



**KENNESAW STATE
UNIVERSITY**

COLES COLLEGE OF BUSINESS
*Bagwell Center for the Study of Markets
and Economic Opportunity*

Commentary

Title:

*"The New Tools of
Monetary Policy: A Brief
Economics Lesson"*

Author(s):

C. Slade Dale

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Motivation

In much of the extant course material for introductory macroeconomics classes, there exists a significant textbook lag/curriculum gap when it comes to monetary policy.¹ Many texts in use today still teach monetary policy as if we live in a pre-2008 financial world, and many curriculum development groups are only just now updating their curriculum maps to reflect a more modern approach to monetary policy.² For example, the College Board—the organization responsible for administering Advanced Placement (college-equivalency) examinations—only recently updated its AP Macroeconomics course to reflect the role that interest on reserve balances has on the Federal Funds Rate. In non-AP classrooms, there still exists a lag.³ Even on college campuses, many instructors teach as if the “new tools” of monetary policy simply do not exist. This ultimately does a disservice to students who should, in theory, exit the university and enter the world as a well-informed citizen, able to understand the world around them at a high level.

The purpose of this brief economics lesson is to help close the curriculum gap between modern monetary policy and the typical Principles of Macroeconomics classroom, giving students a more complete picture of how target interest rates are determined by the Federal Reserve.⁴

Introduction

With the passage of the Federal Reserve Act in 1913, the Federal Reserve System (henceforth, the “Fed”) was enshrined as the monetary authority of the United States. At the outset, the Fed was primarily tasked with providing the country with an “elastic currency” (i.e., ensuring that financial institutions had enough money on hand to weather potential crises).⁵ This established the role of the Fed as the “lender of last resort.” During the 1970’s, however, the Fed received its current “dual mandate:” to maintain full employment and a low, stable rate of inflation. The methods and mechanisms by which the Fed achieves its two-pronged approach to economic stability is known as Monetary Policy. Broadly defined, monetary policy consists of the actions undertaken by a central bank to ultimately influence interest rates.⁶ By pulling the various levers of monetary policy, a central bank is able to expand or contract the money supply, leading to changes in interest rates around the economy. Of particular importance is the rate known as the Federal Funds Rate.⁷ This interest rate serves as the basis for many other important interest rates, including the Prime Rate. The Federal Funds Rate is the policy rate targeted by monetary policy.

¹ Ihrig, J., & Wolla, S. (2022). Let’s close the gap: Updating the textbook treatment of monetary policy. *The Journal of Economic Education*, 53(3), 232–249. <https://doi.org/10.1080/00220485.2022.2075509>

² Many newer editions of college-level texts briefly discuss new tools of monetary policy, however studies show that, at least for the K-12 level, textbook adoption occurs in cycles of up to 10 years, leading to significant lag; <https://ies.ed.gov/learn/blog/are-open-educational-resources-new-textbooks>.

³ For example, the Georgia Performance Standards do not even specifically mention *any* tools of monetary policy by name; <https://lor2.gadoe.org/gadoe/file/718cd76e-7ea7-44a8-95bf-fd4047eb9cea/1/Social-Studies-Personal%20Finance-and-Economics-Georgia-Standards.pdf>

⁴ Moving forward, I will approach monetary policy by analyzing the tools employed by the Federal Reserve. I recognize that there may be other tools employed by international central banks, however those tools will not be the focus of this commentary.

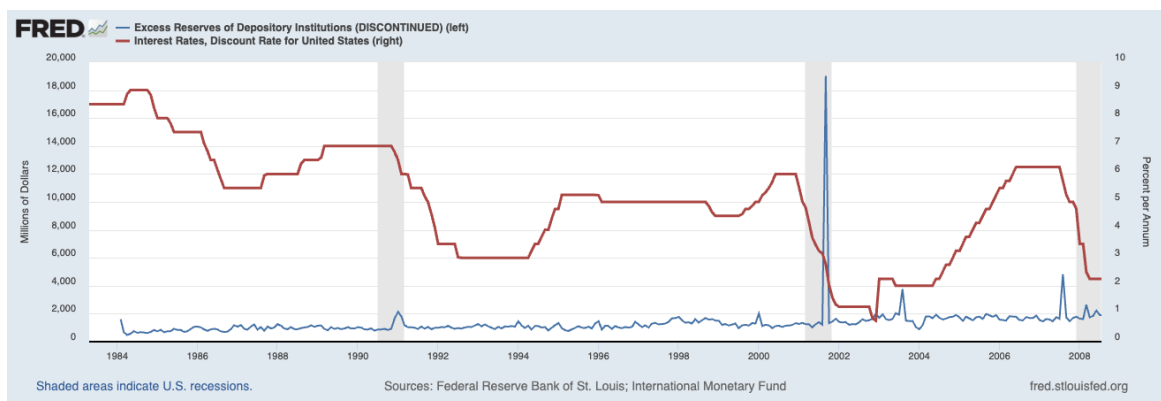
⁵ <https://www.frbsf.org/research-and-insights/publications/economic-letter/1999/01/the-goals-of-us-monetary-policy/#:~:text=The%20Federal%20Reserve%20Act%20of,%E2%80%9Clender%20of%20last%20resort%2C%E2%80%9D>

⁶ Mankiw defines monetary policy as “the setting of the money supply by policymakers in the central bank” (*Principles of Macroeconomics*, 10th ed.). He goes on to explain that the money supply has a close connection to short-run interest rates.

⁷ The federal funds rate is the name of the interbank lending rate in the United States.

Traditionally, monetary policy has been taught using a three-tool model, meaning students are taught that there are three primary levers the Fed uses to achieve its mandate: open-market operations, the setting of the discount rate, and the setting of the reserve requirement. I will not go into much detail regarding the traditional tools, as my assumption is that the typical principles-level macroeconomics student is familiar with them. What may be less familiar to students is the financial environment required for these tools to operate at maximum effectiveness. Under the assumption of limited bank reserves, each of these tools can lead to measurable and impactful changes in the amount of loans that a typical bank is able to make—which, in turn, changes the amount of money in circulation.⁸ By altering any of the three traditional tools, the Fed is able to make a sizeable impact to the amount of excess reserves banks hold, and, assuming that the banking system operates under conditions of holding fractional reserves (as is taught in nearly all macroeconomics courses), we see the resulting change in the money supply by either the increase or decrease in the number of new loans made. As an example of the mechanism by which the traditional tools work, Figure 1 shows a fairly strong inverse correlation between the discount rate—the rate at which the Fed lends funds to financial institutions—and the amount of excess reserves held by banks prior to 2008.

Figure 1. Inverse Correlation between Discount Rate and Excess Reserves^{9,10}



This assumption of holding limited reserves has historically been a safe assumption. However, post-2008 banks began to hold more and more excess reserves, as shown in Figure 2. The reason is quite simple: banks and regulators became acutely aware of the danger of failing if caught holding limited reserves during an extreme financial downturn.¹¹ How banks acquired these “ample reserves,” and why they chose to retain them (aside from insurance against bank runs), is

⁸ The simplest explanation of bank reserves is that they are bank funds not on loan or invested in other assets. From a Principles of Macro standpoint, we view the source of bank reserves as being demand deposits not on loan and/or reserve funds provided directly by the Fed.

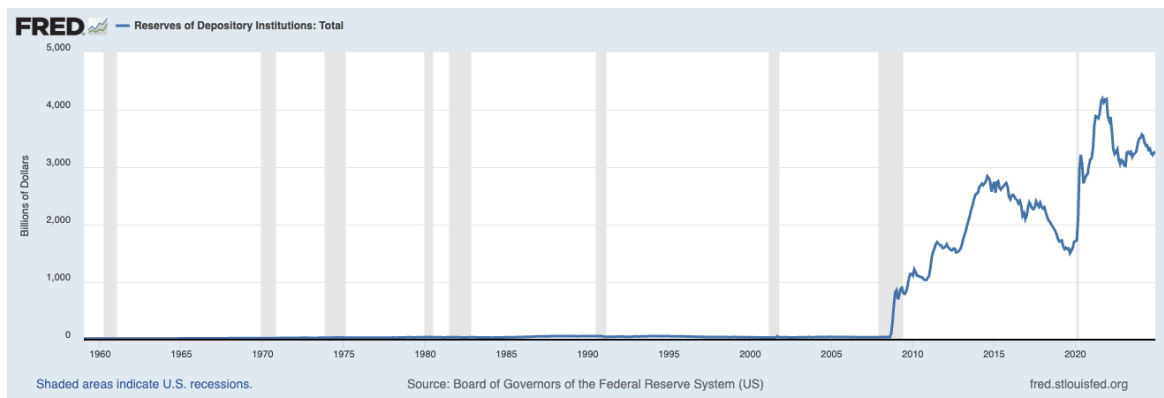
⁹ Federal Reserve Bank of St. Louis, Excess Reserves of Depository Institutions (DISCONTINUED) [EXCSRESNS], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/EXCSRESNS>, February 3, 2025.

¹⁰ International Monetary Fund, Interest Rates, Discount Rate for United States [INTDSRUSM193N], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/INTDSRUSM193N>, February 3, 2025.

¹¹ <https://www.brookings.edu/articles/how-will-the-federal-reserve-decide-when-to-end-quantitative-tightening/#:~:text=Reserves%20are%20funds%20that%20banks.liquidity%20regulations%20and%20supervisory%20guidance.> (See section titled “What are reserves?”)

the subject of this paper. Beginning in 2008, the Fed began to implement two new policy tools that substantially changed the way in which monetary policy in the United States would be conducted: the first was a program called Quantitative Easing (henceforth, “Quantitative Easing” or “QE”) and the second was the tool of Interest on Reserve Balances (henceforth, “Interest on Reserves” or “IORB”).

Figure 2. Change in Reserve Balances Over Time (clear divergence around Sept., 2008)¹²



Quantitative Easing

While vague and mystical,¹³ Quantitative Easing was perhaps one of the most effective tools at stemming the bleeding in the financial system during the downturn of 2008 and has been a regular practice of the Fed ever since.^{14,15} QE is the process of the Fed expanding its balance sheet (its record of assets versus liabilities) through the purchase of long-term Treasury bonds and other assets from commercial banks and financial institutions.¹⁶ Simply put, the Fed buys risky long-term assets from banks (in 2008, the first rounds of QE consisted of purchases of Mortgage-Backed Securities in addition to other assets) in exchange for cash.¹⁷ Banks then hold this money as excess reserves, or reserve balances.

Generally speaking, QE functions as a tool of monetary policy in the following way: As the Fed buys up long-term Treasury bonds, the price of existing bonds in the secondary bond market begins to increase. As the price of bonds increases, the yield (the amount received at the bond’s maturity) on those bonds decreases. As the bond yields decreases, banks rebalance their

¹² Board of Governors of the Federal Reserve System (US), Reserves of Depository Institutions: Total [TOTRESNS], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/TOTRESNS>, January 29, 2025.

¹³ Former Chairman of the Federal Reserve Ben Bernanke himself made a quip about the difficulty in understanding the mechanism of QE; <https://www.cnn.com/2014/01/16/bernanke-cracks-wise-the-best-qe-joke-ever.html>

¹⁴ More recently, we have seen the introduction of QE’s counterpart, “Quantitative Tightening”

¹⁵ See also, [https://www.investopedia.com/terms/q/quantitative-easing.asp#:~:text=Quantitative%20easing%20\(QE\)%20is%20a.Reserve%20implements%20quantitative%20easing%20policies.](https://www.investopedia.com/terms/q/quantitative-easing.asp#:~:text=Quantitative%20easing%20(QE)%20is%20a.Reserve%20implements%20quantitative%20easing%20policies.)

¹⁶

[https://www.cbo.gov/publication/58457#:~:text=Quantitative%20easing%20\(QE\)%20refers%20to,increasing%20liquidity%20in%20financial%20markets.](https://www.cbo.gov/publication/58457#:~:text=Quantitative%20easing%20(QE)%20refers%20to,increasing%20liquidity%20in%20financial%20markets.)

¹⁷ In reality, this exchange is conducted almost exclusively at the Fed. The Fed purchases the target asset from the bank and subsequently credits the account which the bank holds at the Fed (remember that one of the Fed’s roles is the “banker’s bank”). This transaction directly increases the amount of reserves held by the bank.

portfolios, decreasing their holdings of bonds and increasing their holdings of higher interest-earning private assets (i.e., private and commercial loans), leading to an increase in the supply of loanable funds, thereby expanding the money supply and lowering interest rates. This fuels Investment and Consumption, leading to an increase in Aggregate Demand, closing the output gap in the economy.

At the same time as the above mechanism successfully inundated banks with new reserves, banks also chose to hold onto much of the money infused into the financial system via QE, leading to a dramatic uptick in the amount of reserves in the overall financial system. This was likely caused by tightening lending standards, and a general aversion to an overextension of credit. This increase in reserves led to a new problem in the conduct of monetary policy: namely, that the traditional tools of altering the amount of a bank's limited reserves were no longer as effective as they once were. In stepped the new "fourth tool" of monetary policy—Interest on Reserve Balances.

Interest on Reserve Balances^{18,19}

As banks retained the funds secured from QE, it was quickly realized that the so-called traditional tools of monetary policy would no longer be as effective at manipulating interest rates.²⁰ Primarily, this was due to the fact that increasing or decreasing excess reserves through, say, open-market operations or changing the reserve requirement would not have a sizeable impact on a bank's lending practices. That is, a bank already holding "ample reserves" would likely not engage in new lending at a rate commensurate with the increase in excess reserves through the purchases of securities by the Fed, nor would it really feel the effects of monetary tightening with such reserves already in store.

Given the new reality that the U.S. financial system had begun the transition from a "limited reserves" system to an "ample reserves" system, a new mechanism for influencing the Federal Funds Rate needed to be introduced. This new tool would be interest payments for bank reserves on deposit with the Fed. The logic behind the tool was simple; by offering interest payments on reserves (a reasonably safe investment from the bank's perspective), the Fed could manipulate the Federal Funds Rate by forcing banks to offer each other funds on loan at an interbank rate close to the IORB.

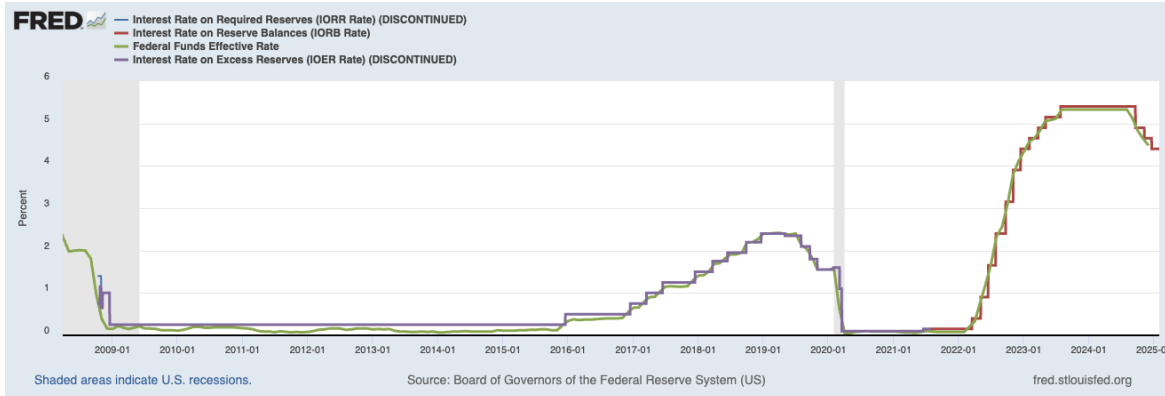
Figure 3 illustrates the highly effective nature of the IORB tool at influencing the Federal Funds Rate. Data since 2008 show that the Federal Funds Rate tracks nearly perfectly with the IORB, detailing the precise nature with which the Fed can manipulate the policy rate.

¹⁸ Please keep in mind that there is some editorializing and simplification taking place so that the principles of IORB can be understood. I make every attempt to maintain fidelity to the spirit of the tool, even if minimizing some of the more complex details.

¹⁹ Initially, the Fed offered two separate rates, one for excess reserves and one for required reserves, the IOER was rendered ineffective when the Fed set the reserve requirement to 0% in 2020, then in 2021 the IOER was replaced with the IORB

²⁰ For the Federal Reserve press release detailing the implementation of IORB, see the following: <https://www.federalreserve.gov/monetarypolicy/20081006a.htm>; in reality, the tool of IORB was already being considered, however implementation was pushed up by several years

Figure 3. Correlation between IORB and Effective Federal Funds Rate^{21,22,23,24}



The IORB was intended to function as a “price floor” for the Federal Funds Rate. The opportunity to earn a guaranteed return on bank reserves at a specified rate ensures that qualifying institutions (those with reserve accounts at the Fed, and able to earn the IORB on said accounts) are unlikely to loan out those reserves at a rate lower than the IORB. Because not all institutions are qualified to earn IORB, the Fed introduced a second administered rate, the Overnight Reverse Repurchase Agreement, to work in tandem with the IORB rate. Together, these two rates act as the de facto rate floor for the Federal Funds Rate.²⁵

Conclusion

This commentary is an attempt to close the curriculum gap present in many Principles of Macroeconomics classrooms regarding the introduction of the new tools of monetary policy, in particular Quantitative Easing and the Interest on Reserve Balances. The IORB is a relatively new topic for teachers and students, and Quantitative Easing is rarely broached in the curriculum at all. I have attempted to offer a simple explanation of each tool and its functioning. The reason is because these two tools—the IORB and the expansion/contraction of the Fed’s balance sheet (QE)—have proven to be the most reliable and effective methods of conducting modern monetary policy in a post-Great Recession economy.

²¹ Board of Governors of the Federal Reserve System (US), Interest Rate on Reserve Balances (IORB Rate) [IORB], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/IOER>, January 29, 2025.

²² Board of Governors of the Federal Reserve System (US), Federal Funds Effective Rate [FEDFUNDS], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/FEDFUNDS>, January 29, 2025.

²³ Board of Governors of the Federal Reserve System (US), Interest Rate on Required Reserves (IORR Rate) (DISCONTINUED) [IOER], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/IOER>, January 29, 2025.

²⁴ Board of Governors of the Federal Reserve System (US), Interest Rate on Excess Reserves (IOER Rate) (DISCONTINUED) [IOER], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/IOER>, January 29, 2025.

²⁵ For a description of how the ON RRP facility works, see: <https://www.federalreserve.gov/monetarypolicy/overnight-reverse-repurchase-agreements.htm>