

Clarity on the Vanishing Reserve-Requirement Tax

Nicholas R. Pusateri

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Reserve requirements no longer tax deposits—or do they? Since 2008, U.S. banks earn interest on reserves and hold massive excess balances. I show the Bailey-Friedman tax hasn't vanished but moved from average to marginal cost. Extending standard portfolio models, I derive when raising requirements imposes zero tax: $i_{RR} \geq i_L$ or $\Delta RR \leq ER$. Federal Reserve data reveals extraordinary capacity: with 57% excess reserves relative to deposits, requirements could rise fifty-fold without distortion. This sharp boundary—requirements are either costless or fully taxing—reframes debates on macroprudential policy, seigniorage, and central bank operating frameworks.

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Email: pusaterin@sacredheart.edu. *Address:* Department of Economics, Sacred Heart University West Campus, 3135 Easton Tpke, Fairfield CT 06825-1081, USA. A previous version of this paper was circulated under the title *A Curious Case for Cagan*. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

1. Introduction

Since October 2008, the Federal Reserve has paid interest on reserve balances, fundamentally altering the monetary policy landscape. This regime shift—accelerated by the financial crisis—explicitly aimed to "remove the implicit, distortionary tax that reserve requirements impose on banks" ([Board of Governors of the Federal Reserve System 2008](#)). With reserves now earning market returns, U.S. banks willingly hold trillions in excess balances. Between October 2008 and March 2020, excess reserves exceeded required balances by a factor of 17 on average.

In 2009, [Walter and Courtois \(2009\)](#) confidently stated that “paying interest on required reserves avoids the implicit tax that reserve requirements impose on banks, which is equal to the income banks could have earned by using those funds for profit-generating loans and investments.” The reserve-requirement tax famously analyzed by [Bailey \(1956\)](#), [Friedman \(1959\)](#), and many more appears to have vanished.¹

I show this conclusion is premature. The key insight is that reserve-requirement incidence depends on *marginal* cost, not average cost. Using a parsimonious portfolio model, I derive the precise condition for tax neutrality:

$$\text{Marginal tax} = 0 \iff i_{RR} \geq i_L \text{ or } \Delta RR \leq ER \quad (1)$$

where i_{RR} is the rate on required reserves, i_L the lending rate, and ER excess reserves. When the central bank pays market rates on reserves and increases requirements by less than the excess buffer, no tax burden emerges. Federal Reserve data from January 2001 to December 2024 reveals the practical magnitude: since October 2008, the Fed could have raised reserve requirements eightfold without reimposing the Bailey tax.

I derive this condition by utilizing a simple portfolio framework and introducing a binding reserve requirement into the post-2008 interest on reserve balances (IORB) environment. Such a framework is common when considering the implicit tax imposed by reserve requirements and aligns with treatments of calculating the implicit tax.²

The intuition is straightforward: when banks voluntarily hold excess reserves, requiring more (up to their excess) imposes no cost—it merely relabels existing behavior. The tax only bites when requirements exceed voluntary holdings. This result connects directly to the foundational seigniorage literature.

¹See also [Poole \(1968\)](#); [Baltensperger \(1980\)](#); [Mitchell \(1982\)](#); [Goodfriend \(2002\)](#) and many others for analysis of the implicit tax and suggestions that paying interest on reserves would remove it.

²For a small sample of relevant papers see [Baltensperger \(1980\)](#); [Mitchell \(1982\)](#); [Ahmed \(1987\)](#); [Molho \(1992\)](#); [Grubel \(2013\)](#); [Ennis \(2018\)](#); [Gunji and Miura \(2025\)](#).

Bailey (1956) and Cagan (1956) established that unremunerated reserve requirements function as an implicit tax on deposits, with banks earning nothing on compulsory balances. Friedman (1959) advocated paying interest on reserves to eliminate this distortion.³ My contribution crystallizes the marginal-incidence logic implicit in modern treatments: the tax vanishes not when reserves earn interest, but when *changes* in requirements don't bind.

The post-2008 regime exemplifies this principle. In the Federal Reserve's ample-reserves system, banks hold substantial excess balances earning the IORB rate. This creates what Ennis and Keister (2008) identify as the flat portion of reserve demand—precisely where my tax-neutral condition applies. Armenter and Lester (2017) formalize how banks willingly accumulate reserves when remunerated at market rates, while Ennis (2018) demonstrates how this decouples rate control from reserve quantities.

Recent policy debates highlight the relevance of understanding when reserve requirements bite. Kashyap and Stein (2012) argue that central banks should use reserve requirements as Pigouvian taxes on short-term bank debt to address systemic risk externalities. De Grauwe and Ji (2023) propose making some ECB reserves unremunerated to stem central bank losses—effectively reimposing a reserve tax. My analysis shows these proposals face a sharp discontinuity: requirements within the excess buffer are costless labels; beyond it, they impose the full Bailey tax. Policymakers cannot fine-tune the burden—it's all or nothing. More broadly, Cutsinger and Luther (2022) document how the ample-reserves regime has altered seigniorage flows, though my analysis suggests that revenue effects depend critically on whether requirements bind at the margin.

2. Model

I utilize a bank portfolio framework to derive a closed-form condition for when raising reserve requirements imposes no tax. The key innovation is reintroducing a binding reserve floor into the post-2008 interest on reserves (IOR) environment. This model follows the logic of Ennis (2018) and is directly related to Ahmed (1987).

2.1. Setup

A competitive bank accepts deposits D and allocates assets between loans L and reserves R . The reserve requirement $R \geq \rho D$ binds when $\rho > 0$, where ρ is the required reserve ratio. Reserves earn i_{RR} , loans earn i_L , and the balance sheet requires $L + R = D$. Define excess reserves as $ER = R - \rho D \geq 0$.

³See also Hall (1983) and Fama (1983) for similar arguments.

Since March 2020, the Federal Reserve sets $\rho = 0$, so $ER = R$. The analysis covers both cases: $\rho > 0$ with $ER < R$, and $\rho = 0$ with $ER = R$.

2.2. Bank optimization

The representative bank maximizes profit (Π), viz,

$$\Pi = i_L L + i_{RR} R - i_D D \quad (2)$$

subject to $L + R = D$ and $R \geq \rho D$. The first-order conditions yield a corner solution: if $i_{RR} < i_L$, the bank holds exactly $R = \rho D$ (constraint binds); if $i_{RR} \geq i_L$, the bank is satiated and holds excess reserves voluntarily.⁴

2.3. The marginal tax

When the regulator raises the requirement from ρ to $\rho + \Delta\rho$, the bank must reallocate $\Delta R = \Delta\rho \cdot D$ from loans to reserves—but only after exhausting existing excess reserves. The profit loss is

$$\Delta\Pi = -(i_L - i_{RR}) \cdot \max\{0, \Delta\rho \cdot D - ER\}. \quad (3)$$

The marginal deposit-tax rate per dollar of deposits, τ is

$$\tau = (i_L - i_{RR}) \cdot \mathbb{I}\{\Delta\rho \cdot D > ER\} \quad (4)$$

where marginal deposit-tax rate per dollar of deposits, τ , is equal to the difference between the loan rate and the reserve remuneration rate, $(i_L - i_{RR})$, but only if the increase in required reserves exceeds the bank's existing excess reserves. If the bank already holds enough excess reserves to meet the new requirement, the tax is zero.

PROPOSITION 1. *An increase in reserve requirements imposes no implicit tax if and only if*

$$i_{RR} \geq i_L \quad \text{or} \quad \Delta\rho \cdot D \leq ER. \quad (5)$$

PROOF. From equation (4), $\tau = 0$ when either $(i_L - i_{RR}) = 0$ or $\mathbb{I}\{\Delta\rho \cdot D > ER\} = 0$. □

COROLLARY 1. *If $i_{RR} < i_L$ and current requirements are zero, raising them to ρ^* is tax-neutral whenever*

$$\rho^* \leq \frac{R}{D}. \quad (6)$$

⁴The Lagrangian is $\mathcal{L} = i_L L + i_{RR} R - i_D D + \lambda_1 (D - L - R) + \lambda_2 (R - \rho D)$ with Kuhn-Tucker conditions yielding $\lambda_1 = i_L$ and $\lambda_2 = i_L - i_{RR}$. When $i_{RR} < i_L$, we have $\lambda_2 > 0$ so $R = \rho D$ (constraint binds) and $ER = 0$. When $i_{RR} \geq i_L$, we have $\lambda_2 = 0$ so $R > \rho D$ (constraint slack) and $ER > 0$.

2.4. Economic interpretation

The zero-tax condition operates through two channels. First, the “Rate channel.” When $i_{RR} \geq i_L$, holding reserves is costless regardless of requirements. The traditional opportunity cost vanishes. Second, the “Quantity channel.” When $i_{RR} < i_L$ (the empirical norm), raising requirements is still costless until it exhausts excess reserves. The tax activates only when forced reallocation begins.

Figure 1 illustrates this modified Bailey curve. Unlike the classic version, tax revenue remains zero until ρ exceeds $\rho^* = ER/D$. In the U.S. “abundant-reserves regime,” this threshold has been substantial: Section 3 shows the Fed could have tripled requirements without entering the tax region.

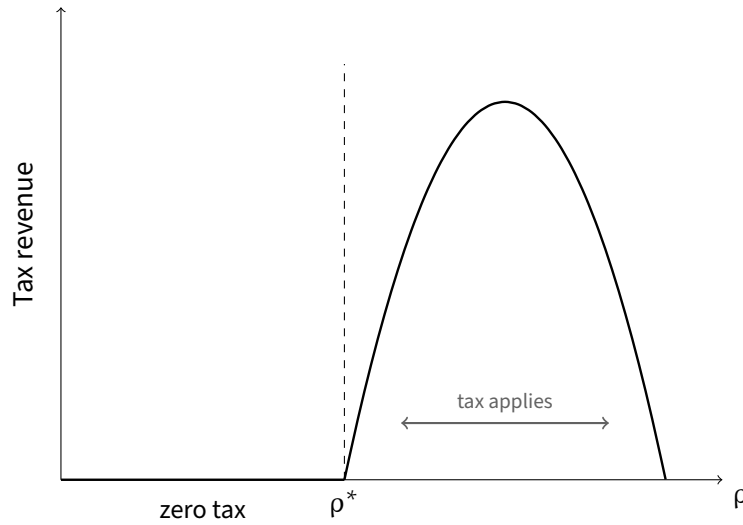


FIGURE 1. Modified Bailey curve: tax revenue is zero until ρ exceeds $\rho^* = ER/D$.

3. Data

I quantify the tax-neutral window using Federal Reserve data from January 2001 to December 2024. The key metric is the reserve-to-deposit buffer, which maps directly to the zero-tax threshold in Corollary 1.

3.1. Construction

The buffer is defined as

$$\text{Buffer}_t = \frac{ER_t}{D_t} \quad (7)$$

where ER_t is excess reserves and D_t is demand deposits (WDDNS). The construction of excess reserves reflects the Federal Reserve’s policy change in March 2020:

- Before March 26, 2020: ER_t = excess reserves (EXCSRESNW)
- After March 26, 2020: ER_t = total reserves (TOTRESNS)

This switch is necessary because the Federal Reserve eliminated reserve requirements ($\rho = 0$) on March 26, 2020, making all reserves effectively “excess.” With $\rho = 0$, we have $ER = R - \rho D = R$, so the buffer becomes R/D —precisely the zero-tax threshold from Corollary 1.

3.2. Results

Figure 2 reveals three striking facts:

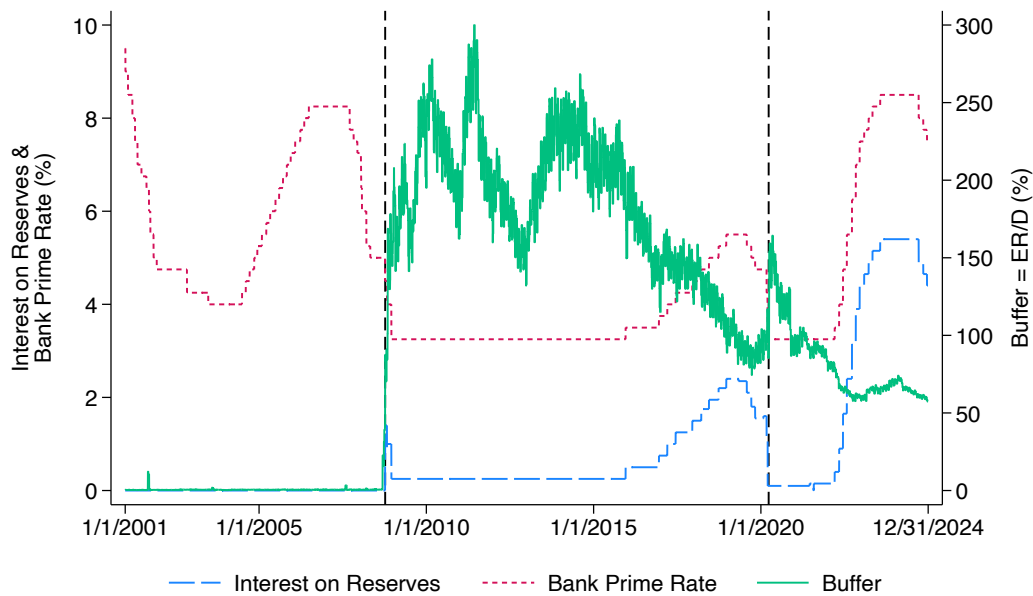


FIGURE 2. Reserve buffer and interest rates, 2001–2024. The buffer (solid green, left axis) shows excess reserves as a percentage of deposits. Interest rates (right axis) show IORB (long-dashed blue) and the prime rate (short-dashed red). The vertical line mark October 9, 2008 when the Federal Reserve began paying IOR and March 26, 2020, when reserve requirements dropped to zero.

Sources: [FRED 2025a](#); [FRED 2025b](#); [FRED 2025c](#); [FRED 2025d](#).

Note: Authors Calculation. Data are from January 1, 2001 to December 31, 2024.

First, the buffer averaged 180% from October 2008 to March 2020—banks held nearly twice their deposits in excess reserves. Even at the minimum (70%), the Fed could have raised requirements from 10% to 80% without imposing any tax.

Second, the spread $i_L - i_{RR}$ remained positive throughout, confirming we’re in the empirically relevant case where only the quantity margin matters. The prime rate exceeded IOR by 300 basis points on average.⁵

Third, the buffer persists after requirements dropped to zero in March 2020, averaging 81% since March 2020. This suggests the tax-neutral window remains substantial: requirements could rise to 57% (the minimum buffer) before any tax emerges.

Table 1 summarizes the tax-neutral capacity across regimes:

TABLE 1. Tax-neutral reserve requirement capacity by period

Period	Mean Buffer	Min Buffer	Max ρ without tax
Pre-IOR (2001–2008)	0.8%	0.2%	0.2%
IOR with $\rho > 0$ (2008–2020)	179.2%	70.3%	80.3%
IOR with $\rho = 0$ (2020–2024)	81.1%	57.4%	57.4%

Sources: [FRED 2025a](#); [FRED 2025b](#); [FRED 2025c](#); [FRED 2025d](#).

Note: Authors Calculation. Data are from January 1, 2001 to December 31, 2024. The “Max ρ without tax” reflects the maximum reserve requirement that could be imposed without triggering a marginal tax, based on the minimum observed reserve buffer in each period. In Period 1 (pre-IOR), excess reserves (0.2%) were likely incidental and not voluntarily held; the statutory 10% requirement bound tightly, and any additional requirement would have imposed a tax. In Period 2 (post-IOR with $\rho = 10\%$), observed excess reserves were substantially above the requirement, indicating meaningful voluntary holdings and enabling tax-neutral increases. In Period 3 (post-IOR with $\rho = 0\%$), all reserves are classified as excess, so the buffer directly corresponds to the tax-neutral threshold.

The contrast is stark. Before IOR, essentially any requirement imposed a tax. After IOR, the Fed gained enormous capacity to adjust requirements without distortionary effects—a capacity that persists today despite the formal abandonment of requirements.

4. Policy implications

4.1. The tax-neutral window

This analysis reveals substantial capacity for raising reserve requirements without imposing the classic Bailey tax. With $\rho = 0$ since March 2020 and the reserve-to-deposit buffer at 57% (2024 Q4 minimum), the Federal Reserve could implement requirements

⁵I use the bank prime lending rate rather than risk-free rates because the relevant opportunity cost for banks is the return on loans, not Treasury securities. When banks face binding reserve requirements, they must substitute reserves for loans, not for risk-free assets. The federal funds rate, while important for monetary policy, represents interbank lending and often trades below IORB due to institutional frictions. Using the FFR would suggest reserves earn a premium rather than imposing a tax, which contradicts the economic logic of reserve requirements as a burden on intermediation. Moreover, if risk-free rates were the relevant comparison, reserves would often appear to earn a premium (when $FFR < IORB$), suggesting banks would voluntarily hold infinite reserves—clearly contradicting observed behavior where banks actively minimize reserve holdings when unremunerated.

up to 57% while remaining tax-neutral. This capacity—over five times the pre-crisis 10% requirement—exists because banks already hold these reserves voluntarily at market rates.

4.2. When the tax returns

The reserve-requirement tax reemerges when policy adjustments violate either margin in Proposition 1. Specifically, a tax is imposed if (i) required reserves exceed the existing stock of excess reserves—activating the quantity channel—or (ii) required reserves are remunerated below the lending rate—engaging the rate channel. However, it is essential to distinguish that these channels are not jointly binding under typical conditions. In practice, the rate channel only imposes a cost when the quantity constraint is active.

Quantity channel. The marginal tax remains zero so long as reserve requirements rise within the bank's voluntarily held excess reserves. In this region, reclassification from excess to required reserves does not necessitate asset reallocation, and thus imposes no opportunity cost. The tax arises only when incremental requirements exceed this buffer, compelling banks to reallocate interest-earning loans toward lower-yielding reserves.

Rate channel. A positive spread between the lending rate and the rate on required reserves, $i_L - i_{RR} > 0$, implies that reserve holdings are costly at the margin—but only if such holdings are involuntary. That is, the rate channel is dormant until the reserve requirement binds on the bank's portfolio choice. Within the excess-reserve buffer, even unremunerated required reserves generate no marginal tax, since they simply formalize preexisting behavior.

Accordingly, the existence of a positive rate spread is a necessary but not sufficient condition for the reserve tax to apply. The sufficient condition is that the reserve requirement binds—i.e., that $\Delta RR > ER$. Only beyond this threshold does the rate differential translate into a marginal tax burden.

This clarification is crucial for interpreting the post-2008 regime: the observed tax neutrality stems not from a favorable rate environment, but from the presence of a substantial excess-reserve buffer. Throughout this period, the quantity margin has been slack, rendering the rate channel economically irrelevant despite persistently positive spreads.

The relevant boundary is sharp. Policymakers face a binary choice: requirements within the buffer impose no tax; requirements beyond the buffer with below market rates resurrect the full distortion.⁶

⁶Central banks outside the US face the same margin: the European Central Bank and Bank of Japan tier reserves, while the Bank of England abolished requirements entirely ([European Central Bank 2019](#); [Bank of Japan 2016](#); [Bank of England 2009](#)).

4.3. The broader trade-off

While raising requirements within the buffer avoids the deposit tax, it is not a free lunch. Converting voluntary excess reserves to required reserves: (i) reduces banks' liquidity management flexibility, (ii) locks in a larger central bank balance sheet, and (iii) may be misperceived as punitive despite the tax-free nature. The zero-tax condition identifies what is possible, not necessarily what is optimal.

The key insight remains: in an ample-reserves regime with IORB, the statutory reserve requirement functions as a quantity tool rather than a tax instrument—unless policy-makers explicitly choose otherwise by breaching the buffer or cutting remuneration. As [Barro \(1982\)](#) and [Jefferson \(1998\)](#) showed for classical seigniorage and [Cutsinger and Luther \(2022\)](#) confirmed for the modern regime, the fiscal implications depend critically on where requirements bind. This clarifies how we should evaluate proposals to adjust reserve requirements for macroprudential, fiscal, or operational purposes.

4.4. Statutory versus effective requirements

This analysis assumes the binding constraint is the Federal Reserve's statutory requirement. In practice, bank examiners often pressure banks to hold buffers above regulatory minimums, creating a gap between de jure and de facto requirements. If the effective requirement exceeds the statutory one, my tax-neutral window shrinks accordingly. For instance, if examiners effectively require 20% reserves when the statutory requirement is 10%, then the excess buffer available for tax-free increases is halved. Future work should incorporate these supervisory pressures to bound the true tax-neutral capacity.

5. Conclusion

The reserve-requirement tax that dominated monetary economics from Bailey to Friedman has not disappeared—it has moved. I show that paying interest on reserves shifts the tax from the average to the margin. The condition is stark: no tax emerges when the central bank raises requirements within its excess-reserve buffer even while paying below market rates. Outside these bounds, the full Bailey tax returns.

Federal Reserve data reveals the practical magnitude of this shift. Throughout 2008–2024, excess reserves exceeded requirements by factors of 17 to 81, creating unprecedented capacity for tax-neutral requirement adjustments. Even today, with requirements at zero, the Fed could impose a 57% requirement without distorting deposit markets.

This finding reframes current policy debates. Proposals to reclaim seigniorage through unremunerated reserves or to implement macroprudential requirements must reckon

with a sharp discontinuity: within the buffer, requirements are merely labels; beyond it, they are taxes. Central banks cannot split the difference.

Future research should examine how this tax boundary interacts with other post-crisis regulations—particularly liquidity coverage ratios that also encumber reserves—and whether the tax-neutral window varies systematically with monetary policy stance. As central banks worldwide reconsider their operating frameworks, understanding when reserve requirements bind remains as relevant as when Bailey first traced his curve.

References

- Ahmed, Syed Mushtaque. 1987. “The Effects of Reserve Requirements as an Implicit Tax on Banking: Theory and Empirical Evidence.” Ph.D. thesis, Simon Fraser University. Burnaby, BC, Canada.
- Armenter, Roc, and Benjamin Lester. 2017. “Excess Reserves and Monetary Policy Implementation.” *Rev. Econ. Dyn.* 23: 212–235. DOI: <https://doi.org/10.1016/j.red.2016.11.002>.
- Bailey, Martin J. 1956. “The Welfare Cost of Inflationary Finance.” *J. Polit. Econ.* 64 (2): 93–110. DOI: <https://doi.org/10.1086/257766>.
- Baltensperger, Ernst. 1980. “Alternative Approaches to the Theory of the Banking Firm.” *J. Monet. Econ.* 6 (1): 1–37. DOI: [https://doi.org/10.1016/0304-3932\(80\)90016-1](https://doi.org/10.1016/0304-3932(80)90016-1).
- Bank of England. 2009. “Markets and Operations.” *Bank Engl. Q. Bull.* 49 (4): 258–271, <https://www.bankofengland.co.uk/quarterly-bulletin/2009/q4/markets-and-operations-2009-q4>.
- Bank of Japan. 2016. “New Framework for Strengthening Monetary Easing: “Quantitative and Qualitative Monetary Easing with Yield Curve Control.”” Monetary Policy Statement, https://www.boj.or.jp/en/mopo/mpmdeci/mpr_2016/k160921a.pdf.
- Barro, Robert J. 1982. “Measuring the Fed’s Revenue from Money Creation.” *Econ. Lett.* 10 (3–4): 327–332. DOI: [https://doi.org/10.1016/0165-1765\(82\)90074-X](https://doi.org/10.1016/0165-1765(82)90074-X).
- Board of Governors of the Federal Reserve System. 2008. “Federal Reserve Begins to Pay Interest on Reserve Balances.” press release, Federal Reserve Board of Governors. <https://www.federalreserve.gov/monetarypolicy/20081006a.htm>.
- Board of Governors of the Federal Reserve System (US). 2025a. “Bank Prime Loan Rate [DPRIME].” <https://fred.stlouisfed.org/series/DPRIME>. Retrieved from FRED, Federal Reserve Bank of St. Louis, June 4, 2025.
- Board of Governors of the Federal Reserve System (US). 2025b. “Demand Deposits [WDDNS].” <https://fred.stlouisfed.org/series/WDDNS>. Retrieved from FRED, Federal Reserve Bank of St. Louis, June 3, 2025.
- Board of Governors of the Federal Reserve System (US). 2025c. “Excess Reserves of Depository Institutions (DISCONTINUED) [EXCSRESNW].” <https://fred.stlouisfed.org/series/EXCSRESNW>. Retrieved from FRED, Federal Reserve Bank of St. Louis, June 4, 2025.
- Board of Governors of the Federal Reserve System (US). 2025d. “Reserves of Depository Institutions: Total [TOTRESNS].” <https://fred.stlouisfed.org/series/TOTRESNS>. Retrieved from FRED, Federal Reserve Bank of St. Louis, June 4, 2025.

- Cagan, Phillip. 1956. "The Monetary Dynamics of Hyperinflation." In *Studies in the Quantity Theory of Money*, edited by Milton Friedman, 25–117: University of Chicago Press. ISBN: 0-226-26404-1.
- Cutsinger, Bryan, and William J. Luther. 2022. "Seigniorage Payments and the Federal Reserve's New Operating Regime." *Econ. Lett.* 220: 110880. DOI: <https://doi.org/10.1016/j.econlet.2022.110880>.
- De Grauwe, Paul, and Yuemei Ji. 2023. "Monetary Policies That Do Not Subsidize Banks." VoxEU column, <https://cepr.org/voxeu/columns/monetary-policies-do-not-subsidise-banks>.
- Ennis, Huberto M. 2018. "A simple general equilibrium model of large excess reserves." *J. Monet. Econ.* 98: 50–65. DOI: <https://doi.org/10.1016/j.jmoneco.2018.04.008>.
- Ennis, Huberto M, and Todd Keister. 2008. "Understanding Monetary Policy Implementation." *FRB Richmond Econ. Q.* 94 (3): 235–263. https://www.richmondfed.org/publications/research/economic_quarterly/2008/summer/ennis_keister.
- European Central Bank. 2019. "ECB Introduces Two-tier System for Remunerating Excess Liquidity Holdings." press release, European Central Bank. https://www.ecb.europa.eu/press/pr/date/2019/html/ecb.pr190912_2~a0b47cd62a.en.html.
- Fama, Eugene F. 1983. "Financial Intermediation and Price Level Control." *J. Monet. Econ.* 12 (1): 7–28. DOI: [https://doi.org/doi.org/10.1016/0304-3932\(83\)90045-4](https://doi.org/doi.org/10.1016/0304-3932(83)90045-4).
- Friedman, Milton. 1959. *A Program for Monetary Stability*.: Fordham University Press.
- Goodfriend, Marvin. 2002. "Interest on Reserves And Monetary Policy." *FRBNY Econ. Pol. Rev.* 8 (1). <https://www.newyorkfed.org/medialibrary/media/research/epr/02v08n1/0205good.pdf>.
- Grubel, H.G. 2013. "The New International Banking." *PSL Q. Rev.* 36 (146). DOI: <https://doi.org/10.13133/2037-3643/10780>.
- Gunji, Hiroshi, and Kazuki Miura. 2025. "Do Reserve Requirements Restrict Bank Behavior?" *Review of Financial Economics* 43 (2): 147–165. DOI: <https://doi.org/https://doi.org/10.1002/rfe.1225>.
- Hall, Robert E. 1983. "Optimal Fiduciary Monetary Systems." *J. Monet. Econ.* 12 (1): 33–50. DOI: [https://doi.org/10.1016/0304-3932\(83\)90047-8](https://doi.org/10.1016/0304-3932(83)90047-8).
- Jefferson, Philip N. 1998. "Seigniorage Payments For Use of the Dollar: 1977–1995." *Econ. Lett.* 58 (2): 225–230. DOI: [https://doi.org/10.1016/S0165-1765\(97\)00284-X](https://doi.org/10.1016/S0165-1765(97)00284-X).
- Kashyap, Anil K., and Jeremy C. Stein. 2012. "The Optimal Conduct of Monetary Policy with Interest on Reserves." *American Economic Journal: Macroeconomics* 4 (1): 266–82. DOI: <https://doi.org/10.1257/mac.4.1.266>.
- Mitchell, Douglas W. 1982. "The Effects of Interest-Bearing Required Reserves on Bank Portfolio Riskiness." *Journal of Financial and Quantitative Analysis* 17 (2): 209–216. DOI: <https://doi.org/10.2307/2330846>.
- Molho, Lazaros E. 1992. "Reserve Requirements on Bank Deposits as Implicit Taxes: A Case Study of Italy." imf working papers, International Monetary Fund. <https://www.imf.org/en/Publications/WP/Issues/2016/12/30/Reserve-Requirementson-Bank-Deposits-aL558s-Implicit-Taxes-A-Case-Study-of-Italy-769>, number=1992/018.

- Poole, William. 1968. "Commercial Bank Reserve Management in a Stochastic Model: Implications for Monetary Policy." *The J. of Fin.* 23 (5): 769–791, <http://www.jstor.org/stable/2325906>.
- Walter, John R, and Renee Courtois. 2009. "The effect of interest on reserves on monetary policy." *Fed Reserv Richmond Econ Brief*: 09–12. https://www.richmondfed.org/publications/research/economic_brief/2009/eb_09-12.