

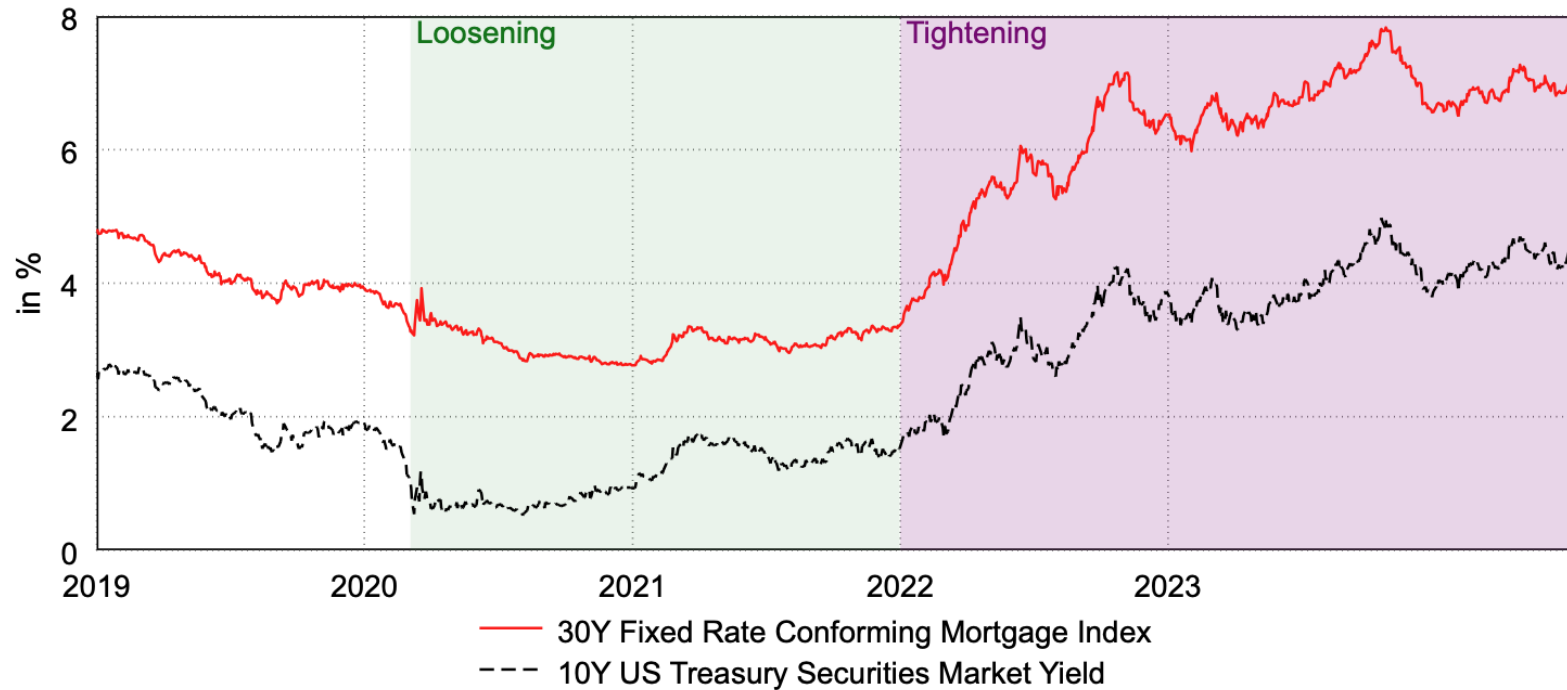
Monetary Policy and the Mortgage Market

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Monetary Policy since Covid

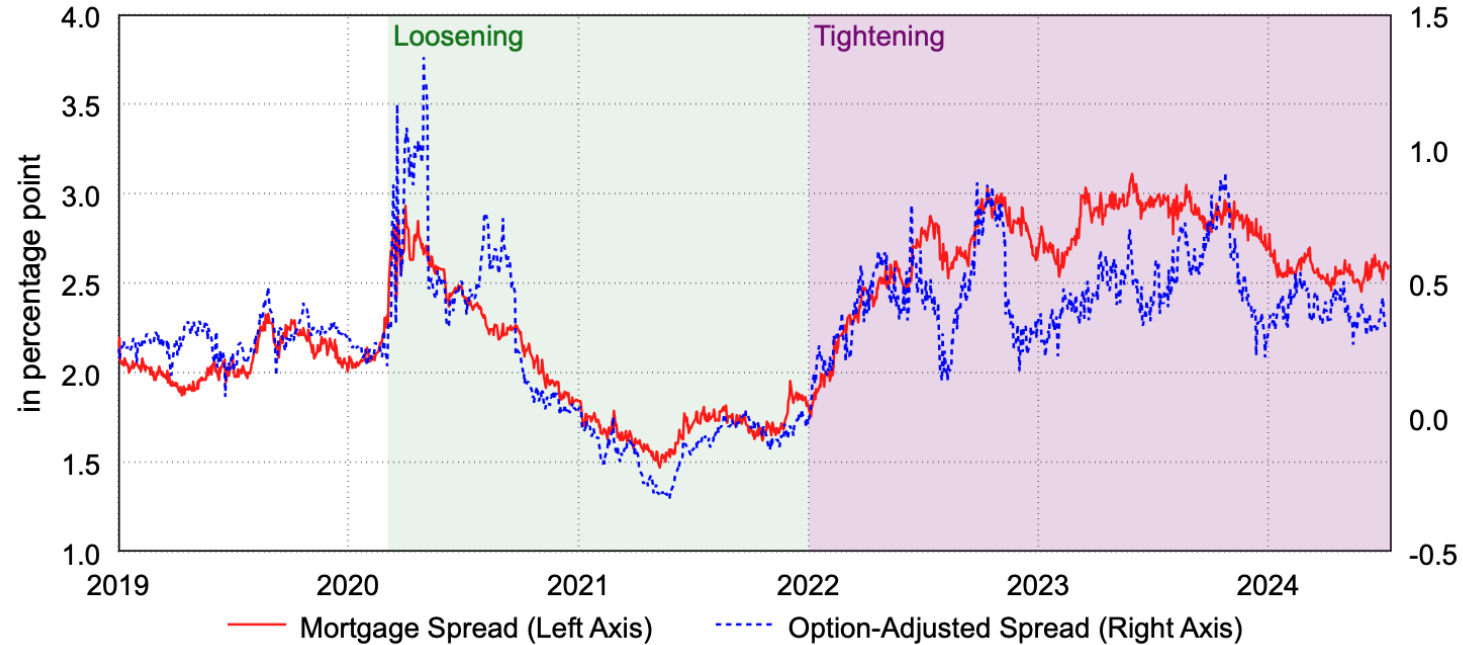
1. There have been large fluctuations in monetary policy since the onset of covid-19
 2. Fed cut rates sharply back to ZLB in 2020 to ease conditions
 3. Fed raised rates rapidly starting in 2022Q1 in response to inflationary pressures
- Despite large fluctuations, it is unclear/open question what impact monetary policy had on consumption/output, the labor market, and inflation
 - Evidence on impact through traditional Phillips curve/labor market is unclear/weak
 - Labor market and consumption remained very strong even after rate rise
 - Inflation receded despite tight labor market and strong consumption growth
 - Mortgage credit/housing is the one area where the response to monetary policy has been clear and strong
 - During 2020-21, mortgage rates/spread fell to historic lows and issuance boomed
 - During 2022-23, mortgages rates/spreads rose sharply and issuance collapsed

The fall and rise of mortgage rates



1. 2020-21: mortgage rates plummet to all-time lows after Fed loosens policy in response to covid (2.8% in Jan 2021)
2. 2022-23: mortgage rates spike dramatically when Fed tightens policy rapidly in response to inflation (7.8% in Oct 2023)

The fall and rise of mortgage spreads

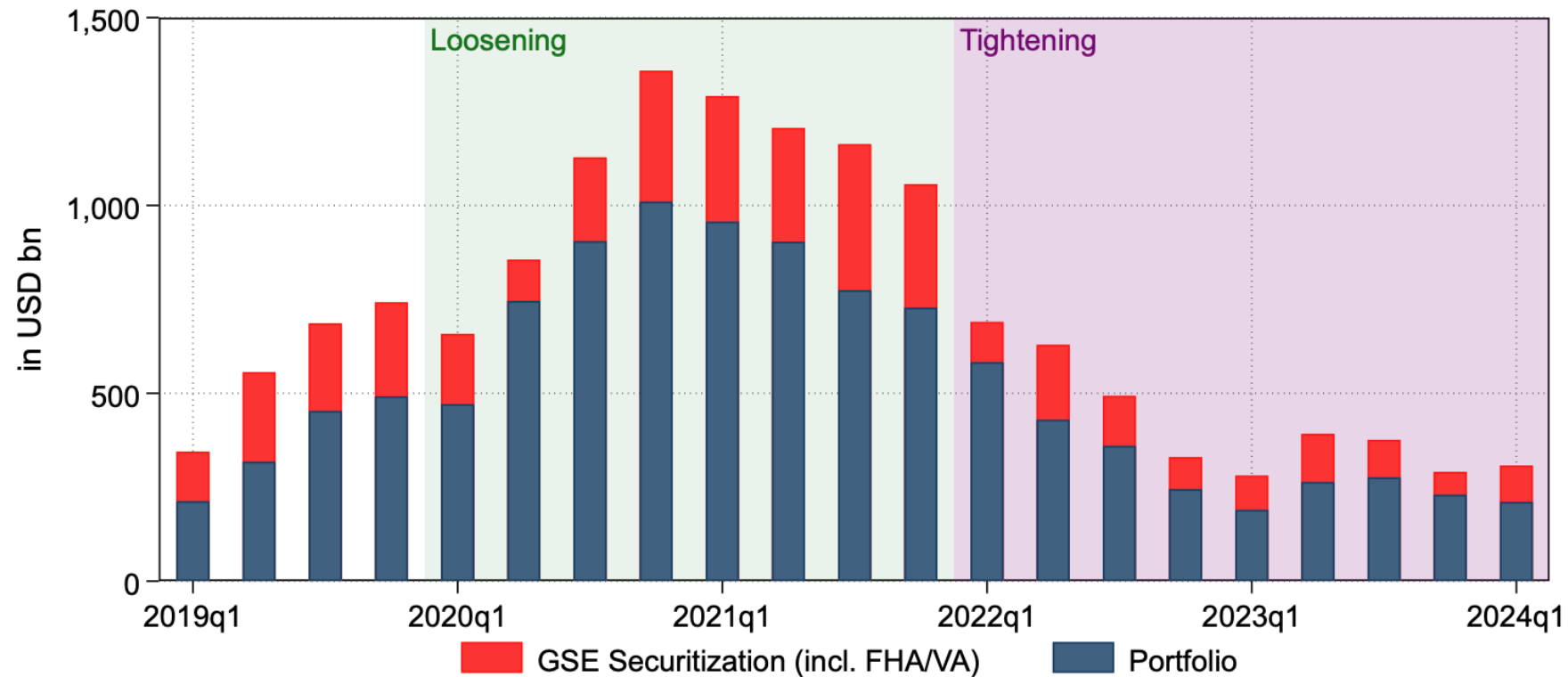


1. Mortgage rates fell and rose much more than long-term Treasury yields
→ Mortgage spread: Mortgage rate - 10-year Treasury yield
 - measures yield premium that mortgage borrowers pay → isolates the disproportionate impact of monetary policy on mortgage credit conditions
 - QE/QT affects this spread by buying MBS
 2. Option-adjusted spread removes the estimated value of the prepayment option and mortgage fees
 3. Mortgage spreads narrowed when rates fell and widened when rates rose
 - Mortgage spread increased by 150 bps from 2021 to 2022 (OAS accounts for 100 bps of the increase)
- Mortgage credit was very cheap in 2020-21, became expensive in 2022-23

Did mortgage rates fluctuate because of changes in credit *supply* or *demand*?

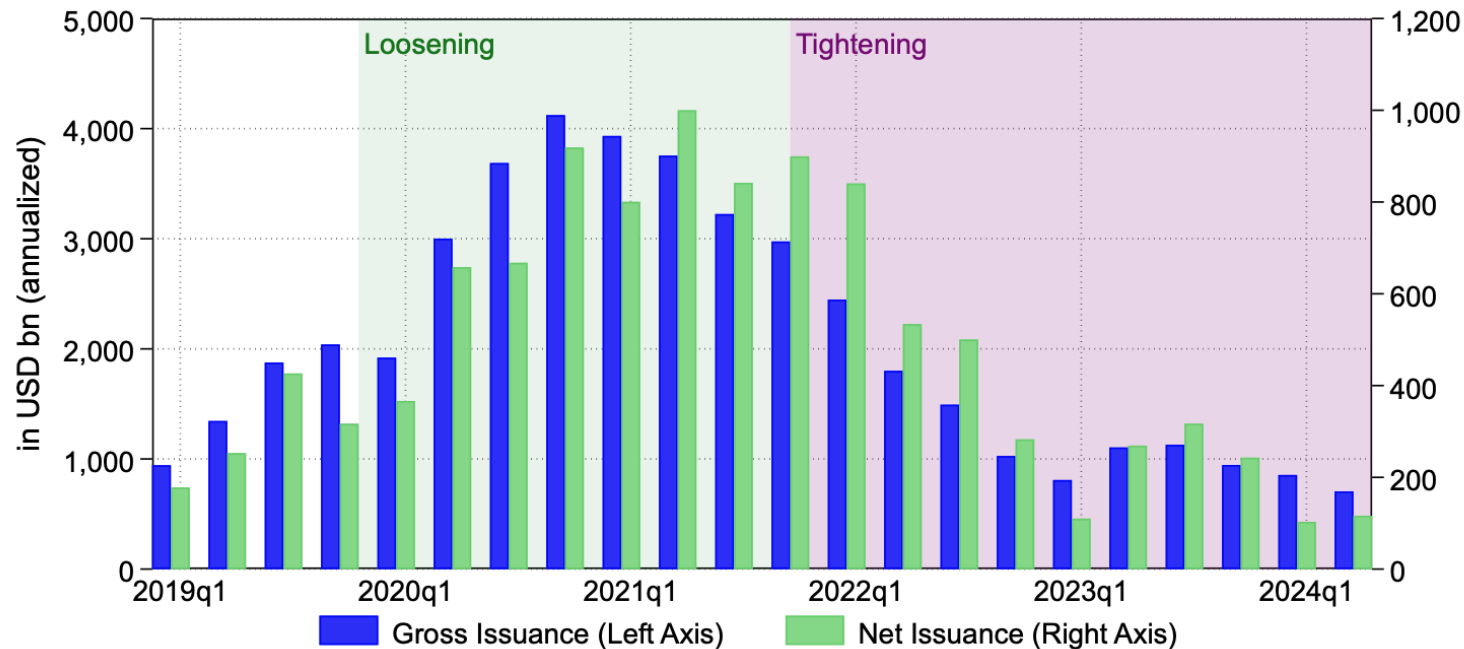
1. To answer this, we need to look at the ***quantity*** of mortgage credit
 2. If mortgage spread and mortgage quantity change in opposite directions → the main shift is in supply of mortgage credit
 - e.g., QE/QT
 3. If instead the mortgage spread and mortgage quantity change in the same direction → main shift is in demand for mortgage credit
 - e.g., increased demand due to rise of remote work
- Mortgage credit supply is important because it affects economic activity
 - home building, rent prices, household moving decisions

The rise and fall of mortgage originations



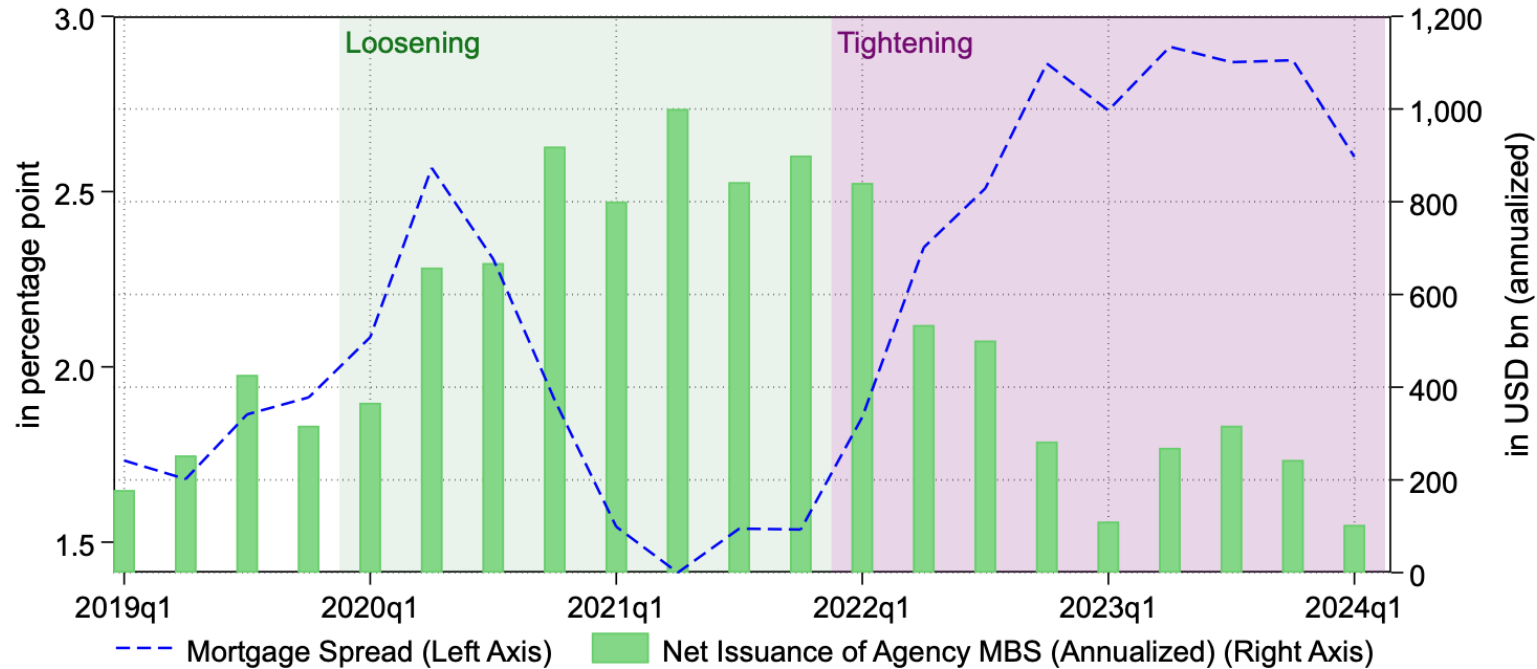
1. 2020-21: mortgage originations surged
2. 2022-23: mortgage originations collapsed

The rise and fall of MBS issuance



1. Both gross issuance (including refinancings) and net issuance rose sharply in 2020-21 and collapsed in 2022-23
 - Net issuance = change in total MBS dollars outstanding
 2. Net issuance tripled from \$294B in 2019 to \$886B in 2021 and collapsed to \$235B in 2023
 3. Gross issuance grew from \$1.5T (2019) to \$3.5T (2021) and fell to \$1T (2023)
- **Large changes in net *supply of* mortgage credit**
- **credit supply expanded in 2020-21, contracted in 2022-23**

The rise and fall of mortgage credit supply

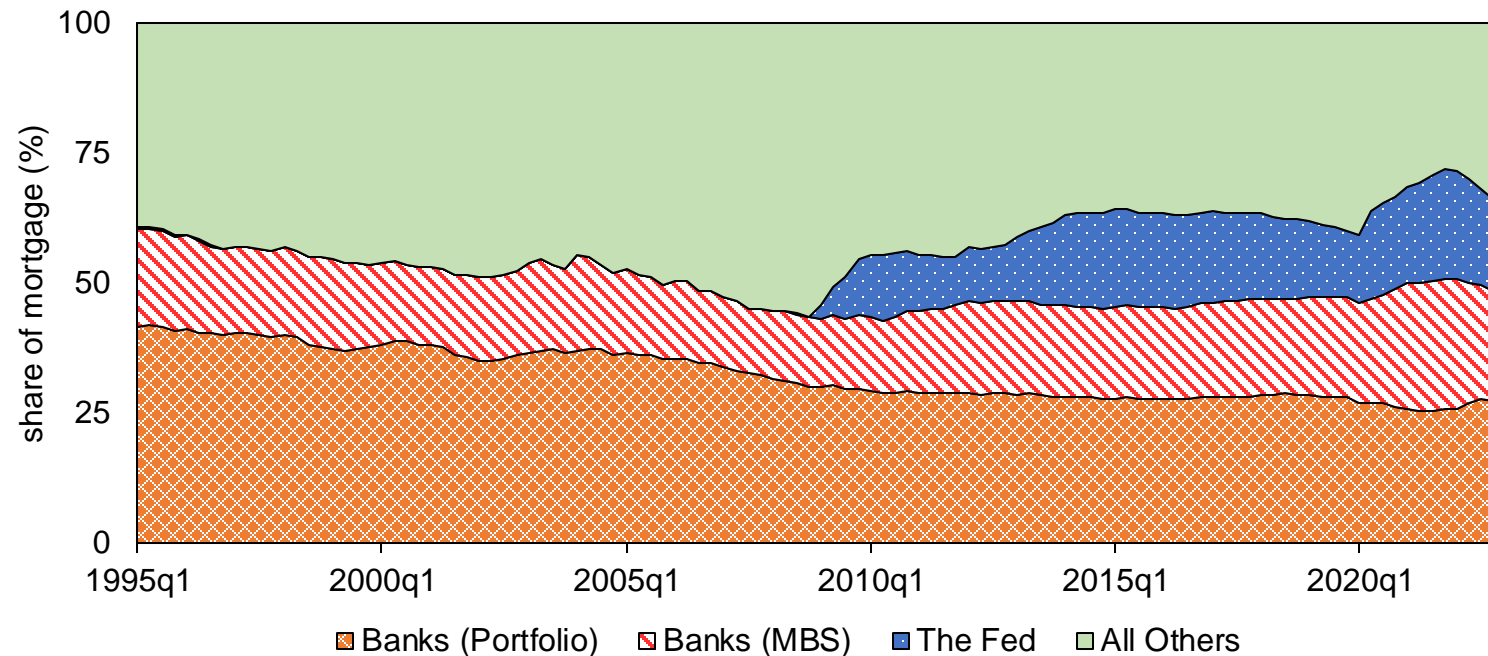


- Mortgage spread and mortgage issuance/quantity changed in opposite directions
→ There were large shifts in mortgage credit *supply*
- 2020-21: mortgage supply expanded → mortgage spread fell and mortgage issuance skyrocketed
- 2022-23: mortgage supply contracted → mortgage spread rose and mortgage issuance collapsed

Why did mortgage credit supply change?

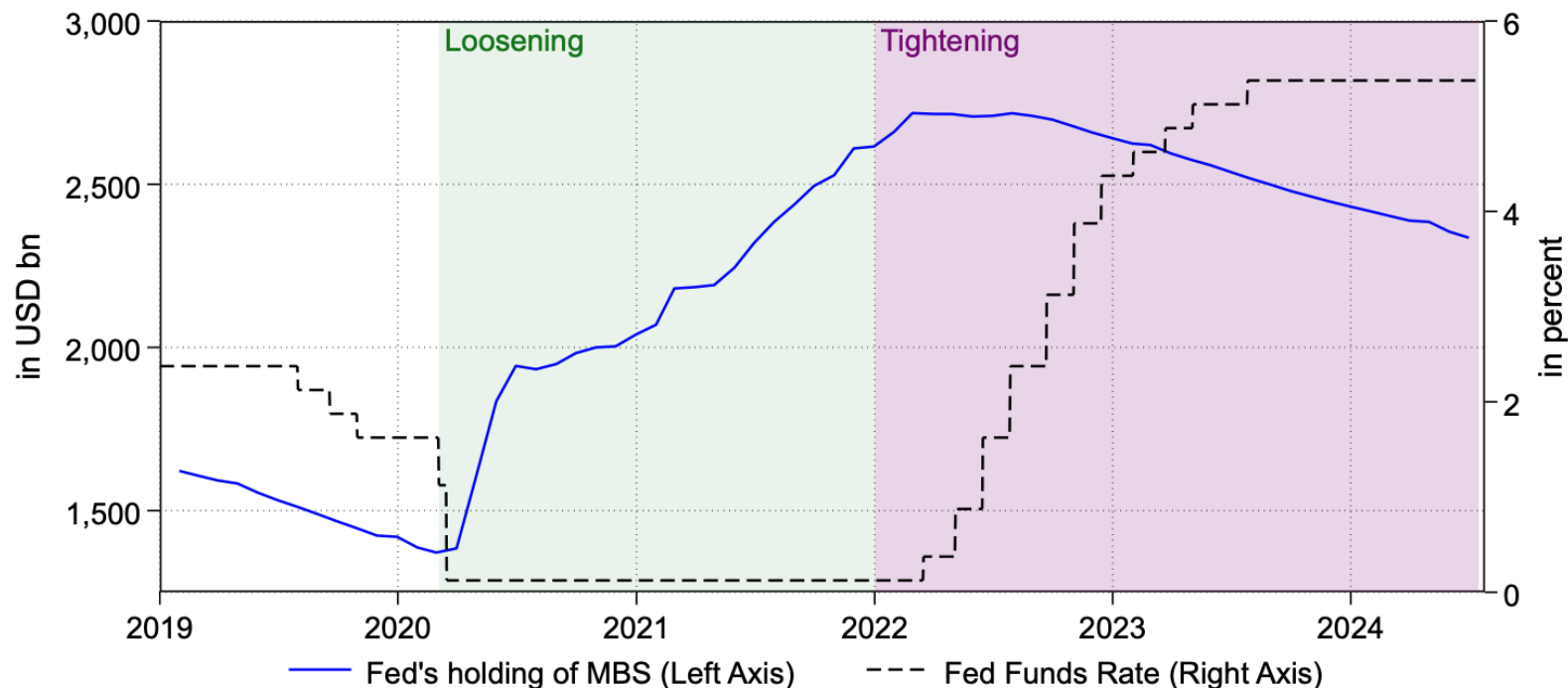
1. New Keynesian theory (price rigidities) does not explain how monetary policy affects long-term real rates (e.g., Hanson and Stein, 2015)
2. Moreover, does not explain why it would disproportionately affect long-term *mortgage rates/spreads*
3. We show that the credit supply changes are due to the buying/selling of the two large and *price insensitive* (inelastic) mortgage market participants
 - (1) The Fed, and (2) Banks: two largest investors in the mortgage market (and long-term debt more generally)
 - In 2020-21 they bought → increased credit supply, driving spreads down
 - In 2022-23 they sold → decreased credit supply, driving spreads up

Banks Are The Largest Source of Mortgage Credit



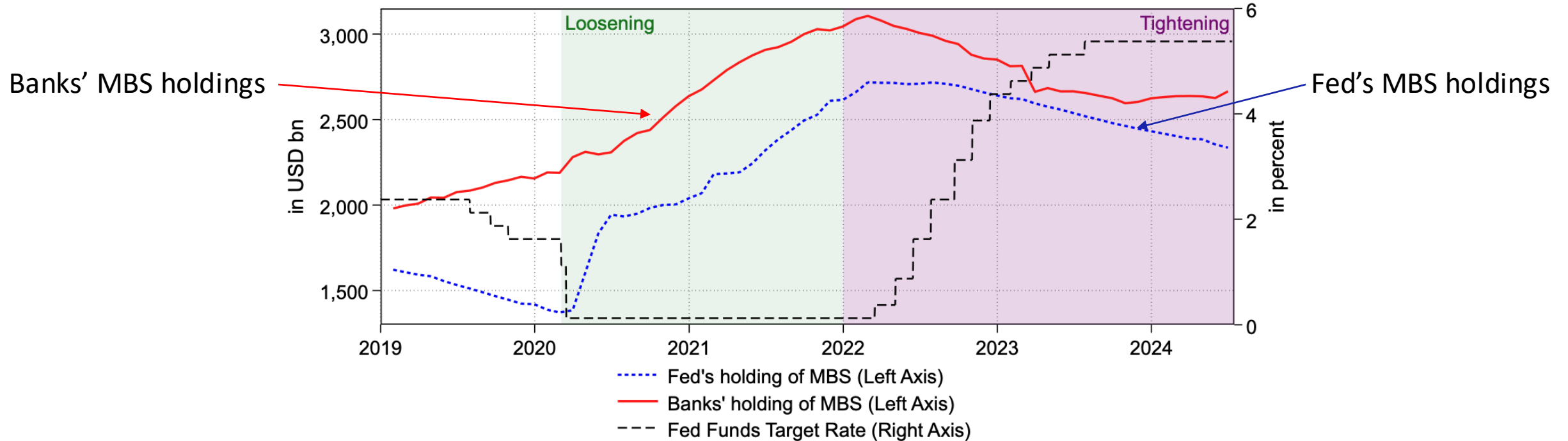
1. There is a common misconception that banks no longer play a major role in the mortgage market due to securitization
2. While non-banks now *originate* many mortgages, they do not ultimately provide the financing
3. This is because they immediately sell the mortgages to the GSEs, who securitize them into MBS and sell them to investors
 - It is these ultimate investors who determine the cost of mortgage credit
4. *Banks are the single largest investors in MBS and by far the largest providers of mortgage credit*
5. Main change in mortgage investor composition in the past 30 years has been an increasing role of the Fed, which reduced the share of investors other than banks (e.g., mutual funds, insurance companies)

Fed's MBS holdings



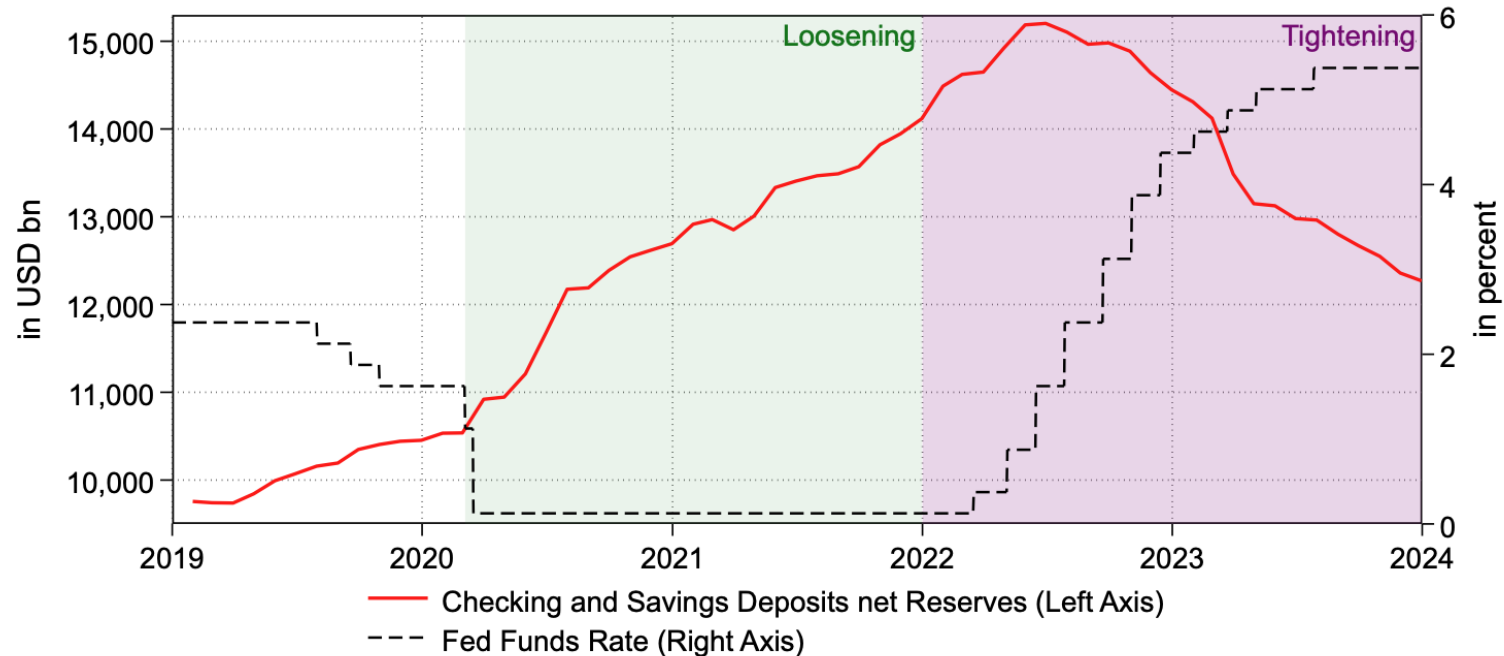
1. From 2020-2022Q1, under QE, the Fed increased its MBS holdings by over \$1.3T (93% increase) from \$1.4T to \$2.7T (April 2022)
2. From 2022Q2 to 2023Q4, under QT, the Fed decreased its MBS holdings by \$0.3T (11% decrease) from \$2.7T to \$2.4T
3. Under QE/QT the Fed is price inelastic: buys/sells regardless of the MBS price

Banks' MBS holdings



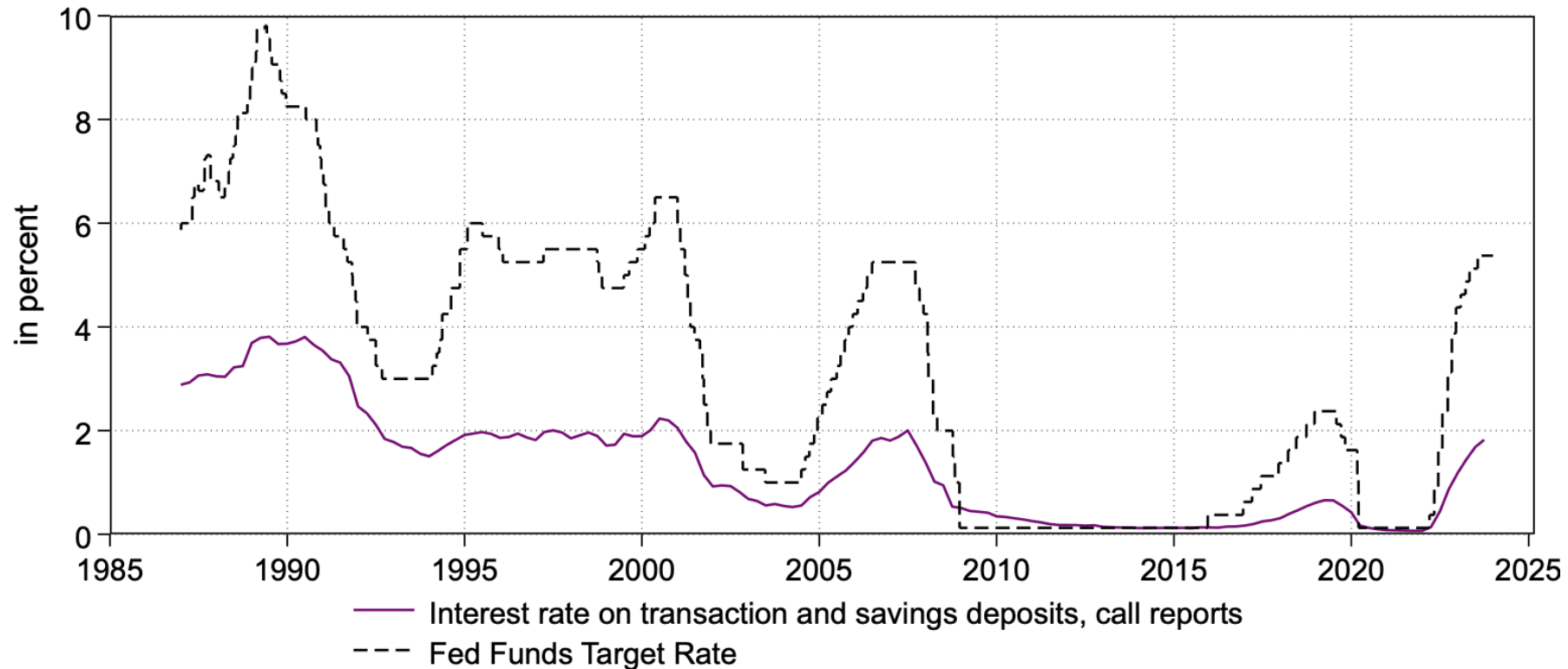
1. From 2020-21 banks bought about \$1T in MBS (50% increase)
2. From end of 2021 to end 2023, banks decreased their MBS holdings by \$0.5T (17% decrease)
→ Banks' portfolio changes were very large
3. Are banks price insensitive?
4. Note that banks did their own QE and QT
 - Like the Fed, banks bought when prices were high (2021) and sold when prices were low (2023)

Why did banks do their own QE and QT? → Deposits



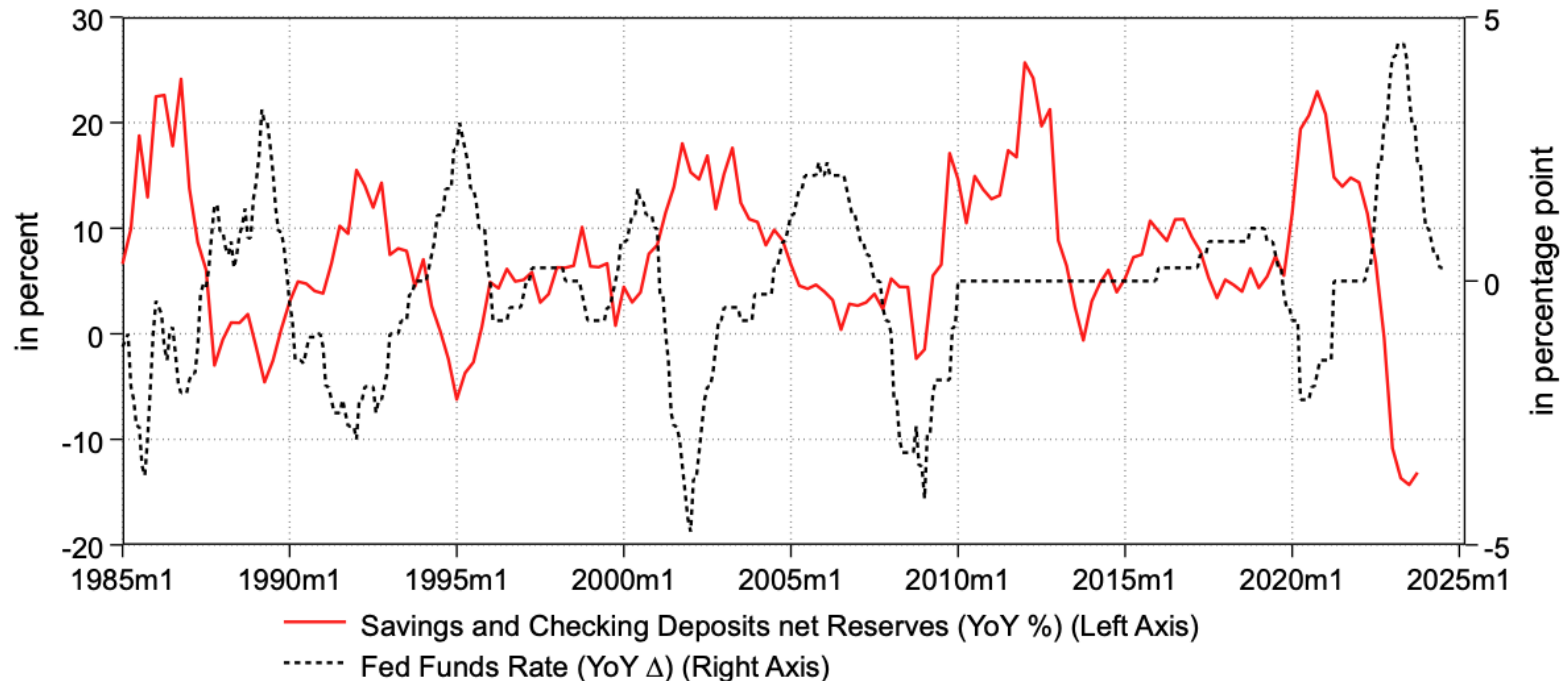
1. Banks got very large inflows of savings + checking (zero-maturity) deposits in 2020q1-2022q1
 - Zero-maturity deposits account for 84% of total deposits (Feb. 2020)
 - \$4.3T increase in savings + checking deposits in excess of reserves (\$10.5T to \$14.8T)
 - We net out reserves to avoid double counting deposits created by the Fed's QE
2. From 2022q1 to 2023q4 banks had large outflows of zero-maturity deposits
 - \$2.4T decrease in savings + checking deposits in excess of reserves holdings (\$14.8T to \$12.4T)

Why do bank deposits flow in and out? (#1)



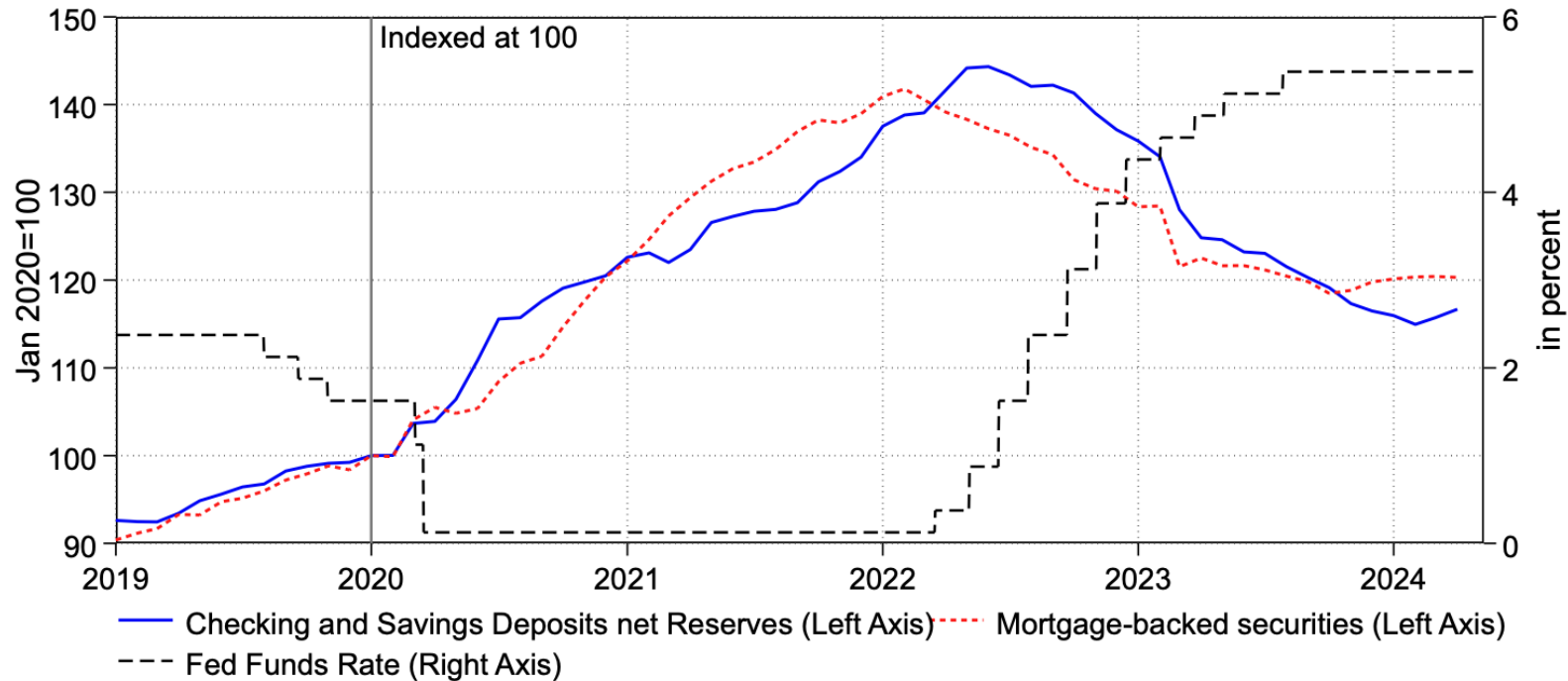
2. Reason: banks have market power → keep deposit rates low as the Fed raises rates (deposits have a low “beta”)
- this makes deposits more expensive to hold
 - this has happened in each cycle, including the one that began in 2022

Why do bank deposits flow in and out? (#2)



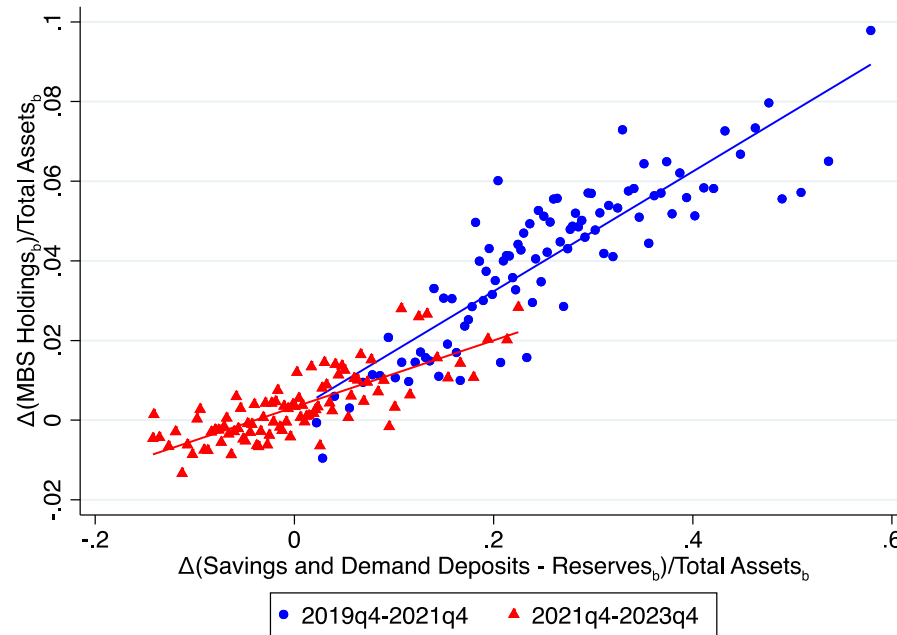
1. Because deposits become more expensive when the Fed raises rates, some depositors leave → deposit outflows
 - the bank earns large deposit profits on deposits that stay
- The reverse occurs when the Fed decreases rates → deposits flow *in*
3. This mechanism is called the ***Deposits Channel of Monetary Policy*** (DSS, 2017)
 - as the figures shows, it has been robust over time
 - It explains why deposits flowed in from 2020-2021 and flowed out from 2022-2023

How do banks invest deposits?



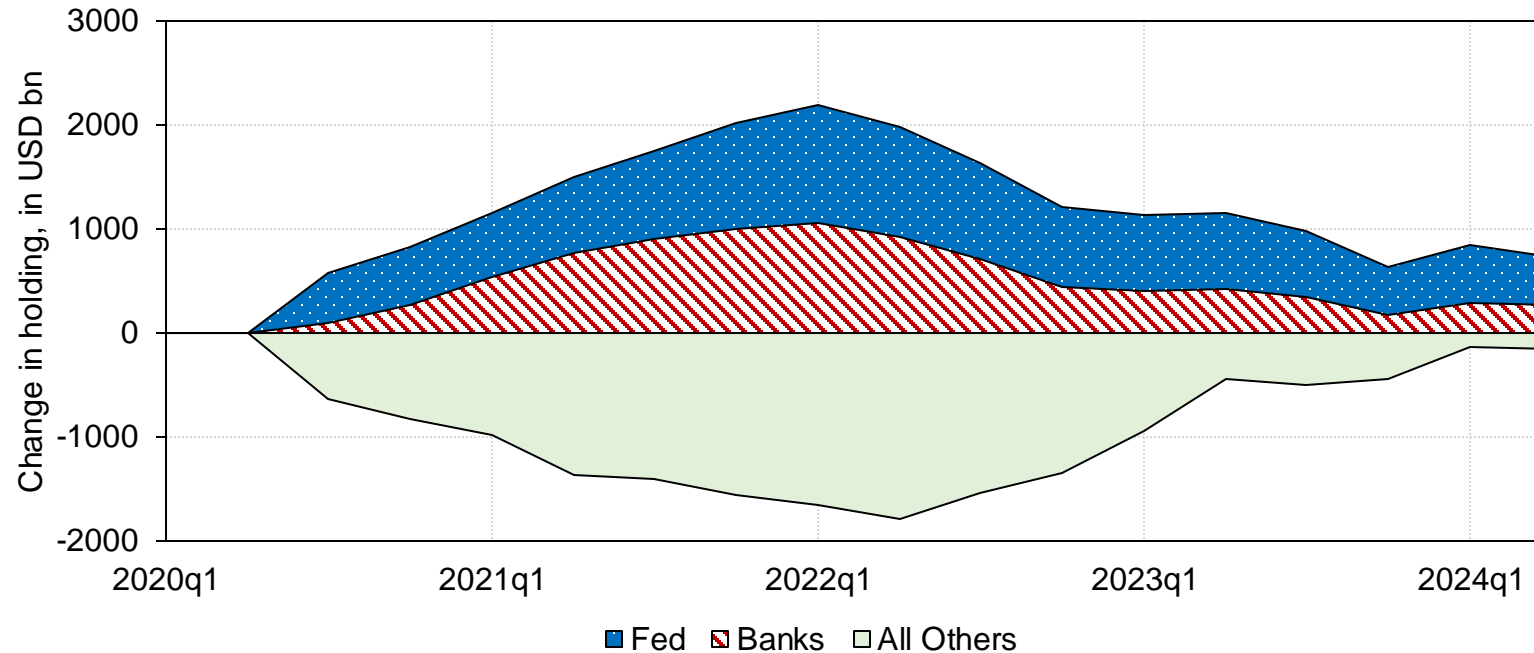
1. Banks use deposits to buy long-term fixed-rate assets
2. Reason: deposits have low beta \rightarrow function like long-term debt \rightarrow banks invest them in long-term fixed-rate assets (DSS, 2021)
3. The largest category of such assets is MBS
 \rightarrow Banks invest a substantial fraction of deposit inflows into MBS

Banks invest deposits in MBS



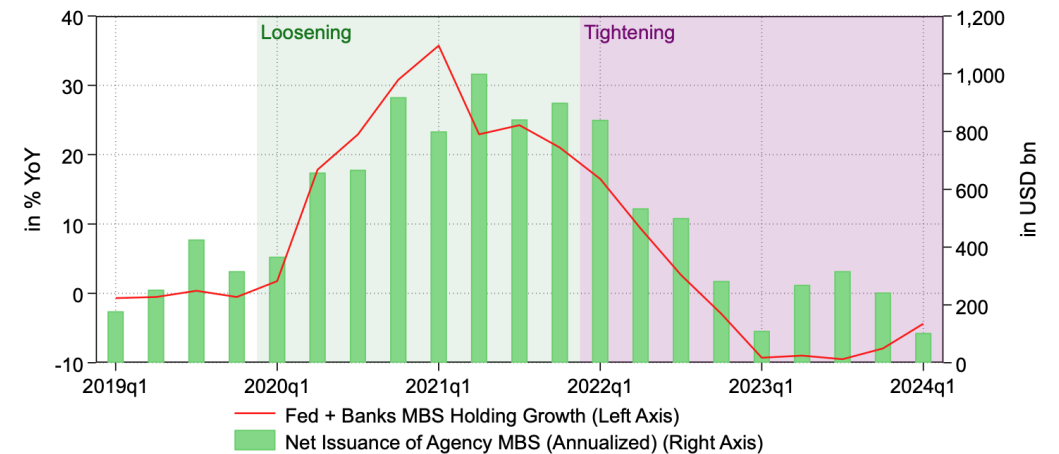
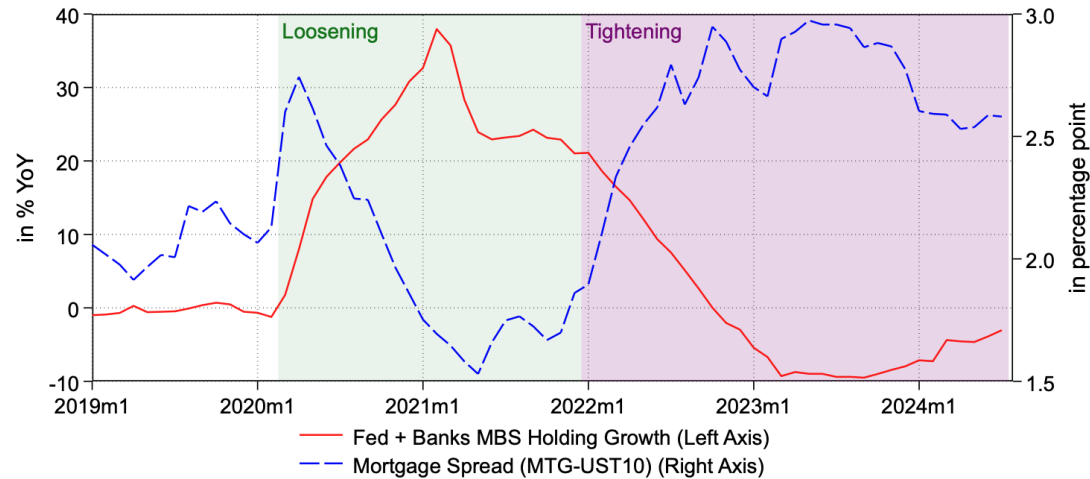
1. The relationship between deposit flows and MBS investment also holds at the individual bank level (i.e., it holds in the cross section)
 - Banks that had more deposit *inflows* grew their MBS holdings faster during 2019-2021 (blue dots)
 - Banks that had more deposit *outflows* shrank their MBS holdings faster during 2022-2023 (red triangles)

The Price Sensitive Investors



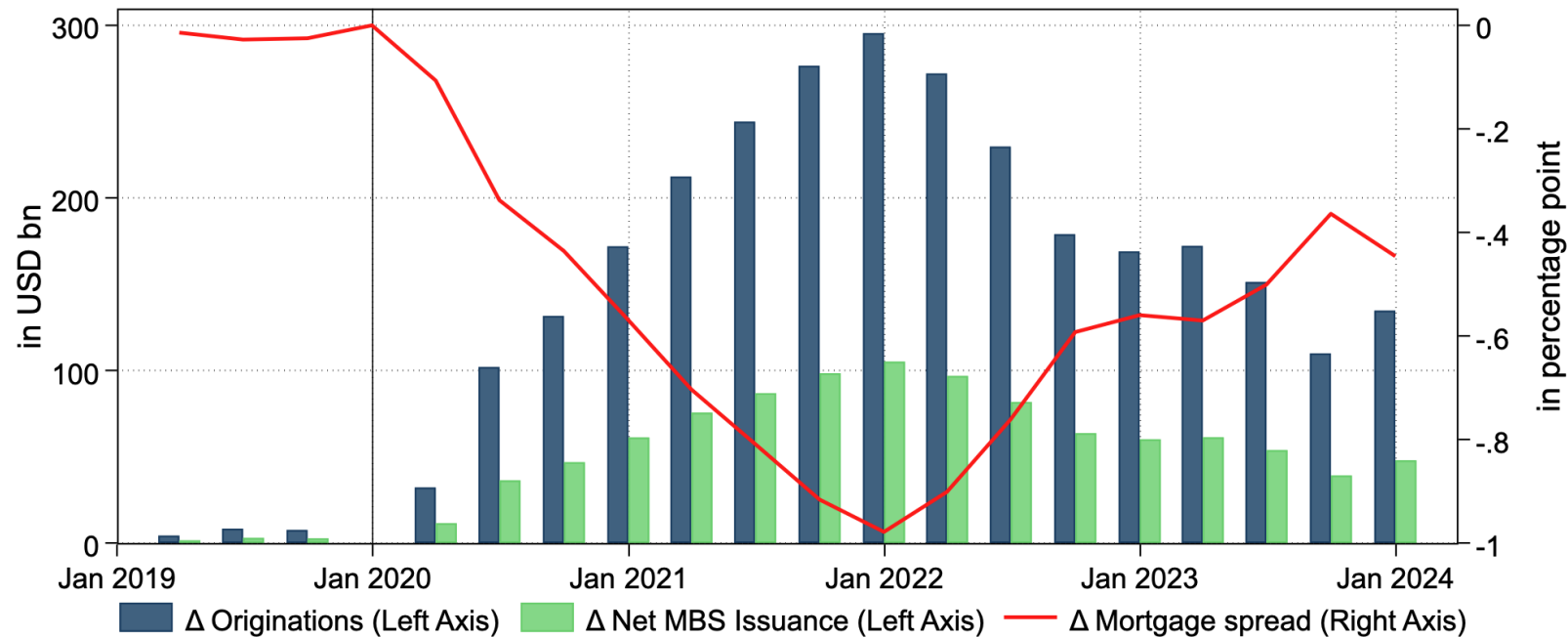
1. The other MBS investors are largely asset managers (mutual funds, hedge funds, private wealth, Rest of World) → they are *price sensitive* investors
→ They respond to the price impact of the Fed + Banks' buying/selling
2. When Fed+Banks bought MBS during 2020-21 and drove prices up, price-sensitive investors took the other side and sold at high prices
→ Fed+Banks bought *more than 100%* of net MBS issuance during 2020-21
3. When Fed+Banks reduced MBS holdings during 2022-23 and drove prices down, price-sensitive investors took the other side and bought at low prices
→ MBS price/quantity changes are driven by the buying/selling of the Fed + Banks

Putting it All Together



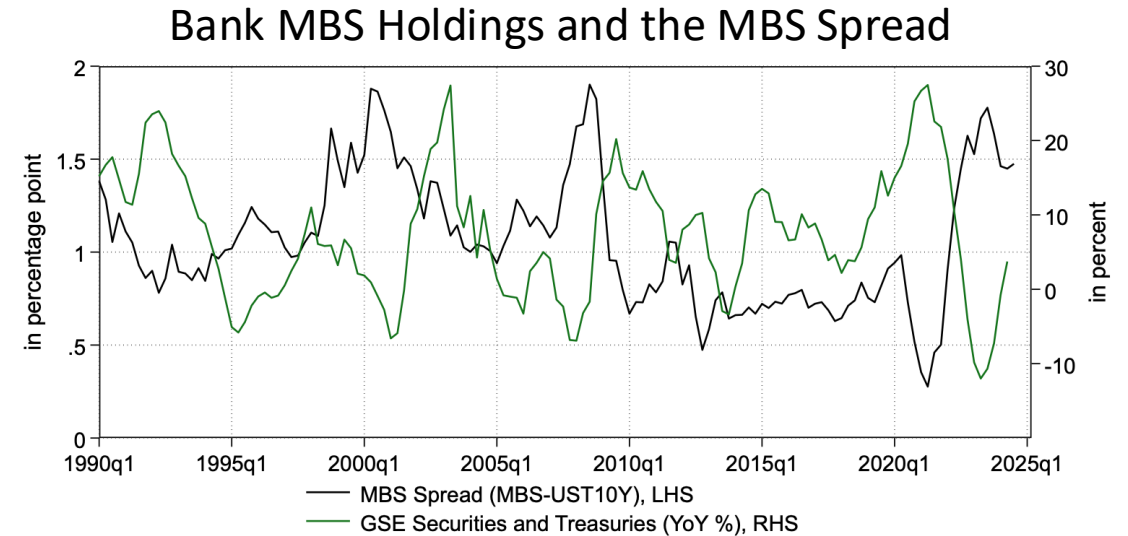
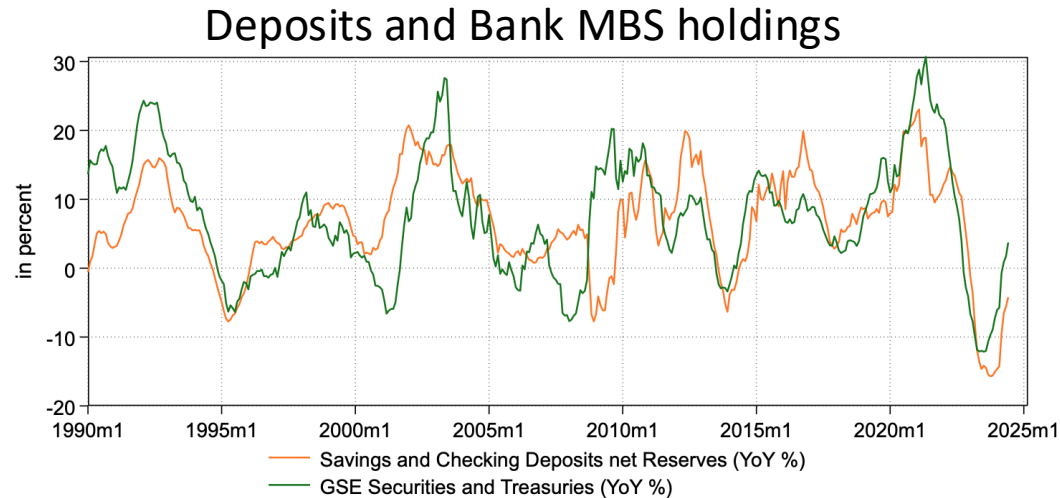
1. Monetary Policy drove the supply of mortgage credit
 - it did so through the Fed's buying/selling (QE/QT)
 - and through banks' buying/selling (by inducing deposit inflows/outflows)
 2. When the Fed + banks bought, they drove down the cost of mortgages and led to an issuance boom
 3. When the Fed + banks sold, they drove up the cost mortgages and issuance collapsed
- Explains why monetary policy had a disproportionate impact on mortgage credit/housing

Estimated impact of Fed and bank MBS purchases



- We estimate a model of the MBS/mortgage market to isolate and quantify impact of Fed and MBS purchases
 - Fed and bank MBS purchases led to 100 bps decline in the mortgage spread
 - Increased gross originations by \$300B per quarter at the peak; net by \$100B

Does Monetary Policy Always Work This Way?



1. While QE/QT is recent, monetary policy has always driven banks' willingness to supply mortgage credit
2. Monetary policy \rightarrow deposits inflows/outflows \rightarrow banks buy/sell MBS
3. Implies the mortgage market will continue to be a central transmission channel for monetary policy