

## Bank Capital Regulation and the Off-Ramp

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### Bank Capital and Systemic Risk

One of the important lessons from the 2007-2009 financial crisis has been that failures of large financial institutions can impose costs on the entire system (referred to as systemic risk). The failure of “systemically important financial institutions” (SIFIs) invariably puts regulators in a compromised situation since, absent a credible bankruptcy regime, they are forced to rescue the failed institutions to preserve a functioning financial system and avert a credit crunch. In the most recent financial crisis, this involved protecting not just insured creditors, but also sometimes uninsured creditors and even shareholders. The anticipation that these bailouts will occur compromises market discipline in good times, encouraging excessive leverage and risk taking. This reinforces the systemic risk in the system and creates the need for bank regulation to contain systemic risk.<sup>10</sup>

Capital requirements play an important role in limiting systemic risk. Banks have an incentive to issue too little capital relative to their size because they do not take into account the cost of a systemic crisis. Bank capital regulation ensures that banks have a specified minimum amount of capital relative to their risk exposures. If the banking system is sufficiently capitalized, the likelihood of a systemic crisis is low. In the extreme case, if all banks

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<sup>10</sup> See Chapters 5 and 6 of Acharya et al. (2011).

are financed with 100% equity, there is no risk of a bank failure, and there is no risk of a systemic crisis.<sup>11</sup> Hence, bank capital regulation can ensure that banks have sufficient capital to withstand a crisis.

The need for bank capital requirements must be weighed against the direct and indirect costs of capital regulation. The direct costs are expenses paid by regulators and banks in order to implement capital regulation. There will also be recurring expenses, because regulations have to be updated as the banking industry evolves. Some of these costs may be offset by better bank risk management if banks benefit from interacting with regulators. Such benefits may arise if regulators collect and distribute information that improves the efficiency of the system but cannot be accessed by individual banks (e.g., information on system-wide exposures).

The indirect costs are inefficiencies in the banking system due to capital regulation. Some argue that, at least theoretically, high capital requirements may distort incentives for bank management. Specifically, higher capital requirements may reduce monitoring by debt holders and depositors and lead to a less efficient banking system. It has also been argued that higher capital requirements may impair lending. Specifically, if bank equity is costly due to informational frictions, then requiring more capital can lead to a decrease in credit supplied by the banking system. This reduction in lending is inefficient if potential projects have a positive net present value and firms cannot access other sources of financing (e.g., Calomiris and Kahn (1991), Diamond and Rajan (2000)).<sup>12</sup>

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<sup>11</sup> A 100% equity-financed banking system is considered extreme because a significant part of a bank's business is the issuance of money-like securities such as deposits or wholesale funding (e.g., repos, commercial paper, etc.). These money-like securities provide liquidity benefits that are part of a bank's business model.

<sup>12</sup> Bank capital requirements may reduce lending because higher capital requirements reduce the expected value of FDIC insurance and too-big-to-fail guarantees. In this case, the decline in lending is optimal because lending is excessive because of government guarantees.

There is a large empirical literature on the benefits and cost of bank capital. Considerable evidence exists that having banks with higher capital levels is beneficial during a crisis. Banks with more capital are generally better able to withstand crisis and lend more if there is a negative shock (e.g., Peek and Rosengren (2000), Ivashina and Scharfstein (2010), Cornett et al. (2011), Schnabl (2012), Paravisini et al. (2015)). However, there is some uncertainty as to whether there are significant costs of requiring higher capital ratios. Some argue that higher capital requirements decrease lending during normal times, although there is considerable disagreement regarding the economic magnitude of these effects.<sup>13</sup>

Any regulatory framework therefore needs to strike a balance between keeping systemic risk at an acceptable level, while making sure that the costs of regulation are adequate relative to the risk.<sup>14</sup> A general lesson of the 2007-2009 financial crisis was that bank regulation paid insufficient attention to the risk of systemic crisis. Bank regulation was focused primarily on preventing individual bank failures, without paying much attention to preventing a large-scale systemic crisis involving many failures. It turned out that the banking system entered the financial crisis with too little capital, and many banks became distressed once the crisis intensified in October 2008. In order to maintain a functioning financial system, the U.S. Government decided to bail out many banks—including some of the largest ones—which exposed taxpayers to significant credit risk.<sup>15</sup> The government also provided large subsidies to nonbanks that did not fit the regulatory definition of a bank but effectively provided banking services, such as lending, market making, and securitization.

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<sup>13</sup> Admati and Hellwig (2013) argue that the costs of high bank capital requirements are negligible. Calomiris (2012) argues that the costs can be substantial.

<sup>14</sup> Regulators also need to recognize that higher capital requirements increase incentives for nonbanks to arbitrage regulation. Regulation should therefore focus on economic function rather than institutional characteristics.

<sup>15</sup> Optimal Bailouts minimize the cost to taxpayers by providing subsidies only to debt holders and not equity holders (Philippon and Schnabl (2012)).

To ensure that such bailouts are less likely going forward and to minimize the expected cost to taxpayers, many observers have argued that regulation needs to monitor systemic risk and keep it at an acceptable level. The Dodd-Frank Act was an attempt to strike the right balance between the costs and benefits of bank regulation with a special focus on SIFIs.<sup>16</sup>

## **How the Dodd-Frank Act Addresses Systemic Risk**

In June 2010, Congress passed the Dodd-Frank Act. Broadly speaking, the Dodd-Frank Act imposes regulatory constraints on large banks that reduce the likelihood of another systemic crisis. Many features of the Dodd-Frank Act are sensible and conform to the recommendations of the first NYU Stern Book, *Restoring Financial Stability* (2009). Other features of Dodd-Frank, however, are problematic for the financial system, and many are left to the implementation of various regulatory bodies. For an overview of the main issues, see the second NYU Stern Book, *Regulating Wall Street: The Dodd–Frank Act and the New Architecture of Global Finance* (2011). It is beyond the scope of this chapter to review all aspects of how the Dodd-Frank Act addresses systemic risk. But a brief description of the main elements will serve as an introduction to the proposed changes under the Financial CHOICE Act.

The Dodd-Frank Act focuses on systemic risk. It establishes a Financial Stability Oversight Council (FSOC), which is chaired by the

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<sup>16</sup> It is important to distinguish the reasoning for regulating systemic risk from the traditional reasoning of regulating banks. The traditional argument focuses on the liabilities structure of banks and banks' role as providers of risk-free deposits. To guarantee the safety of deposits, the U.S. Government provides deposit insurance through the Federal Deposit Insurance Corporation (FDIC) on deposits below a certain limit. In turn, the provision of deposit insurance exposes the U.S. Government to the risk of bank failures and therefore requires regulation (see, for example, Dewatripont and Tirole (1994)). In addition, bank financing may be biased towards debt because debt financing has tax advantages relative to equity. This bias towards debt financing can be eliminated by giving equal tax treatment to debt and equity.

Secretary of the Treasury and consists of the top financial officers from various governmental and regulatory agencies. The chief role of the FSOC is to identify systemic risks wherever they arise and to recommend policies to regulatory bodies. As a quick rule of thumb, financial institutions that have a huge concentration in volume of one or more product areas are likely candidates to be systemically risky institutions. These entities are likely to be making markets in that product and are likely to be systemic in that their failures would impose significant counterparty risk and disruptions on other financial institutions.

The Dodd-Frank Act leaves significant leeway to regulators regarding the specific policies to reduce systemic risk. Capital regulation through risk-based capital requirements and leverage limits plays an important role. In addition, Dodd-Frank also mentions the following policies:

- Liquidity requirements;
- Resolution plan and credit exposure report requirements;
- Concentration limits;
- Contingent capital requirements;
- Enhanced public disclosures;
- Short-term debt limits; and
- Risk management requirements.

Since the implementation of the Dodd-Frank Act, it has become clear that all banks with at least \$50 billion in assets receive considerable scrutiny under the new regulation. These banks have become the focus of regulators and should be considered the core of banks designated as SIFIs.

SIFIs have to undergo annual stress tests that evaluate whether a bank has sufficient capital to withstand a large-scale crisis. Given that stress tests focus on crisis scenarios, they are particularly well

suited for addressing systemic risk.<sup>17</sup> The stress tests are conducted by bank regulators and require banks to submit detailed plans and documentation for stress scenarios. The submissions are evaluated and verified by bank regulators. If regulators deem a submission unsatisfactory, regulators can require a bank to raise more capital. Regulators have exercised these powers several times over the past few years.

### **How the Financial CHOICE Act Addresses Systemic Risk**

The CHOICE Act argues that banks should be exempt from Dodd-Frank if they have sufficient capital, referring to this opt-out option as the “Dodd-Frank Off-Ramp for Strongly-Capitalized, Well-Managed Banking Organizations.” The CHOICE Act proposes using a simple capital ratio of 10% as the threshold for the “off-ramp.” If a bank’s capital ratio exceeds 10%, the bank should be considered sufficiently capitalized and would not need to follow the regulations of the Dodd-Frank Act. The capital ratio under the Financial CHOICE Act treats all asset risk equally, assigning a risk weight of one to all assets. The Financial CHOICE Act also requires that banks maintain an acceptable risk rating from regulators, which adds an additional layer of security.<sup>18</sup>

The logic behind the Financial CHOICE Act is straightforward: It argues that banks with sufficient capital do not require the supervision imposed by Dodd-Frank. The reason is that banks with sufficient capital have the appropriate incentives for risk taking, because equity holders ultimately bear any cost of excessive risk taking, and there is no scope for moral hazard. Hence, as long as there is sufficient capital, there is no need to be concerned about financial risk-taking leading to financial crisis.

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<sup>17</sup> Most other policies reduce the individual likelihood of failure of SIFIs. These policies will generally reduce systemic risk, but they are not well suited to evaluate and address systemic risk directly.

<sup>18</sup> Banks have to maintain a CAMELS (Capital adequacy, Assets, Management capability, Earnings, Liquidity, Sensitivity to market risk) rating of 1 or 2.

The main benefit of the proposal is that well-capitalized banks would not need to spend resources to comply with the regulations imposed under Dodd-Frank. Presumably, less regulation would reduce the cost of compliance and make banks more efficient. It may also reduce the fixed cost of running a bank, thus promoting bank entry and helping small banks, which find it difficult to cover the fixed costs of complying with bank regulation.

### **Overall Assessment of the Off-Ramp under the Financial CHOICE Act**

The overall logic of the CHOICE Act is sensible. There is a trade-off between the benefits and costs of bank capital regulation. If a bank is highly capitalized, the benefits of regulation are smaller, because moral hazard concerns are less important and bank equity holders are more likely to make efficient lending decisions. Holding everything else equal, it therefore makes sense to reduce regulation as banks hold more equity.

There are two important caveats to this argument: First, banks react to changes in thresholds. If a threshold of 10% provides an opportunity to avoid regulation, banks may choose to structure their balance sheets in a way that satisfies this requirement without necessarily reducing risk. The history of bank regulation has observed this dynamic so many times that it has been coined Goodhart's Law: "When a measure becomes a target, it ceases to be a good measure."<sup>19</sup> As discussed below in more detail, the "off-ramp," therefore, needs to take into account a bank's incentive to adjust its balance sheet in response to the threshold. Banks have a number of ways to achieve a higher capital ratio without reducing their risks, and regulation needs to take these incentives into account.

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<sup>19</sup> The principle is also known as the "Lucas critique."

Second, the level of the threshold is important. At a capital ratio of 10%, banks can still finance 90% of their balance sheet with debt, and thus remain highly levered. Importantly, the ratio proposed under the Financial CHOICE Act is measured during regular times when the economy is doing well. However, from a systemic risk point of view, the question is whether banks have sufficient capital during a crisis.<sup>20</sup> As discussed below, it is therefore important to consider both the level of the threshold and how to measure the capital ratio.

The remainder of this assessment discusses policies that need to be in place in order to allow for a safe off-ramp. In practice, these regulations will require keeping significant elements of the Dodd-Frank Act in order to ensure proper monitoring and regulation of banks choosing the off-ramp. The following discussion focuses on banks that are systemically important—namely the ones with at least \$50 billion in assets. The off-ramp is more defensible and easier to implement for small banks, although some regulation may also be necessary for small banks.<sup>21</sup>

## **Considerations for the Off-Ramp Proposal**

### *The Role of Stress Tests*

Stress tests evaluate capital levels during a crisis. Banks have long conducted internal stress tests to evaluate their exposure to sudden changes in the economic environment. Dodd-Frank introduced stress tests as an important tool for regulators, and it standardized the use of stress tests across banks. Stress tests are now considered an essential tool to understand bank capital levels in stressed scenarios.

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<sup>20</sup> The Volatility Institute at NYU Stern provides estimates of bank systemic risk exposure and systemic risk ranking. The estimates are updated daily and can be accessed at <https://vlab.stern.nyu.edu/welcome/risk/>.

<sup>21</sup> See Dou and Ryan (2017), in this White paper, for a discussion of the off-ramp for medium-sized and small banks.

The CHOICE Act proposes to exclude banks from stress tests if they exceed a capital requirement of 10%. This proposal fundamentally misunderstands the purpose of systemic risk regulation. The objective of systemic risk regulation is to ensure that a bank has sufficient capital during a crisis. Holding everything else equal, a bank with a high level of capital during normal times is also likely to have more capital during a crisis. However, if the bank is also more exposed to a systemic crisis—e.g., by investing in illiquid assets that are likely to decline in value during a systemic crisis—it is not sufficient to have high capital during normal times. In fact, regulation based on a simple leverage ratio provides incentives for banks to increase their exposure to systemic risk.<sup>22</sup> At a minimum, the off-ramp would need to be based on the expected capital ratio during a crisis rather than capital during regular times.

Stress tests are successful if they provide a good measure of expected capital during a crisis. This goal can only be achieved if stress tests are credible in the sense that the results cannot be manipulated by participating institutions. The CHOICE Act proposes to publish all scenarios and models used in stress tests in advance. The underlying idea is that this would make the stress tests more transparent. Even though transparency is a laudable objective, in our view publishing all the information upfront is not recommended. To make a simple comparison, publishing the stress test scenarios in advance is like giving students their exam prior to the exam date. If banks know the scenarios upfront, the test is subject to gaming, and some banks may tailor their submission to pass the test. Hence, in order to minimize gaming against the tests, it is important to keep an element of surprise. Alternatively, regulators would need to ask banks to submit expected capital levels under a much larger number of scenarios than currently used.

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<sup>22</sup> Farhi and Tirole (2012).

This alternative would reduce gaming but may lead to even larger cost for complying with the stress tests.<sup>23</sup>

This is not to say that bank stress tests necessarily have been conducted optimally. Regulators are still learning about this new approach to regulation, and some of the modeling and regulatory choices may appear arbitrary. There is room for streamlining the tests and scope for increasing the transparency. However, given the benefits of the tests, it seems sensible to maintain the current approach and improve the test rather than abandoning it altogether. To continue with the example from above, if a professor gives a badly written exam, the objective should be improving the content of the exam, rather than abandoning exams altogether.<sup>24</sup>

It is also important to be clear about the costs of bank stress tests, which can be separated into a social cost and a private cost. The main penalty for failing a stress test is the requirement to raise more equity—usually through lowering payouts to shareholders. Even though such a penalty may be perceived as costly by banks, it may not be costly from a social perspective. The reduction in payouts simply means that shareholders' equity is increased by the same amount. To the extent that the increase in bank equity is lower than the payouts, the difference can come from decreasing the expected government subsidy. As discussed above, higher equity required under the stress tests is only socially costly to the extent that it distorts bank management and reduces lending to

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<sup>23</sup> A cautionary tale is the failure of stress testing for Government-Sponsored Enterprises (GSEs). GSEs had to undergo stress tests before the 2008 financial crisis, but never experienced meaningful capital shortfalls. A subsequent analysis of these stress tests suggests that the GSEs gamed the tests because the stress test models were fully disclosed prior to the tests (Frame, Gerardi and Willen (2015)).

<sup>24</sup> Acharya, Pedersen, Richardson, and Philippon (2017) find that the bank stress tests deliver similar results to systemic risk measures based on publicly available market data. This finding provides some external validity to results of the stress tests. It also suggests that the results are consistent with information on systemic risk embedded in security prices.

socially optimal projects. Hence, penalties under stress tests do not necessarily represent a social cost and may even improve the safety of the financial system.

### *Market versus Book Values*

The capital ratio is based on a simple leverage ratio. Our understanding of the Financial CHOICE Act is that the capital ratio is computed using book values instead of market values. Yet, book values tend to be uninformative about a bank's capital position—especially in the midst of a crisis. This is because banks have strong incentives to delay the recognition of losses. This delay is partly to avoid attention by regulators and investors but also to avoid triggering bank runs that can lead to bank failure.

The U.S. financial crisis provides plenty of examples of banks that were well-capitalized based on book measure of leverage immediately prior to going bankrupt. Among broker-dealers, Lehman Brothers had a Tier 1 capital ratio of 11% in the week prior to its failure. Among deposit-taking institutions, Washington Mutual was considered sufficiently capitalized with a Tier 1 capital ratio of 7% prior to its failure.

Hence, it is likely that book values become uninformative during a crisis. It is therefore advisable to include information on market values when evaluating bank capital. To be clear, we do not necessarily advocate replacing book values with market values. A reasonable case can be made that market values can overstate the decline in equity value during a crisis. Hence, it seems sensible to incorporate market values in the evaluation of capital levels in addition to using book values.<sup>25</sup>

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<sup>25</sup> Acharya, Engle, and Pierret (2014) examine the role of using market versus book values in the context of the European sovereign debt crisis.

### *Off-Balance Sheet Exposures*

Many financial intuitions have off-balance sheet exposures that can add to a bank's liabilities during a systemic crisis. The Financial CHOICE Act acknowledges such exposures and mentions that some off-balance sheet exposures will be included in the computation of capital ratios. This is sensible but does not go far enough. Banks that want to circumvent capital requirements tend to find ways to structure risk such that they remain off-balance sheet. For example, prior to 2008, many banks sponsored asset-backed commercial paper (ABCP) conduits. The conduits were considered off-balance sheet for regulatory purposes and only triggered small capital charges. Yet, liquidity guarantees were structured to avoid capital requirements, while providing full insurance to outside investors. Once there was turmoil in money market in August 2007, most banks were contractually obligated to purchase the assets in ABCP conduits or finance them otherwise (Acharya, Suarez, and Schnabl (2013)). Given that conduits effectively had no equity, conduit assets increased bank leverage in the midst of a crisis and should have been included in the computation of capital ratios before the crisis.

There are other examples of such regulatory arbitrage. Recent work using data on internal risk models has found that banks with less capital tend to assign lower probabilities of default even for similar loans (Plosser and Santos, 2015). Other research has shown that banks became more optimistic about risk when risk assessments were used for capital regulation, and this effect was larger for less capitalized banks (Behn, Haselmann, and Vig (2014)). There is also work showing that banks assign a lower "Value at Risk" to their security holdings if they are capital constrained (Begley, Purnanandam, and Zheng (2016)).

Post-crisis bank regulation addresses many of the known loopholes for regulatory arbitrage. However, it should be expected that some banks may find new ways to reduce reported leverage ratios by

putting assets off-balance sheet. In many instances, such off-balance sheet exposures are justified by a clear economic rationale, but sometimes they are not. It is important that bank regulators monitor off-balance sheet activities and decide whether to include them in the computation of capital ratios. In combination with stress tests, the proper monitoring of off-balance sheet activities can go a long way toward ensuring that banks have sufficient capital during a crisis.

### *Measuring Leverage*

Measuring leverage is difficult. Setting aside the issue of off-balance sheet vehicles, there are many other choices that can materially affect measured leverage. One way to illustrate this is by comparing leverage under different accounting systems.

U.S. banks generally use Generally Accepted Accounting Principles (GAAP), while European banks use International Financial Reporting Standards (IFRS). One important difference between the two accounting systems is the treatment of derivatives. Under GAAP, banks can net out derivatives exposures on the asset and liabilities sides. Given that derivatives exposures on the liabilities side are debt, the netting generally decreases reported leverage. In contrast, IFRS does not allow netting given that derivatives exposures create liabilities in bankruptcy. Both accounting systems have their merits, but it is important to note that technical decisions regarding derivative exposure can have large effects on measured leverage.<sup>26</sup>

For example, as of the second quarter of 2016, almost all large U.S. banks have capital ratios that are significantly lower than 10%, ranging from 4.93% (Bank of New York Mellon) to 8.97% (Citigroup) using GAAP. Capital ratios are even lower when using IFRS

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<sup>26</sup> For a discussion of the issue of derivatives in measuring leverage, see a blog post by Cecchetti and Schoenholtz (2016) that can be accessed here: <http://www.moneyandbanking.com/commentary/2016/5/2/leverage-and-risk>.

accounting. For large U.S. banks, they range from 4.14% (Goldman Sachs) to 8.01% (Wells Fargo).<sup>27</sup>

### *The Role of Risk Weights*

The Financial CHOICE Act argues that risk-weighted capital ratios such as the Tier 1 ratio have failed. It argues in favor of a simple leverage ratio that does not use risk weights. The underlying logic for this decision is that risk weighting can be manipulated.

The CHOICE Act correctly points out that risk-weighted ratios can be manipulated and performed worse than expected during the U.S. financial crisis. However, the use of a simple leverage ratio does not solve this problem—it simply sets the risk weight equal to 1 for all assets. Even a simple leverage ratio still uses risk weights and therefore provides incentives for banks to adjust their balance sheets and to increase risk while maintaining a certain ratio.

The use of uniform risk weights may even worsen the problem, because banks can invest in risky assets at a low capital charge. In contrast, the risk-weighted capital ratio requires banks to hold more equity if they hold risky assets. It is therefore unclear whether using a simple leverage ratio is an improvement—especially if it replaces a risk-based capital ratio. Even though the risk weights are not perfect in constraining bank risk, they are likely to be superior to a situation with uniform risk weights. Dodd-Frank and Basel III impose joint weights: leverage and risk-weighted ratios. This is a sensible approach in addressing the potential for gaming with respect to a single ratio.<sup>28</sup>

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<sup>27</sup> The estimates are provided by the FDIC and can be accessed at <https://www.fdic.gov/about/learn/board/hoenig/capitalizationratio2q16.pdf>

<sup>28</sup> Acharya and Schnabl (2009) provide a discussion of this issue. They argue that a single ratio is unlikely to be optimal. They point out that a private investor would rarely make a decision based on a single ratio, and neither should a regulator.

### *Choosing the Off-Ramp Threshold*

The Financial CHOICE Act proposes a minimum capital threshold of 10%, but provides little analysis to justify this threshold. Arguably, 10% equity may still be too low to provide a sufficient buffer during a systemic crisis. A brief review of the literature suggests that 10% is at the lower end of range of estimates for suggested minimum capital requirements.

Admati and Hellwig (2013) suggest that bank equity should be at least 20% of bank assets. They argue that any potential costs of equity are negligible at levels below 20%-30%. In their assessment, any reduction in bank value below a 20% capital requirement is likely to come from reduced implicit and explicit guarantees. It is therefore recommended to set bank capital requirements to 20% or higher.

Hoening (2012) points out that that banks had significantly higher capital ratios before the founding of the Federal Reserve Board in 1913 and the introduction of the Federal Deposit Insurance Corporation (FDIC) in 1933. The likelihood of government bailouts was low, and capital levels were market driven. During this period, the U.S. banking industry's ratio of tangible equity to total assets was between 13% and 16%. Arguably, these levels might be a good starting point even for today's banking system.

A group at the Minneapolis Federal Reserve Bank (2016) has estimated required capital levels based on historical data on banking crises with the goal of limiting the likelihood of a systemic crisis. Their proposal calls for a risk-weighted ratio of 23.5%, which is estimated to be equivalent to a 15% leverage requirement. After five years, if an institution continues to be deemed systemic, the plan calls for ratcheting up the capital requirement by five percentage points annually until it reaches 38% (roughly 24% leverage requirement).

Other works suggest a threshold closer to 10%. Calomiris (2012) argues that 10% is a sensible capital requirement. A group of International Monetary Fund (IMF) researchers uses historical banking crisis data and argues for a Tier 1 requirement of 15%-23%, which translates to a leverage ratio of 9% (Dagher et al. (2016)).

To summarize, the required thresholds vary greatly across proposals with recommended capital ratios ranging from 9% to 30%. It is clear that all recommendations come with a number of assumptions on the economic magnitude of the costs and benefits of bank capital. Even though there is no unanimous consensus on the recommended level, none of the proposals recommends a number clearly below 10%, and most proposals recommend a number significantly above 10%. A prudent regulator may prefer a threshold that puts more weight on some of the higher estimates.

## **Summary and Conclusion**

The Financial CHOICE Act proposes an off-ramp for financial institutions. The off-ramp allows banks to opt out of Dodd-Frank regulation if their capital level exceeds a certain threshold. The logic behind the proposal is that banks with sufficient capital pose no systemic risk and therefore do not require regulation.

We believe that any implementation of the off-ramp requires regulators to take into the account banks' responses to using a leverage ratio. The history of bank regulation has shown that a single target may not be sufficient in containing risk. Regulators therefore need to make sure that banks have sufficient capital not only during regular times but also during crises. In practice, this requires regulators to measure capital during a crisis using credible stress tests. It also requires that regulators monitor bank risk using proper measures of leverage, off-balance sheet exposure, and bank risk exposure.

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