BANK POLICY INSTITUTE

July 22, 2019

By electronic submission to fsb@fsb.org

Secretariat to the Financial Stability Board
Bank for International Settlements
Centralbahnplatz 2
CH-4002 Basel
Switzerland

Re: Evaluation of G20 too-big-to-fail reforms

Dear Dietrich,

Please find attached a note prepared by the Research group at the Bank Policy Institute (BPI) in response to the request from the Financial Stability Board for feedback on whether the too-big-to-fail reforms that have been implemented with respect to systemically important banking organizations are achieving their intended objectives. We also published the attached note as a blog post, "BPI Research response to FSB Questions on post-crisis reforms," which is available here: https://bpi.com/bpi-research-response-to-fsb-questions-on-post-crisis-reforms/

Another letter from BPI, reflecting a broader set of views on some of the key policy issues, is being submitted separately.

Sincerely,

Bill Nelson and Francisco Covas

BANK POLICY INSTITUTE

BPI Research Response To FSB Questions On Post-Crisis Reforms

By Bill Nelson and Francisco Covas

July 18, 2019

KEY FINDINGS:

1. The post-crisis changes in the regulation and supervision of the largest U.S. banks have significantly increased the resilience of the U.S. and global financial systems.

2. Large banks in the United States do not benefit from a lower cost of funding resulting from a perception that they are too big to fail.

3. Some important unintended consequences from post-crisis reforms include the lower provision of credit to small and medium-sized enterprises, reduced liquidity in corporate bond markets and the shift of bank lending to the unregulated sector.

In May of 2019, the Financial Stability Board sent a request for feedback on the evaluation of the effects of the too-big-to-fail (TBTF) reforms from stakeholders. The request for comment included several questions to assess whether reforms achieved its intended objectives, its impact on financial system resilience and structure, and material unintended consequences. This blog post addresses these questions by providing an overview of some of the most important academic papers written on this topic.

1. The post-crisis changes in the regulation and supervision of the largest U.S. banks have significantly increased the resilience of the U.S. and global financial systems.

There are potential negative consequences if a bank is viewed by bank investors as "TBTF." Investors in bank debt may not require that the interest rate on the debt include a risk premium that fully reflects the risk of the bank's portfolio. That reduced risk premium could provide the bank an incentive to borrow more and invest in riskier assets. It also could provide some banks with an incentive to become bigger and more systemic in order to realize this advantage. Both changes may increase the likelihood of government intervention.

There are four types of government policies that have been used to address these possible effects. First, the potential need for government intervention to prevent failure can be reduced by making failure possible in a manner that is less costly in terms of reduced externalities or adverse consequences to the financial system and broader economy. Second, the perceived likelihood of government intervention can be reduced by legally removing or restricting the tools that would be used for that intervention and by simply letting large banks fail. Third, the benefit to banks of a TBTF premium (that is, reduced borrowing costs) can be lessened by lowering the probability the bank will become insolvent in the first place (thus reducing the potential need of a bailout). And fourth, banks' incentive to become systemically essential can be reduced by taxing attributes and activities that increase the "systemic" character of the firm.

As part of the post-crisis response to the TBTF issue, all four types of policies have been implemented in the United States.

- The cost of failure in terms of externalities or adverse consequences to the financial system and broader economy have been reduced by increased resolvability of banks. This increased resolvability is the result of several factors, including the requirement that large holding companies prepare plans for their orderly resolution under the Bankruptcy Code, better known as living wills; hold sufficient liquidity to fund orderly resolution under the bankruptcy code; and issue, at the holding company level, substantial minimum amounts of long-term debt that can be converted to equity to capitalize the new institution after failure. In addition, the enactment of Orderly Liquidation Authority under Title II of the Dodd-Frank Act empowers the FDIC – in specified "backstop" circumstances – to resolve a bank holding company in an orderly fashion at no taxpayer cost – authority that did not exist in the financial crisis. Legal obstacles to implementing such a plan have been addressed, including through the issuance of final regulations banning cross

default clauses in derivatives contracts and strictly limiting issuance of short-term debt at the holding company, each of which had been identified as holding the potential to complicate resolution.

- The perceived likelihood of government intervention has been reduced by eliminating the ability of the Fed to lend to an individual non-bank, restricting the ability of the FDIC to guarantee bank liabilities, restricting the ability of the Treasury to tap the funding source used to insure money market mutual funds, and ending the TARP funding authority that Treasury used to recapitalize banks.

- The probability a U.S. bank will fail and need a bailout has been reduced by the required accumulation of significantly higher levels of capital and liquidity. The average ratio of Common Equity Tier 1 to Risk-Weighted Assets of U.S. GSIBs has risen from 6½ percent before the crisis to over 12 percent now. As shown by the most recent stress test results, U.S. GSIBs would maintain CET1 capital ratios well in excess of their Basel III minimums and over 75% higher than the actual levels that prevailed at year-end 2008. The ratio of high quality liquid assets to total assets has risen from about 5 percent before the crisis to over 21 percent now.

- The higher capital and liquidity requirements that have been imposed on large banks act as a tax on the characteristics that could make the bank failure systemic. GSIBs are required to maintain further amounts of common equity as a GSIB surcharge, and U.S. GSIBs are subject to a U.S.-specific calibration of the GSIB surcharge that is about 50 percent higher than the international standard. Notably, neither the U.S. nor international GSIB surcharge has been recalibrated to account for all the other post-crisis reforms that reduce the need for them, especially the reduction in the consequences for the financial system and broader economy if a bank fails.

- In addition, recent legislative and regulatory tailoring to establish more graduated tiers for applying enhanced prudential standards has added to the marginal impact of becoming materially more systemic.

2. Large banks in the United States do not benefit from a lower cost of funding resulting from a perception that they are too big to fail.

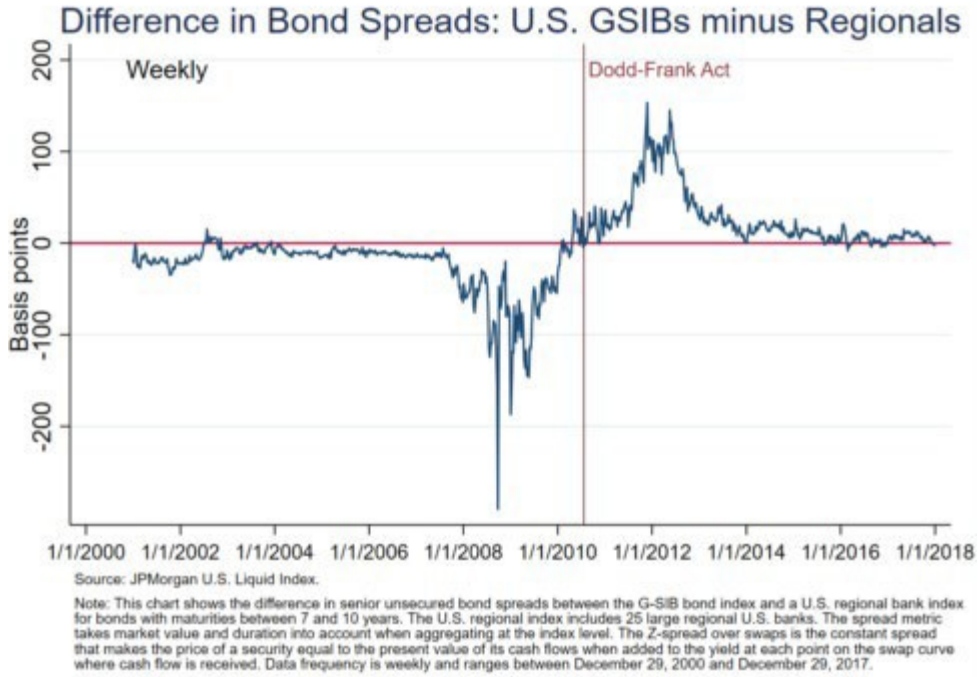
One way to determine how effective these reforms have been is to examine how markets price the debt of large U.S. banks. Of course, the market could be wrong – either by treating banks as not TBTF when they in fact are, or the reverse – but its judgment remains a valuable information point. It is also worth noting that a market judgment that a bank is not TBTF, right or wrong, means that the bank is not realizing any cost of funding advantage in the ordinary course of business, so to that extent, perception is in fact reality.

A growing body of economic literature reaches the conclusion that large banks in the United States no longer benefit from a lower cost of funding resulting from a perception that they are too big to fail. In a 2014 study, the Government Accountability Office (GAO) used 42 different approaches to determine if bigger banks had lower funding costs. The majority of specifications found that, while prior to 2010 (the year the Dodd-Frank Act was enacted) large banks had lower funding costs than small banks, after 2010 large banks faced *higher*, not lower, funding costs than small banks. The report also found that the TBTF benefit declines with risk, raising the possibility that it would return if bank risk returned to crisis levels. However, that finding is only present in a quarter of the specifications the GAO considers, and the GAO calls it "even more uncertain" (p.54) than the other results presented in the report.

Similarly, in an article in the Bank Policy Review of the Philadelphia Fed, Ryan Johnston (2016) reviews the recent empirical literature on TBTF and concludes, "The weight of the evidence is that, while there may have been significant TBTF subsidies prior to and during the financial crisis, following the crisis any subsidies are small." (p.19). Atkeson et al. (2018) conclude that variation in the perceptions of an implicit government guarantee account for substantial variation in the market-to-book ratios of U.S. banks, and that from 2011-2017 such perceptions no longer account for a material part of bank value. Further, Minton et al. (2017) find that the Tobin's q (the ratio of the market value of assets to the book value of assets) and the market-to-book ratio of bank equity decrease with bank size rather than increase as would be expected if larger banks benefitted from a perception of being TBTF.

In "The Decline of Too Big to Fail", Berndt et al. (2018) compare credit default swap spreads and estimates of "distance to default" for 800 U.S. firms to estimate implied market perception of bailout probabilities and the impact on the cost of debt. They conclude that there has been a "dramatic and persistent reduction in market-implied probabilities of government bailouts of U.S. GSIB holding companies…[and]…similar but smaller effects for domestically important non GSIB banks…" (p.2). They also find that the decline in bailout probability has reduced the market value of banks by nearly one-third. (They are unable to determine if the reduction is the result of post-crisis reforms or a shift in market perception owing to the fact that the government allowed Lehman to fail.)

An alternative way to examine whether bond investors have indeed priced in a reduced expectation of government bailouts is to look at the difference in bond spreads between U.S. GSIBs and large U.S. regional banks, as shown in the chart below. This is a useful identification strategy because the underlying macroeconomic fundamentals that drive the behavior of bond spreads are similar across the two bank samples and GSIBs are subject to more stringent capital, liquidity, resolution planning and TLAC requirements.



As shown in the chart, bond spreads of U.S. regional banks were higher than bond spreads of U.S. GSIBs prior to the enactment of the Dodd-Frank Act (shown by the vertical line). This evidence could be attributed to U.S. regionals being riskier, or alternatively, U.S. GSIBs enjoying an expectation of government support during that period. This pattern reverses in the post-Dodd-Frank Act period, as bond spreads of GSIBs rise above bond spreads of large regional banks. This evidence could be attributed to U.S. GSIBs becoming fundamentally riskier in terms of the likelihood of experiencing financial distress post-Dodd-Frank, but this is unlikely given the heightened capital, liquidity and other prudential standards applied to U.S. GSIBs in that period. Rather, the more likely reason for the change is a market perception that U.S. GSIB debt no longer enjoys an expectation of government support.

There is some research that sheds light on the reasons for the reduction in bailout expectations including changes that lower costs in terms of externalities and consequences to the financial system and broader economy if a bank fails as well as ones that reduce the likelihood of failure or future financial crises. Cetorelli and Traina (2018) find that requirements that large U.S. BHCs complete living wills increased their cost of funds by 22 basis points, 10 percent of their cost of capital, and that the impact was stronger for systemically important banks. Goldberg and Meehl (2019) note that complexity can make banks harder to resolve and that although these large banking groups remain complex, they have succeeded over the past decade in reducing the number of legal entities in their organizations and, in some cases, the number of countries in which they have affiliates.

In an IMF discussion note, Dagher et al. (2016) conclude that total loss -absorbing capacity of 15 percent would prevent most banking crises and a capacity of 23 percent in 2007 would have "…eliminated the need for [capital] injection in virtually all cases" (p. 20) during the U.S. and European banking crises. Total loss -absorbing capacity (TLAC) of banks in the United States – which consists generally of (1) going concern loss absorbency in the form of regulatory capital and (2) gone concern loss absorbency that consists of long-term debt that would be subject to bail-in in resolution – currently averages about 24 percent. With respect to the going concern loss absorption element of TLAC, U.S. banks have a Tier 1 capital ratio of 13½ percent, on average. Moreover, higher liquidity requirements also make failure less likely. Covas et al. (2018a) estimate that compliance with the liquidity coverage ratio should, in principle, reduce the appropriate calibration of the GSIB surcharge by 50 to 100 basis points in view of the associated reduction in losses under stress that flow from a more liquid balance sheet that is less vulnerable to fire-sales.

Some research that purports to find that U.S. banks continue to benefit from a perception that they are TBTF has significant flaws. For example, Gudmondsson (2016) claims to show that the 11 largest global banks continue to benefit from a 30-40 basis point subsidy per unit of debt. In fact, he begs the question by simply *assuming* that the banks will be bailed out with 100 percent certainty; the 30-40 basis point figure is his estimate of their current probability of failure. The GAO report on TBTF included a large literature review but excluded estimates like Gudmondsson's because "…this methodology assumes a too-big-to-fail funding cost advantage exists and only estimates its magnitude." (See p. 42 of the GAO report.)

A New York Fed blog post, "Did the Dodd-Frank Act End 'Too Big to Fail' by Afonso et al. (2018) finds that debt spreads between bank holding companies and their commercial bank subsidiaries have not widened and suggests that markets therefore have not reduced the likelihood they attach to government bailouts. However, those spreads likely are narrow for several other reasons not considered by the authors, including the fact that BHC probabilities of default are extremely low and that the GSIB surcharge – which applies as a legal matter at the holding company level rather than the bank subsidiary level – can consequently be expected to reduce the bond spreads of the parent company more than that of the main subsidiary bank. Moreover, only a few banks have both parent and subsidiary bond and CDS spreads (see Covas et al. (2018b)).

An article in the FRBNY *Economic Policy Review* by Santos (2014) finds that data on bond yields suggest large banks face lower funding costs, but the data examined end in 2009 and so do not include the period after the post-crisis reformswere put in place. While as noted above Goldberg and Meehl (2019) find a reduction in large bank complexity, their main measure of complexity – number of legal entities in the bank organization – includes in its coverage many entities—for instance an asset management entity whose only activity is to hold client funds – that do not make resolution more difficult.

3. Some important unintended consequences from post-crisis reforms include the lower provision of credit to small and medium-sized enterprises, reduced liquidity in corporate bond markets and shift of bank lending to the unregulated sector.

The post-crisis changes in the regulation and supervision of the largest U.S. banks, as well as changes implemented by those banks in light of the lessons learned in the 2008 Financial Crisis, have increased the resilience of the U.S. and global financial systems. As noted above, the near-doubling that has occurred in the common equity ratio – the measure of the most loss-absorbing form of capital – and the quadrupaling of the ratio of liquid assets to total assets of U.S. bank holding companies, have significantly reduced the probability of a financial crisis, while concurrently the complexity of the largest banks has declined. The financial stability reports published by the Financial Stability Oversight Council (2018) and the Federal Reserve Board (May 2019, see also Powell speech May 20), as well as the Annual Report to Congress of the Office of Financial Research conclude that the greater capitalization and liquidity of banks in the U.S. is contributing to financial stability. The IMF's 2019 Article IV mission concluded that the U.S. financial system is healthy in large part because banks are well capitalized and maintain good credit quality.

Nevertheless, that greater resilience comes at the expense of a reduction in the supply of credit and lower economic output. Estimates of the cost and benefit of capital by the Basel Committee on Banking Supervision (2010), IMF (2016), Bank of England (2015), and Federal Reserve Board (2017) all calculate the cost of higher capital in terms of a permanent reduction in GDP. The foundational 2010 BCBS analysis, for example, concludes that each percentage point increase relative to pre-Basel III capital (Total Common Equity/Risk Weighted Assets) reduces the level of GDP permanently by 9 basis points. Using the conversion factor provided in a subsequent BIS working paper (Fender and Lewrick (2016)), a percentage point increase in post Basel III Common Equity Tier 1/Risk Weighted Assets results in an 11½ basis point permanent reduction in GDP. Consequently, the greater financial resilience achieved by the 4 percentage point increase in such U.S. banks average CET1 capital ratio since before the crisis comes at the expense of a permanent ½ percentage point reduction inGDP.

Tighter regulations have also engendered many consequences that were not foreseen by the designers of the post-crisis regulatory and supervisory framework. Several papers have noted that measures of leverage and the credit risk posed by banks derived from market capitalization, CDS and other market-based metrics are higher in the post-crisis period despite the large increases in capital and banks having much more liquid balance sheets. In particular, Sarin and Summers (2017) and Chousakos and Gorton (2017) attribute the decline in market-to-book ratios of banks to the decline in bank profitability or "franchise value" caused by new regulations. Instead, Atkeson, et al. (2019) argue that the decline in market-to-book ratio of banks in the post-crisis period is due to the rollback of implicit government guarantees. Irrespective of the main driver, a material unintended consequence of the implementation of the reforms has been the decline in banks' market-to-book ratio in the post-crisis period which made banks more vulnerable to adverse shocks.

In the United States, evidence exists that the implementation of stress tests and the GSIB capital surcharge framework have significantly curtailed the provision of credit to small and medium-sized enterprises. A study by Acharya, Berger and Roman

(2018) finds that banks subject to the stress tests have reduced the supply of credit to borrowers with less -than -pristine credit scores or cyclical firms, including small businesses. Chen, Hanson and Stein (2017) attribute the decline in small business loan originations by the largest banks immediately after the crisis to the effects of the U.S. stress tests, the GSIB capital surcharge and anti-money laundering requirements. Cortés, Demyanyk, Li, Loutskina and Strahan (2018) also find that banks most affected by the stress tests reduced their supply of business loans by increasing loan interest rates and shifting their portfolios towards safer loans. Lastly, Bordo and Duca (2018) find that an increase in regulatory compliance requirements brought about by the Dodd-Frank Act (DFA) reduced the incentives for banks of all sizes to originate small business loans. Covas (2018) and Doerr (2019) also show that post-crisis stress tests have reduced the availability of credit to small businesses, particularly lending secured by real estate collateral.

Another important material unintended consequence has been the shift of bank lending from the regulated to the unregulated sector. In the household sector, the market share of nonbanks has expanded significantly in the post-crisis period both for mortgages as well as business loans. In the residential mortgage market, the share of nonbank originations climbed from 10% at the end of the crisis to more than 55% at the end of 2017. Nonbanks also service close to 50 percent of the mortgages outstanding in the U.S. As shown by Buchak et al. (2018), most of this increase in the nonbank share has been driven by the higher capital requirements imposed on banks. In the corporate sector, borrowing from nonbank lenders has become more concentrated among the riskiest of firms. According to the Federal Reserve's most recent financial stability assessment (May 2019), loans to the riskiest firms are mainly held by nonbanks via collateralized loan obligations and mutual funds.

The post-crisis regulatory changes have also reduced liquidity conditions in corporate bond markets. Bao, O'Hara, and Zhou (2016) finds that the Volcker Rule reduced the liquidity of riskier corporate bonds. Bessembinder, Jacobsen, Maxwell and Venkataraman (2018) show that bank affiliated dealers have become less willing to play the role of a market maker, which uses its balance sheet to cushion imbalances in customers' orders. Adrian et al. (2017) show that Basel III capital requirements reduced banks' willingness to hold corporate bond positions. Covas (2019) also shows that the global market shock component in the stress tests led to a reduction in banks' holdings of private securities.

Du, Tepper and Verdelhan (2018) show persistent and systemic violations from covered interest parity (CIP) in foreign exchange markets that are the result of the post-crisis regulations. Specifically, they identify the supplementary leverage ratio and the GSIB surcharge as the main drivers of CIP violations. The paper concludes CIP violations may have sizable welfare implications because of deadweight costs borne by firms seeking to hedge their cash flows. Moreover, CIP violations also introduce a wedge between the interest rates in the cash and swap markets, which impacts the transmission of monetarypolicy.

CONCLUSION

Although further research would be welcome, the evidence indicates that the broad public policy effort to eliminate the view that some U.S. banks are too big to fail has been successful. That success has come with the benefit of reduced moral hazard and a lower likelihood of a financial crisis in the United States, but at the cost of lower U.S. economic growth and financial market liquidity. Given the overlapping and mutually reinforcing character of most of the post-crisis U.S. regulations, it would be appropriate to consider whether the TBTF success can be achieved with higher growth and greater financial market efficiency by recalibrating the requirements.

REFERENCES

Acharya, Viral and Anginer, Deniz and Warburton, Joseph A. (2016), The End of Market Discipline? Investor Expectations of Implicit Government Guarantees, February, 1-59.
http://pages.stern.nyu.edu/~sternfin/vacharya/public_html/pdfs/End%20of%20Market%20Discipline%20-%20Acharya%20Anginer%20Warburton%202_10_2016.pdf

Afonso, Gara and Blank, Michael and Santos, Joao (2018), Did the Dodd-Frank Act End 'Too Big to Fail'?, Federal Reserve Bank of New York Liberty Street Economics, March 5. https://libertystreeteconomics.newyorkfed.org/2018/03/did-the-dodd-frank-act-end-too-big-to-fail.html

Atkeson, Andrew G. and d'Avernas, Adrien and Eisfeldt, Andrea L. and Weill, Pierre-Olivier (2018), Government Guarantees and the Valuation of American Banks, National Bureau of Economic Research Working Paper Number 24706, June.
https://www.nber.org/papers/w24706

Bao, Jack and O'Hara, Maureen and Zhou, Xing (2016), The Volcker Rule and Market-Making in Times of Stress, Journal of Financial Economics, Forthcoming Fourth Annual Conference on Financial Market Regulation, September 11.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2836714

Berndt, Antje and Duffie, Darrell and Zhu, Yichao (2018), The Decline of Too Big to Fail, November, 1-48. https://www.darrellduffie.com/uploads/pubs/BerndtDuffieZhuTBTF.pdf

Bessembinder, H., Jacobsen, S., Maxwell, W., & Venkataraman, K. (2018). Capital Commitment and Illiquidity in Corporate Bonds. Journal of Finance, 73(4), 1615-1661. https://doi.org/10.1111/jofi.12694

Bordo, Michael D. and Duca, John V. (2018), The Impact of the Dodd-Frank Act on Small Business, Hoover Institute Economics Working Paper 18106, April 2, 1-39. https://www.hoover.org/sites/default/files/research/docs/18106-bordo-duca.pdf

Brooke, Martin et al. (2015), Measuring the macroeconomic costs and benefits of higher UK bank capital requirements, Bank of England Financial Stability Paper N. 35, December, 1-33. https://www.bankofengland.co.uk/-/media/boe/files/financial-stability-paper/2015/measuring-the-macroeconomic-costs-and-benefits-of

Buchak, Greg and Matvos, Gregor and Piskorski, Tomasz and Seru, Amit (2017), Fintech, Regulatory Arbitrage, and the Rise of Shadow Banks, Columbia Business School Research Paper No. 17-39, Journal of Financial Economics, Forthcoming, 1-83. https://ssrn.com/abstract=2941561

Cetorelli, Nicola and Traina, Nicola (2018), Resolving "Too Big to Fail", Federal Reserve Bank of New York Staff Reports No. 859, June, 1-26. https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr859.pdf

Chen, Brian S. and Hanson, Samuel G and Stein, Jeremy C. (2017), The Decline of Bog-Bank Lending to Small Business: Dynamic Impacts on Local Credit and Labor Markets, National Bureau of Economic Research Working Paper Series N. 23843, September, 1-59. https://www.nber.org/papers/w23843.pdf

Chousakos, Kyriakos and Gorton, Gary (2017), Bank health post-crisis, Banque de France Financial Stability Review, January, 1-16. http://www.kyriakoschousakos.com/wp-content/uploads/2017/03/Bank_Health_Post_Crisis_Chousakos_Gorton_Feb_2017.pdf

Cortés, Kristle Romero and Demyanyk, Yuliya and Li, Lei and Loutskina, Elena and Strahan, Philip E., (2018), Stress Tests and Small Business Lending March, NBER Working Paper No. w24365. March, 1-55, https://ssrn.com/abstract=3134262

Covas, Francisco, Capital Requirements in Supervisory Stress Tests and Their Adverse Impact on Small Business Lending (January 2018). Available at SSRN: https://ssrn.com/abstract=3071917 or http://dx.doi.org/10.2139/ssrn.3071917

Covas, Francisco, Bill Nelson and Robert Lindgren (2018a), Estimating the LCR Haircut to the GSIB Surcharge, BPI Blog, June 13. https://bpi.com/estimating-the-lcr-haircut-to-the-gsib-surcharge/

Covas, Francisco, John Court and Bill Nelson (2018b), Yes, the Dodd-Frank Act Ended 'Too Big to Fail', BPI Blog, March 22. https://bpi.com/yes-the-dodd-frank-act-ended-too-big-to-fail/

Covas, Francisco and Adam Freedman (2019), the Global Market Shock and Bond Market Liquidity, BPI Blog, May 23. https://bpi.com/the-global-market-shock-and-bond-market-liquidity/

Dagher, Jihad and Dell'Ariccia, Giovanni and Laecen, Luc and Ratnovski, Lev and Tong, Hui (2016) Benefits and Costs of Bank Capital, IMF Staff Discussion Note 16(04), September 14, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2838437

Doerr, Sebastian (2019), Unintended Side Effects: Stress Tests, Entrepreneurship, and Innovation, May 7, 1-50. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3384006

Du, Wenxin and Tepper, Alexander and Verdelham, Adrien (2018), Deviations from Covered Interest Rate Parity, The Journal of Finance 73(3), February 19, 915-957. https://onlinelibrary.wiley.com/doi/epdf/10.1111/jofi.12620

Fender, Ingo and Ulf Lewrick (2016), Adding it all up: the macroeconomic impact of Basel III and outstanding reform issues, BIS Working Papers, No. 591, November. https://www.bis.org/publ/work591.pdf

Government Accountability Office (2014), Large Bank Holding Companies: Expectations of Government Support, Report to Congressional Requesters, GAO-14-621, July. https://www.gao.gov/assets/670/665162.pdf

Goldberg, Linda and Meehl, (2019), Complexity in Large US Banks, February, 1-29. https://www.newyorkfed.org/medialibrary/media/research/economists/goldberg/goldbergmeehltop50us_020619.pdf?la=en

Gudmundsson, Tryggvi (2016), Whose Credit Line is it Anyway: An Update on Banks' Implicit Subsidies, IMF Working Paper 16(224), November. https://ssrn.com/abstract=2886392

Johnston, Ryan, 2016. "Banking Policy Review: Did Dodd–Frank End 'Too Big to Fail'?," Banking Policy Review, Federal Reserve Bank of Philadelphia, issue Q4, pages 16-20. https://www.philadelphiafed.org/-/media/research-and-data/publications/banking-policy-review/2016/bpr-dodd-frank.pdf?la=en

Minton, Bernadette and Stulz, Rene and Taboada, Alvaro G. (2017), Are Large Banks Valued More Highly?, Fisher College of Business Working Paper No. 2018-03-012., 1-47. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3213623

Santos, Joao (2014), Evidence from the Bond Market on Banks' "Too-Big-to-Fail" Subsidy, Federal Reserve Bank of New York Economic Policy Review 40(2), December, 29-39.
https://www.newyorkfed.org/medialibrary/media/research/epr/2014/1412sant.pdf

Board of Governors of the Federal Reserve System (2019), The Federal Reserve System: Financial Stability Report, Board of Governors of the Federal Reserve System, 1-60. https://www.federalreserve.gov/publications/files/financial-stability-report-201905.pdf

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