Federal Reserve System Balance Sheet Expansions: WW I, WW II and their Effects

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Big Picture

- Start with the Graphics –
  - Federal Reserve System "established" in 1914
  - Operational by 1917 – still getting up to speed

- Look at aggregate balance sheet of Federal Reserve System from 1917 – 2015 – annual
  - Taken with respect to nominal GDP
  - Taken with respect to M2 monetary aggregate
  - Growth rate of nominal Balance Sheet

Figure 1: Federal Reserve System Total Assets Relative to Nominal GDP

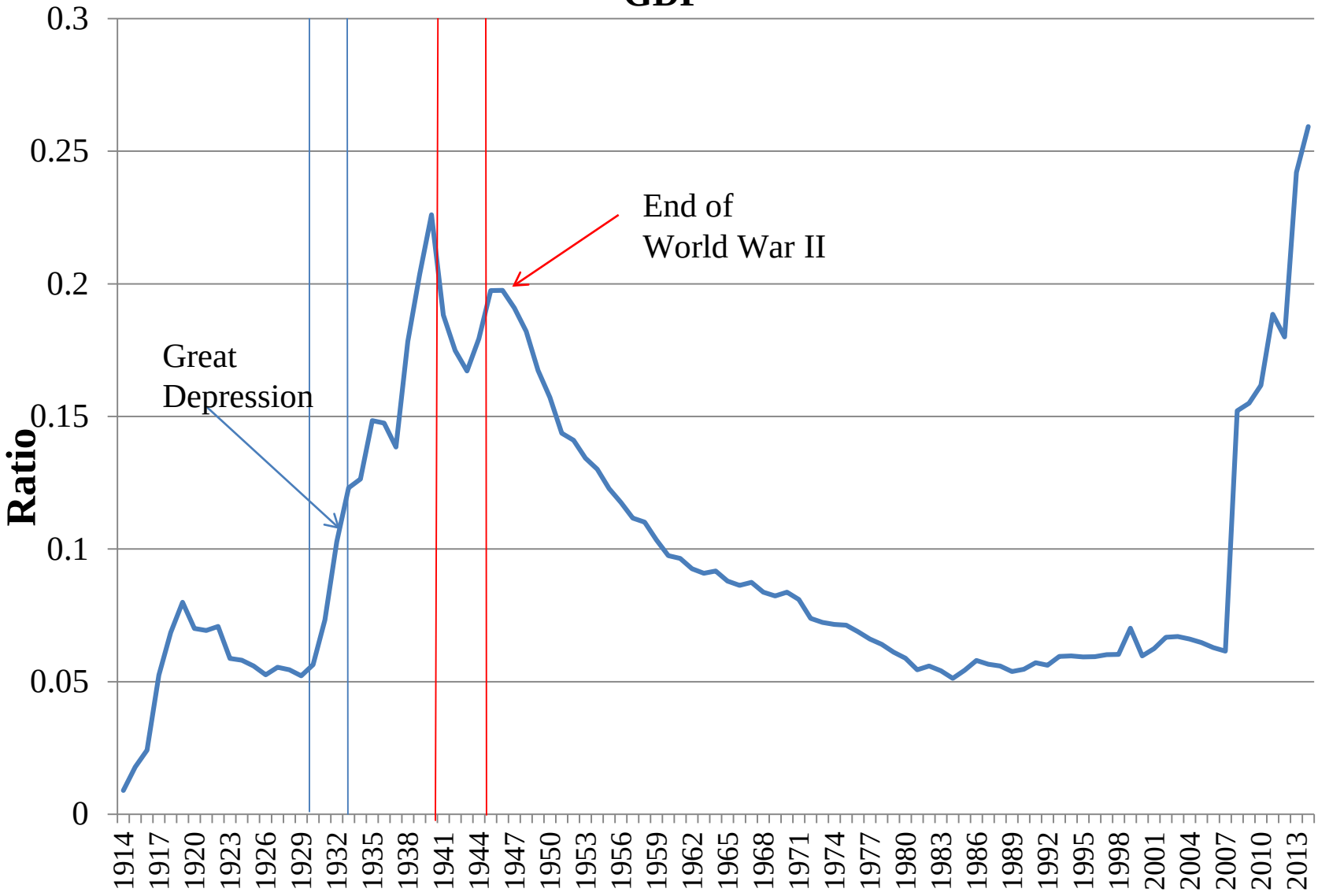


Figure 2: Federal Reserve System Assets Relative to M2

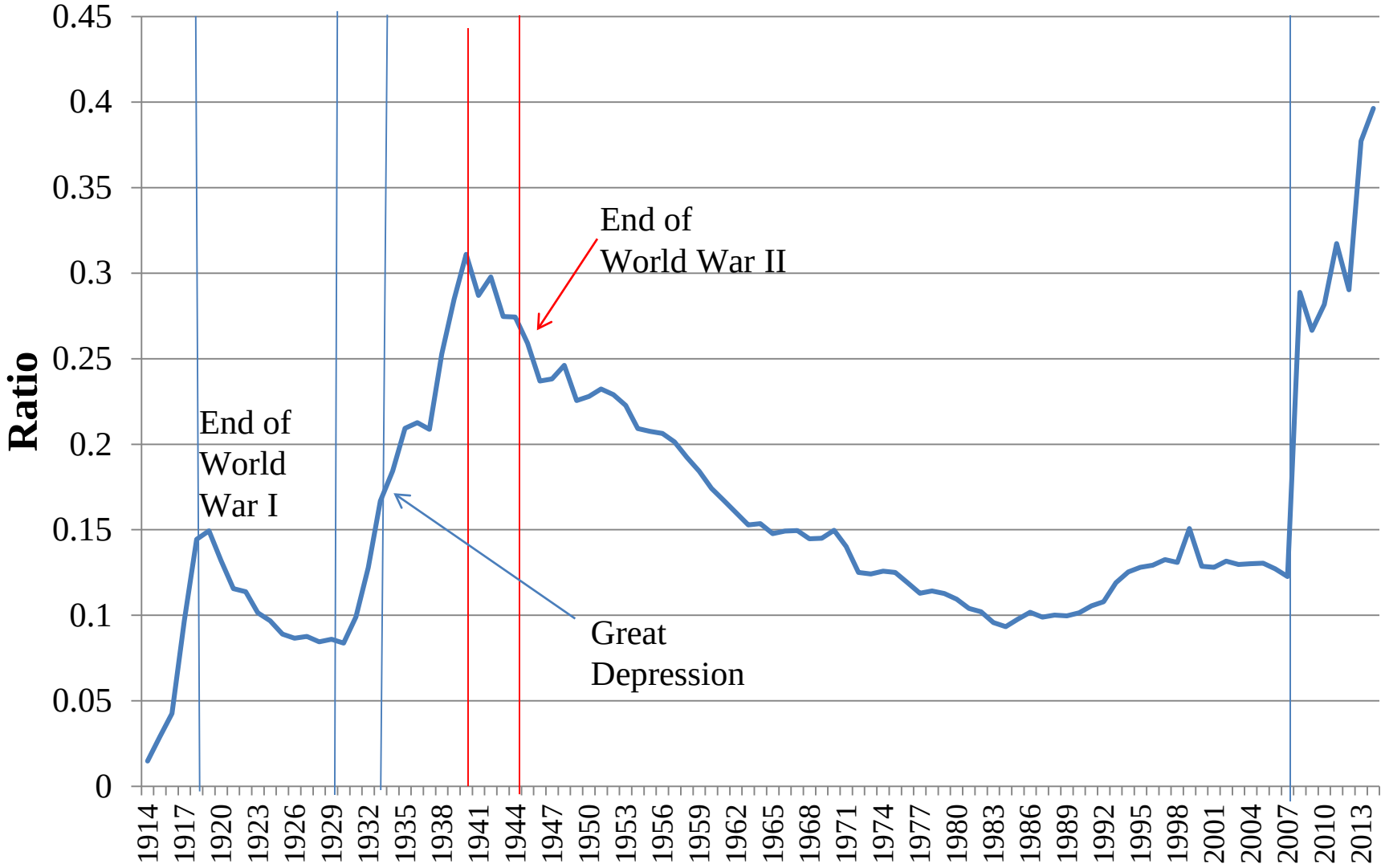


Figure 3: Growth Rate of nominal Federal Reserve Balance Sheet

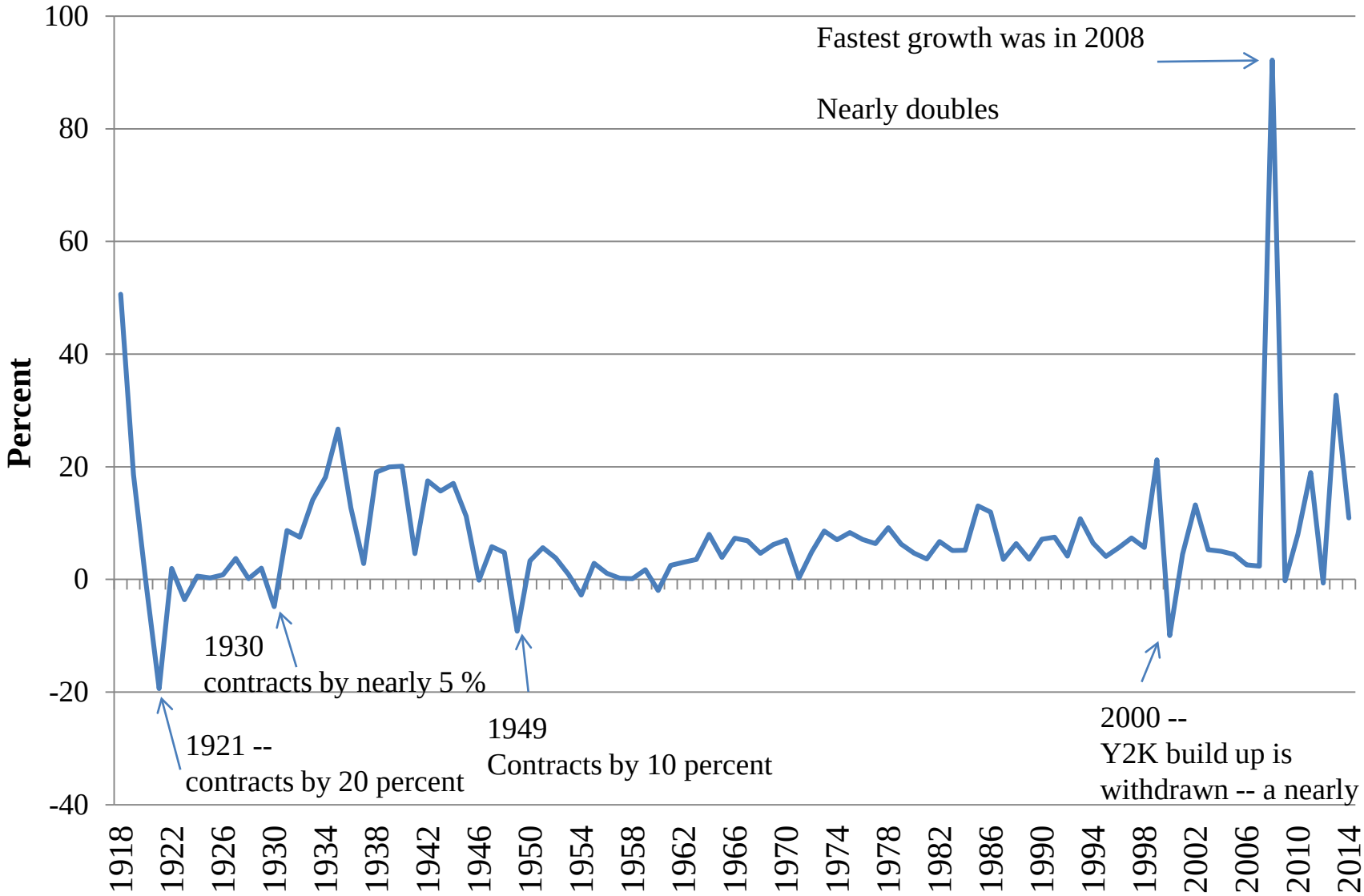


Chart 3A: Composition of Federal Reserve System Assets

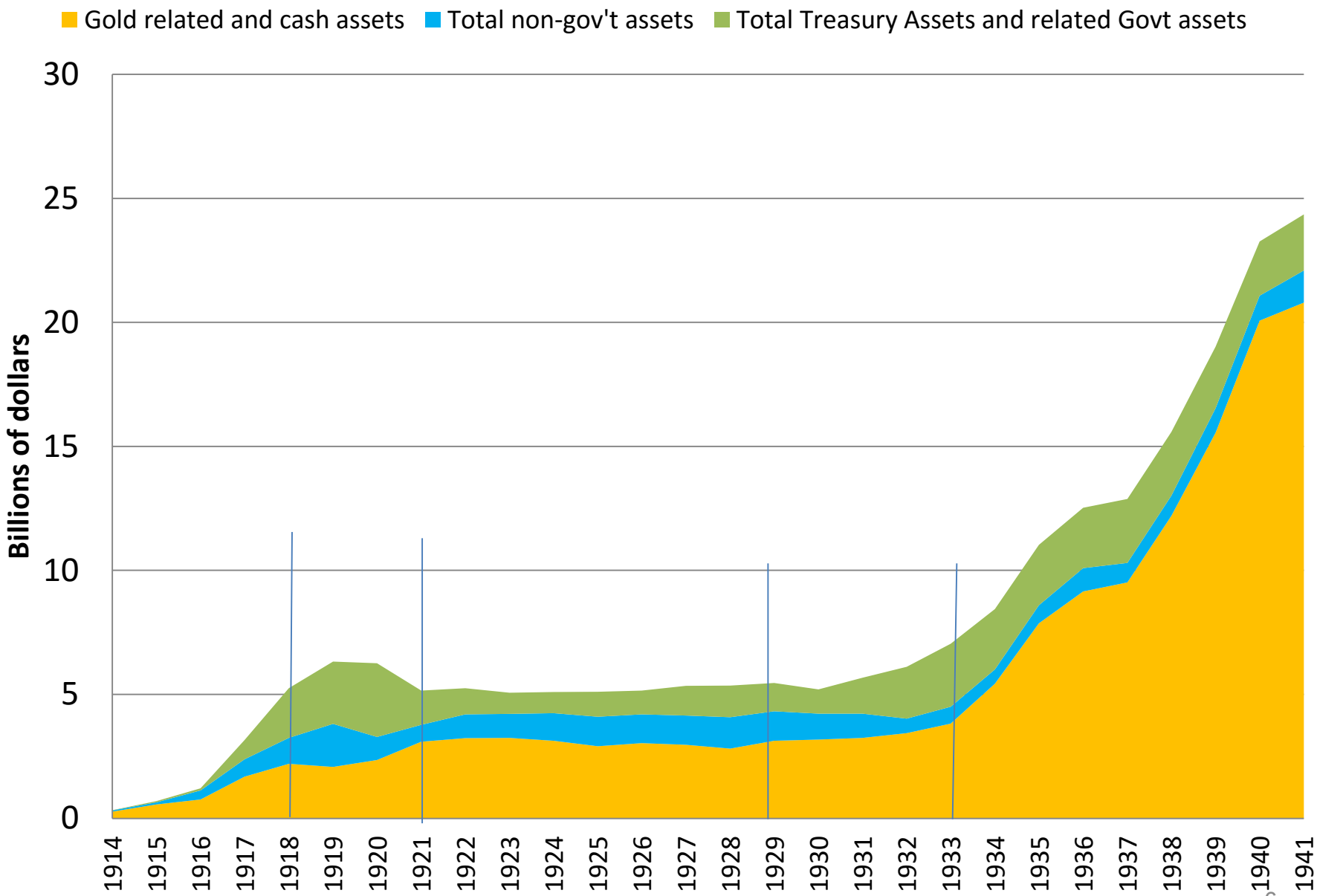
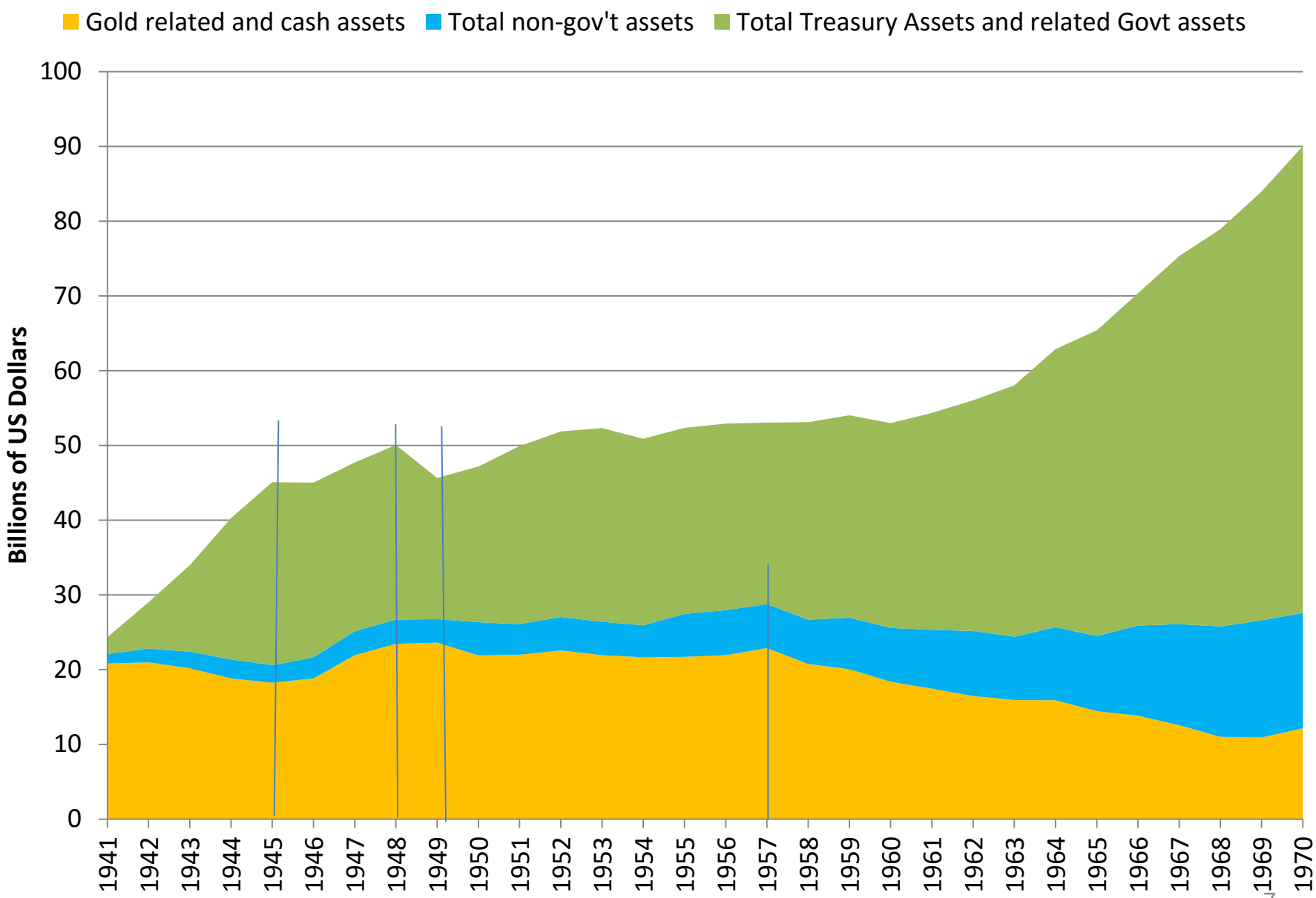


Chart 3B: Composition of FRS Balance Sheet Assets



Treating War Finance as Active Balance Sheet Policy

- WW I subsidy for lending on Treasury collateral
  - A result of "real bills" doctrine – fear of central bank owning Treasury long-term debt
- The active part in WW II is more comparable
- Gold standard makes the period less comparable

Starting Point – WW I Financing

- Federal Reserve System in 1917 – operational
  - But really had not time to implement policies fully
- Declaration of War in April 1917
  - Change in priorities – funding the Treasury primary goal
- Governance structure --
  - Secretary of the Treasury McAdoo was the Chairman of the Federal Reserve Board – Comptroller of Currency also a member
  - Governor was a separate title, separate position – vice governor, and three other Board members
- Treasury policies were driving Federal Reserve actions

Fed Balance Sheet Increases

- Explicit support for the sale of US Treasury Debt
  - Discount window lending on US Treasury collateral
    - Preferential interest rates – June 12, 1917 until mid 1921
      - Set below discount rates on other eligible collateral
      - Preferential discount rate below interest rates on Treasury debt
- Size of the balance sheet was purposely increased
  - Financing Treasury debt securities was a policy choice
    - May have been unanimously supported by Federal Reserve – few complaints during the war
- Real bills doctrine influenced how Fed acted
  - Federal Reserve System did not increase US Treasury debt in its permanent asset portfolio
    - Instead wanted to support credit to "productive" investment

Fed Balance Sheet Size -

- Notable increase in balance sheet relative to GDP
  - From 5.3 percent in 1917 to 6.9 percent in 1918
  - Local peak at 8 percent in 1919 – falls to 5.8% in 1924
- Balance Sheet relative to M2 – similar pattern
  - From 12.3 percent in 1917, to 18 percent in 1918
  - Local peak at 18.7 percent in 1919 – 12.6% in 1924
- Nominal terms – a "reasonable" comparison
  - 1918 $5.25 billion, 1919 $6.3 billion 1920 $6.3 billion
    - 1921 $5.1 billion -- sharp contraction in 1921

Chart 4: Balance Sheet Size Relative to Aggregates

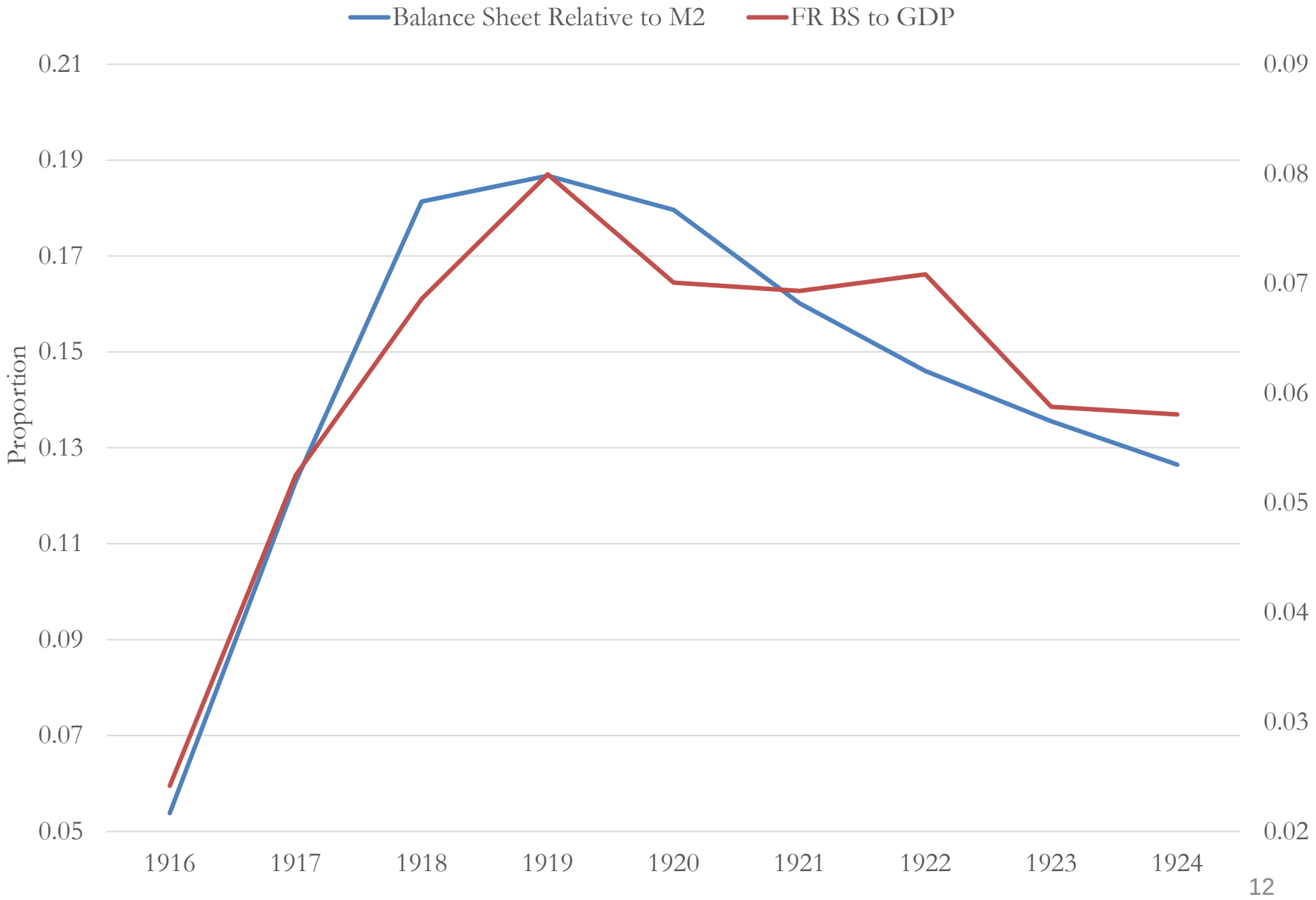
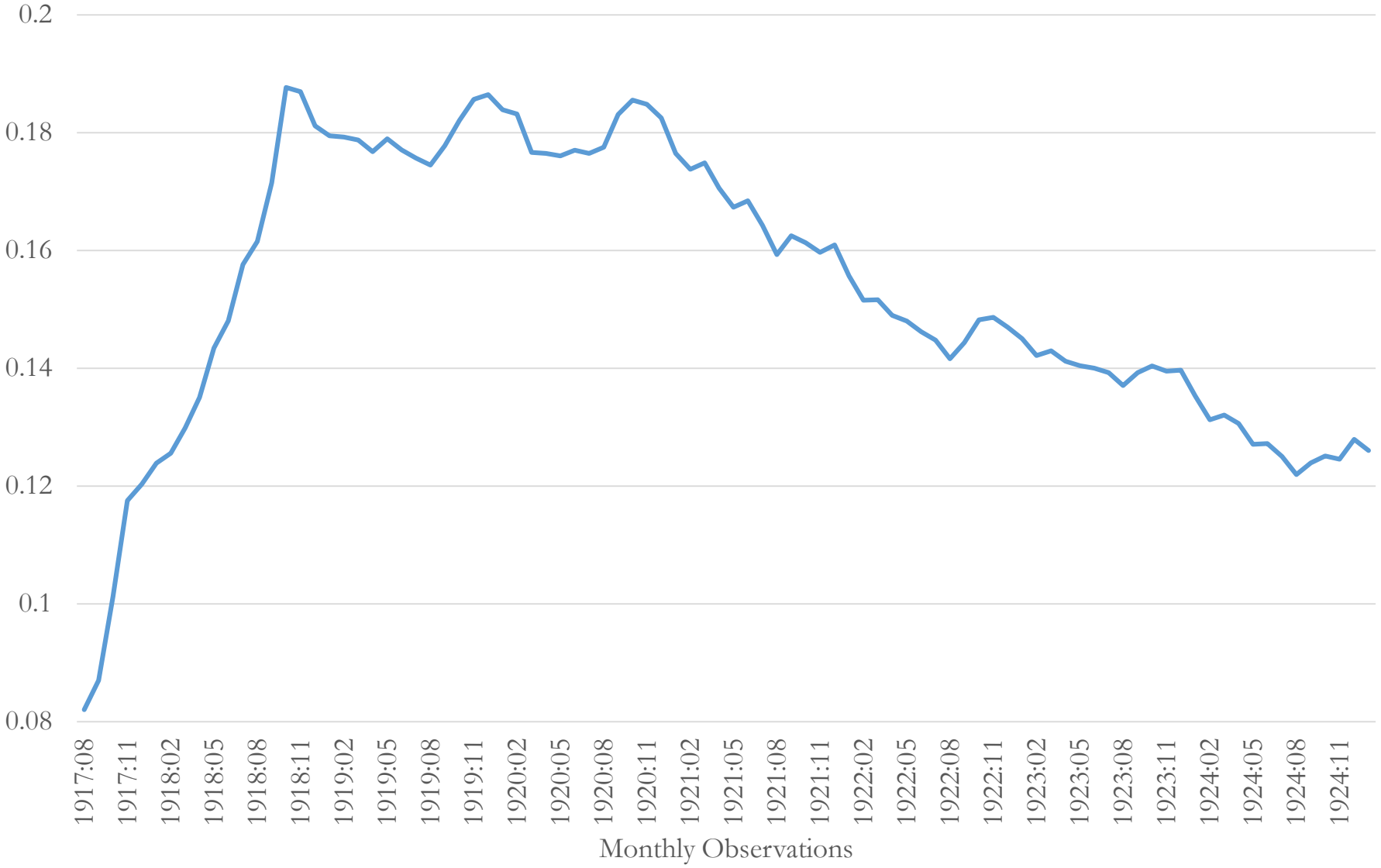


Chart 5: Federal Reserve Total Assets Relative to M2 (NBER)

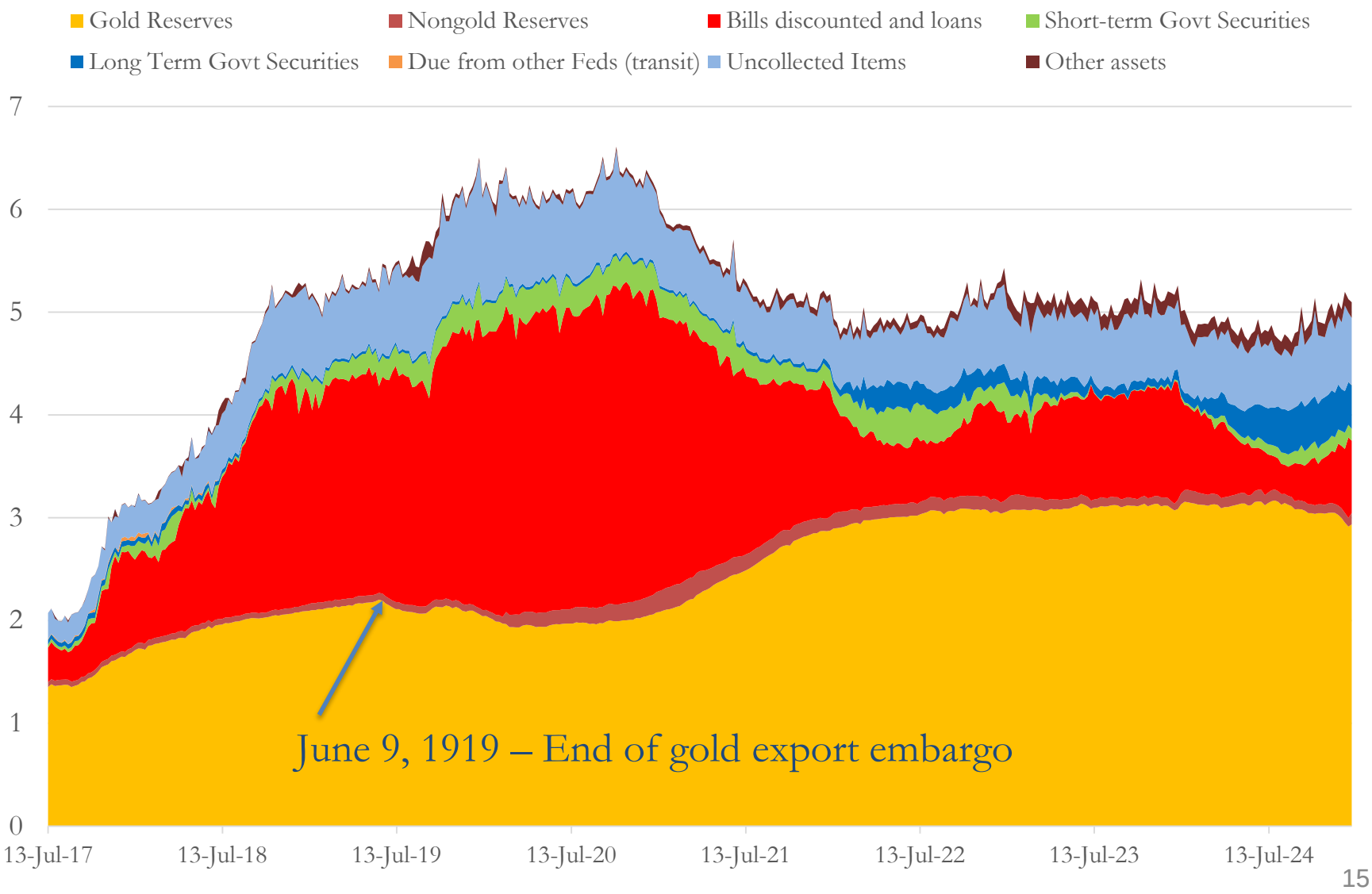


Composition of Fed Balance Sheet

- Embargo on gold exports and payments of gold (trade induced inflows) enabled relatively unrestrained increase in the balance sheet
  - Lasted until mid-1919 when embargo was lifted

- Sharp rise in member bank borrowing
  - Borrowing (red in Chart 6 to follow) rises from about 25 percent of the balance sheet in early 1918 to 40 percent by October
  - Dominant component of assets; the clear means for a "temporary" increase in the balance sheet to aid war finance
    - "Temporary" increase was a policy choice
    - Planned to return to a "normal" balance sheet size

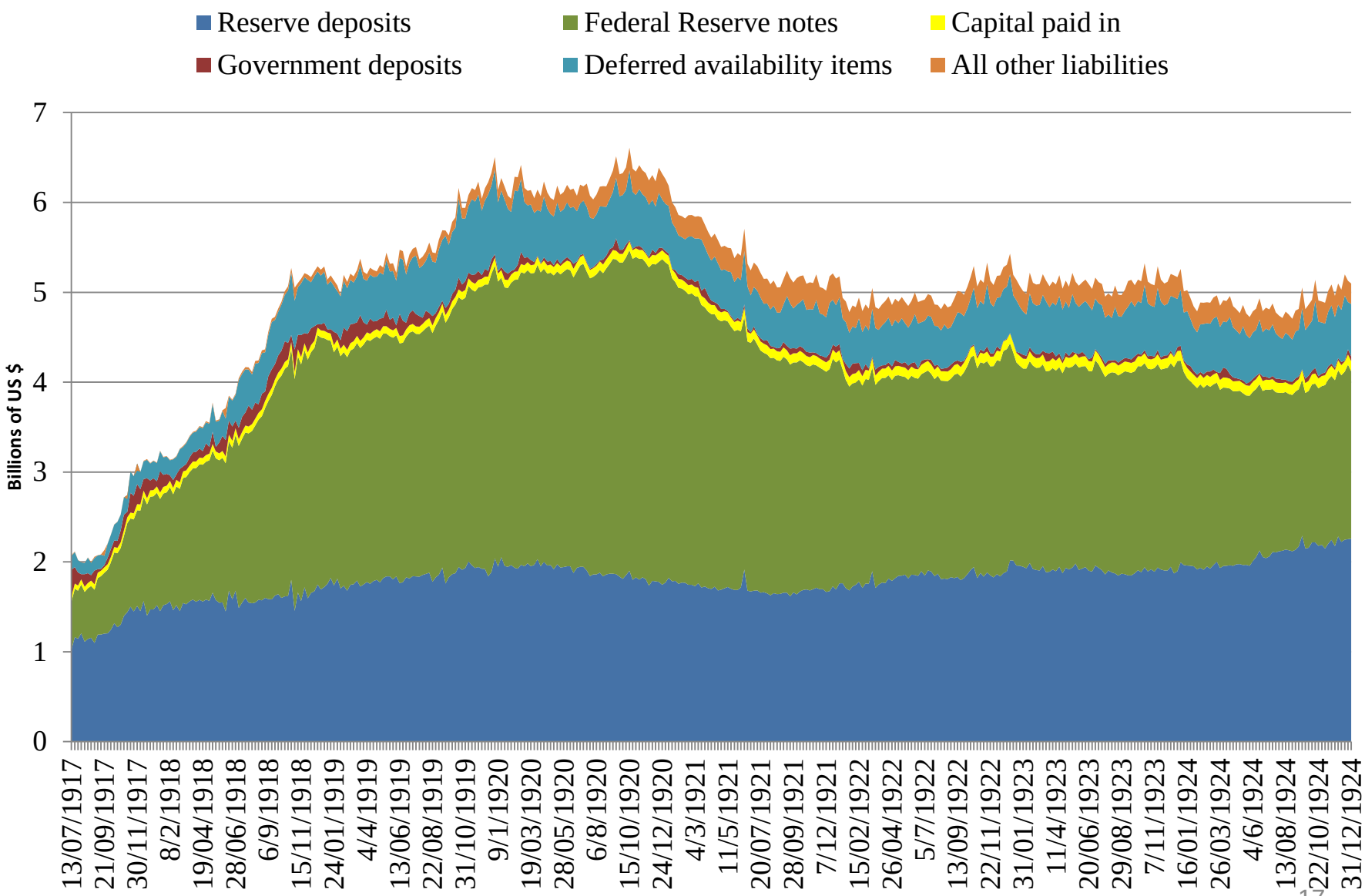
Chart 6: Federal Reserve System Assets: July 1917 to January 1925



Liabilities

- Federal Reserve Notes increase (green, Chart 3)
  - Main liability to increase as the balance sheet rose
  - Comparatively minor increase in bank reserves
    - Limited severity of bank credit contraction when Fed policy led to increased rates
- Decline in Federal Reserve notes starts late 1920

Chart 7: Federal Reserve System Liabilities: July 1917 to December 1924



Financial Stability Concerns

- Federal Reserve financial stability role
  - Liquidity provision – primary
    - Discount window function was effective as rates increased in 1920-21
  - Contain "speculative excess" – restrain unproductive credit
    - Macro prudential actions – restrict liquidity to limit speculation
    - Discount window interest rates – also effective, but blunt
  - Maintain the gold standard for the US
    - Discount rate increases to support gold inflow and also restrain liquidity to speculative markets (commodities as well as stocks)
  - Preserve gold reserves of the Federal Reserve System
    - Gold Ratio seen as indicator of Federal Reserve System stability

Real bills elements in Financial Stability Policies

- Real bills doctrine - credit preferences
  - "Productive" credit preferred to speculative credit
    - Aversion to credit associated with stock market, for example
  - Financial stability might require Fed to allocate credit to specific sectors actively
    - Allocation of credit by differential discount rates on eligible collateral

Financial Stability Policies and Debates

- Carter Glass, Treasury Secretary
  - Preferred "moral suasion" or "direct pressure"
    - Methods to limit credit to "speculative" enterprises
  - Would prefer to avoid discount rate increases
- Benjamin Strong – NY Fed Governor
  - Proposed raising interest rates as only way to slow credit accumulation
- Charts that follow -- Discount rate vs Stock index – 1917-1925
  - As discount rate increased, stock market declined
  - When discount rate declined, stock index rebounded
    - Reflected policy choices – Strong's perspective as well

Chart 8: NY Fed Discount Rate vs Stock Index Level

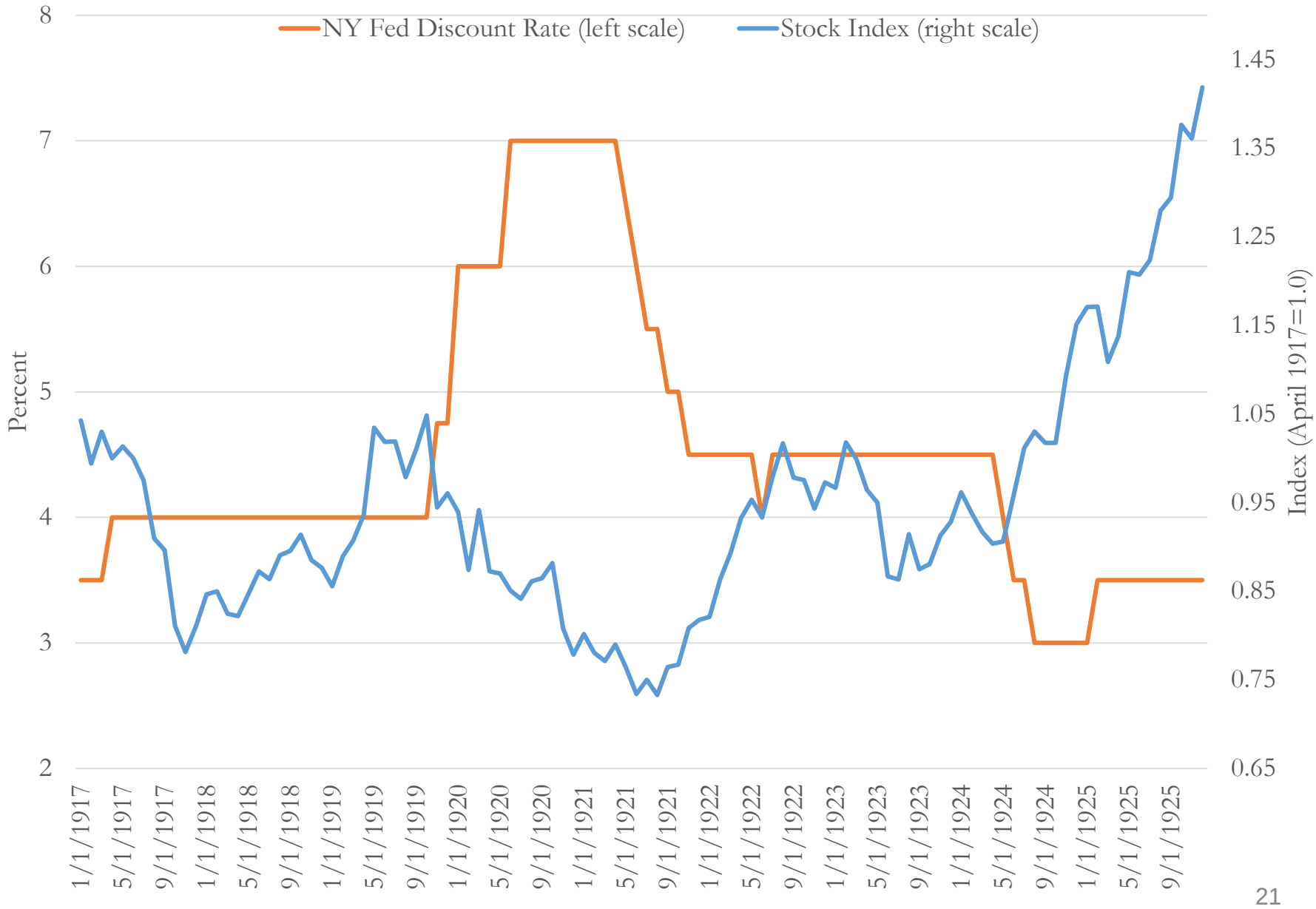
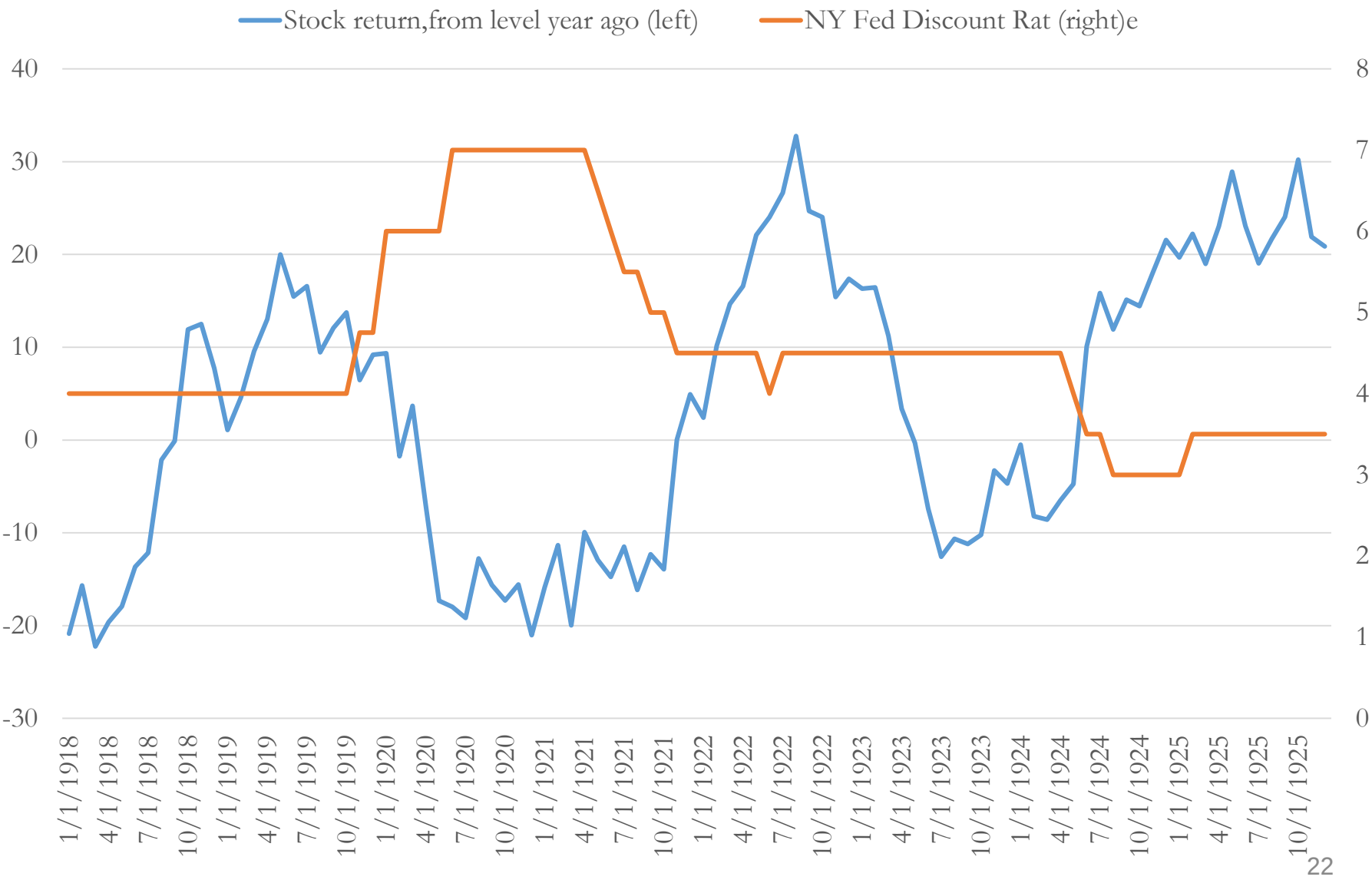


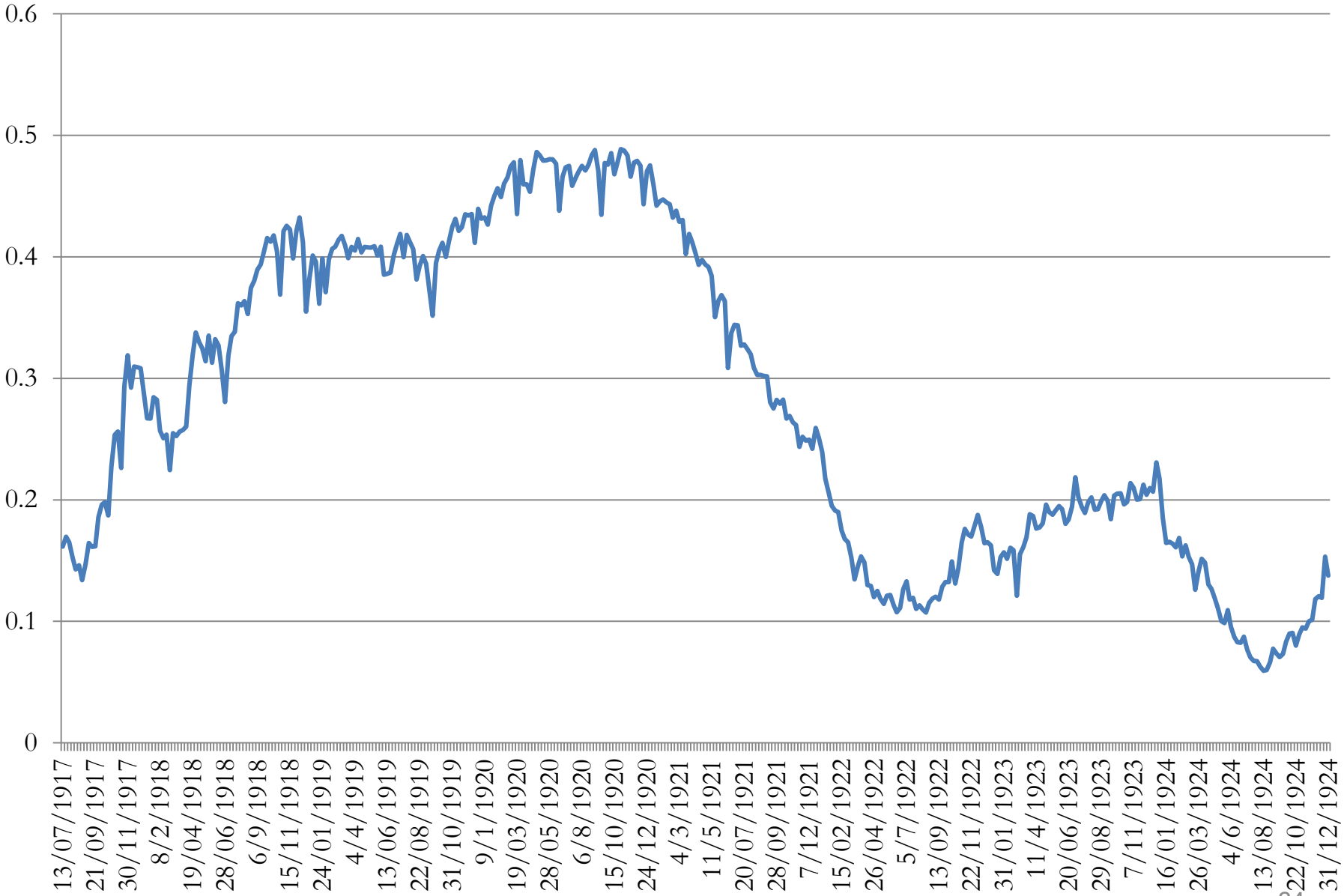
Chart 9: 12 Month Stock Return vs NY Fed Discount Rate



Borrowing Proportion and Collateral Composition

- Borrowing relative to total FRS assets (See Chart 10)
  - Borrowing rises from about 25 percent in early 1918 to 40 percent by October 1918
  - The preferential discount rate on Treasury debt led member banks to borrow over $3 Billion from Fed
- Sharp rise in proportion of Treasury debt as collateral for Discount window loans
  - Continued until November 1919 when Fed increased the discount rate for the first time in over two years

Chart 10: Borrowing relative to Total Balance Sheet



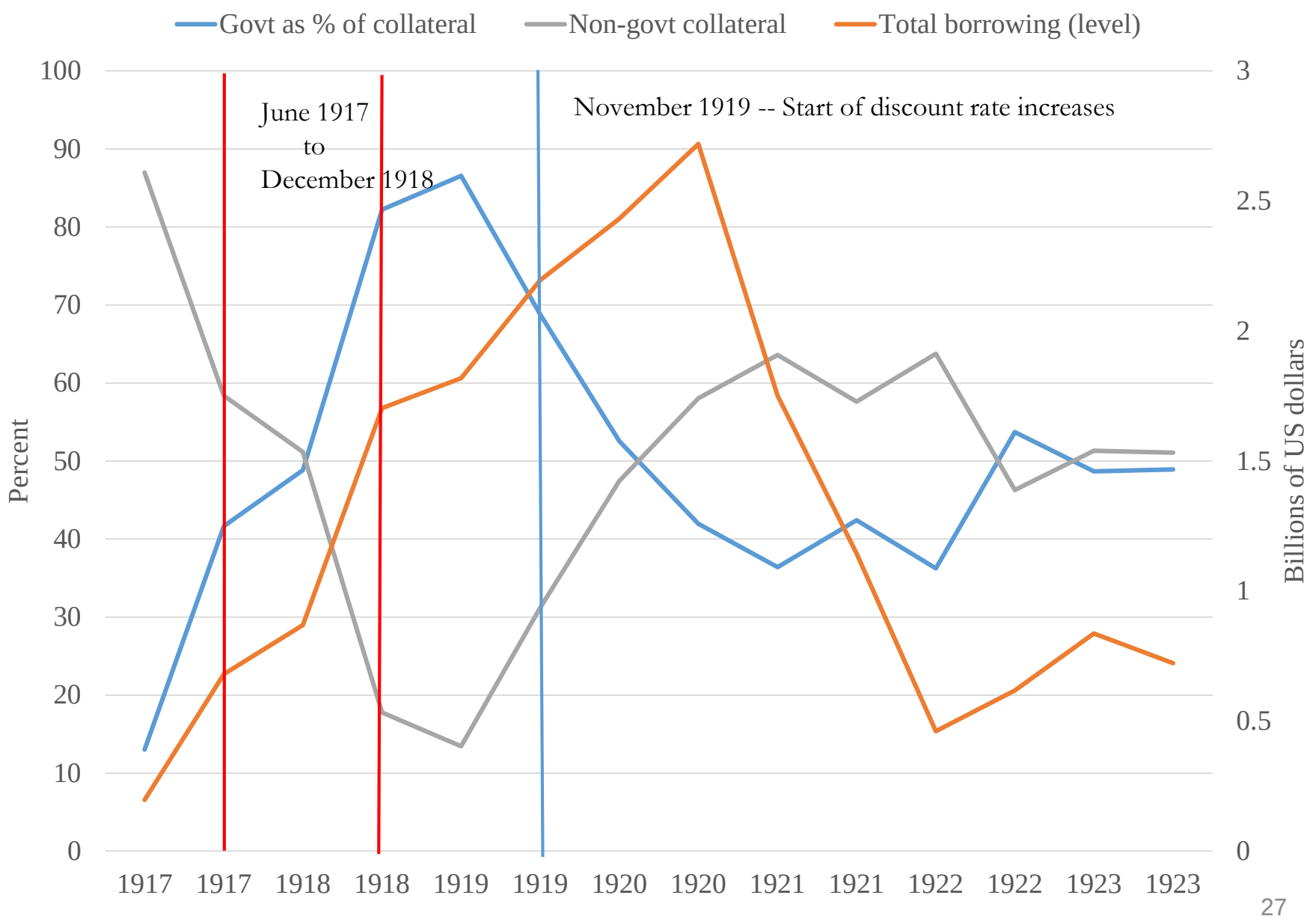
Real bills in policy debates

- Real bills approach to credit
  - Keep credit capacity for productive investment
  - Leave Treasury debt for private investors
    - Get Treasury debt off bank balance sheets
- Conflicting views of how to affect credit
  - Carter Glass, Treasury Secretary – real bills
    - Direct allocation of credit – differential discount rates
  - Benjamin Strong, NY Fed Governor – not real bills
    - Interest rate policy to influence credit growth

Collateral Composition

- Collateral composition changes as Fed increases rates
  - Treasury debt as collateral for discount loans starts to decline from mid 1919 peak of nearly 90 percent
  - Keeping Treasury debt off commercial bank balance sheets was a policy objective for Treasury and Fed
  - As preferential rate disappears, banks substitute other collateral for discount window loans
    - But the loan volume does not contract until October 1920

Chart 11: Discount Window Collateral and Total Borrowing



Federal Reserve Notes, Reserves and the Gold Ratio

- US was on the gold standard as other countries went off the standard during WW I
  - A key reason why the Fed balance sheet could rise without threatening their gold ratios
- Gold ratio not at risk as the Fed Balance sheet increased
  - Gold embargo (1917-1919) helped keep gold in Federal Reserve
  - Sufficient for liabilities with gold reserve requirements
    - Bank reserves and Federal Reserve Notes
- Gold reserves came under pressure after the war
  - Embargo on gold exports lifted June 1919
  - From March 1920 to November 1920, Fed was close to its limit

Federal Reserve Gold Ratio

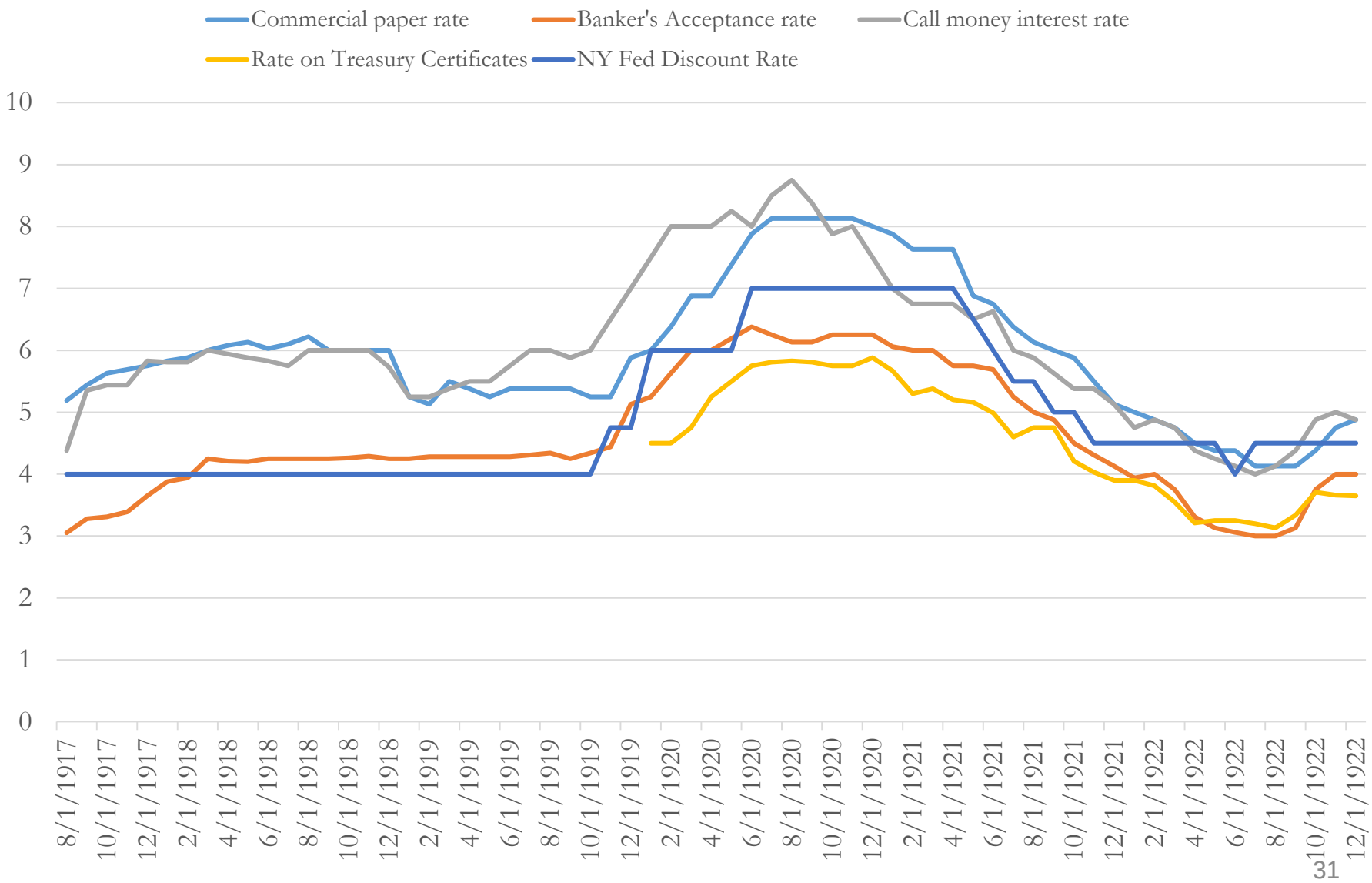
- What helped restore the Fed gold ratio
  - Balance sheet contracted – but took longer than expected
  - Sharp decline in Federal Reserve Notes (see again Chart 7)
    - From December 1920 to December 1921, contracted by 37.4 percent
    - Supply of FR notes outstanding fell by $1.35 Billion
  - Decline in bank reserves was smaller, and occurred later

How the balance sheet contracted

- Discount rate increases were the policy tool to achieve the contraction
  - But there was a surge in borrowing as the Fed started increasing rates
    - Peak borrowing from the Fed was as late as October 1920 –
    - Discount rate hit its local peak at 7 percent in June 1920
- FR Credit increased following initial discount rate increases
  - Perception: Bagehot's golden rule – lend on good collateral at a high rate – discount rate was above key market rates

- Federal Reserve System Policy still led to the contraction in FBS.
  - Discount rate for eligible collateral was at 4 percent from 1917
    - Discount rate increased nearly a year after the war ended
  - Initial increase from 4 to 4.75 percent November 4, 1919
  - January 1920 – increases to 6 percent
  - June 1920 increases to 7 percent

Chart 12: Market Rates and the NY Fed Discount Rate



Summary

1. Increasing the Federal Reserve Balance Sheet temporarily to support Treasury debt financing of WW I was a chosen policy action
2. Treasury financing determined Fed policy until about a year after the war ends.
3. There were credit policies resembling macro prudential policy
4. Discount rate was the main policy tool to combat over-extension of credit.

Chart A1:Federal Reserve Balance Sheet and M2 (NBER)