When Mortgage Lock-In Locks Out Homebuyers

As interest rates rose, home sales fell more than predicted. The era of low rates may explain why.

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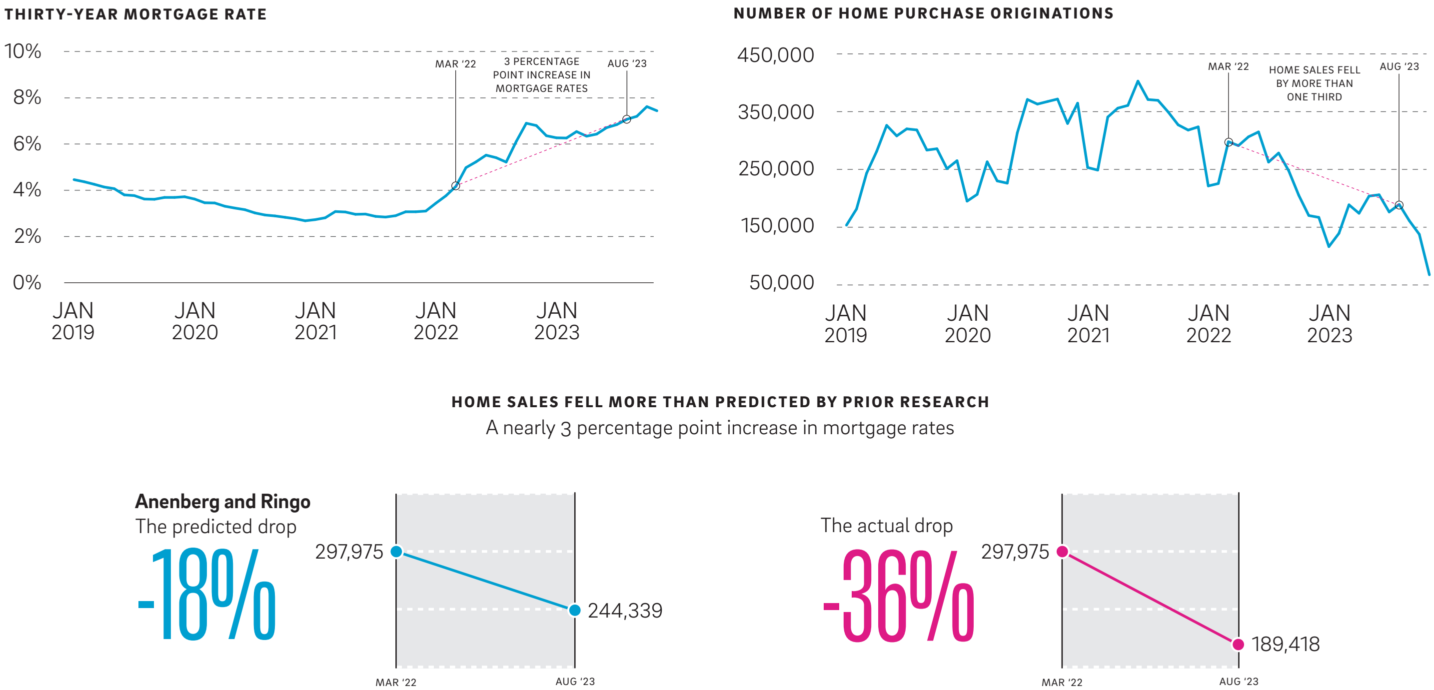
The current cycle of interest rate hikes that began in early 2022 seems to have had a striking impact on the housing market. Mortgage rates went from just above 4 percent in March 2022 to over 7 percent by August 2023. Over this period, home sales fell by more than one third (Figure 1). Although rising rates generally slow housing market activity, this drop in sales was greater than historical experience would suggest.

Mortgage lock-in may explain why interest rate hikes have had such a large impact on the mortgage market. This latest round of interest rate hikes was unusual in that it was preceded by many years of very low rates. So, many homeowners had locked in their historically low mortgage rates before the latest round of interest rate hikes. These homeowners may be reluctant to sacrifice these low rates by moving. This may explain why home sales have declined dramatically. But other than lowering sales, what are the real consequences of high rates? For instance, does mortgage lock-in affect households' willingness to move to find a better job?

FIGURE 1

When Mortgage Rates Rose After COVID, Home Sales Fell by One-Third

The 30-year mortgage rate (quarterly) and the number of home purchase originations (monthly), 2019–2023



Data Sources: Home purchase mortgage originations data come from ICE, McDash® and are restricted to first-lien mortgages; mortgage rate data come from Freddie Mac.

In addition, high mortgage rates may have other consequences—notably, they may increase inequality by making it difficult for low- and moderate-income households to buy a home. Lock-in would exacerbate this inequality by reducing home sales and thus keeping house prices high.

If mortgage lock-in aggravates the impact of high rates on housing sales, and if this has substantial real consequences, then we might be able to one day alleviate these consequences through relatively modest changes to mortgage contracts. This would be particularly important if lock-in's impact on low- and moderate-income households is significant.

How Lock-In Explains Homebuying's Departure from Historical Trends

A recent paper by Federal Reserve Board of Governors economists Elliot Anenberg and Daniel Ringo finds that, historically, the *semi-elasticity* of home purchases with respect to mortgage rates is approximately 6. That is, a 1 percentage point increase in rates reduces purchases by 6 percent relative to a year prior. But their work suggests that historical patterns explain only part of the recent drop in sales. Based on their findings,

FIGURE 2

Most Homeowners Have Locked in Very Low Rates

Share of mortgages with a rate more than 1 percentage point below the market rate, 2005–2023

Data Sources: ICE, McDash® and Freddie Mac the recent 3 percentage point rise in rates should have led to an 18 percent drop in sales. In fact, sales dropped by more than a third.

One result of the recent refinancing boom is that most existing homeowners have locked in very low rates. Over 80 percent of mortgages have rates more than 1 percentage point below the market rate. By contrast, during most of the period Anenberg and Ringo studied (2002–2021), this was the case for fewer than 10 percent of homeowners (Figure 2). So, in today's environment, moving is very costly for these homeowners. Financing the same house with a new 30-year mortgage would cost the median borrower—who has a $230,000 mortgage and a 3 percent interest rate taken out in mid-2020—more than $450 per month (an increase of over 40 percent in their mortgage payment). This represents the immediate shock to monthly payments.[1]

As a result, these homeowners may be reluctant to move. A decline in the number of homeowners willing to sell would reduce both housing supply and demand, and thus home sales. If this is an accurate diagnosis, then we should expect the impact of rates to be larger and activity to remain depressed for longer, and rates might need to fall further for the market to recover.[2]

In a recent paper, University of Illinois Urbana-Champaign Assistant Professor of Finance Julia Fonseca and University of Pennsylvania Assistant Professor of Finance Lu Liu quantify the consequences of mortgage lock-in. Using credit-bureau data from 2010 to 2018 to identify homeowners who relocate (by changes in borrower zip code), they find that a 1 percentage point change in the difference between a borrower's mortgage interest rate and the current market rate changes moving rates by 9 percent.

Fonseca and Liu's estimates help explain the gap between the actual decline in sales and estimates based on historical experience. Their model predicts that a 3 percentage point increase in mortgage rates, as occurred from March 2022 through August 2023, should lead to a 27 percent reduction in the homeowner-moving rate solely as the result of lock-in. This effect is on top of any other impact of interest rates on housing market activity. One cannot simply add this 27 percent to the 18 percent predicted by Anenberg and Ringo because their estimates also incorporate any mortgage lock-in that prevailed in past episodes. However, mortgage lock-in was much less likely to have played a role in the past, because, as we have seen, far fewer borrowers had mortgages far under market rates. Thus, a large share of the gap between the actual decline in sales and estimates based on historical experience can be explained by mortgage lock-in.[3]

Fonseca and Liu also suggest that mortgage lock-in hinders moving for better employment opportunities. This would be a real effect of high rates. They consider how likely someone is to move if wages grow in areas 50 to 150 miles away. They focus on these areas because it would be difficult for residents to commute to them. They find that locked-in homeowners are only one-third as responsive to these increases as are other homeowners.

But one should not overemphasize mortgage lock-in's impact on the ability of households to find good jobs. When wage differences are sufficiently large, lock-in should become less important. In addition, the increase in working from home may mitigate this impact, as homeowners may be more willing to commute longer distances if they only need to do so infrequently. Indeed, a group of economists at Stanford University found that the share of workers living more than 50 miles from their employer rose seven-fold from 2019 to 2023.[4] Finally, people who need to move for higher wages can avoid the impact of high rates by choosing to retain their old home as a rental property and rent a new home in their destination market.

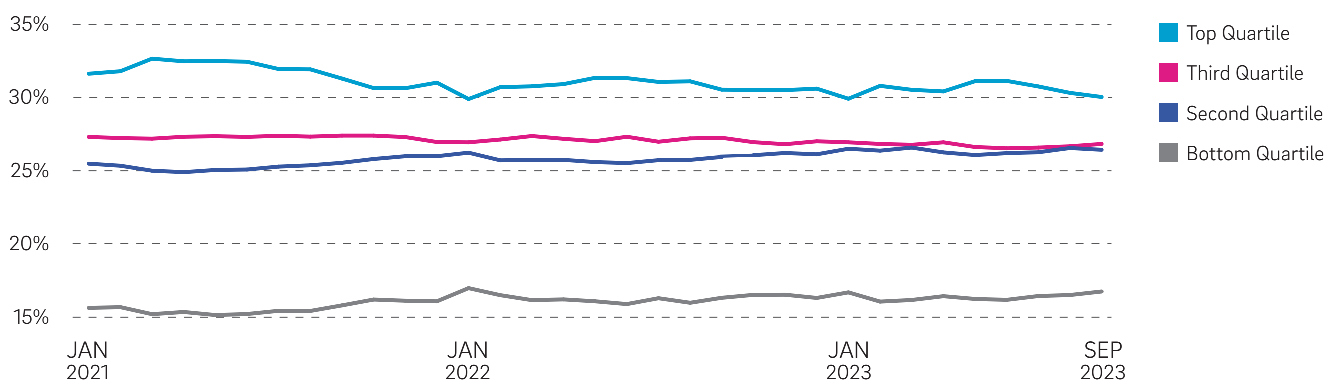
Lastly, Fonseca and Liu show that in counties where more borrowers are locked in, the number of homes listed for sale is lower, and as a result, house prices in those locations might

FIGURE 3

Home Lending Has Strengthened in Relatively Poorer Zip Codes

This is despite the fact that high rates and home prices may be hurting affordability.

Share of loans for home purchases, by quartile of each county's zip codes, ranked by median income, 2021–2023



Data Sources: ICE, McDash® and U.S. Census Bureau

Note: Income quartiles are based on the median 2021 Household Income for Zip Code Tabulation Area.

not fall as much as one might expect in response to higher rates, despite the fact that fewer buyers may be searching as a consequence of those higher rates.[5]

Do High Rates Exacerbate Inequality in the Housing Market?

Federal Reserve policymakers are concerned about the distributional effects of monetary policy.[6] This concern is particularly relevant to the housing market. Researchers have found that, historically, when rates increase, purchases decline more for low- and moderate-income borrowers because of affordability, largely because of payment-to-income ratio ("debt to income," or DTI, in the mortgage industry) constraints. Another paper by Ringo matches 2013–2019 Home Mortgage Disclosure Act (HMDA) loan applications and rate lock data from Optimal Blue, and finds that a 1 percentage point increase in rates leads to a 7.5 percent decline in the share of low- and moderate-income buyers. To understand why, look at what occurs when rates *fall*. For example, Philadelphia Fed Special Advisor Neil Bhutta and Ringo studied the impact of a 50 basis point decline in the Federal Housing Administration (FHA) insurance premium in 2015.[7] (FHA loans are traditionally used by lower-income borrowers.) Bhutta and Ringo show that this decline in the FHA premium, which is added to the interest rate that borrowers pay and thus sheds light on the impact of interest rates on home purchases, led to an almost immediate 14 percent increase in the share of mortgages insured by the FHA. They also show that this occurred because, with lower premia, payments were lower, which allowed more low-income borrowers to satisfy their DTI constraint (typically 45 percent in 2014). In the 2014 HMDA data, inability to satisfy the DTI constraint was reported as an important reason for FHA mortgage denials.

Based on Bhutta and Ringo's work, one would expect a *rise* in rates to make it *more* difficult for low-income borrowers to satisfy DTI constraints. Compounding this difficulty, mortgage lock-in may have kept house prices from falling over the past few years despite the high rates. But recent evidence is more nuanced. Although the share of purchases by below-median-income borrowers fell slightly in 2022,[8] lending shares subsequently grew in zip codes with median income in the bottom half of their county (Figure 3). And the FHA share of purchases has grown since mid-2022 (Figure 4).

Does this mean that low-income borrowers are not faring as badly as one might expect? Not necessarily. Wealthier borrowers may be using FHA loans because of their more generous underwriting criteria. Indeed, the average FICO credit score for FHA borrowers has risen over the past two years, and previous research has found that income and credit scores are positively correlated.[9]

In addition, homebuyers seem to be moving from higher-income to lower-income zip codes (Figure 5)—evidence that wealthier borrowers may also be buying in more affordable, lower-income areas. Both these trends could crowd out the less fortunate.

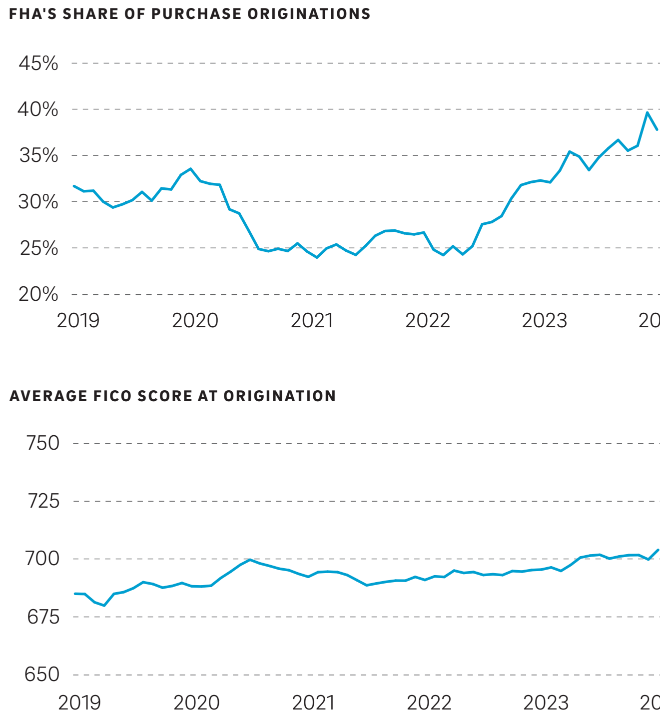
Finally, credit bureau data suggest that although the number of first-time homebuyers fell, their share of purchases *increased*. After falling to around 37 percent of purchase mortgage originations in early 2021, by March 2023 they made up nearly 50 percent. This is partly due to the retreat of existing mortgage holders—it is not necessarily a sign that new homeowners are finding credit easier to obtain or homes more affordable, but rather that with rates this high, many existing homeowners locked into low rates may feel that moving is too costly. And indeed, the share of homebuyers purchasing in the same zip code they already live in (who tend not to be first-time buyers) has fallen sharply since rates started rising.

FIGURE 4

The FHA's Share of Purchases Has Grown Since Mid-2022

But the average FICO score at origination for FHA borrowers has risen, too, suggesting that these buyers are not all low income.

The FHA's share of purchase mortgage originations and average FICO score at origination, 2019–2024



Data Sources: ICE, McDash®

Could Changes to Mortgage Contracts Address Mortgage Lock-In?

Mortgage lock-in may be costly: It may slow home sales more than in past rate-rise cycles because so many more homeowners have mortgages at rates far below market; it may impede homeowners' ability to take new jobs; and it may make it harder for low- and moderate-income households to buy homes. Could changes to mortgage contracts moderate these costs? Mortgage lock-in results from the prevalence of fixed-rate mortgages in the United States.[10] If a large share of borrowers had adjustable-rate mortgages with payments that rose and fell in concert with market rates, then lock-in would not be an issue. But this would mean that they would be exposed to the risk of large fluctuations in their monthly budget, which could lead to considerable pain for households.

It would be both legally and politically difficult to devise a policy that allows current homeowners to preserve the benefit of their low rates after moving to a new house, because existing holders of mortgages, most notably banks and investors in mortgage-backed securities, would take large losses if they did. But two proposed changes to *new* mortgage contracts might mitigate the cost of *future* rate-hike episodes. These two changes are *assumability* and *portability*.

When a mortgage is *assumable*, a borrower has the option to take over the existing mortgage when buying the property. This might allow a homebuyer to get a lower interest rate than they would otherwise, thus diminishing the effect of mortgage lock-in. FHA and Veterans Affairs (VA) mortgages are already assumable–a borrower has the option to take over the existing mortgage when buying the property. This doesn't happen often: Our estimates using deeds data from CoreLogic Solutions suggest that fewer than 5 percent of FHA or VA borrowers who took out a mortgage in 2021 or early 2022 (when mortgage rates were low) and sold their house in 2023 (when rates were higher) sold to a buyer who also used an FHA or VA loan of comparable size (and thus might have assumed the original loan). This low percentage may be because house prices rose rapidly during the low-rate period. Thus, these new borrowers, who tend to be credit-constrained, may have found it difficult to come up with the extra cash or financing needed to bridge the gap between the original mortgage and the amount needed to purchase the home. In addition, making non-FHA and non-VA loans assumable would be challenging, as the new homebuyer might not be as creditworthy as the original homeowner.[11]

Alternatively, when a mortgage is *portable*, a homeowner can take the mortgage with them to their new home, thus retaining the lower rate they had locked in.[12] Mortgages are already portable in some countries (for example, Canada, the UK, the Netherlands, and Denmark).[13] In these countries, the borrower can take their mortgage to a new property (if the purchase price is no lower than the sale price of the old property, so that the loan-to-value ratio does not deteriorate). Because the borrower does not change, creditworthiness is less likely to be an issue.

Because lenders would need to recoup the cost of providing the low rate for the newly purchased homes, mortgage rates would likely rise in response to instituting portability. But the increase might be relatively modest because market participants

FIGURE 6

How Mortgage Lock-In Works

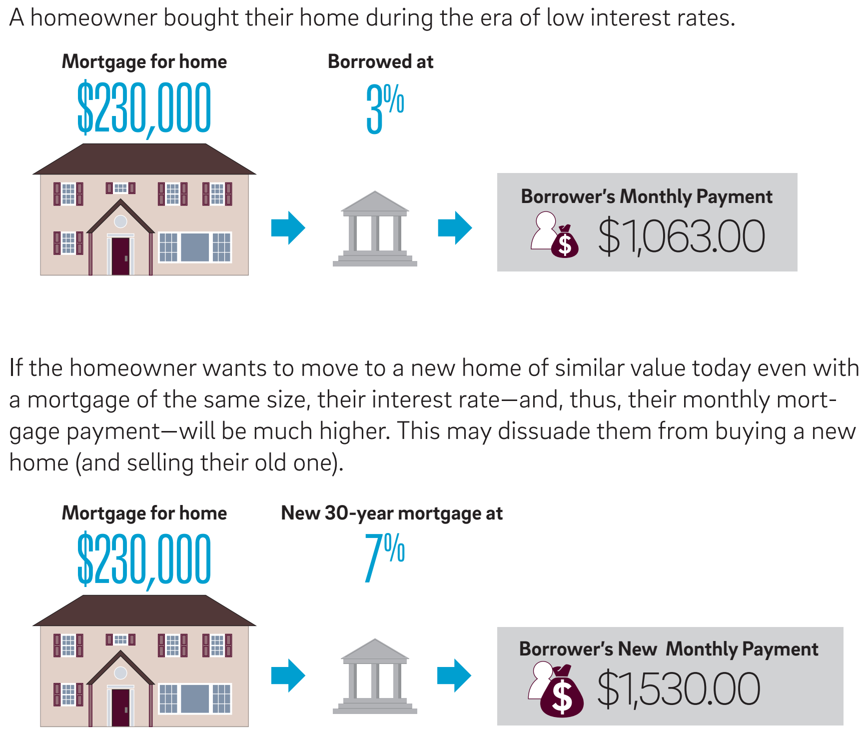
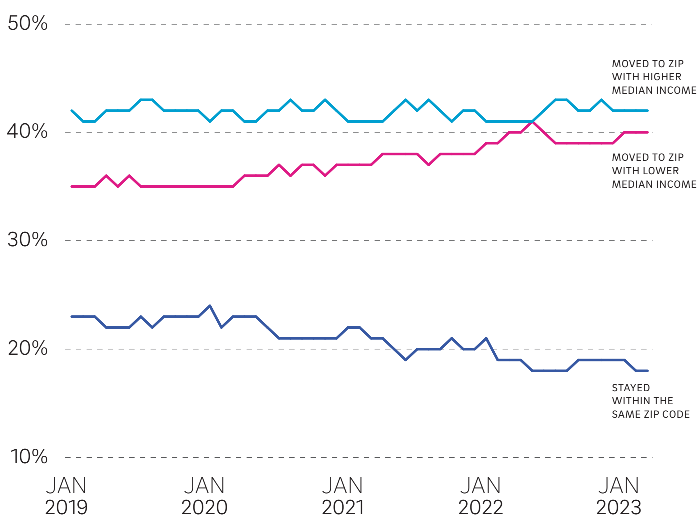


FIGURE 5

More Homebuyers Are Moving from Higher-Income to Lower-Income Zip Codes

This could be a sign that higher-income households are crowding out the less fortunate.

Share of all mortgages where the homebuyer stayed within the same zip code, moved to a higher-income zip code, or moved to a lower-income zip code, 2019–2023



Data Sources: Federal Reserve Bank of New York/Equifax Consumer Credit Panel and U.S. Census Bureau

Note: This figure uses the median 2021 Household Income for Zip Code Tabulation Area.

likely won't anticipate that rates will increase in every future eventuality. In addition, even if mortgage rates did rise, homeowners may still be better off, as portability would ensure that they could move during a future high-rate episode.

Of the two proposed changes, portability seems more workable in the U.S., as it would avoid the challenges associated with assessing the credit worthiness of a new borrower.

Conclusion

The slowdown in housing sales is greater than what is predicted by research into the link between home purchases and interest rates. We attribute a substantial share of this gap to *mortgage lock-in*. That is, for a large share of borrowers today, moving would entail giving up a substantial benefit in the form of their low-rate mortgage (Figure 6). Many of these borrowers would also find it difficult to qualify for a mortgage of the same size but at a higher rate. Mortgage lock-in can have additional real consequences, in that it makes labor markets less agile by making moving for a better job more expensive for homeowners. But the overall impact of this is unclear.

Our estimates of the impact are based on research that uses historical data preceding the current rate rise cycle; more recent data can help refine these estimates. Researchers may also want to quantify the costs of making future mortgages portable, so that they can see if the benefits would outweigh the costs. Another topic for further research is the extent to which high rates lead better-off borrowers to crowd out lower-income borrowers, and the channels through which that occurs.

Notes

1 Of course, this is an upper bound because borrowers can refinance if rates drop. This would also represent a significant increase in their monthly debt payments overall, since credit bureau data indicate that mortgage payments represent about two-thirds of a typical homeowner's monthly debt payments.

2 Following the collapse of the housing bubble and the subsequent sharp decline in house prices, some authors—such as Fernando Ferreira, Joseph Gyourko, and Joseph Tracy—also found that household mobility was impeded by negative equity lock-in, that is, because selling their home would require them to make substantial cash payments in cases where their house was worth less than their outstanding mortgage balance.

3 However, Fonseca and Liu used data from periods in which far fewer households were locked in. Work by several authors currently underway using more recent data should shed more light on this.

4 Akan et al. (2024).

5 Anenberg and Ringo find that changes in supply (due to fewer sellers listing their homes, for example) tend to have a relatively modest impact on housing market conditions, because those homeowners are not then searching for new homes. This would suggest that lock-in should not have much effect on prices. However, their data only include periods where mortgage lock-in was much less prevalent. So, it is plausible that lock-in could still be keeping prices from falling in the current environment.

6 See, for example, the spring 2019 conference, Distributional Consequences of the Business Cycle and Monetary Policy, held at the Federal Reserve Bank of Minneapolis.

7 FHA-insured mortgages are used disproportionately by low-income buyers because they have looser underwriting criteria; most saliently, these criteria permit more borrowing relative to one's income.

8 See Consumer Financial Protection Bureau (2023). The most recently available HMDA data are from 2022.

9 See, for instance, Albanesi et al. (2022).

10 More than 95 percent of mortgages outstanding at the start of 2024 had fixed rates. (Source: authors' calculations using data from ICE, McDash®.)

11 However, the underwriting requirements for FHA and VA mortgages are less demanding.

12 If the new home they are buying is significantly more expensive than the one they are selling, they might lose some of this benefit because they might need to take out a more expensive second mortgage to make up the difference.

13 Berg et al. (2018) discuss the mortgage finance system in Denmark, which has aspects of both assumability and portability.

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