that can be turned quickly into cash, but not traditional bank loans. The requirement to park assets in HQLA keeps those assets from being loaned out to consumers and businesses.

Moreover, as currently constructed, the Basel capital standards are procyclical. This means that they exacerbate business cycles by making downturns more severe. In a recession, higher expected credit losses reduce a bank's capital relative to its assets. In order to strengthen its capital ratios, a bank is incentivized to make fewer loans in order to reduce its risk-weighted assets. The risk-based capital standards motivate banks to cut back lending during recessions, just when the economy needs more bank lending, not less. In an attempt to offset this admitted procyclicality, the more recent iterations of the Basel process have added a capital conservation buffer that is designed to be drawn down during a recession. However, current regulatory practice makes it unlikely that the buffer will be used for its intended purpose in a recession.

In addition, "stress tests" are used to predict bank results under various pessimistic scenarios to make sure that the banks will still meet capital requirements. Large banks undergo stress tests known as the Comprehensive Capital Analysis and Review (CCAR) and the Dodd-Frank Act Stress Test (DFAST). Unfortunately, in order to pass these tests, banks are expected to show that even in the pessimistic scenarios they won't dip into the capital conservation buffer that was originally designed to be drawn down in recessions.

Small business loans are particularly disadvantaged in the stress tests. By one estimate (Covas, 2017), the effective risk weight used in CCAR for small business loans is between three and five times the Basel III risk weight. On the other hand, the European Union has been declared "materially noncompliant" in its implementation of Basel III because it has decreed a lower risk weight for loans to small and medium enterprises (SMEs) than the Basel III requirement.



The cumulative impact of stress tests combined with Basel III is a *de facto* level of capital requirements that is much higher than needed to protect the solvency of the banking system. This restricts the ability of banks to lend during a recession, which will increase unemployment in the next recession.

These findings lead to the following seven recommendations:

1. **Establish better countercyclical capital standards.** The Basel III/IV standards have not solved the procyclical nature of risk-based capital standards. Serious consideration should be given to capital standards that automatically permit or even encourage banks to dip into the capital conservation buffer in times of high unemployment. Stress tests should accommodate this use of the buffer in a recession.
2. **Lower risk weights for SMEs.** The European Union ignored the Basel accords and decided to impose a lower risk weight for loans to SMEs. The Basel Committee's latest recommendations on bank capital requirements now also have a lower risk weight for SMEs. The United States should implement lower effective risk weights for SMEs without delay while it considers the rest of the Basel Committee's recommendations.
3. **Re-examine CCAR and DFAST models.** One of the consequences of the stress tests is that they impose an effective level of capital requirements higher than required under the Basel accords. Furthermore, the CCAR stress tests have a disproportionate impact on lending to SMEs. The tests should be more closely examined to determine why this is the case. Furthermore, the tests and standards should be modified to encourage, not discourage, banks to make more commercial loans during a recession.
4. **Rationalize the passing grades on stress tests.** The optimal level of bank capital represents tradeoffs between economic growth, job creation, and perceived solvency of the banking system. The interaction between the Basel III standards and the higher effective standards imposed by the stress tests results in capital standards higher than necessary. Serious consideration should be given to lowering the "passing grade" in the adverse scenario stress tests. In particular, a bank whose predicted minimum capital ratio in the adverse scenario is within the capital conservation buffer should pass.
5. **Seriously consider dropping the liquidity coverage ratio.** The LCR has the effect of quarantining assets that could and should be used for loans to consumers and businesses. Central banks were designed to be the lenders of last resort, and there is nothing wrong with their doing so. Central banks should not shirk their duties as lenders of last resort.
6. **Promote further research and action into reducing regulatory barriers to SME capital formation.** This study addresses only bank capital requirements, but numerous other regulatory barriers to capital formation for small and medium enterprises need to be addressed for the economic health of the nation.
7. **Work towards fundamental reform of the U.S. financial regulatory structure.** The antiquated design of our financial regulatory structure has contributed to the decline in small business lending. Numerous overlapping regulatory agencies exercise their specific mandates to the best of their ability without proper consideration of the big picture. This regulatory structure has remained essentially unchanged for over 80 years, despite massive changes in the economy and technology. Serious efforts need to be made to modernize our financial regulatory structure.

Congress recognized the importance of these concerns in the recent passage of the Economic Growth, Regulatory Relief, and Consumer Protection Act.¹ These concerns need to be addressed in the regulatory implementation of the new law.

¹ S. 2155, P.L. 115-174



LIST OF ACRONYMS

BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCAR	Comprehensive Capital Analysis and Review
CET1	Common Equity Tier 1
CRA	Community Reinvestment Act
CRR	Capital Requirements Regulation
DFAST	Dodd-Frank Act Stress Test
eSLR	Enhanced Supplemental Leverage Ratio
EU	European Union
FDIC	Federal Deposit Insurance Corporation
FSB	Financial Stability Board
GSIB	Global Systemically Important Bank
HQLA	High Quality Liquid Assets
LCR	Liquidity Coverage Ratio
NSFR	Net Stable Funding Ratio
RWA	Risk Weighted Assets
SBA	Small Business Administration
SF	Supporting Factor
SMEs	Small and Medium Enterprises
TLAC	Total Loss-Absorbing Capacity
TLE	Total Leverage Exposure



INTRODUCTION: THE DECLINE IN BANK LENDING TO SMALL BUSINESSES

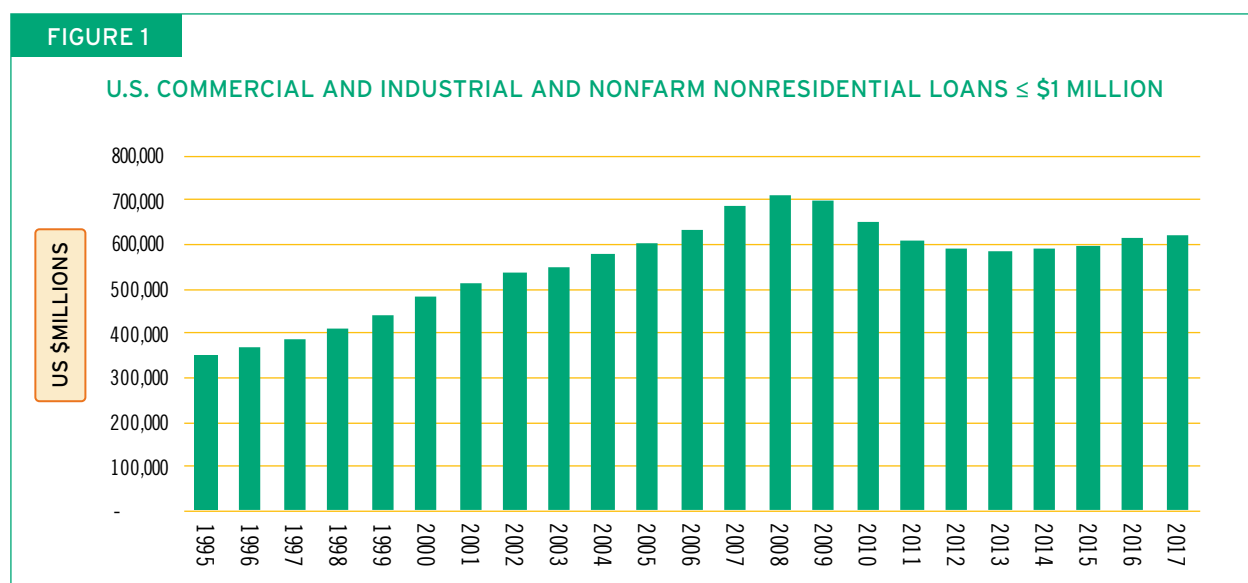
Banks perform many extremely important functions in the U.S. economy. They provide safe and liquid investment opportunities for savers, and then allocate those funds to creditworthy borrowers. Bank lending helps consumers invest in houses, automobiles, and education. It helps consumers smooth the gaps between when they earn money and when they spend it. Bank lending is an important source of capital for businesses. Bank lending provides funds that businesses can use to expand operations, purchase new equipment, and hire more workers. A sound banking system is essential to the growth and stability of the economy.

Stable access to affordable bank credit is especially important to the small businesses that are critical to the growth of the U.S. economy. Almost half (47.8%) of U.S. employees are employed by businesses of less than 500 employees (U.S. Small Business Administration). These smaller enterprises are the engines of U.S. economic growth. Small businesses typically create more jobs and grow faster than larger ones. From 2010 to 2016, small businesses were responsible for 63% of net jobs created. Yet small businesses are also more vulnerable. During the Great Recession of 2008-2009, small businesses accounted for 61% of the net jobs lost.

Bank lending is especially important for the formation of new businesses. Conroy, Low, and Weiler (2017) show that small business lending increases the formation of new businesses that employ people.

LENDING TO SMALL BUSINESSES HAS DECLINED

However, in recent years, bank lending to small businesses has not kept up with the needs of the economy. Figure 1 demonstrates the problem by displaying the total dollar amount of small business loans—defined as commercial and industrial loans and nonfarm nonresidential (e.g., commercial real estate) loans of less than \$1 million—by year. While total small business loans have increased from the low point of the recession, they have still not regained their pre-recession peak. Indeed, they are down 13% from 2008.

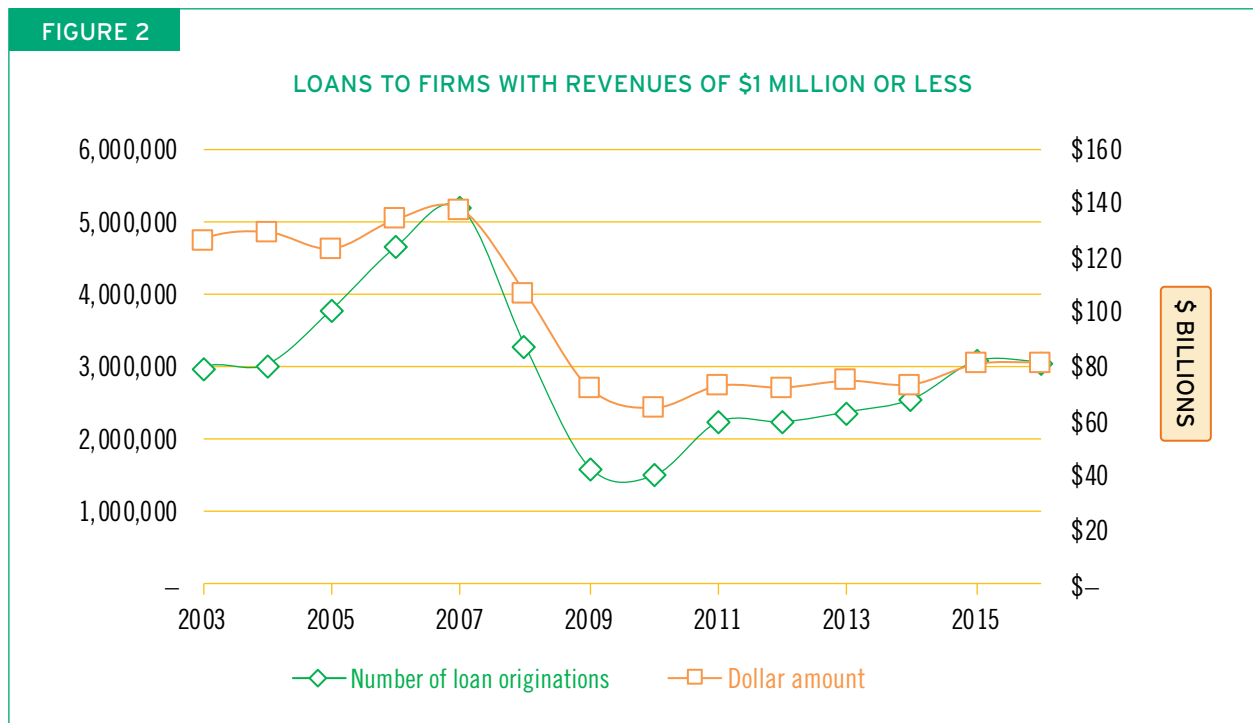


SOURCE: FEDERAL DEPOSIT INSURANCE CORPORATION QUARTERLY PROFILES SPREADSHEET, AVAILABLE AT [HTTPS://WWW.FDIC.GOV/BANK/ANALYTICAL/QBP/TIMESERIES/SMALL-BUSINESS-FARM-LOANS.XLS](https://www.fdic.gov/bank/analytical/qbp/timeseries/small-business-farm-loans.xls)



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Community Reinvestment Act (CRA) data draw a similar picture. Figure 2 shows the number of loan originations to businesses with less than \$1 million in revenue. Both the total number of originations and the total amount loaned has dropped by 41% from 2007 through 2016, the most recent year for which data are available.



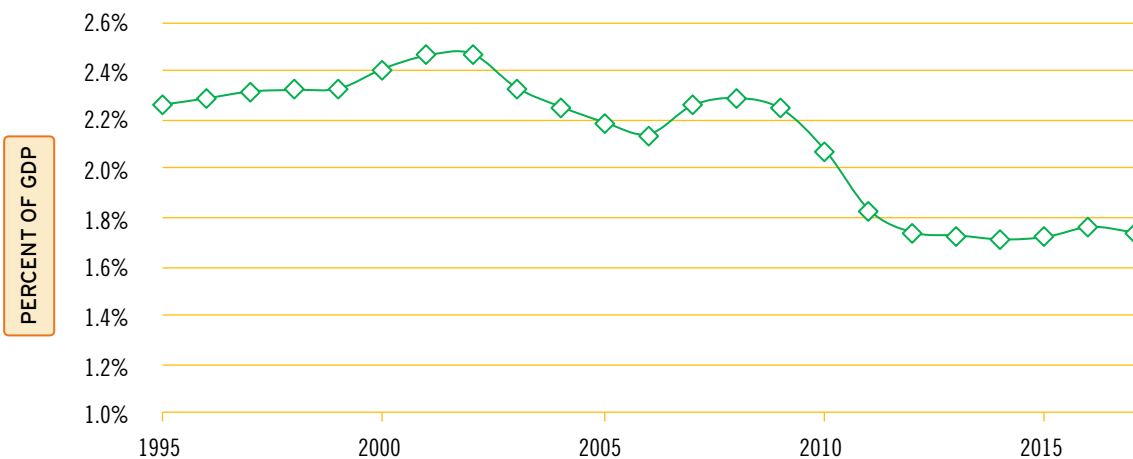
SOURCE: COMMUNITY REINVESTMENT ACT DATA, REPORT 1, AVAILABLE AT [HTTPS://WWW.FFIEC.GOV/CRAADWEB/NATIONAL.ASPX](https://www.ffiec.gov/craadweb/national.aspx)

To put this into perspective, it is helpful to examine this lending relative to the overall size of the economy as measured by gross domestic product (GDP). U.S. commercial and industrial loans less than \$1 million fell from 2.5% of GDP in 2001 to 1.7% in 2017. Figure 3 demonstrates how total bank lending to small enterprises as a fraction of the economy has been steadily shrinking and has not recovered from the recession.



FIGURE 3

U.S. COMMERCIAL AND INDUSTRIAL LOANS \leq \$1 MILLION (AS % OF GDP)



SOURCE: FEDERAL DEPOSIT INSURANCE CORPORATION QUARTERLY PROFILES SPREADSHEET, COMBINED WITH GDP DATA DOWNLOADED FROM ST. LOUIS FED, AVAILABLE AT [HTTPS://FRED.STLOUISFED.ORG/SERIES/GDPA](https://fred.stlouisfed.org/series/GDPA)

SMALL BUSINESSES REPORT TROUBLE OBTAINING CREDIT

This decline in small business lending is not a result of a lack of demand for loans. Small businesses themselves report trouble obtaining credit. In a Federal Reserve System (2017) survey of 10,303 employer small businesses, 47% of those who applied for credit did not receive all of the funding they sought. The problem is even worse for smaller firms with less than \$1 million in revenue. Of those firms that applied for credit, 67% received less than they sought. That is just for the firms that applied for credit. Of the firms that did not apply for credit, 25% stated that they did not apply because they were discouraged or the cost of credit was too high.

Indeed, obtaining credit as a business is so difficult that the majority (87%) of small business employers rely on their owner's credit score in order to obtain credit.

Startup firms, defined as firms less than five years old, are responsible for almost all net new job creation (Federal Reserve Bank of New York, 2017). However, they too suffer from inadequate access to credit. While many startups are risky, many are not. Over half (53%) of the low-credit-risk firms in the Federal Reserve's study reported that they experienced a financing shortfall.



POTENTIAL CAUSES FOR THE DECLINE

At first it might appear that the supply of funds available for lending in the banking system should not be a problem. Banks are holding more than \$2 trillion of reserves in excess of their required reserves at the Federal Reserve.² The Federal Reserve currently pays 1.95% interest on excess reserves.³ With the prime rate currently at 5%, and many commercial loans at much higher rates, it might seem that banks have adequate funds to lend to businesses and good financial incentives to lend them. Unfortunately, banks cannot possibly lend out all of these “excess” reserves because doing so could cause them to violate various bank capital standards including the Liquidity Coverage Ratio requirements.

Reserve requirements are but one of the many regulatory restrictions on bank lending. Reserves should not be confused with bank capital used to meet various bank capital standards. Reserves deposited with the Federal Reserve are assets of a bank and appear on the left side (the asset side) of a bank’s balance sheet. Bank capital for purposes of meeting bank capital requirements generally consists of shareholders’ equity and certain other items, such as preferred stock and some subordinated debt securities. Bank capital items appear on the right side (the liability side) of the balance sheet as equity and liability entries.

BANK CAPITAL REQUIREMENTS AND THE BASEL ACCORDS

In general, banks operate on borrowed money, known as leverage. Indeed, financial intermediaries including banks generally employ much higher leverage than non-financial businesses. In truth, such leverage is the reason they exist: to gather funds from savers (e.g., depositors) and channel them efficiently to borrowers. By standing in the middle, banks reduce search and information processing costs for both savers and borrowers. Furthermore, banks invest in many different types of loans and other assets, and this diversification reduces the risk of their holdings. Many savers do not have the scale needed to diversify their lending activities as efficiently. Banks also transform the relatively illiquid claims of bank loans into the relatively liquid claims of bank deposits and other bank liabilities. This production of safe liquid assets is one of the many valuable services that banks provide to society.

Higher leverage increases returns when returns are positive. This gives banks an incentive to have high leverage. However, higher leverage brings on higher risk and can amplify losses when they occur. An overleveraged bank is excessively risky, imposing risk not only on its creditors, but also on the entire financial system. If a bank has too little shareholder capital relative to its assets, a relatively small loss can wipe out its capital and cause the bank to fail.

For this reason, regulators impose a series of capital requirements on banks designed to limit their leverage and induce them to operate in a safe and sound manner.

Nevertheless, capital is expensive and there are real costs associated with capital levels that are too high. Banks have three general methods for raising their capital ratios—the amount of capital they have relative to

² U.S. depository institutions (including commercial banks, savings banks, and credit unions) are required to keep a certain fraction of their deposits as reserves. Reserves can be held either as vault cash or deposits either directly or indirectly with the Federal Reserve. Current reserve requirements can be seen at <https://www.federalreserve.gov/monetarypolicy/reservereq.htm>.

³ As of August 1, 2018. See <https://www.federalreserve.gov/newsevents/pressreleases/monetary20180801a1.htm>.



their assets. First, they can raise additional capital by selling stock or other securities that count as capital.⁴ However, such equity capital is expensive, as investors expect to be compensated for the risks they are taking on. At times, the capital markets may be unwilling to provide additional capital on acceptable—or even any—terms.

Second, banks can raise their capital by retaining more of their earnings through paying smaller dividends to their shareholders. They can reinvest their profits and thus build up shareholders' equity. This generally has a negative impact on share prices, and banks naturally resist the pressure to reduce payouts.

Third, banks can raise their capital relative to their assets by shrinking their assets. They can do this by either selling assets such as loans outright and paying down debt, or by making fewer new loans. With fewer loans to fund, they can borrow less money from depositors and the capital markets, and this makes their existing capital larger relative to their assets. Thus, higher bank capital requirements can create financial incentives to make fewer loans.

Bank capital requirements are set as a function of the assessed riskiness of their assets. Instead of actually shrinking their total assets to meet capital requirements, banks can reduce the assessed riskiness of their assets by purchasing safer assets instead of making loans. For example, shifting away from small business loans, which are assessed a high penalty for risk, into safer investments such as government securities will meet capital requirements.

Regulators thus face a tradeoff. Bank capital requirements that are too low increase the level of risk in the banking system and the economy. Bank capital requirements that are too high suppress bank lending and economic growth.

THE BASEL COMMITTEE ON BANKING SUPERVISION

Prior to existence of the Basel accords, each country imposed its own capital requirements and there was no standardization. Banks domiciled in different countries faced different capital requirements, leading to concerns about unfair competition. The Basel Committee on Banking Supervision (BCBS) was formed in 1974 to set global standards for bank regulation.⁵ BCBS, part of the Bank for International Settlements, acts as an international standard-setter. Finance ministers and bank regulators participate in the dialogues and negotiations that lead to the accords. U.S. agencies including the Federal Reserve and Department of the Treasury are active participants in the Basel discussions.

Unlike treaties, the Basel accords have no explicit legal force and do not require congressional ratification. Nevertheless, they are generally implemented as binding requirements by regulators in most developed nations, although implementation differs from country to country. The appendix contains more details on the evolution of the Basel accords.

⁴ In addition to common stock, various other securities are sometimes counted as bank “capital” depending on which version of the Basel accords is being followed and the decisions of regulators. Examples of other securities that may or may not count as a particular form of capital include preferred stock, long-term subordinated debt, and hybrid debt instruments such as contingent convertibles.

⁵ See <https://www.bis.org/bcbs/history.htm>.



The current standards, known as Basel III, work as follows:

RISK WEIGHTED ASSETS (RWA)

The amount of capital that a bank is determined to hold is a function of the quantity of the bank's assets and their perceived riskiness. Smaller banks use a "standardized approach" that assigns a risk weight to each asset class. Rather than calculate credit losses directly, the standardized model applies various weights to classes of assets. Non-real-estate commercial loans to smaller businesses generally have a 100% risk weight. A loan with excellent collateral requires the same amount of capital as a risky unsecured loan. The standardized approach also ignores the diversification inherent in making many smaller loans to different commercial enterprises. Loans to other banks, however, have only a 20% risk weight. Residential mortgages have a 50% risk weight. Thus, a bank has to hold twice as much capital for a commercial loan that is backed with 100% collateral than for a residential mortgage with similar collateral backing.

Larger banks use the so-called "advanced approach." In the advanced approach, a bank uses its own internal risk models to estimate the probabilities of default and expected credit losses. The United States goes beyond what is required under Basel III. Under the so-called Collins Amendment to the Dodd-Frank Act, larger banks are effectively required to calculate their RWA under both the standardized and advanced approaches and use the higher of the two.⁶ Indeed, U.S. regulators have imposed substantially more stringent standards in other areas as well, including the surcharge for Globally Systemic Important Banks (GSIBs), Liquidity Coverage Ratio (LCR), Total Loss-Absorbing Capacity (TLAC), the enhanced Supplemental Leverage Ratio (eSLR), and the definition of operational risk.

COMMON EQUITY TIER 1

The core of the Basel III capital requirements is a reliance on common shareholders' equity. This includes not just the original paid-in capital but also retained earnings. This represents the "skin in the game" that common shareholders have at risk and also the first defense against losses to depositors and other creditors of the bank. This is known as Common Equity Tier 1 (CET1) and is required to be at least 4.5% of the risk-weighted assets.

ADDITIONAL TIER 1 CAPITAL

The Basel regulations permit a few other types of capital instruments to be included as additional Tier 1 Capital. These can include certain types of perpetual preferred stock and some contingent convertible debt that contain a mandatory conversion to equity feature in the event of financial distress.

TIER 2 CAPITAL

Some types of debt that are subordinated to depositors and senior creditors are counted as Tier 2 Capital. One example is long-term subordinated debt. In the event of a bank liquidation, the subordinated debtholders would absorb losses before the depositors. Thus, the existence of such Tier 2 Capital protects depositors and makes it less likely that depositors (or, more likely, deposit guarantee entities such as the Federal Deposit Insurance Corporation) will experience losses. However, instruments such as subordinated debt are still debt and do not reduce the risk of failure. Basel III requires total capital of Tier 1 and Tier 2 of 8% of RWA.

⁶ Dodd-Frank §171. 12 U.S.C. 5371. See Kini et al. (2013) and Federal Financial Analytics (2017).



CAPITAL CONSERVATION BUFFER

In addition to the total capital requirement of 8% of RWA, banks are also expected to hold an additional 2.5% of RWA as a “capital conservation buffer” consisting of CET1. This brings the total capital requirement up to 10.5% of RWA. The notion is that banks should build up a capital buffer in good times that can be allowed to go down in bad times. In theory, the capital buffer should decrease the procyclical nature of bank capital requirements. In a stress situation, recognizing losses will cause the CET1 to drop. By allowing banks to dip into the buffer, the banks will be able to continue normal lending while still having adequate CET1 (more than 4.5%) so that their solvency is not in question. Banks will have less incentive to cover up losses because the immediate regulatory implications will be less severe. They will presumably not be forced to take actions to increase their capital ratios by making fewer loans.

While the capital buffer may appear theoretically attractive, it will not work as well in practice. Should a bank's CET1 capital fall in the buffer range of 4.5% to 7.0%, the bank will be expected to reduce capital distributions (dividends or stock buybacks) to shareholders in order to increase its capital.

However, reducing dividends generally results in a fall in the share price of the bank.⁷ Even worse, the fall in the share price from a decreased dividend increases the *de facto* real leverage of the bank based on the market value of its equity. This lower price makes it harder for the bank to raise equity capital. Thus, forcing a decrease in payouts can actually increase, not decrease, the riskiness of the bank. For this reason, bankers will be reluctant to reduce distributions. It is more likely that as a bank gets closer to its capital conservation buffer, it will take actions to reduce RWA, and this means making fewer commercial loans.

COUNTERCYCLICAL CAPITAL BUFFER

In addition to the capital conservation buffer, the larger banks that are required to use the “advanced approach” could be required to hold an additional countercyclical capital buffer. This is another attempt to counteract the procyclical nature of the risk-based capital requirements. The size of this buffer will range between 0% and 2.5% of RWA. At its peak of 2.5%, this brings the total requirement to 13% of RWA for the affected banks. The idea is that when times are good, regulators should require banks to build up even more capital. In times of stress, wise regulators could reduce the buffer as low as 0%, leaving the total capital requirement at 10.5% (including the capital conservation buffer) to lower the incentives for banks to reduce lending when the economy is in a downturn.

One of the major problems with the countercyclical capital buffer is that the perpetual threat of a 2.5% increase in capital requirements will cause affected banks to treat the 2.5% as a *de facto* permanent capital requirement. It takes banks a significant amount of time to increase capital in an optimal manner. Increasing capital ratios by retaining earnings and suppressing payouts is a slow process. Selling equity requires a good sense of market timing, and the capital markets are not always eager to buy more bank shares. The lengthy adjustment period is one of the reasons for the long phase-in period for Basel III. Although U.S. regulators state that they intend to give a 12-month notice of an increase, even 12 months may not be enough time for an orderly adjustment.⁸ Furthermore, future regulators are not necessarily bound by the intentions of past regulators, so there is always the risk that future regulators may arbitrarily impose an instant increase. For these reasons, many banks will view the countercyclical capital buffer as a permanent requirement.

⁷ It is well known that stock prices generally fall on the announcement of dividend cuts. Bessler and Nohel (1996) found an 11.46% drop over a two-week period in their study of dividend cuts for bank stocks.

⁸ This intention is noted in the promulgation of the rule implementing Basel III in the US 78 Fed. Reg. 62038 (October 11, 2013).



Another problem with the countercyclical buffer is that it depends on not only the good judgment, but also the timely cooperation, of financial regulators around the world. Regulators in one country will be reluctant to increase the capital requirements in their jurisdiction unless other jurisdictions do so at the same time, as this would put their banks at a competitive disadvantage to banks in other jurisdictions. Indeed, one of the driving forces behind the BCBS process is a global desire for harmonized bank capital requirements. In order for the countercyclical capital buffer to be raised in practice, there will need to be some form of a global understanding among key regulators. Such global agreements are likely to take considerable time and could well result in action so late as to be procyclical, not countercyclical.

Despite its name, a countercyclical capital requirement can in fact be procyclical in its implementation. BCBS intended that the countercyclical capital buffer should be increased at times when credit growth is excessive relative to the economy. Repullo and Saurino (2011) demonstrate that using rules to implement a countercyclical capital buffer based on the credit-to-GDP ratio is actually procyclical, because credit growth tends to lag the business cycle.

LIQUIDITY COVERAGE RATIO

Banks not only channel funds from savers to borrowers, they also transform illiquid loans into liquid assets for their depositors. This beneficial liquidity transformation, however, adds risk to a bank. If too many of a bank's creditors demand payment at once, it may not be able to pay. Even if the bank's assets are worth far more than its liabilities, it may be unable to meet customer demands because the assets are tied up in illiquid loans. In the event of a bank run, the bank may engage in a fire sale and liquidate assets at whatever price it can get. This may depress asset prices and cause even wider financial distress.

One of the major functions of a central bank is to provide liquidity in these situations as the lender of last resort. As Walter Bagehot (1877, page 173) famously prescribed:

Theory suggests, and experience proves, that in a panic the holders of the ultimate Bank reserve (whether one bank or many) should lend to all that bring good securities quickly, freely, and readily. By that policy they allay a panic; by every other policy they intensify it.

The financial crisis made it clear that many banks were overly reliant on short-term funding that could and would run out the door in a financial crisis. In order to reduce such reliance on volatile short-term funding (and thus the likelihood that central banks would have to do what they were designed to do and lend money to solvent institutions in times of financial stress), Basel III instituted the Liquidity Coverage Ratio.

The LCR is intended to make sure that banks have a high degree of liquidity to meet all possible demands for funds. Banks are required to hold enough high-quality liquid assets (HQLA) to cover projected net cash outflows over a 30-day stress period. Note that the selection of 30 days was not backed by a careful analysis of the costs and benefits of different metrics. Indeed, even the estimation of what the cash outflows would be in a 30-day stress scenario is fraught with guesswork and arbitrary assumptions.

HQLA are generally cash, reserves at the central bank, liquid government securities, and a few liquid corporate securities with haircuts. Banks are required to calculate projected net cash outflows using various formulas based on the types of assets and liabilities they hold. For example, insured retail deposits are given a lower outflow weight than deposits above the deposit insurance limit. The United States has adopted a



form of the LCR that, in the words of the Federal Reserve, is “more stringent in certain areas” than that recommended by Basel III.⁹

The intent and the impact of the LCR is that banks must hold more liquid assets than they would otherwise choose to hold. Instead of making loans to consumers and businesses, banks are forced to park otherwise loanable funds in HQLA.

As HQLA include many government bonds, the LCR is also a way to force banks to finance the massive government deficits of recent years. Furthermore, the yields on HQLA are generally lower than those of traditional bank assets such as loans, and in some cases they are even negative. This makes holding HQLA costly to banks. On the plus side, many HQLA, such as cash and some government bonds, have zero risk weights, so they do not increase RWA.

To compound the problem, the demand for HQLA can distort financial markets as banks scramble to borrow funds in order to buy HQLA to meet the LCR requirements. Hartlage (2012) documents how an LCR-like regulation in Korea created a snowball effect in which banks increased their leverage to meet liquidity requirements. The distortions were so bad that Korea scaled back the regulations.

LEVERAGE RATIO

In addition to the other capital requirements, Basel III has a simpler leverage requirement: Tier 1 Capital has to be at least 3% of total “exposures”—exposures being virtually all assets with corrections for off-balance-sheet items such as derivatives. This is an additional safeguard designed to make sure banks are properly capitalized in case some banks manage to evade the other capital requirements. It is simple to calculate and hard to evade. As discussed below, it is also one of the most binding capital requirements for many large banks.

NET STABLE FUNDING RATIO

Basel III addressed more than just the riskiness of assets. It also addressed the riskiness of the funding of the institution. Not only did BCBS want to make sure that banks had enough liquidity to cover outflows in a stress situation, it also wanted to dissuade banks from relying on too much short-term funding that would run at the first sign of trouble. Such funding includes borrowing in the short-term “repo” market, commercial paper, large uninsured deposits, and large corporate deposits.

Banks are required to maintain a Net Stable Funding Ratio greater than 100%. This means that stable funding (capital, long-term debt, and sticky core deposits) must be greater than the required amount. The required stable funding is calculated similarly to the risk-weighted assets approach, in that weights are assigned to the various assets on the balance sheet. Assets that can be quickly turned into cash get a low weight, while longer-term assets get higher weights. Again, the illiquid nature of loans to businesses put them into a higher weight category, and thus business loans lead to higher required stable funding than more-liquid assets.

⁹ See the Federal Reserve’s press release from September 3, 2014: <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20140903a.htm>.



EUROPEAN IMPLEMENTATION

The BCBS recommendations themselves do not have the force of law. Each jurisdiction adapts the BCBS recommendations in light of its own circumstances, and implements them through its own legal and regulatory processes. Jurisdictions can and do alter them. Indeed, BCBS (2014) declared that the European Union (EU) was “materially noncompliant” in its implementation of Basel III due to its more lenient treatment of loans to small and medium enterprises (SMEs).

In the EU, major parts of Basel III were implemented in its Capital Requirements Regulation (CRR).¹⁰ Unlike the U.S. implementation, the EU’s CRR contains an explicit reduction in the RWA for SMEs.¹¹ This special treatment for SMEs was one of the factors that led BCBS (2014) to declare the EU “materially noncompliant” in its implementation of Basel III. Note that while U.S. regulators have gone above and beyond Basel III in many areas that have impacted SME lending, the EU has intentionally chosen a less stringent approach to lending to SMEs.

Although evidence is mixed, this special treatment of SMEs in the EU appears to have had benefits. The Banco de España (2014) found that lending to SMEs relative to larger enterprises in Spain increased by 5.8% as a result of the change. The European Banking Authority (2016) also studied the impact and was unable to identify an increase in bank lending to SMEs relative to large corporations due to the lower risk weights, but cautioned that it may take longer to observe an impact and that more study was needed. Izquierda et al. (2017) studied the impact of this reduction in capital requirements for SMEs in Spain and found that it increased GDP growth by 0.8%.

STRESS TESTS: CCAR AND DFAST

In addition to the Basel requirements, there are additional U.S. requirements that further impact lending. Following the financial crisis of 2008, U.S. regulators began to perform stress tests. The laudable goal of these tests is to examine whether banks have sufficient capital to survive various stress scenarios. The regulators decide on adverse scenarios in which the economy falters along with the financial markets. They then, in conjunction with the banks, forecast what the bank balance sheets would look like under these adverse scenarios. If a bank’s predicted capital ratios in the most adverse scenario are below any one of the many capital requirements (including the capital conservation buffer), the bank fails the test. The bank is then expected to take necessary actions to increase its capital so that it does not fail the stress tests. These actions include making fewer loans in categories with high risk weights, selling stock, and cutting dividends.

The stress tests were developed in the United States subsequent to the financial crisis and were independent of the Basel process. However, combining these tests with the Basel standards results in a form of double counting. The goal of the capital standards is that banks have enough capital to withstand a serious shock without collapsing or being so stressed that they stop lending. Thus, the capital requirements are set rather high. The stress tests also have the same goal. However, in practice, passing the stress test means that the

¹⁰ EU Law 575/2013. Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:321:0006:0342:EN:PDF>.

¹¹ Section 501 of the CRR reduces the RWA for SMEs through a “supporting factor” (SF) of 0.7619, the ratio of the old 8.0% total capital requirement of Basel II to the new 10.5% requirement of Basel III. The apparent logic is that EU legislators wisely saw no need to increase capital requirements for loans to SMEs in implementing Basel III. This SF is a multiplier for the risk weight for SME loans, leading to a 24% reduction in the capital required for loans to SMEs. For the purposes of the CRR, the definition of SME is a firm with net turnover less than €50 million.



minimum capital ratios are never breached even in the most adverse scenario. Note that this includes the capital conservation buffer, making effectively a permanent requirement and not one allowed to be drawn down in a recession

U.S. banks with more than \$50 billion in assets undergo the Comprehensive Capital Analysis and Review (CCAR) stress tests.¹² The Federal Reserve specifies various scenarios and requires banks to analyze the impact of the scenarios on their operations. The Federal Reserve then analyzes the results using its own risk models to estimate the various capital ratios in those scenarios. The severely adverse scenario for 2018 includes a recession in which unemployment rises to 10% along with a steepening yield curve.

In addition, large banks with more than \$250 billion in assets undergo another stress test required by the Dodd-Frank Act, the Dodd-Frank Act Stress Test (DFAST). One of the major differences between the DFAST and CCAR stress tests is that under the DFAST test the bank's dividend policy is held constant and under CCAR the bank uses its own plan for the payment of dividends and other capital actions. The recently enacted Economic Growth, Regulatory Relief, and Consumer Protection Act (S. 2155) generally raised the threshold for DFAST to \$250 billion, and permits tailoring beyond this asset threshold, but did not directly address the threshold for CCAR.

Table 1 displays the results of the 2017 CCAR. Note that, even in the severely adverse scenario, all 34 participating firms still have CET1 above 7.0%, the 4.5% Basel III minimum plus the 2.5% conservation buffer.

TABLE 1. PROJECTED MINIMUM REGULATORY CAPITAL RATIOS UNDER THE SEVERELY ADVERSE SCENARIO, 2017:Q1 TO 2019:Q1 (34 PARTICIPATING FIRMS)

REGULATORY RATIO	ACTUAL 2016:Q4	PROJECTED MINIMUM STRESSED RATIOS	
		ORIGINAL PLANNED CAPITAL ACTIONS	ADJUSTED PLANNED CAPITAL ACTIONS
COMMON EQUITY TIER 1 CAPITAL RATIO	12.5%	7.2%	7.2%
TIER 1 CAPITAL RATIO	13.9%	8.7%	8.7%
TOTAL CAPITAL RATIO	16.5%	11.3%	11.3%
TIER 1 LEVERAGE RATIO	9.2%	5.7%	5.7%
SUPPLEMENTARY LEVERAGE RATIO	not applicable	4.4%	4.4%

NOTE: These projections represent hypothetical estimates that involve an economic outcome that is more adverse than expected. These estimates are not forecasts of capital ratios. The tables include the minimum ratios assuming the capital actions originally submitted in April 2017 by the bank holding companies in their annual capital plans and the minimum ratios incorporating any adjustments to capital distributions made by a bank holding company after reviewing the Federal Reserve's stress test. The minimum capital ratios, other than for the supplementary leverage ratio, are for the period 2017:Q1 to 2019:Q1. The minimum supplementary leverage ratio is for the period 2018:Q1 to 2019:Q1. The minimum capital ratios do not necessarily occur in the same quarter. Supplementary leverage ratio projections only include estimates for firms subject to advanced approaches.

SOURCE: FEDERAL RESERVE, CCAR 2017 ASSESSMENT AND RESULTS, [HTTPS://WWW.FEDERALRESERVE.GOV/PUBLICATIONS/FILES/2017-CCAR-ASSESSMENT-FRAMEWORK-RESULTS-20170628.PDF](https://www.federalreserve.gov/publications/files/2017-CCAR-ASSESSMENT-FRAMEWORK-RESULTS-20170628.PDF)

¹² The recently passed S. 2155 did not directly address the \$50 billion threshold for CCAR. However, the Federal Reserve could and should consider raising the limit to be consistent with the spirit of S. 2155, which raised the threshold for the Dodd-Frank Act Stress Test.



Note that these institutions are not expected to dip into the conservation buffer in even the severely adverse scenario. It appears that, in order to pass the stress test, an institution must show that it will never dip into the conservation buffer, even in the most pessimistic scenario. This contradicts the original purpose of the buffer by transforming it into a permanent capital requirement not to be breached in a recession.

The conservation buffer was designed to offset the procyclical nature of the capital standards. In tough times, capital goes down due to loan losses and RWA goes up due to higher probabilities of default and expected loan losses. With a permanent fixed capital requirement, this means that a bank is motivated to reduce lending just when the economy needs it the most. The idea behind the capital buffer is that bank capital would be allowed to go down in a recession, but not to dangerously low levels. Unfortunately, the impact of the U.S. stress tests has been to lessen this important safety valve.

If the stress tests have been performed properly, this indicates that the capital standards are too high. This brings up the question of what the passing score should be on the stress tests. The optimal “low point” for bank capital in the severe stress test is the lowest capital level at which (1) a bank’s solvency is not questioned and (2) the bank’s lending is not restrained because of required actions to raise capital. Presumably this would be somewhere inside the conservation buffer.

With all of these different capital requirements, which ones are the most binding? The Clearing House (2017) examined the CCAR results and found that in 2016, the results of the CCAR tests were most binding for 59% of the banks.¹³ The Basel III risk-based capital requirements were binding for 33% of the CCAR banks, and other Basel III requirements for the remaining 8%. It is thus clear that the stress tests are the key binding requirements. Unfortunately, the current implementation of these tests creates significant disincentives to business lending.

IMPACT OF CCAR ON RISK WEIGHTS FOR SMALL BUSINESS LOANS

Given the binding nature of the stress test process, the next step is to examine how the CCAR tests in practice affect the ability of banks to make loans to small businesses. Although the actual models used by the Federal Reserve in the CCAR process are secret, it is possible to reverse engineer the results of the stress tests to approximate the effective risk weights that are implicit in the stress tests. Covas (2017) combined the capital levels that resulted from the stress tests with known data about the CCAR banks’ portfolios to determine the effective risk weights for various assets classes using a nonlinear regression. The effective risk weights implied by the CCAR results were generally much higher than the banks’ own implied risk weights from their DFAST submissions. In particular, the value for commercial and industrial loans was 20% higher, and the value for small business loans was 140% higher. The results are in Table 2.

¹³ Capital requirements in the CCAR test were the most binding for 38% of the banks and the leverage ratio for 21%.



TABLE 2. TYPE OF CCAR CAPITAL REQUIREMENTS RELATIVE TO BANKS' OWN DFAST ESTIMATE

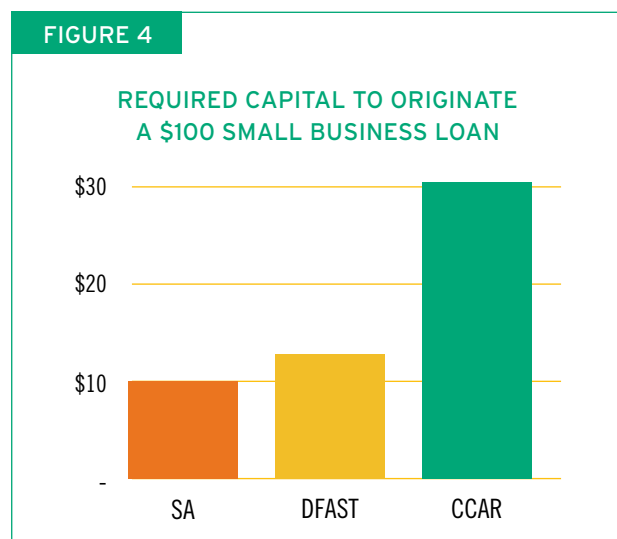
TYPE OF LOAN	CCAR CAPITAL REQUIREMENTS RELATIVE TO BANKS' OWN DFAST ESTIMATE
COMMERCIAL AND INDUSTRIAL	+20%
COMMERCIAL REAL ESTATE	-30%
SMALL BUSINESS	+140%
FIRST-LIEN MORTGAGE	+35%
CONSUMER	+5%
OTHER	-30%
TRADING ASSETS	+25%

SOURCE: COVAS (2017)

The results are clear and striking. For most categories of loans (except commercial real estate), the CCAR process resulted in much higher required capital than the banks' own DFAST estimates or what would be required under Basel III.

When comparing the CCAR results with the Basel III requirements, Covas (2017) also finds small business loans generate capital requirements significantly higher than those required by Basel III. In terms of risk weights, the same study found that CCAR led to an effective risk weight for small business loans between 327% and 521% higher than the Basel level. Covas concludes,

"Our results show that stress tests are imposing dramatically higher capital requirements on certain asset classes—most notably, small business loans and residential mortgages—than bank internal models and Basel standardized models."



SOURCE: COVAS (2017)

Note that while the EU has explicitly required a lower risk weight for SME loans than the Basel III requirement, the United States has effectively required a much higher weight.

Figure 4, from Covas (2017), demonstrates the capital that would be required for a global systemically important bank to make a \$100 small business loan. Under the standardized approach (SA), a bank would be required to hold approximately \$10 in capital for the \$100 loan, while under the CCAR the bank would effectively be required to hold approximately \$30, or three times as much capital.



If one assumes a 10% cost of equity to the bank, the cost of the equity capital alone would be about \$1 under the standardized approach (adding about 1% to the bank's cost of funding the loan), while CCAR drives it up to about \$3 (adding 3% to the bank's cost of funding the loan). Thus, the CCAR banks are at a 2% relative disadvantage in funding loans to small businesses. This has undoubtedly contributed to their reluctance to make loans to small businesses.

As the Federal Reserve's models are secret, it is not clear why they produce results that are so skewed against small business loans. It was not lending to small and medium enterprises that made the recent financial crisis so devastating, but the lack of such lending clearly made it worse.

IMPACT OF CCAR ON LENDING

These increases in capital requirements are not just theoretical concerns. They have a real impact on lending. Acharya, Berger, and Roman (2018) examined the impact of stress tests on banks. They compared banks affected by the stress tests with other control banks and found that the stress-tested banks did indeed reduce their lending after controlling for other variables. Using CRA data, they found that the stress-tested banks reduced their supply of credit to small businesses.

OTHER RESEARCH SUPPORTS THE LINK BETWEEN REGULATION AND THE DECLINE IN BANK LENDING

A large number of papers in the banking literature document that a reduction in bank equity capital leads to a reduction in bank lending.¹⁴ This paper will focus on more recent research that specifically looks at the impact of post-crisis reforms on small business lending. For example, Cortés et al. (2017) use confidential Federal Reserve data on loan pricing to show that the banks most affected by the CCAR stress tests reduced the quantity of small business loans and also raised prices on them. They conclude:

Our results suggest that banks more affected by stress tests reduce their willingness to supply loans to small business, and this reduction has been concentrated among relatively riskier small-business borrowers. The result helps explain patterns in aggregate lending to small business, which has not recovered to the levels seen before the 2008 Financial Crisis.

Other researchers reach similar conclusions about the impact of increased bank capital requirements on lending. Chen, Hanson, and Stein (2017) also document the decline in lending by large banks to small businesses. While not blaming any single cause, they point to increased regulatory requirements and in particular bank capital requirements as contributing factors.

The stricter capital standards that apply to the largest banks affect not only the largest banks but also the behavior of banks trying to avoid classification as large banks. Bouwman, Hu, and Johnson (2017) show that banks just below the Dodd-Frank threshold grew their loans more slowly and charged more for the loans.

¹⁴ See Martynova (2015) for a survey of recent work in this area. Basset, Lee, and Spiller (2015) showed that more stringent supervisory standards led to a decrease in bank lending.



Two recent papers, however, appear at first glance to provide alternative views. But closer examination reveals that they do not, because they do not directly examine the impact of the capital requirements and stress tests on loans. Flannery, Hirtle, and Kovner (2017) examine the impact of differences of opinion between the Federal Reserve and the banks they supervise on loss rates in the CCAR stress tests and find that the differences do not affect total loan growth over the next three quarters. They find “little consistent evidence that BHC [bank holding company] loan portfolios grow more slowly when the Federal Reserve projects higher loss rates for those loans.” However, they do not examine how CCAR itself affected loan growth, nor do they explicitly examine small business loans.

Similarly, Barrett and Berrospide (2017) examine the “capital gap” between banks’ own estimates of their minimum capital in the stress test and the Federal Reserve’s estimate later determined under CCAR. They find that this gap does not statistically explain loan growth over the next year. However, this result does not say anything about the overall impact of capital requirements on lending, just that the difference between what the Federal Reserve estimated and what the banks themselves estimated does not show up in the changes in loans over the next year. Indeed, Berrospide and Edge (2016) examine the impact of increased capital requirements directly and find that higher capital requirements led to a decrease in lending.

CONCLUSIONS AND RECOMMENDATIONS

Small businesses are one of the major engines of U.S. economic growth. The relative decline in U.S. lending to small business represents a serious threat to long-term economic growth and development. Regulators and legislators should devote more effort to alleviate capital constraints for smaller enterprises.

In recent years, following the financial crisis, bank capital requirements have been substantially tightened. While bank lending to smaller businesses was not a contributing factor to the crisis, higher bank capital requirements have nevertheless created multiple financial incentives for banks to make fewer loans to smaller enterprises. These disincentives include unreasonably high risk weights for commercial loans along with the Liquidity Coverage Ratio that quarantines otherwise lendable bank assets into so-called high-quality liquid assets.

The reforms of Basel III have not solved the procyclical nature of bank capital requirements. In recessions, the combination of credit losses and higher probabilities of default cause bank capital ratios to drop, leading to pressure to increase the ratios by curtailing lending. It is unlikely that banks will be able to dip into the capital conservation buffers without being forced to increase their capital ratios. This means making fewer commercial loans. Furthermore, global regulators are unlikely to be able to agree on how to implement the countercyclical buffer in a timely manner.

Banks cannot pass the stress tests if the tests project that their capital ratios will fall into the capital conservation buffer range in a severely adverse scenario. This means that the capital conservation buffer is not a buffer, but an iron standard. The optimal capital standard is the minimum level of capital that, in the severely adverse scenario, maintains a safe enough level of capital that the solvency of the bank is not questioned and that the bank feels free to lend without worrying about pressure to increase its capital ratios.

Commercial loans are unfairly penalized with higher risk weights in both the U.S. implementation of Basel III’s standardized weights and in the *de facto* risk weights resulting from the CCAR process.



These findings lead to the following policy recommendations:

Establish better countercyclical capital standards. The Basel III/IV standards have not solved the procyclical nature of risk-based capital standards. Serious consideration should be given to capital standards that automatically permit or even encourage banks to dip into the capital conservation buffer in times of high unemployment. Stress tests should accommodate this use of the buffer in a recession.

Lower risk weights for SMEs. The European Union, in violation of the Basel accords, decided to impose a lower risk weight for loans to small and medium enterprises. The Basel Committee's latest recommendations on bank capital requirements now also have a lower risk weight for SMEs. The United States should implement lower effective risk weights for SMEs without delay while it considers the rest of the Basel Committee's recommendations.

Re-examine CCAR and DFAST models. One of the consequences of the stress tests is that they impose an effective level of capital requirements higher than required under the Basel accords. Furthermore, the CCAR stress tests have a disproportionate impact on lending to SMEs. This should not be the case, due to the lower systemic risk in SME lending. The tests should be more closely examined to determine why this is the case. Furthermore, the tests and standards should be modified to encourage, not discourage, banks to make more commercial loans during a recession. As recently passed legislation has reduced the threshold size at which banks must perform the DFAST tests, adjustments to the CCAR threshold should also be considered.

Rationalize the passing grades on stress tests. The optimal level of bank capital represents tradeoffs between economic growth, job creation, and perceived solvency of the banking system. The interaction between the Basel III standards and the higher effective standards imposed by the stress tests results in capital standards higher than necessary. Serious consideration should be given to lowering the passing grade in the adverse scenario stress tests. In particular, a bank whose predicted minimum capital ratio in the adverse scenario is within the capital conservation buffer should pass.

Seriously consider dropping the liquidity coverage ratio. The LCR has the effect of quarantining assets that could and should be used for loans to consumers and businesses. Central banks were designed to be the lenders of last resort, and there is nothing wrong with their doing so. Central banks should not shirk their duties as lenders of last resort.

Promote further research and action into reducing regulatory barriers to SME capital formation. This study addresses only bank capital requirements, but numerous other regulatory barriers to capital formation for small and medium enterprises need to be addressed for the economic health of the nation.

Work towards fundamental reform of the U.S. financial regulatory structure. The antiquated design of our financial regulatory structure has contributed to the decline in small business lending. Numerous overlapping regulatory agencies exercise their specific mandates to the best of their ability without proper consideration of the big picture. This regulatory structure has remained essentially unchanged for over 80 years, despite massive changes in the economy and technology. There needs to be a widespread discussion on how to improve our financial regulatory structure, followed by implementation. This discussion needs to look not only at the United States, but also at what does and does not work in other jurisdictions. Implementing needed structural reforms may take many years, as there is widespread pessimism about getting major reforms through the current Congress. Even so, developing a consensus is the first step. Reform will never happen if it is never started.



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APPENDIX

A BRIEF HISTORY OF THE BASEL ACCORDS

There have been three major rounds of the Basel accords. So-called Basel I was released in 1988 and focused on credit risk. Banks were required to hold a specific amount of capital relative to their risk-weighted assets (RWA). So called Tier 1 Capital (mostly common shareholders' equity and disclosed reserves) had to be at least 4% of RWA. Other items such as some subordinated debt, undisclosed reserves, and some hybrid instruments counted as Tier 2. Total capital, the sum of Tiers 1 and 2, had to be at least 8% of RWA.

Under Basel I, bank assets were assigned to five categories, with different risk weights assigned to each category (BCBS, 1988). Cash and some government bonds had a zero risk weighting. This means that assets held in cash or government bonds did not add to the measurement of RWA and thus banks did not have to hold any capital at all against those assets, despite the credit and interest rate risk they contained.

Uninsured residential mortgages had a risk weight of 50%, while corporate loans had a risk weight of 100%. Thus, a bank would have to hold \$8 in total capital against a \$100 corporate loan, but only \$4 for a \$100 residential mortgage or zero for a \$100 government bond. The relatively high risk weight given to all corporate loans regardless of their true risk served as a disincentive to banks to make corporate loans.

The arbitrary assignment of risk weights was one of the problems with Basel I. All assets within a particular category were given the same risk weight, regardless of how risky they were or how they were correlated with other assets of the institution.¹⁵ This provided numerous incentives for banks to move away from investing in assets with high risk weights, such as commercial loans.

BASEL II

The Basel process is an ongoing one. The standards continue to evolve over time with repeated clarifications and occasional major updates. The update known as Basel II was published in 2004 (BCBS, 2004) and it consisted of three "pillars." The first pillar of Basel II was a set of minimum capital requirements. Basel II recognized three tiers of capital. Tier 1 was mostly common equity and some disclosed reserves. Tier 2 included some additional reserves and various hybrid instruments as well as long-term subordinated debt.¹⁶ Tier 3 included short-term subordinated debt. Basel II still required total capital including all three tiers to be 8% of RWA.

Basel II provided two methods of calculating RWA. Smaller banks would continue to use a standardized approach, which was a more refined version of the formulas from Basel I. Different risk weights were assigned to different categories of assets. External credit ratings were used to help categorize assets into different risk categories.

¹⁵ The correlation of risky assets is an important consideration in calculating the total risk of a portfolio. A diversified portfolio of very risky assets can have low risk if the assets are not highly correlated with each other.

¹⁶ Subordinated debt is debt whose claim in the event of bankruptcy is junior to the claim of senior debt. Thus, if there is a bankruptcy liquidation, subordinated debtholders are to receive nothing unless the more senior debtholders (and also the depositors) are paid in full. The existence of subordinated debt on bank balance sheets thus makes it less likely that depositors will suffer losses in a bankruptcy.



Larger institutions, however, used an “advanced approach” incorporating their own internal risk models to measure probabilities of default and expected losses under the watchful eyes of bank supervisors. In addition, there was an additional capital requirement related to operational risk that was based on income from various activities.

The second Basel II pillar was enhanced supervision. In short, regulators were to make sure that banks had appropriate risk management processes in place. Regulators were also to examine risks not captured by the capital standards, such as credit concentration and interest rate risk. Finally, regulators were expected to intervene promptly when banks faltered to prevent bank capital levels from getting dangerously low.

The third pillar of Basel II was market discipline, to be achieved through enhanced disclosures. Banks were required to make various qualitative disclosures about the risk management practices as well as quantitative disclosures about their capital position and credit risk.

BASEL III

The financial crisis that began in 2007 indicated additional problems with the global financial system. Many banks did not have sufficient capital to weather the storm. Furthermore, it was clear that some banks were overly dependent on very short-term sources of funding, such as the repo market, and lacked sufficient liquidity to survive if short-term funding dried up.¹⁷

It also became clear that the Basel II requirements were procyclical, meaning that they make business cycles worse. When times were good, probabilities of default and expected losses appeared low, reducing the RWA. Banks thus appeared to have more than adequate capital and could lend freely. As business conditions deteriorated, the probability of defaults for loans increased along with expected losses from defaults. Under the Basel II methodology, an increase in default probabilities for loans increased the risk-weighted assets and thus bank capital requirements. Even if the bank did not make any additional loans, its RWA went up as business conditions worsened and thus its capital ratios went down. Banks were thus incentivized during the crisis to reduce their RWA by extending fewer commercial loans precisely at the time when the economy needed more bank lending, not less.

In December 2010, BCBS (2010ab) issued Basel III, to be phased in over several years through 2019. Basel III contains several measures to shore up the solvency of the banking system.

One of the major components is a significant increase in both the quantity and quality of bank capital. The earlier standards allowed a variety of subordinated debt and hybrid instruments to count as capital since they were subordinated to customer deposits and thus protected depositors from losses in the event of default. However, such protection did not reduce the likelihood of default. Basel III places more of an emphasis on common equity and restricts the use of innovative securities such as trust-preferred shares.¹⁸

¹⁷ A “repo” is a repurchase transaction. It is a very short-term loan that is fully collateralized by a security. The legal form is that the borrower sells the security to the lender and at the same time agrees to buy the security back later at a pre-specified higher price. The higher price reflects the interest that the borrower pays. If the borrower goes bankrupt before repurchasing the security, the lender is already the owner and is free to liquidate the security immediately. This is a stronger claim for the lender than if the lender had to litigate in bankruptcy court for years in order to get paid.

¹⁸ Trust-preferred shares are a hybrid instrument in which a bank issues preferred shares that are owned by a trust. The trust then issues long-term debt securities that are backed by the preferred shares in the trust. Basel I and II allowed such instruments to be counted as capital as they were subordinated to depositors.



In addition, Basel III made significant changes in the calculation of risk-weighted assets that significantly increased the RWA of the banking system. According to the BCBS (2010c) estimates, this increased RWA by 23.0% for the largest banks known as “Group 1” banks.¹⁹

BCBS (2010c) itself estimated that just the tightened definition of capital along with the changes in calculation of RWA decreased the amount of Common Equity Tier 1 (CET1) by 41.3% for Group 1 banks. These qualitative redefinitions alone result in a major increase in bank capital requirements even before the quantitative increases.

Basel III retains the advanced approach for the calculation of risk-weighted assets for larger banks. In the advanced approach, banks use their own internal risk models to estimate credit losses, and the results are fed into Basel III formulas to calculate RWA.

On top of the qualitative changes, Basel III imposes significant increases in the total capital requirements. The minimum CET1 becomes 4.5% plus a “conservation buffer” of 2.5%, bringing the CET1 requirement to 7.0%.²⁰ Some additional capital, such as long-term subordinated debt, is allowed in the total capital requirement of 8.0% plus the capital conservation buffer of 2.5% for an effective total capital requirement of 10.5%. Figure 5 shows the increase.

In 2015, additional requirements were placed on the largest banks, known as globally systemically important banks (GSIBs) by the Financial Stability Board (FSB), another international body.²¹ These requirements include the Total Loss Absorbing Capacity (TLAC). When fully phased in by 2022, GSIBs will be required to have 22% of their RWA in TLAC instruments. These TLAC instruments include Tier 1 Capital in addition to various types of subordinated debt instruments. In addition, there is a requirement for a total leverage exposure (TLE) such that the TLAC instruments relative to the “leverage exposure measure” (mostly accounting assets) must be greater than 6.75%. The TLAC logic is that in a restructuring the TLAC instruments will absorb the losses and thus represent a “bail-in” that does not require a taxpayer-funded bailout. However, by relying on RWA this requirement exacerbates the procyclical nature of the Basel regime. The Federal Reserve Board of Governors (2016) has imposed more stringent requirements than the FSB. In particular, the United States has adopted a TLE of 7.5% plus a buffer.

COMING SOON: BASEL IV

The Basel process is one of ongoing consultations. A series of proposals are under consideration; these are sometimes called Basel IV, although sometimes they are described as enhancements or complements to Basel III. McKinsey and Co. (2017) estimates that these new standards will result in substantially higher capital requirements for banks. McKinsey estimates that European banks alone will have to raise €120 billion in additional capital.

¹⁹ “Group 1 Banks” are defined as having Tier 1 capital greater than €3 billion.

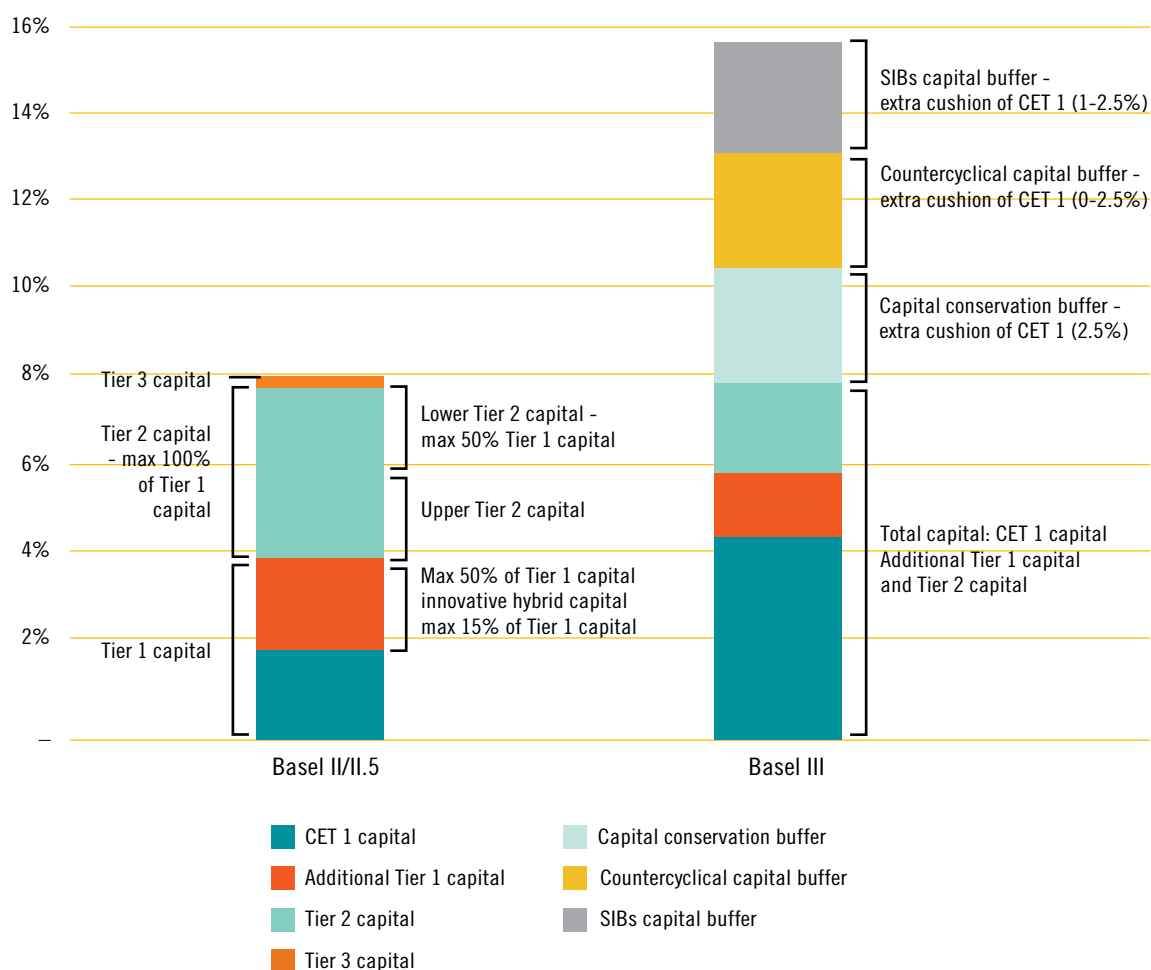
²⁰ Common Equity Tier 1 generally consists of common equity (common stock, additional paid-in capital, retained earnings, and accumulated other comprehensive income). Goodwill and deferred tax assets are not included in CET1. Some additional capital items not permitted in CET1 are permitted as additional Tier 1 capital. One example is contingent convertible debt that is converted to equity when CET1 falls below a triggering threshold. The Basel III Tier 1 requirement is 6.0%.

²¹ Financial Stability Board, 2015, Principles on loss-absorbing and recapitalization capacity of G-SIBs in resolution, available at <http://www.fsb.org/wp-content/uploads/TLAC-Principles-and-Term-Sheet-for-publication-final.pdf>. The FSB was founded in 2009. The FSB consists of representatives from 54 nations, most of whom are central bank governors. For more information, see www.fsb.org.



BCBS (2017) has just issued revised capital standards as part of this process. These proposals include additional refinements to the calculation of RWA in the standardized approach and restrictions on some of the results of the advanced approach through the application of a floor. Of particular note, BCBS is adopting a more European attitude toward small and medium enterprises and has dropped the risk weight to 75% from the previous 100%.

FIGURE 5



SOURCE: ACCENTURE; SEE https://www.accenture.com/T20150713T233453_W_US-EN/ACNMEDIA/ACCENTURE/CONVERSION-ASSETS/DOTCOM/DOCUMENTS/GLOBAL/PDF/INDUSTRIES_13/ACCENTURE-BASEL-III-GOING-BEYOND-COMPLIANCE.PDF





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