

# Normalizing the Federal Reserve's Balance Sheet: *The Impact on the Mortgage-Backed Securities Market*

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**D**uring the Global Financial Crisis, the U.S. Federal Reserve found the traditional tools for monetary policy insufficient to stimulate the economy. From December 2008 to December 2015, the Fed's primary policy tool, the target federal funds rate, was set between 0 and 0.25%. But the economy remained weak, and there was no room to cut rates further. As a result, the Fed began to purchase large quantities of assets from the private sector. These programs are referred to as quantitative easing or large-scale asset purchases. The Fed owned \$1.77 trillion of agency mortgage-backed securities (MBS) and \$2.45 trillion of U.S. Treasury securities in late September 2017 and began to reduce the amount of these portfolio holdings in October 2017.

Some background: Since the Great Recession, the Fed has done three rounds of quantitative easing. From November 2008 to March 2010, it purchased \$1.75 trillion in long-term Treasuries, Fannie Mae and Freddie Mac agency debentures, and agency MBS (comprising Ginnie Mae, Fannie Mae, and Freddie Mac issuances). From November 2010 to June 2011, the Fed purchased an additional \$600 billion of Treasuries. From September 2012 to September 2014, the Fed engaged in its third round of quantitative easing, initially purchasing \$85 billion a month in Treasuries and agency debt and

MBS, with \$40 billion of the \$85 billion in agency MBS. The Fed began to taper its purchases in December 2013 and ended the program in October 2014. From October 2014 through September 2017, the Fed has reinvested its runoff. The Treasuries runoff was reinvested in Treasuries, and agency MBS and agency debentures runoffs were reinvested exclusively in agency MBS. Through these actions, the Fed owned \$1.77 trillion of agency MBS, nearly 29% of all outstanding MBS as of late September 2017.

The Federal Open Market Committee announced on September 20, 2017, that it would begin to normalize its balance sheet in October 2017. The committee has been transparent about the course. It will begin by reducing the reinvestment rates on its portfolio. In months 1 through 3, the Fed would let the System Open Market Account (SOMA) portfolio run off by \$10 billion each month, increasing to \$20 billion in months 4 through 6, \$30 billion in months 6 through 9, \$40 billion in months 10 through 12, and \$50 billion a month thereafter. The maximum runoff in each month, if met, would comprise 60% Treasuries and 40% MBS. If there is not enough runoff in that month, the Fed will not sell to meet these targets.

Although this timetable is clear, additional questions arise about the MBS portfolio that the Fed should shed some light on. The largest questions include the

following: What size and mix of assets does the Fed eventually want to hold? And how does it intend to get there? In this brief, we argue that this is not an academic exercise. When the Fed reaches its desired balance sheet size, it will hold approximately \$1.18 trillion in mortgage assets. It will take a long time for these to run off if there is no selling. This may be fine, but the Fed has made several comments that indicate it could sell the “residual.” For example, the minutes of the September 2014 meeting includes the following statement:

The Committee currently does not anticipate selling agency mortgage-backed securities as part of the normalization process, although limited sales might be warranted in the longer run to reduce or eliminate residual holdings. The timing and pace of any sales would be communicated to the public in advance.

It is not at all clear what constitutes a “residual.”

This brief first shows that under assumptions reasonably close to what the Fed has used, there will still be close to \$1.18 trillion of MBS on its books when the Fed balance sheet normalizes. We then review the arguments about the Fed’s long-term desired portfolio mix. If it is Treasuries only, this raises questions about whether and how quickly the Fed should change its mortgage and Treasury mix to avoid making asset allocation decisions that distort financial markets. In the next section, we argue that the Fed should do some active portfolio management while they are still doing a small amount of reinvestment. Finally, we make the case that the Fed could play a costless and helpful role in launching the single government-sponsored enterprise (GSE) security.

## THE SIZE OF THE MBS HOLDINGS WHEN THE FED PORTFOLIO NORMALIZES

The Federal Reserve’s purchase of assets resulted in lower interest rates (Gagnon et al. [2010]; Hancock and Passmore [2014]). As the Fed bought securities from private investors, it increased the demand for these instruments, driving down the yields. It also signaled an intent to keep rates low. An additional stimulatory effect was that the Fed, in paying for these securities, increased the amount of cash available to the public, which can be placed in banks as deposits. These deposits

are initially held as reserve balances at the Fed, which are available to lend. The mechanics of Fed asset purchase programs are discussed in a *Liberty Street Economics* blog post.<sup>1</sup>

As the Fed portfolio declines, this process should reverse. The Fed will demand fewer securities, requiring other investors to absorb these securities, theoretically requiring higher yields. The market signal is also important, although the Fed has other ways to communicate its intentions. The gradual and well-communicated wind-down schedule should minimize the likelihood of a sharp rise in mortgage and Treasury rates. And certainly, in the week after the Fed’s September 20 announcement, there were no sharp changes. In fact, the yield spread between agency MBS and Treasury securities declined modestly.

In July, the Federal Reserve Bank of New York [2017] published projections, based on May 2017 holdings, showing that it expects the Fed portfolio to normalize in the base case at about \$3 trillion in 48 months. That is, the Fed’s portfolio starts out larger than the baseline portfolio but is shrinking because of the securities runoff while the baseline portfolio is growing. The actual portfolio size is equal to that of the baseline portfolio in about four years under the Fed’s median scenario. This is the *point of normalization*. After the Fed’s portfolio normalizes, it will follow the baseline path. We generally follow the Fed’s methodology and come close to replicating its numbers. We then look at the MBS holdings when the Fed’s portfolio normalizes and find they would total approximately \$1.18 trillion.

Exhibit 1 shows the actual Federal Reserve balance sheet in September 2007, 2012, and 2017. The overall size has increased from \$872 billion to \$4.46 trillion since September 2007. The growth in securities, from \$780 billion to \$4.24 trillion, has been made possible by the expansion on the liability side of the balance sheet. In September 2007, before quantitative easing, the balance sheet consisted primarily of currency in circulation (89% of the \$872 billion portfolio). Bank reserves were \$13 billion. Now, although the entire balance sheet has grown, currency in circulation is over \$1.5 trillion and bank reserves are over \$2 trillion.

No one knows what the baseline Fed portfolio should look like, but the balance sheet will be larger than it was in 2007, as the amount of currency in circulation puts a floor on portfolio size. For our

## EXHIBIT 1

### The Federal Reserve Balance Sheet in 2007, 2012, and 2017, and Normalized Portfolio Projections from Market Participants (baseline)

	Sept. 19, 2007	Sept. 20, 2012	Sept. 21, 2017	Baseline <sup>a</sup>
<b>Assets (\$billions)</b>				
Securities held outright	780	2,583	4,243	2,769
Unamortized premiums and discounts	0	0	148	0
Repurchase agreements	33	0	0	0
Maiden Lane and TALF	0	4	2	2
Gold + SDRs	14	18	18	18
Other assets	45	27	48	48
<b>Total assets</b>	<b>872</b>	<b>2,823</b>	<b>4,459</b>	<b>2,837</b>
<b>Liabilities (\$billions)</b>				
Currency in circulation (Federal Reserve Notes)	773	1,083	1,534	1,534
U.S. Treasury, General Account	4	76	151	300
Other deposits <sup>b</sup>	0	82	83	40
Reverse repurchase agreements <sup>c</sup>	36	94	414	300
Other liabilities and capital	44	68	48	50
Bank reserves	13	1,421	2,229	613
<b>Total liabilities</b>	<b>872</b>	<b>2,823</b>	<b>4,459</b>	<b>2,837</b>

<sup>a</sup>Our initial baseline values are as of September 2017, based on projections from surveyed market participants on what the balance sheet would look like in 2025; following closely the methodology of the Federal Reserve Bank of New York. All components other than currency are assumed to be constant. The baseline will move with the growth of currency. For the methodology, see Federal Reserve Bank of New York [2017].

<sup>b</sup>Comprises term deposits of depository institutions, foreign official and other deposits, and bank-clearing deposits.

<sup>c</sup>Comprises foreign official and international accounts and other accounts.

Notes: SDRs = special drawing rights; TALF = Term Asset-Backed Securities Loan Facility. Baseline assumes \$613 billion in reserve balances. All numbers are in billions of dollars.

Sources: Urban Institute calculations from FRB H.4.1 Statistical Release. See “Factors Affecting Reserve Balances—H.4.1,” Board of Governors of the Federal Reserve System, last updated October 19, 2017. <https://www.federalreserve.gov/releases/h41/>.

purposes, we use assumptions similar to what the Fed adopted in its July 2017 projections, assumptions based on a survey of primary dealers and a separate survey of market participants.<sup>2</sup> The surveys, done in June 2017, asked about the Fed balance sheet size the market expected, on average, in 2025. In the final column of Exhibit 1, we show the balance sheet components as of September 2017, the baseline, based on the Fed’s assumptions in their projection. We focus on the liability side of the balance sheet, as the liabilities determine the necessary assets, and the asset that does the adjusting is the securities portfolio. The Fed assumes that currency in circulation increases over time and assumes most other components do not. We find that the baseline portfolio would be \$2.84 trillion, larger than the pre-crisis level but smaller than the current level of \$4.46 trillion. Readers who wish to skip the details of our calculations about how long and at what

point the Fed portfolio normalizes can move to the next section, “The Wind Down.”

**Currency in circulation.** In the base case, using the currency position as of September 2017, we found that a 3.3% growth rate will replicate the Fed’s median 2025 currency projections. The Fed also considers a lower and higher scenario, which we can replicate assuming 1.3% and 5.4%.<sup>3</sup> The actual growth of currency in circulation has been close to 7.1% a year over the past decade, so these are conservative numbers for the baseline portfolio size.

**Bank reserves.** In 2007, the banks held \$6 to \$15 billion of reserves at the Fed, averaging about \$10 billion. This number is now up to \$2.2 trillion. Before the crisis, the Fed managed short-term interest rates using open market operations, a technique with which they managed the quantity of reserves in the system. This generally resulted in a low volume of reserves.

Now, the Fed manages short-term interest rates by setting administered rates, including the rate it pays on bank reserves held with the Fed. This is often referred to as the *floor system*, as it sets a floor for interest rates, and rates trade at that floor. This requires the banking system to be saturated with reserves.<sup>4</sup> The Fed surveyed market participants for their expectations and used \$400 billion as the lower bound, \$1 trillion as the upper bound, and \$613 billion as their base case.

**Treasury General Account.** The Treasury holds cash balances at the Fed. These balances act as the Treasury's checking account for incoming and outgoing cash flows. Treasury General Account balances fluctuate because of seasonal variations in expenses and tax receipts but have averaged around \$245 billion. The Fed's projections assume a range of \$200 to \$400 billion, with \$300 billion as the base case.

**Other deposits.** Other financial institutions—including the GSEs, financial market utilities that are systematically important, and international and multilateral organizations—are authorized to hold cash deposits at Federal Reserve Banks. These deposits averaged \$60 billion over the past year and stood at an elevated \$83.3 billion in September 2017. The assumption was that they would range from \$30 to \$85 billion, with \$40 billion in the median scenario, according to the Fed surveys.

**Reverse repurchase agreements.** The Fed engages in repurchase agreements to support monetary policy implementation—in effect, borrowing funds to reinforce the floor. These reverse repurchase agreements are conducted with eligible overnight counterparties through the reverse repurchase facility. These have averaged \$155 billion over the past year. Survey results indicated a range of \$50 to \$121 billion in 2025, with a median of \$100 billion. The Fed also offers a *foreign repo pool*, a repurchase pool to foreign official and international account holders. This investment is part of the range of services offered to these entities. The foreign repo pool has averaged \$245 billion over the past year. Market participants expected \$125 to \$250 billion, with a median of \$200 billion in 2025.

**Other liabilities and the capital account.** The Fed's capital account is about \$41 billion. Other liabilities include earning remittances to the U.S. Treasury, accrued dividends, and other smaller items. This item was roughly \$48 billion in June 2017. We assumed a flat value of \$50 billion for our projections.

Adding all these components, as done in Exhibit 1, the baseline portfolio at the present time would be \$2.84 trillion. This is higher than pre-crisis levels but lower than the current level.

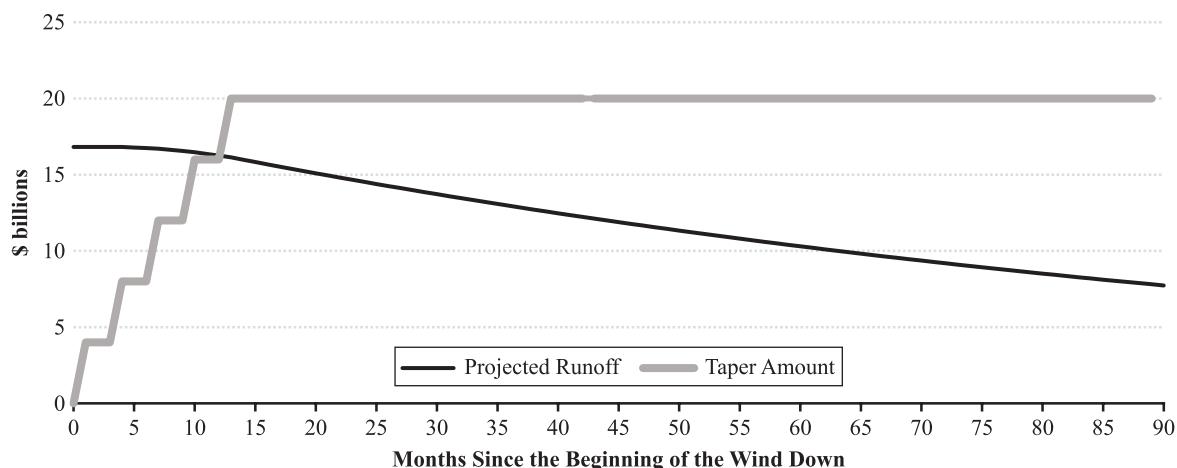
## THE WIND DOWN

Once the Fed begins its wind down in October 2017, Fed announcements indicate that the Fed would let the SOMA portfolio run off by \$10 billion a month in months 1 through 3, \$20 billion in months 4 through 6, \$30 billion in months 7 through 9, \$40 billion in months 10 through 12, and \$50 billion a month thereafter. These reductions would be 60% Treasuries and 40% mortgages. If there is not enough runoff in a given month to meet the targeted reduction amount, the Fed would not sell, and the amount would not be accrued. If the Fed met its targeted reduction amount every month, it would achieve its desired portfolio size in 35 or 36 months, when the portfolio size would be about \$3 trillion. Under these conditions, the Fed would have run off just under \$600 billion of its \$1.77 trillion mortgage portfolio, leaving \$1.17 trillion in mortgages. After 47 months, the Fed would have run off more than \$820 billion of mortgages, leaving holdings under \$1 trillion.

But there will be shortfalls in meeting both the Treasury and mortgage reduction targets, a point the Federal Reserve Bank of New York [2017] made in its paper. On the mortgage side, while the runoff is prepayment dependent, we figured the projected pay-downs in the first year total about \$197 billion, similar to the Fed's median projections of \$195 billion. This will produce a runoff of \$120 billion and a reinvestment of \$77 billion. By the end of the first year and thereafter, in the base case, the paydowns generated by the portfolio will be insufficient to cover the targeted runoff. Exhibit 2 shows the projected monthly runoff versus the taper amount. The minimum of the two determines the monthly reduction in the Fed's MBS holdings.

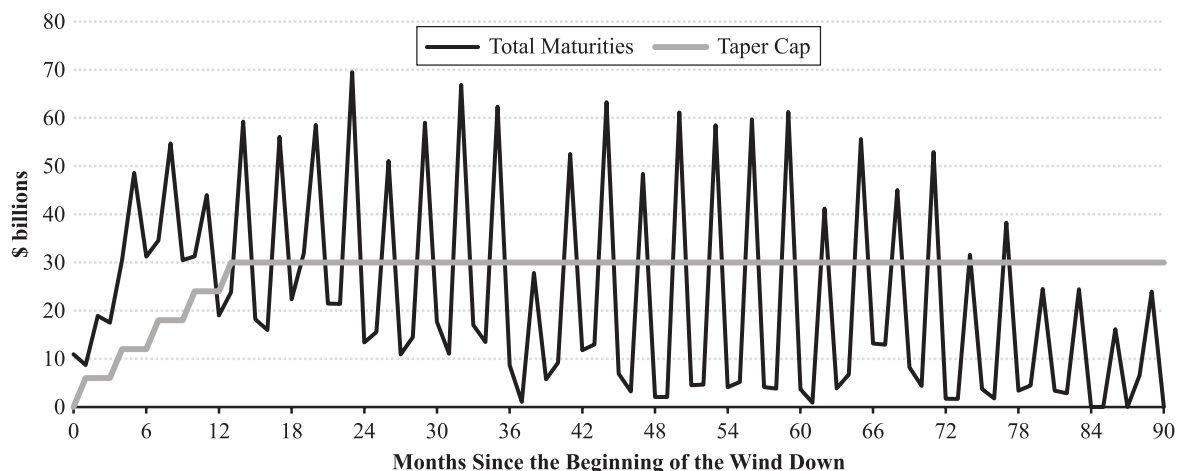
On the Treasury side, the pattern is more irregular. In some months, particularly months when Treasury refundings are conducted, the runoff is higher, and in other months, it is lower. We calculate there will be \$369 billion in paydowns in the first year, producing a runoff of \$175 billion and a reinvestment of \$194 billion. Moreover, the Treasury wind down will also depend

## EXHIBIT 2 Projected MBS Wind Down



Sources: Urban Institute calculations from FRB H.4.1 Statistical Release. See “Factors Affecting Reserve Balances–H.4.1,” Board of Governors of the Federal Reserve System, last updated October 19, 2017. <https://www.federalreserve.gov/releases/h41/>.

## EXHIBIT 3 Projected Treasuries Wind Down



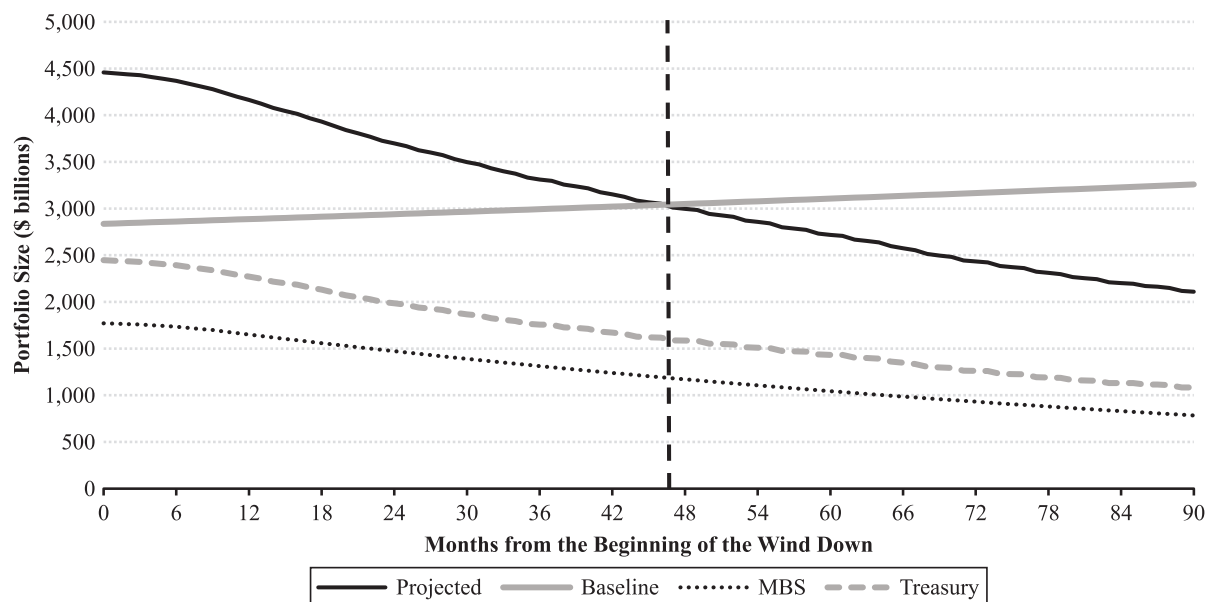
Sources: Urban Institute calculations from FRB H.4.1 Statistical Release. See “Factors Affecting Reserve Balances–H.4.1,” Board of Governors of the Federal Reserve System, last updated October 19, 2017. <https://www.federalreserve.gov/releases/h41/>.

on how the money is reinvested, an issue that begins to affect the cash flows after the second year (as the Fed does not buy instruments shorter than two years). Exhibit 3 shows the projected monthly Treasury runoff versus the taper cap. The minimum of the two determines the monthly reduction in the Fed’s Treasuries holdings.

Exhibit 4 shows the portfolio wind down versus our estimates of the Fed’s baseline portfolio. The decline of the portfolio is a result of the monthly reductions in MBS and Treasury holdings as shown in Exhibits 2 and 3. The projected size of the SOMA portfolio is greater than the size of the baseline portfolio at the beginning of the wind down. The projected portfolio

## EXHIBIT 4

### Projected Wind Down, Base Case



Sources: Urban Institute calculations from FRB H.4.1 Statistical Release. See “Factors Affecting Reserve Balances—H.4.1,” Board of Governors of the Federal Reserve System, last updated October 19, 2017. <https://www.federalreserve.gov/releases/h41/>.

shrinks as the Fed lets securities run off, and the baseline size grows because of the growth of currency in circulation. The projected portfolio size normalizes—that is, it reaches the size of the baseline portfolio—at 47 months. When it reaches this size, there are still \$1.18 trillion of agency MBS. After this point, the portfolio size is determined by the baseline portfolio.

### THE ROLE OF MORTGAGES IN THE FED’S PORTFOLIO

There has been considerable discussion on what role mortgages should play in the Fed’s portfolio. There is general but not universal agreement that the Fed should not be in the asset allocation business over the long term because it distorts financial market prices. Lawrence White [2017] stated that “government programs that divert credit away from the most productive uses, as evaluated by the marketplace, are inherently wasteful, even if policymakers have the best of intentions.”<sup>5</sup> Charles Plosser [2017, p. 7], a former president of the Federal Reserve Bank of Philadelphia, sees additional dangers, noting that holding securities other than

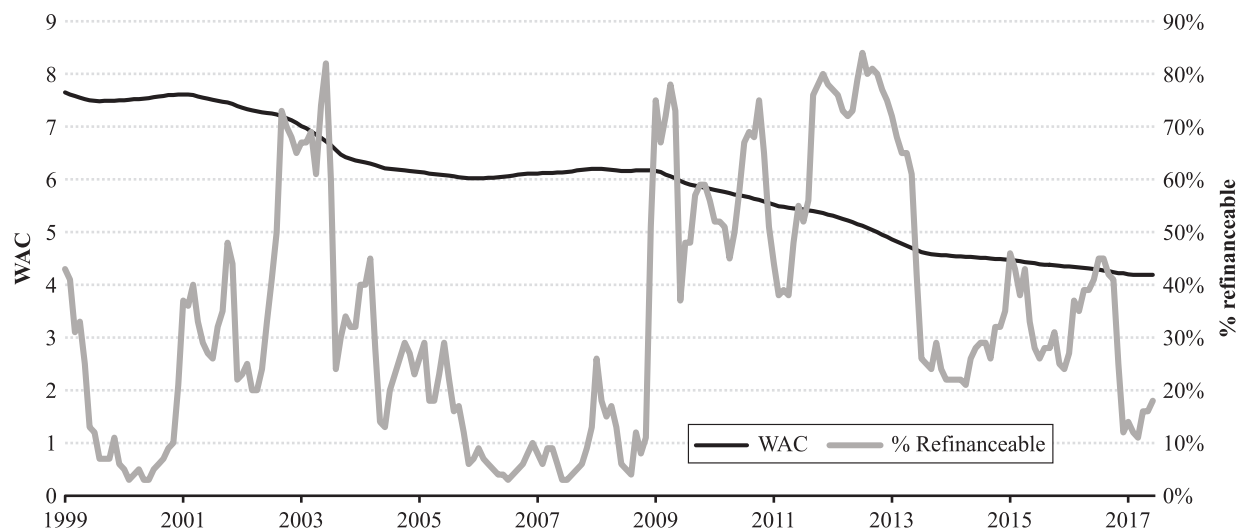
Treasuries opens the door for Congress (or the Fed) to use the balance sheet for political purposes. The Fed’s balance sheet could be “a huge intermediary and supplier of taxpayer subsidies to selected parties through credit allocation.” For example, if there was an infrastructure bill, the funds could be used to purchase the bonds that support the infrastructure initiative. Similarly, the funds could be used to purchase bonds to keep a municipality from defaulting.<sup>6</sup>

The argument for holding a mix of assets is that it can be valuable in a crisis. Benjamin Friedman has said that if the Fed’s balance sheet had included MBS before the crisis, the Fed could have sold them, dampening the froth in the housing market without depressing the rest of the economy.<sup>7</sup>

But the starting point is not zero. The Fed is not discussing entering an MBS purchase program. The securities in its portfolio now total almost \$1.80 trillion and will total \$1.18 trillion when the Fed reaches its desired portfolio size in the median scenario. Doing anything but allowing for runoff would represent an asset allocation decision. Moreover, if the Fed wants the flexibility to make large-scale asset purchases in securities

## EXHIBIT 5

### Effects of Interest Rates on the Share of the Mortgage Universe That Is Non-Refinanceable



Note: WAC = weighted average coupon.

Sources: eMBS, Freddie Mac Primary Mortgage Market Survey, and the Urban Institute.

other than Treasuries in the next crisis, it might make sense to hold some MBS to maintain the expertise in managing an MBS portfolio at the Fed.

Notably, the estimate that the Fed will hold \$1.18 trillion in agency MBS in the median scenario when the Fed's balance sheet reaches steady state is exactly that—an estimate. The Fed could easily hold more securities than this if rates rise further. Three factors could contribute to a sharp slowdown in speeds: 1) the choking off of prepayments, 2) less sales activity because of the lock-in effect from higher rates, and 3) the decline in geographic mobility. Let's look at each of these factors in turn.

Prepayment rates will slow as interest rates rise. The number of borrowers that could save money by refinancing would be small. Exhibit 5 shows the share of 30-year fixed rate mortgages that is currently refinanceable.<sup>8</sup> At a rate of 3.8%, 18% of the 30-year universe is refinanceable. If the 30-year fixed rate mortgage goes up to 5%, only 4% would be refinanceable.

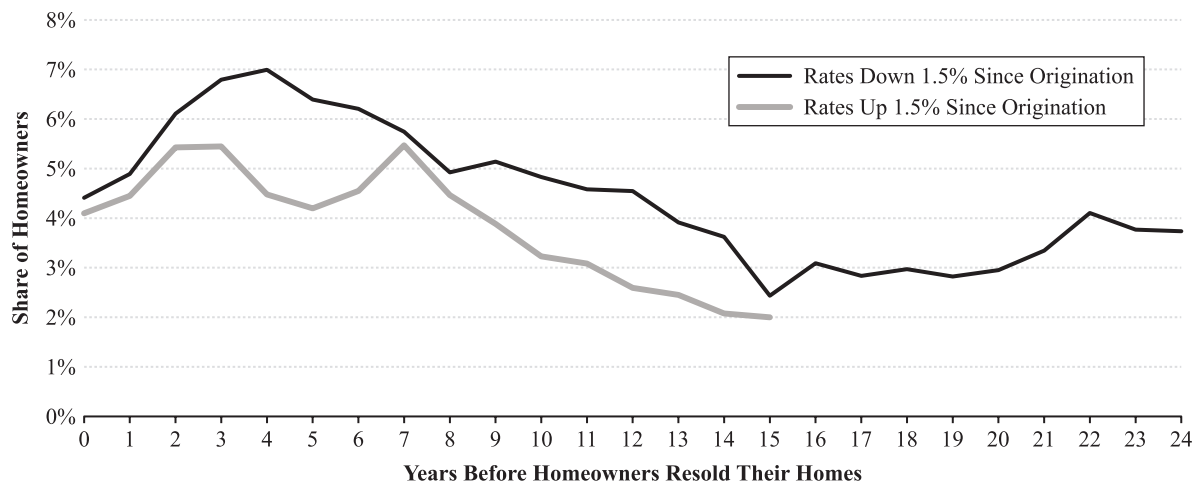
We would expect a substantial lock-in effect. That is, borrowers who have a 3.5% mortgage will be reluctant to simply buy a home with an extra bedroom if it means their mortgage rates will increase to

4.5 or 5.0%. They are more likely to stay where they are and either forgo the extra bedroom or put an addition on their current home. Borrowers do stay in their homes longer when current interest rates are higher than their original mortgage rates. Frank Nothaft compared mortgage rates on the property purchase date and the property sale date using property records data.<sup>9</sup> He found that when rates were 1.5% lower at the point of sale than at the point of origination, one-quarter of owners resold their homes within five years, but when rates were 1.5% higher, it took about a year longer (Exhibit 6).

The third contributor to the decrease in prepayment speeds (in addition to lower prepayment speeds and the lock-in effect) is the decline in U.S. households' geographic mobility. There has been a secular decline in mobility for both owners and renters since the 1980s (Exhibit 7). Molloy, Smith, and Wozniak [2011] showed that the decline since 1980 occurs among all age groups and all races and ethnicities. Although many factors contribute to this decline, including the rise of dual-career families and some ability to work remotely, these factors fail to explain the extent of the decline.

## EXHIBIT 6

### Share of Homeowners Selling Their Homes Based on Changing Interest Rates Since Loan Origination



Source: CoreLogic.

## THE FED'S MBS CHOICES

The Federal Reserve has three choices with respect to the MBS portfolio:

1. *Let the portfolio run off on its own, per the current plan.* One can argue the securities are already in portfolio. Doing anything but allowing for runoff further distorts financial decisions.
2. *Do some selective selling.* For example, the Fed could run off up to \$20 billion a month, regardless of the actual runoff. This could be communicated well in advance of the date in which the increased runoff would begin.
3. *Sell more aggressively.* This could disrupt the market, as we argue in the following section.

## MORTGAGE MARKET STABILITY CONSIDERATIONS

The mortgage market has undergone a dramatic transformation over the past decade, which has in many ways made it less resilient. In particular, there has been a move from investors who manage their portfolio actively to investors who are not active managers (Kaul and Goodman [2015]). There has been a dramatic shift in MBS assets from the GSEs and the broker-dealer communities (who actively manage their assets) to the Fed and commercial banks (who do not) (Exhibit 8). In 2007,

the broker-dealer community and the GSEs held 40% of mortgage assets; now, they hold 11%. In contrast, in 2007, the Fed and banks and thrifts held 28% of total mortgage assets (with the Fed holding 0%); now, they hold 57%, split roughly equally between the Fed and the banks and thrifts. Before the crisis, the broker-dealer community and the GSEs played an important stabilizing role in the market, buying mortgages when spreads were wide and selling when spreads narrowed. Neither the Fed nor the banks and thrifts play this stabilizing role, and because of regulatory changes, broker-dealers cannot take the amount of risk they once did. For any amount of supply, spreads would need to widen more to absorb it than would have been the case a decade ago.

It has not been a problem, as the Fed has been a dominant presence in the market. The Fed stopped adding to its MBS positions in October 2014. But even between October 2014 and September 2017, when the Fed was only reinvesting the runoff from MBS and agency debentures into MBS, it was still purchasing 20%–30% of the market's gross supply. As the Fed begins to unwind its portfolio, the past decade's large structural change to the mortgage market needs to be a consideration.

## REINVESTMENT CONSIDERATIONS

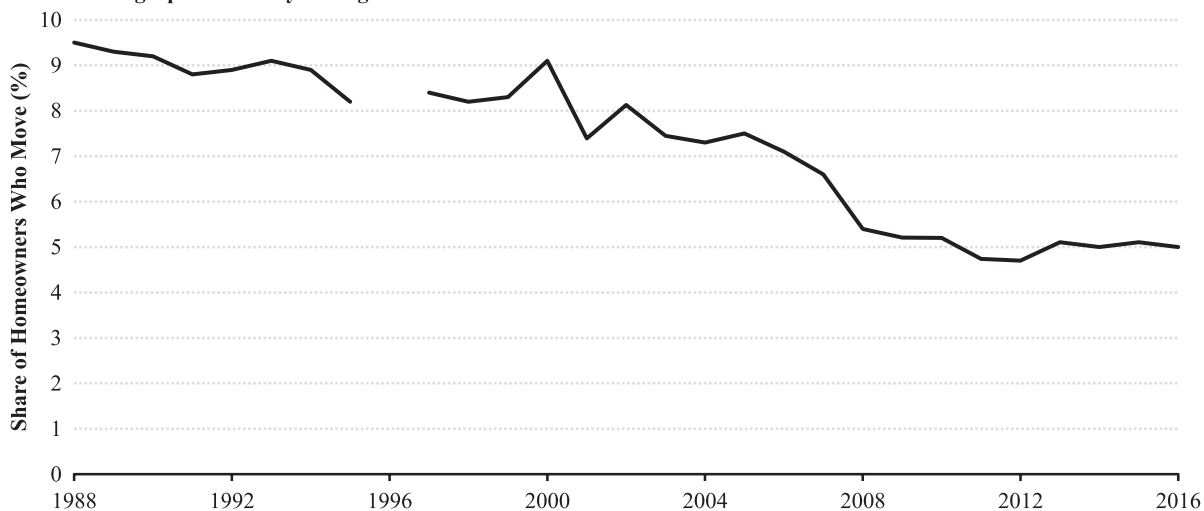
The Fed will begin to unwind its portfolio slowly and will do some reinvesting. In particular, the Fed will



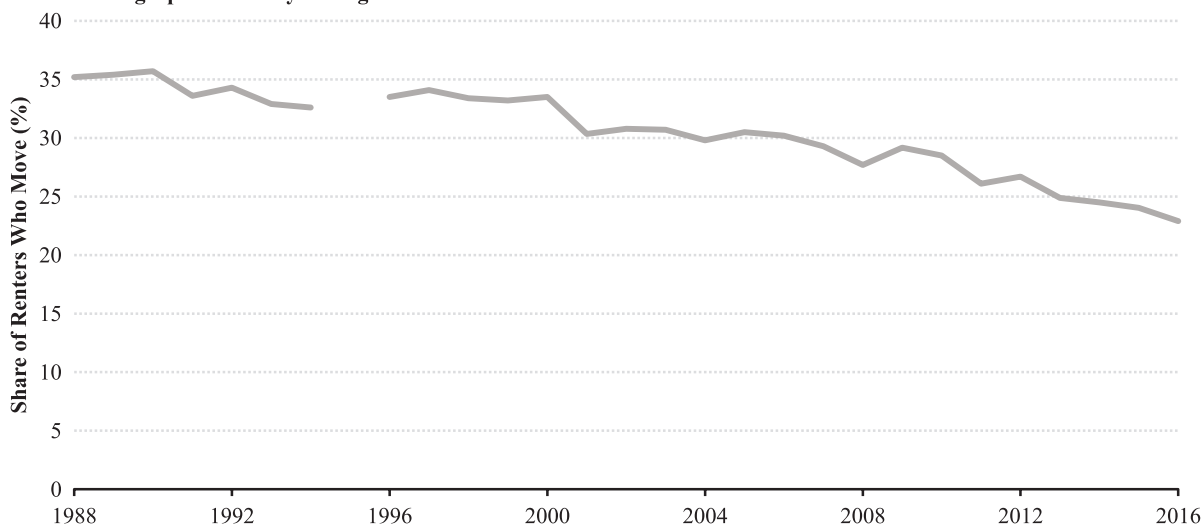
## EXHIBIT 7

### Geographic Mobility among Homeowners and Renters, 1988–2016

Panel A: Geographic Mobility among Homeowners



Panel B: Geographic Mobility among Renters



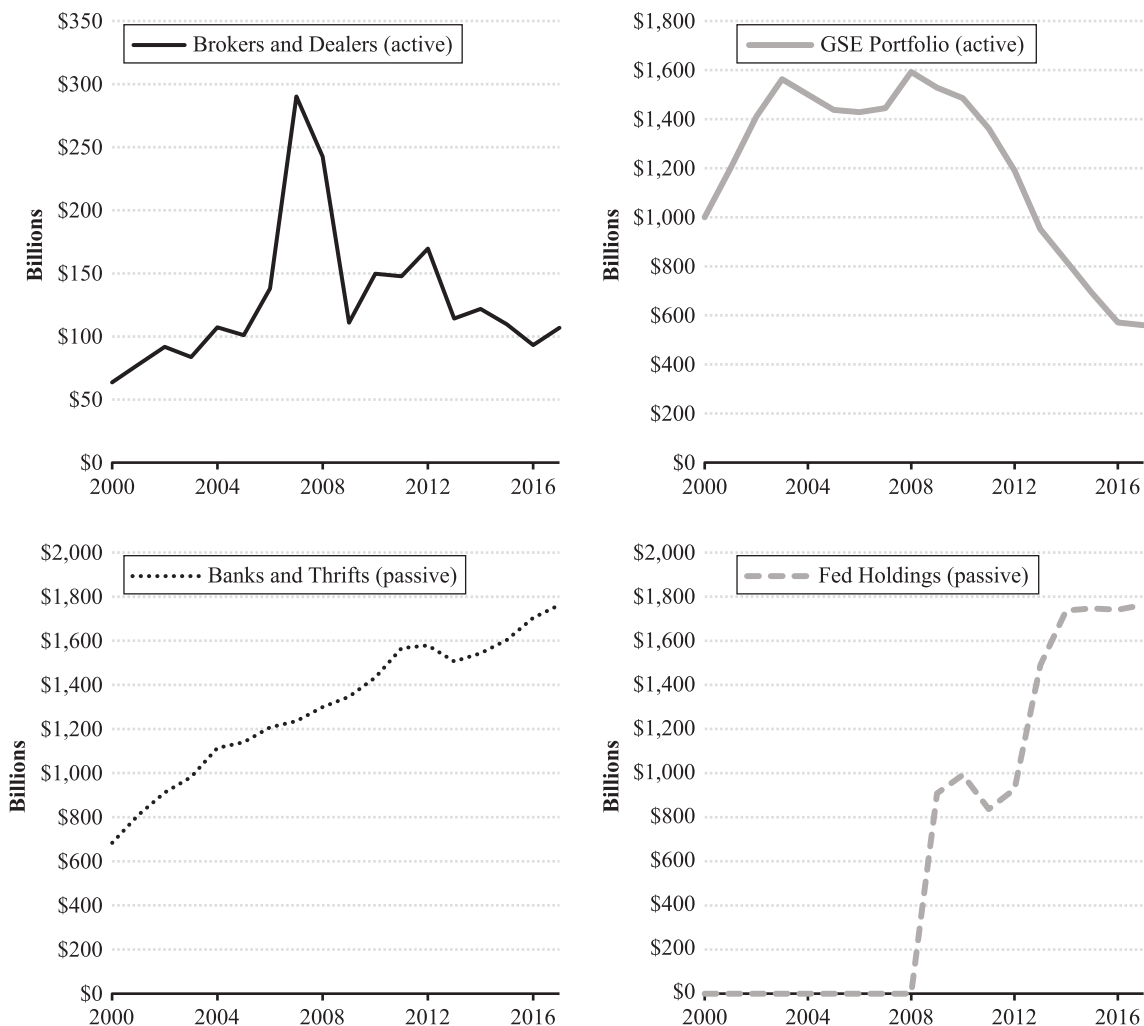
Source: U.S. Census Bureau, Current Population Survey.

reinvest its MBS runoff at an estimated level of \$77 billion during the first year. The working assumption is the Fed will reinvest to reflect the current mix of origination activities. The question is whether the Fed wants to use this limited reinvestment to alter the coupon mix or the agency mix in the portfolio. Deliberate decisions to move up in coupon could raise the speed at which mortgages run off. Deliberate decisions on the agency mix could produce a portfolio that more closely resembles today's mortgage market.

The Fed tends to buy the current coupon at that point in time. As a result, 37.8% of the Fed's portfolio consists of 3.0% coupon securities (average mortgage rate of 3.6%), and another 33.0% of the portfolio consists of 3.5% coupon securities (average mortgage rate of 4.0%). More than 70% of the portfolio is in these coupons. If rates rise, these coupons will quickly become non-refinanceable. Because rates are a bit higher now, there will be a slight bias toward higher-coupon mortgages anyway. This raises the question as to whether the Fed

## EXHIBIT 8

### Movement from Active Investors to Passive Investors



Note: 2017 values are through the first quarter only.

Sources: Federal Reserve Flow of Funds, Board of Governors of the Federal Reserve System, Inside Mortgage Finance, and the Urban Institute.

wants to deliberately move up in coupon more than production patterns would dictate to avoid locking in more mortgages with these lower coupons and potentially slower speeds. In doing so, the Fed would be doing deliberate asset allocation within the mortgage market to better position the portfolio going forward.

The Fed holds both Ginnie Mae and conventional (Fannie Mae and Freddie Mac) securities. Approximately 47% of the Fed's MBS holdings are Fannie Mae securities, 29% are Freddie Mae securities, and 24% are Ginnie Mae securities. The Ginnie Mae market, which comprises Federal Housing Administration (FHA) and U.S.

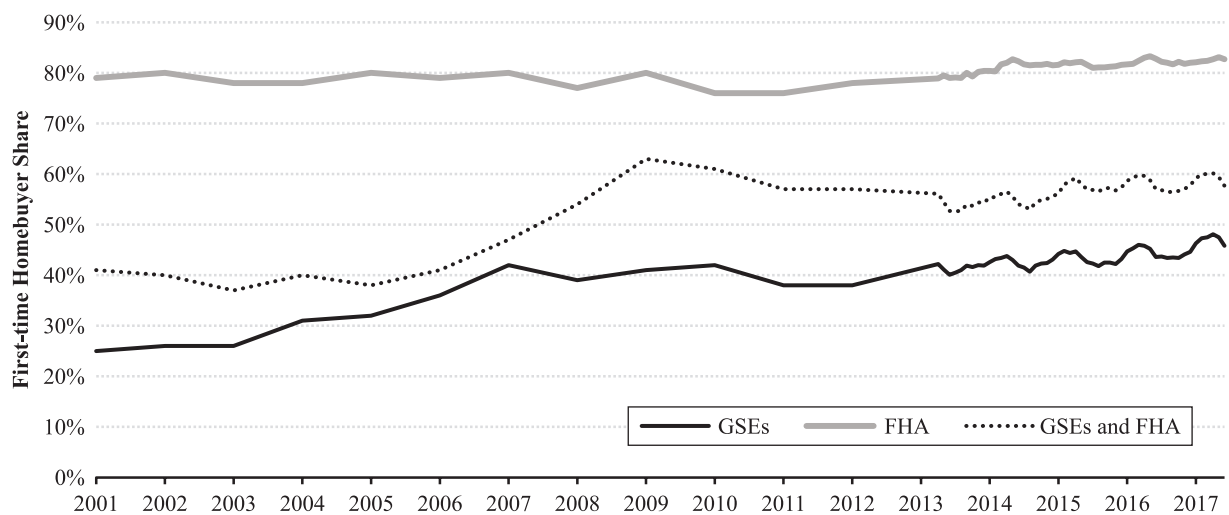
Department of Veterans Affairs (VA) securities, has grown more than the conventional market the past few years, mostly because of the growth of the VA sector. The Fed now holds less of the Ginnie Mae market (23%) than it does of the conventional market (30%). The question is whether the reinvestment should be used to allow the Fed to own the same proportion of each market. The argument for doing so is essentially asset allocation: Ginnie Mae securities (FHA-insured products, in particular) are more important for first-time homebuyers and minorities than they are for others. Exhibit 9 shows that 82.7% of the FHA purchase loans for principal residences

were to first-time homebuyers versus 45.8% in the GSE market. In addition, more of the Ginnie Mae loans are to African American and Latino families: 28% of government loans were made to African American and Latino borrowers in 2016 compared with 12% for conventional loans (Exhibit 10). New Ginnie Mae mortgages have an average FICO score of 682. The average credit score is 752 for Fannie Mae mortgages and 754 for Freddie Mac mortgages. The median loan-to-value ratio is 96.5% for new

Ginnie Mae mortgages and is 80% for Fannie Mae and Freddie Mac mortgages. Moreover, Ginnie Mae mortgages have traded poorly in the market recently because of concerns about churning in VA mortgages.

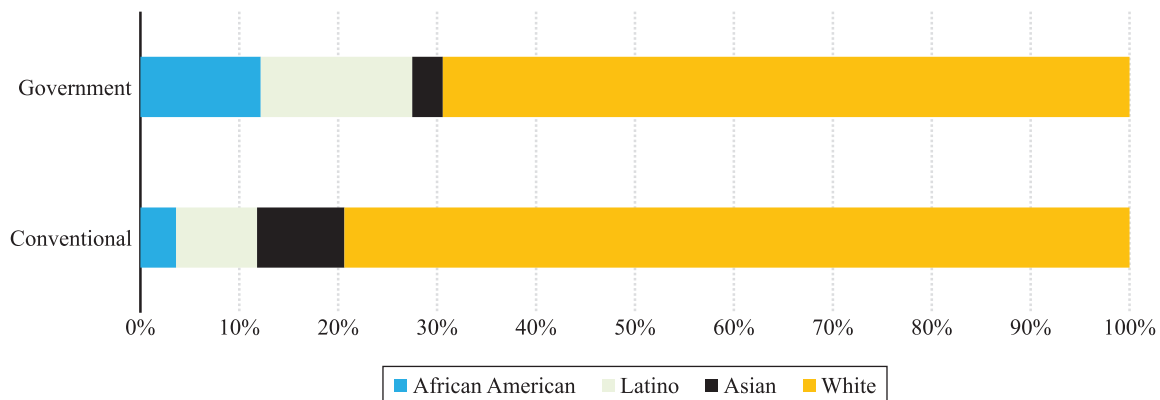
The effect of this will be small but significant. Under the projections shown earlier, the Fed is reinvesting about \$77 billion of MBS the first year and nothing thereafter. If the Fed increased its Ginnie Mae purchases to 65% of its reinvestment (rather than its

## EXHIBIT 9 First-Time Homebuyer Shares



Sources: The Federal Housing Administration, Federal Housing Finance Agency, eMBS, and the Urban Institute.

## EXHIBIT 10 Share of Loans by Channel and Race or Ethnicity



Notes: Values are based on 2016 HMDA originations. Whites and African Americans are non-Latino.

Sources: The Home Mortgage Disclosure Act (HMDA) and the Urban Institute.

roughly 35% share of new originations), the Fed would invest \$50 billion in Ginnie Mae purchases over the next year, \$23 billion more than otherwise. This is approximately 11% of projected 2017 gross Ginnie Mae origination. One additional consideration: Ginnie Mae securities receive the same treatment as cash for the purpose of meeting the liquidity coverage ratio (LCR). While the LCR has already been fully phased in for large U.S. banking organizations, there may be some residual demand for Ginnie Mae securities from non-U.S. banks. Thus, at the margin, it is possible that if the Fed were to disproportionately increase Ginnie Mae purchases, it may make it more expensive for foreign banks to meet their LCR requirements.

On the negative side, overweighting Ginnie Mae securities in its reinvestment choice is asset allocation. Moreover, although Ginnie Mae speeds have been faster than their conventional counterparts for the past few years, they could slow down more as FHA loans are assumable. This could result in a longer portfolio down the line.

## CONVERTING LEGACY FREDDIE MAC SECURITIES INTO NEW AGENCY MBS IN 2019

The Fed owns \$516 billion (29% of its holdings) in Freddie Mac securities, or 30% of outstanding Freddie Mac securities. The common securitization platform is expected to go live in the second quarter of 2019, when issuance of the single security will commence. Several years ago, Freddie Mac securities traded more poorly than Fannie Mae securities because they were less liquid. This resulted in a loss to taxpayers because Freddie was forced to make up the difference. The path to a single security, first announced in 2014, would align the current Fannie and Freddie securities by combining the best features of each. The single security will have the superior pooling features of the current Fannie Mae MBS, including the 24-day delay, and the superior disclosure features of the Freddie Mac participation certificates.

Under the single-security framework, both Fannie Mae and Freddie Mac will continue to issue their own securities, which conform to the standards of the common security. But Fannie Mae Mega pools and Freddie Mac Giant pools (securities in which the underlying collateral is existing Fannie Mae or Freddie Mac securities, not loans), multiclass Fannie Mae and Freddie Mac real estate mortgage investment conduits, and stripped MBS would allow co-mingling of Fannie Mae and Freddie

Mac securities. For example, in level 2 securitizations, new or legacy Freddie Mac participation certificates, which have been converted into the common security, could be placed into Fannie Mae Mega pools. This will ensure price convergence. As the single security moves toward a reality, investors have priced this in this price convergence. Freddie securities used to trade worse than Fannie securities, but they now trade similarly.

The common security will have payments from the previous month made on the 25th day of the following month (the 24-day delay), as Fannie does now, rather than on the 15th day of the following month, as Freddie does. Legacy Freddie securities can be converted to be deliverable into the common security. Freddie is compensating legacy investors for the increase in the payment delay. This program's success depends on market acceptance of the single security. Legacy conversions are a signal that the single security has been accepted.

A successful single security program will enhance the MBS market's overall liquidity, to the benefit of all players, and the Fed should further this goal. Enhancing liquidity would not involve any credit allocation decisions. If the Fed converted all its legacy securities on day 1, it would send an important signal to the market that the Fed endorses the single security. If the Fed converted its legacy Freddie securities and then let its securities run off, it would have no effect on transactions volume, as there would be no market transactions. But the optics are important. The market is likely to track the share of legacy conversions as a sign of acceptance, and the Fed could play a huge role with its endorsement.

Any Fed transactions in the single security—buying or selling—would aid the liquidity in the single-security market. In our base case, we have the Fed doing no reinvestment by the time the single security is operational, but scenarios are rate dependent, and there could be circumstances in which the Fed is reinvesting. Moreover, if the Fed ever decided to sell MBS, liquidity in the single security would be enhanced if the Fed converted legacy Freddie securities into the single security. The Fed could take this one step further and sell Fannie Mega pools and Freddie Giant pools, both consisting of Fannie and Freddie securities.

## CONCLUSION

With the Federal Reserve's announcement that it will wind down the size of its portfolio, the near-term

path is clear. But we anticipate that over the next few years, there will be many discussions about the mortgage portion of the portfolio. In particular, when the size of the Fed portfolio normalizes, we project there will be \$1.18 trillion in MBS in the Fed's portfolio, and in a higher-rate regime, it is apt to run off slowly. This raises questions about whether the Fed would consider selling MBS to extract itself from the asset allocation business or whether simply unwinding previous asset allocation decisions is itself asset allocation. If the Fed decides to sell beyond market expectations, it will happen in a mortgage market that is in many ways more volatile and less resistant than it was before the crisis. In particular, broker-dealers and the GSEs, both of which provided a stabilizing influence, are diminishing. Meanwhile, the Fed and commercial banks and thrifts have increased in importance. If the Fed, which owns almost 28% of the mortgage market, pursues a more aggressive wind-down path, it could exacerbate volatility in the mortgage market. These issues could be partially mitigated by communicating intent in advance, as the Fed is doing.

While the Fed is reinvesting, there are a few considerations. Does it want to reinvest more aggressively in higher-coupon mortgages so that future wind down is not so slow? Does it want to reinvest more heavily in Ginnie Mae securities, which have fared badly in the market this year and are the source of mortgages for first-time homebuyers and African American and Latino families? These decisions apply only for the first year, as the Fed is not apt to reinvest thereafter. As a result, the numbers and the impact will be small.

Finally, the Fed's support could make a big difference to the single-security initiative. This is not an asset allocation decision.

## ENDNOTES

<sup>1</sup>D. Leonard, A. Martin, S. Potter, and B. Rose, "How the Fed Changes the Size of Its Balance Sheet: The Case of Mortgage-Backed Securities," *Liberty Street Economics* (blog), Federal Reserve Bank of New York, July 11, 2017, <http://libtystreeteconomics.newyorkfed.org/2017/07/how-the-fed-changes-the-size-of-its-balance-sheet-the-case-of-mortgage-backed-securities.html>.

<sup>2</sup>Michael Fleming et al., "Just Released: Updated SOMA Portfolio and Income Projections," *Liberty Street Economics* (blog), Federal Reserve Bank of New York, July 10, 2017, <http://libtystreeteconomics.newyorkfed.org/2017/07/just-released-updated-soma-portfolio-and-income-projections.html>.

<sup>3</sup>Our numbers differ slightly from the Fed's, as we have used the September 20, 2017, balance sheet, not the end-of-May 2017 balance sheet.

<sup>4</sup>B. Bernanke, "Shrinking the Fed's Balance Sheet," *Ben Bernanke's Blog* (blog), Brookings Institution, January 26, 2017, <https://www.brookings.edu/blog/ben-bernanke/2017/01/26/shrinking-the-feds-balance-sheet/>.

<sup>5</sup>L.H. White, "Time to End the Fed's Credit-Allocation Policies," American Institute for Economic Research, March 23, 2017, <https://www.aier.org/research/time-end-feds-credit-allocation-policies>.

<sup>6</sup>Although the Federal Reserve has chosen to buy only Treasuries and agency MBS and debentures, the range of securities it can buy is wider. Section 14 of the Federal Reserve Act explicitly includes state and local government bonds. See G. Shill, "Does the Fed Have the Legal Authority to Buy Equities?" *Confessions of a Supply-Side Liberal* (blog), March 18, 2015, <https://blog.supplysideliberal.com/post/114021461013/greg-shill-does-the-fed-have-the-legal-authority>.

<sup>7</sup>B. Friedman, "The Perils of Returning a Central Bank Balance Sheet to Normal," *Financial Times*, June 9, 2014.

<sup>8</sup>We define *refinanceable* as having a mortgage rate of 75 basis points or more above the prevailing rate. The costs of refinancing are approximately 50 basis points, and we assumed the borrower needed a 25 basis point incentive for the "hassle factor."

<sup>9</sup>F. Nothaft, "U.S. Economic Outlook, April 2017: Effect of Higher Mortgage Rates on Homeowner Mobility: Higher Mortgage Rates May Slow Homeowner Resale Volume," *Insights* (blog), CoreLogic, April 10, 2017, <http://www.corelogic.com/blog/authors/frank-nothaft/2017/04/us-economic-outlook-april-2017.aspx#.WfEWrltSxQJ>.

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