Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

How Central Bank–Treasury Settlement Rules Shape Government Financing Choices

Wensheng Zhao

zhaowensheng2004@163.com

Shanxi University of Finance and Economics

Research Article

Keywords: central bank financing, Treasury cash management, settlement rules, public debt

Posted Date: November 20th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11798965/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: The authors declare no competing interests.

How Central Bank–Treasury Settlement Rules Shape Government Financing Choices

Abstract

Can a financing arrangement that reduces market borrowing today leave a payment due tomorrow uncovered? This paper derives the combinations of market borrowing and central bank financing that allow a Treasury to meet two successive payments. When the first draw uses capacity that remains committed at the second date, the amount the Treasury can safely draw today depends on tomorrow's settlement and the funding already authorised to meet it. The model gives the minimum market borrowing needed today. The ranking reverses when the market debt falling due outweighs the capacity used by the first draw. Financial statements from the US Federal Reserve Banks and the UK Asset Purchase Facility illustrate how to identify the relevant payment obligations. Deferred US earnings affect future remittances, while the British indemnity gives rise to Treasury cash payments. These accounts identify settlement rules, while the financing thresholds depend on the specified constraints.

Keywords central bank financing, Treasury cash management, settlement rules, public debt

JEL classification E58, E62, H63

Introduction

A Treasury must finance a payment today and knows that a second payment will fall due before it can freely rearrange its borrowing. It can issue debt now or use financing available under an agreement with the central bank. Either choice pays today's bill. The choice matters tomorrow if a draw today reduces the amount that can be drawn again. How much market borrowing can the Treasury dispense with today while keeping the second payment within reach?

These decisions become especially visible when central bank income falls. Under one arrangement the Treasury receives less income until the central bank has recovered its losses. Under another it owes cash on agreed settlement dates. The income statement is informative in both cases, but a debt manager deciding how many bills to sell also needs to know what is due before the next borrowing opportunity. Even an expected future receipt of

equal present value cannot meet an earlier obligation without someone having authority and funds to advance it.

Two lines of research help to narrow the question. Government cash managers match receipts, expenditure and financing across dates. Lienert (2009) describes this task, and the OECD (2025) documents how the instruments available to debt managers and the depth of domestic markets affect their cash buffers. Given two fixed cash schedules, the larger peak cumulative deficit requires more opening cash. That familiar calculation is the starting point here. It leaves a policy choice open when drawing on one source today changes the cash that can be raised tomorrow.

Work on central bank finances explains why the value of a government's claims depends on the distribution of earnings and the provision of fiscal support (Del Negro & Sims, 2015; Hall & Reis, 2015). Bunea et al. (2016) document the variety of profit distribution and loss coverage arrangements. Bell et al. (2023) explain why a central bank can continue to fulfil its mandate despite losses. Consolidating the Treasury and the central bank can clarify the public sector's exposure to outside holders of debt, especially when asset purchases shorten the effective maturity of public liabilities (Greenwood et al., 2014). A consolidated account, however, does not assign responsibility for a payment on a particular day. Marszałek (2003) approaches coordination through the authorities' objectives and instruments. Here the objectives can already be agreed; the question is whether the instrument that pays the first bill will still be available for the second.

I derive the amount of market borrowing that can be replaced today while preserving the ability to settle tomorrow. The result turns on the part of the initial draw that remains outstanding, the next unavoidable cash call, and alternative funds accessible by the deadline. A numerical example shows why a financing decision that passes the current cash test can leave a positive shortfall at the next date. The ordering can reverse if the market debt itself comes due before the second payment: a longer-lived central bank draw uses some future capacity but can avoid a still larger rollover need. These statements concern a finite payment horizon. They do not establish a national debt limit or measure the welfare consequences of monetary financing.

The two financial systems examined below make different parts of this decision observable. The US accounts describe the future earnings an individual Reserve Bank must retain before

resuming remittances. The UK accounts record a Treasury indemnity, associated revaluations and cash received by the Asset Purchase Facility. Section 1 develops the financing condition, and Section 2 uses a fixed payment schedule to isolate the role of cash timing. Section 3 traces the institutional evidence. Section 4 considers how to apply the condition before a payment is made, including where access to funding depends on an explicit decision.

1. Financing two successive payments

1.1. What can be financed at each date?

Consider a Treasury with a net financing requirement G at date 0. Receipts already available have been deducted. Market borrowing and a draw on an authorised monetary financing arrangement fund the same current payment in the same currency. Market borrowing is available for the whole initial requirement; the Treasury may choose an amount x of monetary financing between zero and G. Its initial market borrowing is therefore $G - x$. The market instrument matures after the second payment, and any interest or other amounts due inside the horizon have already been included in the cash requirements. If those amounts differ across choices, Section 4 explains the adjustment.

The monetary arrangement has a limit K on exposure outstanding after each draw. This can represent a facility with a contractual ceiling. In the more general interpretation it is a specified limit on the monetary exposure the authorities admit over this horizon. A draw uses one unit of that capacity per unit of financing. A fraction ρ of previously outstanding exposure remains at each date, with $0 < \rho \leq 1$. Exposure that runs off does so independently of the two current choices. If run-off involves a Treasury cash repayment, the scheduled cash forecasts must include it. The ceiling applies to the specified instrument. It places no general ceiling on a sovereign's ability to issue its currency.

Let L_0 denote inherited exposure before run-off at date 0. The second bill is P. The amount H available for that bill includes uncommitted Treasury cash, receipts usable by the deadline and other financing already authorised and obtainable by then. Define m as the part of the second bill that still needs to be covered. The two post-draw exposures are L_1 and L_2, and y is the second draw. All amounts are in the same units.

$$m = \max(0, P - H), \qquad L_1 = \rho L_0 + x, \qquad L_2 = \rho L_1 + y. \qquad (1)$$

A feasible plan covers both bills and observes the ceiling at each date. The smallest adequate second draw is m. A larger second draw uses more capacity and cannot rescue a plan that fails at m. This is where a financing decision enters the calculation. The residual bill may be identical under two choices, yet the headroom available to pay it need not be.

1.2. The largest first draw consistent with both payments

Proposition 1. Suppose $0 \le L_0 \le K$, the date-0 market option is available as stated, and H is attainable independently of x. A two-payment plan exists precisely when $\rho^2 L_0 + m \le K$. Whenever it exists, the admissible first draws form the interval from zero to x^*, where

$$x^* = \min\left\{G,\ K - \rho L_0,\ \frac{K - \rho^2 L_0 - m}{\rho}\right\}. \qquad (2)$$

To see the result, the first payment requires $x \le G$, and the first post-draw exposure requires $x \le K - \rho L_0$. Substituting $y = m$ in the second exposure gives the third bound in (2). If its numerator is negative, even financing the first bill entirely in the market leaves too little capacity at the second date. Otherwise every draw up to the smallest bound works: borrow $G - x$ now and draw m when the bill falls due. This construction proves sufficiency as well as necessity. The least initial market borrowing consistent with payment at both dates is $G - x^*$.

Equation (2) distinguishes three policy situations. The Treasury can use the facility for the entire initial bill when both exposure bounds permit that draw. A restriction on the first draw binds immediately if the agreement already has little unused capacity. The more interesting case is an agreement with ample capacity today but a large unavoidable bill tomorrow. When the third bound alone binds and $P > H$, one extra unit of second-date funding raises the permissible first draw by $1/\rho$ units, until another bound becomes binding. A promise of funds after the settlement deadline has no such effect.

The same result can be read from the payment side. After choosing an admissible x today, the largest bill the Treasury can cover at the second date is the sum of alternative resources and remaining drawing capacity:

$$P_{\max}(x) = H + K - \rho^2 L_0 - \rho x. \qquad (3)$$

A cash office can use (3) without having to assign a monetary value to every future policy. With comparable payment dates and resources, a larger first draw reduces tomorrow's maximum payable bill by ρ per unit. If the initial draw runs off in full before the next

deadline, this term vanishes. An agreement granting enough independent bridging finance also makes the second bound on exposure irrelevant for paying the stated bill. These limiting cases identify circumstances in which the simpler cash calculation is sufficient.

1.3. A payment covered today can leave a shortfall tomorrow

Table 1 uses the two-period construction to show how much the choice can matter. Take $K = 1$, $L_0 = 0.70$, $\rho = 0.90$ and $G = 0.20$. At the second date a payment of 0.40 falls due and 0.10 can be raised from other authorised sources, leaving 0.30 to draw. The values are normalised units chosen to illustrate the condition. The two pure strategies finance exactly the same first payment.

Table 1. Financing choices when the second payment is due

Initial financing choice	First draw	Market borrowing	First exposure	Second exposure needed	Unfunded payment
Facility only	0.2000	0.0000	0.8300	1.047	0.047
Market only	0.0000	0.2000	0.6300	0.867	0.000
Largest feasible draw	0.1478	0.0522	0.7778	1.000	0.000

Source: author's calculations in normalised units. The limit is 1, the second payment is 0.40 and alternative funds are 0.10. The boundary row uses 133/900 for the draw and 47/900 for market borrowing before rounding.

Using the full first draw leaves 0.83 outstanding after date 0. By the next draw this falls to 0.747, leaving 0.253 available against a residual bill of 0.30. The shortfall is 0.047. Using only market borrowing today leaves 0.433 available for the second draw, so the same 0.30 can be covered with headroom to spare. The exposure of 1.047 in the first row is what would be required to pay in full; respecting the agreement leaves part of the payment unfunded.

The mixed plan in Table 1 identifies the smallest change in the financing mix that preserves payment. It requires market borrowing of at least $47/900$, or approximately 0.0522, at date 0. A Treasury that has drawn the whole 0.20 instead needs an additional 0.047 of cash or authorised finance at date 1. The two figures differ because a unit shifted from the first facility draw to market borrowing releases future capacity by 0.90 units. Neither figure measures the fiscal cost of the arrangement. Comparing that cost would require pricing the market debt, future interest on monetary liabilities and the positions still outstanding after the second payment.

The same numbers identify which authority could restore the plan. If the cash office already has a binding commitment for an extra 0.047 by the deadline, the full initial draw becomes feasible. If the same amount needs a fresh approval that may come after the bill is due, relying on it leaves a contingent funding gap. The facility limit itself is a maintained assumption in this exercise. The US and UK documents used below supply examples of settlement obligations, not estimates of this ceiling.

2. What a fixed cash schedule can establish

A useful benchmark gives the cash manager all future flows in advance. Let p_t be the settlement payment due at date t, positive for a Treasury outflow. Let f_t be all other net funds available at that date, including previously arranged bridging and its dated repayments. Opening cash b is usable immediately. The Treasury can carry balances forward, and dates should be fine enough to capture any binding intraday ordering of receipts and payments.

$$b_{\min} = \max\left\{0,\ \max_{0\le h\le T} \sum_{t=0}^{h} (p_t - f_t)\right\}. \qquad (4)$$

After each settlement the Treasury must have enough opening cash to cover the accumulated excess of payments over funds available. The largest such excess is therefore necessary; starting with that amount also covers every earlier date. This proves (4) for the specified flows. If the office must hold a separate reserve that cannot be spent on settlement, only cash in excess of that reserve counts as opening cash.

For example, consider one contract with a payment of 1 today, and another with a payment of 1.10 tomorrow. At a discount factor of 10/11 for the later date, the two payment streams have the same present value. Suppose a receipt of 1.10 arrives tomorrow and there is no bridge today. The required buffers are 1 and 0, respectively. With opening cash of 0.50, the first arrangement misses the first payment by 0.50 even though its end-of-horizon cash total is positive. The second arrangement pays both dates as scheduled. If a bridge is available, its proceeds, repayment and interest all belong in the dated cash schedule.

This example also answers a methodological question. Once the cash and borrowing available under a particular policy have been fixed correctly for every date, a cash-flow calculation detects the shortfall. To choose among policies one first has to work out which second-date borrowing plans the first decision leaves available. Reusing the same undrawn credit amount

in the cash forecast for both initial choices would double-count capacity after the larger draw. Equations (2) and (3) supply the missing conditional input to (4). They explain when an arrangement that is affordable on the date of approval still leaves an uncovered bill.

3. What the US and UK accounts identify

3.1. From a reported loss to a payment obligation

The public-sector balance sheet and the Treasury payment schedule answer different questions. An internal transfer can affect the cash that one public institution holds today while disappearing on consolidation. Conversely, replacing a long-dated government bond held outside the public sector with remunerated reserves can change future interest costs even if there is no contemporaneous transfer to the Treasury. Assessing the net fiscal consequences of asset purchases would require an alternative financing path and a value for assets and liabilities at the end of the comparison (Cecchetti & Hilscher, 2024; Greenwood et al., 2014). The calculations here ask which flows enter a Treasury cash forecast under the observed arrangements.

The observations are taken from paired annual financial statements for the Federal Reserve Banks and from the indemnity note of the UK Asset Purchase Facility Fund Limited. The first series follows combined Reserve Banks over calendar years; the second follows the indemnified company over years ending in February. Source data are kept in millions of the respective currencies and displayed in billions. These series were selected because their notes allow the reader to trace the same reporting item from one period to the next under each settlement rule. Adding the two balances, converting them to a common currency or interpreting them as matched policy shocks would discard the institutional distinction.

3.2. United States: future earnings absorbed before remittances resume

Each Reserve Bank normally distributes excess earnings after costs, dividends and the required surplus allocation. If earnings fall short, the bank suspends its weekly remittances and records a deferred asset. Subsequent net excess earnings must cover its deferred balance before that bank resumes remittances. The combination of banks can therefore show positive reported transfers in a year when the combined system makes a loss. Note 3r also distinguishes amounts accrued before payment from those paid. These rules make it

important to identify both the bank and the accounting line used in constructing a national series (Federal Reserve Banks, 2024, 2026).

Table 2 shows how the distribution lines and the deferred balance move together. The change from profits to losses was large: combined net interest income went from USD 116.806 billion in 2021 to a net interest expense of USD 106.571 billion in 2023 (Federal Reserve Banks, 2022, 2024). In 2025 a substantial deferred balance still remained even as the annual increase slowed. The final row gives the information needed to interpret that year's reported remittances.

Table 2. US Reserve Banks' reported transfers and deferred earnings (USD billion)

Year	Reported transfers to Treasury	Increase in deferred asset	Net earnings remittances	Deferred asset at year end
2022	76.031	16.585	59.446	16.585
2023	0.670	116.733	−116.063	133.318
2024	3.533	82.637	−79.104	215.955
2025	6.281	27.526	−21.245	243.481

Source: Federal Reserve Banks (2022, 2024, 2026), combined statements and Note 12. Values in the transfer column are the annual distribution item as reported. Changes in the deferred asset use an opening 2022 balance of zero.

In 2025, the USD 6.281 billion on the transfer line less the USD 27.526 billion increase in the deferred asset gives negative net earnings remittances of USD 21.245 billion. The closing stock of USD 243.481 billion concerns future earnings needed for recovery. It gives the Treasury no current obligation to pay that amount. For a cash forecast the relevant question is how much remittance income will be available by a specified date. A forecast of aggregate future central bank profit cannot answer this without the distribution rule, each remitting bank's balance and the dates on which distributions are paid. The annual transfer line in Table 2 is used as reported; a daily Treasury receipt series requires separate settlement records.

3.3. United Kingdom: a Treasury indemnity with cash settlements

The UK Asset Purchase Facility has an indemnity from HM Treasury for losses, with profits passing to the Treasury. The accounts value the indemnity and report separately the cash paid under it. They also state that the timing and amount of loan repayments depend on the unwind of the portfolio and payments under the indemnity, with the pace of the unwind determined by the Monetary Policy Committee. A reader seeking the Treasury payment due

in a quarter therefore needs the applicable cash arrangements, the portfolio flows and their dates (Bank of England Asset Purchase Facility Fund Limited, 2024, 2026).

Table 3 reconstructs the indemnity balance from Note 8. A positive entry in the cash column is money received by the facility and paid by the Treasury. The receivable and its fair-value increase are shown as positive amounts, reversing the presentation of amounts due from the Treasury in the note. This convention makes the closing balance equal to the opening balance plus the valuation increase less the cash received.

Table 3. UK Asset Purchase Facility indemnity reconciliation (GBP billion)

Year ending in February	Opening receivable	Fair-value increase	Cash received from Treasury	Closing receivable
2023/24	191.113	32.064	44.549	178.628
2024/25	178.628	23.335	36.323	165.640
2025/26	165.640	1.697	16.660	150.677

Source: Bank of England Asset Purchase Facility Fund Limited (2024, 2026), Note 8. Receivables are positive assets of the facility. Cash receipts reduce the outstanding claim.

In 2025/26 the Treasury paid GBP 16.660 billion while the receivable increased by GBP 1.697 billion through revaluation. The result was a GBP 14.963 billion decline in the receivable, leaving GBP 150.677 billion outstanding. Taking the closing balance as the cash due for that year would overstate the observed payment many times over. Ignoring the balance altogether would also be costly for forecasting, because the indemnity is a contractual commitment that can generate future cash calls. The two items belong in different parts of the debt manager’s working papers.

The US and UK cases show which side of a payment forecast needs further evidence. A Reserve Bank’s recovery out of future earnings changes a potential Treasury receipt. An indemnity settlement can enter the Treasury’s payment schedule directly. In both cases the annual accounts identify the mechanism and document reported amounts after the event. They reveal neither the full daily settlement path nor the financing options available before each deadline. The figures in Tables 2 and 3 therefore cannot establish that a cash limit bound in either country. The model identifies what additional information would allow that question to be answered.

4. Using the financing condition in policy analysis

4.1. Information available when the decision is made

Take a debt office considering whether to reduce a bill auction after a central bank operation. It can first identify the payment currently being financed and the date on which alternative market funding could next settle. For the interval between those dates it can list the earliest contractual calls, the cash left after other commitments, and the facilities on which it has legal authority to draw. A funding source counts in H only to the amount that can actually be raised by the deadline under the policy being tested. An available credit line already counted in the monetary exposure limit cannot also be included in H.

An estimate made for a budget hearing might supply the expected annual transfer but leave the settlement day unspecified. A cash manager can work with a range of calls and report the bill that the proposed first draw could cover under each dated funding commitment. For a fixed policy today's draw must be chosen before the call is known; tomorrow's draw can respond to the bill once it arrives. If the policy must work in all admissible scenarios, replace m in (2) with the largest value of $\max(0, P - H)$ across those scenarios. Taking the largest bill and smallest available funding from unrelated scenarios can overstate the requirement if the two cannot occur together. Supplement A sets out the timing of those decisions.

The calculation changes where market issuance today brings a repayment into the second period. The repayment of $G - x$ and the associated interest then belong in the bill conditional on the initial choice. If independently available funds also change, write them as $H(x)$. The cash test remains valid with the actual paths, but substituting fixed P and H in (2) can mis-rank the financing plans. For example, a first-date bill that must be refinanced before a facility payment consumes part of the very market access that the office was counting on for settlement. The debt and cash calendars must use a common horizon.

The direction of this effect has a simple test. Let P_b be the second bill before redemption of the initial market debt, and suppose a fraction λ of that debt falls due by the second deadline with no automatic rollover. Take H as fixed and assume that a positive residual call remains throughout the range being compared. The spare capacity after paying both the bill and the redemption then satisfies

$$S(x) = H + K - \rho^2 L_0 - P_b - \lambda G + (\lambda - \rho)x. \qquad (5)$$

A unit moved into monetary financing uses ρ of future drawing capacity but avoids λ in required debt redemption. If $\lambda < \rho$, the first effect dominates. If $\lambda > \rho$, a larger initial draw improves the ability to pay at the second date, so long as the first-date limit is respected. This is a comparison of maturities and committed capacity. It remains meaningful even when both financing mixes record the same cash balance immediately after the first payment.

For example, keep the original funding need, limit, persistence and opening exposure. Let the baseline second bill be 0.34, other funds 0.10, and all the initial market debt mature at the second date. Market-only financing then requires an exposure of 1.007 to pay the bill and redeem the debt. Financing the first payment entirely through the arrangement requires 0.987. Shifting at least 0.07 into the initial draw is sufficient to cover the second date in this scenario. A blanket rule to preserve all facility capacity until the last possible moment misses this reversal.

4.2. An authorisation can change the available funds

Brazil provides a documented example of why the authority to use funds deserves its own entry in the forecast. Banco Central do Brasil's reporting for 2020 records a transfer of BRL 325 billion from its results reserve to the National Treasury Operating Account on 28 August. The National Monetary Council authorised the transfer after judging that severe liquidity restrictions were significantly affecting domestic federal public debt refinancing. Note 23.2 of the central bank's financial statements records the authorising body, amount and settlement date (Banco Central do Brasil, 2021). For a debt office, the critical dates are when the reserve becomes available for debt payments and when the cash reaches the Treasury's account.

This episode illustrates how to apply the model in another institutional setting. A forecast made before approval should record the transfer as contingent; a forecast after settlement can count the amount as cash, subject to the purposes for which it is available. A retrospective assessment would also need the information the Council and the debt office possessed at the time, the maturity schedule, and the alternatives that could have been executed without the transfer. Brazil's episode supplies evidence on authorisation. It does not supply a value for the model's exposure persistence or the Treasury's minimum borrowing, and the arithmetic for the US and UK accounts is kept separate.

UK practice gives a related example on the funding side. In April 2020 HM Treasury and the Bank of England announced a temporary extension of the Ways and Means facility as a

source of additional short-term liquidity if required, while retaining the normal market financing arrangements (HM Treasury, 2020). A comparison of two plans could recognise such a facility only on its actual terms and only over the dates on which it was available. Its existence in that episode cannot establish its availability to finance a later indemnity payment. The practical value of documenting an instrument is precisely that its holder, term and permissible use can be checked before it enters a forecast.

4.3. Interpreting a failure of the cash plan

If the scheduled bill exceeds the amount payable in (3), the difference is the uncovered payment under that financing plan. It also gives the size and deadline of the adjustment needed to restore that plan. A treasury might pre-fund the gap in the market, agree a larger line, obtain a legally valid change of settlement date, or reduce another permitted payment. Each possibility changes a specified term in the calculation, and each depends on an identified decision maker. A calculation that assumes these changes have already been approved conceals the condition on which payment depends.

The debt manager can compare costs after identifying the available plans. For example, larger initial bill issuance may carry interest and a cash buffer may earn less than the borrowing rate. A cheaper plan in expected-value terms may also expose the Treasury to a late approval in the scenario where cash is needed earliest. Welfare and consolidated fiscal cost depend on the public services provided, outside interest flows and the future value of outstanding positions. The present framework answers the prior question of which policies meet the specified payment obligations through the horizon. A government may reasonably choose a different horizon, a different exposure limit or a different risk criterion; those choices should be visible to the reader.

Conclusions

A Treasury can reduce market borrowing today and still pay every bill due today, yet have too little authorised credit left to settle a known payment tomorrow. Whether this happens can be checked before choosing the financing mix. The decisive quantities are the exposure that survives from the first draw, the residual second payment and the alternative funds that can be used by its deadline. In the numerical example both pure financing choices cover the first payment. The minimum initial market financing is 47/900 units (about 0.0522). Using only the monetary arrangement leaves a shortfall of 0.047. When the alternative debt matures

before the next deadline, the ordering instead depends on whether the redemption avoided exceeds the capacity used.

For an office that already has complete dated cash flows under each financing choice, ordinary cash-flow analysis is enough to check payment. Its inputs become difficult when the first decision changes the second credit limit or an expected receipt still requires approval. The US and UK accounts illustrate how to distinguish future earnings offsets from Treasury cash calls, and the Brazilian transfer illustrates why an authorisation date matters. Reporting the remaining drawing capacity and the settlement deadline beside the annual totals would make it possible to assess a specific financing decision while leaving long-run fiscal sustainability to a model suited to that question.

Open Science Practices

The annual observations, source locations, reporting conventions, Python code and expected results accompany the article as supplementary material. They reproduce the accounting reconciliations and the hypothetical financing examples. The original institutional reports are publicly accessible through the references.

Declaration of Generative AI Use

The author used OpenAI ChatGPT (including GPT-5.6) and OpenAI Codex for literature and source searches, drafting and revising portions of the text, English language editing, developing the mathematical exposition, and preparing and checking the replication code and calculations. The numerical observations come from the cited institutional reports. The author has carefully reviewed the AI-assisted material and takes full responsibility for the manuscript.

References

Banco Central do Brasil. (2021). *Financial statements at December 31, 2020* (Note 23.2). Official financial statements

Bank of England Asset Purchase Facility Fund Limited. (2024). *Annual report and accounts 2023/24*. Bank of England. Official report

Bank of England Asset Purchase Facility Fund Limited. (2026). *Annual report and accounts 2025/26*. Bank of England. Official report

Bell, S., Chui, M., Gomes, T., Moser-Boehm, P., & Pierres Tejada, A. (2023). *Why are central banks reporting losses? Does it matter?* (BIS Bulletin No. 68). Bank for International Settlements. BIS Bulletin

Bunea, D., Karakitsos, P., Merriman, N., & Studener, W. (2016). *Profit distribution and loss coverage rules for central banks* (Occasional Paper No. 169). European Central Bank. https://doi.org/10.2866/983615

Cecchetti, S. G., & Hilscher, J. (2024). *Fiscal consequences of central bank losses* (Working Paper No. 32478). National Bureau of Economic Research. https://doi.org/10.3386/w32478

Del Negro, M., & Sims, C. A. (2015). When does a central bank's balance sheet require fiscal support? *Journal of Monetary Economics, 73*, 1–19. https://doi.org/10.1016/j.jmoneco.2015.05.001

Federal Reserve Banks. (2022). *Combined financial statements as of and for the years ended December 31, 2021 and 2020*. Board of Governors of the Federal Reserve System. Official financial statements

Federal Reserve Banks. (2024). *Combined financial statements as of and for the years ended December 31, 2023 and 2022*. Board of Governors of the Federal Reserve System. Official financial statements

Federal Reserve Banks. (2026). *Combined financial statements as of and for the years ended December 31, 2025 and 2024*. Board of Governors of the Federal Reserve System. Official financial statements

Greenwood, R., Hanson, S. G., Rudolph, J. S., & Summers, L. H. (2014). *Government debt management at the zero lower bound* (Hutchins Center Working Paper No. 5). Brookings Institution. Working paper

Hall, R. E., & Reis, R. (2015). *Maintaining central-bank financial stability under new-style central banking* (Working Paper No. 21173). National Bureau of Economic Research. https://doi.org/10.3386/w21173

HM Treasury. (2020, April 9). *HM Treasury and Bank of England announce temporary extension of the Ways and Means facility*. Government announcement

Lienert, I. (2009). *Modernizing cash management* (Technical Notes and Manuals No. 09/03). International Monetary Fund. https://doi.org/10.5089/9781462304127.005

Marszałek, P. (2003). Coordination of monetary and fiscal policy. *Economics and Business Review, 3*(2), 41–52. https://doi.org/10.18559/ebr.2003.2.497

OECD. (2025). *Managing government cash: A review of practices in OECD countries*. OECD Publishing. https://doi.org/10.1787/7675eb58-en