

Reconsidering the Regulatory Uses of Stress Testing

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Introduction

“When the next episode of financial instability presents itself, it may do so in a messy and unexpected way. Banks will need to be ready not just for expected risks, but for unexpected ones. Thus, the tests will need to vary from year to year, and to explore even quite unlikely scenarios. If the stress tests do not evolve, they risk becoming a compliance exercise, breeding complacency from both supervisors and banks.”

— Chair Jerome Powell, July 9, 2019

The use of annual stress tests to set minimum capital requirements for large banks was among the most important innovations in prudential regulation following the Global Financial Crisis of 2007-2009 (GFC). Using stress tests for this purpose promised greater risk sensitivity at the individual firm level and a better assessment of the banking system as a whole than the pre-crisis methods of fixed capital requirements or the use of banks’ internal models. It also carried the potential for integrating more macroprudential factors into large-bank capital regulation. A dozen years later, however, the robust stress testing regime that motivated its use for setting capital requirements has been diluted and is now a more routinized, predictable process. As the current Federal Reserve stress test proceeds to its conclusion in June, this paper is intended to prompt a policy debate on whether stress testing should remain the basis for large bank minimum capital requirements in the United States.¹

Box 1.

Stress tests use an economic model to measure the impact on bank losses and revenues of one or more hypothesized unfavorable economic scenarios. A stress test is “forward looking,” in the sense that the model is used to project the impact of the unfavorable scenario on the assets held on a bank’s balance sheet. This feature contrasts with the “point-in-time” risk weights for assets established by bank regulators on the basis of past experience. Thus, for example, a standardized risk weight for a residential mortgage will be set based on loss experience over some historical period, whereas a scenario positing a significant nationwide decline in housing prices may result in higher losses for that unusual, but plausible event. The stress test thus evaluates whether a financial institution has enough capital to weather the hypothesized severe economic conditions.

Prior to the Global Financial Crisis (GFC), stress testing had been used as an internal risk management tool by banks, and the IMF had begun to use a form of stress testing in its assessments of financial stability policies in its member nations. During and following the GFC, bank regulators in the United States and other countries began to use stress testing as a tool to help set regulatory capital requirements. These supervisory stress tests are administered simultaneously to many banks—usually a group of large institutions that collectively account for a substantial share of the jurisdiction’s banking system.

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1. Stress testing has also become part of prudential regulation in China, the European Union, Japan, Singapore, Switzerland, United Kingdom, and other countries. However, the characteristics and use of stress testing vary considerably across these jurisdictions, at least in part because of differing legal authority and institutional contexts.

The basic frame for this policy debate is the conflict between, on the one hand, the dynamism required to realize the benefits of stress testing and, on the other, the pressures for more regularized, predictable processes generated by both bank lobbying and organizational factors within the Federal Reserve. The key issue is the likelihood that inertial institutional pressures—both external and internal—will in practice limit the considerable conceptual advantage of using stress tests to set capital requirements.

Part I provides background on the current regime as it has evolved since an ad hoc stress test was used during the GFC to determine how much capital large banks needed to raise to ensure their viability. Part II discusses the basic advantages and limitations of the current regime, in which annual stress testing significantly determines the minimum capital requirements of large banks. Part III presents policy options for the relationship between stress testing and the determination of ongoing minimum capital requirements.

To summarize, stress tests can and do provide information about bank resiliency even if they are not used in setting capital requirements. The primary advantage of linking them is that financial system resiliency can be enhanced by regularly adapting capital requirements to changing financial risks and bank practices. The limitations to linking stress tests and capital regulation are of two sorts—technical and institutional. By technical, I mean areas in which the Fed’s model and testing process do not incorporate features that are now state of the art. One example is that the Fed uses just one severe stress scenario to project potential bank losses, and thus capital needs, despite the unpredictability of future triggers of stress. Others are the exclusion from the Fed’s model of such relevant factors as the impact of second-order effects and market information that might reveal the book values of bank assets to be overstated.

Of course, lags in incorporating advances in stress test technology into Fed models are inevitable, given the practicalities of embracing even well-validated technical innovations into a complex exercise involving more than 30 large banks. But many compelling improvements to the current approach are well-enough established that they could be incorporated into the Fed’s current approach without concerns about their validity. Similarly, both the Fed and the banks have now had enough experience with stress testing that significant improvements could be implemented without substantial augmentation of the resources currently devoted to the process.

Here is where institutional considerations are at the forefront—the incentives of banks and the constraints of administrative agency organization and practice. Banks desire, and lobby hard for, more predictability and less volatility in their capital distributions. Doubtless emboldened by anti-regulatory decisions of the Supreme Court and much of the federal judiciary, banks are now threatening legal challenges to the current stress testing regime. Like most government agencies, the Fed tends toward regularization, even in the absence of significant political or legal pressure. It is especially difficult to continually adapt processes, especially if there are direct regulatory consequences. The use and, perhaps more saliently, non-use of stress testing during the early stages of the COVID-19 crisis highlights these tendencies at the Fed. There is no little irony in the fact that while the current regime was inspired by the 2009 success of stress testing in helping restore financial stability, the bureaucratization of stress testing appeared to discourage—or at least substantially delay—its use in the economic crisis that followed.

In Part III, I begin by describing an approach that is most likely to protect the resiliency of the banking system—maintaining the connection between stress testing and ongoing capital requirements, but with an explicit commitment to a more dynamic process that uses multiple scenarios and regularly refines the model to reflect market developments and changes in banks’ balance sheets. In principle, this approach would likely be favored by many finance economists and banking regulators. Unfortunately, the experience of recent years strongly suggests that even if an especially intrepid Federal Reserve Board

leadership had committed to this policy it would not be sustainable. The inertial tendencies that now inhibit the Fed from even moderate levels of dynamism would surely reassert themselves. Moreover, shifts in Board leadership would likely lead to significant variability in bank capital requirements when presidential administrations change from one party to the other. Thus, this policy is not really a live option, but it provides a basis for evaluating two more realistic options.

The first of the realistic options would decouple the annual stress test from the determination of minimum capital requirements. Annual stress testing would become a supervisory exercise designed to elicit information about risks faced by individual banks and by the banking system as a whole. To compensate for the decline in actual capital requirements that would result from this decoupling, point-in-time capital requirements would be increased. Although the results of stress tests would no longer be the presumptive basis for setting minimum capital levels, they could still be used by supervisors as an input in deciding whether to direct specific banks to increase their capital ratios and to inform changes in generally applicable capital requirements. The effect of the decoupling should be to reduce many, though not all, of the inertial pressures that bear on the current regime, thereby freeing supervisors to take greater advantage of the information potential of a dynamic stress testing regime, importantly including the administration of a special stress test at the onset of serious financial instability. Capital requirements for large banks would also be less likely to fluctuate based on which party occupies the White House. On the downside, some risk sensitivity in capital requirements would be lost. Additionally, both the Fed and the banks would likely devote less attention, especially high-level attention, to the stress testing process.

The other option is to maintain the status quo despite its many problems. Even a relatively non-dynamic stress testing regime produces some risk sensitivity that would be lost in an approach relying solely on point-in-time requirements. The loss of that advantage and the possibility that a stress testing process decoupled from capital requirements would not be maintained as well as by the Fed or the banks are reasons for retaining the admittedly flawed current regime.

To a considerable extent, the choice between decoupling and the status quo rests on one's views of the strength of the inertial forces described in Part II. In the Conclusion, I explain why my assessment of those forces leads me to lean, albeit quite reluctantly, to the decoupling option. However, as my reluctance itself suggests, my principal purpose in this paper is less to argue a position than to prompt discussion among all interested parties.

I. Stress Testing as a Regulatory Tool

Prior to the Great Financial Crisis of 2007-2009, large banks employed stress testing in their internal risk management, both on their own initiative and prompted by supervisors. This use was, of course, limited to a single firm and focused especially on market risk for traded portfolios. As part of its Financial Sector Assessment Program launched following the emerging markets financial crisis of the late 1990s, the International Monetary Fund pioneered the use of stress testing to evaluate financial stability risks in member countries.² But it was the Supervisory Capital Assessment Program (SCAP) conducted by the Federal Reserve in the early months of 2009 that led to the use of stress testing as a key determinant of regulatory capital requirements.

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2. Tobias Adrian, James Morsink, and Liliana Schumacher Stress Testing at the IMF, IMF Departmental Paper No. 20/04 (2020), <https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2020/01/31/Stress-Testing-at-the-IMF-48825>.

SCAP was very much a crisis policy instrument, intended to determine how much capital the largest U.S. bank holding companies would need to remain viable in the event of a prolonged serious recession following the financial turbulence of late 2008.³ The stress test in SCAP was, by today's standards, fairly rudimentary. Using an adverse scenario created by the Federal Reserve, each of the nineteen participating banks ran its own model to determine impacts on losses and revenues. Federal Reserve supervisors reviewed the bank estimates, compared them to independent benchmarks, and then calculated the supervisory loss estimates.⁴

Applying these estimates to the banks' capital positions, the supervisors concluded that, were the adverse scenario to materialize, ten of the 19 banks would need additional capital to remain above the minimum capitalization levels necessary to remain a credible and viable intermediary.⁵ To the extent they had not already done so, these banks were required to raise capital adequate to absorb projected losses and still meet minimum requirements. In the ensuing months the banks raised even more capital than the amounts implied by the SCAP results.⁶

In its announcement of the SCAP results, the Federal Reserve stated that “[t]he SCAP buffer does not represent a new capital standard and is not expected to be maintained on an ongoing basis.”⁷ But its success in helping restore confidence in the solvency of large banks helped convince legislators that stress testing should be a permanent part of the prudential regulatory system. When Congress passed the Dodd-Frank Act in 2010, a requirement for annual supervisory and firm stress testing of large banks was included.⁸

The statutory provision requires only that stress tests be used to evaluate “whether such companies have the capital ... necessary to absorb losses as a result of adverse economic conditions”⁹ and that a

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3. The methodology and results of the SCAP are explained in Board of Governors of the Federal Reserve System, The Supervisory Capital Assessment Program: Overview of Results, May 7, 2009, available at <https://www.federalreserve.gov/newsevents/files/bcreg20090507a1.pdf> [hereinafter “SCAP Results”].
4. SCAP Results at 4.
5. SCAP Results at 16-17. The Fed essentially created a Tier 1 common equity capital requirement in the SCAP. The then-applicable capital requirements mandated at least 4% Tier 1 capital, which included non-cumulative perpetual preferred stock, qualifying minority interests in securities, and qualifying trust preferred securities. In SCAP, the Fed for the first time required a 4% minimum for Tier 1 *common equity* alone, explaining that supervisors expected bank holding companies to have capital “well in excess of” minimum capital requirements, and referring to “the Board’s long-held belief that common equity should be the dominant form of Tier 1 [c]apital.” SCAP Results at 14.
6. If a bank was unable or unwilling to raise the needed capital in markets, it had the option of taking an investment in the required amount from the U.S. Treasury’s Troubled Assets Relief Program (TARP) fund. Because the terms of a TARP investment were relatively unattractive, and because release of the SCAP results both coincided with, and reinforced, more favorable market sentiment on banks’ prospects, only one of the ten banks—Ally Financial (formerly GMAC, an auto-financing arm of General Motors)—was unable to raise enough capital in the market and was obliged to take a government investment. As it happened, Ally did not take TARP funds, but met their specified capital shortfall with funds obtained through the Auto Industry Financing Program. These funds, appropriated as part of the government rescue of two major auto firms, were available on somewhat better terms than Treasury’s terms for TARP.
7. SCAP Results at 3. The report also referred to the “one-time buffer.” *Id.* at 15.
8. P.L. 111-203, 124 Stat. 1376, 1430, §165(i), July 21, 2010. This provision, codified at 12 U.S.C. §5365(i), was amended in 2018 to require a minimum of two scenarios, rather than the three required in the original legislation.
9. 12 U.S.C. §5365(i)(1)(A).

“summary of the results” be published.¹⁰ The legislation itself did not specify what the Board of Governors was to do if it determined that one or more firms subject to the stress tests did not have the necessary amount of capital. Congress thus left with the Board the discretion to draw on any of its prudential rulemaking, supervisory, and capital directive authorities—as augmented in Dodd-Frank itself—in reacting to such a shortfall.¹¹

Meanwhile, the SCAP experience affected how Federal Reserve staff and Board members thought about post-crisis regulation. Much had changed since the SCAP, which the Board had characterized as a one-time exercise. Not only was annual stress testing now required, it also presented a means for implementing a more risk-sensitive and dynamic approach to capital regulation of large banks, consistent with other parts of Dodd-Frank that called for more stringent regulation of larger banks and took greater account of system-wide risks to financial stability.¹² In light of these and other changed circumstances, the Board implemented a supervisory stress testing program that was tied to capital planning requirements and, potentially, limitations on capital distributions.

By 2012 the annual stress test required by Dodd-Frank was incorporated by regulation into the Comprehensive Capital and Analysis Review (CCAR), the results of which were binding on the participating banks.¹³ Each of the roughly 20 covered banks was required to submit a capital plan detailing its projected capital position during the period of stress hypothesized by the Board.

Like SCAP, the CCAR regime stressed bank balance sheets over a two-year horizon.¹⁴ And, like SCAP, the calculation of projected losses and revenues under a severely adverse scenario was combined with the going-in capital levels of each bank to determine whether it would remain above applicable minimum capital requirements—both risk-weighted and leverage—assuming the adverse scenario and attendant losses materialized and its planned capital distributions were made. If any of these minimum requirements was projected to be breached during any quarter of the stress period, the Board would presumptively object to the bank’s capital plan.¹⁵ The bank would then need to revise downward its intended distributions and resubmit a plan.¹⁶

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10. 12 U.S.C. §5365(i)(1)(B)(5).

11. The capital directive authority of the federal banking agencies is discussed below at p. 23.

12. The rest of §165 contained a host of additional regulatory requirements for larger banks, including more stringent capital, liquidity, concentration, and risk management standards. Section 165 also introduced new prudential requirements such as resolution planning and counterparty exposure limits.

13. Board of Governors of the Federal Reserve System, Final Rule, Capital Plans, 76 Fed. Reg. 74631, Dec. 1, 2011, available at <https://www.govinfo.gov/content/pkg/FR-2011-12-01/pdf/2011-30665.pdf>. This regulation has been amended a number of times, most importantly in March 2020, as described in the text *infra*. The current regulation can be found at 12 C.F.R. §225.8.

14. Technically, CCAR covers nine quarters—roughly two years from the announcement of results plus the quarter that elapses between the date of the bank balance sheet to be tested and the announcement of results.

15. The CCAR regulation included additional factors for the Fed to consider in passing upon banks’ capital plans. It also provided an administrative process for a bank to question the accuracy of the stress test results. 12 Code of Federal Regulations §225.8(h)(4)(i).

16. If one or more of a bank’s capital ratios were projected to fall below minimum required levels even in the absence of capital distributions, the regulation would have allowed the Board to prohibit even past levels of dividend payments by the bank. In the few instances in the early years of CCAR in which banks were found to be in this position, the Board in practice permitted the bank to continue its prior year’s dividends while it continued to retain most of its earnings and thereby build its capital buffer.

Also like SCAP, the Board published the results of the stress test on a bank-by-bank, as well as aggregated, basis.¹⁷ After a few years of allowing banks to project balance-sheet reductions as one way of meeting minimum capital ratios, the 2014 and later CCAR exercises said that banks could not do so, reviving the macroprudentially-motivated assumption in SCAP.¹⁸

There were many differences between SCAP and CCAR.¹⁹ Here I will mention only the three that are most relevant to evaluating the utility of stress testing to set ongoing capital requirements.

First, the severely adverse scenario used in CCAR was of necessity wholly hypothetical—a serious recession, along with a shock to traded assets roughly the size of the 2008 experience. In contrast, SCAP had extrapolated from the actual economic shock experienced in the fall of 2008. This difference between SCAP and CCAR was so obvious that it often goes unmentioned. But, as discussed later, it accounts for a good bit of the tension between the virtues of stress testing and its use in ongoing capital regulation.²⁰ To reflect the possibility, if not likelihood, that the next episode of financial stress will have different origins from the Global Financial Crisis, each year the Board added to the severely adverse scenario some “salient risks”—specific shocks not intrinsic to the scenario, such as an hypothesized bad outcome of European sovereign debt problems.

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17. The decision by the Board of Governors to publish bank-by-bank results occasioned considerable controversy among Fed staff. Those against disclosure worried that, in the absence of the TARP funds back-up that had been available to any bank that could not raise capital in public markets following SCAP, a bank falling short of minimum post-stress capital levels could suffer something like a soft run by investors and depositors. Those favoring disclosure argued both that this practice was necessary for public confidence in the tests and that banks falling short of minimum post-stress ratios were unlikely to suffer runs since the banks could always reduce their intended capital distributions, and, in any case, the hypothesized stress scenario under which the bank's capital would fall short was a low (though not zero) probability event. The latter view proved correct, though banks “failing” the CCAR stress test did sometimes suffer declines in their stock prices.
18. SCAP essentially froze each bank's balance sheet as of the starting date for the stress test. Beginning in 2014, CCAR actually assumed a small *increase* in the size of the balance sheet. The projection of an increase in the aggregate assets of major banks during a recession is somewhat counterintuitive. Defaults on loans will rise, trading books will decline in value, and demand for loans will fall. The assumption of an increase in bank balance sheets was made for the macroprudential purpose of ensuring that reductions in lending that *did* in fact occur during a recession would result from decreased demand rather than from capital constraints on banks that had suffered losses and could not acquire new assets (loans) without lowering their capital levels too close for risk management, market, or regulatory comfort. As noted below, this assumption of an increase has now reverted to the SCAP assumption of a constant size balance sheet.
19. The minimum post-stress common equity ratio was raised to 5% and then lowered to 4% before settling at the 4.5% level to conform to the U.S. banking agencies 2013 implementation of the Basel III capital reforms.
20. Another important difference between SCAP and CCAR related to the indeterminacy of the eventual actual shock was the addition of an assessment of the quality of each bank's capital planning process. If a bank's risk management and associated processes were deficient, the Board could issue “qualitative objects” to bank capital plans. The bank was then prohibited from executing its plan for share repurchases or dividend increases until the shortcomings had been remediated and a revised capital plan submitted. The rationale for this exercise was that many conceivable scenarios other than the one used in the supervisory test would have much greater idiosyncratic effects on some banks. The immediate motivation was the startling finding during SCAP that many of the country's largest banks lacked the ability to, for example, determine aggregated exposures to a single important counterparty across the various parts of a banks in anything less than a period of days. In the early years of CCAR, the Board lodged several “qualitative” objects to bank capital plans. The qualitative review has since been discontinued. Board of Governors of the Federal Reserve System, Press Release, Federal Reserve Board Announces It Will Limit the Use of The “Qualitative Objection” in its Comprehensive Capital Analysis and Review (CCAR) Exercise, Effective for the 2019 Cycle, March 6, 2019, available at <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20190306b.htm>.

Second, the Board created and used a supervisory model rather than reviewing and adjusting the results reported by each bank after running the scenarios through its own model. The supervisory model was not disclosed. But because the Board disclosed estimated losses for each major category of assets at each firm, banks and—to a somewhat lesser degree—outside analysts were able to develop progressively more information about the model. As we shall see, the question of how much information on the model should be released has been much contested.

Third, the CCAR banks were required to “pre-fund” any dividends, share repurchases, and other capital distributions that it might want to execute over the two-year horizon. In other words, a bank’s capital plan would not be approved unless the results of the stress test showed that its capital would remain above minimum required levels even under the hypothesized severely adverse scenario and even if it had made *all* the capital distributions contemplated for the succeeding two years.²¹ This too was a controversial feature, in large part because it meant that capital distributions would be more limited.²²

After five years, CCAR had helped prompt continued increases in the capital ratios of participating banks—by the Fed’s estimation, common equity capital ratios at banks subject to CCAR had risen from 4.9% in the first quarter of 2009 to 12.3% in the fourth quarter of 2018.²³ In part for this reason, and in part because both regulators and banks had become more efficient in executing the program, CCAR had also lost some of the drama of its early years. No longer did CNBC run in the corner of its screen a clock counting down the time until the results were to be released. Still, there was ample commentary on technical issues, regulatory inconsistencies, and opportunities for improvement—from banks, of course, but also from outside academics and analysts, and from Federal Reserve supervisors themselves. Accordingly, in 2015 the Board undertook a comprehensive review of CCAR.

Although the results of this review and an agenda for proposed modifications were shared publicly in September 2016,²⁴ implementation of the basic changes contemplated at that time was completed only in early 2020. Transforming a set of high-level decisions into regulatory form, as well as the ensuing notice-and-comment process once regulatory language was drafted, would normally have taken 18-24 months at best. But the 2016 election and subsequent change in leadership at the Federal Reserve delayed the

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21. Additionally, Fed supervisors created a soft ceiling for dividends of 30% of earnings by indicating in their instructions to firms for the annual exercises that a capital plan proposing higher dividends would be subject to “heightened scrutiny,” even though it would not be objected to on that ground alone. The rationale for this guideline was the observed stickiness of dividend increases relative to share repurchases. That is, once the board of directors of a firm increases dividends, it will generally be quite reluctant to reduce the payout later, fearing the reduction will signal weakness or concern to markets. Share repurchases, on the other hand, are not generally expected to be sustained at any given level over time, in large part because the traded price of a firm’s stock is a key factor in a board’s decision whether to initiate a share repurchase.
22. Some banks also observed, correctly, that the post-crisis addition to generally applicable capital requirements of a fixed “capital conservation buffer” above minimum capital levels meant that banks’ capital distributions would, as a legal matter, become progressively more restricted as capital fell progressively further into that buffer. Thus, the banks argued, the CCAR framework was built on an assumption that the banks would ignore their legal obligation to curtail capital distributions once the buffer was breached. When the Board of Governors eventually imposed capital surcharges that increased the size of those buffers for the largest banks, there came to be a clumsy inconsistency between CCAR and point-in-time capital requirements. Until the 2020 changes discussed below at p. 8, these capital surcharges for systemically important banks were not included in the CCAR buffer.
23. Staff Memo to Board of Governors on Draft Final Rule Regarding the Stress Capital Buffer, Feb. 19, 2020, available at <https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20200304a1.pdf>.
24. Daniel K. Tarullo, Next Steps in the Evolution of Stress Testing, Remarks at the Yale University School of Management Leaders Forum, New Haven, Connecticut, September 26, 2016, available at <https://www.federalreserve.gov/newsevents/speech/tarullo20160926a.htm>.

process further. While the broad outline of the changes was consistent with the 2016 announcement, the final version was considerably more bank-friendly.²⁵ There were three key changes from the original CCAR.

First, CCAR-derived capital requirements and generally applicable point-in-time-capital requirements were substantially integrated. This was achieved through reorienting CCAR to determine a “stress capital buffer” (SCB). The SCB is the largest projected decline in a firm’s common equity tier 1 (CET 1) capital ratio over the stress period. The SCB replaces the fixed 2.5% capital conservation buffer (CCB) applicable to all banks, though the SCB has a 2.5% floor.²⁶ Thus a bank may make capital distributions only to the point at which its CET 1 ratio equals the sum of the minimum 4.5%, the SCB, and—for G-SIBs—the applicable G-SIB surcharge.²⁷ As CET 1 dips below this level into the buffer zone, the bank’s capital distributions became progressively more restricted.

Second, there is no longer any post-stress leverage ratio requirement beyond the point-in-time capital requirements. That is, the SCB does not take into account declines below minimum leverage levels that are projected to occur during the stress period. The impact of this change on total capital requirements—that is, in the number of dollars of capital required to be held by a bank with a given portfolio—is uncertain. The change, much sought by banks whose capital constraint had been the post-stress leverage ratio,²⁸ is at least partially offset by the incorporation of G-SIB surcharges into the post-stress buffer. But there is no guarantee that a bank portfolio with higher proportions of low-risk-weighted assets will always require as much capital as before the change.

Third, various assumptions in CCAR have been relaxed. The two most important pertain to “pre-funding” and balance sheet size. The SCB includes only four quarters of dividends rather than all potential capital distributions during the two-year stress period, as was effectively the case in the original CCAR. The assumption of a modest increase in balance sheet size during the stress period was changed back to the SCAP assumption of a fixed balance sheet. Together, these and other changes in assumptions effectively reduce capital requirements for CCAR firms. However, again, the G-SIB surcharges provide an offset to these reductions for the eight systemically important banks (at least for CET 1).²⁹ Regional banks with over \$100 billion in assets, which have no capital surcharges, enjoy lower total capital requirements following adoption of the SCB approach.

Congress also triggered some changes in the regulatory role of stress testing in the 2018 Economic Growth, Regulatory Relief, and Consumer Protection Act.³⁰ This law generally raised the Dodd-Frank threshold for banks subject to additional prudential requirements from \$50 billion in assets to \$250

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25. Sufficiently so that then-Governor Lael Brainard, an early supporter of the switch to an SCB system, voted against the March 2020 regulation.

26. 12 C.F.R. §225.8(f)(2).

27. Thus banks in the SCB regime may have a capital requirement no higher than is calculated under the point-in-time requirements applicable to all banks if their SCBs are 2.5% or lower. The G-SIB surcharge applies to both point-in-time requirements and the SCB regime.

28. The Board’s SCB proposal in 2018 had included a post-stress leverage ratio requirement, as had been the case in the original 2011 CCAR rule.

29. At the time of adoption of the final rule, Vice Chair Quarles and Governor Brainard offered contrasting views of the net impact of the changes on required bank capital. The differences appeared, at least in part, to depend on the baseline selected for calculating the impact of the rule. Going forward, of course, the most important factors for determining SCBs are the supervisory model and the characteristics of the scenarios.

30. Public Law No. 115-174, 132 Stat. 1296, May 24, 2018.

billion in assets. It retained stress testing requirements for banks with between \$100 and \$250 billion in assets but with the somewhat vague proviso that they be on a “periodic” basis (in contrast to the requirement for annual tests established in Dodd-Frank).³¹ In implementing this part of the law, the Fed interpreted “periodic” as every other year—specifically even-numbered years.³² The law also changed the requirement for “at least three” scenarios to “at least two”—baseline and severely adverse.³³ While the “at least” language indicates that the Fed *could* use more than two scenarios (of which only one is a stress scenario), it has limited itself to the statutory minimum since the 2018 legislation.

In 2023 and 2024, the Fed included some additional scenario “elements” that reflect risks different from those in the severely adverse scenario.³⁴ However, as explained by the Fed, these scenarios are meant to provide information on “risks to the broader banking system, rather than focusing on firm-specific results.”³⁵ The results yielded by these additional elements are not included in the calculation of each bank’s SCB, and they are released only in aggregated form. Though the use of these exploratory elements could conceivably evolve over time, at least for now there is no connection to capital requirements.

II. Evaluating the Current Stress Testing Regime

Although changes in composition of the Board have obviously affected the relative dynamism of the stress testing process, trends over fifteen years of experience with stress testing provide a reasonable basis for evaluating its use as a key determinant of normal-time capital requirements.

A. Accomplishments and Advantages

Using a supervisory stress test in setting regular minimum capital requirements has had three basic advantages: First, capital requirements derived from stress testing results have been more risk-sensitive than standardized approaches, while avoiding the reliability problems of using banks’ internal models. Second, the stress testing component of the capital regulatory process has been useful in implementing or reinforcing other regulatory aims. Third, the availability of details about the results of the stress tests has helped inform regulatory, market, and banks’ own analyses of the capital positions and resiliency of covered firms.

The first type of advantage is closely related to the overall virtues of stress testing. As a dynamic, forward-looking approach to evaluating capital adequacy, stress testing is generally more risk-sensitive than backward-looking, standardized risk-weights. In particular, the scenarios against which the banks’ balance sheets are evaluated can include features that yield a better assessment of the impact on various asset classes for which standardized risk-weighting does not capture tail risk.

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31. §401(e), *codified as a note to* 12 U.S.C. §5365.

32. 12 C.F.R. § 252.44(d)(1). The Board gave banks with between \$100 and \$250 billion in assets the option of participating in the odd-year stress tests, presumably to allow them to more quickly escape a relatively large SCB produced in an even year stress test.

33. Public Law No. 115-174 §401(e), *codified at* 12 U.S.C. §5365(i)(B)(1).

34. Board of Governors of the Federal Reserve, Press Release, Federal Reserve Board Releases the Hypothetical Scenarios for its Annual Stress Test, February 15, 2024, <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20240215a.htm>.

35. *Id.*

The model-driven calculation of losses corrects, to at least some degree, for the stickiness of the book values that underlie traditional capital measures. The slow adjustment of book values in accordance with accounting conventions can produce a misleadingly favorable capital ratio during the early stages of high stress periods. Also, unlike point-in-time capital requirements, which are derived solely from the assets on a bank's balance sheet, the stress test projects the impact of an adverse scenario on bank revenues, thereby yielding a more complete picture of bank resiliency. Finally, unlike traditional approaches to capital regulation, stress testing can reveal the degree of loss correlations among asset classes.³⁶

Stress testing has also provided a point of entry for macroprudential considerations into setting firm-based capital requirements, though one that has been only modestly utilized to date. By testing all large bank balance sheets simultaneously, stress testing has given the Fed some insight into risks to the banking system as a whole. The supervisory model has also been constructed to offset somewhat the unhelpful pro-cyclical features of point-in-time capital requirements. So, for example, the Federal Reserve's stress testing scenarios assume an increase in unemployment to at least 10%, no matter how low unemployment might be at the outset of the period covered by the test.³⁷

It is important to distinguish between *higher* capital requirements and more *risk-sensitive* ones. While stress testing was an integral part of the Federal Reserve Board's program for increasing the capital levels of large banks in the eight years following the financial crisis, those levels could have been boosted through imposition of higher point-in-time capital requirements, either simple (like the leverage ratio) or complex (like the risk-weighted requirements in Basel III). The case for stress testing as the basis for regulatory capital requirements thus rests more on its informational advantages—that the considerably greater risk sensitivity of a stress test, especially to the effects of tail events, can achieve a specified degree of bank resiliency at lower cost to useful, sustainable credit intermediation than a point-in-time approach, which would have to set requirements much higher in order to cover possible tail events.

The second advantage of using stress testing as the basis for minimum capital requirements has been its connection to other post-GFC regulatory aims. In particular, the Board effectively combined into the CCAR process the separate Dodd-Frank mandates for stress testing and for imposing increasingly stringent capital requirements on more systemically important banks.³⁸ With the further integration of the G-SIB surcharges into the stress testing regime, as effected by the SCB approach, the most systemically important banks now always have higher risk-weighted capital requirements than do other banks. As discussed earlier, the 2.5% SCB floor means that the other large banks covered by stress testing

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36. Traditional approaches generally calibrate capital requirements based on historical losses of the assets on a firm's balance sheet. While these assets may be categorized with greater or lesser specificity, the capital requirement for each asset is determined only by reference to loss rates over time for that asset. The regulator may choose a capital requirement that is toward the high end of the range of historical losses or closer to the mid-point. Regardless, the correlation of losses across asset classes resulting from economic shocks is not considered. As a result, total capital requirements may not realize the regulator's choice of trade-off between increased near-term financial activity and potential future losses.

37. For discussion of other macroprudential features of the current stress testing regime, see Donald Kohn and Nellie Liang, *Understanding the Effects of the U.S. Stress Tests*, July 11, 2019, available at <https://www.brookings.edu/research/understanding-the-effects-of-the-u-s-stress-tests/>. The countercyclical potential of capital requirements based on stress tests is hindered by the widely recognized "resistance" of loss models to hypothesized serious recessions when the test is administered in a period of solid economic growth.

38. The requirement for progressively more stringent prudential standards, including risk-weighted capital requirements is set forth in §165 of the Dodd-Frank Act, codified at 12 U.S. Code §5365.

can never have lower requirements than under generally applicable risk-weighted capital rules. Depending on the stringency of the stress scenarios, they may have higher capital requirements.³⁹

As also mentioned earlier, the Federal Reserve used CCAR to further its aim of better risk management and capital planning practices at large banks. The prospect of a “qualitative object” certainly motivated senior management at the banks to drive improvements wanted by supervisors.⁴⁰ So, for example, supervisors’ longstanding concerns that certain banks were deficient in modelling tail events that posed idiosyncratic risks were finally addressed seriously by management. More generally, the data requirements for the stress test forced banks with flawed internal information systems to improve their data collection and management systems across all affiliates within their holding companies.

As evidenced by the elimination of the qualitative part of CCAR, there is no necessary link between stress testing and other regulatory aims. More stringent capital requirements for larger banks can be implemented solely through adding surcharges to point-in-time requirements, though perhaps at the cost of some efficiency. And improvements in risk management can be pursued through more traditional supervisory channels, though probably not with as much bite as when a bank faces disapproval of its capital distribution plan if its quantitative risk management is found wanting.⁴¹ To a considerable extent, then, the magnitude of this type of advantage for using stress testing to set capital requirements depends on the comparative effectiveness of alternative means for achieving other regulatory aims, given prevailing bank circumstances and the priorities of the Board of Governors.

A third advantage often mentioned for using stress testing as the basis for capital requirements is the information it generates for regulators, banks, and markets.⁴² It is difficult to say just how useful the stress test results have been for these different groups. Regulators obviously use the information in setting capital requirements. Additionally, supervisors may refocus their oversight of specific banks based on the results, which sometimes reveal a good deal about bank risks not apparent from even detailed balance sheets. It is harder to say how much bank executives learn from the supervisory exercise. Whatever the case, they are unlikely to admit to regulators or investors that their internal risk and capital assessments were exposed as inadequate by a supervisory stress test.

As to markets, the transparency of the results is surely a plus; the question is how big. Obviously, the results are relevant to investors because of their impact on bank capital requirements. It is less clear how much information the results convey to bank analysts and investors about the underlying condition of the banks, and thus how much the stress test may promote market discipline. It may be that stress test results are of most interest to markets when uncertainty is high. When the SCAP results were released in May 2009, as unemployment was rising rapidly and the potential impact of the recession on bank balance sheets was unclear, interest was very high. In the first couple of years of CCAR, interest also seemed high,

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39. As noted earlier, the SCB has a floor of 2.5%, equal to the generally applicable CCB. Thus, even if the severely adverse scenario turns out not to be so severe, a stress tested bank’s capital requirement can never dip below the level required under generally applicable capital standards. When the stress scenario is more severe, or when a bank’s balance sheet is peculiarly sensitive to the specific hypothesized stress, its CCB—and thus capital requirement—will be higher than that calculated under generally applicable capital standards.

40. Kohn & Liang at 5.

41. The virtues of stress testing in improving bank risk management are explained in Nellie Liang, Higher Capital is Not a Substitute for Stress Tests (April 24, 2017), <https://www.brookings.edu/articles/higher-capital-is-not-a-substitute-for-stress-tests/>.

42. See, for example, Ben S. Bernanke. “Stress Testing Banks: What Have We Learned?” April 8, 2013, at the “Maintaining Financial Stability: Holding a Tiger by the Tail” Financial Markets Conference, Stone Mountain, Georgia, <https://www.federalreserve.gov/newsevents/speech/bernanke20130408a.htm>.

perhaps because of questions about the ease with which banks could meet rising regulatory requirements. By 2014, though, the announcement of stress test results elicited less interest. The economy was growing steadily, if unspectacularly, and most bank capital levels were by then comfortably above anticipated stress losses. Still, research by staff at the Federal Reserve Bank of New York concluded from an investigation of the movement of various market prices around Fed stress test announcements that market participants reacted to the results even in calmer times, albeit less than during SCAP or the early years of annual stress testing.⁴³

B. Limitations and Disadvantages

While the supervisory stress testing regime of the last dozen years enjoys at least presumptive advantages over standardized point-in-time regulations or the use of banks' own models to set capital requirements, it has its own limitations and disadvantages. The limitations have been well-documented (and argued over) in an extensive literature critiquing the current approach and offering suggestions for improvement.⁴⁴ Most commentators contributing to this literature either explicitly or implicitly accept the superiority of a system that sets regulatory capital by reference to stress testing over one using only point-in-time requirements. That is, if asked, most would probably say that even the current third or fourth best approach is preferable to relying solely on standardized point-in-time requirements for achieving greater resiliency in large banks.⁴⁵ However, quite apart from the untapped potential for technical improvements, there may be disadvantages in the current regime relative to alternatives in which stress testing is not the starting point for setting large bank capital requirements. Foremost among these is the organizational inertia that appears to have taken root within the stress testing process.

Still, there are some general themes running through the academic and policy commentary on stress testing that are pertinent to the issue of whether stress testing should remain the basis for capital requirements. Not surprisingly, there is great emphasis on dynamism and adaptability in stress testing. This emphasis on dynamism stands in contrast to what I will shortly describe as the inertial institutional tendencies of regularized stress testing. Additionally, much of the literature—including by authors supportive of using stress testing to set capital requirements—suggests that one should not mistake the results of even a well-conducted stress test for a precise measure of the resiliency banks would need to

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43. Mark Flannery, Beverly Hirtle, and Anna Kovner. Evaluating the Information in the Federal Reserve Stress Tests, Federal Reserve Bank of New York Staff Report No. 744 (August 2016), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr744.pdf?sc_lang=en&hash=D484D0CE51AACEC127E440D4450348AC. A later paper reinforces the conclusions of this study by using the distinction between the DFAST results and CCAR results to help filter out the information conveyed in the latter as to the levels of bank capital distributions that will be forthcoming. Luca Guerrieri and Michele Modugno (2021). "The Information Content of Stress Test Announcements," Finance and Economics Discussion Series 2021-012. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2021.012>.
44. For a good compendium of criticisms and suggestions, see J. Doyne Farmer, Alissa M. Kleinnijenhuis, Til Schuermann, and Thom Wetzer, eds., *Handbook of Financial Stress Testing* (2022).
45. Most commentators who point out limitations are suggesting improvements to what they either explicitly or implicitly regard as the preferred means for setting large bank capital requirements. A few commentators, though, come close to suggesting the current regime is hopeless. Bulow and Klemperer, for example, thoroughly critique the stress test regime and offer a wholly different approach to capital requirements. Jeremy Bulow and Paul Klemperer, *Misdiagnosing Bank Capital Problems*, National Bureau of Economic Research Working Paper No. 29223, Sept. 2021, https://www.nber.org/system/files/working_papers/w29223/w29223.pdf. However, they do not express a preference for point-in-time capital requirements over the stress test.

remain viable intermediaries in the wake of actual financial and economic crises. Both these points are reflected in some of the most frequently offered proposals for changing the current annual stress test.

One is to use multiple scenarios rather than the single, necessarily speculative, severely adverse scenario used in the Fed's current annual test. The scenario used in SCAP in 2009 was a projection based on the financial shock that had already occurred. Indeed, six months had passed since the September 2008 events that led to the most acute period of financial instability. While supervisors did have to estimate the potential magnitudes of further declines in housing prices and other variables, the initial market shock had largely run its course and the sources of continuing strain on bank balances sheets were apparent. During non-stress times, the Fed has to construct a scenario that is necessarily wholly hypothetical. In doing so for its annual exercise, the Fed has derived the core elements of its scenario from "conditions that characterize post-war U.S. recessions," with primary reliance on the unemployment rate.⁴⁶ For the market shock component, the Fed uses what it calls a hybrid approach, which begins with key features of the 2008 market shock but can also include hypothetical elements reflecting perceptions of current risks.⁴⁷

But neither the Fed nor anyone else knows the actual stress scenario banks will one day face. The Fed certainly did not include a pandemic in any severely adverse scenario prior to COVID-19. And the impact of various possible shocks on bank losses and revenues can vary enormously. If regulators had followed current practice and used only one severely adverse scenario from year to year and the scenario in the years leading up to 2008 had not correctly anticipated the nationwide decline in housing prices and shock to mortgage-backed securities, some banks might still have been undercapitalized when the GFC began. Thus, even a rigorous stress test with but a single scenario risks engendering false confidence that banks are resilient to *any* severe stress.⁴⁸ Hence the frequent call for multiple scenarios in order to capture a wider set of possible severe stress.⁴⁹

A second frequently observed limitation of the current Fed stress test is that its macroprudential dimensions are relatively underdeveloped. In any actual financial crisis, the negative effect on banks does not end with the shock of reduced asset values and earnings. Feedback loops and second-order effects invariably ensue. In recognition of this history, many commentators have suggested incorporating factors such as fire sale effects and funding stress into the supervisory model to give a more accurate picture of bank resiliency. Indeed, this addition was part of the action plan resulting from the Fed's 2015-2016 review of stress testing, but it has never been implemented.

A third recurring criticism is that the reliance on book values of bank assets, as adjusted in accordance with generally accepted accounting principles, may give a misleadingly optimistic picture of bank

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46. Board of Governors of the Federal Reserve System, Amendments to Policy Statement on the Scenario Design Framework for Stress Testing, 84 Fed. Reg. 6651, 6658 (Feb. 28, 2019).

47. *Id.* at 6661-6662.

48. Some banking interests have suggested as much in arguing against additional regulation or for deregulation. This kind of self-interested claim from industry is common, though, and far from specific to stress testing. However, at times government regulators have also been a bit loose in how they characterize the results of the annual stress tests, neglecting to note some of the key limitations discussed in the text. Similarly, because media coverage of the stress test results tends toward broad statements about what the results reveal about banks' ability to withstand severe stress, the public may be under a misapprehension. While loose talk from the Fed is not helpful, it can easily be avoided just by officials being more precise in their comments.

49. As a theoretical matter, a test with dozens of scenarios might be optimal. As a practical matter, this would seem difficult to implement, even with the increased stress testing experience and efficiency of both banks and supervisors. In light of these practical considerations, many commentators have gravitated to proposals of between four and six scenarios.

resiliency in the face of severe stress. Perhaps the best illustration of this critique is the fact that securities that are classified by banks as held-to-maturity are valued at book for purposes of the stress test, even under macroeconomic conditions such as those that prevailed in 2023, when fast-rising interest rates had substantially reduced the market value of longer-dated bonds. There is a wide range of proposals for recognizing the potentially significant gap between book and market value. Most commentators propose a bottom-up effort to assign market values to some or all bank assets.⁵⁰ Recognizing how much noise can be present in market prices, many advocate incorporating only some market values or using a market-based exercise to check the results of the traditional stress test.

Taken as a whole, these and other criticisms of the current stress testing regime argue for more adaptability and supervisory discretion. Yet, while academic commentary and the conceptual foundations of stress testing both push in the direction of more dynamism, institutional factors push toward less. These factors are of two sorts. The first is the incentive structure for banks, or, more precisely, the advocacy efforts undertaken by banks and their representatives based on that incentive structure. The second—connected to, but not coincident with the first—is the effect of organizational motivations and constraints on Federal Reserve policies. Over time, these factors have made the stress testing regime, and thus the capital requirements emerging out of the CCAR and SCB processes, less dynamic and more predictable—that is, something closer to a variation on point-in-time capital requirements.

The desire of banks for a less dynamic capital regime has been strongly in evidence almost since the inception of the annual CCAR exercise. Like most firms, banks favor predictability in all the regulations to which they are subject so that they are better able to project the costs and consequences of operating, expanding, and diversifying their businesses. Predictability in capital requirements is especially helpful as they manage their capital policies, allowing them to plan for future dividends and other capital distributions more precisely. A dynamic stress testing regime means that the capital required for a given portfolio of assets will vary over time. Other things being equal, if capital requirements vary in ways that are not reasonably predictable, banks must maintain an additional cushion of capital above regulatory requirements. If they do not, they might find themselves compelled to reduce capital distributions when their required stress capital buffers increase because a later stress test projects materially higher losses for their portfolios.

Even if socially optimal capital requirements are higher than current actual requirements, the features of substantial unpredictability and fluctuation can create additional challenges for banks trying to attract investors.⁵¹ To the extent this circumstance increases the cost of banks' capital and adversely affects their competitive position vis-à-vis lenders not subject to prudential regulation, this could be a social—and not just a private—cost. It is difficult to quantify this effect, and the relatively predictable character of the current regime would suggest that it is not great. But conversations with bank investors suggest there is at

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50. A few propose taking the market value of the bank as a whole, derived from its publicly traded stock price, as the measure of its capital.
51. Standard finance theory would suggest that a constraint on dividends or share repurchases should not in itself make the equity shares of a bank less attractive. However, if the impact of the regulatory system is effectively to require a higher level of capital indefinitely because of the need for the buffer, then reasonable investor expectations may be affected. Also, of course, if a bank had already been running close to its stress capital buffer without significant capital distributions, it might find itself unable to distribute *any* capital.

least some impact.⁵² Even though this uncertainty is a feature of the regime, rather than a bug, it does carry some cost.

The variation in losses obviously follows if there are changes in the loss function for a particular asset or other features of the supervisory model. Potentially much more significant is the impact of changes in the annual stress scenario. Some assets and activities will fare better under the annual scenarios than others, even if all these scenarios can be fairly described as “severely adverse.” The more the Board tries to cover the range of possible shocks by varying the “salient risks” to the basic scenario from year to year, the more likely are material changes in the projected bank losses and revenues.

A simple illustration of this point is the difference between the two most recent actual shocks to the financial system. The first, preceding the Global Financial Crisis, involved a shock to the value of traded assets—especially, but far from exclusively, mortgage-backed securities. Firms with heavy involvement in the origination, trading, and holding on balance sheet of these securities were especially hard hit. The second, resulting from the virtual shutdown of the economy in March 2020 because of COVID-19, had a greater effect on the balance sheets of banks involved heavily in traditional lending activities. Were these two stress test scenarios to be run in consecutive years, traditional commercial banks would fare relatively better in the first and then face much higher projected losses in the second. Investment banks would face opposite results. In both cases, their stress capital buffers would be significantly different for the two years, even if the composition of their balances sheets was basically unchanged.

It is thus not surprising that banking interests have advocated slowing down changes in the supervisory model and scenarios by arguing that Administrative Procedure Act public notice-and-comment is required before the Federal Reserve can adopt or change the supervisory model or specify a stress test scenario.⁵³ Bank trade associations have periodically raised the decibel level on these calls, including implicit threat of legal action, during periods when the stress testing regime has been even *relatively* less predictable.⁵⁴

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52. Investors have also mentioned a related signaling effect. That is, when a particular bank’s SCB comes in especially high one year, investors may be uncertain as to whether this outcome is the result only of some peculiarity in the current scenario or whether it reflects significant problems in the bank—i.e., whether it will be evident again in the next year’s stress test and SCB. At the margin, this uncertainty may make the bank’s equity less attractive.
53. ⁵³ The notice-and-comment requirement of the Administrative Procedure Act involves publication of a proposed rule, a public comment period (often 60-90 days), agency evaluation of the comments, and then a final rule incorporating the changes that have been made. Interpretations of the APA by the courts over the years have imposed additional requirements on agencies, including the expectation of agency responses to all comments raising significant issues and a prohibition on changes in a final rule that are not “logical outgrowths” of the proposed rule. As a result of these interpretations, the process consumes at least six months for any rule eliciting significant comment.
54. In September 2016 the *Wall Street Journal* reported that a number of large banks were considering filing suit based on these arguments. Emily Glazer & Ryan Tracy, *Bank Groups Weigh Legal Challenge to Fed Stress Tests*, Wall S. J., Sept. 1, 2016, available at <https://www.wsj.com/articles/bank-groups-weigh-legal-challenge-to-fed-stress-tests-1472751110>. Later that month, a paper making the administrative law case against elements of the stress testing program was released by the Committee on Capital Markets Regulation, a group consisting mostly (though not entirely) of individuals with strong ties to the banking industry, including current bank employees, trade association employees, industry consultants, and former bankers. Committee on Capital Markets Regulation, *The Administrative Procedure Act and Federal Reserve Stress Tests* (September 2016), available at <https://www.wsj.com/public/resources/documents/StressTestStatement09-15-2016.pdf>. The Clearing House, a trade association consisting of most of the nation’s largest banks, subsequently echoed the Committee’s call for notice and comment. The Clearing House, *Submission to the U.S. Treasury Department: Aligning the U.S. Bank Regulatory Framework with the Core Principles of Financial Regulation*, May 2, 2017, at 12, available at https://www.theclearinghouse.org/~media/TCH/Documents/TCH%20WEEKLY/2017/20170502_TCH_Submission_to_UST_re

The pressures exerted by banks, lobbyists, and trade associations to make the stress test more predictable run the gamut from public complaints to private, more technical communications to Federal Reserve staff. In the face of these pressures, the dynamism of stress testing thus depends on the steadfastness of the Federal Reserve. Here institutional incentives and motivations are more complicated than for banks. But there are at least two reasons why, over time, the Fed may not be able to sustain the requisite dynamism.

First is the possibility that the members of the Board will be responsive to the urging of the banks and take steps to make stress tests more predictable. This is what happened during the 2018-2021 period.⁵⁵ More information about the supervisory model was released, and significant changes in the model are now phased in to allow banks time to adjust their portfolios. During that period, Fed leadership also publicly indicated sympathy for the banks' aim of less variability in stress test results, and thus capital requirements.⁵⁶ Though the Fed did not release the actual code of the supervisory model, it revealed enough relevant information that the banks probably have been able to substantially reverse engineer the model itself. The severely adverse scenario adopted by the Fed each year changed somewhat but not enough to make the loss functions for asset classes vary as much as actual losses from differing economic shocks. The "salient risks" added to the scenario became less consequential. The 2016 plan to incorporate the effects of fire sales and liquidity strains into the supervisory model appears to have been abandoned.

Since staff must take direction from the agency principals, one might be tempted to conclude that a change to a less bank-friendly composition of the Board would push the Fed back toward more rigor in its stress testing regime. This has been the case to some degree since Vice Chair Michael Barr was confirmed. But there has been only a modest rebound in the dynamism of the stress test. Here is where the second reason for questioning the Fed's ability to maintain dynamic stress testing—institutional inertia—becomes relevant.

At an organizational level, there are incentives that pull in opposite directions. One is the Board's financial stability mission, which favors a dynamic, rather than predictable, stress testing regime. The other is the tendency toward a regularized—perhaps bureaucratized—process that is characteristic of most organizations, especially those in which both the entity and individuals within it are subject to scrutiny and held accountable for outcomes.

Most people who have worked in larger organizations administering programs will recognize the tendency toward routinization and often some degree of ossification. Norms are established and routines develop for the good reasons of giving direction to the staff who administer a program, as well as clarity to

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[_Core_Principles_Study.pdf](#). As the stress test became more predictable and the Federal Reserve released more information on the supervisory model, these threats faded. After a moderately less predictable stress test and indications by Vice Chair for Supervision Michael Barr that some dynamism would be reinjected into the stress test (as, for example, through additional—though non-binding—scenarios), the pressure from banking interests returned. In July 2023, the Bank Policy Institute and the American Bankers Association filed a petition requesting that the Federal Reserve initiate a rulemaking process that would implement notice-and-comment procedures. <https://bpi.com/wp-content/uploads/2023/07/Petition-for-Rulemaking-and-FOIA-Request-for-Secret-Stress-Testing-Rules-vF-2023.07.24.pdf>. As of this writing, the Federal Reserve has not taken action on the petition.

55. With the exception of Governor Lael Brainard, Members of the Board also favored a number of regulatory changes that weakened capital requirements during this period. In the stress testing context, the elimination of a post-stress leverage ratio requirement is the most notable. Though obviously related when considered from the broader perspective of banks' effective resiliency, the calibration of quantitative capital requirements is conceptually distinct from the issue of dynamism in the stress test itself.

56. Vice Chair Randal Quarles, Stress Testing: A Decade of Continuity and Change, July 9, 2019, <https://www.federalreserve.gov/newsevents/speech/quarles20190709a.htm>.

those affected by it. In the usual situation in which organization principals are not continually involved in the details of the program, the original norms and routines at least generally reflect the decisions of principals. They also provide staff some insulation from criticism of their role in administering the program, precisely because they are following established practice. Change, on the other hand, will need to be justified, either *ex ante* in trying to convince principals or *ex post* if principals or stakeholders disagree with a change that has been made. For parallel reasons, principals who ultimately have to answer for the program will often prefer considerable regularity in program administration so that they are not surprised by staff innovations. Hence there is usually at least a moderately inertial tendency in program administration.

In theory, there would seem no bar to regularizing stress testing schedules, reporting, and other administrative processes while maintaining sufficient dynamism in the substance of the stress test itself. The Board's practice of having the Division of Financial Stability develop and present scenario options to Board members while the Division of Supervision and Regulation maintains the model and administers the test was one practical way the Fed tried to strike an appropriate balance. But it is hard to maintain dynamism in any regulatory program as it becomes more established. Where, as at the Federal Reserve, a committed and expert staff has invested considerable intellectual and organizational effort into a program, the external impetus needed to overcome inertial tendencies may grow.

Unless one is inside the Federal Reserve, evaluating the sources and degree of inertia necessarily involves a good bit of speculation and not much in the way of direct observation. Still, the organizational response of the Fed to the COVID-19 crisis lends at least some indirect support to the proposition that its organizational tendencies do tend in that direction.

The annual stress test—the first since the stress capital buffer approach had been adopted—was just underway in March 2020 as the dimensions of the COVID-19 crisis became clear. The resulting market turbulence and staggering declines in employment and GDP instantly rendered stale the “severely adverse” stress scenario announced only a few weeks before. The prospect of a protracted serious drag on the economy because of the medical need to restrict human gatherings injected enormous uncertainty into the economic outlook. It was immediately apparent that the stress scenario announced in February was not nearly as severe as the path the economy was following because of COVID-19.

Faced with this situation, the Fed might have invoked its stress testing regulation and required bank holding companies to submit new capital plans because “changes in financial markets or the macro-economic outlook that could have a material impact on a [bank holding company](#)'s risk profile and financial condition require the use of updated scenarios.”⁵⁷ Then it could have substituted a severely adverse scenario based on the COVID-19 shock and restarted the stress testing process. Indeed, as with the 2009 SCAP, stress testing is probably most useful in assessing capital adequacy soon after an actual shock, when the severely adverse scenario is based on a bad-case extrapolation of known, actual causes (as opposed to the hypothetical shock used in the annualized process for calculating capital requirements).

Yet the Fed continued with what it admitted was a stale scenario,⁵⁸ all the way to the originally scheduled announcement of the results in June. In apparent recognition of the absurdity of this course of

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57. 12 CFR §225.8(e)(4)(i)(B)(3).

58. Vice Chair for Supervision Randal K. Quarles, “The Adaptability of Stress Testing,” Remarks at Women in Housing and Finance, Washington, D.C., June 19, 2020

“This scenario, however, predated the serious economic effects of the COVID event, which began in March. This timing

action, the Fed also undertook a “sensitivity analysis” of bank balance sheets based on three possible scenarios for the COVID-19-afflicted economy. According to then Vice Chair for Supervision Randal Quarles, the scenarios were less detailed than those used in actual stress tests. Their purpose, said the Fed somewhat cryptically, was “to understand the implications of quite plausible downside scenarios from our current position for bank capital.”⁵⁹ On the date the stress test results were announced, the Fed also indicated that “[a]ll large banks will be required to resubmit and update their capital plans later this year to reflect current stresses, which will help firms re-assess their capital needs and maintain strong capital planning practices during this period of uncertainty.”⁶⁰ Later in 2020, the Fed did conduct a full-fledged stress test with an updated scenario, though it was not used to determine bank capital requirements.⁶¹ Additionally, of course, it was by then apparent that the massive fiscal and monetary stimulus earlier that year would prevent the economy from sinking into a prolonged, deep recession.

Why this confusing course of action? A cynical view is that Fed leadership was trying to accommodate the banks’ desire to continue paying dividends,⁶² which could have been thwarted by an up-to-date stress test showing potentially much larger losses through a prolonged recession.⁶³ There may be something to this view. But there were hints of what I have termed inertial tendencies, both in Vice Chair Quarles’ explanation of the curious course of action and in contemporaneous informal conversations among bankers, regulators, analysts, and academics. The most obvious was the argument, explicitly made by Vice Chair Quarles, that there wasn’t time to restart the stress test and meet the regular June deadline.⁶⁴ One also heard the suggestion, not included in any public Fed statement, that it was important for the Board to adhere to the regular process it follows each year.

It is impossible for an outsider to know just how much impact these kinds of considerations had on the Fed’s decisions. The outcome, though, was clear. In the face of the first crisis since ongoing capital requirements were derived from stress testing, the Fed continued the regular process for months, even as it acknowledged that something else was required.

To sum up: What I have characterized as “inertial tendencies” in the Federal Reserve’s stress testing regime appear to have had the following effects: (i) deterring adoption of improvements in the annual stress testing regime, including by adding a range of potential scenarios, enhancing the model to

... presented challenges and demanded changes to our usual process, and we responded with an approach that required more extensive analysis than normal. We simply would not have been doing our jobs if we had just run the test using a scenario framed before the economy began to deteriorate in March.”

59. *Id.*

60. Board of Governors of the Federal Reserve System, Press Release, Federal Reserve Board Releases Results of Stress Tests for 2020 and Additional Sensitivity Analyses Conducted in Light of the Coronavirus Event, June 25, 2020, *available at* <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20200625c.htm>.

61. Board of Governors of the Federal Reserve, Press Release, Federal Reserve Board Releases Second Round of Bank Stress Test Results, Dec. 18, 2020, *available at* <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20201218b.htm>. By December, unprecedented fiscal stimulus, including massive transfer payments to households, had largely allayed fears of a bank crisis, even as the public health crisis continued to rage.

62. This desire was publicly conveyed in an op-ed by the president of the Bank Policy Institute. Greg Baer, A Ban on U.S. Banks Issuing Dividends Would Be Bad Policy, *Financial Times*, May 24, 2020, *available at* <https://www.ft.com/content/182e8048-09f0-45bc-8365-0c0ba63a92ac>.

63. In fact, under the two less optimistic scenarios of the non-binding sensitivity analysis, “a number of firms could experience significant capital depletion and several would approach minimum capital requirements.” Board of Governors of the Federal Reserve, Assessment of Bank Capital during the Recent Coronavirus Event 14 (June 2020).

64. Quarles, Adaptability of Stress Testing.

incorporate secondary effects, and regularly adjusting the model in response to changes in credit markets; (ii) eroding the value of the current regime over time through facilitating effective reverse engineering of the supervisory model by banks and consistently using a fairly similar severely adverse scenario with less meaningful “salient risk” add-ons; (iii) risking a projection of false assurance that banks “passing” the annual stress test are resilient to *all* plausibly severe shocks; and (iv) inhibiting what is arguably the highest and best use of stress testing—at the early stages of potentially severe financial disturbance, where the severe scenario is an extrapolation of building pressures and the need to assess the capital adequacy of large banks urgent. These inertial tendencies are reinforced by the essentially continuous pressures from banking interests to modify the stress test so as to make it more predictable.

III. Policy Options

As always in policy decisions, the ultimate issue is not whether the status quo has problems but whether there is a viable alternative whose mix of advantages and disadvantages net out more favorably. In this section I consider the relative merits of, on the one hand, decoupling stress testing from the process of setting regular, normal-time capital requirements for large banks and, on the other, retaining a single severely adverse scenario and the current SCB process—that is, the status quo, perhaps with some incremental enhancements. First, though, I describe the outlines of a regime tying regular capital requirements to a genuinely dynamic stress testing regime. As will be explained, this approach is probably not a realistic option as a practical matter. But it is useful as a point of comparison with the two more realistic options, as it helps reveal the different advantages of the hypothetical, superior regime that will be lost in choosing one of these two.

A Hypothetical First-Best Regime

The hypothetical regime is best understood as the vision of stress test enthusiasts: The Federal Reserve would administer the annual stress test in a much more dynamic fashion than at present. The supervisory model would be regularly updated to reflect modeling advances, such as incorporating second-order effects like funding squeezes and fire sales. It would also be regularly adjusted to take account of changes in the composition of bank balance sheets and system-wide holdings of major asset classes. Each year there would be varying multiple scenarios, some of which would extrapolate relatively apparent contemporary risks (e.g., a big interest rate hike for the 2022 stress test) and others of which would reflect more discontinuous developments (e.g., a pandemic that shut down large parts of the economy, in a context of fiscal constraints that foreclosed the stimulus and assistance measures of 2020 and 2021). As at present, the SCB for each bank would be set by reference to the results of the stress test. When a shock hit, as with the collapse of mortgage-backed securities and housing prices in 2008, the Fed would quickly suspend capital distributions, devise a severely adverse scenario based on the shock, administer a stress test, and require whatever capital actions the test results suggested were necessary to ensure bank resiliency. In theory, the only feature of the regime just described that could not be achieved under current regulations would be the use of multiple scenarios, for which the Fed would need to undertake a notice-and-comment rulemaking process to change its regulation.

In the abstract, this option has considerable appeal. The use of multiple, varying scenarios would yield considerable additional information about the vulnerabilities of banks in a range of possible tail events. At least potentially, then, the resulting SCBs should boost the resiliency of the financial system. Similarly, the regular incorporation of advances in stress testing methodology into the supervisory model should

improve projections of the impact of financial stress on banks' ability to remain viable financial intermediaries. And, with the hypothesized feature of a standing willingness by the Fed to administer an ad hoc stress test in the early stages of financial turbulence, the most critical use of stress testing would be employed when needed.

Even at this abstract level, the Fed would face the nettlesome policy question of how the individual SCBs calculated by the model from the various scenarios would be translated into the presumptive SCB requirement binding on a bank. The highest yielded by any scenario? An average of all? An average of the top two? If truly novel scenarios were used—resulting in loss projections for certain asset classes well above historical ranges—the highest SCB, or even an average of the two highest, might be very high indeed. If the Fed's position was that banks should fully self-insure against all manner of tail events, this policy decision would be straightforward. But that posture would be a major departure from the implicit social welfare function behind capital requirements—one that weighs the costs of reduced financial intermediation against the benefits of avoiding the immediate and longer-term costs of financial crisis. Thus, quite apart from the prospect of substantial political pressure, the Fed would have reason to limit the chances of dramatically outlying SCBs by one or more means: by specifying that the binding SCB would be an average of those generated by the scenario, by avoiding “excessive” SCBs through opaquely exercising discretion in the administrative process between calculation of the SCB and announcement of the binding SCB, or by avoiding scenarios that might produce high outlier SCBs in the first place.⁶⁵

When we move from the abstract to the actual context in which this option would be proposed, adopted, and implemented, external and internal inertial tendencies assume even greater importance than under the current regime. A Board of Governors interested in this option would presumably be contemplating higher and more variable SCBs than under current practice, though possibly with a qualification for outlier SCBs. Although the size and variability of the resulting SCB buffers could be moderated by using the average of the scenario SCBs as the presumptive capital requirement, it is not clear how much greater resiliency this approach would yield over the current regime. If the Board were interested mostly in the additional information yielded by multiple and more creative scenarios, it could simply add some scenarios that are not used in the SCB calculation. (Indeed, the current Board appears to be doing just that, as discussed below.) Faced with the prospect of both higher and more variable capital requirements, the opposition from banking interests and their Congressional allies would likely be intense. Given the growing indications that banks are willing to challenge agency regulations in court, the battle could be waged on political, policy, and legal grounds.⁶⁶

It seems fair to presume that a Board willing to make a proposal along these lines would understand its implications and have the requisite determination to see it through. Assuming the new regime was not quickly derailed by a legal challenge, one could also anticipate that it would be implemented robustly in its early years. The question is how enduring the rigor would be. Bank lobbying would continue, of course. The more dynamic the new regime, the more vigorous that lobbying would likely be. Moreover, since it is unlikely that the Fed could take as detailed and careful approach to running half a dozen scenarios as it does with today's single severely adverse scenario, the opportunities for banks' technical complaints would increase. Change in the composition of the Board would almost surely lead to a

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65. The last suggested option would, of course, negate some of the benefits of using multiple scenarios in the first place.

66. In addition to standard industry arguments in a challenge to a regulation, banks might argue that the 2018 legislative change removing the *requirement* for an adverse scenario should be read to preclude the *option* of the Fed using multiple scenarios, at least to the extent that they are direct inputs into the calculation of a bank's capital requirement. While this is not what the amended law says, some federal courts are now receptive to what not so long ago would have regarded as weak industry arguments against regulation.

periodic dilution of the regime, just as it did in the 2018-2021 period. The institutional forces discussed earlier would likely reappear over time. In short, even if what presently appears the unlikely prospect of a dynamic linked regime were to be realized, it could be difficult to sustain.

Decoupling Stress Testing from Regular Capital Requirements

One realistic option is to decouple the annual stress test required by the Dodd-Frank Act from setting the regular, ongoing capital requirements of large banks. That is, the SCB framework would be eliminated, and the binding capital requirements of large banks would generally be those set forth in notice-and-comment regulations. However, as explained below, the stress test results could be used to inform both changes in those regulations and possible issuance of directives requiring specific banks to increase their capital ratios because of significant idiosyncratic risks.

Even with a decreasingly dynamic stress testing regime, there *has* been a significant increase in the resiliency of the very largest banks since the Global Financial Crisis. To preserve these gains, this option would require increasing the fixed capital conservation buffer for large banks from the current 2.5% level applicable to all banks. It is true that, reflecting in part the diminished dynamism of the regime, recent stress tests have resulted in SCBs no higher than that level for up to half of the large banks. But, as shown in Table 1, SCBs for the rest *have* been at least modestly larger. Moreover, for most of the CCAR years, effective capital requirements were higher—sometimes considerably so—for most participating banks. Thus, a simple reversion to existing requirements in generally applicable regulations would be a *reduction* in capital requirements for the largest banks—absent, of course, a substantial increase in point-in-time requirements, perhaps of the magnitude contemplated in the Basel III endgame proposal issued by the banking agencies in July 2023. It would also sit uncomfortably with the Dodd-Frank requirement of progressively greater resiliency for banks of greater systemic importance.⁶⁷

Table 1. Number of Banks with Stress Capital Buffers in Specified Range

	2.5%	> 2.5% but ≤ 4%	FBOs > 4%	U.S. Banks >4 %
2020	16	7	8	3 GS, MS, Cap One
2021	16	10	6	2 GS, MS
2022	13	11	7	3 GS, MS, M&T
2023	15	7	8	4 GS, MS, Cap One, Citi

Source: Board of Governors of the Federal Reserve, *Large Bank Capital Requirements Annual Release*

Note: Each annual release by the Board lists all 34 banks subject to the supervisory stress test. However, because banks with between \$100 and \$250 billion of assets can elect to skip the stress test in odd numbered years, and to retain their SCBs from the previous year, some of the results for those years are carried over from the previous year’s test.

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67. While the eight G-SIBs would still be subject to surcharges, a superregional bank with—for example—\$500 billion in assets would, after decoupling, have the same capital requirement as a \$50 billion bank unless its CCB was increased. Under the current regime, that bank might still have the same requirement—again, a circumstance that sits uneasily with Dodd-Frank requirements. But there is a reasonable chance that the requirement will be modestly higher in any given year, as shown in columns 2 and 4 of Table 1.

The questions of how much the capital conservation buffer would be raised and whether the increase would be the same for all banks with more than \$100 billion in assets would obviously be critical for all sides in weighing this alternative approach. The starting point for discussion would probably be some average or range of SCBs or their functional equivalent during the CCAR period. One could, of course, start from scratch or use other metrics. But, as a practical matter, the dozen years of experience will likely be the closest thing to a common frame of reference that can be found. From that starting point, of course, all sides could make their cases for how to calculate the “average” and why past results yielded capital requirements that were too strict, too lax, or reasonable. One salient consideration in setting CCBs for large banks is the consistently higher SCB range of banks with a high proportion of traded assets on their balance sheets (Goldman Sachs, Morgan Stanley, and many of the foreign banking organizations). It is still possible (though at this point far from clear) that the changes to the capital rules in the so-called Basel III endgame rulemaking will increase point-in-time requirements for the trading book in a way that would largely offset the effect of decoupling. If not, it would be advisable to structure an increase in the CCB to reflect the consistently higher SCBs of this subgroup of banks.

There are several potential advantages of this alternative. First, by establishing higher point-in-time capital buffer requirements, it guards against the diminution in resiliency that has come from the loss of dynamism in stress testing, even as nominal capital requirements remained the same. Consider, for example, that in the middle of the COVID-19 crisis nearly half the banks subject to the stale, early-2020 stress test were found to require stress capital buffers no higher than the 2.5% floor set by the generally applicable capital conservation buffer.⁶⁸ A future Board could, of course, lower the increased CCBs. But, in contrast to the opaque relaxation effected through more predictable stress testing with fewer consequential salient risk add-ons, there would be full transparency around a notice-and-comment rulemaking to lower the CCBs.

Second, it should foster more dynamism in the annual stress tests. As explained earlier, a single hypothetical scenario reveals considerably less information about the resiliency of the banking system than, say, four or five scenarios. While the first option of multiple, capital-determining scenarios would yield more information, the continued link of the results to ongoing capital requirements would likely increase lobbying and institutional pressures, at least over time. Freed from most of these pressures, the annual exercise would allow the Board greater scope for projecting the systemic consequences of widely differing—but conceivable—adverse scenarios. Similarly, once the stress test is decoupled from the process of setting near-term capital requirements, Fed staff will have more flexibility in modifying the supervisory model to account for financial market changes or to address some of the current limitations in stress testing (e.g., through incorporating features that track second-order effects or experimenting with mark-to-market adjustments to bank balance sheets before testing for losses).

Third, this alternative should remove many of the institutional inhibitions against conducting an ad hoc, customized stress test in the early stages of a significant shock to the economy or financial system. There should no longer be concern that an ad hoc test would imply that the regular test was somehow incorrect or that the Fed was not “standing behind” its earlier test. Thus, what is arguably the most valuable use of stress testing would more likely be deployed in a timely fashion.

Fourth, while the annual stress tests would no longer play a direct role in determining regular, ongoing capital requirements of each bank, the information generated would still be useful to the banking

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68. Board of Governors of the Federal Reserve System, Press Release, Federal Reserve Board Announces Individual Large Bank Capital Requirements, Aug. 10, 2020, *available at* <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20200810a.htm>.

agencies in establishing minimum capital levels—both generally applicable standards and requirements for a specific bank. As to the former, the results yielded by stressing multiple scenarios over several years could suggest, for example, that the risk weights assigned certain asset classes in generally applicable capital regulations were in need of adjustment. Similarly, if a range of scenarios over several years suggested that the minimum common equity capital ratio was not appropriate for large banks as a whole, the agencies could undertake a review of CCB levels. In both circumstances, the stress test results would have provided solid data in support of the change, which in any case would be effected through notice-and-comment rulemaking.

With respect to specific banks, the stress test results could be highly relevant data for Board decisions on issuing capital directives, which require specific banks to raise their capital ratios based on supervisory assessment of their specific risks.⁶⁹ The Fed’s broad authority to issue capital directives has not been used for large banks in the post-Global Financial Crisis period, when annual stress testing was intended to routinely produce higher capital requirements for banks facing higher risk. With the annual stress test no longer directly affecting capital requirements, the Fed could dust off this authority. For example, if the results across several of the scenarios over consecutive years suggested that the generally applicable capital requirements did not capture the idiosyncratic risks of a bank, the Fed might begin a review of that bank’s overall capital position. If a deeper supervisory dive into the bank’s capital position confirmed the vulnerability, a capital directive could be issued instructing that bank to raise its capital ratio.⁷⁰ As with changes in generally applicable capital requirements, the stress test results will have provided support for a directive.

Fifth, decoupling would relieve a good bit of the uncertainty in capital planning faced by banks and investors when the annual stress test changes capital requirements from year to year. Of course, with a predictable or softened stress testing regime, that uncertainty is not currently especially high for most large banks. But it has not disappeared. And, as compared to a dynamic, multi-scenario approach of the sort envisioned in Option 1, the decoupling approach would eliminate the potential for an unpleasant surprise in the form of an anomalously higher SCB in one annual stress test. Obviously, the trade-off for banks is that their permanent CCB would be higher.

Decoupling the annual stress tests from ordinary capital requirements would carry disadvantages as well. First, at least some risk sensitivity would likely be lost. Even a less dynamic stress test will likely capture some firm-specific risks better than the risk categories included in the standardized method for capital requirements applicable to all banks. Opportunities for regulatory arbitrage would also increase in a capital regime dominantly based on infrequently changing point-in-time capital requirements, though it is hard to say by how much relative to the current situation, in which banks have most of what they need to reverse engineer the code of the supervisory stress test model. Both circumstances are reasons why achieving a comparable level of resiliency solely with point-in-time capital requirements would require higher capital levels than with a moderately predictable stress test.

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69. This authority was enacted by Congress in the International Lending Supervisory Act of 1983, as a direct response to a judicial decision that had overturned an FDIC order that a bank increase its capital. For an explanation of the background and scope of capital directive authority, see Daniel K. Tarullo, *Bank Supervision and Administrative Law*, 2022 *Columbia Business Law Review* 279, 335-339 (2022).

70. Obviously the inclination of the Fed or another banking agency to issue a capital directive of this sort would vary with leadership changes. So, it is quite possible that there would be long stretches when this authority was not invoked. Arguably, though, the higher permanent CCB for large banks would ensure a higher level of resiliency than the current regime, under which the Fed can adopt scenarios that yield SCBs no higher than the current CCB for many banks, and the predictability of the stress test might be overstating the resiliency suggested by the results.

Second, if stress testing were regularly used as the basis for directives requiring higher capital levels at specific firms, the inertial tendencies described earlier might reappear. Banks would refocus their lobbying energies on the capital directive process, and the Fed might once again fall into a somewhat bureaucratized practice that undermined the dynamic attributes of the new regime. Indeed, with less transparency around firm-specific capital directives than the CCAR or SCB processes, the situation might actually be somewhat worse.

The best way to foreclose this outcome would be to avoid using capital directives so regularly that they became an effective part of ordinary capital requirements. Were the Board to determine each year that a significant percentage of large banks should have higher capital levels than prevailing regulations require, then it should revise those regulations to reflect what would have been revealed as something more than idiosyncratic or transitory risks—by adjusting risk weights, CCBs, or both through a rulemaking process. To the extent the Board was tempted to use the administratively easier route of frequently issuing capital directives, it would invite the kind of lobbying pressure and litigation threats that we currently observe.

Third, decoupling stress testing from regular capital requirements would likely reduce the effort now devoted to the exercise by the Fed and banks alike. While the current regime has incentivized the banks to lobby for less dynamism in stress testing, it also motivated senior management to pay close attention to the entire process. When the possibility of a qualitative objection loomed, banks invested substantial resources in improving their modelling, risk management, and capital planning processes. Even without that threat, management is still attuned to the outcomes of the test, as well as how to arbitrage it.⁷¹ A decoupling from ongoing capital requirements would almost surely reduce the attention and resources banks devote to stress testing. Similarly, right now the stress test and associated process engage many of the best staff and, at important decision points in the process, senior Fed staff and Governors—including the Board vote on the large bank capital requirements announced each August following the June stress test results. If there are no longer meaningful direct stakes in the annual stress test, key personnel will probably be considerably less involved. As a result, the capacity of the Fed to mobilize for an efficient, high-quality stress test may be diminished.

Ironically, the very consequences of the annual stress test that nurture inertial tendencies also attract high-value resources, and a lot of them, at both the banks and the Fed. There may be ways to limit the impact on stress testing capacities. But it is very likely that some loss of capacity and readiness would be a cost of the alternative approach. Under this option, then, while the Fed would be more likely to launch a stress test at the early stages of serious financial turbulence, that test might be less well done.

Fourth, there would be the potential for confusion around the significance of the stress test results. The Fed would need to decide whether to release the results of all the scenarios on a bank-by-bank basis. If it released only aggregate results,⁷² there would be a loss of whatever information investors and counterparties find useful in the current, reasonably detailed bank results released by the Fed. Banks might, in that circumstance, come under pressure from analysts to themselves release the results. While the Fed could prohibit them from doing so, some market speculation about potential adverse results might ensue. If, on the other hand, the Fed *did* release each bank's results for each scenario, there could be a milder version of the problem discussed under Option 1. Members of Congress, journalists, and

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71. In theory, the Fed can still ride herd over banks' practices through its normal supervisory channels. In practice, though, Board leadership appeared to have deemphasized supervisory oversight in the 2018-2021 period, though with new leadership and the raw experience of the failure of Silicon Valley Bank, the Fed may now be reinvigorating supervision.

72. Section 165 of the Dodd-Frank Act requires publication of a "summary" of the Fed's stress test results. 12 U.S.C. §5365(i)(1)(B)(5). The scope of that summary is left to the Fed's discretion, but it does not have the option of releasing no information at all.

others might ask why every bank was not being asked to raise its capital in light of a result suggesting its losses under one or more scenarios would exceed its now higher CCB. Although this situation might not be as awkward as one in which the multiple scenarios were part of an SCB process, it could still be challenging. While the Fed could explain that no one scenario can sensibly determine a firm's capital requirements and that it has the option of issuing capital directives in appropriate circumstances, there would likely still be some confusion as to just what purposes the stress tests were intended to serve.

The Status Quo

In any policy decision, the status quo is always an option. In the present context, one might characterize as the status quo any option that does not require a change in notice-and-comment regulations (or statutes, of course). However, it should be noted that if the Board of Governors were committed to making a stress test linked to capital requirements more dynamic, it could approximate much of what I described in my hypothetical dynamic linked regime without a regulatory change (the use of multiple scenarios to determine the SCB *would* require a change in the regulations).⁷³ In separating them, I mean to present an option that posits something like the actual status quo—one in which a combination of external and internal tendencies has limited the dynamism of the SCB process and will continue to do so.

The early part of this paper discussed many of the downsides of the status quo in the form of what I have labelled inertial tendencies. To those issues one might add the potential for significant fluctuation in capital requirements for large banks, depending on the composition of the Board of Governors—especially the Chair and Vice Chair for Supervision. In the last few years, we have seen how, even with the effects of the inertial tendencies, the relative rigor and dynamism of the annual SCB exercise has varied with the change in leadership of the Fed's bank regulation function. If this pattern is repeated, capital requirements will regularly rise and fall significantly depending on the occupant of the White House. While regulation of all sorts is obviously affected by national elections, this kind of fluctuation in bank capital regulation—effected opaquely, with no changes in applicable regulations—does not seem an especially good outcome for either financial stability or the banks themselves.

In a system linking a dynamic stress test to regular capital requirements, the variability of any bank's SCB from year to year is a feature rather than a bug. The presumed cohesiveness of the system over time is meant to achieve greater resiliency of large banks in the face of unpredictable tail events, even at the cost of some difficulties in banks' capital planning and some uncertainty for bank investors. The variability produced by the status quo, on the other hand, arises in significant part from changes in Fed leadership resulting from a change in the occupant of the White House. The fluctuations in capital requirements do not reflect the unpredictability of financial stress events so much as the different policy preferences of different administrations.

While the banks themselves might be happy to distribute more capital to shareholders during the periods in which Fed leadership favored less stressful tests, their capital planning would be further complicated by the need to anticipate higher SCBs should administrations change. In fact, the less significant the internal inertial tendencies, the greater the likely variability, since the policy leanings of the Board would play a relatively greater role in determining the dynamism and rigor of the stress test. The alternative, as contemplated in the decoupling option, would be a higher CCB for the larger banks across

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73. In fact, assuming the Fed would eventually decide not to set the SCB solely on the basis of the losses projected under the worst scenario for each bank in a multi-scenario stress test, a more dynamic approach to model changes and the design of each year's single severely adverse scenario would carry the advantage of avoiding the potential awkwardness of having to explain why a bank's SCB was set below what its losses would be under one or more of the scenarios.

administrations but not one as high as some SCBs during periods when appointees with stronger regulatory inclinations led the Fed. That alternative, second best though it may be for all sides, could be preferable as a more stable equilibrium point in the trade-off between guarding against the costs of financial crises and promoting normal-time economic growth through increased credit intermediation.

Two advantages of maintaining the current regime, even with its shortcomings, have also been noted earlier. First, even a substantially less dynamic regime is somewhat more risk sensitive than exclusive reliance on point-in-time capital requirements. The existing stress test does reveal at least some system-wide effects of severely adverse scenarios. Moreover, even under a largely predictable scenario, the assumptions of adverse changes in various asset prices such as commercial real estate may still require highly exposed banks to increase their capital buffers. Second, the greater stakes associated with the link between the annual stress test and regular, binding capital requirements means that both the Fed and the banks are likely to devote more resources to it and to involve senior officials and management. If and when an ad hoc stress test is launched in response to an incipient financial crisis, everyone will to some degree be better prepared than in a regime like Option 2, under which there are no immediate, direct consequences from the annual stress test results.

A third advantage of the status quo, especially from the Fed's perspective, is that the decoupling option would entail significant transition costs for what may be uncertain benefits. Decoupling would involve rulemaking to set higher SCBs for larger banks. And, since capital directives have to date been used only infrequently, a process for determining when and how they should be issued would need to be developed. Both features would likely elicit at least some bank opposition.⁷⁴

Before concluding, I should note that capitulating to the demands of some banks and trade associations that annual stress test scenarios and changes in the supervisory model be adopted only after public notice and comment would further degrade the status quo method of setting regular capital requirements.

Were the scenarios for the stress test put out for notice and comment, there would be two new possibilities for reducing capital requirements. First, the Federal Reserve might significantly reduce the severity of the scenario, either because it was convinced by the banks' arguments or as a defensive maneuver to reduce litigation risk. While this would be the best outcome from the banks' perspective, substantial changes in the scenario would probably not be the usual result. The second possibility, though, would nearly always be realized. By having earlier knowledge of the principal features of the scenario under consideration, banks would have more time to adjust their balance sheets to reduce assets that would be especially hard hit in that scenario, in favor of assets that fared relatively well. After all, if one has the questions in advance, one is likely to do much better on the test.⁷⁵ By critiquing each element of the proposed scenario which, under a traditional understanding of administrative law, would require the Board to respond to these comments, banking interests would presumably be able to stretch the period between proposal and final scenario out for many months. The longer the delay, the more opportunity for favorable balance sheets shifts, which could be partially or wholly reversed following the test.⁷⁶ Finally,

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74. Of course, banks might be enthusiastic about an Option 2 without an increase in their CCBs. But that de facto reduction in capital requirements for the largest banks would be controversial, to say the least. It would certainly make me decidedly opposed to its adoption.

75. Under current practice, the stress test is performed on bank balance sheets as they stood prior to the release of the scenarios. Thus, there is no opportunity to shift assets to a more favorable mix.

76. A preview of what might happen were scenarios to be put out for notice and comment was provided in a blog posting by an employee of a bank trade association after the scenarios were published in 2018. The posting suggested that the Fed would

because of administrative law requirements for notice-and-comment rulemaking, the Fed would not likely be able to substitute a significantly different scenario between its proposal and its adoption of one or more scenarios.⁷⁷

This kind of delay would be especially undesirable if the Fed were conducting a special stress test with a scenario that extrapolated from an actual stress episode. In that circumstance, the very purpose of the test is to assess quickly whether large banks have enough capital to weather a relatively bad outcome from events already underway.⁷⁸

In addition to delay in scenario development, banks simply want to have the full code of the supervisory model.⁷⁹ From the banks' perspective, this is an entirely understandable request. With the model in hand, banks will better be able to calculate the marginal impact on their capital requirements of taking specified assets onto their balance sheets. This knowledge will help them to lend or buy more efficiently given their own risk preferences. That effect, in turn, can both boost bank profits and increase growth-enhancing activity in the economy. It also makes planning capital distributions easier. But this knowledge comes with significant costs to a regulatory approach that tries to set capital requirements with an eye to new or plausible risks. The now well-known story of how Fannie Mae and Freddie Mac gamed the static stress test used by their regulator is a cautionary tale.⁸⁰ For example, when regulated entities have all the details of the model, they can concentrate asset holdings just on the more favorable side of a line demarcating increased riskiness. So, in Lucas Critique fashion, a measure of risk that was reasonable given *ex ante* distributions of assets becomes less accurate as firms target that measure.⁸¹ While banking

... need to provide a convincing explanation for why it chose "a 65% drop in the stock market, and not 50% (or 70%)," a 30% decline in housing prices, why the yield curve was assumed to steepen as it did in the scenario, why unemployment rose so suddenly, and "[w]hat about the rest of the 28 variables." Jeremy Newell, "The Fed's 2018 CCAR Scenarios: A Look at Process," Bank Policy Institute Blog, March 2, 2018, available at <https://bpi.com/the-feds-2018-ccar-scenarios-a-look-at-process/>. The demand that each variable in a stress scenario be "right" reflects a misunderstanding of stress testing, which by definition is projecting hypothetical, though plausible, scenarios. However, the more salient point is that this blog post suggested the intention of the trade association representing most of the largest banks in the country to litigate each element of the Fed's scenario.

77. The test applied by courts is whether changes made by an agency from its proposal to its final rule were a "logical outgrowth" of the original proposed as published in the Federal Register.
78. Of course, were the Fed to suspend capital distributions at the beginning of the comment period on the crisis scenario, this possibility would be foreclosed. The contemplated suspension of capital distributions during the pendency of such a test was included in the Fed's CCAR regulation because of the experience in 2007 and 2008, during which some banks that would later need federal assistance continued to make capital distributions as the housing and mortgage crises deepened. A delay of several months could nonetheless make it more difficult for a bank to raise capital in the early stages of a potential financial crisis should the stress test reveal that it could face a capital deficiency even with a suspension of capital distributions.
79. See, e.g., Bank Policy Institute, Letter to Ann Misback, Esq., Secretary, Board of Governors of the Federal Reserve System on Stress Testing Transparency Proposals (Docket Nos. OP-1586, OP-1587 and OP-1588), Jan. 22, 2018, at 6-7, available at https://bpi.com/wp-content/uploads/2018/07/20180122_tch_comment_letter_re_stress_testing_transparency.pdf. This demand was repeated in the bank trade associations petition for rulemaking in July 2023.
80. W. Scott Frame, Kristopher Gerardi, and Paul S. Willen, The Failure of Supervisory Stress Testing: Fannie Mae, Freddie Mac, and OFHEO, Federal Reserve Bank of Atlanta Working Paper 2015-3, March 2015, available at <https://www.atlantafed.org/-/media/documents/research/publications/wp/2015/03.pdf>.
81. A simple example may help here: If the stress model assigns a higher loss function to revolving credit extended to consumers with a FICO score below 630, banks can reduce their capital requirements by lending more to consumers with FICO scores just over the cut-off and lending less to consumers just below the cut-off. Lenders could also coach their customers how to raise their scores just enough. So with what would likely be only a modest decrease in actual risk and in the interest rate they could

interests usually deny that banks will game stress tests if they have full information on the model, there is some evidence of banks temporarily shifting assets to reduce measured market risk during the lead-up to the Federal Reserve’s annual supervisory stress test.⁸²

By further eroding the already compromised dynamic of the stress test, advance notice of scenarios and model changes would render the status quo even more troubling. Should the Fed incline toward a very defensive litigation posture that sought to eliminate any risk of a loss in court, the case for decoupling becomes much stronger.

IV. Conclusion

My primary purpose has been to provoke discussion of the relationship between annual stress testing and regular, ongoing capital requirements. However, readers of options papers are often interested in the recommendation of the drafter. Furthermore, many readers are doubtless aware that I oversaw bank supervision and regulation at the Fed at the time the direct link between stress testing and capital requirements was established in 2012. In closing, then, I offer some thoughts on each approach. As will become apparent, I feel considerable ambivalence—indeed, tentativeness—even as I lean toward the decoupling approach.

During the early years of the CCAR program, many of us at the Fed anticipated that we would be taking an approach close to what I now describe as a politically and institutionally unrealistic hypothetical regime in which a dynamic stress testing process is linked to regular capital requirements for large banks. Of course, we recognized that some enhancements would need to wait until both the banks and the Fed had become more efficient in executing the stress test. So, for example, the use of multiple severely adverse scenarios was likely some years off. But we expected that both the supervisory stress test model and the CCAR process would regularly evolve. As explained in Part I, that expectation was largely borne out, both incrementally in the first several years and in the 2015-2016 review and plan for more significant changes.

Not surprisingly, then, my hypothetical regime—with its substantial continuing dynamism—remains my preference as a conceptual matter. As suggested earlier, if multiple scenarios are chosen so as truly to test a range of plausible adverse outcomes, there would probably need to be a mechanism for smoothing

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charge, a bank could materially lower its capital requirements.

Knowledge of the model code becomes relatively less useful if there are multiple scenarios or if single severely adverse scenarios differ substantially from year to year. And release of the model code could yield public benefit in the form of comment from finance economists and others without ties to the banking industry, whose analysis and suggestions could put the self-interested arguments of the banking industry in perspective. Still, one suspects that well-financed and highly motivated banking interests would outgun academics and other disinterested policy commentators in a recurring notice-and-comment process for model changes.

82. See Phillip Alexander, How Banks Game Stress Tests: The ‘Shocking’ Truth, Risk.net, Sept. 30, 2019, *available at* <https://www.risk.net/regulation/6989811/how-banks-game-stress-tests-the-shocking-truth>. Representatives of banking interests have also argued that using knowledge of models is no more “gaming” than any adjustment by a regulated company to regulatory requirements. Greg Baer, Bank Policy Institute, Misunderstanding the Fed’s Stress Test: Cost & Consequences, July 14, 2022, <https://bpi.com/misunderstanding-the-feds-stress-test-cost-consequences>. This argument ignores the basic difference between a regulation that sets a requirement and a stress *test* that is necessarily not testing for all possible adverse conditions. Having the scenarios and model code in advance is equivalent to giving students advance knowledge of the questions they will be asked on an exam. Even if they perform admirably, the teacher has no way of assessing how well they know the material not tested.

potentially dramatic fluctuations in a bank’s SCB. In general, though, it would be the most effective approach to promoting systemic stability.

However, I have reluctantly concluded that the dynamism of the early years of the CCAR process cannot be recaptured, much less sustained. The changes in the composition of the Board in the last few years have reinjected a bit of innovation into the SCB process. But there has been no indication of renewed intention to incorporate secondary effects into the supervisory model, as contemplated by the Board in 2016. The 2024 severely adverse scenario, relevant for all 34 stress tested banks, resembles that of the preceding year. The 2024 market shock, applied to only the most systemically important banks, *was* materially different than that of preceding years. Perhaps the Board will build on its use of “exploratory” elements in this year’s test to eventually include multiple scenarios that “count” in calculating the SCB. And perhaps it will eventually make more frequent refinements to the supervisory stress model. But it has given no indication of such an intent.⁸³

Perhaps the most that can now realistically be hoped for is that the annual stress test would present a severely adverse scenario based upon a bad outcome from the most salient risks of the moment, accompanied by exploratory scenarios whose results would not be included in the calculation of each bank’s SCB. That is, there would be less continuity in the severely adverse scenario from year to year than is currently the case. Rather than beginning with a severe recession scenario derived from past experience and then adding some “salient risks,” the Board would begin with the salient risks and build out the whole scenario from them.

In many respects, the approach described in the preceding paragraph is similar to current practice. Indeed, it can be understood as taking a couple of further steps beyond those the Board has taken in the 2023 and 2024 tests. As under current practice, possible tail risks other than those extrapolated from evident contemporary risks would not be factored into capital requirements. It would not incorporate second-order risks such as fire sales into the supervisory model, and it would not provide an opening for using market measures of asset values in place of booked values. But, if the approach were consistently and scrupulously followed, it would meaningfully realize some of the forward-looking benefits of good stress testing. As such, it might tip the balance of costs and benefits away from the decoupling option and toward a version of the status quo. The question is whether the approach would in fact be sustained.

Again, it is difficult for those on the outside—even those of us who once had an insider’s perspective—to judge how much the inertial forces are affecting the Fed’s conduct of the SCB regime. Fed officials will be circumspect in any public comments on this question. Accordingly, we are in the uncomfortable position of having what is arguably the most important factor in this debate being the least understood. But the slipperiness of information on these institutional topics does not make them any less important for deciding whether to attempt changes that would provide organizational support for dynamism or to decouple stress testing from regular capital requirements. As suggested by the COVID-19 episode, strong evidence of organizational inertia may emerge only in a crisis, when damage has already been done.

One external inertial factor that is visible has decidedly increased since the change in regulatory leadership in 2022. Bank trade associations have petitioned the Fed to start a rulemaking that would result in an extended notice-and-comment process for stress test scenarios and any changes in the supervisory model. Perhaps implicit in this petition is a threat to file suit to force the Fed to take these

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83. In this regard, it is notable that Fed staff have published a paper showing how funding shocks could be incorporated into the stress test, as contemplated by the Board following its 2015-2016 review. William Bassett & David Rappoport, “[Enhancing Stress Tests by Adding Macroprudential Elements](#),” in J. D. Farmer, A. M. Kleijnijenhuis, T. Schuermann and T. Wetzler (eds.) *Handbook of Financial Stress Testing* 455-483 (2022). One might thus infer that the Board’s failure to follow through is now more a matter of choice than of technical limitations.

steps. While current Fed practice is well-supported by existing administrative law doctrines,⁸⁴ the increasingly anti-regulatory posture of the federal judiciary introduces some doubt as to how a court might rule on such a suit. The level of doubt rises considerably depending on the specific court in which suit is filed. As suggested by their recent initiation of a challenge to new agency regulations implementing the Community Reinvestment Act, banking interests would probably sue in a federal district court overseen by the Fifth Circuit Court of Appeals, which has acquired a reputation as especially hostile to both regulation and regulatory agencies.⁸⁵

Faced with the prospect not just of litigation by banking interests demanding advance notice of scenarios and full disclosure of the supervisory model code but also of shifts in administrative law doctrine tilted against agencies, the Fed may be more hesitant to reinject even more dynamism into the SCB. This caution could inhibit adoption of such relatively modest changes as an annual bottom-up construction of the severely adverse scenario. In this event, even short of advance disclosure of the scenarios and model discussed in the last section, the current regime would move closer to the compliance exercise about which Chair Powell rightly warned five years ago. Were stress testing to devolve into a completely predictable process, the expense and potential for false confidence of the current SCB approach would probably not be worth the marginal improvement on a point-in-time approach.

Even if a Board leadership inclined toward more dynamic stress testing were to embrace the approach of freshly constructing each year's severely adverse scenario based on an extrapolation of current risks, a succeeding Board leadership with a different bent could reverse course quickly, simply by reverting to a familiar, largely recurring scenario and freezing significant changes in the supervisory model.

The alternative is to decouple the stress test from regular capital requirements, increase the CCB for banks subject to the Dodd-Frank stress testing requirement, and to adjust the risk weights for market assets to take account of the consistently higher SCBs for banks with heavy market exposure. There would, of course, be bank opposition to this alternative—the intensity doubtless determined by the proposed calibration of the amended CCB and market risk weights. But if the Board did adopt such a program, it would likely result in less variability in capital requirements resulting from changes in Board composition and more transparency when changes were made—whether in the direction of more or less stringency.

Decoupling the stress test from ongoing, regular capital requirements would, in a sense, be an admission that the Fed cannot sustain an approach to capital regulation that is forward-looking, dynamic, and macroprudential. Were I reasonably confident that the modestly more dynamic version of the status quo discussed earlier could be implemented and sustained, I would lean towards tepid endorsement of it. However, on the basis of stress testing practice over the last five years, I find myself—with considerable disappointment—approaching the conclusion that decoupling now the best option. I would welcome hearing arguments that would convince me otherwise.

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84. See Daniel K. Tarullo, *Bank Supervision and Administrative Law*, 2022 *Columbia Business Law Review* 279, 324-339 (2022).

85. For a recent review of the Fifth Circuit's decisions, see Jeffrey Toobin, *Circuit Breakers*, *New York Review of Books*, March 7, 2024 issue, <https://www.nybooks.com/articles/2024/03/07/circuit-breakers-jeffrey-toobin/>.



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