

Quantifying Just How High U.S. Capital Requirements Are

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November 20, 2019

Several academic studies have estimated the level of optimal capital requirements using data from banks across various banking systems and economies around the world. Regulators and policymakers often use the estimates from such papers to assess the level of bank capital in their own country. However, differences in the implementation of the Basel III standards across jurisdictions make it challenging to attempt such comparisons and are prone to reaching false conclusions. This blogpost documents one such pitfall by showing that the aggregate Tier 1 capital ratio of domestic global systemically important banks (GSIBs) could be up to 8 percentage points higher if they were subject to the capital framework currently in place in the United Kingdom. That is, subjecting domestic GSIBs to the British framework for calculating risk-weighted assets would result in an increase in the aggregate Tier 1 capital ratio from 14 percent to 22 percent. Thus, through the lenses of the British regulatory capital framework – which is much closer to the Basel III capital standard – regulatory capital ratios of domestic GSIBs are close to the upper range of the most conservative estimates on the “optimum” Tier 1 capital ratio of banks (i.e., for the studies available [here](#) and [here](#)).

This analysis uses the U.K. capital regime as the reference point for two key reasons. First, it is important to show that domestic GSIBs have lower regulatory capital ratios due to differences in the implementation of the Basel III capital standards, and not because those banks hold riskier assets. Specifically, the results of the stress tests in the two countries are used to demonstrate that while the stress scenarios are generally slightly more severe in the United States, projected loan and trading losses were higher for U.K. GSIBs in the latest round of stress tests. Thus, if there are differences in bank risk-taking behavior across the two countries, U.K. banks would be expected to have higher risk-weights relative to domestic banks and not the other way around. Second, the Federal Reserve has indicated that they see some advantages to certain elements of the capital framework in place in the United Kingdom, namely the non-zero CCyB. This underscores the need to understand differences in the level of through-the-cycle capital requirements that already exist across the two regimes.

Two main factors explain the increase in regulatory capital ratios of domestic banks had they been allowed to use the U.K. framework for the calculation of risk-weighted assets (RWA): (1) Domestic banks are subject to the Collins Amendment to the Dodd-Frank Act, which requires them to use the higher of RWA calculated under the internal risk-based approach and the so-called Standardized Approach; and (2) domestic banks are highly constrained in their ability of using internal models to calculate model-based risk-weights. For instance, removing the requirement for U.S. banks to use the Advanced Measurement Approach (AMA) for the calculation of operational risk accounts for approximately half of the 8-percentage-point increase in the aggregate Tier 1 capital ratio of domestic GSIBs. Meanwhile, the Collins Amendment could be applied only to the minimum capital requirements instead of the applicable buffers, on top of the minimum requirements, and domestic banks would still be compliant with the statutory requirements.

The results discussed in this post are also relevant for the ongoing discussion on whether the Federal Reserve should activate the countercyclical capital buffer (CCyB). The CCyB is an extra capital buffer regulators can require banks to hold when there is an elevated risk of above-normal losses, so that banks

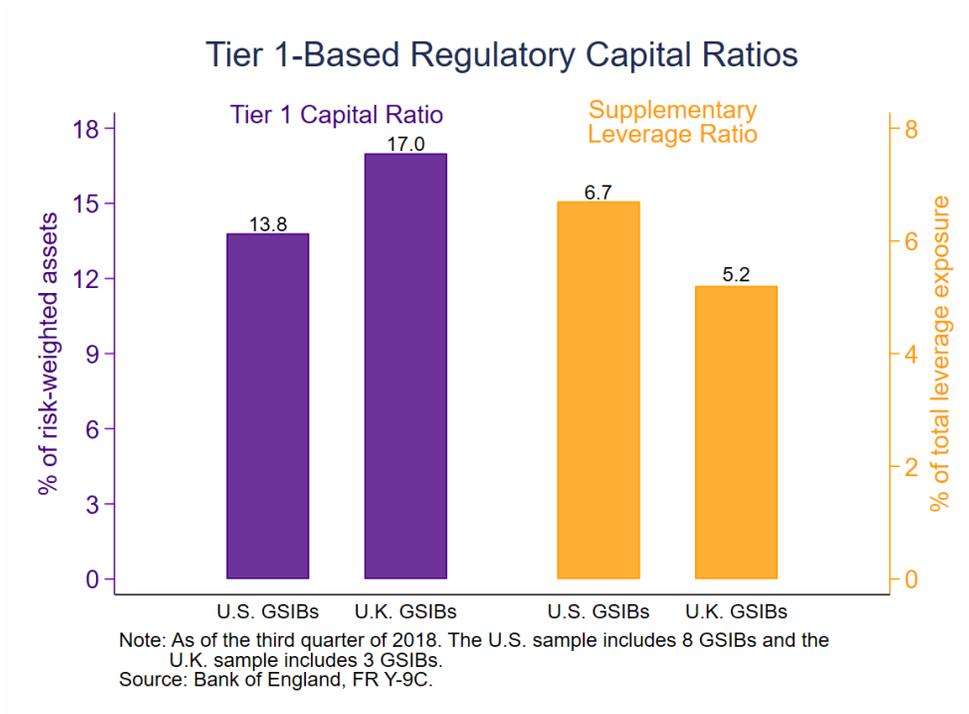
have an extra layer of capital if those vulnerabilities materialize. When expected losses are within a normal range, the CCyB is set at zero in the United States. In the United Kingdom, however, the CCyB is set to 1 percent in normal times, which allows U.K. regulators to lower it in bad times, as they did after the Brexit referendum. If the United States wanted to raise the CCyB, it should offset the increase by removing its gold-plating from the international calculation of risk-based capital standards.

DIFFERENCES IN THE DEFINITION OF THE TIER 1 REGULATORY CAPITAL RATIOS

At the Federal Reserve’s stress testing conference in July 2019, Vice Chair Randal Quarles noted that the Federal Reserve had not yet deployed the CCyB because of the higher through-the-cycle capital requirements and the stringency of the supervisory stress tests. The CCyB had thus effectively already been “turned on” in the United States, and the main challenge would then be to find ways to turn the CCyB off in a future downturn. Domestic banks are subject to more stringent capital requirements relative to other jurisdictions, mainly as a result of several factors:

1. Higher risk-weights for exposures with a similar degree of risk relative to banks headquartered outside the United States;
2. Higher GSIB capital surcharge under Method 2 (higher than the Basel standard); and
3. Tougher stress tests that effectively require banks to hold higher levels of capital.

Measuring the impact of factors 1 and 2 on capital requirements is easier than quantifying that of the more stringent stress tests. The U.K. framework is chosen as the point of comparison because the stress test regimes in the two jurisdictions are perceived to be tough by market participants, which offers useful insights in terms of the amount of risk-taking by banks in each jurisdiction. The comparison with the U.K. capital regime also helps neutralize the impact of stress tests on bank regulatory capital ratios, since the severity of the stress scenarios is similar across the two countries (see the following discussion).



The bar chart compares the aggregate Tier 1 capital ratios with the aggregate supplementary leverage ratios (SLRs) of U.S. and U.K. GSIBs.¹ In the chart, the aggregate Tier 1 capital ratio of domestic GSIBs is more than 3 percentage points lower than the aggregate Tier 1 capital ratio of their U.K. counterparts, while the aggregate SLR of U.S. GSIBs is 1½ percentage points higher than the SLR of U.K. GSIBs. The SLRs and Tier 1 capital ratios both use the same numerator—Tier 1 capital—so the weights assigned to the exposures of domestic GSIBs must be higher on average than U.K. risk-weights. The risk-weights can be higher either because domestic GSIBs hold riskier assets than U.K. GSIBs, or because the U.S. framework effectively imposes a higher risk-weight for an exposure with similar risk.

Differences in the definition of RWA. Although the concept of RWA is the same across the two jurisdictions, the calculation methods differ in several important ways. The discussion below is centered around the two main drivers of such differences.

First, domestic GSIBs are subject to the Collins Amendment, which requires banks to calculate risk-based ratios using both the Standardized Approach and the advanced internal ratings-based (IRB) approach. The binding capital requirement is the one that produces the lowest ratio of the two calculations. Under the advanced approaches, banks estimate the risk-weight of each exposure based on their own internal models. Specifically (and importantly), the risk-weight assigned to each exposure depends on bank self-assessments of the probability of default of the borrower and other loan characteristics. Those models are subject to extensive review by supervisors and have to be approved before they can be used to determine capital requirements. Banks also have to calculate RWA under the Standardized Approach, which sets a constant risk-weight for each exposure type. Under the U.S. rules, it is invariant to the probability of default by the borrower. As of the third quarter of 2018, RWA under the Standardized Approach were binding for six of the eight U.S. GSIBs, in part because the U.S. economy is going through a benign phase of the credit cycle and default rates are generally well below long-run averages. In the United Kingdom, banks are also allowed to use internal ratings-based models, and there is no explicit floor based on standardized risk-weights.²

Second, there are important differences in the constraints imposed on the use of internal models across the two jurisdictions. For instance, U.S. banks can only use the AMA to model operational risk. In contrast, U.K. banks have the option of choosing between the AMA and the Standardized Approach for operational risk. As noted in this [BCBS paper](#), the AMA is much more complex than the Standardized Approach when modeling operational risk. For this reason, the Basel Committee proposed to remove the AMA from the regulatory framework altogether to reduce the variability in RWA calculations across countries. In addition, domestic model-based risk-weights for credit and market risk are also higher than U.K. model-based risk-weights for assets that appear to have similar risks on average.

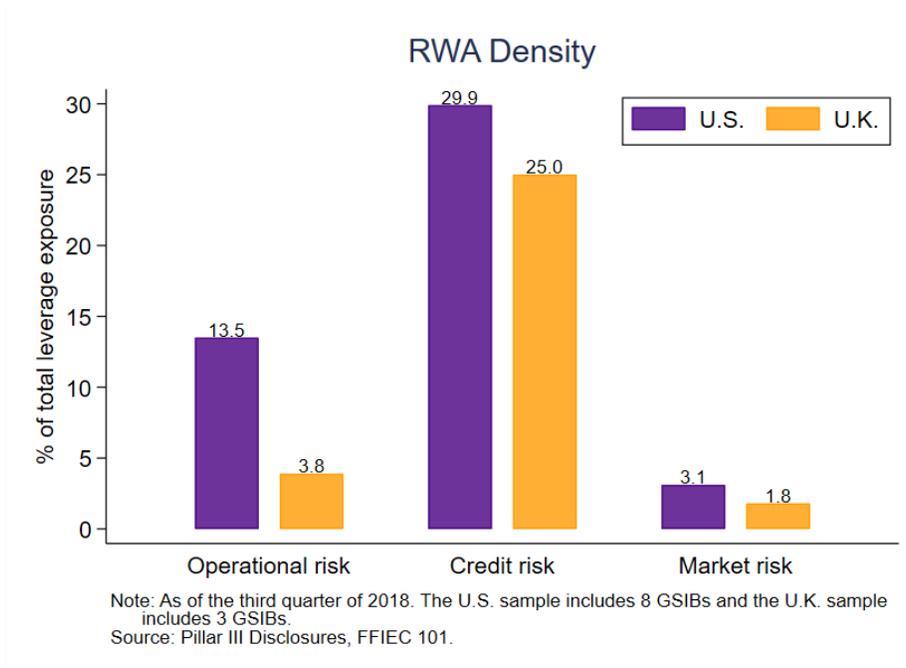
Differences in the definition of total leverage exposure. The definitions of total leverage exposure in the United States and the United Kingdom closely follow the Basel standard, with one important exception. In the United Kingdom, banks are allowed to exclude deposits held at central banks (aka reserves) from the

¹ U.S. GSIBs include BAC, BK, C, GS, JPM, MS, STT, and WFC. U.K. GSIBs include Barclays, HSBC, and Standard Chartered.

² The finalization of the Basel III rules includes an output floor in which RWA obtained under the IRB approach cannot be a certain percentage below RWA under the Standardized Approach. The output floor will start at 50 percent on January 1, 2022, and will be increased annually in increments of 5 percent until it reaches 72.5 percent on January 1, 2027.

definition of total leverage exposure. However, U.K. banks also report total leverage exposure under the Basel standard, and that is the definition used throughout this analysis.³

To estimate the effect of the differences in the calculation of RWA on the aggregate Tier 1 capital ratio of domestic GSIBs, the analysis below relaxes the Collins Amendment requirement and assumes that the ratio of RWA for operational risk, credit risk, and market risk to total leverage exposure is the same across the two jurisdictions. For this approach to be valid, evidence needs to be presented that indicates the risk of exposures held by domestic GSIBs is not greater than the risk of the assets held by U.K. GSIBs.⁴ The next bar chart shows the difference in the RWA density across the two bank groups. The most material difference is observed for operational risk for some of the reasons noted earlier, but differences in the RWA density for credit risk are also significant.



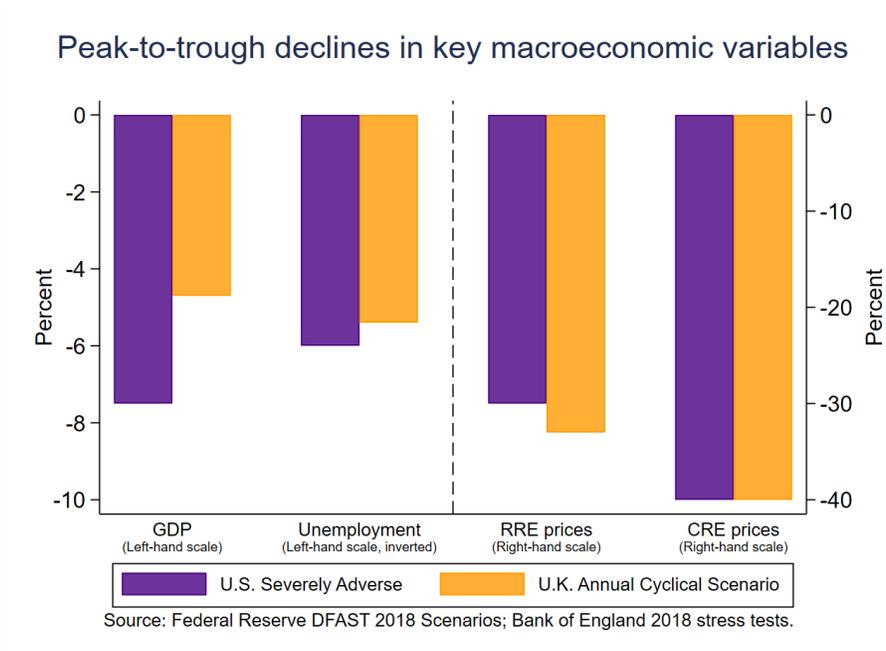
STRESS LOSSES AND MARKET LEVERAGE UNDER STRESS

To demonstrate that domestic GSIBs do not hold riskier assets relative to their British counterparts, this section compares the stress scenario and bank performance under the most recent round of stress tests available in the two countries. The severity of macroeconomic scenarios is a key driver of the overall stringency of the stress tests. The next bar chart plots the peak-to-trough changes in four main macroeconomic series that drive loan losses under stress: real GDP, unemployment, house prices, and commercial real estate prices. On a start-to-stress basis, the macroeconomic scenario included in the U.S. stress tests is more severe than the macroeconomic scenario used in the U.K. stress tests in 2018. Namely, the projected peak-to-trough decline in GDP in the U.S. stress tests was 7½ percent, while U.K. GDP was projected to fall 4¾ percent. The increase in the unemployment rate under stress was also projected to be slightly more severe in the U.S. stress tests. The stress scenarios in both countries also featured a global

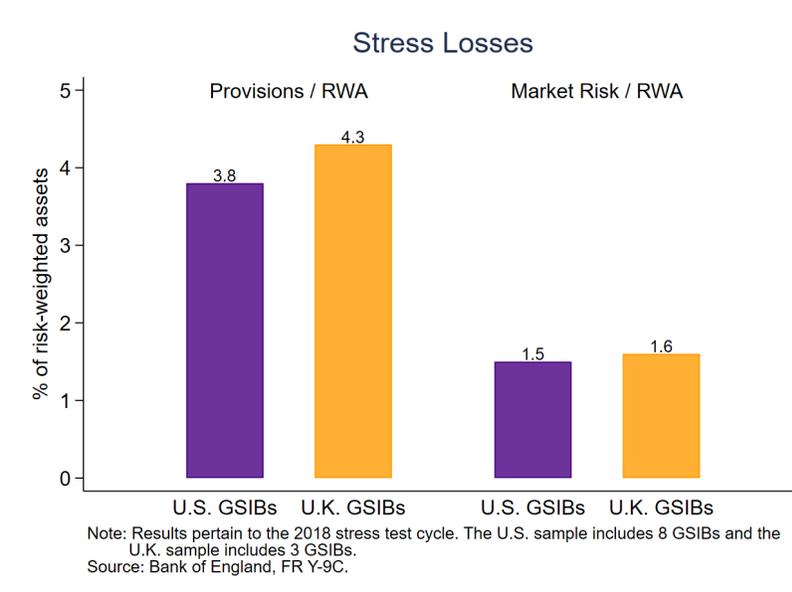
³ I redid the following analysis using the data from the FDIC on the Global Capital Index that adjusted total assets of U.S. GSIBs by the differences between IFRS and GAAP and obtained results similar to those described in the main text.

⁴ The share of loans and trading assets also needs to be similar across the two bank groups.

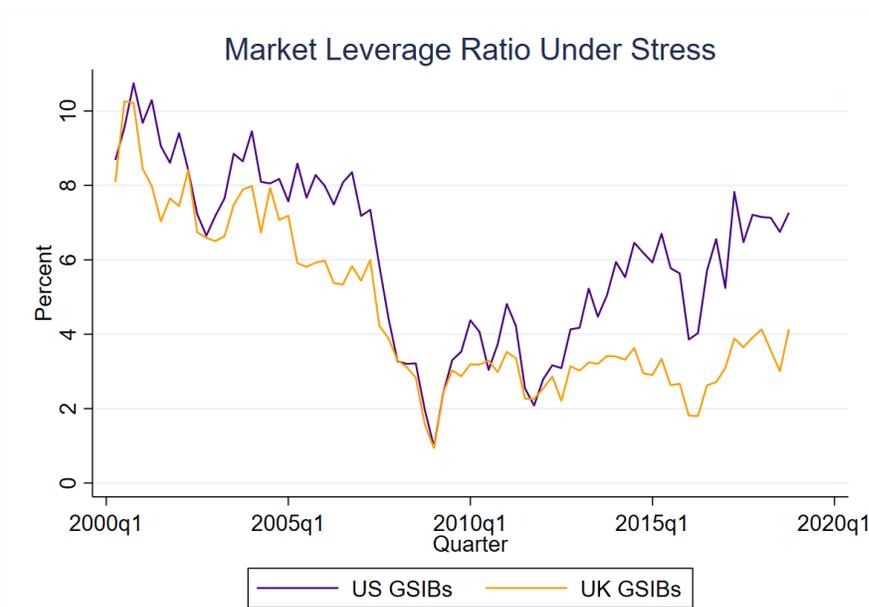
economic downturn. Meanwhile, the drops in residential and commercial real estate prices were about the same across the two stress tests.



Despite the higher severity of the scenario faced by domestic banks, the aggregate ratio of provisions to RWA under stress was lower for U.S. GSIBs relative to U.K. GSIBs. Namely, the ratio of provisions to RWA was 3.8 percent in aggregate for the 8 domestic GSIBs and 4.3 percent for their British counterparts. This result indicates that the higher RWA for credit risk reported by U.S. GSIBs is likely not driven by differences in the underlying risk of the exposures.



Due to the large number of risk factors in the U.S. shock to trading book exposures, it is more difficult to compare the severity of the trading risk scenario across the two jurisdictions. However, losses associated with trading as a percentage of RWA were about the same for domestic and U.K. GSIBs, and this post documents that the global market shock used in the United States is quite stringent.



Moreover, publicly available market data based on the SRISK measure of [Acharya and colleagues](#) (2012) also indicate that domestic GSIBs hold safer assets or higher levels of capital compared with their British counterparts. This measure is defined as the capital a bank is expected to need if there were another financial crisis and is often called a “mark-to-market” stress, as it relies on bank stock returns during a stress scenario. The stress event is defined as a 40-percent fall in the stock market over 6 months. As shown in the line chart, the stressed market leverage ratio has remained at a higher level for domestic GSIBs over the post-crisis period. The higher market leverage ratio under stress, therefore, is also consistent with the hypothesis that that domestic GSIBs have higher RWA densities due to modelling assumptions in the calculation of internal risk-weights, or because U.S. banks have higher levels of capital.

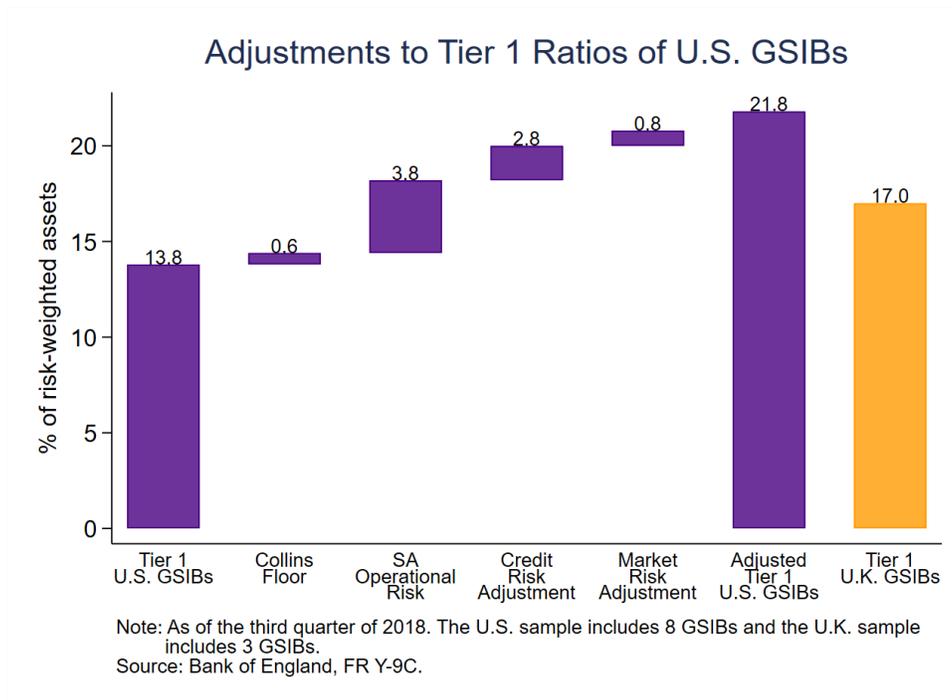
Taking all this evidence together, I conclude that differences in the riskiness of banking book and trading book assets are not a significant driver of the variability in RWA densities across the two bank groups.

Regarding the differences in the measurement of operational risk, it is important to note that in 2016, the BCBS recommended withdrawing the use of the AMA to measure operational risk due to its complexity and lack of comparability resulting from the wide range of approaches used. As an alternative, the Basel Committee developed the Standardized Measurement Approach, which is more risk-sensitive than the current Standardized Approach but much simpler than the AMA. Given the BCBS recommendation to exclude the AMA from the Basel framework, I derive the adjustment to the aggregate Tier 1 capital risk-based ratio, assuming U.S. GSIBs have the same RWA density for operational risk as U.K. GSIBs.

ADJUSTMENT TO THE TIER 1 CAPITAL RATIO OF DOMESTIC GSIBS

Based on this discussion, we can estimate the aggregate Tier 1 capital ratio of domestic GSIBs by imposing the same RWA density for operational risk, credit risk, and market risk. In addition, the Collins Amendment must also apply only to the minimum requirements, instead of setting RWA as whatever is higher under the advanced and standardized approaches. The next bar chart shows that applying the Collins Amendment to the minimum requirements without any other changes to RWA would increase the aggregate Tier 1 ratio of domestic GSIBs by 0.6 percentage point. Second, imposing the same RWA density for operational risk would increase the aggregate Tier 1 capital ratio by another 3.8 percentage points. Third, imposing the same average risk-weights for credit risk would raise the aggregate Tier 1 capital ratio by 2.8 percentage points. Lastly, setting the average market risk-weight of domestic GSIBs to be the same

as the risk weight of their British counterparts would increase the aggregate Tier 1 capital ratio by 0.8 percentage point. Overall, these four changes would raise the aggregate Tier 1 capital of domestic GSIBs by 8 percentage points.



CONCLUSION

Our discussion in this post shows that differences in the implementation of the capital rules across jurisdictions can lead to highly material variation in bank regulatory capital ratios. Specifically, the results reported here indicate that the aggregate Tier 1 capital ratio of U.S. GSIBs would be about 8 percentage points higher if their capital ratios were calculated with the capital framework being used in the United Kingdom. Consequently, the aggregate Tier 1 capital ratio of domestic GSIBs would be close to 22 percent. Based on this estimate, the capital ratio of domestic GSIBs is close to the upper end of the estimate in a paper by Federal Reserve economists, and well above the estimated optimal range of between 10 and 14 percent from a paper by Bank of England economists.

Meanwhile, if the United States were to adopt the U.K. approach, it could set the average level of the CCyB to 8 percent rather than zero and not change the average stringency of U.S. requirements. Assuming the capital standards implemented in the United Kingdom are Basel-standard compliant, if the United States sets the average CCyB to 1 percent, it would have plenty of scope to offset that change by simply removing some of its gold-plating from international standards for calculating risk-based capital measures.

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