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PUBLIC INTEREST COMMENT

COMMENT ON REGULATORY CAPITAL RULE: TEMPORARY EXCLUSION OF U.S. TREASURY SECURITIES AND DEPOSITS AT FEDERAL RESERVE BANKS FROM THE SUPPLEMENTARY LEVERAGE RATIO

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Agency: Federal Reserve System
Comment Period Opens: April 14, 2020
Comment Period Closes: May 29, 2020
Comment Submitted: May 29, 2020
Docket No. R-1707
RIN: 7100-AF81

I appreciate the opportunity to comment on the notice of proposed rulemaking for Regulatory Capital Rule: Temporary Exclusion of U.S. Treasury Securities and Deposits at Federal Reserve Banks from the Supplementary Leverage Ratio. I am a senior research fellow at the Mercatus Center, a university-based research center at George Mason University. My comments do not reflect the views of any affected party but do reflect my general concerns about the effectiveness of regulation and the associated burden and unintended consequences of regulation. I will briefly summarize the points I will make in response to Questions 1 and 2 posed in the notice of proposed rulemaking and then provide more detail supporting my responses.

- Question 1 concerns the advantages and disadvantages of removing Treasuries and deposits at Federal Reserve banks from the total leverage exposure in the supplementary leverage ratio.

  Advantages: One potential advantage arises from avoiding calls for a bank to raise capital as a result of banks accommodating the extraordinary measures undertaken by the federal government in response to the COVID-19 pandemic and bank customer asset liquidations.

  Also, because I believe capital requirements at the bank subsidiary level work more effectively than at the holding company level in terms of protecting depositors and the deposit insurance fund, I view the potential harm here, in terms of greater risk of financial instability, as less than if the rule change applied at the subsidiary level.

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Disadvantages: One disadvantage of the change arises from the fact that the exclusion turns the leverage ratio into yet another risk-based capital ratio by effectively assigning Treasuries and deposits at Federal Reserve banks risk weights equal to zero. I will show, using a simple model of a profit-maximizing bank that's subjected to both a leverage ratio and a risk-based capital ratio, that as one excludes more Treasuries and reserves from the denominator of the leverage ratio, the bank allocates more toward these assets and allocates less to loans. While that seems to be the aim of the rule change, since loans tend to have among the highest risk weights, the model shows how risk-based capital, rather than the non-risk-based leverage ratio, encourages large banks to substitute away from high-risk-weight assets, such as loans. As people in the United States eagerly await a recovery, regulatory-capital-requirement-related disincentives to hold loans could factor into a slower recovery from the COVID-19 pandemic if the largest banks shift their portfolios away from loans and other banks cannot step in to fill the void. The model also shows that excluding Treasuries and reserves from the leverage ratio also makes banks more leveraged.

- Question 2 concerns other assets that could be excluded. Adding more assets to the list of those excluded from the total leverage exposure will make the supplementary leverage ratio even more like the complex risk-based capital requirements— and therefore redundant. If the goal is to limit potential unintended consequences and create regulatory redundancies, the net benefits of making fewer changes likely exceed the net benefits of making more changes.

CONCERNING QUESTION 1: CHANGES ARE UNDERSTANDABLE, REVERSING SOONER HAS POTENTIAL BENEFITS

Question 1 asks about the advantages and disadvantages of the proposed rule change and also about how long the changes should last. The advantages of the change arise simply as a matter of convenience in that the changes may help avoid triggering a capital-raising event, so that banks can accommodate the extraordinary measures taken by the federal government in response to the COVID-19 pandemic as well as customer asset liquidations.

Concerning financial stability, one view in the literature suggests that capital adequacy at the bank subsidiary level should remain the focus of efforts to regulate, if protecting depositors and the deposit insurance fund remains the goal.[1] In that sense, one advantage of the proposed rule arises from the focus on changes to holding company rather than bank-level capital requirements, since subsidiary-level capital requirements protect depositors and the deposit insurance fund, while holding company capital requirements may not.

At the same time, the inconvenience should be weighed against potential unintended consequences of regulatory changes associated with the use of risk weights. In the appendix, I

1. See, for instance, Fischer Black, Merton H. Miller, and Richard Posner, "An Approach to the Regulation of Bank Holding Companies," *Journal of Business* 51, no. 3 (1978): 379–412, especially pages 404–5. The authors suggest that effective regulation of bank holding companies would consist of ensuring that bank subsidiaries have sufficient capital. This approach offers a cost-effective way to protect depositors and the deposit insurance fund. They also argue that holding company capital requirements do not help foster those objectives. Paul Kupiec also identifies the problem with holding company regulatory capital, but he suggests a different approach: higher capital requirements at the subsidiary level funded with holding company issued debt. Paul H. Kupiec, "Is Dodd Frank Orderly Liquidation Authority Necessary to Fix Too-Big-to-Fail?" (AEI Economic Policy Working Paper No. 2015-09, American Enterprise Institute, Washington, DC, October 22, 2015).

present a model of a profit-maximizing bank that chooses among loans, Treasuries, and reserves that is funded with deposits and equity capital.[2] The bank faces both a leverage ratio and a risk-based capital constraint.

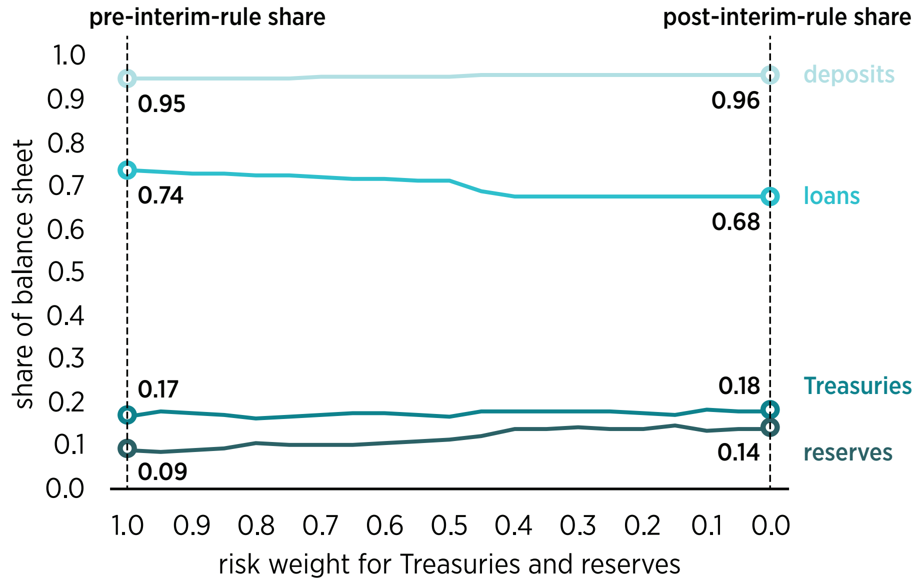
Based on the model, figure 1 depicts the ceteris paribus optimal shares for loans, Treasuries, and reserves on the asset side of the bank's balance sheet, as well as the share allocated to deposits, which serves as a model-based measure of leverage, as I increasingly exclude Treasuries and reserves from the leverage ratio. Under the pre-interim final-rule-type leverage ratio, Treasuries and reserves have a risk weight equal to one, so they're included in the leverage ratio. Increasingly excluding Treasuries and reserves from the leverage ratio amounts to reducing the risk weights toward zero, which is effectively what the interim final rule does.

Figure 1 shows that, ceteris paribus, as one decreases the de facto risk weights on Treasuries and reserves from 1 to 0, the bank allocates away from loans and toward Treasuries and reserves. Without the exclusions, the bank allocates 73.75 percent of its portfolio to loans, 17.03 percent to Treasuries, and 9.22 percent to reserves; the bank also funds with 95 percent deposits and 5 percent equity. With Treasuries and reserves fully excluded, the bank allocates 67.8 percent of the portfolio to loans, 18.15 percent to Treasuries, and 14.04 percent to reserves; the bank now funds with 95.93 percent deposits and only 4.07 percent equity, even though the required equity-to-risk-weighted-assets ratio has not changed. Overall, these findings suggest that the rule change could distort bank allocations away from higher-risk-weighted assets, such as loans, and toward lower-risk-weighted assets, such as Treasuries and reserves, and the banks will become more leveraged.

The way the distortions work could have implications for the timing of the policy change. If and when a COVID-19 pandemic recovery occurs, the exclusions will tend to create disincentives for large banks to hold higher-risk-weighted assets. Since loans tend to fall in high-risk-weight categories, the rule change could mean that larger banks may be less willing to expand loan holdings, which could limit their contribution to bank lending during an eventual recovery. That does not mean they will not be able to contribute to an eventual recovery, as large banks offer many other services aside from lending, which can have value during a recovery, too.

2. The model in the appendix extends the model of Donald Dutkowsky and David VanHoose to show how bank capital regulation may influence bank balance sheets. Donald Dutkowsky and David VanHoose, "Interest on Reserves, Regime Shifts, and Bank Behavior," *Journal of Economics and Business* 91, issue C (2017): 1–15. The model here also accounts for the March 26, 2020, elimination of reserve requirements mentioned at "Reserve Requirements," Board of Governors of the Federal Reserve System, last updated March 20, 2020, https://www.federalreserve.gov/monetarypolicy/reservereq.htm.

FIGURE 1. BANK ALLOCATIONS TO TREASURIES, RESERVES, LOANS, AND DEPOSITS



Source: Author's calculations.

CONCERNING QUESTION 2: THE NET BENEFITS OF MAKING FEWER CHANGES MAY OUTWEIGH THE NET BENEFITS OF MAKING MORE CHANGES

Question 2 concerns whether other assets could be excluded from the total leverage exposure. Doing so, however, would make the supplementary leverage ratio more like the complex risk-based capital requirements and, as the analysis in the previous section suggests, therefore redundant. Risk-based capital requirements are complex, and they may have unintended consequences. Limiting the proposed number of changes to the supplementary leverage ratio will allow regulators to better manage any unintended consequences that might arise.

CONCLUSION

Overall, I conclude that the proposed temporary changes are understandable, and it would make sense to roll back the temporary change once an eventual recovery gets underway. That way, any unwanted distortions created by changing the leverage ratio into a simple (and redundant) risk-based capital ratio can be eliminated.

APPENDIX

In this appendix, I present the results of a simple model that shows how risk-based capital ratios, rather than non-risk-based capital ratios, distort bank asset allocations. The model predicts that the more Treasuries and reserves get excluded from the leverage ratio, the more the bank switches from higher-risk-weighted assets, such as loans, toward lower-risk-weighted assets, such as Treasuries and reserves. The model also shows how excluding assets from the leverage ratio makes the bank more leveraged.

PROBLEM TO GENERATE FIGURE 1

In this model, the bank chooses the share of assets allocated to loans (w_L), the share of assets allocated to Treasury securities (w_T), and lastly, the share of assets allocated to reserves (w_R). Since March 26, 2020,[3] the Federal Reserve has eliminated reserve requirements, so the model has only reserves, making no distinction between required and excess reserves. The bank funds those investments with deposits (w_D) and equity (w_E), each expressed as a fraction of total assets.

The bank maximizes profits (which are defined as revenues minus funding and quadratic administrative costs) subject to a balance sheet constraint, a funding constraint, a leverage ratio constraint, and a risk-based capital constraint:

$$\max \Pi = w_L r_L + w_T r_T + w_R r_R - w_D r_D - w_E r_E - {}^1\!/_2\,(\alpha w_L^2 + \tau w_T^2 + \phi w_R^2 + \delta w_D^2 + \varepsilon w_E^2)$$
$$s.t.\, w_L + w_T + w_R \leq 1$$
$$w_D + w_E = 1$$
$$k_{LEV}(1 - (1 - \theta_T)w_T - (1 - \theta_R)w_R) \leq w_E$$
$$k_{RBC}(\omega_L w_L + \omega_T w_T + \omega_R w_R) \leq w_E$$

Table A1 defines the parameters and variables used in the subsequent analysis. The funding constraint, $w_D + w_E = 1$, provides the breakdown between deposit and equity funding. The risk-based capital constraint, $k_{RBC}(\omega_L w_L + \omega_T w_T + \omega_R w_R) \leq w_E$, indicates that the bank must fund at least k_{RBC} of its risk-weighted assets with equity. The leverage ratio constraint, $k_{LEV}(1 - (1 - \theta_T)w_T - (1 - \theta_R)w_R) \leq w_E$, indicates that the bank must fund at least k_{LEV} of total assets with equity. The parameters θ_T and θ_R are de facto risk weights that I use to illustrate the effects of excluding Treasuries and reserves from the leverage ratio. When Treasuries and reserves are included, the risk weights equal one, and the constraint simplifies to the basic leverage ratio. When at least some or all Treasuries and reserves get deducted from the leverage ratio, that effectively implies that these assets get assigned a risk weight that is less than one and no less than zero. I assume that loan holdings are more costly to administer than Treasuries or reserves ($\alpha > \tau > \phi$), and I assume that the equity funding cost parameter equals that for deposits, or $\varepsilon = \delta$. In terms of remaining parameters, $k_{LEV} = 0.05$, defined as equity to total assets, denotes the minimum leverage ratio; $k_{RBC} = 0.06$, defined as risk-weighted assets relative to equity, denotes the minimum risk-based capital ratio, where ω_L, ω_T, and ω_R represent the risk weights for loans, Treasury securities, and excess reserves used to calculate risk-weighted assets.

3. "Reserve Requirements," Board of Governors of the Federal Reserve System.

TABLE A1. VARIABLE AND PARAMETER DEFINITIONS

Variables	Parameters
loan share: w_L	interest rate on loans: $r_L = 0.0378$
Treasuries share: w_T	return on Treasuries: $r_T = 0.0016$
reserves share: w_R	interest rate on reserves: $r_R = 0.001$
deposits share: w_D	interest rate on deposits: $r_D = 0.0004$
equity share: w_E	return on equity: $r_E = 0.06$
balance sheet Lagrange multiplier: λ	administrative cost parameter for loans: $\alpha = 0.05$
leverage ratio Lagrange multiplier: μ_{LEV}	administrative cost parameter for Treasuries: $\tau = 0.004$
risk-based capital ratio Lagrange multiplier: μ_{RBC}	administrative cost parameter for reserves: $\phi = 0.001$
	administrative cost parameter for deposits: $\delta = 0.01$
	administrative cost parameter for equity: $\varepsilon = 0.01$
	risk weight for loans: $\omega_L = 1$
	risk weights for Treasuries: $\omega_T = 0$, $\theta_T = [0,1]$
	risk weights for reserves: $\omega_R = 0$, $\theta_R = [0,1]$
	supplementary leverage ratio: $k_{LEV} = 0.05$
	Tier 1 risk-based capital ratio: $k_{RBC} = 0.06$

By substituting the funding constraint into the two capital constraints, one can simplify the problem and write the Lagrangean as follows:

$$\begin{aligned}\mathcal{L} = w_L r_L + w_T r_T + w_R r_R - w_D r_D - (1 - w_D) r_E - {}^{1}\!/_{2}\,(\alpha w_L^2 + \tau w_T^2 + \phi w_R^2 + \delta w_D^2 + \varepsilon w_E^2) \\ + \lambda(1 - w_L - w_T - w_R) + \mu_{LEV}\big(1 - w_D - \kappa_{LEV}(1 - (1 - \theta_T) w_T - (1 - \theta_R) w_R)\big) \\ + \mu_{RBC}\big(1 - w_D - \kappa_{RBC}(\omega_L w_L + \omega_T w_T + \omega_R w_R)\big)\end{aligned}$$

The Kuhn-Tucker first-order necessary conditions for the model include the following:

1. $r_L - \alpha w_L - \lambda - \mu_{RBC}\kappa_{RBC}\omega_L \leq 0$

1′. $w_L[r_L - \alpha w_L - \lambda - \mu_{RBC}\kappa_{RBC}\omega_L] = 0$

2. $r_T - \tau w_T - \lambda + \mu_{LEV}\kappa_{LEV}(1 - \theta_T) - \mu_{RBC}\kappa_{RBC}\omega_T \leq 0$

2′. $w_T[r_T - \tau w_T - \lambda + \mu_{LEV}\kappa_{LEV}(1 - \theta_T) - \mu_{RBC}\kappa_{RBC}\omega_T] = 0$

3. $r_R - \phi w_R - \lambda + \mu_{LEV}\kappa_{LEV}(1 - \theta_R) - \mu_{RBC}\kappa_{RBC}\omega_R \leq 0$

3′. $w_R[r_R - \phi w_R - \lambda + \mu_{LEV}\kappa_{LEV}(1 - \theta_R) - \mu_{RBC}\kappa_{RBC}\omega_R] = 0$

4. $r_E - r_D - \delta w_D + \varepsilon(1 - w_D) - \mu_{LEV} - \mu_{RBC} \leq 0$

4′. $w_D[r_E - r_D - \delta w_D + \varepsilon(1 - w_D) - \mu_{LEV} - \mu_{RBC}] = 0$
5. $1 - w_L - w_T - w_R \geq 0$
5′. $\lambda[1 - w_L - w_T - w_R] = 0$
6. $1 - w_D - \kappa_{LEV}(1 - (1 - \theta_T)w_T - (1 - \theta_R)w_R) \geq 0$
6′. $\mu_{LEV}[1 - w_D - \kappa_{LEV}(1 - (1 - \theta_T)w_T - (1 - \theta_R)w_R)] = 0$
7. $1 - w_D - \kappa_{RBC}(\omega_L w_L + \omega_T w_T + \omega_R w_R) \geq 0$
7′. $\mu_{RBC}[1 - w_D - \kappa_{RBC}(\omega_L w_L + \omega_T w_T + \omega_R w_R)] = 0$

Equations 1–3 in the list define the benefits and costs of holding the three asset classes. Equation 4 defines the tradeoff between funding with deposits versus funding with capital. I assume interior solutions for equations 1–4. For the balance sheet constraint, I assume that equation 5 binds such that it holds with equality. For equations 6 and 7, since banks tend to fund with more than the minimum amount of capital, I assume that the constraints do not bind.

OBTAINING SOLUTIONS

Given the number of choice variables and multipliers, I use the Augmented Lagrange Minimization Algorithm to obtain numerical solutions.[4] The parameters summarized in table A1 come from work by Donald Dutkowsky and David VanHoose when possible.[5] They assume $\alpha = 0.05$ and that the cost parameter for reserves $\phi = 0.001$. I assume the cost parameter is low but higher than reserves at $\tau = 0.004$. I assume lower costs for deposits than Dutkowsky and VanHoose, $\delta = 0.01$, since with significantly higher values the costs tend to exceed revenues, thereby generating negative profits. I also assume the equity and deposits cost parameters are equal. For the risk weights I assume that for loans, $\omega_L = 1$, and that for reserves and Treasuries, $\omega_T = \omega_Q = 0$. For the return on reserves, I use the April 2020 rate $r_R = 0.001$.[6] Following Dutkowsky and VanHoose, I assume $r_D = 0.0004$. For loan rates, I compute the April 2020 monthly average daily prime rate $r_L = 0.0378$.[7] For the return on Treasuries, I use the April 30, 2020, rate on one-year Treasuries, $r_T = 0.0016$.[8] For the return on equity, I assume $r_E = 0.06$. I assume κ_{LEV} equals the supplementary leverage ratio value of 0.05 and that κ_{RBC} equals the Tier 1 risk-based capital ratio value of 0.06. Using these parameters, figure 1 shows how the optimal portfolio shares vary as the minimum leverage ratio increasingly excludes Treasuries and reserves, by varying the de facto leverage ratio risk weights θ_T and θ_R from 1 to 0.

4. After choosing starting values for the choice variables, the method makes use of a penalty term in the Lagrangean to get close to the optimal choices and then uses the multipliers to converge toward the optimal values. I use the Alabama package for R to solve the nonlinear optimization problems. "Alabama: Constrained Nonlinear Optimization," The R Project for Statistical Computing, March 6, 2015, https://CRAN.R-project.org/package=alabama.
5. Dutkowsky and VanHoose, "Interest on Reserves."
6. The rate of interest on reserves in April 2020 equaled 0.001. Federal Reserve Bank of St. Louis, "Interest Rate on Required Reserves" (dataset), accessed May 18, 2020, https://fred.stlouisfed.org/series/IORR.
7. The monthly average daily prime rate in April 2020 equaled 0.0378. Federal Reserve Bank of St. Louis, "Bank Prime Loan Rate" (dataset), accessed May 18, 2020, https://fred.stlouisfed.org/series/MPRIME.
8. The April 30, 2020, one-year Treasury rate equals 0.0016. US Department of the Treasury, "Daily Treasury Yield Curve Rates" (dataset), accessed May 18, 2020, https://www.treasury.gov/resource-center/data-chart-center/interest-rates/pages/TextView.aspx?data=yieldYear&year=2020.