



March 2018

HOMEOWNERSHIP

Information on Mortgage Options and Effects on Accelerating Home Equity Building

Accessible Version

GAO Highlights

Highlights of [GAO-18-297](#), a report to the Honorable Richard Shelby, U.S. Senate

Why GAO Did This Study

The federal government has a number of programs to help increase access to affordable homeownership for first-time buyers and lower-income households, including programs that provide guarantees for certain types of mortgages and funding that can be used for down-payment assistance. Generally, homeowners can build home equity by making payments on a mortgage to reduce the outstanding principal (assuming home value does not depreciate). Recently, there has been interest in mortgage products that accelerate home equity building.

GAO was asked to explore options for building equity through homeownership. This report discusses (1) how federal homeownership assistance programs affect home equity building; and (2) options, including private-sector mortgage products, through which borrowers can accelerate home equity building and the trade-offs of these options for both borrowers and lenders.

GAO analyzed relevant laws and program guidance of federal homeownership assistance programs. GAO attended housing conferences and interviewed relevant federal and state agency officials, academics, and industry stakeholders, including mortgage insurers and lenders, to identify existing and proposed accelerated equity-building products and mechanisms and to better understand the benefits and trade-offs of accelerated equity building. GAO also developed examples of mortgage scenarios to illustrate the trade-offs of accelerated equity building. Federal agencies provided technical comments, which were incorporated where appropriate.

View [GAO-18-297](#). For more information, contact Daniel Garcia-Diaz, 202-512-8678 or GarciaDiazD@gao.gov

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What GAO Found

Federal homeownership assistance programs generally are not designed to accelerate equity building (home equity is the difference between the value of a home and the amount owed on a mortgage). For example, programs that offer grants for down-payment assistance can provide a one-time boost to home equity. However, these programs are not specifically designed to accelerate equity building—that is, increasing the pace of paying off principal more quickly than would be the case with a 30-year fixed-rate mortgage. Instead, the focus of federal programs is on providing affordable access to homeownership, including through grants, loans, and mortgage insurance or guarantees. For instance, federal mortgage insurance programs help provide market liquidity by protecting lenders from losses, in turn increasing access to credit and homeownership, and ultimately, the opportunity for equity building for home buyers.

Borrowers have options to accelerate equity building that include obtaining shorter-term mortgages, making more frequent or additional payments, or choosing a mortgage product designed to accelerate equity building. For example, a mortgage product introduced by private lenders in 2014—the Wealth Building Home Loan (WBHL)—has features designed to accelerate equity building, including shorter terms (15 or 20 years) and the option to buy down the interest rate. The product also allows for no down payment. However, these products have trade-offs, including the following:

- Shorter-term loans build home equity (in terms of principal reduction) at a faster rate, but require higher monthly payments (see fig.). Payments for a 15-year fixed-rate mortgage can be more than 40 percent higher than for a 30-year fixed-rate mortgage.
- Higher payments may make mortgages less affordable or limit access for lower-income borrowers. For example, higher payments may result in a higher debt-to-income ratio for some home buyers, which may prevent them from qualifying for a mortgage unless they buy a less expensive home.
- In contrast, all else equal, loans with a shorter term generally have reduced credit risk—the likelihood of a home buyer defaulting on a mortgage—for lenders.

Principal Reduction Pace: 15-Year Fixed-Rate Wealth Building Home Loan (WBHL) versus 30-Year Fixed-Rate Loan



Source: GAO analysis. | GAO-18-297

Note: Monthly mortgage payments do not include property tax or any type of insurance. Interest rates used are generally consistent with market rates in September and October 2017.

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Abbreviations List

AHP	Affordable Housing Program
ARM	adjustable-rate mortgage
CDBG	Community Development Block Grant
Dodd-Frank	Dodd-Frank Wall Street Reform and Consumer Protection Act
enterprises	Fannie Mae and Freddie Mac
Federal Reserve	Board of Governors of the Federal Reserve
FHA	Federal Housing Administration
FHFA	Federal Housing Finance Agency
FHLBanks	Federal Home Loan Banks
Fixed-COFI	Fixed-Payment Cost-of-Funds Index
HUD	Department of Housing and Urban Development
LTV	loan-to-value
QM	qualified mortgage loans
RHS	Rural Housing Service
USDA	Department of Agriculture
VA	Department of Veterans Affairs
WBHL	Wealth Building Home Loan

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March 15, 2018

The Honorable Richard Shelby
United States Senate

Dear Senator Shelby:

The federal government has a number of programs to help increase access to affordable homeownership for first-time buyers and lower-income households, including programs that provide guarantees for certain types of mortgages and funding that can be used for down-payment assistance.¹ Homeownership has long been perceived to provide a number of financial and nonfinancial benefits. For example, homeownership can build wealth through the accumulation and appreciation of home equity—the difference between the value of a home and the amount owed on the mortgage.² Home equity can serve as a financial cushion in times of hardship or financial emergencies, especially among lower-income households for whom housing generally constitutes a larger percentage of assets than for higher-income households.³

According to the U.S. Census Bureau, the homeownership rate was about 64 percent at the end of the third quarter 2017, and according to the Board of Governors of the Federal Reserve (Federal Reserve), the total outstanding mortgage debt in the same period was \$10.5 trillion. In addition, more than 21 percent of homeowners had less than 20 percent equity in their homes (see app. II for more information). According to our analysis, for a borrower who bought a home with a 30-year fixed-rate mortgage and a small down payment, it could take more than 8 years in the current interest rate environment to achieve 20 percent equity in the home (assuming the home’s value remained unchanged from loan

¹We use “lower-income” to refer to households for which federal homeownership assistance programs are generally targeted, though many programs have specific income eligibility requirements.

²Although there are many ways to build equity and wealth—including saving and investing in other types of financial assets—this report will focus on building equity through homeownership.

³Board of Governors of the Federal Reserve System, *Survey of Consumer Finances* (Washington, D.C.: 2016).

origination).⁴ Homeownership can build wealth, but it also entails risks (such as depreciating home values) and costs (such as for maintenance, taxes, and insurance). Recently there has been some interest in mortgage products designed to accelerate equity building—that is, products that increase the ongoing pace of paying off the loan principal compared to a traditional 30-year fixed-rate mortgage—and improve access to homeownership.⁵

You asked us to explore options for building equity through homeownership.⁶ This report describes (1) how federal homeownership assistance programs affect home equity building, and (2) options, including private-sector mortgage products, through which borrowers can accelerate home equity building and the trade-offs of these options for both borrowers and lenders. You also asked us to include regional data on equity building, which is included in an appendix to this report.

To address these objectives, we reviewed relevant literature, including prior GAO reports on housing assistance and homeownership, housing finance, and mortgage reforms.⁷ We interviewed officials with knowledge of federal homeownership assistance programs from the Department of Housing and Urban Development (HUD), Federal Housing Finance Agency (FHFA), Department of Agriculture (USDA), Department of Veterans Affairs (VA), Fannie Mae, Freddie Mac, Federal Home Loan Banks (FHLBanks), and state housing finance agencies. We attended housing conferences and met with housing experts and stakeholders from academia, housing advocacy organizations, and industry, including mortgage lenders and insurers, selected because they made proposals to increase homeownership or build home equity faster, wrote on

⁴For this scenario, we assumed that a homeowner purchased a \$250,000 home with 3 percent down and that the interest rate on the loan was 3.875 percent.

⁵For purposes of our report, we are defining accelerated equity building as increasing the ongoing pace of paying down principal, and not just a one-time extra payment towards principal.

⁶This review was conducted in response to a 2016 request from Senator Richard Shelby—then Chairman, Senate Committee on Banking, Housing, and Urban Affairs.

⁷For example, see GAO, *Housing Assistance: Opportunities Exist to Increase Collaboration and Consider Consolidation*, [GAO-12-554](#) (Washington, D.C.: Aug. 16, 2012); *Housing Finance System: A Framework for Assessing Potential Changes*, [GAO-15-131](#) (Washington, D.C.: Oct. 7, 2014); and *Mortgage Reforms: Actions Needed to Help Assess Effects of New Regulations*, [GAO-15-185](#) (Washington, D.C.: June 25, 2015).

homeownership issues, were recommended by government officials, or were involved in providing mortgage products designed to accelerate equity building. From interviews with industry stakeholders and housing conferences we attended, we were able to identify and review information on two private-sector mortgage products—one existing and one proposed—designed to accelerate home equity building. We used examples from those products to illustrate effects and trade-offs on home equity of select scenarios. See appendix I for more information on our scope and methodology.

We conducted this performance audit from January 2017 to March 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Home Equity Building

A homeowner can build home equity immediately by making a down payment on their home, assuming the down payment is not financed separately as a loan.⁸ Throughout the life of a mortgage, homeowners can continue to build equity (1) by making regular mortgage payments to reduce the principal amount outstanding, (2) by making additional payments to further reduce the principal amount outstanding, and (3) through appreciation in their home's value. Additionally, the components of a mortgage (discussed below) may affect the pace of home equity building.

Throughout this report, for the purposes of illustrating home equity building, we assumed that a home's value remained unchanged from the time of the loan origination. However, home values are highly contingent on market conditions and other factors that are beyond a homeowner's control. For example, although homes can appreciate in value, homes

⁸This assumes the homeowner purchased the home at or below the appraised market value. If a homeowner paid more than the appraised market value, the homeowner might have negative equity in the home.

also can depreciate in value, which can have a negative effect on homeowners' equity. Homeowners also could lose money on their home if they sold it shortly after purchasing because principal reduction in the initial years of a mortgage is relatively small and the benefit of any home value appreciation would be limited. Additionally, selling a home incurs transaction costs, such as realtor commissions. To avoid losing money on a home sale, homeowners would need to sell their home at an amount higher than their purchase price plus transactions costs. For example, if a homeowner buys a home for \$250,000 (all fees included) and plans to sell it 3 years later, assuming transaction costs of 10 percent (or \$25,000), the homeowner would have to sell the home for at least \$275,000 to break even, meaning an annual appreciation in home value of more than 3 percent. If the home's value did not appreciate at that rate, or depreciated, the homeowner would lose money on the sale.

Mortgage Loan Components

The majority of American families achieve homeownership by taking out a loan—a mortgage—to cover at least some of the purchase price.⁹ The primary components of a mortgage loan are the following:

- **Term (duration).** The most common term is 30 years. According to the Urban Institute, the 30-year fixed-rate mortgage represented approximately 90 percent of the fixed-rate purchase mortgages (that is, not for refinancing an existing mortgage) originated every month from January 2010 through July 2017, and 15-year fixed-rate purchase mortgages represented about 6 percent.¹⁰
- **Down payment.** Most mortgage lenders require borrowers to make a down payment (of 3 percent or more of the purchase price, depending on the mortgage) that is applied to the purchase price of the home. A down payment also helps a borrower build home equity, assuming the down payment is not financed as a separate loan.

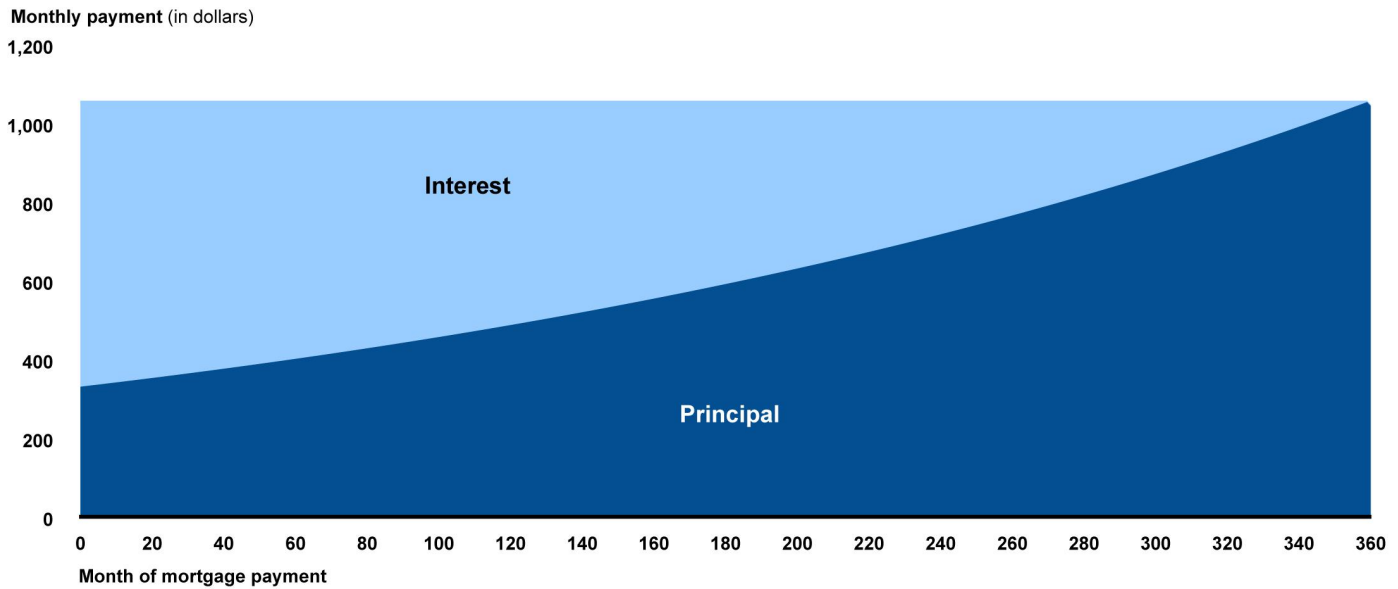
⁹For purposes of this report, a mortgage or mortgage loan refers to both a promissory note and a security interest. A promissory note evidences the debt and a borrower's agreement to make principal and interest payments to the lender for a period of time. To secure the debt, lenders obtain a lien or security interest in the underlying property as collateral against borrower default.

¹⁰The 15-year fixed-rate mortgage is more commonly used for refinancing. Urban Institute, *Housing Finance at a Glance: A Monthly Chartbook* (Washington, D.C.: October 2017).

- **Interest rate.** Lenders charge borrowers a percentage of the mortgage amount, in exchange for providing funds to buy a home. An interest rate can be fixed or adjustable for the life of the mortgage (adjustable-rate mortgage or ARM). Because a fixed-rate mortgage's interest rate does not change regardless of prevailing rates, a borrower's payments for principal and interest remain the same for the life of the mortgage. In contrast, an adjustable-rate mortgage's interest rate, for which the initial interest is generally lower than for a fixed-rate mortgage, will adjust at agreed-upon intervals.¹¹ As a result, adjustable-rate mortgage payments can increase or decrease depending on the changes in interest rates and terms of the loan.
- **Payment frequency and amount.** Payments are generally made on a monthly basis. Fixed- and adjustable-rate mortgages generally have fully amortizing payment schedules—that is, the regularly scheduled payments will fully pay down the principal and interest over the life of the mortgage, with the amounts allocated to reducing principal and interest changing over time (see fig. 1).

¹¹Adjustments generally are based on a specific index rate, and the adjusted rate will fall within an agreed maximum and minimum range.

Figure 1: Example of the Allocation of Monthly Mortgage Payment to Interest and Principal, for a Selected 30-Year Fixed-Rate Mortgage



Source: GAO analysis. | GAO-18-297

Note: This scenario is based on an amortized monthly payment for a \$225,000, 30-year mortgage with a fixed annual interest rate of 3.875 percent. The monthly payment amount does not include taxes, insurance, or any condominium or association fees.

The Federal Role in Mortgage Markets

The U.S. markets for single-family housing finance include a primary market, in which lenders make (originate) or refinance mortgage loans, and a secondary market, in which mortgage loans are purchased from lenders and packaged into securities—known as mortgage-backed securities—that are sold to investors.¹² The federal government participates in the primary and secondary mortgage markets.

In the primary market, federal agencies provide homeownership assistance programs and products intended for increasing access to and

¹²In the secondary market, institutions purchase loans from primary market mortgage originators and then hold the loans in portfolio or bundle the loans into mortgage-backed securities that are sold to investors. According to FHFA officials, mortgage products, including mortgage-backed securities, must have features attractive to investors for securitizing and trading in the secondary market. For example, products must be scalable in terms of volume, uniformity, and performance data.

affordability of homeownership. Relevant federal agencies and a government-sponsored enterprise that provide homeownership assistance and their primary housing-related policy goals include the following:

- **Department of Housing and Urban Development** provides housing assistance to low-and moderate-income families and promotes urban development.
 - **Federal Housing Administration (FHA)** seeks to broaden homeownership, strengthen the mortgage marketplace, and increase access to credit by providing mortgage insurance.
 - **Public and Indian Housing** helps ensure safe, decent, and affordable housing through programs such as housing choice vouchers.
 - **Community Planning and Development** seeks to develop viable communities and provide decent housing and a suitable living environment through block grant assistance.
- **Department of Veterans Affairs** assists service members, veterans, and eligible surviving spouses of veterans to become homeowners through guaranteeing and issuing (in limited circumstances) mortgages for home purchases.
- **Rural Housing Service (RHS)**, which is an agency within USDA, insures and guarantees housing loans for home purchases, repair, and rental housing development.
- **Federal Home Loan Banks** help provide liquidity to each bank's member financial institutions to support housing finance and community investment. FHLBank members include commercial banks, thrifts, and credit unions. FHLBanks provide 10 percent of their earnings for affordable housing programs, including grants for affordable housing for households with incomes at or below 80 percent of the area median.

Federal homeownership assistance programs can be categorized in terms of the products or services they offer or the mechanisms they use. The categories include mortgage guarantees and insurance, down-payment assistance, vouchers, and direct loans (discussed in more detail later in this report). In addition to these categories of homeownership assistance, tax expenditures, such as exclusions, exemptions, deductions (including the mortgage interest deduction), credits, deferrals, and preferential rates, can promote homeownership. For example, homeowners can take advantage of tax deductions (by choosing to

itemize deductions on their tax returns) to help lower their taxable income. Taxpayers who itemize deductions may deduct qualified interest they pay on their mortgage. Taxable income may be reduced by the amount of interest paid on first and second mortgages of up to \$750,000 for homes purchased generally after December 15, 2017.¹³ Additionally, taxpayers generally may deduct up to \$10,000 for state and local taxes, including property taxes paid by homeowners on their homes.¹⁴

Participation in the secondary mortgage market occurs through the following entities:

- **Fannie Mae and Freddie Mac.** Fannie Mae and Freddie Mac are government-sponsored enterprises (enterprises)—congressionally chartered, for-profit, shareholder-owned companies. They are the two largest participants operating in the secondary mortgage market.¹⁵ Generally, Fannie Mae and Freddie Mac purchase mortgage loans that meet certain criteria for size, features, and underwriting standards—known as conforming loans—from lenders.¹⁶ In purchasing loans, the enterprises provide market liquidity, so lenders can provide more loans to borrowers.

¹³For homes purchased on or before December 15, 2017, taxpayers can deduct interest on the total mortgage, generally for debt up to \$1 million. Prior to 2018, homeowners generally could also deduct interest payments on up to \$100,000 of home equity debt. For 2017, the mortgage interest deduction cost an estimated \$64 billion in forgone income tax revenue, according to the Joint Committee on Taxation. For taxable years beginning after December 31, 2025, taxpayers may deduct interest on up to \$1 million, regardless of when the indebtedness is incurred.

¹⁴Prior to 2018, there were no dollar limits on the amounts of property taxes that homeowners could deduct. The new limitation is applicable to tax years beginning after December 31, 2017, and before January 1, 2026. For 2017, the deduction of property taxes for owner-occupied homes cost an estimated \$33.3 billion in forgone income tax revenue, according to the Joint Committee on Taxation.

¹⁵The FHFA is an independent agency responsible for oversight of Fannie Mae, Freddie Mac, and the FHLBanks. FHFA has a statutory responsibility to ensure that these entities operate in a safe and sound manner and that their operations and activities foster liquid, efficient, competitive, and resilient national housing finance markets. On September 6, 2008, FHFA placed Fannie and Freddie into conservatorship, due to a substantial deterioration in their financial condition.

¹⁶The conforming loan limit for single-family homes in 2018 is \$453,100 (\$679,650 in high-cost areas) in the contiguous United States, District of Columbia, and Puerto Rico. In areas outside of the contiguous states, the limit is \$679,650 (\$1,019,476 in high-cost areas). Mortgages that are larger than the conforming loan limit are known as “jumbo loans.”

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- **Ginnie Mae.** Ginnie Mae is a wholly-owned government corporation. Ginnie Mae guarantees the timely payment of principal and interest on mortgage-backed securities supported by pools of loans backed by government-insured mortgages, including mortgages insured by FHA, VA, and USDA.

Mortgage-Related Regulations

In a process called underwriting, mortgage lenders evaluate the creditworthiness of potential borrowers in making mortgage loans, among other things. Amid concerns that risky mortgage products and poor underwriting standards contributed to the recent housing crisis, Congress included mortgage reform provisions in the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act). The Dodd-Frank Act generally requires lenders to determine consumers' ability to repay home mortgage loans before extending credit and provides a presumption of compliance with the ability-to-repay requirement for qualified mortgages.

The ability-to-repay regulations set forth lenders' responsibilities to determine a borrower's ability to repay a residential mortgage loan, and special payment calculation rules apply for loans with balloon payments, interest only payments, or negative amortization.¹⁷ The regulations require lenders to make a reasonable and good faith determination of a consumer's reasonable ability to repay a loan. The regulations establish a safe harbor and a presumption of compliance with the ability-to-repay rule for certain qualified mortgage loans (QM). The rule generally prohibits loans with negative amortization, interest-only payments, or balloon payments from being qualified mortgages, and limits the points and fees a lender may charge borrowers on a qualified loan.¹⁸ The regulations establish general underwriting criteria for qualified mortgages. For example, under QM requirements borrowers generally cannot exceed a

¹⁷When making the ability-to-pay determination, lenders generally must consider at least eight underwriting factors: (1) current or reasonably expected income or assets; (2) current employment status; (3) the monthly payment on the covered transaction (the monthly payment must be calculated based on any introductory rate or fully indexed rate for the loan, whichever is higher, and substantially equal, fully amortizing monthly payments); (4) the monthly payment on any simultaneous loan; (5) the monthly payment for mortgage-related obligations; (6) current debt obligations, alimony, and child support; (7) the monthly debt-to-income ratio or residual income; and (8) credit history.

¹⁸A point is equal to 1 percent of the amount of a loan.

maximum monthly debt-to-income ratio of 43 percent, unless the loan is eligible for sale to an enterprise.¹⁹ If a mortgage loan meets the requirements of a QM loan, it is eligible for the safe harbor and the lender is deemed to have complied with the ability-to-pay requirement unless the loan is a higher priced mortgage loan. A higher priced mortgage loan that otherwise meets the definition of a QM is presumed to have complied with the ability-to-pay requirements, but the presumption can be rebutted if the consumer proves that the lender did not make a good faith and reasonable determination of the consumer's ability to repay.²⁰ Additionally, federal mortgage insurance is included in the determination of whether an FHA-insured loan is a higher priced mortgage loan.²¹

Federal Homeownership Assistance Programs Can Have Equity-Building Effects, but Are Not Specifically Designed to Accelerate Equity Building

Existing federal homeownership assistance programs use features and mechanisms that can have equity-building effects, but the programs are

¹⁹The rule provides for a temporary category of qualified mortgages that have a more flexible underwriting requirement if they meet the general product feature prerequisites for a qualified mortgage and are eligible to be purchased by the enterprises. The monthly debt-to-income ratio represents the percentage of a borrower's total monthly income that goes toward total monthly debt obligations, including the mortgage payments, simultaneous loans, mortgage-related obligations, current debt obligations, alimony, and child support. A higher ratio is generally associated with a higher risk that the borrower will have cash flow problems and may miss mortgage payments.

²⁰In general, a higher-priced mortgage has an annual rate exceeding the prime offer rate by 1.5 percentage points or more for a first-lien transaction.

²¹Qualified Mortgage Definition for HUD Insured and Guaranteed Single Family Mortgages, 78 Fed. Reg. 75215 (December 11, 2013). Generally, HUD incorporated by reference certain Bureau of Consumer Financial Protection's rules and definitions, but made a specific decision to allow for a higher annual percentage rate than that adopted by the Bureau for the definition of a safe harbor qualified mortgage. This would remediate the fact that some FHA loans would fall under the Bureau's higher priced mortgage loan definition as a result of the mortgage insurance premium. Including the mortgage insurance premium in the calculation of the threshold that distinguishes the safe harbor from the rebuttable presumption mortgage allows the threshold to float as the mortgage insurance premium fluctuates. 78 Fed. Reg. 75235. HUD did not want the mortgage insurance premium to be the factor that determines whether a loan is a higher-priced mortgage loan. 78 Fed. Reg. 75235.

not specifically designed to accelerate equity building. The programs can assist homeowners to build equity over time by providing access to homeownership, but the programs do not have an explicit focus on accelerating the ongoing pace of paying down the loan principal faster than a 30-year fixed-rate mortgage. Rather, the overall focus of the programs is on providing affordable access to homeownership, according to officials of relevant agencies and entities and based on their mission goals. For example, the goal of FHA's mortgage insurance program is to facilitate access to affordable mortgages for home buyers who might not be well-served by the private market. FHA implements this goal by providing insurance to lenders to facilitate access to mortgage financing for lower-income home buyers.

See table 1 for examples of federal homeownership assistance programs, by major program types and potential for affecting equity building, either at a point in time or throughout the life of a mortgage.

Table 1: Examples of Federal Homeownership Assistance Programs and Effects on Equity Building

Type of homeownership assistance	Implementing entity(ies)	Examples of programs	Potential equity-building effects
Mortgage insurance and loan guarantees	Federal Housing Administration (FHA)	FHA: Single-family mortgage insurance program ^a	Help provide market liquidity with equity loss protection to lenders, in turn increasing access to credit and to homeownership and opportunity for home equity building for home buyers.
	Department of Veterans Affairs (VA)	VA: Home Loan Guaranty Program ^b	
	Rural Housing Service (RHS)	RHS: Single Family Housing Guaranteed Loan Program ^c	
Down payment assistance ^d	Department of Housing and Urban Development (HUD)	HUD: HOME Investment Partnership Program, Community Development Block Grants, and self-help housing projects	Can immediately increase a homeowner's equity. Some down-payment assistance programs also allow assistance to be used to buy down the mortgage interest rate, which can have ongoing equity-building effects. A lower interest rate allows a greater portion of each monthly mortgage payment to be applied to the mortgage principal.
	Federal Home Loan Banks (FHLBanks)	FHLBanks: Grants provided through each FHLBank's members (financial institutions)	
	RHS	RHS: Self-help housing projects ^e	
Vouchers	HUD	HUD: Housing Choice Voucher program	Can be used towards down payment and monthly mortgage payments, and increase homeowner's equity as payments reduce the mortgage principal.
Direct loans	VA	VA: Direct loans for Native American veterans	Can help targeted borrowers access homeownership, which in turn allows for home equity building.
	RHS	RHS: Single Family Housing Direct Loan Program	

Source: GAO analysis of agency documents. | GAO-18-297

^aFHA's guarantee provides 100 percent coverage of eligible losses when borrowers default. This guarantee covers the unpaid principal balance, interest costs, and certain costs of foreclosure and conveyance.

^bVA guarantees vary, depending on the amount of the loan. At loan levels at or below \$45,000, VA guarantees 50 percent of the loan. Above \$45,000 and up to and including \$56,250, VA guarantees \$22,500. Above \$56,250 and up to and including \$144,000, VA guarantees the lesser of \$36,000 or 40 percent of the loan. For loan levels above \$144,000, the guarantee is the lesser of 25 percent of the loan or the Freddie Mac conforming loan limit of \$417,000 (\$625,500 for high-cost areas), which are adjusted yearly.

^cRHS guarantees are limited to borrowers in rural areas with incomes of less than 115 percent of the area median income.

^dState and local housing finance agencies also provide down-payment assistance.

^eSelf-help housing projects require future homeowners to help build their own houses, and their "sweat equity" serves as a down payment to reduce the mortgage loan amount.

Federal Mortgage Insurance and Loan Guarantees Increase Market Liquidity

Federal mortgage insurance and guarantee programs increase market liquidity, which ultimately expands access to homeownership. The federal government commits to pay part or all of a loan's outstanding principal and interest loss to a lender or other mortgage holder if the borrower defaults. Because they obtain insurance or a guarantee against the possibility of loss from borrower default, lenders are more willing to provide loans to borrowers who might not otherwise be served by the private market, allowing more homeowners—particularly lower-income borrowers—an opportunity to build home equity.²²

FHA offers mortgage insurance and RHS and VA provide loan guarantees. For example, FHA will insure loans with a down payment as low as 3.5 percent from most borrowers, and conventional mortgages will allow down payments as low as 3 percent.²³ FHA-insured loans also have more lenient credit requirements that particularly benefit minority households and first-time home buyers who might otherwise find it difficult or more expensive to take out a mortgage.²⁴ Among federal mortgage insurance programs, FHA has the highest volume of mortgages insured.²⁵

²²Mortgage insurance or guarantees are available to eligible home buyers. "Insurance" and "guarantee" generally have the same meaning in the context of our review.

²³Conventional mortgages are mortgages that are not insured by FHA or guaranteed by another government agency, such as VA or USDA. See Congressional Research Service, *FHA-Insured Home Loans: An Overview*, RS20530 (Washington, D.C.: Dec. 23, 2016).

²⁴One-third of all FHA loans were obtained by minority households in fiscal year 2016. In calendar year 2015, FHA-insured loans accounted for about 47 percent of all home purchase mortgages obtained by African-American home buyers and 49 percent of all home purchase mortgages obtained by Hispanic home buyers. In fiscal year 2016, 82 percent of FHA-insured mortgages for home purchases were obtained by first-time home buyers. See Federal Housing Administration, *Annual Report to Congress: The Financial Status of the Mutual Mortgage Insurance Fund Fiscal Year 2016*, (Washington D.C.: November 2016).

²⁵According to Home Mortgage Disclosure Act data, FHA insured 865,897 purchase mortgages for 1-4 family residences in calendar year 2016, RHS guaranteed 113,944 mortgages, and VA guaranteed 359,811 loans.

Federal Down-Payment Assistance Programs Can Have Equity-Building Effects

Federal and federally mandated programs that provide funding for grants and loans for down-payment assistance can have equity-building effects. Although accelerated equity building is not the policy goal of these programs, down-payment assistance can lower the barrier to homeownership for some lower-income home buyers so that the equity-building effects of homeownership can accrue. Examples of programs include the following:

- HUD's HOME Investment Partnership Program is a block grant program that provides funding to states and localities to be used exclusively for affordable housing activities to benefit low-income households.²⁶ Funds can be used for down-payment assistance for eligible low-income home buyers. According to HUD data, more than 75 percent of low-income home buyers who have received assistance from the HOME program have used HOME funds for purchasing a home (which includes down-payment assistance) since the program's inception in 1992, directly contributing to homeowner equity building.
- HUD's Community Development Block Grant (CDBG) program also provides funding to eligible states and localities for community and economic development efforts, including housing assistance.²⁷ Eligible uses of home-buyer assistance include grants for down payments and closing costs. In fiscal year 2016, CDBG funds provided direct housing assistance for down payment and closing costs to 2,483 households.
- FHLBanks contribute funding to the Affordable Housing Program (AHP), which can provide grants for down-payment assistance

²⁶The HOME Investment Partnerships Program was authorized by the Cranston-Gonzalez National Affordable Housing Act of 1990 (Pub. L. No. 101-625). Low-income households are generally defined as households with income at or below 80 percent of area median income.

²⁷The Housing and Community Development Act of 1974 created the CDBG program to develop viable urban communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for low- to moderate-income persons. See Pub. L. No. 93-383, tit. I, § 101(c), 88 Stat. 633, 634 (codified as amended at 42 U.S.C. § 5301(c)).

through either the AHP competitive or set-aside program.²⁸ Member financial institutions of the FHLBanks can apply for the set-aside funds and then distribute the funds as grants to eligible households. Set-aside grants may be no greater than \$15,000 per household, and at least one-third of the FHLBanks' annual set-aside allocation must be used for eligible first-time home buyers. According to FHFA, the FHLBanks funded about \$77 million for down-payment or closing-cost assistance in 2016 (almost 90 percent of total set-aside program funding). The down-payment assistance grants have an immediate equity-building effect.

- RHS and HUD administer self-help grant programs that provide opportunities for very-low and low-income home buyers to purchase subsidized homes: Program participants help construct homes in exchange for subsidies, including down-payment assistance.²⁹ RHS officials told us that the home buyer's labor serves as a down payment for the home, providing the home buyer with equity at the time of purchase. RHS's program also includes a subsidized interest rate determined by the home buyer's income, as well as a 33-year mortgage duration that can be extended up to 38 years, to reduce the monthly mortgage payment and make the loan as affordable as possible.

HUD officials raised concerns about the extent to which down-payment assistance promotes home equity building. For example, some mortgages with down-payment assistance can be associated with higher delinquency rates. Specifically, HUD officials pointed to data indicating that FHA has experienced higher loan delinquency rates for loans with

²⁸The Federal Home Loan Bank Act requires each FHLBank to establish an Affordable Housing Program. See 12 U.S.C. § 1430(j). An FHLBank may allocate a portion of its annual AHP contribution to homeownership set-aside programs, which provides grants for down-payment and closing-cost assistance as well as rehabilitation assistance in conjunction with a home purchase. See 12 C.F.R § 1291.6(c)(4).

²⁹Participating families in RHS's self-help program generally are required to contribute 65 percent of the construction labor. For households with more than one adult, HUD requires a minimum of 100 hours of labor to participate in its self-help program.

down-payment assistance.³⁰ As with any homeownership-assistance programs or mortgages, the potential for home equity building requires a homeowner to sustain and pay down the mortgage.

In addition to down-payment assistance, HOME, CDBG, and AHP funds can be used for buying down the mortgage interest rate.³¹ Interest-rate buy-downs have accelerated equity-building effects throughout the life of the mortgage because a higher proportion of monthly mortgage payments are applied to the mortgage principal. However, agency and enterprise officials and housing experts with whom we spoke said the down payment is the biggest barrier to homeownership, and in the current environment of low interest rates, buy-downs of interest rates are not common.

In addition to federal programs, some state housing finance agencies also provide down-payment assistance grants and loans that have accelerated equity-building effects. For example, the Minnesota Housing Finance Agency provides a monthly payment loan (in addition to the mortgage) of up to \$12,000 to be used for down payments or closing costs.³² The monthly payment loan has an interest rate equal to the rate on the borrower's first mortgage, and the loan can be paid back over a 10-year period.³³ According to Minnesota Housing Finance Agency officials, by

³⁰According to HUD's 2017 FHA Mutual Mortgage Insurance Fund Report, FHA-insured new-purchase mortgages with down-payment assistance experienced higher rates of loan delinquency than loans without assistance. See Department of Housing and Urban Development, *Annual Report to Congress Regarding the Financial Status of the FHA Mutual Mortgage Insurance Fund, Fiscal Year 2017* (Washington, D.C.: Nov. 15, 2017). In 2005 GAO reported that FHA-insured loans with down-payment assistance had higher delinquency and claim rates than similar loans without such assistance. See GAO, *Mortgage Financing: Additional Action Needed to Manage Risks of FHA-Insured Loans with Down Payment Assistance*, [GAO-06-24](#) (Washington, D.C.: Nov. 9, 2005). In particular, loans with seller-funded down-payment assistance performed more poorly than those with assistance from other sources, such as government programs. However, seller-funded down-payment assistance was prohibited for FHA loans by the Housing and Economic Recovery Act of 2008, Pub. L. No. 110-289, § 2113, 122 Stat. 2654, 2831 (2008).

³¹Jurisdictions and FHLBanks have some discretion in how they implement HOME and Affordable Housing Program.

³²The Minnesota Housing Finance Agency finances some of its lending activities through the sale of tax-exempt and taxable bonds. Its loans are targeted to low-income borrowers.

³³The Minnesota Housing Finance Agency also offers a deferred down-payment assistance loan, which is an interest-free loan of up to \$8,000 that is repaid when the property is sold, refinanced, or when the first mortgage becomes due. Although the deferred payment loan does not accelerate equity building, the zero-interest loan effectively subsidizes the cost of equity for that portion of the home purchase.

making payments directly on the monthly payment loan, the borrower is effectively accelerating equity building on that part of the home purchase because of the shorter term compared to a 30-year mortgage.

Federal Voucher Program Can Facilitate Equity Building

HUD's Housing Choice Voucher Program provides assistance in helping a homeowner pay for monthly mortgage and other homeownership expenses, which facilitate homeownership and equity building.³⁴ Vouchers are administered locally by public housing agencies, but not all public housing agencies participate in the program. A home buyer would have to apply for a housing choice voucher with a participating public housing agency to use the funding for a mortgage instead of rent. First-time homeowners who meet income limits and receive homeownership counseling can qualify for the program.³⁵ The payment assistance generally continues as long as the family resides in the home, and the maximum term for the assistance is 15 years if the home purchase is financed with a mortgage longer than 20 years.³⁶ According to HUD, about 11,000 homeowners were receiving assistance from the Homeownership Voucher Program as of September 2017, about 0.5 percent of all vouchers.

Federal Direct Loans Can Provide Access to Homeownership

RHS and VA both offer direct loans for home purchases to eligible borrowers who may otherwise be unable to obtain financing in the private marketplace, providing access to homeownership and equity building. RHS offers direct loans to borrowers in rural areas with incomes of generally not more than 80 percent of the area median income. Loan funds can be used to build, repair, renovate, or relocate a home, or to purchase and prepare sites, including providing water and sewage

³⁴Monthly mortgage and homeownership expenses include mortgage principal and interest, mortgage insurance premium, and real estate taxes and homeowner insurance.

³⁵Generally, except in the case of disabled families, the qualified annual income of the adult family members who will own the home must not be less than the federal minimum hourly wage multiplied by 2,000 hours. The local public housing agency also may establish a higher minimum income requirement.

³⁶In all other cases, the maximum term for assistance is 10 years, with exceptions for elderly and disabled homeowners. See 24 C.F.R. § 982.634.

facilities. RHS provided 7,089 direct loans for single-family homes in fiscal year 2016.

VA provides direct home loans to eligible Native American veterans to finance the purchase, construction, or improvement of homes on federal trust land, or to refinance a prior direct loan to reduce the interest rate. According to VA, 13 direct loans were provided to Native Americans in fiscal year 2016.

Options and Mechanisms That Accelerate Equity Building Present Trade-offs for Homeowners and Lenders

Borrowers have options to accelerate equity building that include obtaining shorter-term mortgages, making more frequent or additional payments, or choosing a mortgage product available in the private mortgage market designed to accelerate equity building. These options accelerate equity building by affecting the key components of a mortgage—term (duration), down payment, interest rate, or payment frequency or amount. The advantages of building equity faster can include using home equity as a financial cushion in emergencies, like unexpected medical expenses. However, there are trade-offs to these options, such as higher monthly payments for shorter-term mortgages. Additionally, stakeholders identified key trade-offs and considerations in introducing new products and mechanisms for accelerating home equity building that could affect the success of the products or mechanisms.

Home buyers and Homeowners May Take Actions on Their Own to Accelerate Equity Building

Home buyers and homeowners may take actions on their own to accelerate home equity building. For example, home buyers can choose a 15- or 20-year mortgage rather than a 30-year mortgage. The shorter-term product will increase the relative pace of equity building. In July 2017, almost 6 percent of all new purchase mortgage originations were for 15-year fixed-rate mortgages, according to the Urban Institute.³⁷

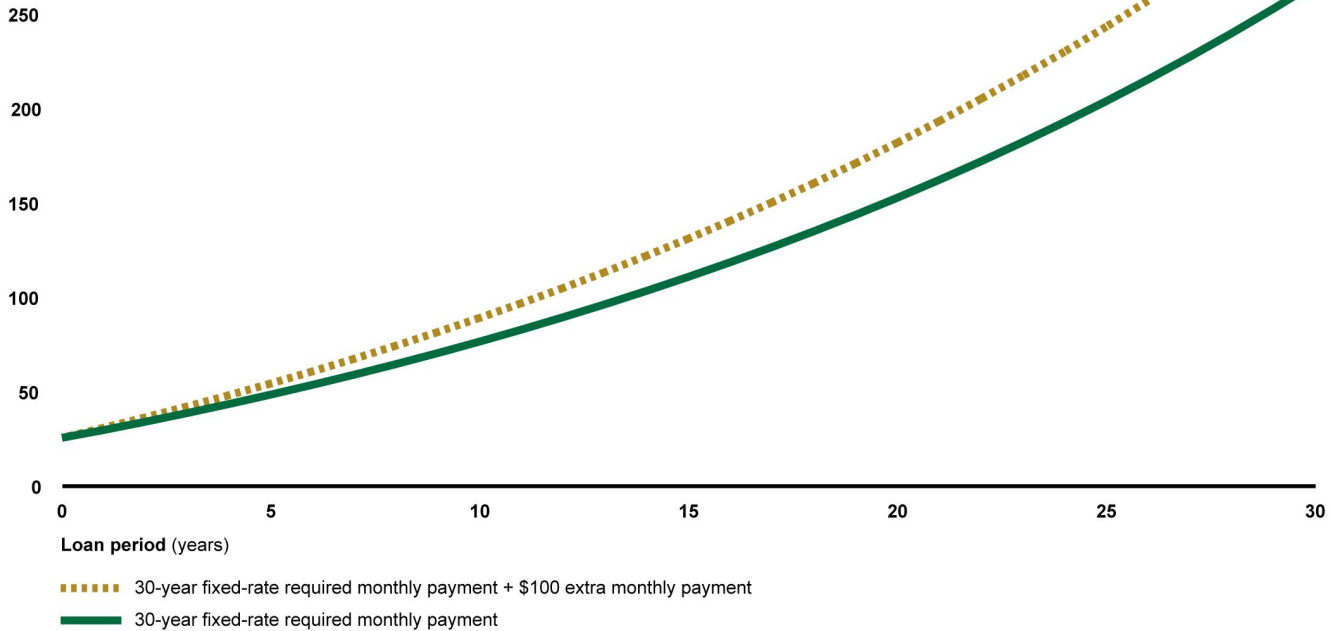
³⁷ See *Housing Finance at a Glance: A Monthly Chartbook* (October 2017).

However, shorter-term loans may present trade-offs for borrowers, which we discuss later in the report.

Homeowners also can make extra mortgage payments to further reduce the principal balance, which can accelerate equity building and shorten the mortgage term. For example, according to our analysis, a homeowner making an extra monthly payment of \$100 on a 30-year fixed-rate mortgage for \$225,000 would accelerate equity building and reduce the mortgage duration by more than 4 years (see fig. 2). Homeowners generally have the flexibility to make extra payments at their discretion and could discontinue the extra payments at any time if they need the funding for other priorities.³⁸

Figure 2: Example of Home Equity Built over Time for a \$225,000, 30-year Fixed-Rate Mortgage: Required Payment versus Additional \$100 Payment Each Month

Equity: down payment + principal paid (dollars in thousands)



Source: GAO analysis. | GAO-18-297

Note: We compared equity building in two payment scenarios for a \$250,000 home, bought with a 10 percent down payment: (1) Only required payments were made on a 30-year mortgage of \$225,000

³⁸According to Black Knight, a financial services firm that analyzes the mortgage market, borrowers made additional principal payments of about 1 percent of their mortgages in September 2017. See Black Knight, *Mortgage Market Monitor* (September 2017).

and a fixed annual interest rate of 3.875 percent, and (2) Additional monthly payments of \$100 applied to the principal balance were made on the same mortgage. For illustration purposes, we assumed the home's value remained unchanged from the time of the origination of the loan.

Homeowners also can refinance their mortgage to take advantage of lower interest rates, shorter mortgage terms or both. Lower-interest and shorter-term loans can help build equity faster. About 27 percent of mortgage refinances were for 15-year fixed-rate mortgages in October 2017, according to enterprise data reported by FHFA. However, refinancing (similar to purchase loans) incurs transaction costs (see table 2).³⁹ A lender may offer low- or no-cost refinancing, but likely would charge a higher interest rate in exchange for lowering or eliminating fees. Additionally, other payments might be required at closing (which would be out-of-pocket expenses unless they were financed), including upcoming mortgage insurance and property taxes.

Table 2: Examples of Mortgage Loan and Refinancing Fees and Cost Estimates

Type	Reason for charge	Estimated fee ranges ^a
Application fee	To cover the initial costs of processing a loan request and checking an applicant's credit report.	\$75–\$640
Loan origination fee	To evaluate and prepare a loan.	0–1.5% of loan principal
Points	A point is equal to 1 percent of the amount of a loan. (1) A loan-discount point is a one-time charge paid to reduce the interest rate of a loan. (2) Some lenders also charge points to earn money on the loan.	0–3.0% of loan principal
Appraisal fee	To pay for an appraisal of a home (to assure the lenders that the property is worth at least as much as the loan amount). If a homeowner is refinancing and has had a recent appraisal, the homeowner can ask the lender to waive the requirement for a new appraisal.	\$225–\$700
Survey fee	To confirm the location of the property and improvements on the land. A loan applicant may not have to pay this fee if a survey recently had been conducted for the property.	\$150–\$400
Inspection fee	To meet lender and governmental requirements. A lender may require an inspection of the structural condition of the property, and the state in which the property is located may require additional, specific inspections.	\$175–\$350
Attorney review and closing fee	To pay for services of lawyers or other parties who conduct the closing for the lender.	\$500–\$1,000

³⁹Under the QM regulations, a lender cannot charge a borrower more than 3 percent in total points and fees on most loans if a lender wants legal liability protection from distressed borrowers. The cap varies for loan amounts less than \$100,000, with a maximum of 8 percent for a loan amount of less than \$12,500.

Type	Reason for charge	Estimated fee ranges ^a
Title search and title insurance	To pay for search of property records to ascertain ownership/clear legal title and check for liens. Title insurance covers the lenders against errors in the results of the title search. If a problem arises, the insurance covers the lender's investment in a mortgage.	\$700–\$900
Recording and transfer fees	To pay for filing by local government of official records of a real-estate transaction.	0–3.0% of loan principal (costs vary regionally)

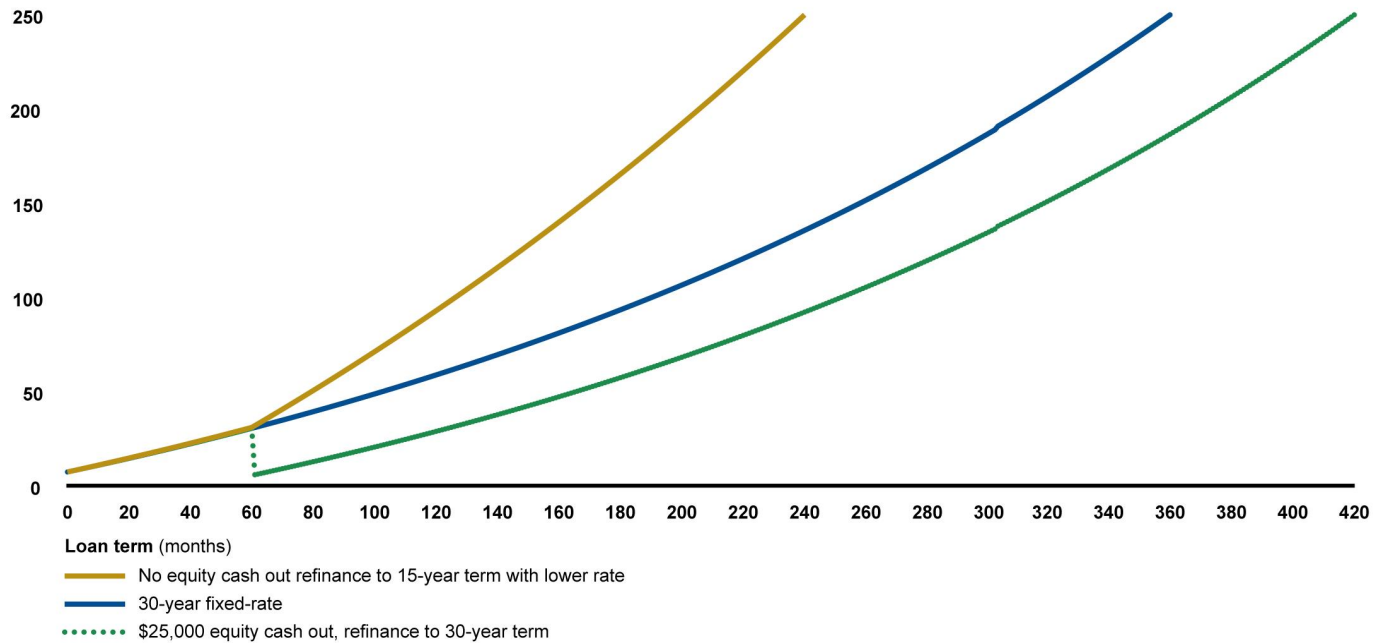
Source: GAO analysis of Housing and Urban Development, Bureau of Consumer Financial Protection, and Federal Reserve documentation. | GAO-18-297

^aEstimates of fee ranges are drawn from mortgage settlement costs guides from HUD, Bureau of Consumer Financial Protection, and the Federal Reserve.

Also, homeowners who refinance to take advantage of lower interest rates could extend their mortgage term or choose to cash out some of the existing home equity, thereby eliminating the potential for accelerated equity-building effects in refinancing. See figure 3 for a comparison of how different refinancing options can affect home equity building.

Figure 3: Examples of the Effects of Select Refinancing Scenarios on Home Equity

Equity: down payment + principal paid (dollars in thousands)



Source: GAO analysis. | GAO-18-297

Note: We compared equity building in three scenarios for a \$250,000 home, bought with a 3 percent down payment: (1) refinancing a 30-year fixed-rate (3.875 percent) mortgage after 5 years to a 15-year mortgage with a lower interest rate (3.125 percent), with no cash out at refinancing, (2) a 30-year fixed-rate (3.875 percent) mortgage with no refinancing, and (3) refinancing a 30-year fixed-rate (4 percent) mortgage after 5 years to a 30-year mortgage with the same interest rate (3.875 percent),

with \$25,000 cash out at refinancing. For illustration purposes, we assumed the home's value remained unchanged from the time of the origination of the loan.

A Recently Introduced Mortgage Product Accelerates Equity Building through Shorter Terms and Lower Interest Rates

The Wealth Building Home Loan (WBHL) is a relatively new private-sector mortgage product that incorporates a number of features specifically designed to accelerate equity building (see fig. 4). The WBHL, which has been offered commercially on a limited basis for about 3 years, has shorter mortgage terms (15 or 20 years), can have a fixed or adjustable rate, and allows the interest rate to be bought down.⁴⁰ A lower interest rate would allocate a greater portion of each monthly payment to reduce mortgage principal and also reduce the amount of the monthly payments.⁴¹

Moreover, the WBHL allows for no down payment (including allowing the financing of closing costs). The no down-payment feature is designed to facilitate access to homeownership. According to lenders we spoke with who offer WBHLs, allowing for no down payment is the key feature that distinguishes the WBHLs from standard 15- or 20-year mortgage loans available in the private-sector mortgage marketplace.⁴² Consistent with what we heard from lenders, officials from Fannie Mae and Freddie Mac told us loans that do not require a down payment generally are not available in the private-sector mortgage marketplace. Additionally, because of the low or no down-payment features, lenders we spoke with who offer WBHLs typically require private mortgage insurance, which is provided by a major mortgage insurer.

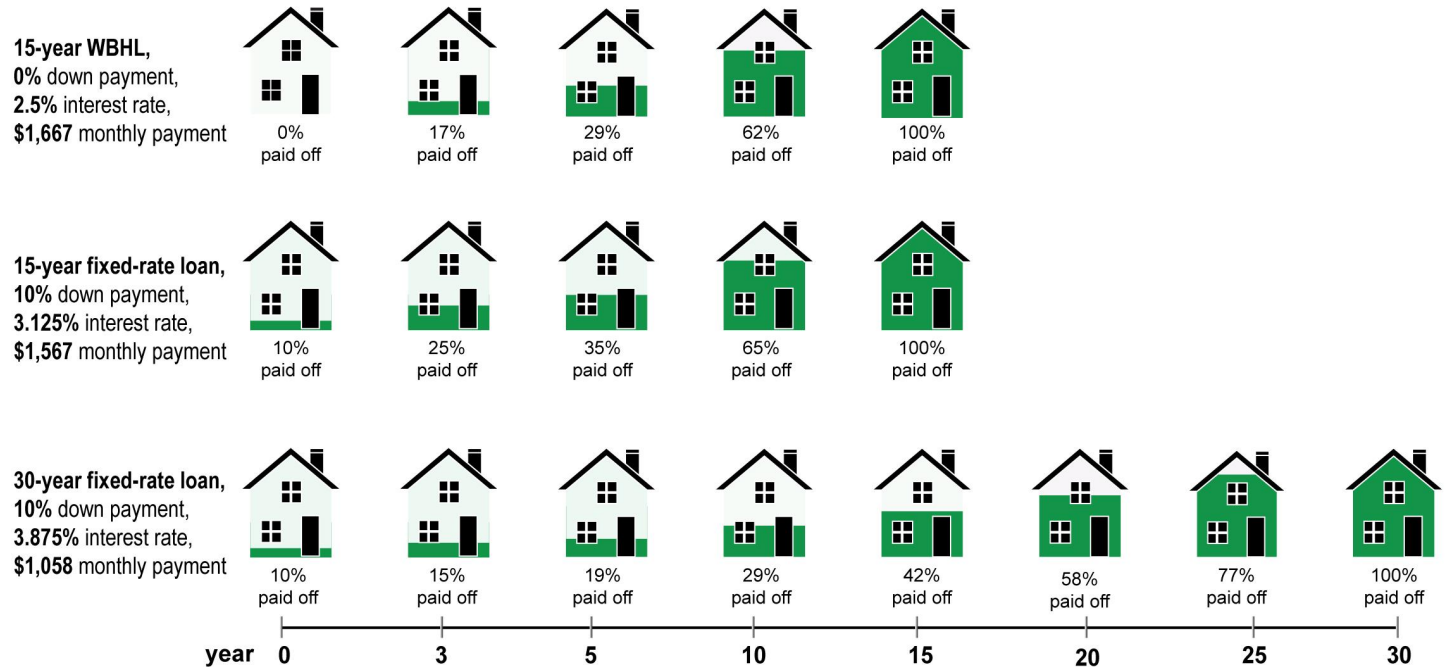
⁴⁰This mortgage product was developed by Edward Pinto and Stephen Oliner of the American Enterprise Institute. See, for example, Edward Pinto, *A Housing Primer: Wealth Building for the 21st Century* (Washington, D.C.: 2015).

⁴¹Developers of the loan envisioned borrowers using the funds available for a down payment to buy down the mortgage interest rate. The developers of the loan also recommend using VA's credit underwriting guidelines, which include consideration of residual income. VA's residual income underwriting standards evaluate all of a borrower's sources of income and expenditures, including living expenses. According to VA officials, the standard allows lenders greater flexibility in considering compensating factors in making loan approval decisions.

⁴²Actual features of WBHLs may vary, depending on a lender's product offerings and terms.

Figure 4: Comparison of Home Equity Built over Time: 15-year Wealth Building Home Loan (WBHL) versus 15- and 30-Year Fixed-Rate Mortgages

\$250,000 home



Source: GAO analysis. | GAO-18-297

Note: We compared equity building for (1) a 15-year Wealth Building Home Loan for \$250,000 with no down payment and a fixed annual interest rate bought down to 2.5 percent, (2) a 15-year mortgage for \$225,000 with a \$25,000 down payment and a fixed annual interest rate of 3.125 percent, and (3) a 30-year mortgage for \$225,000 with a \$25,000 down payment and a fixed annual interest rate of 3.875 percent. For illustration purposes, we assumed the home's value remained unchanged from the time of the origination of the loan. Interest rates used for illustration purposes are generally consistent with market rates in September and October 2017.

As shown in figure 4, the monthly mortgage payments of a WBHL can increase substantially, compared with the payments of a 30-year fixed-rate mortgage.

Some lenders we interviewed offer WBHLs with the option to buy down the interest rate, and some require a minimum buy-down.

- One lender requires borrowers to pay 2 points (or 2 percent of the mortgage loan amount), which buys down one-half of a percentage point of the interest rate.
- Another lender offers a 15-year loan with an option to pay 3 points to buy down the interest rate to 1.75 percent for the first 7 years. Rates increase to 5 percent for the remaining 8 years. The lender also offers

a 20-year loan with the option to pay 2 points to buy down the interest rate to 2.99 percent for the first 7 years. Rates increase to 5.25 percent for the remaining 13 years.

Although the option to buy down the interest rate has been advanced as a feature that accelerates equity building, some lenders we interviewed said that borrowers tend to pay the minimum required points only, because borrowers generally prefer to pay as little cash as possible at loan origination. Additionally, some lenders and other stakeholders have said that, in a low interest-rate environment, the incentive for borrowers to buy down the mortgage interest rate is greatly reduced.

A Proposed Mortgage Product May Accelerate Equity Building through an Equity Savings Account

Another mortgage product that we identified during our review—the Fixed-Payment Cost-of-Funds Index (Fixed-COFI) Mortgage—has been proposed by two economists, but has not yet been offered by private-sector lenders.⁴³ This type of mortgage is intended to provide another option for consumers that encourages equity building and limits exposure for borrowers and lenders to interest rate fluctuations. The Fixed-COFI would allow borrowers with little or no money down to obtain an adjustable-rate mortgage that features a fixed monthly mortgage payment and an equity savings account.⁴⁴ Funds in the equity savings account could be used to pay down the mortgage principal, thereby accelerating home equity building. According to the economists of this proposed product, the low to no down-payment feature may help individuals with little to no savings access homeownership, particularly those who live in high-cost areas where the rent payment is comparable to a mortgage.

In addition to the borrower's fixed monthly payments, the Fixed-COFI mortgage also would determine how the borrower's fixed payments would be allocated, including to the equity savings account. The borrower's fixed

⁴³This product was proposed by Wayne Passmore and Alexander H. von Hafften. See Wayne Passmore and Alexander H. von Hafften, "Financing Affordable and Sustainable Homeownership with Fixed-COFI Mortgages" (Washington, D.C.: 2017).

⁴⁴The authors define COFI as the nationwide average cost-of-funds index for the banking system, which is equal to the total interest expenses of domestic commercial banks divided by their total interest-bearing liabilities. They use quarterly data compiled by the Federal Financial Institutions Examination Council to calculate the COFI rate, which is the adjustable rate that underpins the mortgage. Because it is a short-term rate, it is generally lower than the 30-year fixed mortgage rate.

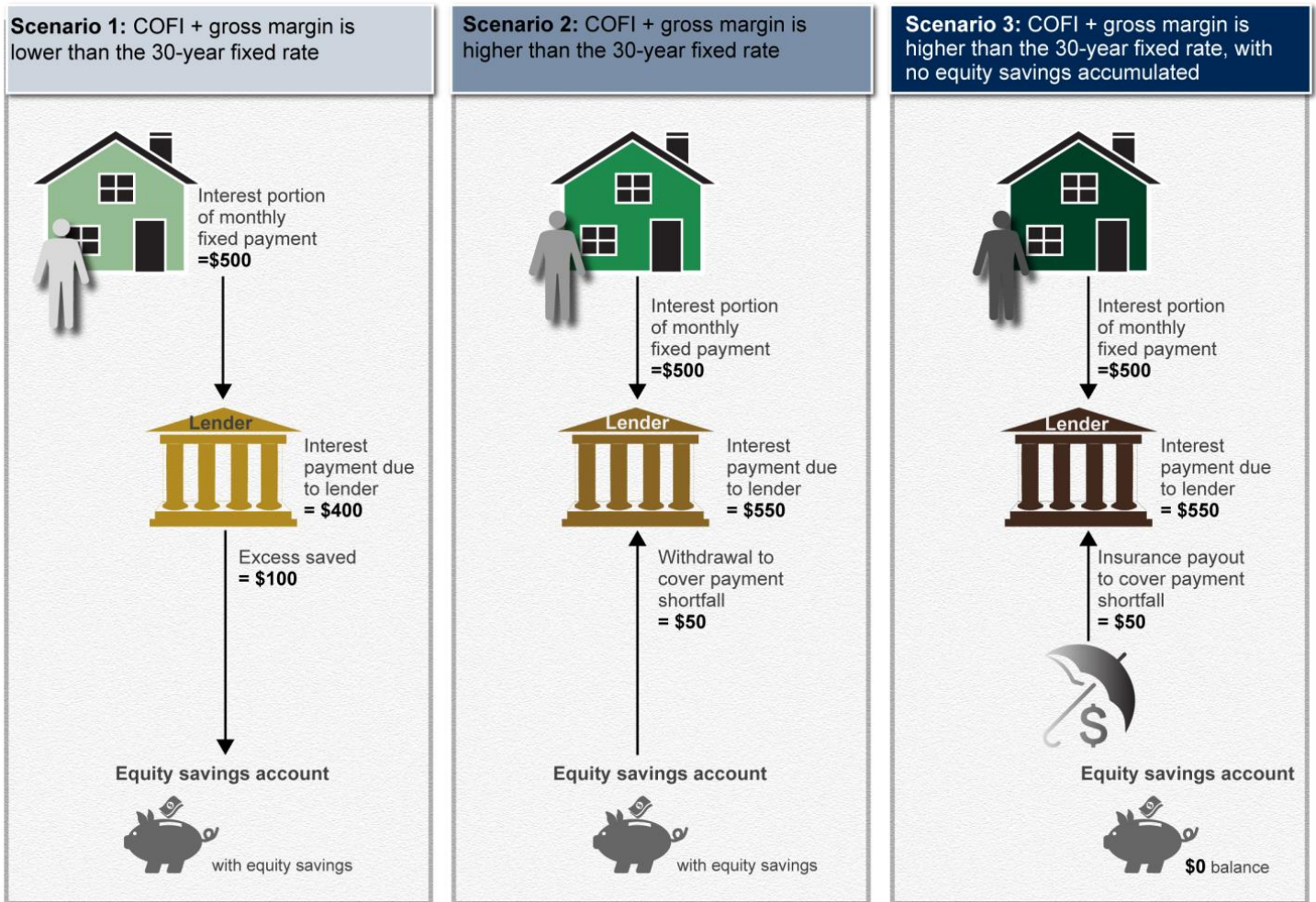
monthly payment would be fully amortizing and be calculated based on prevailing rates for a 30-year fixed-rate mortgage at the time of loan origination. But the interest portion of the payment due to the lender would be separately calculated each month, based on a rate derived from COFI plus a gross margin to account for lenders' costs and insurance risk premiums.⁴⁵ Each month, the difference between the borrower's fixed payment and interest due the lender based on the COFI rate plus a gross margin would determine if any funds from the borrower's payment would be added to the equity savings account.

The funds allocated to the equity savings account are designed to be used to pay down the principal. However, the ways in which the home equity funds could be used to pay down mortgage principal depend on the terms of each loan. If the home equity account were depleted, lenders might cover any payment shortfalls and seek insurance reimbursements. In addition, the accelerated equity-building effect of the Fixed-COFI mortgage product would rely on the historical difference between the COFI rate and 30-year fixed rate (see fig. 5). If the difference between the rates narrowed, the savings allocated to the equity savings account would lessen, and equity-building effects would be reduced. That is, in months in which the COFI rate plus the gross margin was lower than the 30-year fixed rate used to calculate the monthly payments, the difference between the COFI-based and fixed amounts would be deposited into a home equity savings account.⁴⁶ In months in which the fixed payment would not cover the interest payment (because the COFI rate plus the gross margin is higher than the 30-year fixed rate used to calculate the fixed monthly payment), funds could be withdrawn from the equity savings account to cover any shortfall. If the equity savings account had a zero balance, the lender could seek an insurance payout.

⁴⁵The gross margin is constant over the life of a loan and covers servicing costs, insurance against credit risk, a return on equity, and premiums for "payment shortfall" insurance and "balloon payment" insurance. Payment shortfall insurance would cover any monthly shortfalls over the life of the mortgage, and balloon payment insurance would cover any outstanding mortgage principal after 30 years. Estimates of the gross margin range between 1.75 percent and 2.5 percent.

⁴⁶In a recent update to the Fixed-COFI proposal (dated Nov. 15, 2017), Mr. Passmore and Mr. von Hafften also proposed an "affordable" Fixed-COFI variation, in which the excess funds can be rebated to homeowners, which may help lessen monthly financial burdens for homeowners.

Figure 5: Overview of Monthly Payment Scenarios for Fixed-Payment Cost-of-Funds Index (Fixed-COFI) Mortgage



Source: GAO analysis of Fixed-COFI Mortgage Proposal. | GAO-18-297

Note: The excess funds allocated to the equity savings account (see scenario 1) can be used to pay down the mortgage principal or can be rebated to homeowners.

According to the economists, some details of the Fixed-COFI contract can be modified for different rules concerning refinancing and savings. For example, a borrower and a lender can agree to how and when funds in the home equity savings account could be applied to pay down the mortgage principal. However, the Fixed-COFI mortgage contract would place limits on a borrower's options to refinance—for instance, only in the

case of the loss of a job—because it is designed to protect borrowers and lenders from fluctuations in interest rates.⁴⁷

If interest rates drop significantly, benefits from the rate decrease for a borrower with a Fixed-COFI mortgage would be limited as compared with the benefits of a borrower with a 30-year fixed-rate mortgage who refinances. For example, the additional savings from lower interest rates for the borrower with a Fixed-COFI mortgage could only be used to pay down the mortgage principal. In contrast, although refinancing has costs, borrowers with a traditional 30-year fixed-rate mortgage would be able to refinance to take advantage of the lower rate and reduce their monthly payment. They could use the resulting difference in monthly payments from the new, refinanced loan to pay down mortgage principal, build up savings, or for any other purposes.

Advantages of Accelerated Home Equity Building Include a Financial Safeguard

For some homeowners, building home equity faster can provide financial benefits. Home equity can serve as a financial asset to fund retirement, education expenses, or absorb financial emergencies like the loss of a job.⁴⁸ All else being equal, having more home equity also can help sustain homeownership through a downturn in the housing market. For example, default rates are generally higher for loans with higher loan-to-value (LTV) ratios.

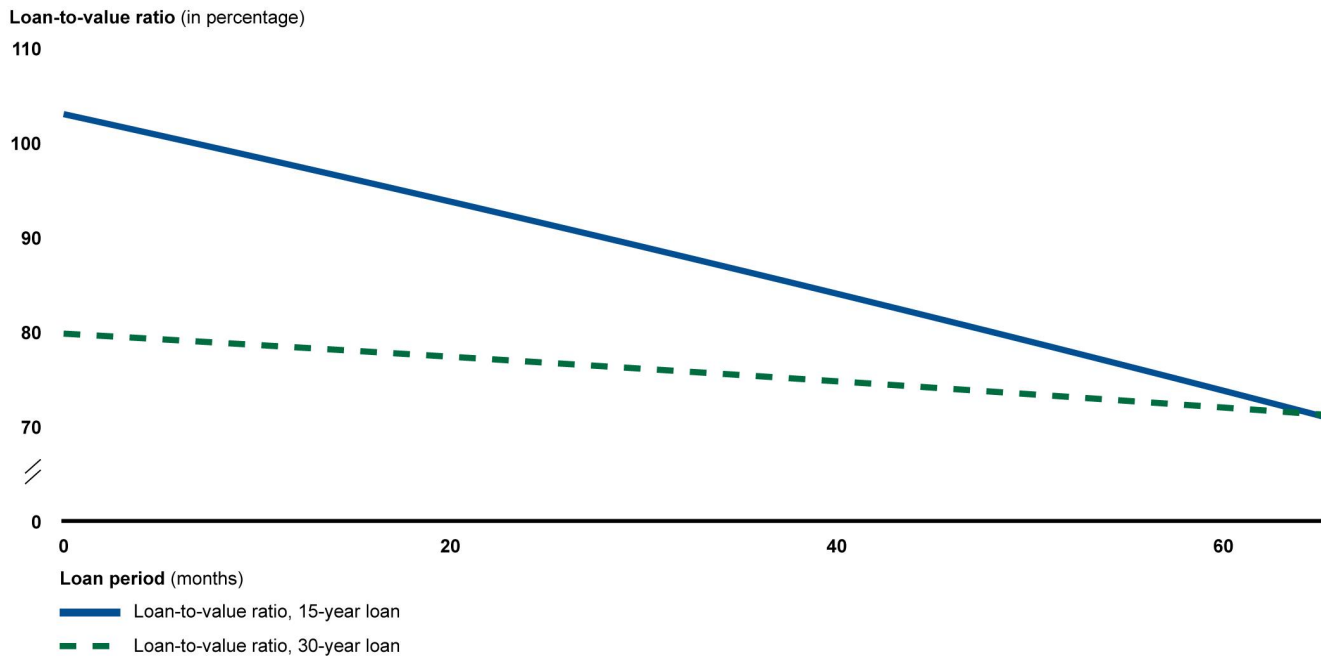
Although some accelerated equity-building options are designed to be originated with high LTV ratios (in some cases exceeding 100 percent), the accelerated equity-building effect can lower the LTV ratio at a faster pace than for a 30-year fixed-rate mortgage. As shown in figure 6,

⁴⁷In a traditional fixed-rate mortgage, a borrower compensates a lender or investor for the option to prepay (or refinance) as part of the interest rate charged to borrowers. Borrowers with a 30-year fixed-rate mortgage can experience savings if interest rates fall substantially and they exercise their option to refinance to a lower rate. If interest rates do not fall, or do not rise appreciably enough to cover the amount borrowers compensated lenders or investors for the option to prepay, they would “lose” and the lenders or investors would “win.”

⁴⁸Home equity generally can be accessed through a home equity line of credit or a home equity loan. The costs associated with accessing home equity can include interest expenses and transaction expenses. Additionally, borrowing against home equity would deplete rather than build equity.

according to our analysis, LTV ratios can converge after about 5 years for a 15-year fixed-rate mortgage with a high LTV and a 30-year fixed-rate mortgage with a higher down payment. More specifically, in about 5 years a 15-year fixed-rate loan with an LTV ratio of 103 percent at origination will reach the same LTV ratio as a 30-year fixed-rate loan with an LTV ratio of 80 percent at origination. Borrowers under both mortgage scenarios would have accrued close to 30 percent equity in about 5 years, assuming no change in the home's value.

Figure 6: Example of Loan-to-Value (LTV) Ratio over 5.5 years, 15-Year Fixed-Rate Mortgage (103 Percent LTV Ratio at Origination), and 30-year Fixed-Rate Mortgage (80 Percent LTV Ratio at Origination)



Source: GAO analysis. | GAO-18-297

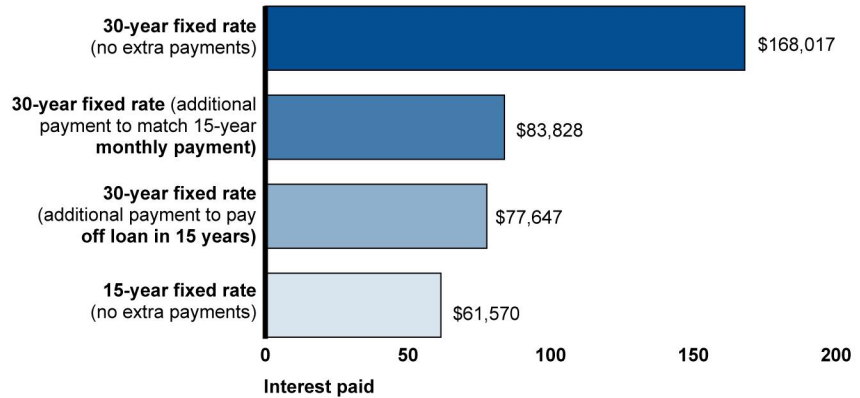
Note: For each scenario the home value is \$250,000, and we assume the home's value remains constant. The 30-year fixed-rate loan has an interest rate of 3.875 percent, and at origination the loan-to-value ratio is 80 percent (for a loan amount of \$200,000). The 15-year fixed-rate loan has an interest rate of 3.125 percent, and at origination the loan-to-value ratio is 103 percent (for a loan amount of \$257,500). Interest rates used for illustration purposes are generally consistent with market rates in September and October 2017.

Lenders and proponents of accelerated equity building with whom we spoke said that having substantial equity in a home provides more options for remediation in the event the homeowner encounters difficulties making mortgage payments. For instance, a lender with whom we spoke said that having more equity in a home provides a borrower with a better opportunity to refinance to get a better interest rate and also extend their

loan term, both of which would lower their monthly payment. Two lenders with whom we spoke also said that accelerated equity-building options can provide financial discipline and serve as a forced savings mechanism by, for example, paying additional principal on the mortgage. In addition, proponents of accelerated equity building have suggested that homeowners with more equity at stake may have more incentive to stay in their home because they have more invested in the home.

In addition to building equity, borrowers with shorter-term mortgages or those opting to make extra payments on 30-year mortgages would reduce overall loan expenditures—relative to the interest they would pay on a 30-year loan (see fig. 7). However, the overall higher mortgage payments can make these options less affordable for lower-income borrowers or limit financial flexibility, as discussed below.

Figure 7: Total Interest Paid on a \$250,000 Mortgage under Different Scenarios



Source: GAO analysis. | GAO-18-297

Note: The interest rate for the 30-year fixed-rate loan scenarios is 3.875 percent, and the interest rate for the 15-year fixed-rate loan is 3.125 percent. Interest rates used for illustration purposes are generally consistent with market rates in September and October 2017.

Trade-offs for Home Buyers and Homeowners Include Limited Access to Shorter-Term Loans and Reduced Affordability

Limited Access

Accelerated equity-building products, such as a 15-year fixed-rate mortgage or a WBHL, may not be accessible for all borrowers, partly due to tighter credit requirements. Officials from a state housing finance agency told us that minimum credit score requirements for some WBHLs limit access for borrowers with lower credit scores, which includes many lower-income borrowers. For example, a private mortgage insurer for WBHLs requires a minimum credit score of 680, compared with the minimum for the state housing finance agency of 640 for 30-year fixed-rate mortgages. The average score for WBHLs insured by the private mortgage insurer is 749.

Moreover, requirements for a minimum debt-to-income ratio may also limit lower-income borrowers' ability to access WBHLs or 15-year fixed-rate loans. According to a private mortgage insurer, the average income of borrowers for WBHLs it insures is 177 percent of county median income. As mentioned previously, the QM rule generally requires home buyers to have a debt-to-income ratio of 43 percent or less. As we previously reported, although QM regulations are not expected to significantly affect the overall mortgage market, some researchers have estimated that QM regulations could adversely affect certain lower-income home buyers, particularly those living in high-cost areas.⁴⁹ The higher monthly payments of shorter-term loans can result in debt-to-income ratios significantly above the 43 percent limit, as illustrated in table 3.

⁴⁹See [GAO-15-185](#).

Table 3: Examples of Different Mortgages' Effects on Debt-to-Income Ratio

Mortgage type	Loan amount (dollars)	Interest rate (percent)	Monthly payment amount (dollars)	Gross monthly income (dollars)	Debt-to-income ratio (percent)
30-year fixed rate	200,000	3.875	940	2,187	43
20-year fixed rate	200,000	3.50	1,160	2,187	53
15-year fixed rate	200,000	3.125	1,393	2,187	64

Source: GAO analysis. | GAO-18-297

Note: Monthly payment amount does not include taxes, mortgage insurance, homeowner's insurance, or any condominium or association fees. For purposes of this illustration, the debt-to-income ratio does not include any other debt, such as for an automobile or student loan. Interest rates used for illustration purposes are generally consistent with market rates in September and October 2017. Monthly payment amount and gross monthly income are rounded to the nearest dollar.

In areas where housing costs are high, research suggests that lower-income home buyers are more likely to have high debt-to-income ratios. Higher monthly payments for accelerated equity-building mortgages could make some of these borrowers ineligible for those types of loans, or essentially limit those borrowers to significantly smaller loans, as discussed in the following section.

Reduced Affordability and Financial Flexibility

The biggest barrier to homeownership is affordability, which includes having enough savings for a down payment as well as sufficient monthly income to sustain a mortgage, according to agency officials and stakeholders with whom we spoke. For example, 53 percent of adults were unable to save any money in 2016 and 13 percent of adults had difficulty paying their bills at least once in 2016 because of income volatility, according to the Federal Reserve.⁵⁰ For the same loan amount, the monthly payments of a 15-year mortgage can be more than 40 percent greater than the monthly payments of a 30-year mortgage,

⁵⁰Board of Governors of the Federal Reserve System, *Report on the Economic Well-Being of U.S. Households in 2016* (Washington, D.C.: May 2017). The report also notes that income volatility disproportionately affects black and Hispanic individuals.

depending upon the current market interest rates.⁵¹ The higher monthly payments may make shorter-term loans unaffordable for many low-income home buyers or leave borrowers with less discretionary income to cover other obligations, including paying off higher-interest debt, putting some of them at greater risk of defaulting on monthly mortgage payments.

The higher monthly payments of shorter-term loans thus reduce homeowners' financial flexibility. In contrast, experts and stakeholders highlighted the greater flexibility a 30-year mortgage affords homeowners, including for situations where individuals may experience instability or fluctuations in their income. For example, though some home buyers may have adequate income over the course of a year to afford monthly mortgage payments, fluctuations in monthly income can affect a homeowner's ability to sustain a higher monthly mortgage payment. However, a 30-year fixed-rate mortgage may enable a homeowner to make additional payments to build equity faster and still maintain a lower monthly payment than a 15-year mortgage.⁵² As shown in the scenario in figure 7 above, a homeowner could pay off a 30-year mortgage in 15 years by making additional monthly payments.

Reduced Home Purchasing Power

The higher monthly payment required of a shorter-term mortgage can reduce a home buyer's purchasing power. As seen in table 4, a longer-term mortgage allows for a substantially higher home purchase price for the same monthly payment for principal and interest.

⁵¹Proponents of WBHLs said that a 20-year WBHL can have similar monthly payments to a 30-year fixed-rate mortgage. For the purchase of the same home, a home buyer would have to buy down the interest rate on the 20-year WBHL to less than 1 percent to have the same monthly payment (excluding mortgage insurance costs) compared to a conventional 30-year fixed-rate mortgage with 97 percent LTV. At current rates and assuming the cost of buying down the interest rate 0.25 percent is 1 point (the cost for one lender in our study), a homeowner would have to pay more than 8 points on WBHLs to have the same monthly payment as the 30-year fixed-rate mortgage, or purchase a less expensive home. For example, for the purchase of a \$250,000 home, 8 buy-down points would cost a home buyer \$20,000.

⁵²Prepayment penalties generally do not apply if a homeowner makes additional mortgage payments to be applied to the principal balance. Individual lenders could confirm if any prepayment penalties would apply for additional mortgage payments.

Table 4: Example of Different Mortgage Type’s Effect on Purchasing Power

Mortgage type	Monthly payment amount (dollars)	Interest rate (percent)	Loan amount (dollars)	Loan-to-value ratio (percent)	Home purchase price (dollars)	Change in purchasing power (percent)
30-year fixed rate	1,000	3.875	212,659	97	219,236	-
20-year fixed rate	1,000	3.500	172,426	97	177,759	-19 (decrease)
15-year fixed rate	1,000	3.125	143,552	100	143,552	-35 (decrease)

Source: GAO analysis. | GAO-18-297

Note: Monthly payment amount does not include taxes, mortgage insurance, homeowner’s insurance, or any condominium or association fees. Interest rates used for illustration purposes are generally consistent with market rates in September and October 2017.

Borrowers are likely to qualify for smaller loan amounts for shorter-term mortgages because of the effect of the higher monthly payments (of shorter-term mortgages) on their debt-to-income ratio. Some proponents of accelerated equity-building loans advertise that the monthly payment amounts of shorter-term and 30-year fixed-rate mortgages are comparable, with minimal loss in purchasing power. This might be the case if the loan amount for the shorter-term mortgage were less than the loan for the 30-year fixed-rate mortgage, as illustrated in table 4. However, determining loss of purchasing power based on the monthly payments of two mortgages with different loan amounts may not provide an equivalent comparison.

Potential Lower Lifetime Wealth

Shorter-term mortgages can reduce lifetime wealth. This is because the difference between the higher monthly payments and the monthly payments of a 30-year mortgage could have been invested elsewhere to produce a higher return—assuming an individual has the financial knowledge and discipline to invest the funds.⁵³ The higher required monthly payments of a 15-year mortgage can ensure a larger investment in home equity. However, some research suggests that, depending on market conditions and the risk appetite of a homeowner, purchasing a house with a 30-year fixed-rate mortgage can provide a higher lifetime return on investment compared to a 15-year fixed-rate mortgage because

⁵³Proponents of accelerated equity-building products suggest that more lifetime wealth can be accumulated through shorter-term mortgage products. However, we believe that such a comparison should include the scenario of homeowners investing the savings resulting from the difference between the monthly payment amounts of a shorter-term mortgage and a 30-year fixed-rate mortgage—a key assumption in estimating potential lifetime wealth accumulation with a 30-year fixed-rate mortgage.

the difference between the monthly payments can be invested at a rate of return that likely would be higher than the difference in mortgage interest rates between 30- and 15-year mortgages.⁵⁴

In addition, homeownership may not always be the most effective means of building household wealth. For example, in some circumstances individuals may achieve greater household wealth through renting rather than buying a home. Individuals for whom rental payments would be less than mortgage payments for a comparable home can invest the difference and build greater wealth—if the return on their investment exceeded the return associated with the appreciation of the value of a home.⁵⁵ However, factors such as an individual’s financial literacy and risk tolerance, and overall market conditions can affect the success of any investment strategy, including investing in a home or in any alternatives.

Trade-offs for Lenders Include Market Uncertainty

For lenders, shorter-term mortgages generally reduce credit risk—the likelihood of loss with default—compared with longer-term loans. In addition, lenders with whom we spoke said that borrowers choosing shorter-term loans (such as WBHLs) generally have good credit and high incomes, further reducing credit and default risk. However, market uncertainties related to the lack of a secondary market and performance data could limit lenders’ willingness to offer accelerated equity-building products.

Lack of a Secondary Market

Products like WBHLs are not currently eligible for purchase by Fannie Mae and Freddie Mac. According to Fannie Mae and Freddie Mac, WBHLs are not currently traded in the secondary mortgage market

⁵⁴See, for example, John R. Aulerich, “Effect on Net Worth of 15- and 30-Year Mortgage Term,” *Financial Counseling and Planning*, vol. 15, no. 2 (2004). The comparison also assumes that a homeowner consistently invests the difference in monthly payments between a 30-year mortgage and a 15-year mortgage over the life of the loan.

⁵⁵See, for example, Federal Reserve Bank of Kansas City, *The Effectiveness of Homeownership in Building Household Wealth*, Economic Review (Kansas City, Mo.: 2010).

because of factors such as the low volume of transactions and the high LTV ratio.⁵⁶

Lenders with whom we spoke who offer WBHLs generally have been holding the loans in their own portfolio, which can expose them to credit risk and interest-rate risk.⁵⁷ Some of the lenders told us they only offer adjustable-rate WBHLs, to reduce interest-rate risk.⁵⁸ But homeowners could experience a rate shock when the interest rate adjusts. For example, according to our analysis, if a WBHL for \$250,000 adjusted the interest rate after 7 years, the monthly payment could increase by more than \$200 (13 percent).⁵⁹ The rate adjustment also might increase credit risk for lenders, because some borrowers then might be less able to sustain the monthly payments.⁶⁰

Some lenders may be unwilling to take on these risks, which could limit the availability of accelerated equity-building mortgages in the market. However, lenders with whom we spoke have been exploring options to sell loans that have “seasoned”—for example, after the LTV ratio of the loan reached 97 percent—on the secondary market.

Risk Premium

Mortgages with LTV ratios of 96.5 percent or more (those that have 3.5 percent or less in down payment) also would be ineligible for some

⁵⁶The maximum LTV ratio for conforming loans eligible for purchase by Fannie Mae and Freddie Mac is 97 percent.

⁵⁷Credit risk is the risk that a borrower will default on a mortgage by failing to make timely payments. Credit risk can vary based on borrower characteristics and the terms of the mortgage. Interest-rate risk is the risk that an increase in interest rates will reduce the value of a mortgage. Fixed-rate mortgages have greater interest-rate risk for lenders than adjustable-rate mortgages.

⁵⁸For example, if a mortgage lender is funded by short-term deposits, and interest rates rise, the cost of the lender’s funds increase. If the lender had previously made a long-term fixed-rate mortgage at a lower rate, the difference between the interest the lender receives from the mortgage payments and the interest the lender pays its depositors decreases. As a result of the interest spread narrowing, the lender’s profits would decrease.

⁵⁹The increase may be less if the borrower was also paying mortgage insurance and mortgage insurance was no longer required after the initial period.

⁶⁰For this comparison, the interest rate for the first 7 years is 1.75 percent. The interest rate for the final 8 years is 5.00 percent. This scenario does not include taxes and insurance costs, which would make monthly payments higher. If mortgage insurance was no longer required after the initial period, the increase in monthly payment could be less.

federal guarantee programs.⁶¹ Generally, high-LTV loans have a greater risk of default, and lenders with whom we spoke who offer WBHLs all require private mortgage insurance for those loans. Lenders and private mortgage insurers may price WBHLs at a premium—for example, through higher fees, interest rates, or insurance premiums—to account for the risk, which may add to the costs of monthly payments and make these mortgages less affordable for some borrowers.

Lack of Performance Data

Because WBHLs are new (introduced in 2014) to the marketplace, there are not enough data on loan performance to adequately assess payment delinquency and default risk. The number of lenders currently offering WBHLs is limited. According to the American Enterprise Institute, about \$100 million of WBHLs have been originated since 2014. Mortgage insurers with whom we spoke provided a similar estimate.

Lenders told us that the performance of their WBHLs is strong but may not offer a meaningful indicator of future performance if the loans were to become more widely available (because WBHLs currently tend to attract less-risky borrowers). According to lenders and housing experts with whom we spoke, performance data on similar loans, such as fixed-rate 15-year mortgages, cannot be readily used to project performance for WBHLs because WBHLs are not strictly comparable (they have higher LTV ratios).

Other Trade-offs Include Limited Promotion and Adoption Due to Product Complexity

Stakeholders, including agency officials, also identified key trade-offs and considerations in introducing new products and mechanisms to accelerate equity building, such as how product complexity and reduced market liquidity could affect the success and the costs to borrowers of the products or mechanisms. These trade-offs and considerations apply to proposed products such as the Fixed-COFI as well as to actions or mechanisms for accelerating equity building, such as making mortgage payments on a biweekly basis and paying off a percentage of the loan principal in a shorter term (such as financing 20 percent of the principal in 5 years).

⁶¹The maximum LTV ratio for FHA loans is 96.5 percent. See 12 U.S.C. § 1709(b)(9)(A).

Some stakeholders said that new products that have unfamiliar or complex features, such as the Fixed-COFI mortgage's underlying adjustable rate and equity savings account, could be difficult for lenders, borrowers, and investors to understand, which could limit the promotion and adoption of such products. In addition, administering new products or mechanisms to accelerate equity building could have additional complications, such as how to schedule and credit biweekly payments. For example, lenders or servicers may not have a structure in place to properly credit additional payments on a biweekly basis and may hold the extra payment until the end of the month, negating the accelerated equity-building effect of the extra payment. Moreover, a few stakeholders said that lenders or servicers may charge additional fees for processing biweekly mortgage payments.

Stakeholders and agency officials also noted that any new mortgage product would not (at least initially) be eligible for securitizing and trading in the secondary market. As a result, a new product would not be as liquid as current products securitized and sold in the secondary market by Fannie Mae or Freddie Mac, such as 30-year fixed-rate mortgages. Because of the lack of market liquidity for new products, lenders may charge a premium, making the products less affordable for lower-income borrowers.

Agency Comments

We provided a draft of this report to HUD, FHFA—and FHFA also provided copies to Fannie Mae and Freddie Mac, FHLBanks, Agriculture, and VA for their review and comment. HUD, FHFA, FHLBanks, and Agriculture provided technical comments on the report draft, which we incorporated where appropriate.

We are sending copies of this report to appropriate congressional committees, the Secretary of HUD, the Director of FHFA—who provided copies to the President and Chief Executive Officer of Fannie Mae and the Chief Executive Officer of Freddie Mac, the President of the FHLBank of Des Moines (coordinating for the FHLBanks), the Secretary of Agriculture, the Secretary of Veterans Affairs, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-8678 or GarciaDiazD@gao.gov. Contact points for our

Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Daniel Garcia-Diaz". The signature is fluid and cursive, with a long horizontal stroke at the bottom.

Daniel Garcia-Diaz
Director, Financial Markets and Community Investment

Appendix I: Objectives, Scope, and Methodology

This report describes (1) how federal homeownership assistance programs affect home equity building, and (2) options, including private-sector mortgage products, through which borrowers can accelerate home equity building and the trade-offs of these options for both borrowers and lenders. We define accelerated equity building as any mortgage product or feature that accelerates the pace of principal reduction on a mortgage debt, relative to a 30-year fixed-rate mortgage. We used the 30-year fixed-rate mortgage as our point of comparison because it is the most common type of mortgage product and represents the market standard.

To describe how federal homeownership assistance programs affect home equity building, we reviewed relevant federal statutes, regulations, and agency program policies and guides and other resources to identify relevant homeownership assistance programs from the Departments of Housing and Urban Development (HUD), Veterans Affairs (VA), and Agriculture (USDA); and Fannie Mae, Freddie Mac, and the Federal Home Loan Banks (collectively, the enterprises). We reviewed prior GAO reports on federal homeownership assistance programs and the U.S. housing finance system.¹ We also reviewed relevant academic papers and literature discussing homeownership and equity building.

We interviewed agency and enterprise officials to discuss the relevant homeownership assistance programs and policy goals, including the extent to which products or mechanisms used in the programs affect or accelerate home equity building, and the role of the secondary mortgage market in providing market liquidity for new mortgage products. In addition to federal agencies and the enterprises, we interviewed officials from two state housing finance agencies. Some stakeholders we interviewed recommended the two state housing agencies because the

¹GAO, *Housing Assistance: Opportunities Exist to Increase Collaboration and Consider Consolidation*, [GAO-12-554](#) (Washington, D.C.: Aug. 16, 2012); *Housing Finance System: A Framework for Assessing Potential Changes*, [GAO-15-131](#) (Washington, D.C.: Oct. 7, 2014); and *Mortgage Reforms: Actions Needed to Help Assess Effects of New Regulations*, [GAO-15-185](#) (Washington, D.C.: June 25, 2015).

agencies likely placed a greater focus on accelerating home equity building.

To describe the options (or mortgage products) borrowers have to accelerate home equity building, including any trade-offs, we used databases such as ProQuest and searched for and reviewed papers and literature published from 2007 to 2017 by individuals who discussed options to accelerate home equity building. We also attended two housing conferences and met with housing experts and stakeholders from academia, housing advocacy organizations, and industry, including mortgage lenders and insurers, selected because they made proposals to increase homeownership or build home equity faster, wrote on homeownership issues, were recommended by government officials, or were involved in providing mortgage products designed to accelerate equity building. From interviews with industry stakeholders and housing conferences we attended, we identified two products: (1) the Wealth Building Home Loan (WBHL), which has been introduced in the marketplace, and (2) the Fixed-Payment Cost-of-Funds Index (COFI) Mortgage, which has been proposed but is not currently offered by any lenders.

We reviewed and analyzed relevant academic papers and literature on the advantages and trade-offs of options to accelerate equity building. We also conducted interviews with academics, experts, industry stakeholders (including mortgage lenders and insurers), and organizations to discuss advantages and trade-offs of accelerated equity-building products, and the role of the secondary market in providing market liquidity for new mortgage products. We selected academics, experts, and industry stakeholders and organizations who proposed accelerated equity-building mortgage products, had written on homeownership and wealth building issues, or whom officials of federal agencies and the enterprises or our other interviewees recommended. We also attended housing conferences, which provided additional suggestions for publications to review and academics and stakeholders to interview.

Furthermore, to illustrate methods to accelerate home equity building and compare the effects of different mortgage products on home equity building, we developed hypothetical mortgage scenarios. For the mortgage scenarios, we used Excel's payment function to calculate the amortization schedule of the mortgages in our hypothetical scenarios. The payment function is a standard formula that calculates monthly payment schedules based on inputting interest rate, number of payment periods over the life of a mortgage, and the present value of the

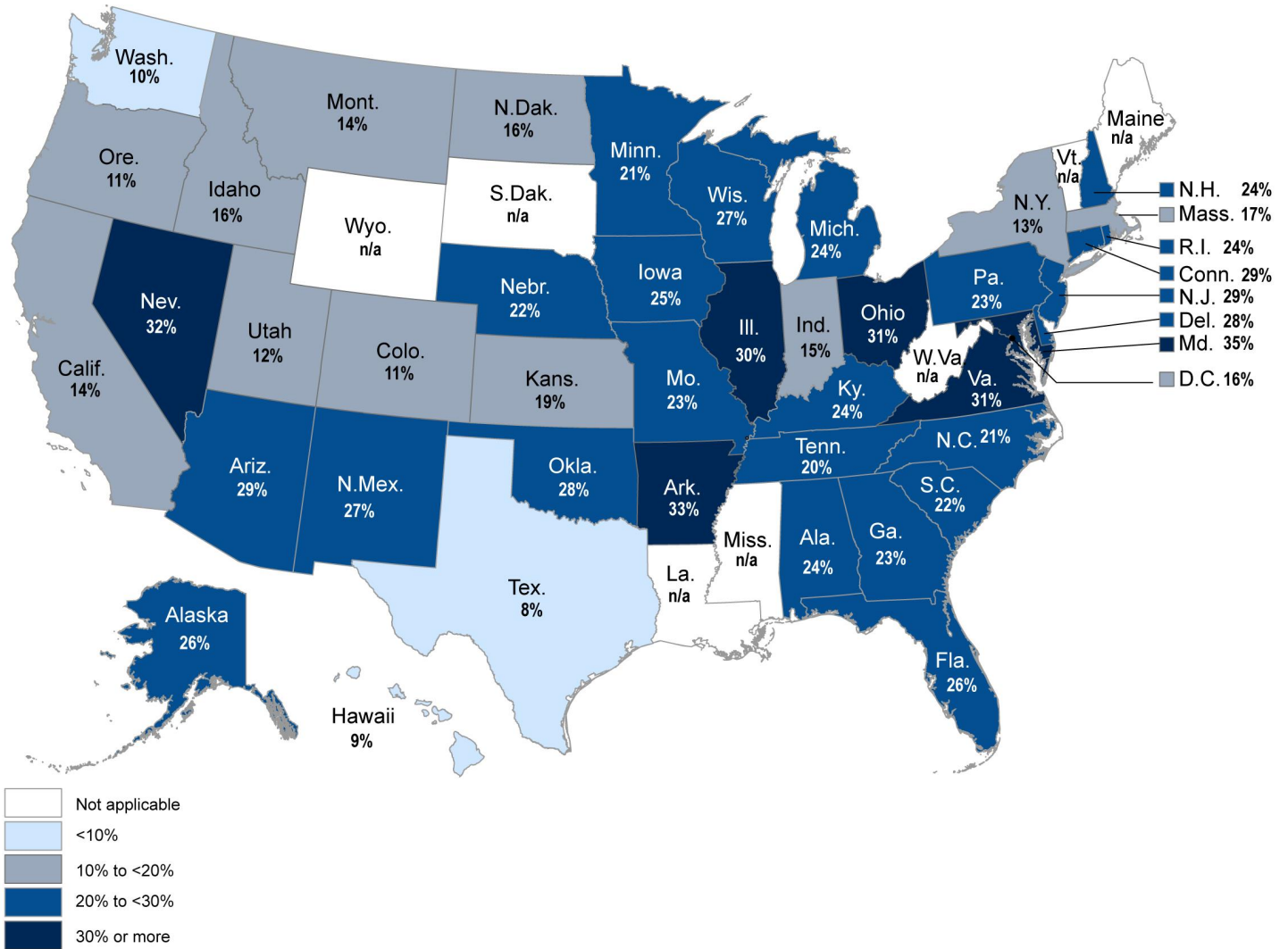
mortgage. The scenarios we developed were only several possible scenarios out of the many that we could have chosen. We identified specific mortgage features in papers and literature by individuals who proposed mortgage products designed to accelerate home equity building. For illustration purposes, we used an average of the monthly interest rates published in Freddie Mac's Primary Mortgage Market Survey for September and October 2017, as well as current market rates advertised by private mortgage lenders, to inform our selection of interest rates for our scenarios.

We conducted this performance audit from January 2017 to March 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: CoreLogic Home Equity Data, by State

This appendix provides regional data on equity building that we obtained from CoreLogic. CoreLogic is a publicly traded company that provides data, analytics, technology, and services related to the mortgage industry, among other things. The data in figure 8 show the percentage of homeowners in each state who have 20 percent equity or less in their homes. The level of home equity can be affected by a number of factors, including the age of the loan, the amount of principal paid down, and home market values. We did not assess the reliability of CoreLogic's data.

Figure 8: Percentage of Residents with Less Than 20 Percent in Home Equity, by State, as of First Quarter 2017



Source: GAO analysis of CoreLogic data; Map Resources (map). | GAO-18-297

Note: According to CoreLogic, Louisiana, Maine, Mississippi, South Dakota, Vermont, West Virginia, and Wyoming had insufficient data to determine the percentage of residents in each state who had less than 20 percent in home equity.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Daniel Garcia-Diaz, (202) 512-8678 or garciadiazd@gao.gov

Staff Acknowledgments

In addition to the contact named above, Andrew Pauline (Assistant Director), Kun-Fang Lee (Analyst in Charge), Steve Brown, Raheem Hanifa, Jeff Harner, Jill Lacey, Barbara Roesmann, Jessica Sandler, MaryLynn Sergent, Jena Sinkfield, Anne Stevens, and Jim Vitarello made key contributions to this report.

Appendix IV: Accessible Data

Data Tables

Data Table for Principal Reduction Pace: 15-Year Fixed-Rate Wealth Building Home Loan (WBHL) versus 30-Year Fixed-Rate Loan

\$250,000 Home

Year	15-year WBHL, 0% down payment, 2.5% interest rate, \$1,667 monthly payment	30-year fixed-rate loan, 10% down payment, 3.875% interest rate, \$1,058 monthly payment
0	0% paid off	10% paid off
5	29% paid off	19% paid off
10	62% paid off	29% paid off
15	100% paid off	42% paid off
20		58% paid off
30		100% paid off

Data Table for Figure 1: Example of the Allocation of Monthly Mortgage Payment to Interest and Principal, for a Selected 30-Year Fixed-Rate Mortgage

Months	Principal	Interest
0	331.47	726.56
1	332.54	725.49
2	333.62	724.42
3	334.69	723.34
4	335.77	722.26
5	336.86	721.18
6	337.95	720.09
7	339.04	719
8	340.13	717.9
9	341.23	716.8
10	342.33	715.7
11	343.44	714.6
12	344.55	713.49
13	345.66	712.37
14	346.77	711.26

Appendix IV: Accessible Data

Months	Principal	Interest
15	347.89	710.14
16	349.02	709.02
17	350.15	707.89
18	351.28	706.76
19	352.41	705.62
20	353.55	704.49
21	354.69	703.34
22	355.84	702.2
23	356.98	701.05
24	358.14	699.9
25	359.29	698.74
26	360.45	697.58
27	361.62	696.42
28	362.79	695.25
29	363.96	694.08
30	365.13	692.9
31	366.31	691.72
32	367.49	690.54
33	368.68	689.35
34	369.87	688.16
35	371.07	686.97
36	372.26	685.77
37	373.47	684.57
38	374.67	683.36
39	375.88	682.15
40	377.1	680.94
41	378.31	679.72
42	379.53	678.5
43	380.76	677.27
44	381.99	676.04
45	383.22	674.81
46	384.46	673.57
47	385.7	672.33
48	386.95	671.09
49	388.2	669.84
50	389.45	668.58
51	390.71	667.32

Appendix IV: Accessible Data

Months	Principal	Interest
52	391.97	666.06
53	393.24	664.8
54	394.51	663.53
55	395.78	662.25
56	397.06	660.98
57	398.34	659.69
58	399.63	658.41
59	400.92	657.12
60	402.21	655.82
61	403.51	654.52
62	404.81	653.22
63	406.12	651.91
64	407.43	650.6
65	408.75	649.29
66	410.07	647.97
67	411.39	646.64
68	412.72	645.31
69	414.05	643.98
70	415.39	642.64
71	416.73	641.3
72	418.08	639.96
73	419.43	638.61
74	420.78	637.25
75	422.14	635.89
76	423.5	634.53
77	424.87	633.16
78	426.24	631.79
79	427.62	630.41
80	429	629.03
81	430.39	627.65
82	431.78	626.26
83	433.17	624.86
84	434.57	623.47
85	435.97	622.06
86	437.38	620.65
87	438.79	619.24
88	440.21	617.82

Appendix IV: Accessible Data

Months	Principal	Interest
89	441.63	616.4
90	443.06	614.98
91	444.49	613.55
92	445.92	612.11
93	447.36	610.67
94	448.81	609.23
95	450.26	607.78
96	451.71	606.32
97	453.17	604.86
98	454.63	603.4
99	456.1	601.93
100	457.57	600.46
101	459.05	598.98
102	460.53	597.5
103	462.02	596.01
104	463.51	594.52
105	465.01	593.02
106	466.51	591.52
107	468.02	590.02
108	469.53	588.51
109	471.04	586.99
110	472.57	585.47
111	474.09	583.94
112	475.62	582.41
113	477.16	580.88
114	478.7	579.33
115	480.24	577.79
116	481.8	576.24
117	483.35	574.68
118	484.91	573.12
119	486.48	571.56
120	488.05	569.98
121	489.63	568.41
122	491.21	566.83
123	492.79	565.24
124	494.38	563.65
125	495.98	562.05

Appendix IV: Accessible Data

Months	Principal	Interest
126	497.58	560.45
127	499.19	558.85
128	500.8	557.23
129	502.42	555.62
130	504.04	553.99
131	505.67	552.37
132	507.3	550.73
133	508.94	549.09
134	510.58	547.45
135	512.23	545.8
136	513.88	544.15
137	515.54	542.49
138	517.21	540.82
139	518.88	539.15
140	520.55	537.48
141	522.24	535.8
142	523.92	534.11
143	525.61	532.42
144	527.31	530.72
145	529.01	529.02
146	530.72	527.31
147	532.44	525.6
148	534.16	523.88
149	535.88	522.15
150	537.61	520.42
151	539.35	518.69
152	541.09	516.95
153	542.84	515.2
154	544.59	513.44
155	546.35	511.69
156	548.11	509.92
157	549.88	508.15
158	551.66	506.38
159	553.44	504.6
160	555.23	502.81
161	557.02	501.01
162	558.82	499.22

Appendix IV: Accessible Data

Months	Principal	Interest
163	560.62	497.41
164	562.43	495.6
165	564.25	493.79
166	566.07	491.96
167	567.9	490.14
168	569.73	488.3
169	571.57	486.46
170	573.42	484.62
171	575.27	482.76
172	577.13	480.91
173	578.99	479.04
174	580.86	477.17
175	582.74	475.3
176	584.62	473.42
177	586.51	471.53
178	588.4	469.63
179	590.3	467.73
180	592.21	465.83
181	594.12	463.92
182	596.04	462
183	597.96	460.07
184	599.89	458.14
185	601.83	456.2
186	603.77	454.26
187	605.72	452.31
188	607.68	450.36
189	609.64	448.39
190	611.61	446.42
191	613.58	444.45
192	615.57	442.47
193	617.55	440.48
194	619.55	438.49
195	621.55	436.49
196	623.56	434.48
197	625.57	432.46
198	627.59	430.44
199	629.62	428.42

Appendix IV: Accessible Data

Months	Principal	Interest
200	631.65	426.39
201	633.69	424.35
202	635.73	422.3
203	637.79	420.25
204	639.85	418.19
205	641.91	416.12
206	643.99	414.05
207	646.07	411.97
208	648.15	409.88
209	650.24	407.79
210	652.34	405.69
211	654.45	403.58
212	656.56	401.47
213	658.68	399.35
214	660.81	397.22
215	662.95	395.09
216	665.09	392.95
217	667.23	390.8
218	669.39	388.65
219	671.55	386.48
220	673.72	384.32
221	675.89	382.14
222	678.08	379.96
223	680.27	377.77
224	682.46	375.57
225	684.67	373.37
226	686.88	371.16
227	689.1	368.94
228	691.32	366.71
229	693.55	364.48
230	695.79	362.24
231	698.04	359.99
232	700.29	357.74
233	702.56	355.48
234	704.82	353.21
235	707.1	350.93
236	709.38	348.65

Appendix IV: Accessible Data

Months	Principal	Interest
237	711.67	346.36
238	713.97	344.06
239	716.28	341.76
240	718.59	339.44
241	720.91	337.12
242	723.24	334.79
243	725.57	332.46
244	727.92	330.12
245	730.27	327.77
246	732.63	325.41
247	734.99	323.04
248	737.37	320.67
249	739.75	318.29
250	742.13	315.9
251	744.53	313.5
252	746.94	311.1
253	749.35	308.69
254	751.77	306.27
255	754.2	303.84
256	756.63	301.4
257	759.07	298.96
258	761.52	296.51
259	763.98	294.05
260	766.45	291.58
261	768.93	289.11
262	771.41	286.62
263	773.9	284.13
264	776.4	281.63
265	778.91	279.13
266	781.42	276.61
267	783.94	274.09
268	786.48	271.56
269	789.02	269.02
270	791.56	266.47
271	794.12	263.91
272	796.68	261.35
273	799.26	258.78

Appendix IV: Accessible Data

Months	Principal	Interest
274	801.84	256.2
275	804.43	253.61
276	807.02	251.01
277	809.63	248.4
278	812.25	245.79
279	814.87	243.17
280	817.5	240.53
281	820.14	237.89
282	822.79	235.25
283	825.44	232.59
284	828.11	229.92
285	830.78	227.25
286	833.47	224.57
287	836.16	221.88
288	838.86	219.18
289	841.57	216.47
290	844.28	213.75
291	847.01	211.02
292	849.75	208.29
293	852.49	205.54
294	855.24	202.79
295	858	200.03
296	860.78	197.26
297	863.55	194.48
298	866.34	191.69
299	869.14	188.89
300	871.95	186.09
301	874.76	183.27
302	877.59	180.45
303	880.42	177.61
304	883.26	174.77
305	886.12	171.92
306	888.98	169.05
307	891.85	166.18
308	894.73	163.3
309	897.62	160.42
310	900.52	157.52

Appendix IV: Accessible Data

Months	Principal	Interest
311	903.42	154.61
312	906.34	151.69
313	909.27	148.76
314	912.21	145.83
315	915.15	142.88
316	918.11	139.93
317	921.07	136.96
318	924.04	133.99
319	927.03	131
320	930.02	128.01
321	933.03	125.01
322	936.04	121.99
323	939.06	118.97
324	942.09	115.94
325	945.14	112.9
326	948.19	109.85
327	951.25	106.78
328	954.32	103.71
329	957.4	100.63
330	960.49	97.54
331	963.6	94.44
332	966.71	91.33
333	969.83	88.2
334	972.96	85.07
335	976.1	81.93
336	979.26	78.78
337	982.42	75.62
338	985.59	72.44
339	988.77	69.26
340	991.97	66.07
341	995.17	62.87
342	998.38	59.65
343	1001.61	56.43
344	1004.84	53.19
345	1008.08	49.95
346	1011.34	46.69
347	1014.61	43.43

Months	Principal	Interest
348	1017.88	40.15
349	1021.17	36.86
350	1024.47	33.57
351	1027.77	30.26
352	1031.09	26.94
353	1034.42	23.61
354	1037.76	20.27
355	1041.11	16.92
356	1044.48	13.56
357	1047.85	10.18
358	1051.23	6.8
359	1054.63	3.41
360	1045.09	3.31

Data Table for Figure 2: Example of Home Equity Built over Time for a \$225,000, 30-year Fixed-Rate Mortgage: Required Payment versus Additional \$100 Payment Each Month

Loan period (years)	30-year	15-year
0	25	25
1	29.108	30.3229
2	33.5168	35.8517
3	38.1117	41.5942
4	42.8938	47.5588
5	47.8707	53.7541
6	53.0504	60.1889
7	58.4412	66.8725
8	64.0515	73.8146
9	69.8904	81.0251
10	75.9672	88.5145
11	82.2916	96.2934
12	88.8737	104.373
13	95.7239	112.765
14	102.853	121.482
15	110.273	130.536
16	117.995	139.94
17	126.032	149.707
18	134.396	159.852

Loan period (years)	30-year	15-year
19	143.101	170.39
20	152.16	181.335
21	161.589	192.703
22	171.401	204.511
23	181.614	216.775
24	192.243	229.514
25	203.304	242.745
26	214.816	256.488
27	226.798	
28	239.267	
29	252.245	
30	265.751	

Data Table for Figure 3: Examples of the Effects of Select Refinancing Scenarios on Home Equity

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
0	7.5	7.5	7.5
1	7.85725	7.8494	7.8494
2	8.21566	8.19996	8.19996
3	8.57522	8.55169	8.55169
4	8.93594	8.9046	8.9046
5	9.29783	9.25868	9.25868
6	9.66089	9.61394	9.61394
7	10.0251	9.97039	9.97039
8	10.3905	10.328	10.328
9	10.7571	10.6868	10.6868
10	11.124	11.0469	11.0469
11	11.4938	11.4081	11.4081
12	11.864	11.7705	11.7705
13	12.2353	12.1342	12.1342
14	12.6079	12.499	12.499
15	12.9816	12.8651	12.8651
16	13.3566	13.2323	13.2323
17	13.7327	13.6008	13.6008
18	14.1101	13.9706	13.9706
19	14.4887	14.3416	14.3416

Appendix IV: Accessible Data

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
20	14.8685	14.7137	14.7137
21	15.2496	15.0872	15.0872
22	15.6319	15.4619	15.4619
23	16.0154	15.8378	15.8378
24	16.4001	16.215	16.215
25	16.7861	16.5935	16.5935
26	17.1733	16.9732	16.9732
27	17.5618	17.3542	17.3542
28	17.9516	17.7364	17.7364
29	18.3426	18.1199	18.1199
30	18.7349	18.5047	18.5047
31	19.1284	18.8908	18.8908
32	19.5232	19.2782	19.2782
33	19.9193	19.6668	19.6668
34	20.3166	20.0568	20.0568
35	20.7153	20.448	20.448
36	21.1152	20.8406	20.8406
37	21.5164	21.2345	21.2345
38	21.9189	21.6296	21.6296
39	22.3227	22.0261	22.0261
40	22.7278	22.424	22.424
41	23.1343	22.8231	22.8231
42	23.542	23.2236	23.2236
43	23.9511	23.6254	23.6254
44	24.3614	24.0285	24.0285
45	24.7731	24.433	24.433
46	25.1862	24.8389	24.8389
47	25.6005	25.2461	25.2461
48	26.0162	25.6546	25.6546
49	26.4333	26.0645	26.0645
50	26.8517	26.4758	26.4758
51	27.2714	26.8885	26.8885
52	27.6925	27.3025	27.3025
53	28.115	27.7179	27.7179
54	28.5388	28.1347	28.1347
55	28.964	28.5529	28.5529

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
56	29.3905	28.9724	28.9724
57	29.8185	29.3934	29.3934
58	30.2478	29.8158	29.8158
59	30.6785	30.2396	30.2396
60	31.1106	30.6648	30.6648
61	32.0654	6.01682	31.0914
62	33.0226	6.37004	31.5194
63	33.9824	6.72443	31.9489
64	34.9447	7.08001	32.3798
65	35.9094	7.43677	32.8121
66	36.8767	7.79472	33.2459
67	37.8465	8.15386	33.6811
68	38.8188	8.5142	34.1178
69	39.7937	8.87574	34.5559
70	40.7711	9.23849	34.9955
71	41.751	9.60244	35.4365
72	42.7335	9.96761	35.8791
73	43.7185	10.334	36.3231
74	44.7062	10.7016	36.7685
75	45.6963	11.0704	37.2155
76	46.6891	11.4405	37.664
77	47.6844	11.8118	38.1139
78	48.6824	12.1843	38.5653
79	49.6824	12.5581	39.0183
80	50.6861	12.9331	39.4727
81	51.6918	13.3094	39.9287
82	52.7002	13.6869	40.3862
83	53.7112	14.0657	40.8452
84	54.7248	14.4458	41.3058
85	55.7411	14.8271	41.7679
86	56.76	15.2097	42.2315
87	57.7816	15.5935	42.6967
88	58.8059	15.9786	43.1634
89	59.8327	16.3651	43.6317
90	60.8623	16.7528	44.1015
91	61.8946	17.1418	44.5729

Appendix IV: Accessible Data

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
92	62.9295	17.5321	45.0459
93	63.9672	17.9237	45.5204
94	65.0075	18.3166	45.9966
95	66.0506	18.7108	46.4743
96	67.0963	19.1063	46.9536
97	68.1448	19.5032	47.4345
98	69.1961	19.9014	47.917
99	70.25	20.3009	48.4011
100	71.3067	20.7017	48.8869
101	72.3662	21.1038	49.3742
102	73.4284	21.5073	49.8632
103	74.4934	21.9122	50.3538
104	75.5611	22.3184	50.8607
105	76.6317	22.726	51.34
106	77.705	23.1349	51.8355
107	78.7811	23.5452	52.3327
108	79.86	23.9568	52.8315
109	80.9418	24.3698	53.332
110	82.0263	24.7842	53.8342
111	83.1137	25.2	54.338
112	84.2039	25.6171	54.8436
113	85.2969	26.0357	55.3508
114	86.3928	26.4556	55.8597
115	87.4916	26.877	56.3703
116	88.5932	27.2997	56.8826
117	89.6976	27.7239	57.3966
118	90.805	28.1495	57.9123
119	91.9152	28.5765	58.4297
120	93.0284	29.0049	58.9489
121	94.1444	29.4347	59.4698
122	95.2633	29.866	59.9924
123	96.3851	30.2987	60.5168
124	97.5099	30.7329	61.0429
125	98.6376	31.1685	61.5708
126	99.7682	31.6055	62.1004
127	100.902	32.044	62.6318

Appendix IV: Accessible Data

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
128	102.038	32.484	63.165
129	103.178	32.9254	63.7
130	104.32	33.3684	64.2367
131	105.466	33.8127	64.7752
132	106.614	34.2586	65.3155
133	107.766	34.706	65.8576
134	108.92	35.1548	66.4016
135	110.077	35.6052	66.9473
136	111.238	36.057	67.4949
137	112.401	36.5104	68.0442
138	113.568	36.9652	68.5955
139	114.737	37.4216	69.1485
140	115.91	37.8795	69.7034
141	117.085	38.3389	70.2601
142	118.264	38.7999	70.8187
143	119.446	39.2624	71.3792
144	120.631	39.7264	71.9415
145	121.819	40.192	72.5057
146	123.01	40.6591	73.0718
147	124.204	41.1278	73.6398
148	125.401	41.5981	74.2096
149	126.601	42.0699	74.7814
150	127.805	42.5433	75.3551
151	129.011	43.0183	75.9307
152	130.221	43.4948	76.5082
153	131.434	43.9729	77.0876
154	132.65	44.4527	77.6689
155	133.869	44.934	78.2523
156	135.091	45.417	78.8375
157	136.317	45.9015	79.4247
158	137.546	46.3877	80.0138
159	138.778	46.8755	80.6049
160	140.013	47.3649	81.198
161	141.251	47.8559	81.7931
162	142.493	48.3486	82.3901
163	143.738	48.8429	82.9891

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
164	144.986	49.3389	83.5902
165	146.237	49.8365	84.1932
166	147.492	50.3358	84.7983
167	148.75	50.8367	85.4053
168	150.011	51.3394	86.0144
169	151.275	51.8436	86.6255
170	152.543	52.3496	87.2387
171	153.814	52.8573	87.8539
172	155.088	53.3666	88.4711
173	156.366	53.8777	89.0904
174	157.647	54.3904	89.7118
175	158.931	54.9049	90.3352
176	160.219	55.4211	90.9607
177	161.51	55.939	91.5883
178	162.804	56.4586	92.218
179	164.102	56.98	92.8498
180	165.403	57.503	93.4837
181	166.707	58.0279	94.1197
182	168.015	58.5545	94.7579
183	169.327	59.0828	95.3981
184	170.641	59.6129	96.0405
185	171.959	60.1448	96.685
186	173.281	60.6784	97.3317
187	174.606	61.2138	97.9806
188	175.934	61.751	98.6316
189	177.266	62.2901	99.2847
190	178.602	62.8308	99.9401
191	179.941	63.3734	100.598
192	181.283	63.9178	101.257
193	182.629	64.4641	101.919
194	183.978	65.0121	102.583
195	185.331	65.562	103.25
196	186.687	66.1137	103.918
197	188.047	66.6672	104.589
198	189.411	67.2226	105.262
199	190.778	67.7798	105.937

Appendix IV: Accessible Data

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
200	192.148	68.3389	106.615
201	193.523	68.8999	107.295
202	194.9	69.4627	107.977
203	196.282	70.0274	108.661
204	197.667	70.594	109.348
205	199.055	71.1625	110.037
206	200.447	71.7328	110.728
207	201.843	72.3051	111.421
208	203.242	72.8793	112.117
209	204.642	73.4554	112.815
210	206.052	74.0334	113.516
211	207.462	74.6133	114.218
212	208.876	75.1952	114.924
213	210.294	75.779	115.631
214	211.716	76.3648	116.341
215	213.141	76.9525	117.053
216	214.57	77.5421	117.768
217	216.002	78.1338	118.485
218	217.438	78.7274	119.204
219	218.878	79.323	119.926
220	220.322	79.9205	120.65
221	221.77	80.5201	121.376
222	223.221	81.1217	122.105
223	224.676	81.7252	122.837
224	226.135	82.3308	123.571
225	227.597	82.9384	124.307
226	229.064	83.548	125.046
227	230.534	84.1597	125.787
228	232.008	84.7734	126.531
229	233.486	85.3891	127.277
230	234.968	86.0069	128.025
231	236.454	86.6268	128.777
232	237.943	87.2487	129.53
233	239.437	87.8727	130.286
234	240.934	88.4987	131.045
235	242.435	89.1268	131.806

Appendix IV: Accessible Data

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
236	243.94	89.7571	132.57
237	245.449	90.3895	133.336
238	246.962	91.0239	134.105
239	248.479	91.6605	134.877
240	250	92.2992	135.651
241		92.94	136.427
242		93.583	137.206
243		94.2281	137.988
244		94.8753	138.772
245		95.5248	139.559
246		96.1763	140.349
247		96.8301	141.141
248		97.486	141.936
249		98.1441	142.734
250		98.8044	143.534
251		99.4669	144.337
252		100.132	145.142
253		100.799	145.95
254		101.468	146.761
255		102.139	147.575
256		102.813	148.391
257		103.489	149.21
258		104.167	150.032
259		104.847	150.857
260		105.53	151.684
261		106.215	152.514
262		106.902	153.347
263		107.591	154.182
264		108.283	155.02
265		108.977	155.862
266		109.674	156.706
267		110.372	157.552
268		111.074	158.402
269		111.777	159.254
270		112.483	160.109
271		113.191	160.968

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
272		113.901	161.829
273		114.614	162.692
274		115.329	163.559
275		116.047	164.429
276		116.767	165.301
277		117.489	166.177
278		118.214	167.055
279		118.941	167.936
280		119.671	168.82
281		120.403	169.707
282		121.137	170.598
283		121.874	171.491
284		122.614	172.387
285		123.356	173.286
286		124.1	174.188
287		124.847	175.093
288		125.596	176.001
289		126.348	176.912
290		127.102	177.826
291		127.859	178.743
292		128.619	179.663
293		129.38	180.587
294		130.145	181.513
295		130.912	182.442
296		131.681	183.375
297		132.453	184.311
298		133.228	185.249
299		134.005	186.191
300		134.785	187.136
301		135.568	188.084
302		136.353	189.036
303		137.931	190.948
304		138.724	191.909
305		139.519	192.873
306		140.317	193.84
307		141.118	194.811

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
308		141.922	195.785
309		142.728	196.762
310		143.537	197.742
311		144.349	198.725
312		145.163	199.712
313		145.98	200.702
314		146.8	201.696
315		147.622	202.692
316		148.447	203.692
317		149.275	204.696
318		150.106	205.703
319		150.94	206.713
320		151.776	207.726
321		152.615	208.743
322		153.457	209.763
323		154.302	210.786
324		155.149	211.814
325		155.999	212.844
326		156.853	213.878
327		157.709	214.915
328		158.567	215.956
329		159.429	217
330		160.294	218.048
331		161.161	219.099
332		162.032	220.154
333		162.905	221.212
334		163.781	222.274
335		164.66	223.339
336		165.542	224.408
337		166.427	225.481
338		167.315	226.557
339		168.206	227.636
340		169.1	228.719
341		169.997	229.806
342		170.896	230.897
343		171.799	231.991

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Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
344		172.705	233.089
345		173.614	234.19
346		174.526	235.295
347		175.441	236.404
348		176.359	237.516
349		177.28	238.632
350		178.204	239.752
351		179.131	240.875
352		180.061	242.003
353		180.995	243.134
354		181.931	244.269
355		182.871	245.407
356		183.813	246.55
357		184.759	247.696
358		185.708	248.846
359		186.66	250
360		187.616	
361		188.574	
362		189.536	
363		190.501	
364		191.469	
365		192.441	
366		193.415	
367		194.393	
368		195.374	
369		196.359	
370		197.346	
371		198.337	
372		199.332	
373		200.329	
374		201.33	
375		202.334	
376		203.342	
377		204.353	
378		205.367	
379		206.385	

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
380		207.406	
381		208.431	
382		209.459	
383		210.49	
384		211.525	
385		212.563	
386		213.605	
387		214.65	
388		215.699	
389		216.751	
390		217.806	
391		218.865	
392		219.928	
393		220.994	
394		222.064	
395		223.138	
396		224.215	
397		225.295	
398		226.379	
399		227.467	
400		228.558	
401		229.653	
402		230.752	
403		231.855	
404		232.961	
405		234.07	
406		235.184	
407		236.301	
408		237.422	
409		238.546	
410		239.674	
411		240.806	
412		241.942	
413		243.082	
414		244.225	
415		245.373	

Loan term (Months)	No equity cash out refinance to 15-year term with lower rate	\$25,000 equity cash out, refinance to 30-year term	30-year fixed rate, no refinancing
416		246.524	
417		247.679	
418		248.837	
419		250	

Data Table for Figure 4: Comparison of Home Equity Built over Time: 15-year Wealth Building Home Loan (WBHL) versus 15- and 30-Year Fixed-Rate Mortgages
 \$250,000 Home

Year	15-year WBHL, 0% down payment, 2.5% interest rate, \$1,667 monthly payment	15-year fixed-rate loan, 10% down payment, 3.125% interest rate, \$1,567 monthly payment	30-year fixed-rate loan, 10% down payment, 3.875% interest rate, \$1,058 monthly payment
0	0% paid off	10% paid off	10% paid off
3	17% paid off	25% paid off	15% paid off
5	29% paid off	35% paid off	19% paid off
10	62% paid off	65% paid off	29% paid off
15	100% paid off	100% paid off	42% paid off
20			58% paid off
25			77% paid off
30			100% paid off

Data Table for Figure 8: Percentage of Residents with Less Than 20 Percent in Home Equity, by State, as of First Quarter 2017

State	20% Equity or Less
Alabama	24.2%
Alaska	25.9%
Arizona	28.7%
Arkansas	32.6%
California	14.4%
Colorado	11.2%
Connecticut	29.3%
Delaware	27.9%
District of Columbia	15.8%
Florida	26.4%
Georgia	23.1%
Hawaii	8.9%
Idaho	15.7%
Illinois	30.0%
Indiana	15.3%
Iowa	25.2%
Kansas	18.6%
Kentucky	23.5%
Louisiana	N/A
Maine	N/A
Maryland	34.5%
Massachusetts	17.3%
Michigan	24.0%
Minnesota	21.3%
Mississippi	N/A
Missouri	22.7%
Montana	14.3%
Nebraska	22.3%
Nevada	31.5%
New Hampshire	24.2%
New Jersey	28.6%
New Mexico	26.7%
New York	13.3%
North Carolina	20.9%
North Dakota	15.9%

Appendix IV: Accessible Data

State	20% Equity or Less
Ohio	30.6%
Oklahoma	28.3%
Oregon	10.5%
Pennsylvania	22.9%
Rhode Island	23.8%
South Carolina	22.1%
South Dakota	N/A
Tennessee	20.4%
Texas	8.2%
Utah	12.0%
Vermont	N/A
Virginia	31.4%
Washington	9.8%
West Virginia	N/A
Wisconsin	27.3%
Wyoming	N/A

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