Convexity Hedging During the 2021 Rate Sell Off

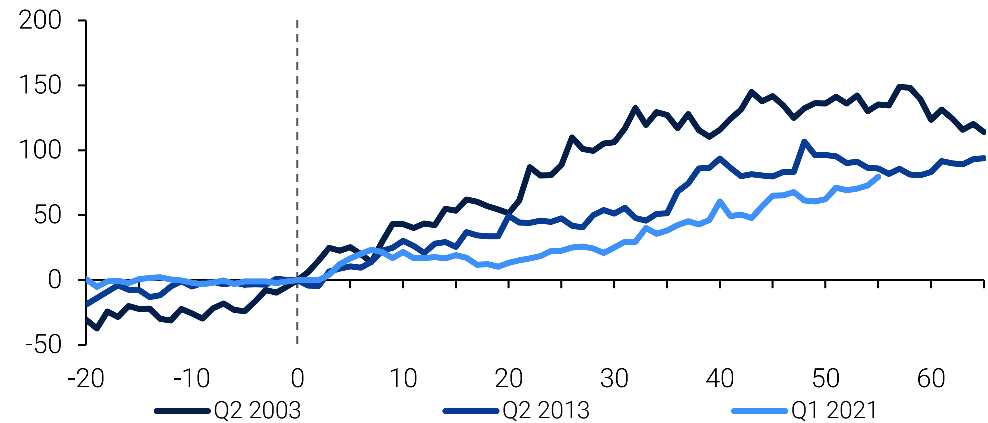
TMPG Meeting | March 23, 2021

The 2021 selloff in interest rates...

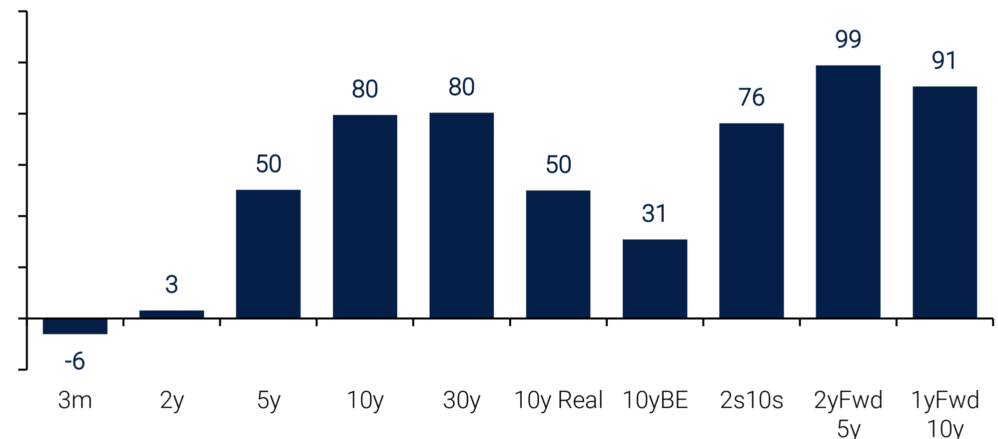
Rates market selloff is being driven by stronger growth and inflation expectations

- Interest rates have sold off ~80 bps in 2021 given:
  - Higher than expected fiscal stimulus under unified Congress
  - An improvement in the growth outlook; 2021 growth expectations have been upgraded by 1.7 percentage points since 2020 YE according to the Bloomberg median economist expectations
  - Expectations for rising inflation
- The selloff has been driven by a combination of real rates and inflation breakevens
- Yield curves have steepened meaningfully as front-end has remained anchored by continued Federal Reserve accommodation in coming years
  - 2s10s Treasury curve has steepened ~75 bps year-to-date
  - Steeper curves have led to meaningfully higher forward rates
- Higher forward rates are typically meaningful drivers of duration extension in the mortgage universe; as forward rates rise, future mortgage rates are higher, making fewer mortgages refinanceable

Interest rates have sold off similar to prior convexity episodes...



...but an anchored front-end has steepened to curve



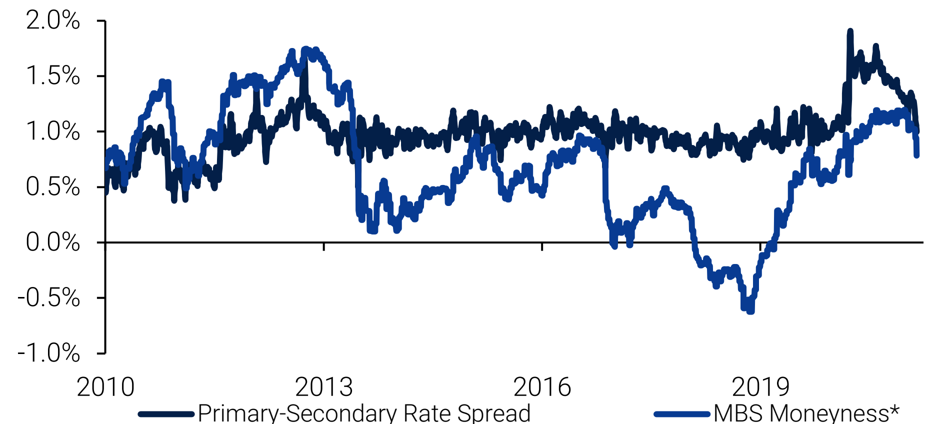
Source: Bloomberg, Freddie Mac, CPR/CDR. Data through 3/18/2021.

...Has seen more limited impact on mortgage universe

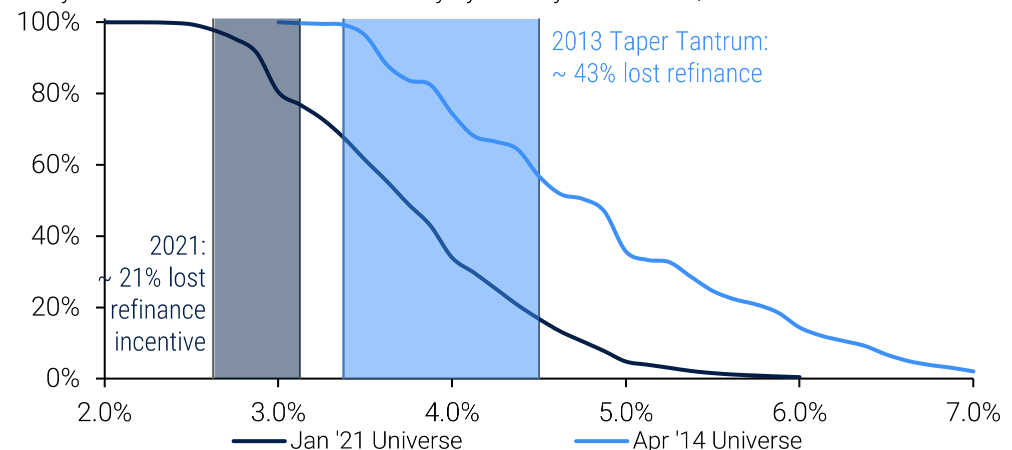
Rise in mortgage rates buffered by compression in primary-secondary mortgage spreads

- The selloff in the rates market has compressed primary-secondary mortgage spreads, mitigating the duration extension risk of MBS
- Primary mortgage rates have increased a more modest ~35 bps in 2021 thus far, making the relative extension of the mortgage universe smaller than implied by the move in Treasury rates
  - Compares to a 110 bps rise in mortgage rates during the taper tantrum
- As a result, a smaller share of the mortgage universe lost refinancing incentive during the current selloff than compared to 2013
- Current relatively sizeable negative convexity in the MBS universe raises concerns that duration extension could increase if rates continue to sell off
  - Following the compression in the primary-secondary mortgage spreads, a <u>further selloff in rates would likely see greater pass-through to primary mortgage rates all else equal, leading to greater duration extension and hedging needs going forward</u>

Primary-secondary mortgage spreads have compressed...



...leading to smaller extension of the mortgage universe than in 2013



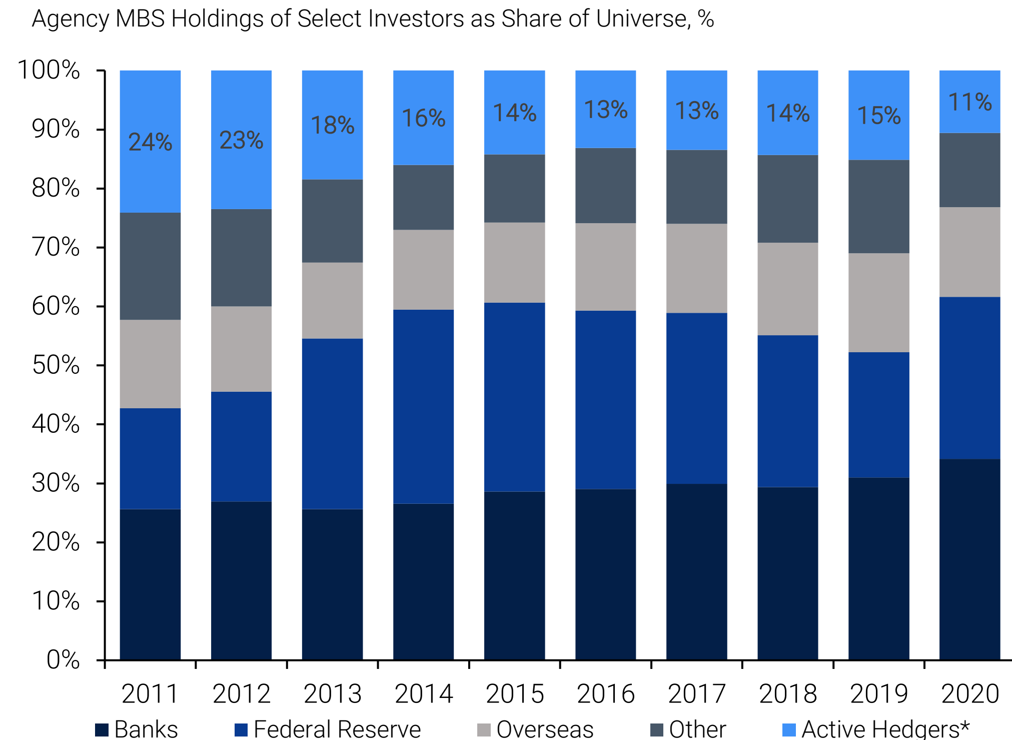
Source: CPR/CDR
* MBS moneyness represents the difference between the 30-year UMBS weighted-average coupon and the Freddie Mac 30-year primary mortgage survey rate

Mortgage investor composition has changed meaningfully...

Current investor composition suggests lower hedging needs

- The investor distribution in the agency MBS universe has shifted meaningfully in recent years
  - Banks and the Fed have increased their relative share of the universe
  - Money managers, mREITs and the GSEs own meaningfully smaller portions of a larger universe
- Actively hedging accounts (GSEs, mREITs, etc.) currently own only ~11% of the Agency MBS universe, making their hedging needs relatively smaller than in past convexity episodes (e.g. 2003, 2013)
  - Although there has been some delta-hedging, investors have reportedly been better positioned, running relatively short duration exposures entering 2021
- Current positioning of hedging accounts is difficult to estimate, suggesting convexity hedging needs could increase if rate selloff continues
- Separately, mortgage originators sold increased amounts of TBAs at times in recent weeks, as rising mortgage rates led to higher-than-anticipated loan closings (a process referred to as "originator pipeline hedging"). This has increased pressure on the mortgage basis at times
  - Meanwhile, investors also needed to invest higher mortgage paydowns, thereby meeting the temporary increase in supply

Select investor composition over time



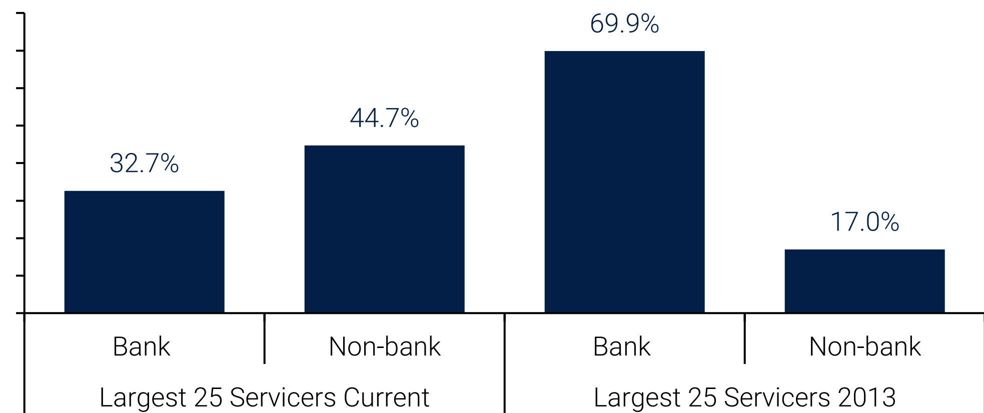
Source: eMBS, Federal Reserve, Flow of Funds
* Active Hedgers represents GSEs, mREITs, and 1/3rd of money manager holdings to account for hedge funds. Banks may hedge a portion of their MBS holdings, particularly in available-for-sale securities.

… As has the composition of servicers

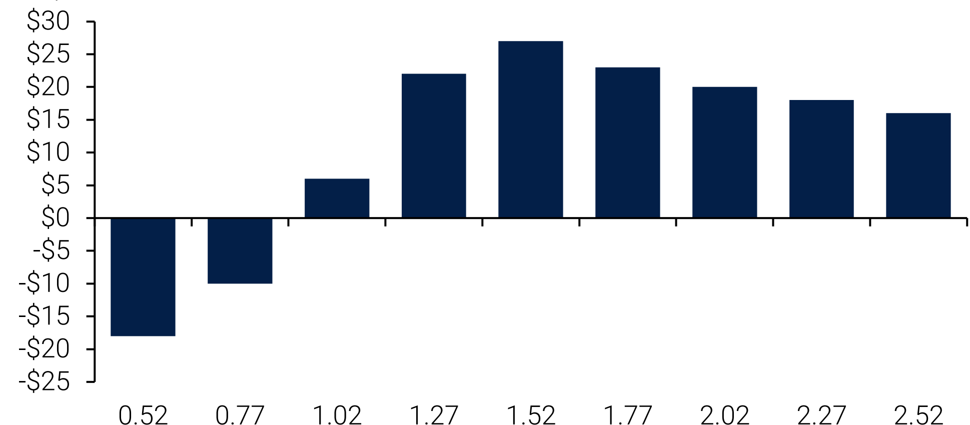
Servicer composition has shifted towards non-banks, which tend to not hedge MSR holdings

- Similar to the investor universe, the composition of servicers has meaningfully changed in recent years
  - Non-bank servicers represent seven of the Top-10 servicers, compared to two in 2013
  - Among the largest 25 servicers, non-banks service 45% of outstanding agency mortgage loans, compared to 17% in 2013
- Most non-bank servicers tend not to hedge changes in the duration of their servicing rights, in turn lowering the aggregate hedging needs of the servicer community
  - Given the low level of interest rates, mortgage-servicing rights were positively convex for much of 2020
- At current rate levels, mortgage servicing rights are likely to be the most negatively convex, suggesting a further selloff will lead to more hedging needs

Agency MBS universe servicer composition



Mortgage servicer convexity near peak at current rate levels



Source: eMBS, CPR/CDR, Morgan Stanley