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What Caused the Post-crisis Decline in Bank Lending?

Thomas L. Hogan, Ph.D., Fellow, Center for Public Finance

The Great Recession associated with the 2008 financial crisis was one of the worst economic downturns in U.S. history. One mystery of the slow recovery is why bank lending failed to respond to expansionary monetary policy. Bank lending declined dramatically during the crisis, and despite the period of very low interest rates since, lending has failed to recover.

How did this happen? The Federal Reserve responded quickly to the crisis by cutting interest rates and aggressively expanding the monetary base. Such policies are typically transmitted through the banking system by lowering interest rates, which encourages banks to lend. Surprisingly, the Fed's efforts were not initially effective at spurring lending or economic activity, causing many to attribute the decline in lending to sluggish economic growth. Since that time, however, most measures of economic activity have improved while lending has not.

This issue brief discusses the potential causes of the post-crisis decline in bank lending. First, it compares bank lending to several measures of economic activity. Second, it discusses two other factors that affect lending: regulation and changes in the Fed's monetary policy. The evidence shows that the reductions in bank lending are more closely associated with changes in regulation and monetary policy than with changes in economic activity.

LENDING SINCE THE CRISIS

How did bank lending change following the 2008 financial crisis? Figure 1 shows the total loans in the U.S. banking system from the start of 2000 through the end of 2017.¹ The total starts at more than \$4 trillion and grows to almost \$10 trillion, but the growth is not smooth over that period. Lending grows steadily through the early 2000s, but it peaks during the financial crisis in mid-2008 and then declines through 2009. Growth resumes around 2011 but at a slower pace than in the early 2000s. The dotted line in

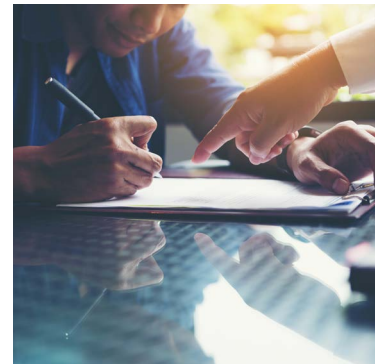
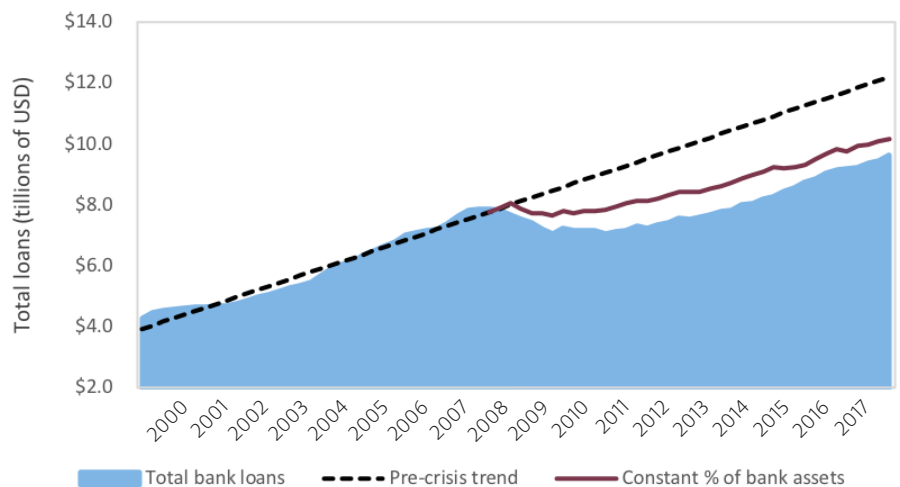


FIGURE 1 — BANK LOANS AND ECONOMIC DATA



SOURCE FDIC Call Reports

Banks appear to have permanently decreased lending relative to their other activities.

Figure 1 shows the trend from 2000 to 2008 projected out through the rest of the period. Had lending continued at this rate, total loans would have exceeded \$12 trillion by 2017.

Of course, some amount of decline should be expected following the 2008 financial crisis. The public's trust in banks was shaken, which could have slowed the growth rate of bank deposits. In addition, falling housing prices might have caused the values of banks' mortgage assets to decline. These effects, however, seem to be fairly minor since banks' assets have grown consistently since the crisis, as have deposits.

Instead, banks appear to have permanently decreased lending relative to their other activities. The solid line in Figure 1 estimates what the total quantity of loans would have been if banks had maintained the same amount of loans as a percentage of assets that they had at the peak of the financial crisis in September 2008. This estimate remains above the actual amount of loans through the rest of the period. Thus, the important puzzle is not simply why the total value of loans has declined, but rather why loans have declined as a percentage of bank assets.

BANK LENDING AND ECONOMIC ACTIVITY

The simplest potential explanation for the decline in bank loans is that lending is down because all economic activity is down. Economic growth and employment were low following the crisis and have only recently rebounded to their long-run rates. These factors could indicate that low rates of lending were due to a lack of loan demand.

Figure 2 compares bank lending to four measures of economic activity as potential indicators of loan demand. The dark area in each subfigure shows bank loans as a percentage of total bank assets. Prior to the crisis, loans averaged 59.9% of total assets, but the percentage fell from 59.1% in June 2008 to 51.7% by September 2011. Lending began to recover in 2015, reaching 54.7% of bank assets by the end of 2017.

The most common measure of economic activity is the growth rate of

gross domestic product (GDP), the total value of new goods and services produced in the economy in a given period. Figure 2a overlays the percentage of loans with the annualized rates of real GDP growth in each quarter. Like loans, GDP growth fell strongly in late 2008 and early 2009. Unlike the percentage of loans, however, the GDP growth rate rebounded quickly in 2010 and remained mostly positive through the rest of the period.

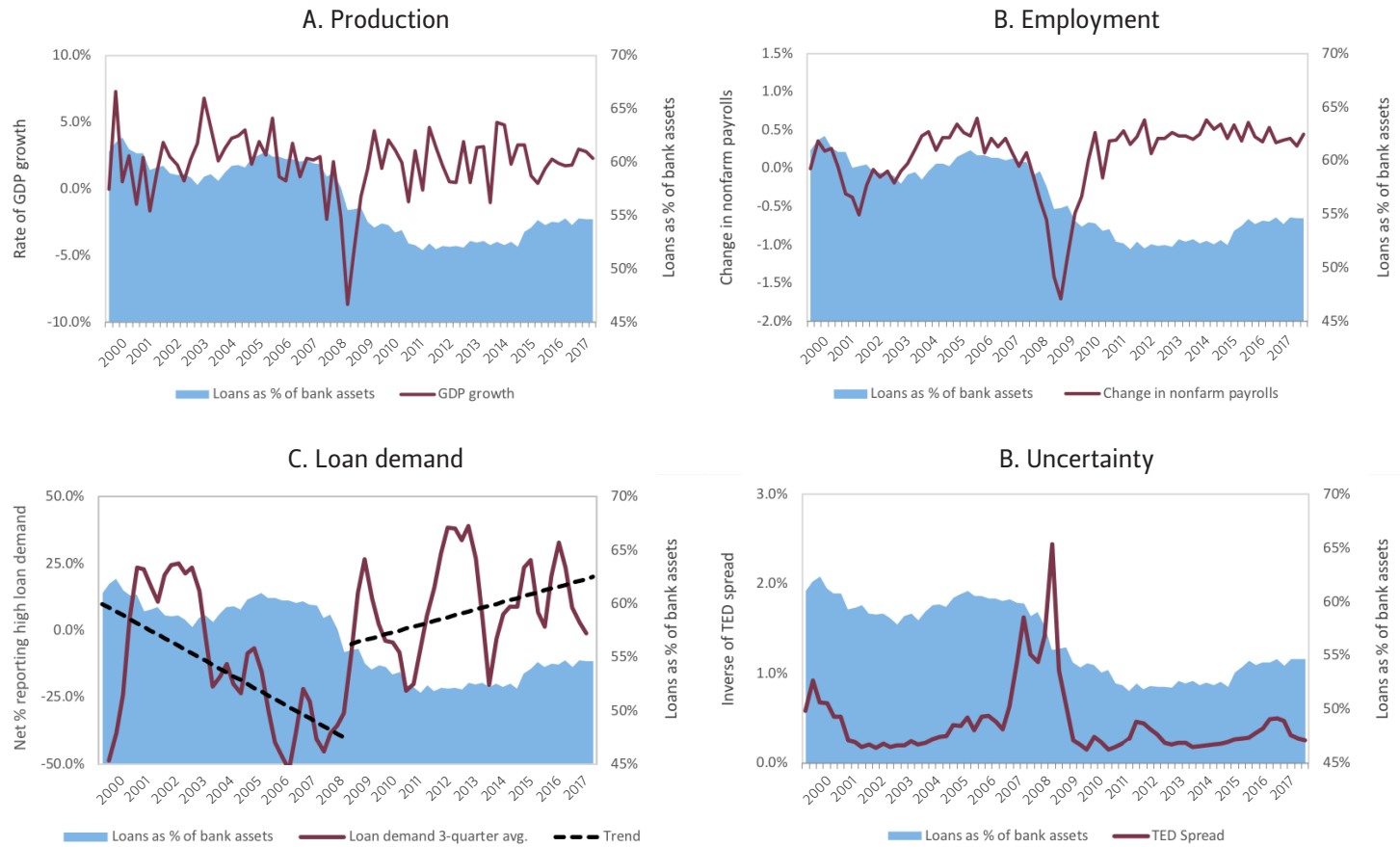
Figure 2b shows the percentage of loans compared to U.S. job growth, commonly measured as the net increase in nonfarm payrolls.² As with loans and GDP growth, the solid line representing job growth falls dramatically in 2007 and 2008, but it rebounds quickly and remains high through 2017, while the percentage of loans remains low. Although changes in employment and GDP growth do correspond to declines in lending during the financial crisis, they do not explain why loans have remained persistently low ever since.

While changes in employment and GDP growth might be proxies for loan demand, Figure 2c shows a survey of loan demand administered by the Fed Board of Governors. Bank managers were asked whether recent demand for loans has been higher or lower than normal. The solid line in Figure 2c represents the net percentage reporting high loan demand in each quarter.³ Dashed lines represent the trends before and after the financial crisis. The survey shows that loan demand was low from 2004 to 2008 but then rebounded in 2009 and 2010 and has remained mostly positive since. Thus, bank loans have been persistently low since the financial crisis despite high demand for loans during this period.

Another reason banks might have reduced lending is that they may have been uncertain about the future. Even if the demand for loans was high, bank managers may have feared another economic downturn or shock to the financial system. The Treasury-Eurodollar (TED) spread shown in Figure 2d is a common measure of uncertainty.⁴ High uncertainty in 2007 and 2008 corresponds to declines in lending, but uncertainty falls thereafter, while loan percentages remain depressed.⁵ As with

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FIGURE 2 — BANK LOANS AND ECONOMIC DATA



SOURCE FDIC Call Reports, Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Board of Governors, Federal Reserve Bank of St. Louis

loan demand, uncertainty does not appear to explain the low levels of bank lending since the financial crisis.

BANK REGULATION

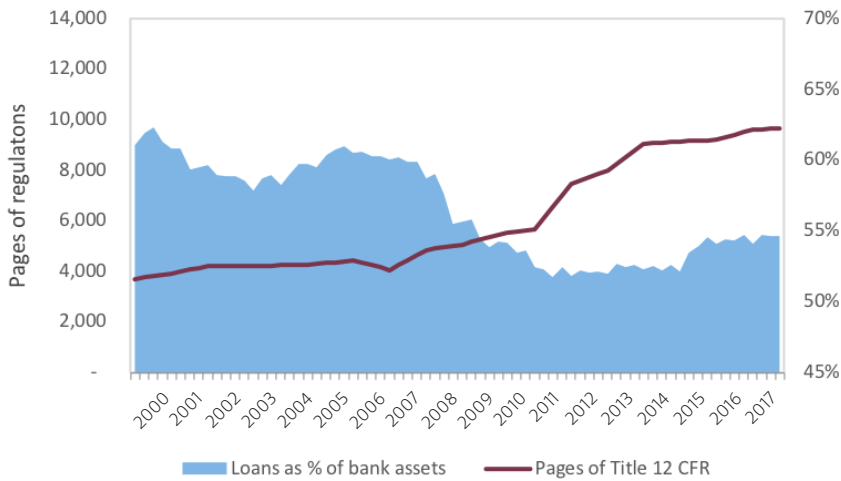
In response to the financial crisis of 2008, Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, described by the U.S. Department of the Treasury as “the most comprehensive set of reforms to our financial system since the Great Depression.”⁶ At more than 2,000 pages and 360,000 words, Patrick McLaughlin and Oliver Sherouse state that the Dodd-Frank Act “may be the biggest law ever.”⁷

How have regulations pursuant to the Dodd-Frank Act affected the banking system? Regulators argue that the new

rules have made the financial system safer,⁸ but academic studies find the evidence is mixed.⁹ Several studies find that increases in regulation actually increase banks’ risk-taking activities since complex regulations make it easier for banks to find loopholes and avoid compliance.¹⁰

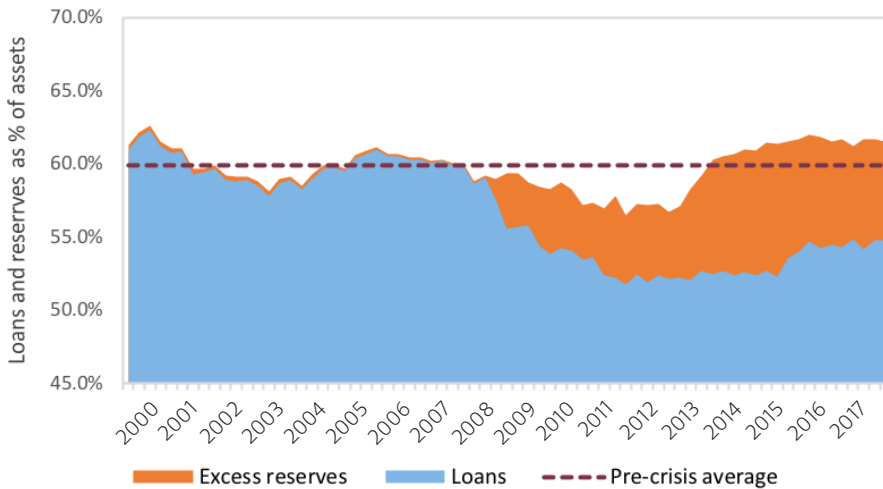
Whatever the effects on financial risk, such a massive expansion of restrictions on banking activities might naturally be expected to have negative effects on lending. Figure 3 compares bank lending to the regulations on U.S. banks. As an approximation for the number of regulations, the solid line represents the number of pages in the Code of Federal Regulations (CFR) Title 12 on Banks and Banking from 2000 to the end of 2017.¹¹ Regulations increase mildly up to 2011 and subsequently shoot up dramatically from

FIGURE 3 — BANK LOANS AND BANKING REGULATIONS



SOURCE FDIC Call Reports, Code of Federal Regulations

FIGURE 4 — BANK LOANS AND EXCESS RESERVES



SOURCE FDIC Call Reports

2012 to 2014 before leveling off through 2017. Thus, regulations and bank loans show similar but inverse patterns: as regulations increased, lending declined.¹²

Several studies find evidence of the negative effects of Dodd-Frank regulations on the banking system.¹³ However, the decline in lending appears to precede the large increases in regulations. Perhaps the decline in bank lending was due to some combination of economic decline causing

lending to fall and new regulations that kept it low. Alternatively, the decline might be more closely associated with other factors, such as changes in monetary policy.

THE FED'S NEW MONETARY POLICY

The financial crisis was also accompanied by institutional changes in the way the Fed conducts monetary policy. The most significant change was the move to an interest rate floor system in which the Fed pays interest to banks on the amount of reserves that they hold. This is perhaps the biggest change ever made to the Fed's monetary policy toolkit, and its effects on lending are not yet well understood.¹⁴

While the payment of interest on required reserves is uncontroversial, the effect of interest on excess reserves (IOER) is a topic of serious debate since excess reserves might instead be used for loans or other investments.¹⁵ For example, Norbert Michel and George Selgin characterizes this policy as “paying banks not to lend,”¹⁶ while Todd Keister argues that reserves “are not displacing other assets [...], like loans to businesses or consumers.”¹⁷

Figure 4 shows total loans and excess reserves as percentages of total bank assets. The decline in loans in 2009 is almost fully offset by an increase in excess reserves. The total of loans and excess reserves since the financial crisis is very close to the pre-crisis average of 59.9%. Higher excess reserve holdings are associated with lower bank loans, contradicting the notion that these assets are unrelated.

Furthermore, the post-crisis declines in bank lending are more closely associated with excess reserves than with regulations or economic activity. Table 1 shows the correlation of regulations, excess reserves, and the previously discussed measures of economic activity to the percentage of bank loans since the financial crisis. None of the economic variables seem to be important drivers of lending during this period. High GDP growth, employment, and loan demand should all be positively correlated with bank loans, while uncertainty should have negative a correlation. None of these appear

to be the case. In contrast, loans and excess reserves show a strong inverse correlation of -53.7%. Regulations are also negatively correlated to loans at -46.4%. This seems to indicate that while economic growth resumed after the crisis, lending did not improve due to increases in regulations and growth in banks' excess reserves.

Despite its importance, there are few studies of the real-world effects of the Fed's IOER policy. Huberto Ennis and Alexander Wolman find little evidence of a relationship between lending and reserves, while Joshua Hendrickson finds that "interest on reserves likely reduced the effectiveness of monetary policy."²⁰ Research by both George Selgin and David Beckworth finds that IOER has had substantially negative effects on bank lending.²¹ More research is needed on this vital yet understudied topic.

CONCLUSIONS

Recovery from the Great Recession was much slower than expected, possibly due to the lack of bank lending. After the financial crisis of 2008, bank lending declined not only in absolute terms but also as a percentage of bank assets. While it might be expected that reductions in lending were associated with the sluggish economy, the evidence suggests otherwise. Lending decreased despite the fact that uncertainty was low and loan demand was high.

Two alternative factors are correlated with declines in bank lending: increases in bank regulations and banks' excess reserves. Bank regulations ballooned following the crisis, and several studies provide evidence of their detrimental effects on lending and the banking system. Since the financial crisis, the Fed's policy of paying interest on reserves has caused banks to take on trillions of dollars of excess reserves, and their loans have declined in equal measure. Future discussions of the decline in bank lending should focus on the effects of regulation and excess reserves rather than on economic activity, which was not an important driver of lending in the post-crisis period.

TABLE 2 — CORRELATIONS TO THE PERCENTAGE OF BANK LOANS, Q4 2008 – Q4 2017¹⁸

| GDP growth | Job growth | Loan demand | TED spread | Regulatory restrictions | Excess reserves |
|------------|------------|-------------|------------|-------------------------|-----------------|
| -56.0% | -70.9% | -36.7% | 69.3% | -46.4% | -53.7% |

SOURCE: FDIC Call Reports, Code of Federal Regulations

ENDNOTES

1. Data are gathered from banks' quarterly *Reports of Condition and Income* (Call Reports) available from the Federal Deposit Insurance Corporation (FDIC). Loans from individual banks are summed to calculate the total value of loans in the banking system in each quarter. Data are available online from the FDIC: <https://cdr.ffiec.gov/public/>.

2. Other measures of employment such as changes in the rate of unemployment or changes in labor force participation show similar results.

3. Because the survey exhibits a high degree of seasonal volatility, the line is shown as a centered three-quarter moving average. In addition, because the survey methodology was altered during the period studied, the loan demand data series is the combination of three surveys for three types of loans: all mortgages from 2000 to Q2 of 2007, prime mortgages from Q3 of 2007 to Q3 of 2014, and GSE-eligible mortgages from Q4 2014 through the end of 2017. These data are available from the Federal Reserve Bank of St. Louis: <https://fred.stlouisfed.org/>.

4. See for example: Jose Berrospide, *Bank Liquidity Hoarding and the Financial Crisis: An Empirical Evaluation*, Federal Reserve Board Finance and Economic Discussion Series 2013-03 (Washington, D.C.: Federal Reserve Board, 2013).

5. Other measures of uncertainty such as the stock market volatility index (VIX) and the Federal Reserve Bank of St. Louis' Financial Stress Index show similar results.

6. Department of the Treasury, *The Dodd–Frank Act: Reforming Wall Street and Protecting Main Street* (Washington, D.C.: U.S. Department of the Treasury, January 2017).

7. Patrick McLaughlin and Oliver Sherouse, “The Dodd–Frank Wall Street Reform and Consumer Protection Act May Be the Biggest Law Ever,” The Mercatus Center at George Mason University, July 20, 2015, <https://www.mercatus.org/publication/dodd-frank-wall-street-reform-and-consumer-protection-act-may-be-biggest-law-ever>.

8. A list of studies is available from: “How is Banking Safer following the financial crisis?” Federal Reserve Bank of San Francisco, accessed November 2018, <https://www.frbsf.org/banking/regulation/regulatory-reform/financial-system-safety-post-financial-crisis/>.

9. See for example Paul Calluzzo and Gang Nathan Dong, “Has the financial system become safer after the crisis? The changing nature of financial institution risk,” *Journal of Banking & Finance* 53 (2015): 233–248; Martin Neil Baily, Aaron Klein, and Justin Schardin, “The Impact of the Dodd–Frank Act on Financial Stability and Economic Growth,” *Russell Sage Foundation Journal of the Social Sciences*, 3, no. 1 (2017): 20–47.

10. For discussion and citations, see Thomas L. Hogan, *Strong, Simple Regulations Promote Financial Stability*, Issue Brief no. 05.21.18. (Houston: Rice University’s Baker Institute for Public Policy, 2018).

11. Available online at <https://www.gpo.gov/fdsys/browse/collectionCfr.action?selectedYearFrom=1996&go=Go>.

12. Other proxies for the number of regulations show similar results. See for example the number of regulatory restrictions from the RegData database based on Omar Al-Ubaydli and Patrick A. McLaughlin, “RegData: A numerical database on industry-specific regulations for all United States industries and federal regulations, 1997–2012,” *Regulation and Governance* 11, no. 1 (2017): 109–123.

13. See for example: Michael D. Bordo and John V. Duca, “The Impact of the Dodd–Frank Act on Small Business,” (NBER Working Paper 24501, National Bureau of

Economic Research, Cambridge, MA, 2018); Federal Reserve and the Conference of State Bank Supervisors, “Community Banking in the 21st Century: Opportunities, Challenges and Perspectives,” (report, second annual Community Bank Research and Policy Conference, St. Louis, MO, September 23–24, 2014); Hester Peirce, Ian Robinson, and Thomas Stratmann, “How Are Small Banks Faring Under Dodd–Frank?” (Working Paper in Economics No. 14–05, Mercatus Center, George Mason University, February 2014).

14. As David Wheelock (2010, p.2) describes, “because the Fed has little experience with paying interest on reserves, it is difficult to predict how much bank loans would change in response to an increase in the interest rate paid on reserve deposits.” David C. Wheelock, “The Monetary Base and Bank Lending: You Can Lead a Horse to Water...” *Federal Reserve Bank of St. Louis Monetary Trends* (September 2010): 2.

15. The Fed pays interest on both required and excess reserves. Required reserves are a percentage of deposits that must be set aside in case of emergency. Excess reserves are the reserves held in excess of a bank’s required minimum. Economists have long proposed that the Fed should pay interest on required reserves since they are required by law, but banks earn no returns on these assets.

16. Norbert Michel and George Selgin, “Fed Must Stop Rewarding Banks for Not Lending,” *American Banker*, May 30 2017, <https://www.americanbanker.com/opinion/fed-must-stop-rewarding-banks-for-not-lending>; see also George Selgin, *Floored! How a Misguided Fed Experiment Deepened and Prolonged the Great Recession* (Washington, D.C.: Cato Institute, 2018).

17. Todd Keister, “Interest on Reserves,” Testimony before the Subcommittee on Monetary Policy and Trade, U.S. House of Representatives Committee on Financial Services, May 17, 2016.

18. The correlation for regulatory restrictions uses annual observations. All other variables are quarterly.

19. Huberto M. Ennis and Alexander L. Wolman, “Large Excess Reserves in the United States: A View from the Cross-

Section of Banks,” *International Journal of Central Banking* 11, no. 1 (2015): 251–289.

20. Joshua R. Hendrickson, “Interest on reserves, settlement, and the effectiveness of monetary policy,” *Journal of Macroeconomics* 54 (2017): 208–216.

21. See Selgin (2018); David Beckworth, “The Great Divorce: The Fed’s Move to a Floor System and Its Implications for Bank Portfolios,” *Mercatus Research*, November 13, 2018, <https://www.mercatus.org/system/files/beckworth-great-divorce-mercatus-research-v1.pdf>; Thomas L. Hogan, “Bank Lending and Interest on Excess Reserves,” (working paper, Baker Institute for Public Policy, Rice University, Houston, 2018).

AUTHOR

Thomas L. Hogan, Ph.D., is a fellow in the Baker Institute [Center for Public Finance](#). He was formerly the chief economist for the U.S. Senate Committee on Banking, Housing and Urban Affairs. His primary research interests include banking regulation and monetary policy.

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