



Report to the Chairman, Subcommittee
on Housing and Insurance, Committee
on Financial Services, House of
Representatives

September 2016

HOME MORTGAGE GUARANTEES

Issues to Consider in Evaluating Opportunities to Consolidate Two Overlapping Single- Family Programs

Accessible Version

GAO Highlights

Highlights of [GAO-16-801](#), a report to the Chairman, Subcommittee on Housing and Insurance, Committee on Financial Services, House of Representatives

Why GAO Did This Study

RHS and FHA help borrowers finance homes by guaranteeing single-family mortgage loans made by private lenders, and both operate in rural areas. However, eligibility for RHS guarantees is restricted to RHS-eligible areas and to low- and moderate-income households. A prior GAO report (GAO-12-554) found overlap in the products offered, borrower income levels, and geographic areas served by the two guarantee programs and recommended that RHS and FHA evaluate and report on opportunities for consolidating similar housing programs.

GAO was asked to expand on the analysis in its 2012 report. This report compares the characteristics, performance, and borrower costs of RHS- and FHA-guaranteed loans in RHS-eligible areas.

GAO analyzed RHS and FHA data for home purchase loans guaranteed in fiscal years 2010–2014 (which allowed for analysis of loan performance over multiple years). GAO also interviewed RHS and FHA officials, eight lenders (selected to capture variation in rural areas served, origination volume, and mix of RHS and FHA business), and industry associations.

What GAO Recommends

GAO makes no new recommendations in this report but maintains that RHS and FHA should evaluate and report on opportunities to consolidate their similar housing programs.

View [GAO-16-801](#). For more information, contact Daniel Garcia-Diaz at (202) 512-8678 or garciadiazd@gao.gov.

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What GAO Found

GAO's comparison of single-family home purchase loans guaranteed by the Rural Housing Service (RHS) and the Federal Housing Administration (FHA) in fiscal years 2010–2014 identified significant overlap and some differences in the borrowers served. Within statutorily defined rural areas (RHS-eligible areas):

- Both agencies served large numbers of rural borrowers, but FHA served over 35 percent more than RHS, while RHS reached a greater number of borrowers in the more rural parts of RHS-eligible areas.
- Most of the borrowers served by each agency had annual incomes below \$60,000. But consistent with RHS's statutory income limits, the median borrower income for RHS (\$44,000) was well below that for FHA (\$57,000).
- RHS and FHA borrowers had similar credit scores (around 685 at the median) and ratios of housing expenses to monthly gross income (23–24 percent at the median).
- Borrowers in both programs had high loan-to-value (LTV) ratios (loan amount divided by home value). But RHS's no-down-payment requirement and FHA's statutorily required 3.5 percent down payment resulted in higher LTV ratios for RHS than for FHA (medians of 101 and 96.5 percent, respectively).
- Significant portions of RHS and FHA borrowers could have met the criteria of the other program. For example, at least 36 percent of RHS borrowers could have met FHA's criteria, including the 3.5 percent minimum down payment.

In RHS-eligible areas, RHS loans guaranteed in fiscal years 2010–2011 performed worse than corresponding FHA loans after 3 years. Specifically, for borrowers whose incomes fell within RHS limits, RHS's 3-year troubled loan rate (the share of loans 90 or more days late, in foreclosure, or terminated with a claim) was 7 percent, compared with 6 percent for FHA. GAO estimated that RHS's loans would be expected to perform worse than FHA's due partly to RHS borrowers' higher LTV ratios.

Borrower costs—at loan closing and paid monthly—were lower for RHS loans than for FHA loans. Due to differences in down-payment requirements, a borrower purchasing a \$125,000 home in 2014 would have paid \$4,375 more in up-front costs with an FHA loan than with an RHS loan. Also, FHA (which must maintain a capital reserve) charged borrowers a higher annual guarantee fee than RHS, which has no capital requirement. Due largely to the difference in this fee (charged monthly), a borrower's initial monthly payments would have been about 7 percent lower with an RHS loan (assuming a 3.75 percent interest rate).

GAO's analysis provides additional evidence of how the programs overlap in terms of income, location, and borrower qualifications. It also highlights issues for RHS and FHA to consider in evaluating opportunities to consolidate these programs, as GAO recommended in 2012. Specifically, differences in the performance and borrower costs of RHS and FHA loans underscore important tradeoffs. Higher LTV ratios and lower guarantee fees help make mortgages more affordable. However, these features also may elevate financial risks to the federal government from increased loan defaults and less revenue to cover unanticipated costs. Agency consideration of these issues would aid congressional decision-making about potential program consolidation.

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Abbreviations

DTI	debt-service-to-income
FHA	Federal Housing Administration
HUD	Department of Housing and Urban Development
LTV	loan-to-value
PTI	payment-to-income
RHS	Rural Housing Service
TOTAL	Technology Open to Approved Lenders
USDA	Department of Agriculture

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September 29, 2016

The Honorable Blaine Luetkemeyer
Chairman
Subcommittee on Housing and Insurance
Committee on Financial Services
House of Representatives

Dear Mr. Chairman:

The Department of Agriculture’s (USDA) Rural Housing Service (RHS) has helped more than 1 million low- and moderate-income families in rural communities finance homes through its Single Family Mortgage Guarantee Program.¹ The program protects private lenders against losses on loans that finance the purchase of properties in areas statutorily designated as rural (RHS-eligible areas) or that refinance existing RHS mortgages. At the end of fiscal year 2015, RHS had a portfolio of more than \$112 billion in outstanding guarantees.² The Department of Housing and Urban Development’s (HUD) Federal Housing Administration (FHA) also protects lenders against losses on single-family mortgage loans (by providing mortgage insurance) and has a much larger program.³ At the end of 2015, FHA had a portfolio of more than \$1 trillion in outstanding guarantees. FHA’s program has no geographic or borrower income restrictions; therefore, it too guarantees loans in rural areas.

Although the programs have some salient differences, in an August 2012 report, we found overlap in the products offered, borrowers’ income

¹The program was authorized by Section 706(b) of the Cranston-Gonzalez National Affordable Housing Act, Pub. L. No. 101-625, 104 Stat. 4079, 4284 (1990), which added subsection 502(h) to the Housing Act of 1949, Pub. L. No. 81-871, 63 Stat. 413 (codified, as amended, at 42 U.S.C. §1472(h)). A loan guarantee is a commitment by the federal government to pay part or all of a loan’s principal and interest to the lender if the borrower defaults.

²Unless otherwise specified, years refer to federal fiscal years throughout this report.

³The program was authorized by Section 203 of the National Housing Act, Pub. L. No. 73-749, 48 Stat. 1246 (1934) (codified, as amended, at 12 U.S.C. § 1709). In contrast to RHS, FHA uses the term “mortgage insurance” instead of “loan guarantee.” Because “insurance” and “guarantee” have the same meaning in the context of our review, we use guarantee throughout the rest of this report.

levels, and geographic areas reached by the RHS and FHA single-family mortgage guarantee programs.⁴ We concluded that there were opportunities for increased collaboration and consolidation in the programs. Although Congress ultimately would have to decide on actions requiring statutory change, we noted that agencies (including RHS and FHA) could further this effort by exploring the potential benefits and costs of consolidating overlapping programs. Such analyses represent a key step on the path to determining the viability of consolidation and helping inform Congress's decision-making process. Thus, in 2012, we recommended that the agencies evaluate and report on the specific opportunities for consolidating similar housing programs, including those requiring statutory changes. The agencies (including RHS and FHA) generally agreed with our recommendation, but they have yet to report on such opportunities, and our recommendation remains unaddressed.

Additionally, relatively little is known about how the loan performance of the two programs compares. For example, one of RHS's performance goals is to be within a specified range of FHA's delinquency rates. RHS has generally met this goal and reported to Congress in April 2015 that during the prior 5 years (2010–2014) RHS-guaranteed loans generally performed slightly better than FHA-guaranteed loans.⁵ However, our March 2016 report found RHS's analysis did not account for the age of the loans, property location, or other loan and borrower characteristics that can influence performance.⁶ We recommended that RHS improve its measures comparing RHS and FHA loan performance, potentially by making comparisons on a cohort basis and limiting comparisons to loans made in similar geographic areas.⁷ RHS has yet to make changes to its

⁴GAO, *Housing Assistance: Opportunities Exist to Increase Collaboration and Consider Consolidation*, [GAO-12-554](#) (Washington, D.C.: Aug. 16, 2012).

⁵Department of Agriculture, *Report to Congress: Rural Housing Service Single Family Housing Guaranteed Loan Program Update 4th Quarter 2014* (Washington, D.C.: Apr. 20, 2015).

⁶GAO, *Rural Housing Service: Actions Needed to Strengthen Management of the Single-Family Mortgage Guarantee Program*, [GAO-16-193](#) (Washington, D.C.: Mar. 31, 2016).

⁷RHS neither agreed nor disagreed with our recommendation, but said it recognized the underlying risk implications and was continuing to consider it. A cohort is the set of loans an agency guarantees in a fiscal year.

performance measures and our 2016 recommendation remains unaddressed.

You asked us to expand on the analysis in our 2012 report and compare the characteristics and performance of rural single-family loans guaranteed by RHS and FHA.⁸ This report (1) compares the property, borrower, and loan characteristics of RHS- and FHA-guaranteed loans in RHS-eligible areas; (2) estimates the number of RHS and FHA borrowers in RHS-eligible areas who could have met key criteria for the other program and describes factors borrowers consider in choosing between the two programs; and (3) compares the performance of RHS- and FHA-guaranteed loans in RHS-eligible areas.

To compare the property, borrower, and loan characteristics of RHS- and FHA-guaranteed loans, we analyzed loan-level data on mortgages for home purchases guaranteed by the agencies in RHS-eligible areas in 2010–2014.⁹ In addition to focusing on home purchase loans in RHS-eligible areas (the areas in which both agencies can operate), we took other steps to make the RHS and FHA data comparable, such as by limiting our analysis to 30-year, fixed-rate loans, and by excluding loans for units in condominium and cooperative developments.¹⁰ We compared the distributions and number of loans for key property characteristics (such as the state and census region); borrower characteristics (such as credit score and debt burden ratios); and loan characteristics (such as loan amount and down-payment percentage) at the time the mortgages were originated. To further differentiate the geographic comparisons of the loans, we used Rural-Urban Commuting Area codes (developed by USDA’s Economic Research Service and the U.S. Health Resources and Services Administration) to assess the “rurality” of a property location (as measured by factors such as commuting patterns and population density).

⁸[GAO-12-554](#).

⁹We limited the set of FHA-guaranteed loans to those for properties in census tracts where 66.7 percent or more of the tract was within an RHS-eligible area. The 2010–2014 time frame allowed for analysis of loan performance over multiple years.

¹⁰RHS does not guarantee mortgages with shorter terms or adjustable interest rates. Additionally, under its 203(b) program, FHA does not guarantee loans for cooperatives and guaranteed few loans for condominiums in 2010–2014.

To assess the extent to which borrowers could have met key criteria for both RHS- and FHA-guaranteed home purchase mortgages and the factors borrowers consider in choosing between the two programs, we reviewed RHS and FHA documentation on their underwriting requirements and qualifying benchmarks to understand similarities and differences in program eligibility and qualification criteria. We analyzed RHS and FHA data for loans guaranteed in 2010–2014 and applied general agency requirements and benchmarks to estimate the number and percentage of RHS and FHA borrowers who could have met key criteria for each program. Our estimates represent the minimum number of borrowers who could have met key criteria for the other program. We also analyzed the costs for RHS- and FHA-guaranteed loans and calculated illustrative up-front and monthly borrower costs for each program under various home price and interest rate scenarios. To confirm key observations from this analysis, we interviewed a nonprobability sample of eight mortgage lenders selected to capture variation in the geographic areas served, volume of guaranteed loans originated, and mix of RHS and FHA business. To gain additional perspective on mortgage lending in rural areas, we interviewed mortgage industry groups selected to cover a range of stakeholders in the RHS and FHA guarantee programs. These included the Independent Community Bankers of America, National Association of Mortgage Brokers, National Association of Realtors, and Mortgage Bankers Association.

To compare the performance of RHS- and FHA-guaranteed loans for home purchases in RHS-eligible areas, we analyzed RHS and FHA loan-level data and determined the performance status (current, delinquent, in the foreclosure process, prepaid, or terminated with a claim) of loans guaranteed in 2010–2012 at 12-month intervals (anniversary months) starting from the month the first payment was due until September 30, 2014.¹¹ For this comparison, we limited the FHA-guaranteed loans to those obtained by borrowers with incomes within the county-level household income limits set by RHS (which we determined using

¹¹We limited the set of FHA-guaranteed loans to those for properties in census tracts where 95 percent or more of the tract was within an RHS-eligible area.

borrower income).¹² We restricted the data in this way to account for RHS's household income limits and FHA's lack of such limits, which resulted in some FHA borrowers with higher incomes than RHS is allowed to serve. We classified loans as troubled if they were 90 or more days delinquent during the anniversary month, were in the foreclosure process, or had terminated with a claim. We compared the performance of RHS- and FHA-guaranteed loans after 2 and 3 years of performance through the end of September 2014. In addition, we developed a statistical model to examine the extent to which differences between RHS and FHA troubled loan rates (the number of troubled loans divided by the number of loans guaranteed) after 2 and 3 years stemmed from the characteristics of their guaranteed portfolios (for example, loan and borrower characteristics).¹³

To assess the reliability of the RHS and FHA data, we tested the data for missing values, outliers, and obvious errors and reviewed documentation on the process that RHS and FHA used to collect and ensure the reliability and integrity of their data. We also interviewed knowledgeable RHS and FHA officials to discuss interpretations of various data fields. We concluded that the data we used were sufficiently reliable for purposes of comparing the characteristics and performance of RHS- and FHA-guaranteed loans and for estimating the percentage of borrowers who could have met key criteria for both programs.

We conducted this performance audit from February 2015 to September 2016 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

¹²The loan-level data we analyzed on FHA borrowers included information on borrower income but not on household income or size. For this comparison, we assumed that the borrower's income was the only source of household income and that all households consisted of no more than four people (the more restrictive limit).

¹³For this analysis, we also used external data, including a Federal Housing Finance Agency house price index for nonmetropolitan areas and data on the Treasury 10-year constant maturity rate, to help assess economic conditions that are associated with changes in loan performance.

and conclusions based on our audit objectives. Appendix I contains additional information on our objectives, scope, and methodology.

Background

Federal Mortgage Guarantee Programs

RHS and FHA operate major federal programs that guarantee mortgage loans.¹⁴ The guaranteed loans generally feature attractive interest rates (comparable to those of prime loans), but serve borrowers who may have difficulty qualifying for conventional mortgage credit (that is, mortgage loans without government guarantees). The programs protect the private lender or other mortgage holder, because the federal government commits to pay part or all of a loan's outstanding principal and interest if the borrower defaults.¹⁵ In exchange, borrowers are required to pay up-front and annual guarantee fees.¹⁶ Both the RHS and FHA single-family programs guarantee 30-year, fixed-rate mortgages for borrower-occupied homes. The mortgage proceeds can be used to buy, build, or refinance homes. The mortgage loans require little or no down payment from borrowers and allow financing of up-front guarantee fees. These terms generally result in high loan-to-value (LTV) ratios (the amount of the loan divided by the value of the home at origination), including LTV ratios greater than 100 percent.

As shown in figure 1, both the RHS and FHA loan guarantee programs have requirements and benchmarks that lenders use to assess borrower eligibility and qualifications. For example, to be eligible for an RHS loan, the property must be located in an RHS-eligible area and the borrower's household income must not exceed 115 percent of the area median

¹⁴The Department of Veterans Affairs also provides a federal guarantee for mortgage loans. The guarantee is available to veterans of a branch of the armed services who received a discharge other than dishonorable, certain members of the Reserves or National Guard, and spouses of veterans under certain circumstances.

¹⁵RHS provides coverage for eligible losses of up to 90 percent of the original principal, including unpaid principal and interest; principal and interest on RHS-approved advances for protection and preservation of the property; and liquidation costs. FHA'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.

¹⁶FHA refers to its guarantee fees as insurance premiums.

income, based on household size (which effectively limits the loan amount). Although FHA does not have income or geographic limits, the amount of the loans it guarantees is limited by statute.¹⁷ Both programs also require lenders to assess the borrower's willingness and ability to repay the loan. To make this assessment, lenders use information collected during the loan origination process—including a borrower's credit score, a numeric value ranging from 300 to 850 (calculated based on credit reports from the national credit bureaus) that indicates a borrower's ability to repay future obligations; payment-to-income (PTI) ratio, the percentage of a borrower's income that goes toward total mortgage debt payments; and the debt-service-to-income (DTI) ratio, the percentage of a borrower's income that goes toward all recurring debt payments. RHS and FHA established specific benchmarks lenders use to evaluate the borrower's qualifications. RHS and FHA also allow lenders to consider loans for approval that differ from these benchmarks by considering compensating factors (such as proof of continuous employment or cash reserves) that demonstrate the borrower's ability to repay the loan.

¹⁷FHA's mortgage limits are calculated at the county and metropolitan-area levels (taking into account the number of living units in the property) and are calculated as a percentage of the standard national limit for Freddie Mac loans. Beginning in January 2014, the national loan limit ceiling for FHA-guaranteed loans for one-unit properties was between \$271,050 in low-cost areas and \$625,500 in high-cost areas (with the exception of Alaska, Hawaii, Guam, and the Virgin Islands where the loan limit was \$938,250). In 2008–2013, the high-cost area limit was increased to \$729,750.

Figure 1: Key Eligibility Requirements and Qualifying Benchmarks for RHS- and FHA-Guaranteed Purchase Loans, Fiscal Years 2010–2014

Criteria	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans
Eligibility requirements		
Borrower household income	Not to exceed 115 percent of area median income	No restrictions
Limits on loan size	Cannot exceed the fair market value of the property or the borrower's income and repayment ability. ^a	Vary by locality. Single-unit properties in 2010-December 2013 ranged from \$271,050 to \$729,750, and beginning in January 2014 ranged from \$270,010 to \$625,500. Loan amount also cannot exceed the fair market value of the property or the borrower's income and repayment ability. ^b
Required down payment	None	3.5 percent
Qualifying benchmarks^c		
Borrower credit score	640 or above ^d	580 or above ^e
Payment-to-income ratio	29 percent or less	31 percent or less
Debt-service-to-income ratio	41 percent or less	43 percent or less

Requirements
 Benchmarks

Source: GAO analysis of RHS and FHA policies. | GAO-16-801

^aThe size of the loans RHS guarantees is effectively limited by RHS's borrower household income requirements and the payment-to-income ratio.

^bThe maximum loan limit for single-unit properties in high-cost exception areas was \$1,094,625 from 2010 through December 2013 and \$938,250 starting January 2014.

^cAccording to RHS and FHA guidelines, borrowers can qualify for a guaranteed mortgage without meeting every benchmark if certain compensating factors are present, such as proof of continuous employment or cash reserves.

^dQualified borrowers with credit scores as low as 581 can obtain an RHS-guaranteed loan if the loan is manually underwritten and the lender provides additional documentation of borrower creditworthiness.

^eBenchmark for FHA's maximum financing option. Qualified borrowers with credit scores of 500 to 579 can obtain FHA-guaranteed loans if they make a down payment of 10 percent.

Both RHS and FHA lenders evaluate the overall creditworthiness of a loan guarantee applicant and determine the associated risk of default using a version of FHA's automated mortgage score card.¹⁸ Lenders may also review loans manually to assess applicants' eligibility and qualifications.¹⁹

Rural Areas

In 1949 Congress authorized separate housing assistance for rural areas and gave USDA responsibility for administering it. Section 520 of the Housing Act of 1949, as amended, defines certain areas as "rural" for purposes of determining RHS program eligibility (in this report, we generally refer to these as RHS-eligible areas). RHS-eligible areas are largely identified based on population, but also consider other factors, such as proximity to metropolitan areas and access to mortgage credit. USDA is to re-evaluate eligibility determinations upon issuance of a decennial U.S. Census of Population and Housing. The eligible areas were most recently updated in 2014 and 2015 to take into account data

¹⁸FHA requires lenders to use its Technology Open to Approved Lenders (TOTAL) score card in conjunction with an automated underwriting system. In 2005, RHS adopted FHA's TOTAL score card and calibrated the tool using RHS's thresholds for determining borrower qualifications and default risk. TOTAL is a component of RHS's Guaranteed Underwriting System, which RHS encourages lenders to use as a complement to the lenders' own underwriting.

¹⁹Applicants for FHA-guaranteed loans who are not accepted by the automated mortgage score card are required to be assessed manually to determine if the applicant should be accepted or rejected.

from the 2010 Census.²⁰ In contrast, FHA's single-family loan guarantee program is not restricted to any geographic location.

As noted previously, rurality can be assessed under classification schemes other than statutory definitions. USDA's Rural-Urban Commuting Area codes classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns, urbanization, and population density. The codes can be consolidated into four types of locations.²¹

- **Urban.** Adjoining census tracts in built-up areas, with total population of 50,000 or more. These areas correspond to the U.S. Census Bureau's urbanized areas.
- **Suburban.** Areas with high commuting flow to urban areas and all areas where 30-49 percent of the population commute to urban areas for work.
- **Large rural town.** Towns with populations between 10,000 and 49,000 and surrounding rural areas where 10 percent or more of the

²⁰The Agricultural Act of 2014, Pub. L. No. 113-79, § 6208, 128 Stat. 861, revised the rural area definition for housing programs. Rural areas are defined as any open country or any place, town, village, or city that is not part of or associated with an urban area and that (1) has a population not in excess of 2,500 inhabitants; (2) has a population in excess of 2,500 but not in excess of 10,000 if it is rural in character; or (3) has a population in excess of 10,000 but not in excess of 20,000, and (A) is not contained within a standard metropolitan statistical area, and (B) has a serious lack of mortgage credit for lower- and moderate-income families, as determined by the Secretaries of USDA and HUD. Any area classified as "rural" or a "rural area" prior to October 1, 1990, and determined not to be "rural" or a "rural area" as a result of data received from or after the 1990, 2000, or 2010 decennial Census, and any area deemed to be a "rural area" for purposes of title V of the Housing Act of 1949, as amended, under any provision law at any time during the period beginning January 1, 2000, and ending December 21, 2010, shall continue to be so classified until receipt of the data from the 2020 decennial Census, if such area has a population in excess of 10,000 but not in excess of 35,000, is rural in character, and has a serious lack of mortgage credit for lower- and moderate-income families.

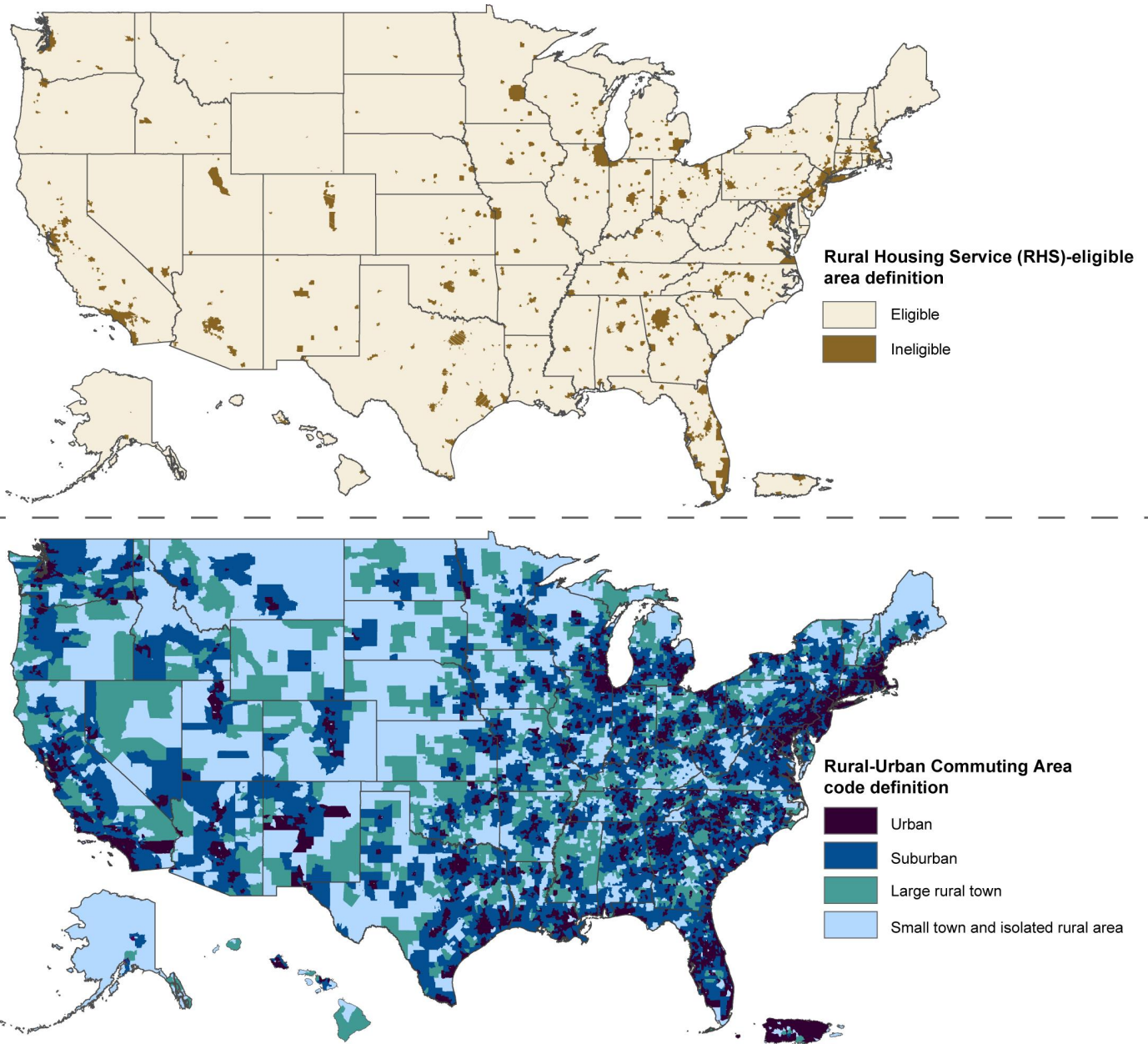
²¹The USDA classification contains 10 primary and 21 secondary codes for classifying census tracts. According to USDA, the system is designed to allow for a combination of codes to meet varying definitional needs. The four-tier consolidated primary and secondary taxonomy is designed to support descriptive analysis of census tract data by providing information about the general character of an area. See Washington State, Department of Health, *Guidelines for Using Rural-Urban Classification Systems for Public Health Assessment* (Feb. 5, 2009).

population commutes to the town and 10 percent or more of the population commutes to an urban area for work.

- **Small town and isolated rural area.** Towns with populations of less than 10,000 and their surrounding commuter areas and other isolated rural areas that are more than 1 hour driving distance to the nearest city.

RHS-eligible areas encompass rural areas (that is, large rural towns and small town and isolated rural areas) as well as areas that are more urban and suburban. As shown in figure 2, in 2015, RHS-eligible areas constituted 97 percent of the land area of the United States. Eligible areas also contained 37 percent of the nation's population. Using the Rural-Urban Commuting Area codes described earlier, rural areas constituted 67 percent of the land area of the United States in 2015. These rural areas contained 12 percent of the population.

Figure 2: Rural and Urban Areas in the United States Based on the Statutory Definition and Rural-Urban Commuting Areas Definition, Fiscal Year 2015



Source: GAO analysis of U.S. Department of Agriculture data. | GAO-16-801

Loan Status

Several categories are used to describe the payment status of mortgages:

- **Current.** The borrower is meeting scheduled payments.
- **Delinquent.** The borrower is behind by 30 or more days on scheduled payments.
- **In the foreclosure process.** The borrower generally has been delinquent for more than 90 days (commonly referred to as in default) and the lender has elected to initiate a legal process against the borrower that generally results in the borrower losing the property. The loan is considered active during the foreclosure process.
- **Terminated with a claim.** The borrower is delinquent, unable to pay off the loan balance, and loses title to the property. The government pays a claim (provides reimbursement) to a lender that incurs a loss on a guaranteed loan. The loan is no longer considered active.
- **Prepaid.** The borrower has paid off the entire loan balance before it is due. Prepayment often occurs as a result of the borrower selling the home or refinancing. A prepaid loan is no longer considered active.

As previously noted, in this report we refer to loans that were 90 days or more delinquent, in the foreclosure process, or that terminated with a claim as troubled loans.

As we and others have reported previously, certain loan features are often associated with an increase in mortgage defaults and foreclosures.²² For example, higher LTV ratios are associated with increased risk of default or foreclosure—especially for borrowers in a

²²GAO, *Mortgage Reform: Actions Needed to Help Assess Effects of New Regulations*, [GAO-15-185](#) (Washington, D.C.: June 25, 2015); *Foreclosure Mitigation: Agencies Could Improve Effectiveness of Federal Efforts with Additional Data Collection and Analysis*, [GAO-12-296](#) (Washington, D.C.: June 28, 2012); *Nonprime Mortgages: Analysis of Loan Performance, Factors Associated with Defaults, and Data Sources*, [GAO-10-805](#) (Washington, D.C.: Aug. 24, 2010); *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); and *Mortgage Finance: Actions Needed to Help FHA Manage Risks from New Mortgage Loans*, [GAO-05-194](#) (Washington, D.C.: Feb. 11, 2005). See also, Ken Lam, Robert M. Dunskey, and Austin Kelly, “Impacts of Down Payment Underwriting Standards on Loan Performance: Evidence from the GSEs and FHA Portfolios” (working paper 13-3), Federal Housing Finance Agency, (Washington, D.C.: December 2013).

negative equity position (when mortgage balances exceed the current value of homes). Borrowers then are limited in their ability to sell or refinance their homes in the event they cannot stay current on their mortgage payments. In addition, lower borrower credit scores at loan origination, higher PTI and DTI ratios, and first-time homebuyers are associated with an increased likelihood of mortgage default and foreclosure.

Overlap and Consolidation

As noted previously, our prior work has assessed the extent to which there is overlap between RHS- and FHA-guaranteed loan programs.²³ In particular, our 2012 report found overlap in the products offered, borrower income levels, and geographic areas served by the two programs. Overlap occurs when programs have similar goals, devise similar strategies and activities to achieve those goals, or target similar users. Our prior work has found that overlap can have positive and negative effects on program implementation, outcomes and impact, and cost-effectiveness.²⁴ Assessing the presence and extent of any overlap and its positive and negative effects can help congressional decision makers and executive branch leaders identify options to reduce or better manage overlap. Among other things, we have found that addressing overlap may require changes in statute, regulation, or guidance to revise or explicitly define agencies' roles and responsibilities or program consolidation. In past reports, including in our 2012 report, we have suggested that agencies could increase their efficiency and effectiveness by consolidating their management functions, such as information-technology or administrative-support services.²⁵ Consolidation is beneficial in some situations and not in others. As a result, a case-by-case analysis is needed to evaluate the goals of the consolidation against realistic expectations of how they can be achieved.

²³[GAO-12-554](#).

²⁴GAO, *Fragmentation, Overlap, and Duplication: An Evaluation and Management Guide*, [GAO-15-49SP](#) (Washington, D.C.: Apr. 14, 2015).

²⁵GAO, *Streamlining Government: Questions to Consider When Evaluating Proposals to Consolidate Physical Infrastructure and Management Functions*, [GAO-12-542](#) (Washington, D.C.: May 23, 2012) and [GAO-12-554](#).

Both Programs Had Similar Loan Characteristics, but RHS Borrowers Had Lower Incomes and Higher Loan-to-Value Ratios Than FHA Borrowers

The mortgages RHS and FHA guaranteed in RHS-eligible areas in 2010–2014 generally had similar property, borrower, and loan characteristics, underscoring the overlap between the two guarantee programs. But key differences existed in certain characteristics, primarily due to statutory program requirements. Both programs served more than 600,000 borrowers in RHS-eligible areas, although RHS served more borrowers in more rural parts of these areas. In addition, the majority of borrowers in both programs had similar credit profiles, debt burdens, and other demographic characteristics. But consistent with income limits for the RHS program, RHS borrowers generally had lower annual incomes than FHA borrowers. Finally, both RHS and FHA generally guaranteed loans that were less than \$150,000 and that had high LTV ratios. In keeping with RHS’s income restrictions, RHS’s loans were smaller than FHA’s, and RHS’s no-down-payment requirement resulted in higher LTV ratios for RHS than for FHA.

Both RHS and FHA Served Large Numbers of Borrowers in RHS-Eligible Areas

In 2010–2014, RHS and FHA both guaranteed large numbers of loans to borrowers in RHS-eligible areas, with FHA serving more borrowers overall and RHS serving a higher number and percentage of borrowers in more rural areas (see fig. 3).²⁶ In this period, FHA guaranteed about 880,000 loans in RHS-eligible areas, compared with about 614,000 loans for RHS, a 36 percent difference.²⁷ The difference is partly attributable to the larger size of FHA’s program (loans in RHS-eligible areas represent 25 percent of the loans FHA guaranteed in 2010–2014).²⁸ But in terms of

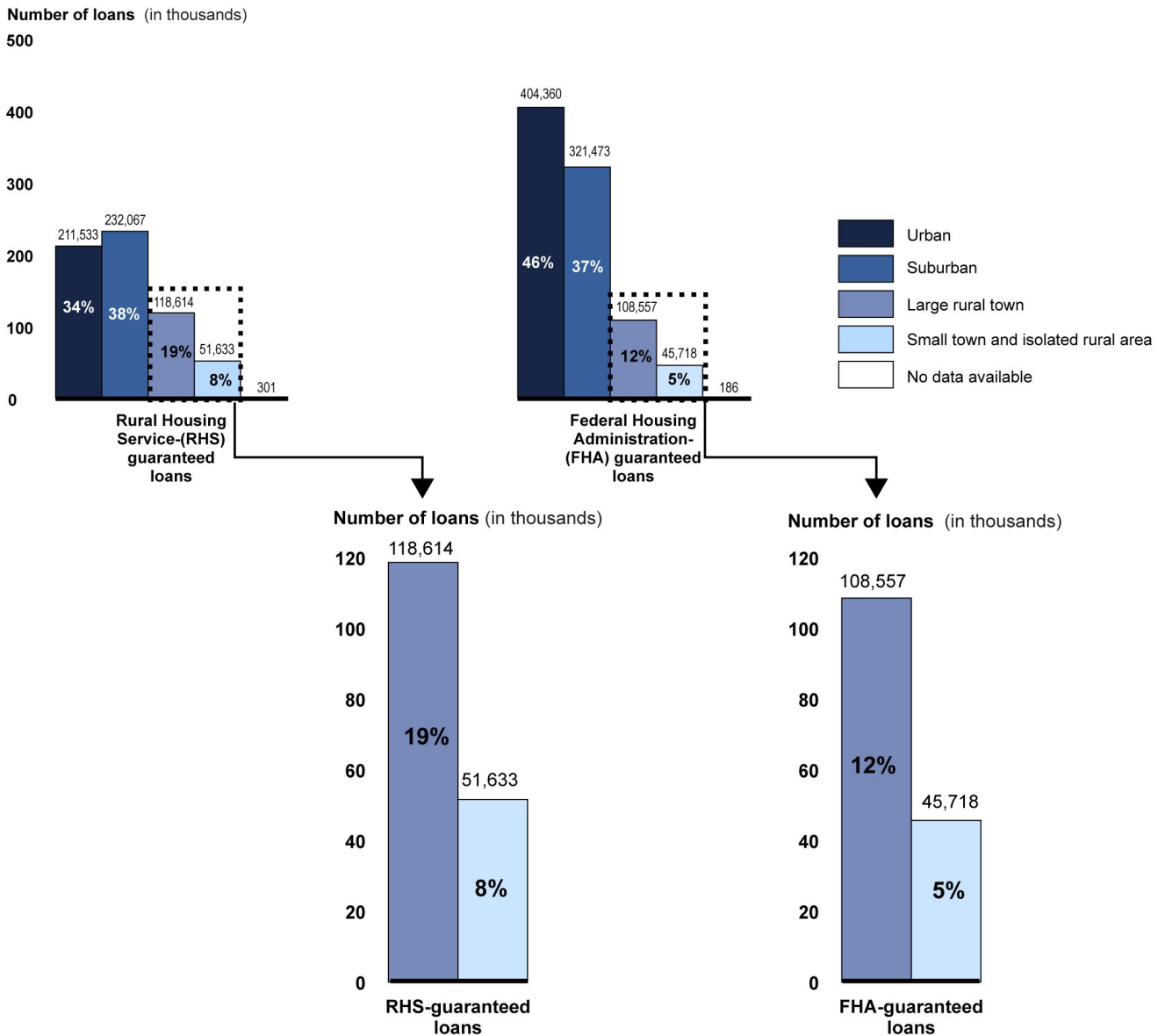
²⁶As previously discussed, we focused on loans for purchasing single-family homes in RHS-eligible areas, excluding loans for units in condominium and cooperative developments. Appendix II provides additional data on each of the property, borrower, and loan characteristics we analyzed. We also analyzed the characteristics of RHS- and FHA-guaranteed loans for refinancing single-family homes in RHS-eligible areas, but less information was available for those loans. For more information on refinance loans, see appendix III.

²⁷As noted earlier, the statutory definition of RHS-eligible areas was updated in 2014 to take into account 2010 census data. As a result, approximately 5 percent of the loans RHS guaranteed in 2010–2014 were not located in the updated RHS-eligible areas. We used the updated definition for our analysis as well as for our analysis of USDA’s Rural-Urban Commuting Area classifications because they both rely on the 2010 census data. We performed our analysis on the remaining 95 percent of RHS-guaranteed loans in RHS-eligible areas based on the updated definition.

²⁸See appendix IV for a description of FHA-guaranteed loans for properties not located in RHS-eligible areas.

geographic distribution within RHS-eligible areas, RHS served more borrowers than FHA in more rural areas (areas classified as large rural towns or small town and isolated rural areas using USDA's Rural-Urban Commuting Area classification). Specifically, in more rural areas, RHS guaranteed approximately 170,000 loans (28 percent of its total), while FHA guaranteed approximately 154,000 loans (18 percent of its total). Conversely, about 72 percent of the loans RHS guaranteed and 83 percent of the loans FHA guaranteed in RHS-eligible areas in 2010–2014 were in areas considered more urban or suburban (using USDA's Rural-Urban Commuting Area classifications).

Figure 3: Geographic Distribution of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014



Source: GAO analysis of RHS and FHA data. | GAO-16-801

Note: Using the Department of Agriculture’s Rural-Urban Commuting Area codes, “urban” is defined as adjoining areas with a population of 50,000 or more; “suburban” is defined as areas with high commuting flows to urban areas and all areas in which 30–49 percent of the population commutes to urban areas for work; “large rural towns” are defined as towns with populations between 10,000 and 49,000 and surrounding rural areas where 10 percent or more of the population commutes to the town and 10 percent or more of the population commutes to an urban area for work; and “small town and isolated rural areas” are defined as towns with populations of less than 10,000 and their

surrounding commuter areas and other isolated rural areas that are more than 1 hour driving distance to the nearest city. Properties located in the U.S. island areas (other than Puerto Rico) and those with insufficient address information to be categorized according to USDA's Rural-Urban Commuting Areas were labeled as "no data available." Percentages are rounded.

Credit and Other Characteristics of RHS and FHA Borrowers Were Similar, but RHS Served More Borrowers with Lower Incomes Than FHA

For loans guaranteed during 2010–2014 in RHS-eligible areas, RHS and FHA borrower characteristics, such as credit score and debt burden, were generally similar. While RHS borrowers had lower incomes, the proportion of borrowers who were racial or ethnic minorities was comparable.

Credit Characteristics

The distribution of borrower credit scores and PTI ratios for loans RHS and FHA guaranteed in RHS-eligible areas was similar overall, although RHS borrowers generally had lower DTI ratios. We and others have previously found that lower credit scores and higher PTI and DTI ratios were associated with poorer loan performance.²⁹

Credit score. In RHS-eligible areas, RHS and FHA borrower credit scores at loan origination were generally similar—median scores were 686 for RHS and 683 for FHA. As shown in figure 4, about one-half of RHS and FHA borrowers had credit scores in the 640–699 range.³⁰ Credit scores also were similar in the higher ranges—41 percent of RHS borrowers and 39 percent of FHA borrowers had scores greater than 700. However, RHS had a smaller proportion of borrowers with scores of less than 640 (9 percent) than FHA did (14 percent).³¹ Although FHA's benchmark for minimum credit score (580 for maximum financing) is lower than RHS's (640), lenders with whom we spoke noted that many

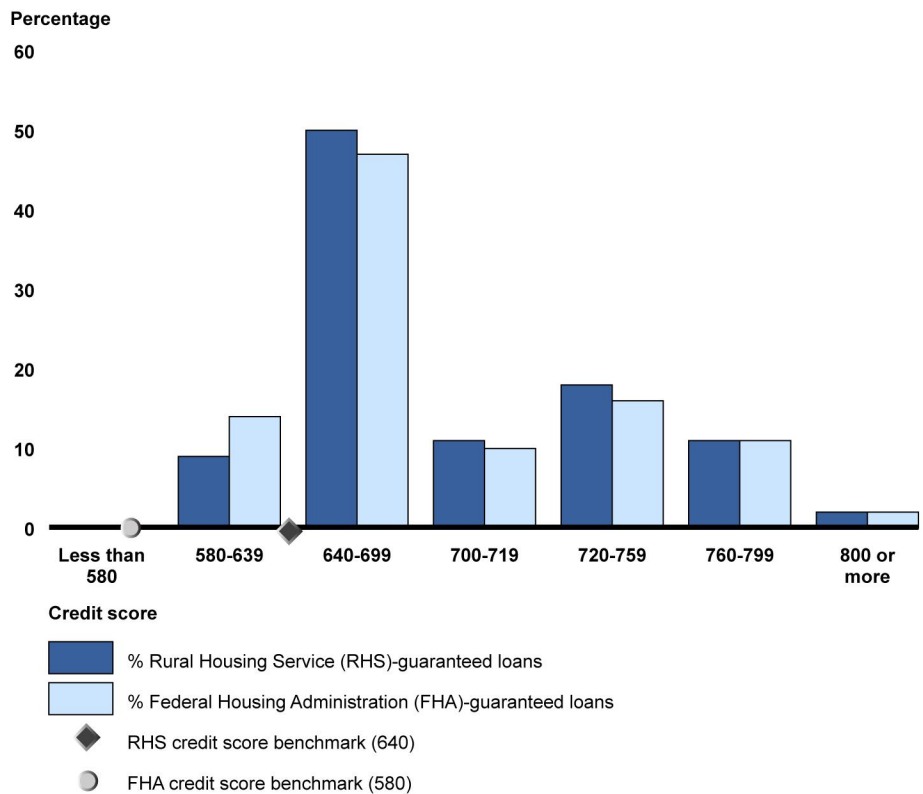
²⁹See [GAO-15-185](#), [GAO-05-194](#), and Ken Lam, Robert M. Dunsky, and Austin Kelly, "Impacts of Down Payment Underwriting Standards on Loan Performance: Evidence from the GSEs and FHA Portfolios."

³⁰During 2010–2014, the proportion of RHS and FHA borrowers with scores in the 640–699 range increased each year. For RHS, the proportion increased from 41 percent in 2010 to 55 percent in 2014, and for FHA the corresponding increase was from 39 percent to 57 percent. See appendix II for analysis of property, borrower, and loan characteristics by annual loan cohort.

³¹As noted in figure 1, RHS and FHA policies allow lenders to approve borrowers with credit scores below the agencies' benchmarks.

FHA lenders and mortgage investors impose minimum credit score requirements that are higher than the FHA benchmark—typically, 640 or greater—to guard against the increased risk of default associated with lower scores. In addition, FHA policy allows lenders to require borrowers to have a higher credit score (in excess of FHA’s benchmark) when the borrower does not meet the benchmark for another characteristic, such as the PTI or DTI ratio. As a result, several lenders said they expected RHS and FHA borrowers to have similar scores.

Figure 4: Distribution of Credit Scores for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014



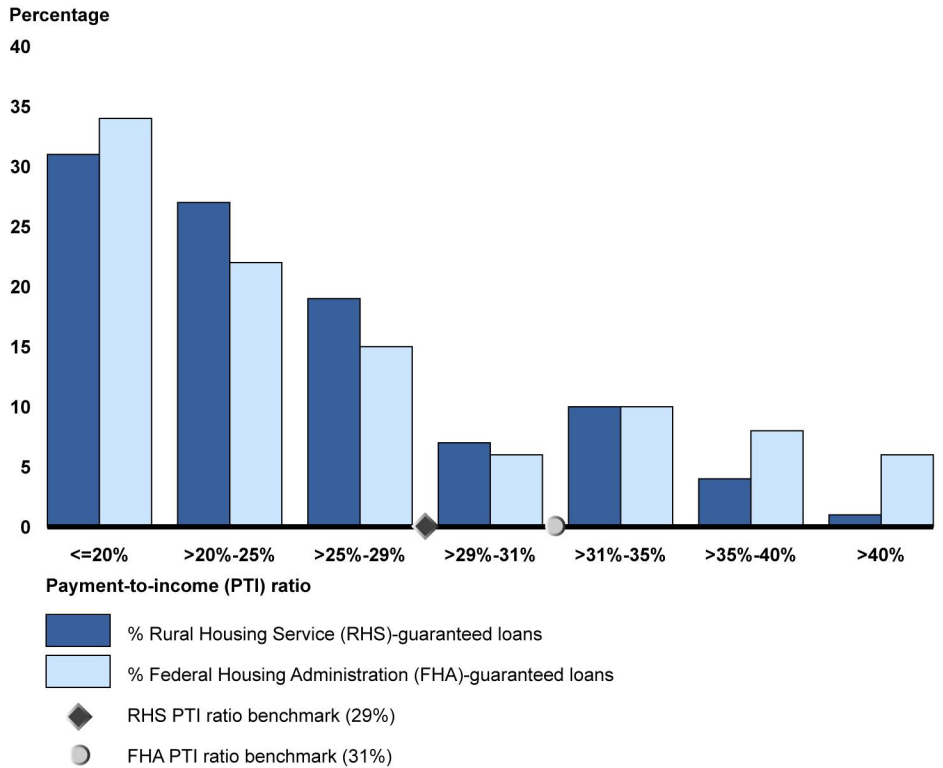
Source: GAO analysis of RHS and FHA data. | GAO-16-801

Note: RHS and FHA policies allow lenders to approve borrowers with credit scores below the agencies’ benchmarks. Qualified RHS borrowers with credit scores as low as 581 can obtain an RHS-guaranteed loan if the loan is manually underwritten and the lender provides additional documentation of creditworthiness. Qualified FHA borrowers with credit scores of 500 to 579 can obtain an FHA-guaranteed loan if they make a down payment of 10 percent.

Payment-to-income ratio. In RHS-eligible areas, RHS and FHA borrowers generally had similar PTI ratios (see fig. 5). Median ratios for both programs were similar—23 percent for RHS and 24 percent for FHA. RHS’s benchmark for PTI ratio is 29 percent and FHA’s is 31 percent.³² Roughly three-quarters of the borrowers in both programs had PTI ratios of 29 percent or less (78 percent for RHS and 71 percent for FHA), and about 10 percent of the borrowers in each program had PTI ratios of greater than 31 to 35 percent (a less favorable category). Finally, a larger share of FHA borrowers—about 13 percent—had PTI ratios greater than 35 percent, compared with 5 percent of RHS borrowers.

³²As noted earlier, both RHS and FHA allow lenders to approve loans with higher ratios when compensating factors are present.

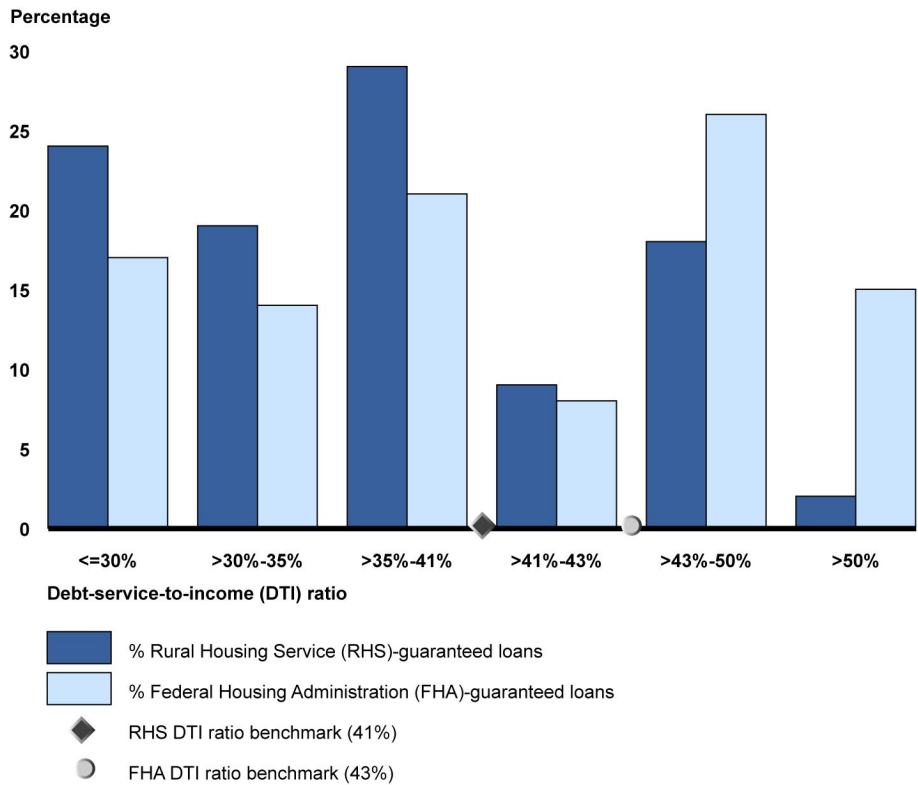
Figure 5: Distribution of Payment-to-Income Ratios for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014



Source: GAO analysis of RHS and FHA data. | GAO-16-801

Debt-service-to-income ratio. In RHS-eligible areas, RHS borrowers generally had lower (more favorable) DTI ratios than FHA borrowers (see fig. 6). The median DTI ratio for RHS borrowers was 37 percent, which was somewhat lower than the median for FHA borrowers (41 percent). RHS’s benchmark for DTI is 41 and FHA’s is 43. Seventy-one percent of RHS borrowers and 51 percent of FHA borrowers had DTI ratios of 41 percent or less. Although both agencies allow lenders to approve borrowers with DTI ratios that exceed their benchmarks when compensating factors are present, several lenders with whom we spoke said that FHA provided greater flexibility than RHS in this regard. Consistent with this view, the share of FHA borrowers with DTI ratios greater than 43 percent was double the corresponding share of RHS borrowers (40 percent and 20 percent, respectively).

Figure 6: Distribution of Debt-Service-to-Income Ratios for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010-2014



Source: GAO analysis of RHS and FHA data. | GAO-16-801

Demographic Characteristics

In RHS-eligible areas in 2010–2014, most of the borrowers served by each agency had annual incomes of less than \$60,000, but RHS borrower incomes were generally lower than those of FHA borrowers. The median income of RHS borrowers was about \$44,000, compared with about \$57,000 for FHA borrowers—a 28 percent difference.³³ Approximately 42 percent of the loans guaranteed by RHS went to

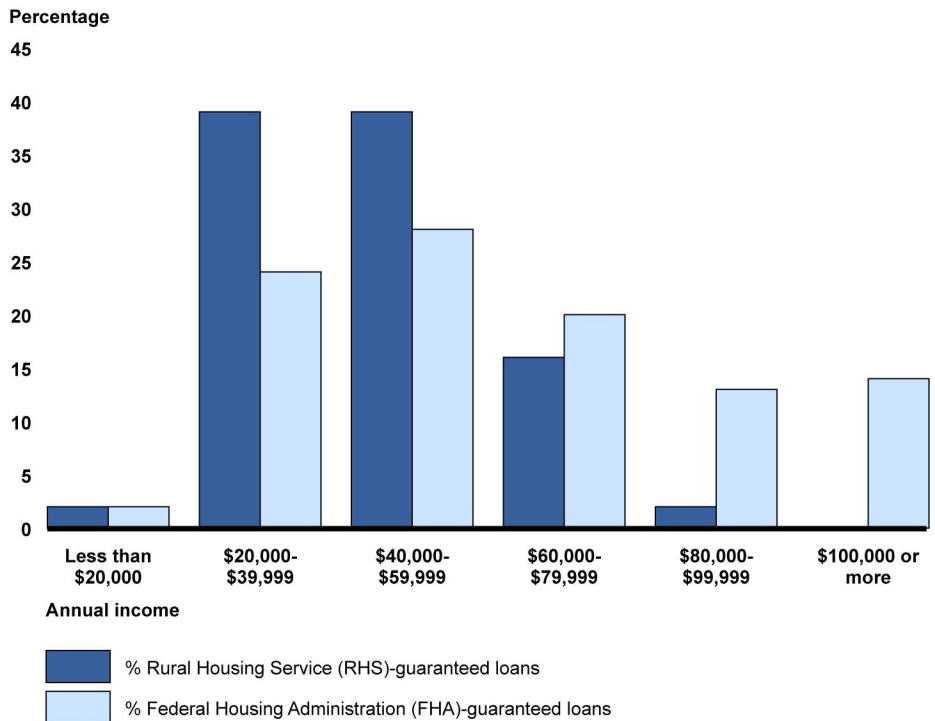
³³For perspective, the U.S. Census Bureau estimated that the median income for owner-occupied housing units with a mortgage in 2014 was \$81,263 plus or minus \$102. See U.S. Census Bureau, *Financial Characteristics for Housing Units with a Mortgage 2014 1-Year Estimates* (report S2506), accessed on June 14, 2016, from <http://factfinder.census.gov>.

borrowers with annual incomes of less than \$40,000 (roughly the median income of all rural households), compared with 26 percent of FHA-guaranteed loans (see fig. 7).³⁴ RHS also served 13 percent more borrowers in this income category than FHA (about 256,000 RHS borrowers compared with about 226,000 FHA borrowers). In contrast, about 27 percent of FHA borrowers had annual incomes of \$80,000 or more, compared with 3 percent of RHS borrowers. These differences are consistent with the RHS program's statutory income limits (the program is designed to serve low- and moderate-income borrowers).³⁵

³⁴USDA's Economic Research Service estimated that in 2012, the median household income for rural households was approximately \$41,000. See U.S Department of Agriculture, Economic Research Service, *Rural Poverty and Well Being: Income* (Washington, D.C.: May 18, 2015).

³⁵As noted previously, to be eligible for the RHS loan guarantee program, household income, which includes the borrower's income, cannot exceed 115 percent of the area's median income. Income limits vary across the country, depending on the property's location. FHA does not have a similar income requirement.

Figure 7: Distribution of Annual Borrower Incomes for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014



Source: GAO analysis of RHS and FHA data. | GAO-16-801

As shown in table 1, in RHS-eligible areas more than three-quarters of both RHS and FHA borrowers identified as white, although the proportion was larger for RHS (86 percent) than for FHA (77 percent).³⁶ A smaller

³⁶We used the race and ethnicity categories defined in the Home Mortgage Disclosure Act data and added an additional category, “more than one race,” to identify those non-Hispanic or Latino borrowers who identified more than one racial category. For this analysis, we made the race and ethnicity categories mutually exclusive. For perspective, the Board of Governors of the Federal Reserve System reported that 69 percent of borrowers with purchase loans in 2014 identified as non-Hispanic white, 8 percent as Hispanic or Latino, 5 percent as black or African American, and 5 percent as Asian. An additional 12 percent of borrowers were another minority (American Indian or Alaska native, or Native Hawaiian or other Pacific Islander), reported two or more races, or did not disclose race or ethnicity data. See Neil Bhutta, Jack Popper, and Daniel R. Ringo, *The 2014 Home Mortgage Disclosure Act Data*, Federal Reserve Bulletin, vol. 101, no. 4 (Washington, D.C.: November 2015).

proportion of RHS borrowers (8 percent) identified their ethnicity as Hispanic or Latino than did FHA borrowers (11 percent). With respect to racial minority groups, about 5 percent of the borrowers served by each program identified as black or African-American, and roughly 1 percent of each program's borrowers identified as Asian.³⁷

Table 1: Borrower-Identified Race and Ethnicity, by Percentage and Number, for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

Borrower race or ethnicity	Rural Housing Service (RHS)-guaranteed loans		Federal Housing Administration (FHA)-guaranteed loans	
	Percentage of loans	Number of loans	Percentage of loans	Number of loans
White	86.3	530,072	76.9	676,665
Hispanic or Latino	7.8	47,610	11.2	98,744
Black or African American	4.5	27,614	4.7	40,973
Asian	0.6	3,443	1.1	10,016
American Indian, Alaska Native	0.4	2,378	0.3	2,825
More than one race (non-Hispanic or Latino)	0.3	1,627	0.2	2,159
Native Hawaiian or other Pacific Islander	0.2	1,403	0.4	3,960
Not disclosed	0.0	1	5.1	44,952
Total	100	614,148	100	880,294

Source: GAO analysis of RHS and FHA data. | GAO-16-801

Note: For this analysis, we made the categories mutually exclusive. Percentages do not sum to exactly 100 percent due to rounding.

Historically, federal mortgage guarantee programs have played a particularly large role among first-time homebuyers, due partly to their low or no down-payment requirements. In RHS-eligible areas, RHS and FHA borrowers both tended to be first-time homebuyers, with RHS having a

³⁷Less than 1 percent of both RHS and FHA borrowers identified as American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, or as of more than one race (non-Hispanic or Latino). In addition, approximately 5 percent of FHA borrowers in RHS-eligible areas (44,952 loans) did not disclose race or ethnicity information (all but one RHS borrower identified a race or ethnicity).

higher proportion of first-time homebuyers (85 percent) than FHA (71 percent).³⁸

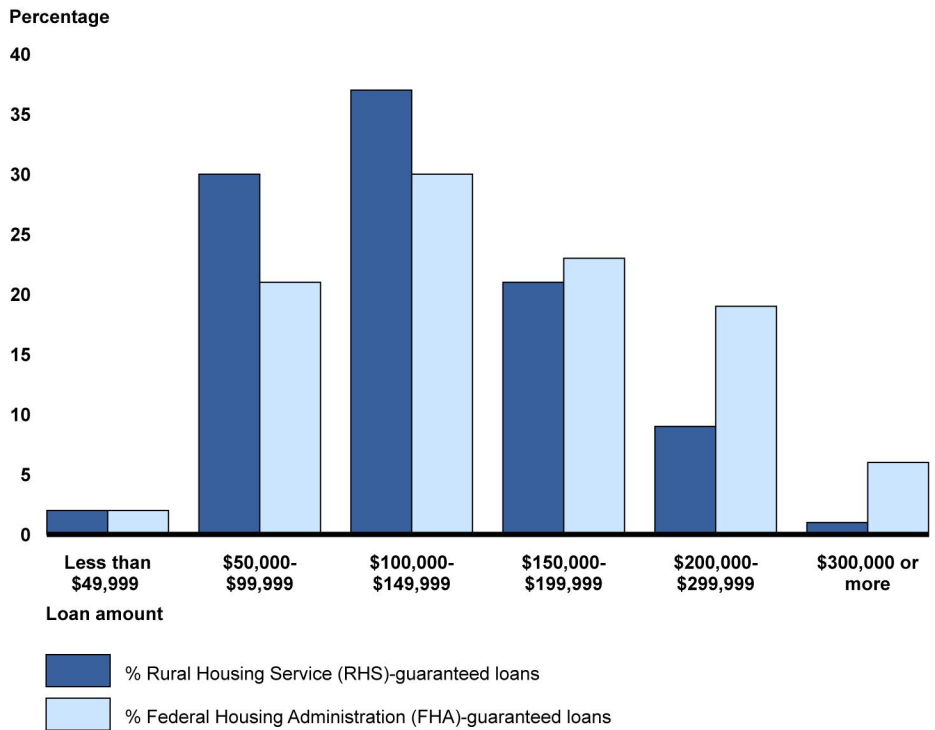
Most RHS- and FHA-Guaranteed Loans in RHS-Eligible Areas Were Less Than \$150,000, but RHS's Had Higher Loan-to-Value Ratios

In RHS-eligible areas in 2010–2014, most RHS- and FHA-guaranteed loans were for less than \$150,000, but RHS's loans generally were smaller than FHA's (see fig. 8).³⁹ More specifically, the median loan amount for RHS (\$124,000) was 17 percent less than the median for FHA (\$146,000). Approximately 69 percent of RHS-guaranteed loans were less than \$150,000, compared with about 52 percent of FHA-guaranteed loans. RHS and FHA served almost the same number of borrowers with loans of less than \$100,000 (about 200,000 loans each), and these smaller loans accounted for about 33 percent of RHS's loans and about 23 percent of FHA's loans. In contrast, about 25 percent of FHA's loans were above \$200,000, compared with 10 percent for RHS. RHS's smaller loan amounts (relative to FHA's) are consistent with RHS borrowers' generally lower incomes.

³⁸RHS and FHA generally define a first-time homebuyer as an individual who has not had ownership in a principal residence during the prior 3-year period.

³⁹For perspective, the median value of owner-occupied homes with a mortgage in 2010–2014 was \$193,500. See U.S. Census Bureau, *Financial Characteristics for Housing Units With a Mortgage 2010-2014 American Community Survey 5-Year Estimates* (report S2506), accessed on July 24, 2016 from <http://factfinder.census.gov>.

Figure 8: Distribution of Origination Loan Amounts for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014



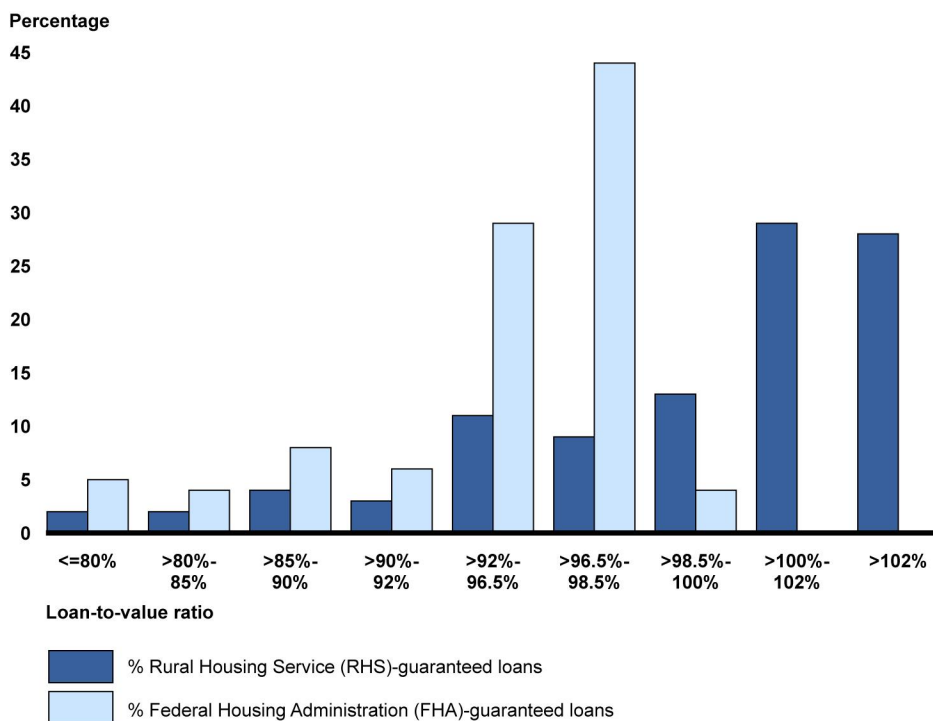
Source: GAO analysis of RHS and FHA data. | GAO-16-801

At origination, both RHS- and FHA-guaranteed loans in RHS-eligible areas had high LTV ratios (above 90 percent)—a median ratio of 101 percent for RHS and 96.5 percent for FHA.⁴⁰ As shown in figure 9, approximately 57 percent of RHS-guaranteed loans had LTV ratios greater than 100 percent, indicating that borrowers were in a negative equity position (owed more on their loans than their homes were worth).

⁴⁰In 1999, the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of Thrift Supervision defined high LTV loans as those with LTV ratios of 90 percent or more. See the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of Thrift Supervision, *Interagency Guidance on High LTV Residential Real Estate Lending* (Washington, D.C.: Oct. 8, 1999).

Among RHS borrowers with negative equity, 28 percent had LTV ratios from 102 percent to 104 percent (the top of the range for RHS). Although less than 1 percent of FHA-guaranteed loans had LTV ratios of more than 100 percent, FHA loans also had high LTV ratios. Approximately 48 percent of FHA loans had LTV ratios from 96.51 to 100 percent (with 44 percent in the 96.51 to 98.5 percent range), and an additional 35 percent had ratios from 90.01 to 96.5 percent. As previously discussed, higher LTV ratios are generally associated with a higher likelihood of default.

Figure 9: Distribution of Loan-to-Value Ratios for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014



Source: GAO analysis of RHS and FHA data. | GAO-16-801

The difference between the LTV ratio distributions for RHS and FHA are consistent with differences in the down-payment requirements of the two programs. RHS does not require borrowers to make a down payment, which allows borrowers to borrow up to 100 percent of the principal amount (prior to financing any allowable fees). In contrast, FHA requires borrowers to make a minimum 3.5 percent down payment, which results

in an initial maximum LTV (prior to financing any allowable fees) of 96.5 percent.

Significant Percentages of RHS and FHA Borrowers Could Have Met Key Criteria for the Other Program

We estimated that at least 36 percent of RHS borrowers with loans guaranteed in 2010–2014 could have met key FHA criteria (credit score, debt burden measured by PTI and DTI ratios, and loan amount) and also had the ability to meet FHA’s down-payment requirement. Similarly, at least 22 percent of FHA borrowers in RHS-eligible areas could have met key RHS criteria (credit score, debt burden ratios, and household income). According to most lenders we spoke with, borrowers who meet the criteria for both RHS- and FHA-guaranteed loans primarily consider the up-front and monthly costs of the loans in deciding between the two loan products.

At Least 36 Percent of RHS Borrowers Potentially Could Have Met FHA’s Down-Payment and Other Key Criteria

Based on our analysis of data on RHS-guaranteed loans, we estimated that at least 36 percent of RHS borrowers could have met key criteria to receive FHA-guaranteed loans and also potentially could have made a 3.5 percent down payment (see fig. 10). We analyzed data on loans RHS guaranteed in 2010–2014 and estimated how many RHS borrowers could have met key criteria for the FHA program.⁴¹ That is, the borrowers would have had to meet FHA’s benchmarks for credit scores of 580 or above, PTI ratios of 31 percent or less, and DTI ratios of 43 percent or less, and had loan amounts within the limits for the FHA program.⁴² We applied FHA’s benchmarks and did not consider any compensating factors that might have allowed borrowers to qualify without meeting those benchmarks.⁴³ We also estimated how many RHS borrowers could have also made FHA’s required down payment of at least 3.5 percent (based

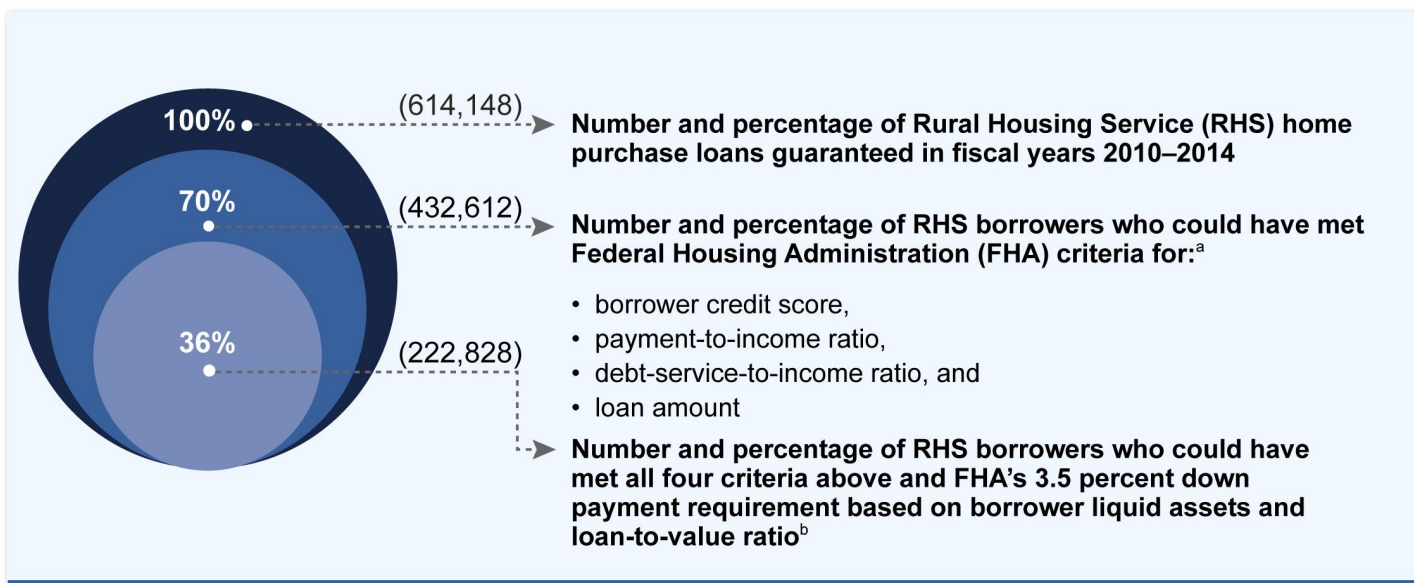
⁴¹As previously discussed, we focused on loans for purchasing single-family homes in RHS-eligible areas and excluded loans for units in condominium and cooperative developments.

⁴²As previously noted, the limits on the size of FHA-guaranteed loans vary by locality.

⁴³RHS’s and FHA’s policies allow lenders some flexibility in applying their benchmarks for credit score and PTI and DTI ratios when there are compensating factors such as proof of continuous employment or a larger down payment. For the purpose of this analysis, we used RHS and FHA benchmarks prior to considering compensating factors. As a result, our estimate represents the minimum number of RHS borrowers who could have met multiple FHA criteria.

on borrowers' liquid assets and LTV ratios).⁴⁴ When only credit score, PTI and DTI ratios, and loan amount were considered, at least 70 percent of RHS borrowers could have met these four FHA criteria.

Figure 10: Estimated Number and Percentage of RHS Borrowers Who Could Have Met Key Criteria for FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2014



Source: GAO analysis of RHS and FHA data. | GAO-16-801

⁴⁴To estimate if RHS borrowers could have made the FHA minimum down payment, we used RHS data on borrowers' liquid assets (cash or other assets, such as stocks and proceeds from the sale of property, that are readily convertible to cash) and LTV ratios. For this analysis, we considered any LTV ratio below 100 percent to reflect money paid by the borrower towards a down payment. While it is possible in some cases that the LTV ratio was below 100 percent because the property's appraised value exceeded the purchase price, RHS officials and lenders we spoke with said that the appraised value and the purchase price of a property are generally equivalent. In addition, for each loan, we used the property's appraised value to calculate the amount the borrower would have been required to pay to make a 3.5 percent down payment. According to FHA policy, the required 3.5 percent down payment is calculated based on the lesser of the appraised value or the purchase price of the property. We determined the percentage of RHS borrowers with (a) sufficient liquid assets to pay the required down-payment amount, (b) LTV ratios corresponding to that amount, and (c) a combination of liquid assets and LTV ratios corresponding to that amount. See appendix I for additional information on our analysis.

Note: The analysis focuses on 30-year, fixed-rate loans guaranteed by RHS (excluding loans for units in condominium and cooperative developments).

^aFHA has benchmarks for credit score and payment-to-income and debt-service-to-income ratios, but it also allows lenders some flexibility in applying these guidelines by considering compensating factors such as the amount of cash reserves. For this analysis, we applied FHA's benchmarks without considering any compensating factors.

^bRHS has information on a borrowers' liquid assets (cash or other assets, such as stocks and proceeds from the sale of property, that are readily convertible to cash) for about 80 percent of the borrowers whose loan guarantee applications were submitted electronically in 2010–2014. We considered borrowers' liquid assets as a proxy for the ability to make a down payment. We also considered any loan-to-value ratio below 100 percent to reflect money paid by the borrower towards a down payment. While it is possible in some cases that the loan-to-value ratio was below 100 percent because the appraised value of the property exceeded the purchase price, RHS officials and lenders we spoke with said that the appraised value and the purchase price are generally equivalent.

Although at least an estimated 36 percent of the RHS borrowers had reported liquid assets sufficient to meet FHA's down-payment and other criteria, the extent to which they would have used their liquid assets for a down payment is unknown. For example, according to a lender and an industry association with whom we spoke, RHS borrowers with liquid assets may choose not to make a down payment because they may want to use the funds to improve the home, cover other expenses, or maintain savings for future use.⁴⁵ In addition, for RHS borrowers who could not have met the down-payment requirement, the extent to which they could have obtained funds from other sources to meet the requirement is unknown. Some RHS borrowers might have been able to obtain a third-party gift to make the down payment.⁴⁶ In 2010–2014, approximately 26 percent of FHA borrowers in RHS-eligible areas received a gift to help make their down payment.

We estimated that a majority of RHS borrowers also could have met individual FHA criteria (see fig. 11). Almost all RHS borrowers could have met FHA's benchmarks for credit score and loan amount and about 80 percent could have met the benchmarks for PTI and DTI ratios.⁴⁷ When only the ability to make FHA's minimum down payment was considered,

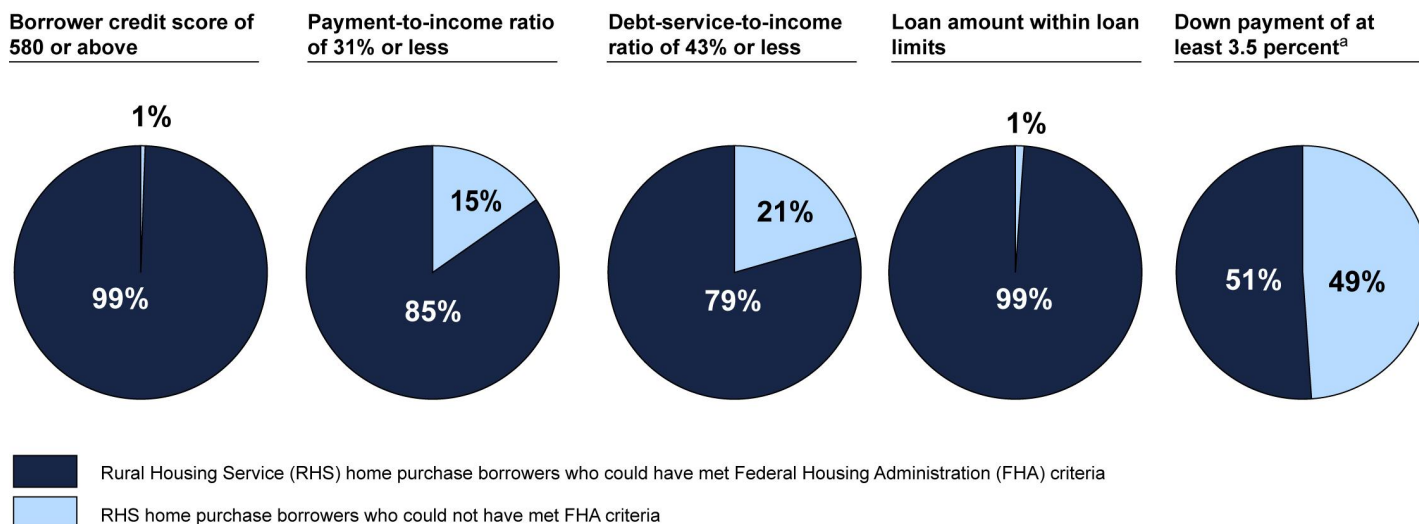
⁴⁵As previously noted, we interviewed eight mortgage lenders and five industry associations.

⁴⁶FHA allows borrowers to obtain third-party gifts from acceptable sources such as family members, employers, and governmental agencies to make the required 3.5 percent down payment.

⁴⁷For this analysis, we considered each FHA benchmark individually and compensating factors were not relevant.

we found that at least 51 percent of RHS borrowers could have met this FHA requirement.⁴⁸

Figure 11: Estimated Number and Percentage of RHS Borrowers Who Could Have Met Individual Criteria for FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2014



Source: GAO analysis of RHS data. | GAO-16-801

Note: The analysis focuses on 30-year, fixed-rate loans guaranteed by RHS (excluding loans for units in condominium and cooperative developments).

^aRHS has information on a borrower's liquid assets (cash or other assets, such as stocks and proceeds from the sale of property, that are readily convertible to cash) for about 80 percent of the RHS borrowers whose loan guarantee applications were submitted electronically in 2010–2014. We considered borrowers' liquid assets as a proxy for the ability to make a down payment. We also considered any loan-to-value ratio below 100 percent to reflect money paid by the borrower towards a down payment.

These results are not unexpected because many RHS borrowers already would have met RHS's relatively stricter benchmarks for credit score and PTI and DTI ratios. And as previously discussed, loan amounts for RHS-guaranteed loans were generally smaller than for FHA-guaranteed loans. However, some RHS borrowers would not have met every FHA benchmark. As noted previously, borrowers can qualify for a guaranteed

⁴⁸As before, we used the property's appraised value to calculate the amount of FHA's 3.5 percent down payment, which was consistent with FHA's policy and likely somewhat underestimated the number of RHS borrowers who could have met FHA's down-payment requirement.

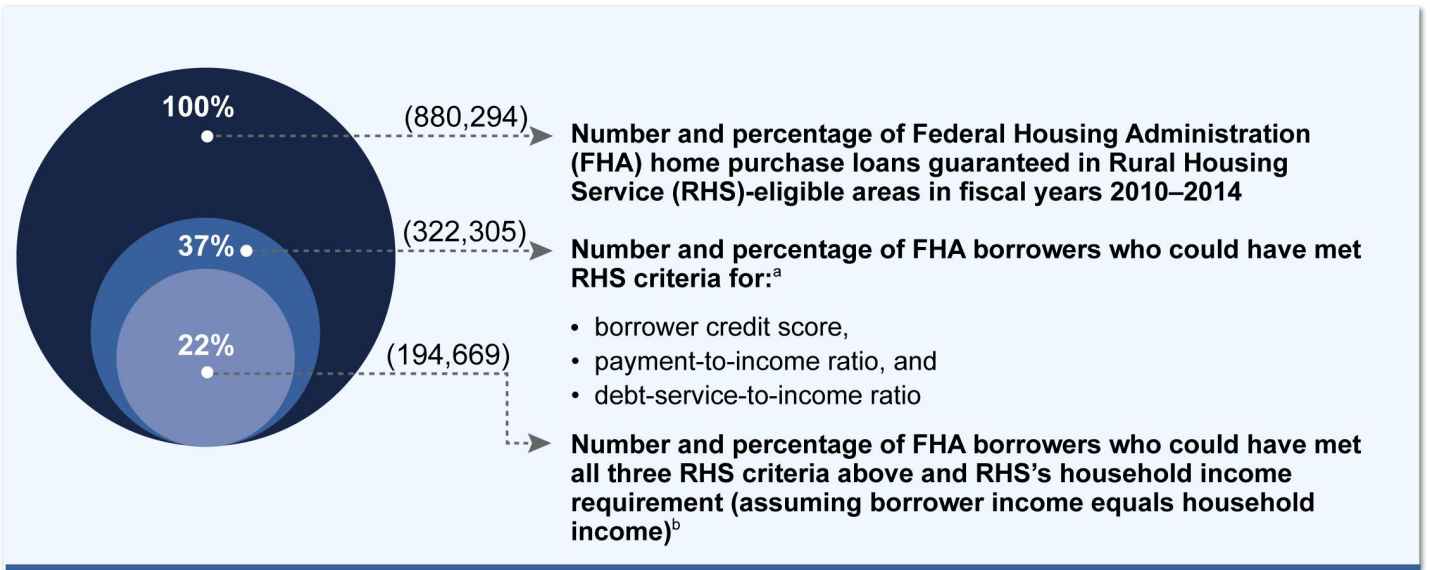
mortgage without meeting every benchmark if certain compensating factors are present.

At Least 22 Percent of FHA Borrowers in RHS-Eligible Areas Could Have Met Key RHS Criteria

Based on our analysis of data on FHA-guaranteed loans, we estimated that at least 22 percent of FHA borrowers in RHS-eligible areas could have met key RHS criteria for credit score, PTI and DTI ratios, and household income (assuming it was equivalent to the borrower's income) (see fig. 12).⁴⁹ We analyzed data on loans FHA guaranteed in 2010–2014 in RHS-eligible areas and estimated how many FHA borrowers could have met key criteria for the RHS program. That is, the borrowers would have had to meet RHS benchmarks for credit scores of 640 or above, PTI ratios of 29 percent or less, and DTI ratios of 41 percent or less. Additionally, the borrower's household income would have had to be within RHS limits. When only credit score and PTI and DTI ratios were considered, at least an estimated 37 percent of FHA borrowers could have met the RHS criteria.

⁴⁹We used the benchmarks and did not consider any compensating factors that lenders can use to qualify a borrower who does not meet those benchmarks. Therefore, our estimate represents the minimum number of FHA borrowers who could have met key criteria for the RHS program. RHS sets household income limits based on property location and household size (different limits exist for one-to-four-person households and five-to-eight-person households). The loan-level data we analyzed on FHA borrowers included information on borrower income but not on household income or size. For this analysis, we assumed that the borrower's income was the only source of household income and that all households consisted of no more than four people (the more restrictive limit). However, some FHA households likely had income from someone other than the borrower that could have pushed the household over the RHS income limit. To test the sensitivity of our assumption about household income, we calculated the median difference between RHS borrower incomes and their household incomes and applied that difference (\$2,960) to all FHA borrowers in RHS-eligible areas. Under this scenario, we found the percentage of FHA borrowers who could have met all four RHS criteria fell from 22 percent to 21 percent. See appendix I for additional information on our methodology.

Figure 12: Estimated Number and Percentage of FHA Borrowers in RHS-Eligible Areas Who Could Have Met Key RHS Criteria for RHS-Guaranteed Home Purchase Loans in Fiscal Years 2010–2014



Source: GAO analysis of RHS and FHA data. | GAO-16-801

Note: The analysis focuses on 30-year, fixed-rate loans guaranteed by FHA (excluding loans for units in condominium and cooperative developments).

^aRHS has benchmarks for credit score and payment-to-income and debt-service-to-income ratios, but it also allows lenders some flexibility in applying these benchmarks by considering compensating factors such as a favorable borrower credit history. For this analysis, we used RHS's benchmarks prior to considering compensating factors.

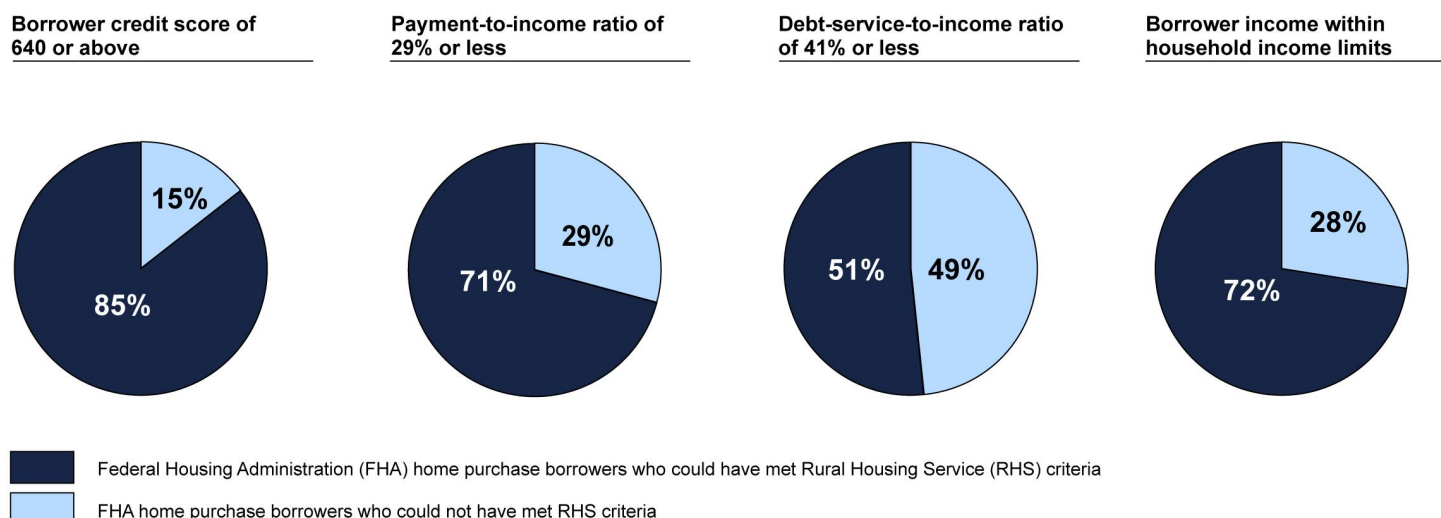
^bThe loan-level data we analyzed on FHA borrowers included information on borrower income but did not include information on household income or size. For this analysis, we assumed that the borrower's income was the only source of household income and that all households consisted of no more than four people (the more restrictive limit). Our analysis of RHS loan-level data found that the median difference between RHS borrower and household incomes was \$2,960 (about 7 percent of the median RHS borrower income).

Although RHS's benchmarks are relatively stricter than FHA's and RHS has eligibility restrictions related to household income that FHA does not have, many FHA borrowers also could have met individual criteria for RHS-guaranteed loans (see fig. 13).⁵⁰ For example, an estimated 72 percent of FHA borrowers in RHS-eligible areas could have met RHS's household income requirement (which we measured using borrower

⁵⁰For this analysis, we considered each RHS benchmark individually and compensating factors were not relevant.

income). This may reflect FHA’s relatively large concentration of first-time homebuyers (about 71 percent of the FHA borrowers we analyzed were first-time homebuyers), many of whom may have relatively lower incomes.

Figure 13: Estimated Percentage of FHA Borrowers in RHS-Eligible Areas Who Could Have Met Individual Criteria for RHS-Guaranteed Home Purchase Loans in Fiscal Years 2010–2014



Source: GAO analysis of FHA data. | GAO-16-801

Notes: The analysis focuses on 30-year, fixed-rate loans guaranteed by FHA (excluding loans for units in condominium and cooperative developments). The loan-level data we analyzed on FHA borrowers included information on borrower income but did not include information on household income or size. For this analysis, we assumed that the borrower’s income was the only source of household income and that all households consisted of no more than four people (the more restrictive limit). Our analysis of RHS loan-level data found that the median difference between RHS borrower and household incomes was \$2,960 (about 7 percent of the median RHS borrower income).

In contrast, fewer FHA borrowers (about 51 percent) could have met RHS’s benchmark for DTI ratio. As previously noted, several lenders with whom we spoke said that FHA provides lenders more flexibility than RHS in considering compensating factors related to DTI ratio, which results in some FHA borrowers with DTI ratios in excess of FHA’s benchmark (and consequently also of RHS’s benchmark).

Lender Views and Our Analysis Indicate that the Costs of RHS-Guaranteed Loans Make Them an Attractive Alternative to FHA-Guaranteed Loans

According to most lenders with whom we spoke, borrowers who meet the criteria for both the RHS and FHA programs primarily consider costs in deciding between the two programs. They stated that borrowers typically prefer the RHS-guaranteed loan over the FHA-guaranteed loan because the borrower's up-front and monthly costs (measured by the amounts borrowers are required to pay) are lower. We asked lenders about other factors borrowers might consider, including how borrowers access the programs and the length of time to obtain the guarantee. They told us that for borrowers who meet the criteria for both programs, differences between the programs—except for cost—were small and had a minimal impact on borrowers. For example, lenders told us that there is little difference in how borrowers access the programs. Specifically, borrowers can access both RHS- and FHA-guaranteed loans through a variety of channels, including nationwide lenders, local banks, and mortgage brokers. Similarly, they explained that RHS's 2-stage process for issuing guarantees versus FHA's 1-stage process did not cause borrowers to opt for FHA-guaranteed loans.⁵¹ In addition, a 2016 survey found that up-front and monthly costs were a factor borrowers consider in choosing a home mortgage and that the importance of costs increased for borrowers with lower household incomes.⁵²

⁵¹RHS requires lenders to submit loans to RHS for approval before closing the loans. In contrast, approved FHA lenders can review and approve loans without prior submission to FHA. Congress provided RHS with authority similar to FHA's to allow approved lenders to review and approve loans directly (Pub. L. No. 114-113, Div. A, sec. 743). RHS has not yet implemented this authority.

⁵²The Bureau of Consumer Financial Protection (also known as the Consumer Financial Protection Bureau) and the Federal Housing Finance Agency surveyed a representative sample of recent mortgage borrowers about their experiences in choosing and taking out a mortgage. The survey found that when taking out a loan for home purchase, 48 percent of borrowers rated low up-front costs (measured by low down payment) as a very important factor and 59 percent rated low monthly costs as a very important factor in making a choice. For purchase and refinance borrowers with low household incomes (\$50,000 to \$99,999), approximately 56 percent rated low up-front costs as a very important factor and 70 percent rated low monthly costs as a very important factor in choosing a mortgage. In contrast, for borrowers with higher incomes (\$175,000 or more), about 31 percent rated low up-front costs and 48 percent rated low monthly costs as very important factors in choosing a mortgage. See National Mortgage Database, Consumer Financial Protection Bureau, and the Federal Housing Finance Agency, *A Profile of 2013 Mortgage Borrowers: Statistics from the National Survey of Mortgage Originations*, Technical Report 16-01 (Washington, D.C.: May 27, 2016).

Both RHS and FHA borrowers pay certain up-front and monthly costs for their guaranteed loans. In addition to closing costs and fees such as payments for home inspections and appraisals, RHS and FHA borrowers pay an up-front guarantee fee, any required down payment, and an annual guarantee fee (charged monthly).⁵³ RHS and FHA charge the up-front and annual guarantee fees to help offset the cost to taxpayers of the loan guarantee programs. The guarantee fee amounts differ, in part because the programs have different requirements and goals for covering their long-term costs. According to RHS officials, since 2010 RHS has had the goal of making each year's new cohort of guaranteed loans credit-subsidy-neutral. That is, initially the present value of the lifetime estimated revenue (cash inflow) equals the present value of lifetime estimated expenses (cash outflow).⁵⁴

In contrast, FHA historically has estimated that its loan guarantee program has a negative subsidy rate for each new cohort. That is, initially the present value of lifetime estimated revenue exceeds the present value of lifetime estimated expenses. FHA's approach is consistent with the statutory requirement that it maintain a 2 percent reserve for its primary mortgage guarantee fund.⁵⁵ FHA's capital reserve represents the amounts in excess of those needed for estimated claims or other costs and is used to cover unanticipated increases in those estimated costs

⁵³According to lenders, these closing costs and fees for RHS and FHA borrowers are typically paid using seller concessions (funds sellers provide to buyers to help pay for closing costs). RHS and FHA allow sellers to pay up to 6 percent of the loan amount (for RHS) or the lesser of the purchase price or the appraised value of the home (for FHA) on behalf of a buyer to help fund these closing costs.

⁵⁴Credit subsidy costs are the costs to the government of extending or guaranteeing credit. These costs are calculated based on the net present value of the estimated lifetime cash flows to and from the government, excluding administrative costs. For a mortgage guarantee program, cash inflows consist primarily of fees received from borrowers and cash outflows consist mostly of claim payments to lenders. The estimated credit subsidy costs from RHS-guaranteed loans substantially increased in recent years, partly due to high losses from the 2007–2011 housing crisis. See [GAO-16-193](#).

⁵⁵The Omnibus Budget Reconciliation Act of 1990 mandated that FHA achieve a capital ratio of at least 2 percent by fiscal year 2000 and maintain that level in all future years. See Pub. L. No. 101-508, § 2105, 104 Stat. 1388, 1388-19 (codified, as amended, at 12 U.S.C. 1711(f)). Due partly to the 2007–2011 housing crisis, the capital ratio fell below 2 percent for several years before coming back in compliance in 2015. FHA raised its guarantee fee multiple times to increase its capital reserves but implemented a fee cut in January 2015.

before FHA draws on funds available through its permanent indefinite budget authority.⁵⁶ RHS does not have a similar requirement, and therefore draws directly on its permanent and indefinite budget authority to cover all estimated cost increases.

As described in the hypothetical example below, borrower costs (as measured by amounts required at loan closing and paid monthly) would be lower for an RHS-guaranteed loan than for an FHA-guaranteed loan for the same property.⁵⁷ On the basis of statements by most of the lenders we spoke with, the example assumes the same interest rate for both loans.

- As described previously, FHA requires borrowers to make a 3.5 percent down payment, but RHS has no down-payment requirement.⁵⁸ Thus, RHS borrowers would not need to bring any cash for a down payment to closing.
- RHS's up-front guarantee fee is higher than FHA's. In 2014, RHS's fee was 2 percent of the loan amount and FHA's was 1.75 percent. However, according to lenders with whom we spoke, most RHS and FHA borrowers finance their up-front guarantee fee into the loan amount and therefore do not need to bring cash to closing to cover this payment.

⁵⁶The Federal Credit Reform Act of 1990, Pub. L. No. 101-508, tit. V, 104 Stat. 1388, 1388-610, codified, as amended, at 2. U.S.C. §§ 661-661f, generally provides federal loan guarantee programs with permanent indefinite budget authority to cover upward reestimates of credit subsidy costs. Permanent indefinite budget authority is available for obligation and expenditure without fiscal year limitation and is not limited to a specified amount or ceiling. In 2013, FHA exhausted the funds available in its capital reserve account and drew on \$1.7 billion in permanent indefinite budget authority to cover estimated cost increases.

⁵⁷FHA's 3.5 percent minimum down payment is required by statute (12 U.S.C. § 1709(b)(9)(A)). We analyzed the borrower up-front and monthly costs for RHS and FHA loans considering various home prices and interest rates. Most lenders with whom we spoke said that interest rates for RHS- and FHA-guaranteed loans were very similar and were not systematically higher or lower for either type of loan. For additional information on our methodology, see appendix I.

⁵⁸As noted previously, FHA permits borrowers to use a down-payment gift (that is, money received from authorized third parties, such as relatives, employers, or governmental agencies, where there is no expectation that the funds will be repaid) to make the down payment. In 2010–2014, approximately 26 percent of FHA borrowers in RHS-eligible areas received a down-payment gift.

-
- Both programs require borrowers to pay an annual guarantee fee (charged monthly) for the life of the loan, which is calculated based on the scheduled outstanding loan balance.⁵⁹ In 2014, RHS's fee was 0.5 percent and FHA's minimum fee (for loans of \$625,000 or less with LTV ratios of 95 percent or more) was 1.2 percent.⁶⁰

As shown in figure 14, a hypothetical RHS borrower purchasing a \$125,000 home in 2014 (near the median loan amount for home purchases made with RHS-guaranteed loans from 2010–2014) would have had lower up-front costs (based on the required down payment and assuming financing of up-front guarantee fees) than a borrower with an FHA-guaranteed loan. Assuming a 3.75 percent interest rate, the monthly mortgage payments (including the annual guarantee fee) during the first year would have been \$50 less, or 7 percent lower, with an RHS-guaranteed loan than with an FHA-guaranteed loan.⁶¹ Over the life of the loan, assuming the borrower made all monthly scheduled payments for 30 years, the RHS borrower would have paid approximately 58 percent less in annual guarantee fees than the FHA borrower (approximately \$11,000 for the RHS borrower versus \$27,000 for the FHA borrower).⁶²

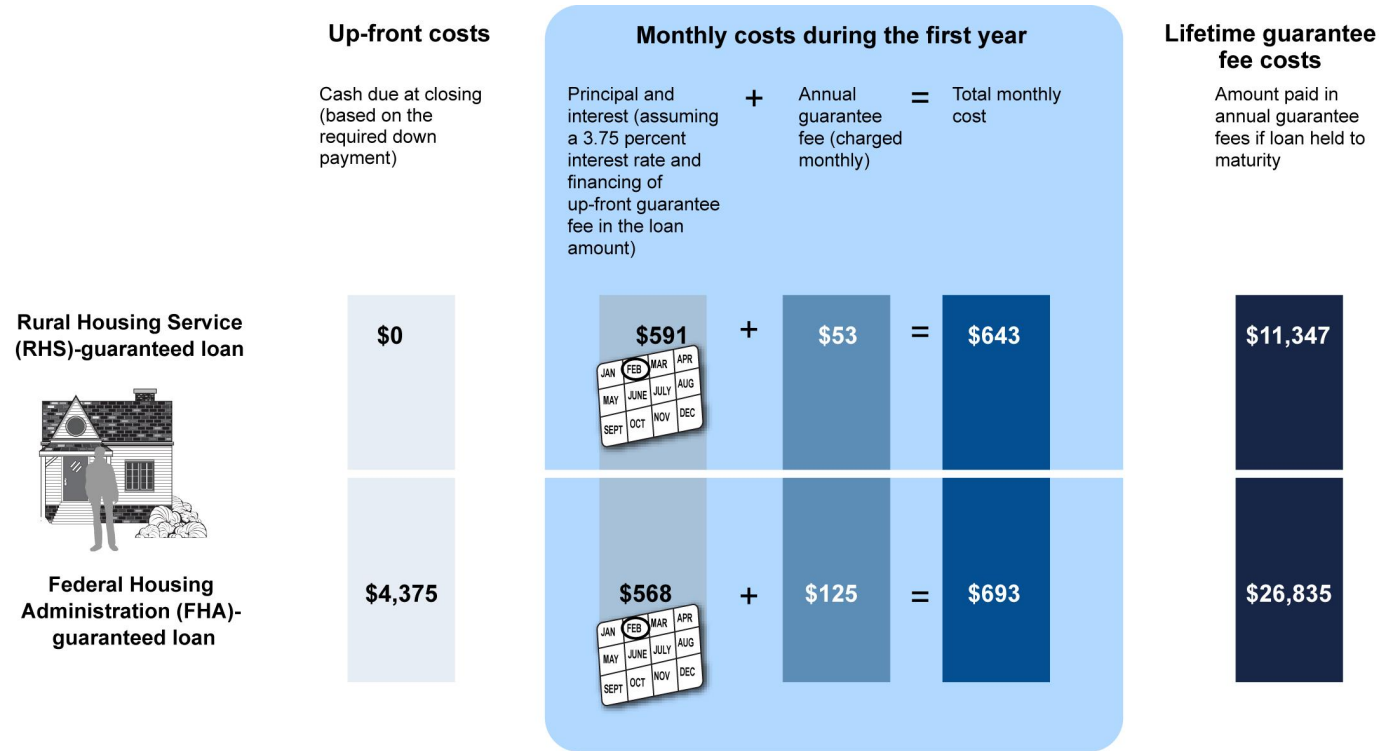
⁵⁹Beginning in June 2013, FHA began collecting annual guarantee fees for the full term of the mortgage loan for FHA-guaranteed loans with LTV ratios greater than 90 percent at origination. Previously, the borrower no longer needed to pay the annual guarantee fee when the borrower's LTV ratio was 78 percent or less.

⁶⁰RHS and FHA annual guarantee fees are calculated based on the average annual unpaid principal balance of the loan. FHA's fees for 30-year purchase loans vary somewhat, depending on whether the loan amount is more or less than \$625,500 and whether the loan's LTV ratio is higher or lower than 95 percent. Higher loan amounts and LTV ratios have somewhat higher fees.

⁶¹According to most lenders with whom we spoke, the interest rates charged for RHS- and FHA-guaranteed loans were similar. However, two lenders told us that the interest rates may differ slightly. As part of our illustrative analysis, we calculated borrower costs under scenarios in which the interest rate for the RHS loan was 0.25 percentage points higher or 0.25 percentage points lower than the rate charged for the FHA loan. In both scenarios, the monthly costs of the RHS loan were lower than the costs of the FHA loan. See appendix I for additional discussion.

⁶²After 10 years, the RHS borrower would have paid approximately \$5,600 in annual guarantee fees and the FHA borrower approximately \$13,600 in annual guarantee fees.

Figure 14: Illustrative Up-front and Monthly Costs for Purchasing a \$125,000 Home in Fiscal Year 2014 Using a 30-Year Fixed-Rate Mortgage Guaranteed by RHS or by FHA



Source: GAO analysis. | GAO-16-801

Notes: The illustrative example assumes that the seller paid all closing costs and other fees and that the borrower made all payments as scheduled. The up-front guarantee fee (which is different for each program) is financed into the loan amount (the guarantee fee in this example is \$2,551 for the RHS loan and \$2,111 for FHA). After considering the up-front guarantee fee and any required down payment, the loan amounts are \$127,551 for the RHS-guaranteed loan and \$122,736 for the FHA-guaranteed loan. The scheduled monthly cost does not include any additional amounts lenders collect to cover taxes, insurance, or other expenses. All numbers are rounded to the nearest dollar.

While RHS-guaranteed loans have lower up-front and monthly costs, they often have higher LTV ratios than FHA-guaranteed loans, because RHS does not require a down payment. In the hypothetical situation presented in figure 14, the RHS borrower's LTV ratio at origination is 102 percent (a negative equity position), compared with 98 percent for the FHA borrower. Because RHS borrowers often start off with negative home equity, they may have fewer options than FHA borrowers to avoid default if they experience financial troubles. For example, they may find it more difficult to sell or refinance their homes to relieve unsustainable mortgage payments. Additionally, RHS borrowers may take longer than FHA

borrowers to build sufficient home equity to refinance into a conventional loan without needing to pay additional guarantee fees.⁶³

RHS loans' higher LTV ratios and lower guarantee fees relative to FHA loans help make loans more affordable. However, these features may also increase financial risks to the federal government from increased loan defaults and less revenue to cover unanticipated costs. Specifically, as discussed further in the next section of this report, higher LTV ratios are associated with a higher probability of troubled loan performance. Furthermore, in setting guarantee fees, RHS does not have to raise sufficient revenue to maintain a capital reserve as FHA does. As a result, RHS's program is not designed to cover unanticipated cost increases without drawing on its permanent and indefinite budget authority. These trade-offs highlight issues for RHS and FHA to consider in evaluating opportunities to consolidate the programs, as we recommended in 2012 and reaffirm in this report.

RHS-Guaranteed Loans Were More Likely to Be Troubled after 3 Years than FHA-Guaranteed Loans

Our analysis of loans RHS and FHA guaranteed in 2010 and 2011 found some differences in loan performance after 3 years. These differences included RHS's lower prepayment rates and higher troubled loan rates (the share of loans at least 90 days delinquent, in the foreclosure process, or terminated with a claim) compared with FHA. Our statistical model also estimated that RHS loans would be expected to have higher troubled loan rates than FHA loans, due partly to the higher LTV ratios of RHS borrowers.

⁶³Conventional loans are mortgage loans that are not guaranteed by the federal government. Generally, borrowers with LTV ratios of 80 percent or less do not require a mortgage guarantee or mortgage insurance when obtaining a conventional loan.

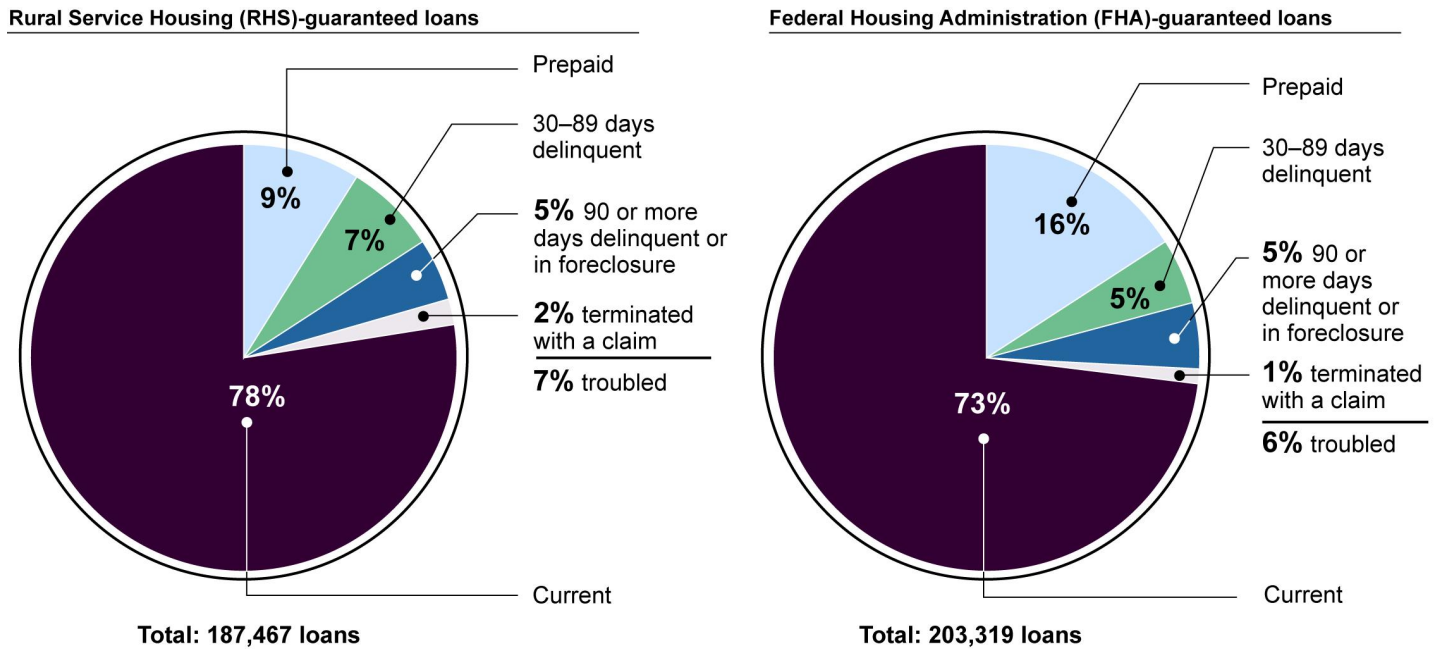
After 3 Years of Performance, RHS Had a Higher Troubled Loan Rate Than FHA

After 3 years, the performance of comparable loans that RHS and FHA guaranteed in 2010 and 2011 in RHS-eligible areas differed.⁶⁴ As shown in figure 15, RHS had a higher troubled loan rate than FHA (about 7 percent for RHS and 6 percent for FHA).⁶⁵ When we restricted the analysis to loans for properties in large rural towns and small town and isolated rural areas (using USDA's Rural-Urban Commuting Area codes), the troubled loan rates were lower for both agencies, but RHS's rate (6.1 percent) remained higher than FHA's (5.4 percent).

⁶⁴We analyzed loan-level data on the performance of 30-year, fixed-rate home purchase loans (excluding those for units in condominium and cooperative developments) that RHS and FHA guaranteed from October 2009 through September 2012 in RHS-eligible areas. For the purpose of comparing performance, we limited the FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas and to borrowers with incomes within the county-level household income limits set by RHS. We restricted the data in this way to account for the absence of FHA limits on borrower household income, which resulted in FHA serving some borrowers with higher incomes than RHS is allowed to serve. Because the analysis in this section focuses on the payment status of the loans, we used the first month a loan payment was due (first payment month) as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in 2010–2011, we focused on loans with first payment months from December 2009 through October 2011. In addition, the data we analyzed did not have performance information for about 0.2 percent each of the RHS- and FHA-guaranteed loans.

⁶⁵As noted previously, troubled loan rates are the number of loans at least 90 days delinquent, in the foreclosure process, or terminated with a claim divided by the number of loans guaranteed. As shown in figure 15, some of the loans RHS and FHA guaranteed prepaid, likely because the borrowers refinanced into new loans or sold their homes. Because we did not have performance information on the loans into which prepaying borrowers may have refinanced, we included prepayments only in the denominator of our calculation of troubled loan rates. As a result, we treated prepaid loans similarly to loans that were current or in an early stage of delinquency. This approach is consistent with the fact that RHS and FHA borrowers generally need to be current on their loans to use the RHS and FHA refinance programs and that the programs are designed to help borrowers lower their monthly loan payments, which may increase their ability to remain current.

Figure 15: Status of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010 and 2011, after 3 Years of Performance



Source: GAO analysis of RHS and FHA loan-level data. | GAO-16-801

Note: For this analysis, we focused on 30-year, fixed-rate loans guaranteed by RHS and FHA for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Because the analysis in this figure focuses on the payment status of the loans, we used the first month a loan payment was due (first payment month) as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2011, we focused on loans with first payment months from December 2009 through October 2011. We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas and to borrowers with incomes within the county-level household income limits set by RHS. Percentages do not always sum to 100 percent due to rounding.

Additionally, across all RHS-eligible areas, RHS had a higher percentage of loans that were current (and not prepaid) than FHA did. Specifically, about 78 percent of RHS-guaranteed loans were current after 3 years, compared with 73 percent of FHA-guaranteed loans. In contrast, RHS had a substantially lower proportion of loans that prepaid relative to FHA. Specifically, about 9 percent of RHS-guaranteed loans and 16 percent of FHA-guaranteed loans prepaid after 3 years of performance. See

appendix V for additional information about the performance status of RHS- and FHA-guaranteed loans after 2 and 3 years of performance.⁶⁶

According to representatives of some lenders and industry associations with whom we spoke, RHS would be expected to have lower prepayment rates than FHA because of differences in the RHS and FHA programs.⁶⁷ As previously noted, prepayments can result from a borrower refinancing into a new loan. The greater initial home equity of FHA borrowers might have allowed them to more quickly reach the level of equity needed to refinance into a conventional loan. A few lenders and an industry association also noted that FHA's streamline refinance program, available nationwide, allows existing FHA borrowers to refinance into a new FHA-guaranteed loan through a process that involves fewer requirements than FHA's traditional refinance process.⁶⁸ In contrast, RHS had no streamline refinance program available to existing RHS borrowers in 2010 and 2011.⁶⁹

We also analyzed the status of comparable RHS- and FHA-guaranteed loans after 2 years of performance.⁷⁰ In contrast to the 3-year troubled loan rates, we found that the agencies had almost identical 2-year troubled loan rates, although RHS's rate was slightly lower (3.8 percent

⁶⁶Due to the relatively brief period for our analysis of loan performance (2 to 3 years from the month of first payment), we did not isolate and analyze the foreclosure rate of RHS- and FHA-guaranteed loans. According to the Federal Reserve Bank of Minneapolis, on average loans in foreclosure in 2010 took from 15 months to 2 years to complete foreclosure—meaning that relatively few of the loans we analyzed would have had time to complete this process. See: Kyle F. Herkenhoff and Lee E. Ohanian, "Foreclosure Delay and the U.S. Labor Market," Economic Policy Paper 16-07 (Minneapolis, Minn.: May 2016).

⁶⁷As previously noted, we interviewed eight mortgage lenders and five industry associations.

⁶⁸Under FHA's streamline refinance program, FHA generally does not require an appraisal or the borrower's credit score. FHA also does not require lenders to certify the borrower's employment and income.

⁶⁹RHS began offering a pilot program that initially was limited to 19 states in 2012. The pilot program was expanded in 2013 to 34 states and Puerto Rico and then made available nationwide in 2016.

⁷⁰For this analysis, we focused on loans with first payment months from December 2009 through October 2012. See appendix V for additional information on our analysis results.

for RHS and 3.9 percent for FHA). However, similar to the 3-year results, we found that RHS had a higher percentage of current loans and a lower percentage of prepaid loans than FHA after 2 years.

Our Estimates Suggest That RHS Would Be Expected to Have a Higher Troubled Loan Rate Than FHA

We developed a statistical model to examine factors that may explain differences between RHS and FHA troubled loan rates (the share of loans at least 90 days delinquent, in the foreclosure process, or terminated with a claim), including the characteristics of their guaranteed portfolios (represented by loan, borrower, and economic variables).⁷¹ For RHS and FHA separately, we analyzed the statistical relationships between the variables and the probability of the guaranteed loans becoming troubled after 3 years (that is, we estimated changes in the troubled loan rate associated with variations in the value of the variables). In general, we found that the statistical relationships between the variables were similar for both agencies. These similarities suggest that the way the agencies and lenders implement the two guarantee loan programs, including methods for evaluating default risk and ensuring compliance with underwriting standards, would be expected to yield similar troubled loan rates for loans with comparable characteristics. Thus, differences in loan performance are likely attributable to differences in portfolio characteristics.

To estimate the influence of portfolio characteristics on differences in agency troubled loan rates, we ran our model using a combined set of RHS and FHA loans.⁷² Specifically, we simulated troubled loan rates for

⁷¹As before, we restricted this analysis to loans to borrowers with incomes less than the income limits set by RHS. We used RHS and FHA loan-level data for loans guaranteed in 2010–2011 and focused on loans with first payment months from December 2009 through October 2011. Among other things, the portfolio characteristics included borrower income and credit score, loan amount, loan interest rate, and DTI and LTV ratios at loan origination. We also used external data, including a Federal Housing Finance Agency house price index for nonmetropolitan areas to measure house price changes and data on the Treasury 10-year constant maturity rate to determine the interest rate spread (that is, the difference between the interest rate on the loan and the Treasury rate for the same period). Prior research has found that these variables influence loan performance. Other variables for which we lacked data, such as borrower employment status, may also influence troubled loan rates.

⁷²The similarities in the separate RHS and FHA statistical relationships allowed us to generate meaningful results from the model using a data set that included both agencies' loans.

RHS and FHA based on a set of characteristics representing the average loan for each agency and compared these expected rates. Overall, the model estimated that RHS would be expected to have a somewhat higher 3-year troubled loan rate than FHA when considering all portfolio characteristics. Specifically, RHS's expected troubled loan rate was 6 percent higher than FHA's (see fig. 16).⁷³ RHS's higher expected rate relative to FHA's is consistent with the pattern observed in the agencies' actual troubled loan rates.⁷⁴

Additionally, when we isolated the influence of individual portfolio characteristics on expected troubled loan rates, we found that LTV ratio and borrower income were the largest contributors to RHS's higher expected rate, as follows (see fig. 16):⁷⁵

- Our model estimated that RHS's higher LTV ratios relative to FHA's were associated with an expected troubled loan rate that was about 11 percent higher than FHA's.
- Similarly, our model estimated that RHS's lower borrower incomes relative to FHA's were associated with an expected troubled loan rate that was about 6 percent higher than FHA's.

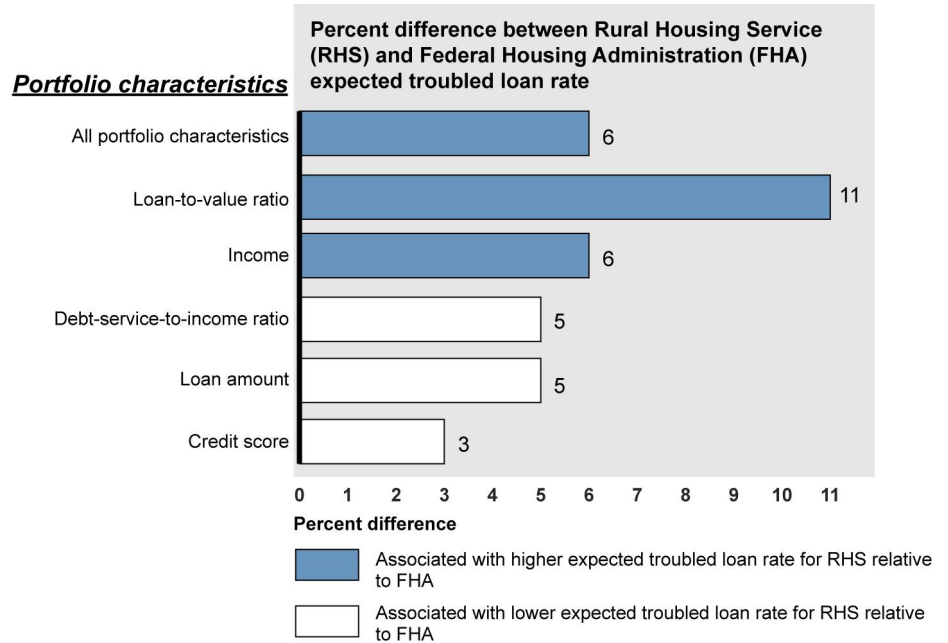
RHS would be expected to have relatively riskier characteristics in these areas due to program requirements that are less restrictive than FHA's for down payment (as reflected in the LTV ratios) and more restrictive for household income.

⁷³We calculated the percent difference between the agencies' expected troubled loan rates by subtracting the FHA rate from the RHS rate, dividing by the average of the FHA and RHS rates, and multiplying the quotient by 100. When we limited the analysis to RHS- and FHA-guaranteed loans for properties in large rural towns and small town and isolated rural areas (as defined using USDA's Rural-Urban Commuting Area classification), RHS's 3-year expected troubled loan rate remained higher than FHA's. See appendixes VI and VII for additional information.

⁷⁴The specific magnitudes of the expected troubled loan rates and the actual troubled loan rates cannot be compared due to differences in the methodologies for calculating them.

⁷⁵To calculate expected troubled loan rates associated with individual portfolio characteristics, we used the agency-specific averages for the characteristic of interest and held other characteristics at their average values for the combined set of RHS and FHA loans. See additional details on our methodology in appendix VI.

Figure 16: Estimated Influence of Portfolio Characteristics on Differences in 3-Year Performance of Home Purchase Loans RHS and FHA Guaranteed in RHS-Eligible Areas in Fiscal Years 2010 and 2011



Source: GAO analysis of RHS and FHA data. | GAO-16-801

Notes: For this analysis, we focused on 30-year, fixed-rate loans guaranteed by RHS and FHA for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Because the analysis in this figure focuses on the payment status of the loans, we used the first month a loan payment was due (first payment month) as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2011, we focused on loans with first payment months from December 2009 through October 2011. We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas and to borrowers with incomes within the county-level household income limits set by RHS. Troubled loan rates are the number of loans at least 90 days delinquent, in the foreclosure process, or terminated with a claim divided by the number of loans guaranteed. We calculated the percent difference between the agencies' expected troubled loan rates by subtracting the FHA rate from the RHS rate, dividing by the average of the FHA and RHS rates, and multiplying the quotient by 100. See appendixes VI and VII for more information about our estimation methodology and results for other portfolio characteristics.

In contrast, the estimated influences of other characteristics were relatively smaller and associated with lower estimated troubled loan rates for RHS, as follows (see fig. 16):

- RHS's lower DTI ratios and loan amounts were each associated with an expected troubled loan rate that was about 5 percent lower for RHS than for FHA.

-
- Similarly, our model estimated borrower credit scores were associated with an expected troubled loan rate that was 3 percent lower for RHS than for FHA.

RHS would be expected to have relatively less risky characteristics along these dimensions due to its stricter benchmarks for credit score and DTI ratio and limits on household income (which indirectly affect the loan amounts).

In contrast to the 3-year results, our statistical model estimated that RHS would have a slightly lower expected 2-year troubled loan rate than FHA given the characteristics of the two agencies' guaranteed portfolios. RHS's marginally lower expected rate is consistent with the pattern observed in the agencies' actual troubled loan rates after 2 years. The estimated influences of individual portfolio characteristics on expected 2-year troubled loan rates were consistent with our estimates for the 3-year rates in terms of direction but differed in magnitude. For example, in the case of LTV ratio, the model estimated that RHS's higher LTV ratios relative to FHA were associated with an expected 2-year troubled loan rate that was about 6 percent higher than FHA's expected rate. By comparison, RHS's corresponding 3-year rate was 11 percent higher than FHA's.

The change in the estimated influence of LTV ratios may reflect that, as time passes, a borrower's chances of experiencing events that can make mortgage payments unsustainable (for example, job loss) increase. Borrowers with greater home equity may be better positioned to resolve such situations through refinancing or sale of the home. As previously noted, RHS borrowers often start off with less home equity (as reflected in their higher LTV ratios) than FHA borrowers and may find it more difficult to refinance or sell their homes to avoid default. See appendixes VI and VII for more information on the model and its results.

Agency Comments and Our Evaluation

We provided a draft of this report to USDA and HUD for review and comment. USDA provided comments via e-mail from the audit liaison officer in Rural Development's Financial Management Division. HUD provided technical comments, which we incorporated into the final report as appropriate.

In its comments, USDA stated that our comparative analysis of the RHS and FHA programs added to the understanding of the programs' capabilities and expanded upon our 2012 report, which concluded that

overlap existed between federal housing programs. USDA also made several more specific points, as follows:

- USDA said that the overlap we found between the RHS and FHA programs was minor and that RHS targets a specific underserved segment of the population, which would not attain successful homeownership but for RHS. We maintain that there is significant overlap between the RHS and FHA loan guarantee programs in RHS-eligible areas, as evidenced by the estimated 36 percent of RHS borrowers and 22 percent of FHA borrowers who could have met the criteria for both programs. Furthermore, we found that the majority of RHS borrowers could have met individual FHA eligibility requirements (99 percent for loan amount and 51 percent for down payment) and individual qualifying benchmarks (99 percent for credit score, 85 percent for PTI ratio, and 79 percent for DTI ratio).
- Regarding our estimate of RHS borrowers with sufficient liquid assets to make a 3.5 percent down payment, USDA noted that many of them would have had little or no savings left to meet the additional expenses associated with homeownership if they had made such a down payment. USDA also said that the greater affordability of RHS loans compared with FHA loans helps families meet other financial needs. Our report discusses differences in RHS and FHA borrower costs, including the down payment and guarantee fees that make RHS loans more affordable. It also recognizes the view that some borrowers may want to use their liquid assets to improve the home, cover other expenses, or maintain savings for future use rather than make a down payment. However, our report also describes important trade-offs associated with these lower costs. For example, because RHS borrowers are not required to make a down payment and can finance their up-front guarantee fee, they often start off with negative home equity (LTV ratios over 100 percent). As we note in our report, they therefore may have fewer options than FHA borrowers to avoid default if they experience financial trouble. Additionally, RHS's higher LTV ratios and lower guarantee fees relative to FHA also may increase financial risk to the federal government from higher potential loan defaults and less revenue to cover unanticipated costs of the loan guarantees.
- USDA said that for methodological reasons, it did not believe that the differences we identified between expected RHS and FHA troubled loan rates were meaningful. USDA stated that RHS's higher expected troubled loan rates were partly attributable to RHS's higher LTV ratios (often greater than 100 percent) and that our performance analysis

did not fully account for differences in LTV ratios between the RHS and FHA portfolios. USDA added that there could be intraregional differences in loan characteristics between RHS and FHA that were not reflected in our analysis. We maintain that the differences between expected troubled loan rates for RHS and FHA are meaningful and that our methodology properly accounted for differences between the RHS and FHA portfolios regarding LTV ratios and geographic areas served. Our statistical model included an LTV variable with four categories, including a category for loans with LTV ratios at or above 100 percent (which accounted for most of RHS's portfolio) and a category for loans with ratios of 96 to 99.9 percent (which accounted for most of FHA's portfolio). We used that structure based on our analysis of RHS loans, which found that loans with LTV ratios slightly above 100 percent performed worse than those with ratios slightly below 100 percent. We specifically highlight this issue in appendix VI of our report. This appendix contains discussion and analysis showing the importance of differentiating loans at the high end of the LTV range in modeling expected RHS loan performance and comparing the performance of the RHS and FHA portfolios. In addition, our analysis of expected loan performance took multiple steps to account for the potential impact of geographic differences between the RHS and FHA portfolios on loan performance. Specifically, we (1) restricted FHA loans to those for properties in RHS-eligible areas, (2) differentiated, within RHS-eligible areas, between areas that were more rural and more urbanized, (3) included a set of variables in our model to control for house price appreciation at the state level, and (4) included a set of regional indicator variables (representing the nine census divisions) in our model to help control for factors not directly measured by other explanatory variables but that might differ by region.

- Finally, USDA said it did not believe that “a single monolithic housing department” would best serve the highly differentiated housing market in rural America and that it was committed to seeking opportunities for intra-agency collaboration to expand mortgage access and improve the quality of housing for rural families. Our report does not state or intend to suggest that a single agency or single program is necessarily the best way to serve rural housing needs. Rather, our report analyzes the extent of overlap between two similar programs and identifies issues that should be considered in assessing opportunities for consolidation. As we note in our report, consolidation may be beneficial in some situations and not in others, but a case-by-case analysis is needed to assess opportunities for improved efficiency and effectiveness and inform congressional decision

making. For this reason, we maintain that RHS and FHA should implement our 2012 recommendation to report on and evaluate consolidation opportunities.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to interested congressional committees, USDA, and HUD. In addition, this report will be 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. Key contributors to this report are listed in appendix VIII.

Sincerely yours,



Daniel Garcia-Diaz
Director, Financial Markets and Community Investment

Appendix I: Objectives, Scope, and Methodology

This report compares the characteristics and performance of single-family mortgage loans guaranteed by the Department of Agriculture's (USDA) Rural Housing Service (RHS) and by the Department of Housing and Urban Development's (HUD) Federal Housing Administration (FHA) in fiscal years 2010–2014.¹ Specifically, this report (1) compares the property, borrower, and loan characteristics of RHS- and FHA-guaranteed loans in statutorily defined RHS-eligible areas (RHS-eligible areas); (2) estimates the number of RHS and FHA borrowers in RHS-eligible areas who could have met key criteria for the other program and describes factors borrowers consider in choosing between the two programs; and (3) compares the performance of RHS- and FHA-guaranteed loans in RHS-eligible areas.

Data Used in Our Analysis

To address these three objectives, we obtained and analyzed loan-level data from RHS and FHA for single-family home purchase and refinance mortgages the agencies guaranteed under RHS's Section 502 program and FHA's Section 203(b) program from 2010 through 2014 (a time frame which allowed for analysis of loan performance over multiple years).² To facilitate comparison of the agencies' guaranteed portfolios, we restricted our analysis to 30-year, fixed-rate mortgages to owner-occupants and excluded loans for units in condominium and cooperative developments.³ The final data sets included records for 672,736 RHS-guaranteed loans (644,514 purchase loans and 28,222 refinance loans) and 5,200,250 FHA-guaranteed loans (3,528,256 purchase loans and 1,671,994 refinance loans). Each loan record included data on property characteristics (such as the property's state and zip code), borrower

¹Unless otherwise specified, years refer to federal fiscal years.

²The RHS loan guarantee program was authorized by Section 706(b) of the Cranston-Gonzalez National Affordable Housing Act, Pub. L. No. 101-625, 104 Stat. 4079, 4284 (1990), which added subsection 502(h) to the Housing Act of 1949, Pub. L. 81-171, 63 Stat. 413 (codified, as amended, at 42 U.S.C. 1472(h)), and the FHA loan guarantee program was authorized by Section 203 of the National Housing Act, Pub. L. No. 73-479, 48 Stat. 1246 (1934) as amended (codified at 12 U.S.C. 1709). In contrast to RHS, FHA uses the term "mortgage insurance" instead of "loan guarantee." Because "insurance" and "guarantee" have the same meaning in the context of our review, we use guarantee throughout this report.

³RHS does not guarantee mortgages with shorter terms or adjustable interest rates. Additionally, under its 203(b) program, FHA does not guarantee loans for cooperatives, and guaranteed few loans for condominiums in 2010–2014.

characteristics (such as credit score and measures of debt burden), and loan characteristics (such as loan amount and loan-to-value ratio) at origination. In addition, approximately 80 percent of the RHS loan records had data on borrowers' liquid assets (cash or other assets, such as stocks and proceeds from the sale of property, which are readily convertible to cash).⁴ The data also included information on mortgage payment status, including number of days (RHS) or months (FHA) delinquent and other performance information (such as in the foreclosure process, prepaid, or terminated with a claim). To assess the reliability of these data, we tested the data for missing values, outliers, and obvious errors and reviewed documentation on the processes RHS and FHA used to collect and ensure the reliability and integrity of their data. We also interviewed RHS and FHA officials to discuss interpretations of various data fields. We concluded that the data we used were sufficiently reliable for purposes of comparing the characteristics and performance of RHS- and FHA-guaranteed loans and estimating the extent to which RHS and FHA borrowers could have met key criteria for the other program.

We supplemented the RHS and FHA data with additional information. Specifically, we determined whether each mortgaged property was located in an RHS-eligible area using RHS's boundary data.⁵ The statutory definition of RHS-eligible areas changed in 2014, and some areas that were previously eligible in 2010–2014 were no longer eligible. To identify RHS-guaranteed loans with properties in RHS-eligible areas according to the new definition, we used loan-level data on the property's location (expressed as latitude and longitude). Of the 672,736 loans, approximately 5 percent or 31,394 loans RHS guaranteed in 2010–2014 were no longer in RHS-eligible areas using the new definition. We excluded these loans from our analysis. As we did not have property addresses for the FHA-guaranteed loans, we used each property's

⁴Data on liquid assets were not available for the approximately 20 percent of borrowers whose loan guarantee applications were submitted manually. Lenders can submit loans for an RHS guarantee electronically or manually. According to RHS officials, more data are collected and stored for loans submitted electronically, including data on liquid assets, than for loans submitted manually. The proportion of guaranteed loans submitted electronically increased from approximately 56 percent in 2010 to 96 percent in 2014.

⁵For this analysis, we used the statutory definition of RHS-eligible. The eligible areas were updated in 2014 and 2015 to take into account data from the 2010 Census. See The Agricultural Act of 2014, Pub. L. No. 113-79, § 6208, 128 Stat. 649, 861.

census tract to determine whether the property was located in an RHS-eligible area.

In addition, we assigned a “rurality” code to each loan using USDA’s Rural-Urban Commuting Area codes. Developed by USDA’s Economic Research Service and the U.S. Health Resources and Services Administration, the codes consist of 10 primary and 21 secondary codes for classifying census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density.⁶ For ease of presentation, we used the Washington State Department of Health’s four-tiered consolidated taxonomy of the codes. The taxonomy classifies all properties as one of the following:

- **Urban.** Adjoining census tracts in built-up areas with a total population of 50,000 or more.
- **Suburban.** Areas with high commuting flows to urban areas and all areas where 30-49 percent of the population commutes to urban areas for work.
- **Large rural town.** Towns with populations of between 10,000 and 49,000 and surrounding rural areas where 10 percent or more of the population commutes to the town and 10 percent or more of the population commutes to an urban area for work.
- **Small town and isolated rural area.** Towns with populations of less than 10,000 and their surrounding commuter areas and other isolated rural areas that are more than 1 hour driving distance to the nearest city.⁷

This classification system was designed to support descriptive analysis of census tract data by providing information about the general character of an area.

Finally, for each RHS- and FHA-guaranteed loan, we also assigned a census region (based on the state where the property was located) and a 10-year Treasury constant maturity rate at the time of origination (using

⁶The codes were updated to take into account the results of the 2010 Census.

⁷Washington State, Department of Health, *Guidelines for Using Rural-Urban Classification Systems for Public Health Assessment* (Feb. 5, 2009).

publicly available data from the Board of Governors of the Federal Reserve System).⁸

Characteristics of RHS- and FHA-Guaranteed Loans

To compare the property, borrower, and loan characteristics of single-family home mortgages RHS and FHA guaranteed in 2010–2014, we reviewed agency documentation on the Section 502 and Section 203(b) programs and analyzed the loan-level data discussed previously. To identify similarities and differences between the two agencies' guarantee programs, we reviewed relevant statutes and regulations, RHS and FHA policy guidelines, and documentation related to the agencies' loan-level data.⁹ We also reviewed our 2012 report comparing the RHS and FHA single-family loan guarantee programs.¹⁰ We focused our analysis of the loan-level data on purchase loans. However, in appendix III, we present tables showing the characteristics of RHS and FHA refinance loans.

Using data in the agency loan records, we compared the characteristics of RHS and FHA purchase loans for properties located in RHS-eligible areas (based on the statutory definition of eligibility). As noted previously, we did not have the property addresses associated with the FHA loans, but we did have the associated census tracts. We used a property's census tract to determine whether the property was located in an RHS-eligible area. We considered FHA loans for properties in census tracts where 66.7 percent or more of the tract was in an RHS-eligible area to be RHS-eligible (a total of 880,294 loans). We separately analyzed the

⁸Rates on 30-year, fixed-rate mortgages are commonly compared with the 10-year Treasury rate. See Howard L. Roth, *Volatile Mortgage Rates—A New Fact of Life?* Federal Reserve Bank of Kansas City Economic Review (Kansas City, Kans.: March 1988).

⁹Sources reviewed included United States Department of Agriculture, *SFH Guaranteed Loan Technical Handbook*, HB-1-3555 (Washington, D.C.), accessed on July 2015 at <http://www.rd.usda.gov/publications/regulations-guidelines/handbooks#hb13555>; Department of Housing and Urban Development, *Lenders' Guide to the Single-Family Mortgage Insurance Process*, 4155.2 (Washington, D.C.: Mar. 24, 2011) and *Mortgage Credit Analysis for Mortgage Insurance on One-to-Four Unit Mortgage Loans*, 4155.1 (Washington, D.C.: Mar. 24, 2011). We also reviewed various HUD mortgage letters and RHS administrative notices related to their respective loan guarantee programs.

¹⁰GAO, *Housing Assistance: Opportunities Exist to Increase Collaboration and Consider Consolidation*, GAO-12-554 (Washington, D.C.: Aug. 16, 2012).

characteristics of FHA loans for properties not in RHS-eligible areas and present that analysis in appendix IV.

We compared the property, borrower, and loan characteristics of RHS and FHA purchase loans by calculating the number and percentage of loans that fell into different categories or ranges of values for each characteristic. To analyze property characteristics, we compared the rurality, state, Census region, and construction type (manufactured or not manufactured home) of properties with RHS- and FHA-guaranteed loans. To analyze borrower characteristics, we compared the credit score, payment-to-income (PTI) and debt-service-to-income (DTI) ratios, annual income, first-time homebuyer status, and borrower-identified race and ethnicity of RHS and FHA borrowers. For borrower race and ethnicity, we used the Home Mortgage Disclosure Act classifications, which place borrowers in one of the following categories: American Indian or Alaska Native, Asian, black or African-American, Native Hawaiian or other Pacific Islander, Hispanic or Latino, white, or borrower did not disclose.¹¹ To analyze loan characteristics, we compared the loan amount, loan-to-value (LTV) ratio (including any financed up-front guarantee fees), and interest rate spread of RHS- and FHA-guaranteed loans.

For refinance loans, RHS provided loan-level data for two refinance programs (refinance of RHS direct loans to guaranteed loans and refinance of existing RHS-guaranteed loans) and FHA provided data on three refinance programs (refinance of conventional loans to FHA-guaranteed loans, refinance of existing FHA-guaranteed loans (not streamlined), and FHA streamline refinance program).¹² Based on our analysis of the program requirements for RHS and FHA refinance loans, we determined that certain aspects of RHS's and FHA's program policies made direct comparison of the two programs problematic. For example, FHA allowed for cash-out refinances (where the borrower refinances their mortgage at a higher amount than the loan balance and uses the remaining funds for other purposes), while RHS did not. In addition, less

¹¹In addition, where non-Hispanic or Latino borrowers identified more than one race we added an additional classification of "more than one race." For this analysis, we made the race and ethnicity categories mutually exclusive.

¹²Loans refinanced under the "streamlined" process generally require limited credit documentation and underwriting and do not require a new appraisal (a valuation of the property to be used as collateral for the loan).

data were available for refinance loans because certain refinance programs do not require collection of information such as LTV ratio and borrower credit score (in the case of streamline refinance loans). As a result, we analyzed the characteristics of each agency's refinance loans (and present the analysis in app. III) but did not directly compare the results as we did for purchase loans.

Estimates of RHS and FHA Borrowers Who Could Have Met Key Criteria for the Other Loan Guarantee Program

To estimate the number and percentage of RHS and FHA borrowers in RHS-eligible areas who could have met key criteria for the other agency's guarantee program in 2010–2014, we compared the characteristics of RHS-guaranteed loans to the requirements and benchmarks for FHA's program and compared the characteristics of FHA-guaranteed loans to the requirements and benchmarks for RHS's program.

To do this, we first reviewed RHS and FHA program documents and analyzed agency loan-level data. Specifically, we examined statutes and regulations for the RHS and FHA loan guarantee programs and RHS and FHA guidelines and policy documents (such as handbooks, mortgagee letters, and administrative notices) to identify each program's key eligibility and qualifying criteria, including statutory requirements and underwriting benchmarks (see fig. 17).¹³ Statutory requirements included minimum down payments and limits on loan amount and borrower household income. Underwriting benchmarks included target values set by the agencies for borrower credit score and PTI and DTI ratios.

¹³Sources reviewed included United States Department of Agriculture, *SFH Guaranteed Loan Technical Handbook*, HB-1-3555, (Washington, D.C.), accessed on July 2015, <http://www.rd.usda.gov/publications/regulations-guidelines/handbooks>, and Department of Housing and Urban Development, *Lenders' Guide to the Single-Family Mortgage Insurance Process*, 4155.2 (Washington, D.C.: Mar. 24, 2011), *Mortgage Credit Analysis for Mortgage Insurance on One-to-Four Unit Mortgage Loans*, 4155.1 (Washington, D.C.: Mar. 24, 2011), and annual HUD mortgagee letters on maximum loan amounts.

Figure 17: Key Eligibility Requirements and Qualifying Benchmarks for RHS- and FHA-Guaranteed Home Purchase Loans, Fiscal Years 2010–2014

Criteria	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans
Eligibility requirements		
Borrower household income	Not to exceed 115 percent of area median income	No restrictions
Limits on loan size	Cannot exceed the fair market value of the property or the borrower's income and repayment ability. ^a	Vary by locality. Single-unit properties in 2010-December 2013 ranged from \$271,050 to \$729,750, and beginning in January 2014 ranged from \$270,010 to \$625,500. Loan amount also cannot exceed the fair market value of the property or the borrower's income and repayment ability. ^b
Required down payment	None	3.5 percent
Qualifying benchmarks^c		
Borrower credit score	640 or above ^d	580 or above ^e
Payment-to-income ratio	29 percent or less	31 percent or less
Debt-service-to-income ratio	41 percent or less	43 percent or less

Requirements
 Benchmarks

Source: GAO analysis of RHS and FHA policies. | GAO-16-801

^aThe size of loans guaranteed by RHS is effectively limited by RHS's borrower household income requirements and the payment-to-income ratio.

^bThe maximum loan limit for single-unit properties in high-cost exception areas was \$1,094,625 from 2010 through December 2013 and \$938,250 starting January 2014.

^cAccording to RHS and FHA guidelines, borrowers can qualify for a guaranteed mortgage without meeting every benchmark if certain compensating factors are present, such as proof of continuous employment or cash reserves.

^dQualified borrowers with credit scores as low as 581 can obtain an RHS-guaranteed loan if the loan is manually underwritten and the lender provides additional documentation of borrower creditworthiness.

^eBenchmark for FHA's maximum financing option. Qualified borrowers with credit scores of 500 to 579 can obtain FHA-guaranteed loan if they make a down payment of 10 percent.

Next, we appended information provided by the agencies to the RHS and FHA loan-level data in conjunction with additional data provided by the agencies. As before, we (1) focused on 30-year, fixed-rate mortgage loans guaranteed by RHS and FHA in 2010–2014 for purchasing single-family homes (excluding loans for units in condominium and cooperative

developments) and (2) considered FHA loans to be in RHS-eligible locations if the properties were in census tracts where 66.7 percent or more of the tract was located in an RHS-eligible area. As noted previously, data on RHS borrowers' liquid assets (cash or other assets, such as stocks and proceeds from the sale of property, which are readily convertible to cash) were not available for approximately 20 percent of RHS borrowers. Our analysis assumed no liquid assets for borrowers for whom data were not available.

The information we appended to the loan-level data included the following, if applicable:

- FHA county-level loan limits to each RHS loan record based on the longitude and latitude of the mortgaged property.
- RHS annual up-front guarantee fee (as a percentage ranging from 2 percent to 3.5 percent) to each RHS loan record based on the loan's origination year.
- RHS county-level household income limits to each FHA loan record based on the loan's origination year and associated census tract (for determining the county in which the mortgaged property was located). RHS's household income limits were different for one-to-four-person households and five-to-eight-person households. As we did not have any information on the size of FHA borrower households, we assumed that the borrower's income was the only source of household income and that all households consisted of no more than four people (the more restrictive limit).¹⁴

Using the appended data sets, we calculated the number and percentage of RHS borrowers who could have met FHA's criteria and the number and percentage of FHA borrowers who could have met RHS's criteria. To do this, we compared the relevant borrower and loan characteristics of each loan to the applicable requirements and benchmarks for the other agency's program (as described in more detail below). In applying these

¹⁴RHS's household income limits are the same for one-person, two-person, three-person, and four-person households. Data from the American Community Survey 2010–2014 Estimates show that in approximately 95 percent of census tracts, the average household size for owner-occupied units was four persons or fewer. The American Community Survey is an ongoing survey that provides publicly available information, such as whether people own or rent their home, on a yearly basis about the United States and the population.

benchmarks, we did not consider the presence of compensating factors—that is, borrower strengths that may lead a lender to qualify a borrower who does not meet all benchmarks. For example, RHS and FHA allow lenders to qualify a borrower with a DTI ratio higher than their benchmarks when the borrower has additional cash reserves. As a result, our estimates represent the minimum number of borrowers who might have met criteria for credit score and PTI and DTI ratios for the other program.

RHS Borrowers Who Could Have Met FHA Criteria

To assess the extent to which RHS borrowers could have met FHA's criteria for borrower credit score and PTI and DTI ratios, we compared pertinent information in the RHS loan records with FHA's benchmarks for these criteria. Similarly, to assess the extent to which RHS borrowers could have met FHA's criterion for loan amount, we compared the RHS loan amounts to the applicable FHA loan limit based on the year the loan was originated and the county in which the mortgaged property was located. We first determined the number and percentage of RHS borrowers who could have met individual criteria and then determined the number and percentage who could have met all of the criteria simultaneously.

To estimate the number and percentage of RHS borrowers who could have met FHA's criterion for down payment (3.5 percent minimum down payment requirement), we used RHS data on borrowers' liquid assets, LTV ratios, and up-front guarantee fees (as a percentage of the loan amount).¹⁵ For this analysis, we assumed that any LTV ratio below 100 percent reflected money the borrower had paid towards a down payment and that all RHS borrowers had financed the applicable 2010–2014 RHS up-front guarantee fee into their loans.¹⁶ In addition, for each loan, we used the property's appraised value to calculate the amount the borrower

¹⁵RHS's data on borrower's liquid assets excluded assets used for a down payment or closing costs.

¹⁶While it is possible in some cases that the LTV ratio was below 100 percent because the property's appraised value exceeded the purchase price, RHS officials and lenders we spoke with said that the appraised value and the purchase price of a property are generally equivalent. According to most lenders with whom we spoke, RHS and FHA borrowers almost always finance the up-front guarantee fee into their loan.

would have been required to pay to make a 3.5 percent down payment.¹⁷ We then determined the number and percentage of RHS borrowers who had (1) sufficient liquid assets to make at least a 3.5 percent down payment, (2) LTV ratios corresponding to at least the minimum down payment amount, or (3) a combination of liquid assets and LTV ratios corresponding to at least the minimum down payment amount. As previously discussed, RHS did not have data on liquid assets for approximately 20 percent of the borrowers, so we assumed that those borrowers had no liquid assets. In addition, it is unknown how many RHS borrowers could have obtained additional assets from a third party to pay the down payment.¹⁸ Thus, our estimate represents the minimum number of RHS borrowers who could have met FHA's down-payment requirement.

Finally, based on the analysis described above, we estimated the number and percentage of RHS borrowers who could have met FHA criteria for borrower credit score, PTI and DTI ratios, loan amount, and down payment simultaneously. These 36 percent of RHS borrowers represented the group who could have qualified for an FHA-guaranteed home purchase loan.

FHA Borrowers Who Could Have Met RHS Criteria

To assess the extent to which FHA borrowers could have met RHS's criteria for borrower credit score and PTI and DTI ratios, we compared pertinent information in the FHA loan records with RHS's benchmarks. We first determined the number and percentage of FHA borrowers who could have met the individual RHS criteria and then determined the number and percentage who could have met all of the criteria simultaneously.

¹⁷According to FHA policy, the required 3.5 percent down payment is calculated based on the lesser of the appraised value or the purchase price of the property. RHS officials and lenders we spoke with said the appraised value and the purchase price of a property are generally equivalent. By using the appraised value, we likely somewhat overestimated the amount of the required down payment and therefore likely somewhat underestimated the number of RHS borrowers who could have met FHA's down-payment requirement.

¹⁸FHA allows borrowers to obtain third-party gifts from acceptable sources, such as family members, employers, and governmental agencies to make the 3.5 percent required down payment.

To estimate the number and percentage of FHA borrowers who could have met RHS's criterion for household income, we compared the amount of each FHA borrower's income with the applicable RHS income limit.¹⁹ However, FHA's loan-level data contained information on borrower income but not on household income or size. FHA does not collect data on household income, so we assumed that FHA borrower and household income were equivalent. Under that assumption, we estimated that 72 percent of FHA borrowers fell within RHS's income limits. By assuming borrower income was the only source of household income, our analysis potentially overestimated the number of FHA borrowers who could have met RHS's household income limits. To test the sensitivity of our estimate to that assumption, we recalculated our estimate using an alternative assumption. Some FHA households likely had income from someone other than the borrower that could have pushed the household over the RHS income limit. To account for this possibility, we calculated the median difference between RHS borrower incomes and their household incomes and added that amount (\$2,960) to the incomes of all FHA borrowers.²⁰ Under this assumption, the percentage of FHA borrowers who met RHS's income limits decreased from 72 percent to 70 percent.

Finally, based on the analysis described earlier, we estimated the number and percentage of FHA borrowers who could have met RHS's criteria for borrower credit score, PTI and DTI ratios, and household income simultaneously. These borrowers represented the group who could have qualified for an RHS-guaranteed home purchase loan. We made the estimates using both income assumptions (the base case of household income equivalent to borrower income and the alternative of household income equivalent to borrower income plus \$2,960). The difference between the two estimates was one percentage point (22 percent and 21 percent for the base case and alternative assumptions, respectively).

¹⁹By statutory requirement, the household income of an RHS borrower may not exceed 115 percent of the area median income.

²⁰Using the median difference in RHS borrower incomes and household incomes means that one-half of RHS borrowers had differences in their income and household income less than this value and one-half had differences greater than this value. Using a median value in this calculation ensures that the results are not distorted by outlier data, but it does not allow us to take into account the individual results of each loan.

Results by Rural-Urban Commuting Areas and Loan Cohort

We expanded our analysis of borrowers who could have qualified for the other program by disaggregating the results by location type. Specifically, using USDA’s Rural-Urban Commuting Area classification system, we estimated the number and percentage of RHS and FHA borrowers in urban, suburban, large rural town, and small town and isolated rural area who could have met all of the other program’s key criteria (see table 2).

Table 2: Estimated Number and Percentage of RHS and FHA Borrowers Who Could Have Met All Criteria for the Other Program by Rurality Using USDA’s Rural-Urban Commuting Area Classification System in Fiscal Years 2010–2014

Rurality category	Number of RHS borrowers who could have met all FHA criteria	Percentage of RHS borrowers who could have met all FHA criteria	Number of FHA borrowers who could have met all RHS criteria	Percentage of FHA borrowers who could have met all RHS criteria
Urban	66,797	30	76,075	39
Suburban	84,741	38	74,677	38
Large rural town	48,170	22	29,961	15
Small town and isolated rural area	23,014	10	13,939	7

Source: GAO analysis of U.S. Department of Agriculture (USDA) data and loan-level data from FHA. | GAO-16-801

Note: For this analysis, we considered Rural Housing Service (RHS) criteria for borrower credit score, payment-to-income and debt-service-to-income ratios, and household income limits. We considered Federal Housing Administration (FHA) criteria for borrower credit score, payment-to-income and debt-service-to-income ratios, loan amount, and down payment.

Finally, we analyzed RHS and FHA loan-level data to estimate the number and percentage of RHS and FHA borrowers by loan cohort (2010–2014) who could have met all of the other program’s key criteria (see table 3).²¹

²¹A cohort is the set of loans an agency guarantees in a fiscal year.

Table 3: Estimated Number and Percentage of RHS and FHA Borrowers in RHS-Eligible Areas Who Could Have Met All Criteria for the Other Program by Loan Cohort, Fiscal Years 2010–2014

Fiscal year	Number of RHS borrowers who could have met all FHA criteria	Percentage of RHS borrowers who could have met all FHA criteria	Number of FHA borrowers who could have met all RHS criteria	Percentage of FHA borrowers who could have met all RHS criteria
2010	47,674	39	50,065	21
2011	40,836	35	37,700	22
2012	44,973	35	36,936	23
2013	48,665	35	39,703	24
2014	40,680	37	30,265	21

Source: GAO analysis of RHS and FHA loan-level data. | GAO-16-801

Note: For this analysis, we considered Rural Housing Service (RHS) criteria for borrower credit score, payment-to-income and debt-service-to-income ratios, and household income limits. Similarly, we considered Federal Housing Administration (FHA) criteria for borrower credit score, payment-to-income and debt-service-to-income ratios, loan amount, and down payment.

Factors Considered by RHS and FHA Borrowers in Choosing between the Two Loan Guarantee Programs

To analyze the factors that RHS and FHA borrowers who meet the criteria for both programs consider in choosing between the two, we analyzed data on up-front and monthly costs, interviewed eight lenders and five industry stakeholders, and analyzed a survey published in 2016 of borrower opinions. To describe RHS’s and FHA’s methodologies for calculating up-front and annual costs, we (1) reviewed RHS’s periodic notices and policy guidance on up-front and annual guarantee fees and RHS’s Guarantee Up-front and Annual Fee Calculator and (2) reviewed FHA’s policy handbook and mortgagee letters containing information on up-front and annual costs and FHA’s methodology for calculating guarantee fees.²²

To compare illustrative up-front, monthly, annual, and lifetime costs of RHS- and FHA-guaranteed loans in 2014, we estimated costs for homes with a \$125,000 purchase price and a mortgage interest rate of 3.75

²²For example, for RHS calculations, see United States Department of Agriculture, “Single-Family Housing Guaranteed Annual Fee: User Guide” ver. 2.0 (Washington, D.C.: October 2012) and USDA’s final rule requiring an annual fee for all loan obligations (Federal Register, vol. 77, no. 133; Wed. July 11, 2012).

percent.²³ To calculate the up-front and annual costs for each program, we assumed that:

- the appraised value and purchase price of the property were the same;
- the full up-front guarantee fee was financed;
- all closing costs and fees (other than the up-front guarantee fee) were paid by the seller (through seller concessions);
- the interest rates were identical; and
- the loan payments were made on time for the life of the loan.

To calculate the up-front costs of RHS-guaranteed loans, we first calculated the amount of the up-front guarantee fee based on the purchase price of the property and the 2 percent up-front fee percentage RHS charged in 2014.²⁴ Second, we added the up-front fee to the purchase price to calculate the final loan amount.²⁵

To calculate the up-front costs for FHA-guaranteed loans, we (1) calculated the amount of the required 3.5 percent down payment based on the appraised value of the property, (2) calculated the base loan amount by subtracting the down payment from the initial purchase price, (3) calculated the amount of the up-front guarantee fee (FHA's up-front fee was 1.75 percent in 2014) using the base loan amount, and (4) calculated the final loan amount by adding the up-front fee to the base loan amount.²⁶ For both RHS and FHA loans, we assumed that the amount of cash required at loan closing was equivalent to the amount of the required down payment (3.5 percent for the FHA loan and zero for the RHS loan).

²³The median RHS loan amount was \$124,000 in 2010–2014.

²⁴To calculate up-front, monthly, annual, and lifetime costs for RHS loans, we used the RHS calculator version PV2.0 as of October 1, 2015.

²⁵For RHS borrowers, the up-front fee is the total loan amount (including the financed up-front guarantee fee) times the up-front guarantee fee percentage.

²⁶To calculate the monthly, annual, and lifetime costs for FHA loans, we used FHA's published formulas found in Federal Housing Administration, Monthly (Periodic) Mortgage Insurance Premium Calculation, attachment to Mortgage Letter 98-22 (Washington, D.C.: May 14, 1998).

To calculate the illustrative monthly, annual, and lifetime costs of RHS- and FHA-guaranteed loans, we calculated:

1. the monthly principal and interest payment based on the final loan amount (including the financed up-front guarantee fee);
2. the amount of the annual guarantee fee by multiplying the annual average outstanding loan balance by the annual guarantee fee percentage (in 2014, the annual guarantee fee was 0.5 percent for RHS loans and 1.2 percent for FHA loans);²⁷
3. the monthly cost of the annual guarantee fee by dividing the amount of the annual guarantee fee by 12 (for 12 months); and
4. the total monthly costs by adding the monthly principal and interest payment to the monthly cost of the annual guarantee fee.

To test the sensitivity of our up-front, monthly, and annual cost calculations, we also calculated those costs assuming alternative home purchase amounts (\$80,000, \$100,000, \$135,000, and \$150,000) and interest rates (6 and 15 percent). We found that for all purchase amounts and interest rates, RHS had lower cash required at closing than FHA because RHS had no down-payment requirement. In addition, we found that as the assumed interest rate increased to 6 and 15 percent, RHS's monthly costs (principal and interest and annual guarantee fees charged monthly) continued to be lower than FHA's, although the percentage difference between RHS and FHA monthly costs decreased.²⁸

To test the sensitivity of our results to the assumption that interest rates for RHS- and FHA-guaranteed loans were identical, we also calculated monthly costs (for a \$125,000 home) under scenarios in which the interest rate charged for the RHS loan was higher or lower than the 3.75 percent interest rate charged for the FHA loan. Specifically, we calculated

²⁷FHA's fees for 30-year purchase loans vary somewhat, depending on whether the loan amount is more or less than \$625,500 and whether the loan's LTV ratio is higher or lower than 95 percent. Higher loan amounts and LTV ratios have somewhat higher fees.

²⁸For example, the percentage difference decreased from 7 percent for a loan with a 3.75 percent interest rate to 1 percent for a loan with a 15 percent interest rate.

the cost to a hypothetical borrower where the interest rate for the RHS loan was 0.25 percentage points higher (that is, 4.0 percent) and 0.25 percentage points lower (that is, 3.5 percent) than the rate charged for the FHA loan. In both scenarios, the monthly costs of the RHS loan remained lower than the costs of the FHA loan.²⁹

To obtain the perspective of program participants, we interviewed a nonprobability sample of eight mortgage lenders selected to capture variation in the geographic areas served, volume of guaranteed loans originated, and mix of RHS and FHA business. To identify these lenders, we analyzed data collected under the Home Mortgage Disclosure Act (including the number of RHS- and FHA-guaranteed loan originations by lender in 2012 and the location of each lender) and RHS and FHA loan-level data for 2010–2014 on the number of guaranteed loans originated by each lender. To supplement our lender interviews and gain perspective on mortgage lending in rural areas, we interviewed mortgage industry groups selected to capture a range of stakeholders in the RHS and FHA loan guarantee programs. These groups included the Credit Union National Association, the Independent Community Bankers of America, National Association of Mortgage Brokers, National Association of Realtors, and Mortgage Bankers Association. Additionally, we reviewed the Consumer Financial Protection Bureau and Federal Housing Finance Agency’s survey of recent mortgage borrowers about their experiences in choosing and taking out a mortgage.³⁰ Among other things, the survey asked a representative sample of borrowers who obtained a mortgage in 2013 how important a variety of mortgage terms or features (such as a low interest rate, low closing fees, low down payment, and low monthly

²⁹Monthly costs for the RHS loan were 7 percent lower than for the FHA loan when the interest rates for both loans were the same (3.75 percent). When the hypothetical borrower paid a higher interest rate (4.0 percent) for the RHS loan than for the FHA loan, monthly costs for the RHS loan were 5 percent lower than for the FHA loan. In comparison, when the hypothetical borrower paid a lower interest rate (3.5 percent) for the RHS loan than for the FHA loan, the monthly costs for the RHS loan were 10 percent lower than for the FHA loan.

³⁰See Consumer Financial Protection Bureau, Federal Housing Finance Agency, and the National Mortgage Database, *A Profile of 2013 Mortgage Borrowers: Statistics from the National Survey of Mortgage Originations*, Technical Report 16-01 (Washington, D.C.: May 27, 2016).

payment) were in their selection of a mortgage.³¹ The survey results were reported in the aggregate and by loan and demographic categories, including loan amount and household income. We reviewed the survey methodology and determined that the survey results were sufficiently reliable for purposes of describing the importance of decision factors borrowers consider when selecting a mortgage loan.

Performance of RHS- and FHA-Guaranteed Loans

To compare the performance of RHS- and FHA-guaranteed home purchase loans in RHS-eligible areas, we analyzed the RHS and FHA loan-level data described previously. We focused on loans guaranteed in 2010–2012 and determined their performance status at 12-month intervals (anniversary months) starting from the month the first payment was due until September 30, 2014. For this comparison, we limited the FHA-guaranteed loans to those obtained by borrowers with incomes within the RHS county-level household income limits (using borrower income as a proxy for household income).³² We restricted the data in this way to account for RHS’s household income limits and FHA’s lack of such limits, which resulted in FHA serving some borrowers with higher incomes than RHS is allowed to serve. We also limited the set of FHA-guaranteed loans to those for properties in census tracts where more than 95 percent or more of the tract was within an RHS-eligible area.³³ Because the analysis focused on the payment status of the loans, we used the first month a loan payment was due (first payment month) as the starting point for measuring performance. The first payment month may be up to 2

³¹According to the report, borrowers are surveyed quarterly, by mail, based on data in the National Mortgage Database. The quarterly sample of approximately 6,000 mortgages represents a sampling rate of 1-in-260 from the population of new mortgage originations.

³²As noted previously, the loan-level data we analyzed on FHA borrowers included information on borrower income but not on household income or size. For this comparison, we assumed that the borrower’s income was the only source of household income and that all households consisted of no more than four people (the more restrictive limit).

³³For our analysis of loan performance, we used this stricter threshold (as opposed to the 66.7 percent threshold used previously) to help ensure that our statistical model did not include FHA loans that may have different performance attributes by virtue of being just outside of RHS-eligible areas (for example, due to different house price or employment patterns).

months after the month the loan is guaranteed.³⁴ We classified the performance status of each loan guaranteed by RHS and FHA into one of the following payment status categories: current, prepaid, 30–89 days delinquent, 90 or more days delinquent or in the foreclosure process, or terminated with a claim.³⁵ Due to the relatively brief period for our analysis of loan performance (2 and 3 years from the month of first payment), we did not isolate and analyze the foreclosure rate of RHS- and FHA-guaranteed loans. According to the Federal Reserve Bank of Minneapolis, on average loans in foreclosure in 2010 took from 15 months to 2 years to complete foreclosure, meaning that relatively few of the loans we analyzed would have had time to complete this process.³⁶ We also classified loans in the last two categories as troubled and calculated troubled loan rates for each agency.³⁷ We compared the actual performance of RHS- and FHA-guaranteed loans after 2 and 3 years from the date of first payment.

To compare the expected performance of RHS- and FHA-guaranteed loans after 2 and 3 years and to examine factors accounting for differences between RHS and FHA troubled loan rates, we developed a statistical model.³⁸ The model primarily used FHA and RHS loan-level data including borrower income and credit score, loan amount, loan

³⁴Therefore, to examine the performance of loans after 3 years of performance (that is, loans that were guaranteed in 2010–2011) we focused on loans with first payment months from December 2009 through October 2011. To examine the performance of loans after 2 years of performance (that is, loans that were guaranteed in 2010–2012), we focused on loans with first payment months from December 2009 through October 2012.

³⁵The data we analyzed did not have performance information for about 0.2 percent each of the RHS- and FHA-guaranteed loans.

³⁶See Kyle F. Herkenhoff and Lee E. Ohanian, “Foreclosure Delay and the U.S. Labor Market,” Economic Policy Paper 16-07 (Minneapolis, Minn.: May 2016).

³⁷Because we did not have performance information on the loans into which prepaying borrowers may have refinanced, we included prepayments only in the denominator of our calculation of troubled loan rates. As a result, we treated prepaid loans similarly to loans that were current or in an early stage of delinquency. This approach is consistent with the fact that RHS and FHA borrowers generally need to be current on their loans to use the RHS and FHA refinance programs and that the programs are designed to help borrowers lower their monthly loan payments, which may increase their ability to remain current.

³⁸For the 3-year comparison, we used RHS and FHA loan-level data for loans guaranteed in 2010–2011. For the 2-year comparison, we also included RHS and FHA loan-level data for loans guaranteed in 2012.

interest rate, and DTI and LTV ratios at loan origination. The model also used data from other sources, including the Federal Housing Finance Agency House Price Index for state nonmetropolitan areas to estimate changes in the value of each mortgaged property and data on the Treasury 10-year constant maturity rate to determine the interest rate spread (that is, the difference between the interest rate on the loan and the Treasury rate for the same period). Prior research has found that these variables influence loan performance, including troubled loan rates. Other variables for which we lacked data, such as borrower employment status, may also influence troubled loan rates.

For RHS and FHA separately, we used logistic regressions to estimate the relationships between relevant loan and borrower characteristics and economic conditions (explanatory variables) and the probability of the loans they guaranteed becoming troubled after 2 and 3 years. That is, we estimated changes in the troubled loan rate associated with variations in the value of the explanatory variables. These relationships are represented by coefficients for each variable. In general, we found that the coefficients were similar for both agencies and consistent with prior research in terms of the direction of the estimated effect.

The similarity in the separate RHS and FHA coefficients allowed us to run our model using a data set that included both agencies' loans in order to estimate coefficients for the combined loan pool. These coefficients represent the statistical relationships between the explanatory variables and loan performance without regard to which agency provided the guarantee. As a result, they provided a common foundation for estimating and comparing how the portfolio characteristics of each agency influenced their troubled loan rates.

We used these coefficients to simulate 2- and 3-year troubled loan rates using average values of the explanatory variables. Specifically, we first estimated an overall expected troubled loan rate for RHS's loan portfolio based on RHS-specific averages for all explanatory variables. Second, to isolate the impact of a particular RHS portfolio characteristic on the expected troubled loan rate, we used the RHS-specific average for the corresponding variable while holding all other variables at their average values for the combined RHS-FHA loan pool. We performed the same two steps for FHA's loan portfolio and compared the results for RHS and

FHA.³⁹ See appendixes VI and VII for additional information on the statistical model and results.

We conducted this performance audit from February 2015 to September 2016 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.

³⁹We calculated the percent difference between the agencies' expected troubled loan rates by subtracting the FHA expected troubled loan rate from the RHS expected troubled loan rate, dividing by the average of the FHA and RHS rates, and multiplying the quotient by 100.

Appendix II: Characteristics of Home Purchase Loans RHS and FHA Guaranteed in RHS-Eligible Areas in Fiscal Years 2010–2014

This appendix describes the results of our analysis comparing the characteristics of single-family home purchase loans guaranteed by the Rural Housing Service (RHS) and the Federal Housing Administration (FHA) in fiscal years 2010–2014 in RHS-eligible areas.¹ We calculated the number and percentage of loans that fell into different categories or ranges of values for each borrower, loan, and property characteristic at loan origination by individual loan cohort and for all loan cohorts collectively.²

Table 4: Distribution of Borrower Credit Scores for RHS- Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Credit score	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 500	728	1	406	<1	235	<1	144	<1	63	<1	1,576	<1
500–579	162	<1	71	<1	36	<1	17	<1	6	<1	292	<1
580–639	22,386	19	11,627	10	8,086	6	5,826	4	4,526	4	52,451	9
640–699	49,972	41	55,529	48	65,249	51	74,189	53	60,448	55	305,342	50
700–719	11,978	10	12,361	11	13,914	11	16,180	12	12,742	12	67,175	11
720–759	20,446	17	20,696	18	22,970	18	25,277	18	18,805	17	108,194	18
760–799	13,235	11	13,296	11	14,191	11	15,174	11	10,815	10	66,711	11
800 or more	2,182	2	2,302	2	2,443	2	2,350	2	1,558	1	10,835	2
No data available	269	<1	306	<1	391	<1	359	<1	247	<1	1,572	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

¹We analyzed loan-level data on 30-year, fixed-rate loans, excluding those for units in condominium and cooperative developments. We limited the FHA-guaranteed loans to those for properties in census tracts that were at least 66.7 percent in RHS-eligible areas.

²A cohort is a set of loans an agency guarantees in a fiscal year.

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
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Table 5: Distribution of Borrower Credit Scores for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Credit score	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 500	16	<1	6	<1	1	<1	0	0	0	0	23	<1
500–579	1,218	1	346	<1	183	<1	77	<1	81	<1	1,905	<1
580–639	41,624	18	22,588	13	20,906	13	15,803	10	21,370	15	122,291	14
640–699	92,136	39	72,223	42	75,297	47	87,749	54	83,108	57	410,513	47
700–719	24,128	10	17,856	10	16,878	10	18,000	11	14,690	10	91,552	10
720–759	41,415	17	30,502	18	26,279	16	24,392	15	16,120	11	138,708	16
760–799	31,260	13	22,859	13	18,178	11	15,098	9	8,321	6	95,716	11
800 or more	5,248	2	3,967	2	3,039	2	2,261	1	1,193	1	15,708	2
No data available	1,339	1	836	1	751	1	561	<1	391	<1	3,878	<1
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

Table 6: Distribution of Payment-to-Income Ratios for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Payment-to-income ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
10 or less	1,577	1	1,592	1	1,641	1	1,409	1	797	1	7,016	1
>10–15	9,904	8	10,824	9	11,962	9	11,976	9	8,145	8	52,811	9
>15–20	25,058	21	24,996	21	28,664	23	30,719	22	22,920	21	132,357	22
>20–25	31,915	26	30,776	26	34,843	27	38,588	28	31,450	29	167,572	27
>25–29	23,233	19	21,301	18	23,674	19	27,194	20	23,937	22	119,339	19
>29–31	8,413	7	7,745	7	8,987	7	10,269	7	8,761	8	44,175	7
>31–35	11,543	10	10,428	9	12,480	10	14,540	10	12,081	11	61,072	10
>35–40	7,190	6	6,546	6	4,489	4	4,457	3	1,097	1	23,779	4
>40	2,459	2	2,365	2	748	1	345	<1	11	<1	5,928	1
No data available	21	<1	21	<1	27	<1	19	<1	11	<1	99	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; > = greater than; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). The payment-to-income ratio represents the percentage of a borrower's income that goes toward total mortgage debt payments. Percentages do not always sum to exactly 100 percent due to rounding.

Table 7: Distribution of Payment-to-Income Ratios for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Payment-to-income ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
10 or less	6,540	3	5,326	3	5,196	3	5,114	3	3,529	2	25,705	3
>10–15	22,724	10	19,272	11	19,139	12	19,216	12	14,553	10	94,904	11
>15–20	45,480	19	35,082	21	34,641	21	34,791	21	29,127	20	179,121	20
>20–25	52,299	22	37,358	22	35,432	22	36,217	22	32,103	22	193,409	22
>25–29	36,809	15	24,761	15	23,081	14	23,637	14	22,021	15	130,309	15
>29–31	15,383	7	10,522	6	9,556	6	9,477	6	9,256	6	54,194	6
>31–35	24,738	10	16,284	10	14,569	9	14,826	9	14,480	10	84,897	10
>35–40	19,908	8	13,121	8	11,417	7	11,781	7	11,687	8	67,914	8
>40	14,395	6	9,379	6	8,409	5	8,810	5	8,480	6	49,473	6
No data available	108	<1	78	<1	72	<1	72	<1	38	<1	368	<1
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage; > = greater than; < = less than
Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). The payment-to-income ratio represents the percentage of a borrower's income that goes toward total mortgage debt payments. Percentages do not always sum to exactly 100 percent due to rounding.

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Table 8: Distribution of Debt-Service-to-Income Ratios for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Debt-service-to-income ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
20 or less	4,030	3	4,314	4	4,796	4	4,702	3	3,008	3	20,850	3
>20–25	8,086	7	8,363	7	9,451	7	10,024	7	7,317	7	43,241	7
>25–30	15,430	13	15,209	13	17,210	14	19,145	14	14,837	14	81,831	13
>30–35	21,553	18	21,029	18	24,819	20	27,512	20	22,791	21	117,684	19
>35–41	33,697	28	31,630	27	35,770	28	40,175	29	34,007	31	175,279	29
>41–43	9,745	8	9,299	8	10,812	9	12,130	9	10,322	9	52,308	9
>43–50	22,995	19	21,768	19	23,700	19	25,456	18	16,892	16	110,811	18
>50	5,777	5	4,962	4	930	1	354	<1	25	<1	12,048	2
No data available	20	<1	20	<1	27	<1	18	<1	11	<1	96	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; > = greater than; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). The debt-service-to-income ratio represents the percentage of a borrower's income that goes toward all recurring debt payments. Percentages do not always sum to exactly 100 percent due to rounding.

Table 9: Distribution of Debt-Service-to-Income Ratios for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Debt-service-to-income ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
20 or less	5,643	2	4,305	3	4,205	3	4,236	3	2,921	2	21,310	2
>20–25	11,558	5	8,548	5	8,507	5	8,544	5	6,501	5	43,658	5
>25–30	21,717	9	15,698	9	15,182	9	15,960	10	12,733	9	81,290	9
>30–35	32,560	14	23,141	14	21,895	14	22,880	14	19,720	14	120,196	14
>35–41	49,427	21	34,982	20	33,665	21	35,119	21	32,751	23	185,944	21
>41–43	18,482	8	13,144	8	12,374	8	13,354	8	13,384	9	70,738	8
>43–50	60,873	26	44,522	26	41,790	26	42,537	26	37,864	26	227,586	26
>50	37,981	16	26,756	16	23,809	15	21,236	13	19,065	13	128,847	15
No data available	143	<1	87	<1	85	<1	75	<1	335	<1	725	<1
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage; > = greater than; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). The debt-service-to-income ratio represents the percentage of a borrower's income that goes toward all recurring debt payments. Percentages do not always sum to exactly 100 percent due to rounding.

Table 10: Distribution of Borrower Annual Incomes for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Annual income (in nominal dollars)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 20,000	3,254	3	3,419	3	3,069	2	2,689	2	1,567	1	13,998	2
20,000–39,999	49,479	41	48,007	41	51,382	40	53,972	39	39,002	36	241,842	39
40,000–59,999	47,195	39	44,764	38	49,470	39	55,410	40	44,993	41	241,832	39
60,000–79,999	18,851	16	17,744	15	20,226	16	23,325	17	19,774	18	99,920	16
80,000–99,999	2,207	2	2,318	2	2,964	2	3,664	3	3,490	3	14,643	2
100,000 or more	285	<1	298	<1	371	<1	426	<1	370	<1	1,750	<1
No data available	42	<1	44	<1	33	<1	30	<1	14	<1	163	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

Table 11: Distribution of Borrower Annual Incomes for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Annual income (in nominal dollars)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 20,000	4,975	2	3,872	2	3,487	2	2,680	2	1,685	1	16,699	2
20,000–39,999	61,608	26	42,161	25	38,814	24	36,729	22	30,320	21	209,632	24
40,000–59,999	67,424	28	45,911	27	43,492	27	44,387	27	40,598	28	241,812	28
60,000–79,999	46,402	20	33,595	20	32,291	20	34,165	21	31,789	22	178,242	20
80,000–99,999	28,743	12	21,812	13	21,230	13	22,292	14	20,444	14	114,521	13
100,000 or more	29,183	12	23,804	14	22,167	14	23,666	14	20,424	14	119,244	14
No data available	49	<1	28	<1	31	<1	22	<1	14	<1	144	<1
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

Table 12: Distribution of Borrower-Identified Race and Ethnicity for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Borrower race or ethnicity	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
White	103,829	86	100,159	86	110,366	87	121,071	87	94,647	87	530,072	86
Hispanic or Latino	9,366	8	9,611	8	9,811	8	10,530	8	8,292	8	47,610	8
Black or African American	6,543	5	5,151	4	5,375	4	5,861	4	4,684	4	27,614	5
Asian	576	<1	655	1	785	1	809	1	618	1	3,443	1
American Indian, Alaska Native	515	<1	445	<1	501	<1	524	<1	393	<1	2,378	<1
More than one race (non-Hispanic or Latino)	253	<1	288	<1	357	<1	399	<1	330	<1	1,627	<1
Native Hawaiian or other Pacific Islander	231	<1	284	<1	320	<1	322	<1	246	<1	1,403	<1
Not disclosed	0	0	1	<1	0	0	0	0	0	0	1	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). For this analysis, we made the categories mutually exclusive. Percentages do not always sum to exactly 100 percent due to rounding.

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Table 13: Distribution of Borrower-Identified Race and Ethnicity for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Borrower race or ethnicity	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
White	184,725	78	131,753	77	124,086	77	126,769	77	109,332	75	676,665	77
Hispanic or Latino	23,906	10	19,517	11	19,138	12	18,494	11	17,689	12	98,744	11
Black or African American	11,104	5	7,287	4	7,066	4	7,632	5	7,884	5	40,973	5
Asian	2,819	1	1,914	1	1,850	1	1,905	1	1,528	1	10,016	1
American Indian, Alaska Native	746	<1	505	<1	490	<1	579	<1	505	<1	2,825	<1
More than one race (non-Hispanic or Latino)	531	<1	360	<1	415	<1	460	<1	393	<1	2,159	<1
Native Hawaiian or other Pacific Islander	1,398	1	858	1	630	<1	548	<1	526	<1	3,960	<1
Not disclosed	13,155	6	8,989	5	7,837	5	7,554	5	7,417	5	44,952	5
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). For this analysis, we made the categories mutually exclusive. Percentages do not always sum to exactly 100 percent due to rounding.

Table 14: Distribution of First-Time Homebuyers for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

First-time homebuyer status	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
First-time homebuyer	104,646	86	96,785	83	109,212	86	119,180	85	93,320	86	523,143	85
Non-first-time homebuyer	16,438	14	19,782	17	18,296	14	20,334	15	15,890	15	90,742	15
No data available	229	<1	27	<1	7	<1	2	<1	0	0	265	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative

**Appendix II: Characteristics of Home Purchase
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developments). RHS and FHA generally define a first-time homebuyer as an individual who has not had ownership in a principal residence during the prior 3-year period. Percentages do not always sum to exactly 100 percent due to rounding.

Table 15: Distribution of First-Time Homebuyers for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

First-time homebuyer status	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
First-time homebuyer	171,267	72	115,262	67	112,039	69	116,716	71	108,650	75	623,934	71
Non-first-time homebuyer	67,117	28	55,921	33	49,473	31	47,225	29	36,624	25	256,360	29
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage;

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). RHS and FHA generally define a first-time homebuyer as an individual who has not had ownership in a principal residence during the prior 3-year period.

Table 16: Distribution of Loan Amounts for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Loan amount (in dollars)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 50,000	3,870	3	3,252	3	3,030	2	2,682	2	2,000	2	14,834	2
50,000–99,999	39,598	33	37,075	32	38,453	30	38,870	28	31,492	29	185,488	30
100,000–149,999	45,129	37	42,653	37	47,500	37	51,263	37	39,426	36	225,971	37
150,000–199,999	23,464	19	23,497	20	26,155	21	30,858	22	23,882	22	127,856	21
200,000–299,999	8,533	7	9,199	8	11,114	9	14,105	10	11,163	10	54,114	9
300,000 or more	719	1	918	1	1,263	1	1,738	1	1,247	1	5,885	1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage

Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Table 17: Distribution of Loan Amounts for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Loan amount (in dollars)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 50,000	4,858	2	3,974	2	3,458	2	2,592	2	2,197	2	17,079	2
50,000–99,999	50,396	21	37,610	22	34,753	22	31,049	19	28,004	19	181,812	21
100,000– 149,999	72,090	30	51,056	30	48,049	30	47,022	29	41,684	29	259,901	30
150,000– 199,999	53,633	23	37,819	22	37,058	23	38,811	24	35,485	24	202,806	23
200,000– 299,999	44,571	19	31,499	18	30,246	19	34,311	21	30,200	21	170,827	19
300,000 or more	12,836	5	9,225	5	7,948	5	10,156	6	7,704	5	47,869	6
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

Table 18: Distribution of Loan-to-Value Ratios for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Loan-to-value ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
80 or less	3,680	3	2,847	2	2,671	2	2,477	2	1,947	2	13,622	2
>80–85	2,820	2	2,304	2	2,387	2	2,135	2	1,636	2	11,282	2
>85–90	5,739	5	4,486	4	4,879	4	4,659	3	3,743	3	23,506	4
>90–92	3,607	3	2,784	2	3,320	3	3,256	2	2,604	2	15,571	3
>92–96.5	14,163	12	11,290	10	13,726	11	14,087	10	10,979	10	64,245	11
>96.5–98.5	12,340	10	8,887	8	12,490	10	13,014	9	10,424	10	57,155	9
>98.5–100	18,371	15	11,796	10	16,883	13	18,325	13	13,903	13	79,278	13
>100–102	37,984	31	18,335	16	39,773	31	44,808	32	35,223	32	176,123	29
More than 102	22,607	19	53,799	46	31,320	25	36,633	26	28,724	26	173,083	28
No data available	2	<1	66	<1	66	<1	122	<1	27	<1	283	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; > = greater than; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Loan-to-value ratios are calculated as the amount of the loan (including financed up-front guarantee fees, if any) divided by the value of the home at origination. Percentages do not always sum to exactly 100 percent due to rounding.

Table 19: Distribution of Loan-to-Value Ratios for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Loan-to-value ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
80 or less	11,891	5	9,820	6	7,830	5	6,255	4	5,979	4	41,775	5
>80–85	9,423	4	7,910	5	6,492	4	5,522	3	4,792	3	34,139	4
>85–90	18,796	8	15,926	9	13,674	9	11,174	7	9,766	7	69,336	8
>90–92	14,258	6	11,166	7	10,346	6	9,163	6	8,286	6	53,219	6
>92–96.5	61,653	26	54,041	32	51,944	32	44,261	27	39,075	27	250,974	29
>96.5–98.5	99,930	42	59,457	35	69,552	43	85,615	52	76,403	53	390,957	44
>98.5–100	20,398	9	11,861	7	617	<1	758	1	357	<1	33,991	4
>100–102	730	<1	317	<1	497	<1	583	<1	304	<1	2,431	<1
More than 102	1,008	<1	426	<1	393	1	464	<1	259	<1	2,550	<11
No data available	297	<1	259	<1	167	<1	146	<1	53	<1	922	<1
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage; > = greater than; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Loan-to-value ratios are calculated as the amount of the loan (including financed up-front guarantee fees, if any) divided by the value of the home at origination. Percentages do not always sum to exactly 100 percent due to rounding.

Table 20: Distribution of Degree of Rurality for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Degree of rurality	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Urban	40,356	33	39,913	34	45,566	36	48,943	35	36,755	34	211,533	34
Suburban	45,189	37	43,546	37	47,440	37	53,349	38	42,543	39	232,067	38
Large rural town	24,988	21	22,925	20	24,162	19	25,781	19	20,758	19	118,614	19
Small town and isolated rural area	10,710	9	10,166	9	10,290	8	11,378	8	9,089	8	51,633	8
Not available	70	<1	44	<1	57	<1	65	<1	65	<1	301	<1
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of U.S. Department of Agriculture (USDA) data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We analyzed the degree of rurality using USDA's Rural-Urban Commuting Area codes, which classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations (urban, suburban, large rural town, and small town and isolated rural area). Percentages do not always sum to exactly 100 percent due to rounding.

Table 21: Distribution of Degree of Rurality for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Degree of rurality	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Urban	110,394	46	78,951	46	74,365	46	75,683	46	64,967	45	404,360	46
Suburban	87,028	37	61,820	36	58,029	36	59,899	37	54,697	38	321,473	37
Large rural town	28,959	12	21,313	13	20,360	13	20,037	12	17,888	12	108,557	12
Small town and isolated rural area	11,965	5	9,059	5	8,725	5	8,283	5	7,686	5	45,718	5
Not available	38	<1	40	<1	33	<1	39	<1	36	<1	186	<1
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of U.S. Department of Agriculture (USDA) and FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We analyzed the degree of rurality using USDA's Rural-Urban Commuting Area codes, which classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations (urban, suburban, large rural town, and small town and isolated rural area). Percentages do not always sum to exactly 100 percent due to rounding.

Table 22: Distribution of Census Regions for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Census region	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Midwest	35,609	29	33,747	29	35,514	28	39,122	28	31,106	29	175,098	29
Northeast	9,253	8	10,094	9	12,145	10	14,088	10	10,900	10	56,480	9
South	56,567	47	51,755	44	57,334	45	63,222	45	49,198	45	278,076	45
West	17,387	14	18,087	16	20,252	16	20,724	15	16,226	15	92,676	15
Not applicable	2,497	2	2,911	3	2,270	2	2,360	2	1,780	2	11,818	2
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Legend: # = Number; % = Percentage

Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Puerto Rico and the Island Areas (U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands) are not part of a census region. In our analysis, these areas are included in “not applicable.” Percentages do not always sum to exactly 100 percent due to rounding.

Table 23: Distribution of Census Regions for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Census region	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Midwest	46,153	19	32,149	19	30,073	19	30,870	19	28,296	20	167,541	19
Northeast	34,651	15	23,787	14	22,234	14	21,116	13	17,253	12	119,041	14
South	107,530	45	76,547	45	72,753	45	76,430	47	68,857	47	402,117	46
West	45,849	19	33,588	20	31,483	20	31,918	20	28,259	20	171,097	19
Not applicable	4,201	2	5,112	3	4,969	3	3,607	2	2,609	2	20,498	2
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Puerto Rico and the Island Areas (U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands) are not part of a census region. In our analysis, these areas are included in “not applicable.” Percentages do not always sum to exactly 100 percent due to rounding.

Table 24: Distribution of Construction Types for RHS-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Home construction type	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Manufactured home	897	1	631	1	573	<1	594	<1	321	<1	3,016	1
Modular or panelized home	717	1	669	1	618	1	729	1	482	<1	3,215	1
On-site construction	113,396	94	112,712	97	124,908	98	137,132	98	107,842	99	595,990	97
No data available	6,303	5	2,582	2	1,416	1	1,061	1	565	1	11,927	2
Total	121,313	100	116,594	100	127,515	100	139,516	100	109,210	100	614,148	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of RHS loan-level data. | GAO-16-801

**Appendix II: Characteristics of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

Table 25: Distribution of Construction Types for FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Home construction type	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Manufactured home	14,105	6	9,755	6	9,460	6	9,488	6	9,851	7	52,659	6
On-site or unknown construction	224,279	94	161,428	94	152,052	94	154,453	94	135,423	93	827,635	94
Total	238,384	100	171,183	100	161,512	100	163,941	100	145,274	100	880,294	100

Legend: # = Number; % = Percentage

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments).

Appendix III: Characteristics of Refinance Loans RHS and FHA Guaranteed in RHS-Eligible Areas in Fiscal Years 2010–2014

This appendix describes the results of our analysis of the characteristics of single-family refinance loans guaranteed by the Rural Housing Service (RHS) and Federal Housing Authority (FHA) in fiscal years 2010–2014 in RHS-eligible areas.¹

RHS provided loan-level data for two refinance programs:

- refinancing of RHS direct loans to RHS-guaranteed loans and
- refinancing of existing RHS-guaranteed loans.

FHA provided data for three refinance programs:

- refinancing of existing FHA-guaranteed loans (not streamlined),²
- refinancing of existing FHA-guaranteed loans (streamlined), and
- refinancing of conventional loans to FHA-guaranteed loans.

For selected borrower and loan characteristics, we calculated the number of loans refinanced under each program, the percentage of loans with missing information for the specified characteristic, and the median value of the characteristic (for the 5-year period collectively).

¹We analyzed loan-level data on 30-year, fixed-rate loans (excluding those for units in condominium and cooperative developments).

²Loans refinanced under the “streamlined” process generally require limited credit documentation and underwriting and do not require a new appraisal (a valuation of the property to be used as collateral for the loan).

**Appendix III: Characteristics of Refinance
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Table 26: Median Value of Credit Scores, Payment-to-Income Ratios, and Debt-Service-to-Income Ratios for RHS- and FHA-Guaranteed Home Refinance Loans in RHS-Eligible Areas by Refinance Program, Fiscal Years 2010–2014

	Refinance program	Credit score			Payment-to-income ratio			Debt-service-to-income ratio		
		Number of loans	% of loans without information ^a	Median value	Number of loans	% of loans without information ^a	Median value (percentage)	Number of loans	% of loans without information ^a	Median value (percentage)
RHS-guaranteed refinance programs	Refinance of RHS direct loan	404	0	702	404	0	22	404	0	31
	Refinance of RHS-guaranteed loan	26,757	<1	703	26,757	<1	21	26,757	<1	32
	Total	27,161	<1	703	27,161	<1	21	27,161	<1	32
FHA-guaranteed refinance programs	Refinance of FHA-guaranteed loan (not streamlined process)	36,985	<1	678	36,985	<1	22	36,985	<1	40
	Refinance of FHA-guaranteed loan (streamlined process)	278,389	86	—	278,389	66	—	278,389	66	—
	Refinance of conventional loan	205,218	<1	680	205,218	<1	23	205,218	<1	41
	Total	520,592	46	—	520,592	35	—	520,592	35	—

Legend: % = Percentage; — = not calculated due to limited data; < = less than

Source: GAO analysis of RHS and FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) and Federal Housing Administration (FHA) for refinancing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to 100 percent due to rounding.

^aLess data were available for some RHS- and FHA-guaranteed loans refinanced under RHS and FHA programs because the programs do not require collection of such information.

**Appendix III: Characteristics of Refinance
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2014**

Table 27: Median Value of Annual Borrower Incomes and Loan-to-Value Ratios for RHS- and FHA-Guaranteed Home Refinance Loans in RHS-Eligible Areas by Refinance Program, Fiscal Years 2010–2014

	Refinance program	Annual income			Loan-to-value ratio		
		Number of loans	% of loans without information ^a	Median value (in dollars)	Number of loans	% of loans without information ^a	Median value (percentage)
RHS-guaranteed refinance programs	Refinance of RHS direct loan	404	<1	39,840	404	12	—
	Refinance of RHS-guaranteed loan	26,757	<1	50,400	26,757	21	—
	Total	27,161	<1	50,160	27,161	21	—
FHA-guaranteed refinance programs	Refinance of FHA-guaranteed loan (not streamlined process)	36,985	0	57,528	36,985	0	87
	Refinance of FHA-guaranteed loan (streamlined process)	278,389	63	—	278,389	96	—
	Refinance of conventional loan	205,218	<1	58,572	205,218	0	87
	Total	520,592	34	—	520,592	51	—

Legend: % = Percentage; — = not calculated due to limited data; < = less than
Source: GAO analysis of RHS and FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) and Federal Housing Administration (FHA) for refinancing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to 100 percent due to rounding.

^aLess data were available for some RHS- and FHA-guaranteed loans refinanced under RHS and FHA programs because the programs do not require collection of such information.

Appendix IV: Characteristics of Home Purchase Loans FHA Guaranteed for Properties Not Located in RHS-Eligible Areas in Fiscal Years 2010–2014

This appendix describes the results of our analysis examining the characteristics of single-family home purchase loans guaranteed by the Federal Housing Administration (FHA) in fiscal years 2010–2014 for properties not in Rural Housing Service (RHS)-eligible areas.¹ Approximately 75 percent (2,646,366) of the home purchase loans FHA guaranteed in 2010–2014 were not located in RHS-eligible areas.² We calculated the number and percentage of FHA-guaranteed loans that fell into different categories or ranges of values for each borrower, loan, and property characteristic at loan origination by individual loan cohort and for all loan cohorts collectively.³

Table 28: Distribution of Borrower Credit Scores for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Credit score	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 580	2,199	<1	531	<1	201	<1	139	<1	206	<1	3,276	<1
580–639	117,578	16	57,113	11	53,090	11	36,874	8	47,556	12	312,211	12
640–699	286,183	39	218,678	43	239,346	47	261,872	54	236,651	59	1,242,730	47
700–719	76,410	10	54,953	11	55,561	11	56,617	12	44,169	11	287,710	11
720–759	136,138	18	92,438	18	86,004	17	76,153	16	47,271	12	438,004	17
760–799	103,377	14	73,205	14	59,914	12	46,388	10	23,490	6	306,374	12
800 or more	15,644	2	11,913	2	9,218	2	6,437	1	2,922	1	46,134	2
No data available	3,587	1	2,065	<1	2,052	<1	1,372	<1	851	<1	9,927	<1
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

¹We analyzed loan-level data on 30-year, fixed-rate loans (excluding those for units in condominium and cooperative developments).

²For this analysis, we used the statutory definition of RHS-eligible areas.

³A cohort is a set of loans an agency guarantees in a fiscal year.

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Table 29: Distribution of Payment-to-Income Ratios for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Payment-to-income ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
10 or less	11,778	2	9,233	2	8,948	2	8,208	2	5,108	1	43,275	2
>10–15	39,663	5	31,615	6	32,704	7	30,860	6	20,407	5	155,249	6
>15–20	101,878	14	75,003	15	78,438	16	74,181	15	54,353	14	383,853	15
>20–25	149,080	20	102,719	20	103,866	21	99,379	21	79,516	20	534,560	20
>25–29	124,778	17	82,231	16	81,153	16	78,768	16	67,016	17	433,946	16
>29–31	57,937	8	37,955	7	36,891	7	36,164	7	31,835	8	200,782	8
>31–35	97,834	13	64,285	13	61,766	12	60,093	12	53,327	13	337,305	13
>35–40	87,036	12	58,435	11	55,277	11	53,573	11	49,363	12	303,684	12
>40	70,679	10	49,155	10	46,065	9	44,408	9	42,091	10	252,398	10
No data available	453	<1	265	<1	278	<1	218	<1	100	<1	1,314	<1
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; > = greater than; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). The payment-to-income ratio represents the percentage of a borrower's income that goes toward total mortgage debt payments. Percentages do not always sum to exactly 100 percent due to rounding.

Table 30: Distribution of Debt-Service-to-Income Ratios for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Debt-service-to-income ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
20 or less	12,411	2	9,104	2	9,019	2	8,689	2	5,387	1	44,610	2
>20–25	29,650	4	20,642	4	21,375	4	20,452	4	13,597	3	105,716	4
>25–30	61,540	8	41,345	8	42,359	8	41,114	9	29,722	7	216,080	8
>30–35	97,137	13	64,985	13	65,541	13	64,657	13	49,962	12	342,282	13
>35–41	155,117	21	104,564	21	105,538	21	104,795	22	89,356	22	559,370	21
>41–43	59,087	8	41,472	8	41,130	8	41,831	9	39,269	10	222,789	8
>43–50	201,913	27	143,514	28	140,982	28	136,381	28	115,284	29	738,074	28
>50	123,694	17	84,965	17	79,149	16	67,702	14	59,991	15	415,501	16
No data available	567	<1	305	<1	293	<1	231	<1	548	<1	1,944	<1
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; > = greater than; < = less than

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Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). The debt-service-to-income ratio represents the percentage of a borrower's income that goes toward all recurring debt payments. Percentages do not always sum to exactly 100 percent due to rounding.

Table 31: Distribution of Borrower Annual Incomes for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Annual income (in nominal dollars)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 20,000	12,773	2	9,936	2	9,621	2	7,016	1	3,945	1	43,291	2
20,000–39,999	198,962	27	133,799	26	133,881	27	120,317	25	93,710	23	680,669	26
40,000–59,999	220,079	30	145,345	28	146,250	29	143,279	30	121,306	30	776,259	30
60,000–79,999	133,165	18	91,911	18	92,396	18	92,455	19	81,204	20	491,131	19
80,000–99,999	78,741	11	55,852	11	54,508	11	55,232	11	48,048	12	292,381	11
100,000 or more	97,204	13	73,955	15	68,608	14	67,474	14	54,881	14	362,122	14
No data available	192	<1	98	<1	122	<1	79	<1	22	<1	513	<1
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: For this analysis, we focused on 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

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Table 32: Distribution of Borrower-Identified Race and Ethnicity for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Borrower race or ethnicity	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
White	458,363	62	309,619	61	305,665	61	292,828	60	223,424	55	1,589,899	60
Hispanic or Latino	120,667	16	91,758	18	94,466	19	92,553	19	88,480	22	487,924	18
Black or African American	80,538	11	54,046	11	53,048	11	51,879	11	50,425	13	289,936	11
Asian	25,335	3	17,964	4	18,186	4	17,313	4	13,751	3	92,549	4
American Indian, Alaska Native	2,322	<1	1,471	<1	1,307	<1	1,176	<1	1,080	<1	7,356	<1
More than one race (non-Hispanic or Latino)	2,306	<1	1,563	<1	1,740	<1	1,757	<1	1,549	<1	8,915	<1
Native Hawaiian or other Pacific Islander	4,999	1	3,099	1	2,602	1	2,223	1	1,950	1	14,873	1
Not disclosed	46,586	6	31,376	6	28,372	6	26,123	5	22,457	6	154,914	6
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: For this analysis, we focused on 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). For this analysis, we made the categories mutually exclusive. Percentages do not always sum to exactly 100 percent due to rounding.

Table 33: Distribution of First-time Homebuyers for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

First-time homebuyer status	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
First-time homebuyer	604,014	82	398,042	78	407,019	81	395,668	81	337,864	84	2,142,607	81
Non-first-time homebuyer	137,102	19	112,854	22	98,367	20	90,184	19	65,252	16	503,759	19
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative

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developments). FHA generally defines a first-time homebuyer as an individual who has had not ownership in a principal residence during the prior 3-year period. Percentages do not always sum to exactly 100 percent due to rounding.

Table 34: Distribution of Loan Amounts for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Loan amount (In dollars)	2010		2011		2012		2013		2014		TOTAL	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Less than 50,000	10,286	1	8,441	2	7,992	2	5,784	1	4,491	1	36,994	1
50,000–99,999	137,361	19	100,152	20	98,497	20	80,849	17	65,117	16	481,976	18
100,000– 149,999	219,368	30	146,519	29	148,096	29	137,833	28	114,991	29	766,807	29
150,000– 199,999	158,409	21	106,454	21	106,986	21	106,925	22	90,263	22	569,037	22
200,000– 299,999	144,763	20	98,151	19	97,424	19	102,505	21	87,573	22	530,416	20
300,000 or more	70,929	10	51,179	10	46,391	9	51,956	11	40,681	10	261,136	10
TOTAL	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: For this analysis, we focused on 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

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Table 35: Distribution of Loan-to-Value Ratios for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Loan-to-value ratio (percentage)	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
80 or less	24,422	3	19,552	4	15,241	3	13,140	3	12,934	3	85,289	3
>80–85	21,248	3	17,381	3	13,990	3	11,613	2	9,897	3	74,129	3
>85–90	46,774	6	38,585	8	32,544	6	25,290	5	20,762	5	163,955	6
>90–92	39,537	5	30,849	6	27,673	6	22,621	5	19,744	5	140,424	5
>92–96.5	178,006	24	156,257	31	154,756	31	116,961	24	97,338	24	703,318	27
>96.5–98.5	357,616	48	206,504	40	255,950	51	290,750	60	239,794	60	1,350,614	51
>98.5–100	66,508	9	38,764	8	1,792	<1	2,136	<1	926	<1	110,126	4
>100–102	2,464	<1	982	<1	1,635	<1	1,674	<1	908	<1	7,663	<1
>102	3,718	1	1,341	<1	1,333	<1	1,352	<1	676	<1	8,420	<1
No data available	823	<1	681	<1	472	<1	315	<1	137	<1	2,428	<1
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; > = greater than; < = less than
Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Loan-to-value ratios are calculated as the amount of the loan (including financed up-front guarantee fees, if any) divided by the value of the home at origination. Percentages do not always sum to exactly 100 percent due to rounding.

Table 36: Distribution of Degree of Rurality for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Degree of rurality	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Urban	714,773	96	493,024	97	487,413	96	467,614	96	387,583	96	2,550,407	96
Suburban	18,100	2	12,447	2	12,700	3	13,132	3	11,161	3	67,540	3
Large rural town	8,226	1	5,413	1	5,268	1	5,090	1	4,298	1	28,295	1
Small town and isolated rural area	14	<1	10	<1	5	<1	15	<1	64	<1	108	<1
Not available	3	<1	2	<1	0	0	1	<1	10	<1	16	<1
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; < = less than

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Source: GAO analysis of RHS loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We analyzed performance by degree of rurality using USDA's Rural-Urban Commuting Area codes, which classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations (urban, suburban, large rural town, and small town and isolated rural area). Percentages do not always sum to exactly 100 percent due to rounding.

Table 37: Distribution of Census Regions for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Census region	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Midwest	157,202	21	101,833	20	104,012	21	104,896	22	88,143	22	556,086	21
Northeast	93,403	13	62,835	12	61,683	12	59,463	12	47,013	12	324,397	12
South	274,598	37	185,423	36	184,167	36	182,720	38	153,290	38	980,198	37
West	215,913	29	160,805	32	155,524	31	138,773	29	114,670	28	785,685	30
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

Table 38: Distribution of Construction Types for FHA-Guaranteed Home Purchase Loans for Properties Not Located in RHS-Eligible Areas by Loan Cohort, Fiscal Years 2010–2014

Home construction type	2010		2011		2012		2013		2014		Total	
	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans	# of loans	% of loans
Manufactured home	2,941	<1	1,890	<1	2,231	<1	2,124	<1	2,219	<1	11,405	<1
On-site or unknown construction	738,175	99.6	509,006	99.6	503,155	99.6	483,728	99.6	400,897	99.4	2,634,961	99.6
Total	741,116	100	510,896	100	505,386	100	485,852	100	403,116	100	2,646,366	100

Legend: # = Number; % = Percentage; < = less than

Source: GAO analysis of FHA loan-level data. | GAO-16-801

Note: Data are for 30-year, fixed-rate loans guaranteed by the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). Percentages do not always sum to exactly 100 percent due to rounding.

Appendix V: Performance of Home Purchase Loans RHS and FHA Guaranteed in RHS-Eligible Areas in Fiscal Years 2010–2012

This appendix describes the results of our analysis comparing the performance of single-family home purchase loans guaranteed by the Rural Housing Service (RHS) and the Federal Housing Administration (FHA) in fiscal years 2010–2012 in RHS-eligible areas after 2 and 3 years of performance.¹ We analyzed performance for all loans and by the degree of rurality of the mortgaged property using the Department of Agriculture's (USDA) Rural-Urban Commuting Areas classification system.²

¹We analyzed loan-level data on the performance of 30-year, fixed-rate loans (excluding those for units in condominium and cooperative developments). For the purpose of comparing performance, we limited the FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas. For our analysis of loan performance, we used this stricter threshold to help ensure that our statistical model did not include FHA loans that may have different performance attributes by virtue of being just outside of RHS-eligible areas (for example, due to different house price or employment patterns). We also limited the analysis to borrowers with incomes within the county-level household income limits set by RHS. We restricted the data in this way to account for the absence of FHA limits on borrower household income, which resulted in FHA serving some borrowers with higher incomes than RHS is allowed to serve. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans after 2 years of performance (that is, loans that were guaranteed in fiscal years 2010–2012), we focused on loans with first payment months from December 2009 through October 2012. Similarly, to examine the performance of loans after 3 years of performance (loans guaranteed in fiscal years 2010–2011), we focused on loans with first payment months from December 2009 through October 2011.

²USDA's Rural-Urban Commuting Area codes classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations: urban (adjoining census tracts in built-up areas, with a total population of 50,000 or more that correspond to the U.S. Census Bureau's urbanized areas); suburban (areas with high commuting flow to urban areas and all areas where 30–49 percent of the population commute to urban areas for work); large rural town (towns with populations between 10,000 and 49,000 and surrounding rural areas where 10 percent or more of the population commutes to the town and 10 percent or more of the population commutes to an urban area for work); and small town and isolated rural area (towns with populations of less than 10,000 and their surrounding commuter areas and other isolated rural areas that are more than 1 hour driving distance to the nearest urban area).

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Table 39: Performance Status after 2 Years of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2012

Loan performance status	RHS		FHA	
	Number of loans	Percentage of loans	Number of loans	Percentage of loans
Current	261,022	86.9	246,209	83.1
Prepaid	9,624	3.2	23,252	7.9
30-89 days delinquent	18,116	6.0	15,142	5.1
Troubled	11,514	3.8	11,538	3.9
90 or more days delinquent or in the foreclosure process	9,818	3.3	10,667	3.6
Terminated with a claim	1,696	0.6	871	0.3

Source: GAO analysis of RHS and FHA loan-level data. | GAO-16-801

Note: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) and Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas and to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2012, we focused on loans with first payment months from December 2009 through October 2012.

Table 40: Performance Status after 3 Years of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011

Loan performance status	RHS		FHA	
	Number of loans	Percentage of loans	Number of loans	Percentage of loans
Current	145,486	77.6	147,891	72.7
Prepaid	16,465	8.8	32,479	16.0
30-89 days delinquent	12,735	6.8	10,985	5.4
Troubled	12,781	6.8	11,964	5.9
90 or more days delinquent or in the foreclosure process	8,623	4.6	9,599	4.7
Terminated with a claim	4,148	2.2	2,365	1.2

Source: GAO analysis of RHS and FHA loan-level data. | GAO-16-801

Note: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) and Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas and to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that

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were guaranteed in fiscal years 2010–2011, we focused on loans with first payment months from December 2009 through October 2011.

Table 41: Performance Status after 2 Years of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Degree of Rurality, Fiscal Years 2010–2012

Loan performance status	Urban		Suburban		Large rural town		Small town and isolated rural area	
	Number of loans	Percentage of loans	Number of loans	Percentage of loans	Number of loans	Percentage of loans	Number of loans	Percentage of loans
RHS Current	75,348	86.8	103,866	86.4	56,870	87.7	24,938	87.9
Prepaid	2,534	2.9	3,847	3.2	2,217	3.4	1,026	3.6
30-89 days delinquent	5,442	6.3	7,658	6.4	3,595	5.5	1,421	5.0
Troubled	3,522	4.1	4,819	4.0	2,197	3.4	976	3.4
90 or more days delinquent or in the foreclosure process	3,106	3.6	4,121	3.4	1,806	2.8	785	2.8
Terminated with a claim	416	0.5	698	0.6	391	0.6	191	0.7
FHA Current	90,010	82.8	101,813	82.8	37,608	84.4	16,778	84.3
Prepaid	8,769	8.1	9,564	7.8	3,322	7.5	1,597	8.0
30-89 days delinquent	5,629	5.2	6,580	5.4	2,080	4.7	853	4.3
Troubled	4,341	4.0	4,990	4.1	1,535	3.5	672	3.4
90 or more days delinquent or in the foreclosure process	4,074	3.8	4,584	3.7	1,401	3.2	608	3.1
Terminated with a claim	267	0.3	406	0.3	134	0.3	64	0.3

Source: GAO analysis of U.S. Department of Agriculture (USDA) and FHA loan-level data. | GAO-16-801

Note: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) and Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas and to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2012, we focused on loans with first payment months from December 2009 through October 2012. We analyzed performance by degree of rurality using USDA's Rural-Urban Commuting Area codes, which classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations (urban, suburban, large rural town, and small town and isolated rural area).

**Appendix V: Performance of Home Purchase
Loans RHS and FHA Guaranteed in RHS-
Eligible Areas in Fiscal Years 2010–2012**

Table 42: Performance Status after 3 Years of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas by Degree of Rurality Fiscal Years 2010–2011

Loan performance status	Urban		Suburban		Large rural town		Small town and isolated rural area	
	Number of loans	Percentage of loans	Number of loans	Percentage of loans	Number of loans	Percentage of loans	Number of loans	Percentage of loans
RHS Current	41,219	77.9	57,524	76.7	32,502	78.4	14,241	78.6
Prepaid	4,283	8.1	6,645	8.9	3,847	9.3	1,690	9.3
30-89 days delinquent	3,717	7.0	5,354	7.1	2,578	6.2	1,086	6.0
Troubled	3,679	7.0	5,445	7.3	2,553	6.2	1,104	6.1
90 or more days delinquent or in the foreclosure process	2,652	5.0	3,688	4.9	1,624	3.9	659	3.6
Terminated with a claim	1,027	1.9	1,757	2.3	929	2.2	445	2.5
FHA Current	54,230	72.2	61,285	72.5	22,428	74.2	9,948	73.9
Prepaid	12,496	16.6	13,231	15.7	4,632	15.3	2,120	15.8
30-89 days delinquent	3,913	5.2	4,863	5.8	1,523	5.0	686	5.1
Troubled	4,491	6.0	5,121	6.1	1,647	5.5	705	5.2
90 or more days delinquent or in the foreclosure process	3,716	5.0	4,060	4.8	1,268	4.2	555	4.1
Terminated with a claim	775	1.0	1,061	1.3	379	1.3	150	1.1

Source: GAO analysis of U.S. Department of Agriculture (USDA) and FHA loan-level data. | GAO-16-801

Note: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) and Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas and to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2011, we focused on loans with first payment months from December 2009 through October 2011. We analyzed performance by degree of rurality using USDA's Rural-Urban Commuting Area codes, which classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations (urban, suburban, large rural town, and small town and isolated rural area).

Appendix VI: Description of Our Statistical Model Comparing the Performance of Home Purchase Loans Guaranteed by RHS and FHA

This appendix describes the statistical model we developed to analyze how mortgage loans recently guaranteed under the Section 502 single-family loan guarantee program, administered by the Department of Agriculture's (USDA) Rural Housing Service (RHS), have performed over time and what factors explain performance empirically.¹ We provide a comparison of RHS loan performance to that of single-family loans guaranteed by the Federal Housing Administration (FHA) through its Section 203(b) program.

Our fundamental approach was to define an individual loan's performance in terms of its status as observed in a particular anniversary month. Status is a measure of whether a loan is current at a particular time, or, if not, a measure of its delinquency or an indication of its termination. Given knowledge of a loan's month of first payment, we can define an anniversary month as the month of any particular scheduled payment, such as the 24th or 36th payment month. A loan's anniversary status is then simply a snapshot of its status in that month.

Given observations of anniversary month status, we developed binary measures of loan performance in that month: troubled (at least 90 days delinquent, in the foreclosure process, or terminated with a claim) on the one hand or nontroubled (current, 30–89 days delinquent, or prepaid) on the other. We then used logistic regressions to estimate the effects of various factors that are understood to influence loan performance on this binary measure. The underlying variation in the values of these explanatory variables across a large set of loans permits us to estimate the effects of these factors on loan performance and to discuss results in terms of changes in expected probabilities of troubled performance.

To undertake our analysis, we obtained loan-level data from RHS and FHA. The agencies provided us with information for loans guaranteed in fiscal years 2010–2014.² Specifically, we obtained information on 6,181,365 FHA loans and 687,564 RHS loans, although we analyzed only

¹As a basic matter, loans are said to be performing if borrowers are making regularly scheduled payments of principal and interest.

²We are focusing on this specific period for purposes of this review and do not claim that the performance during this particular period reflects performance of RHS or FHA loans during prior or future periods.

fixed-rate loans with a 30-year term for home purchases and, given the requirements of the anniversary-month approach, could not include every loan record in the statistical analysis. The agencies provided us with two types of information for each loan: static and performance. In general terms, static information describes loan and borrower characteristics at the time of loan origination, such as the loan amount and the borrower's credit score. Performance, or history, files contain information that includes a loan's status in each month (for example, current or 30 days delinquent). The performance information for each loan in our data set covers performance from loan origination through September 2014, the last month of fiscal year 2014. Thus, we have approximately 5 years of observed performance for the earliest loans in our data, but only a few months for the most recent loans in our data. The month of first mortgage payment was not itself a variable in the data we received, but both agencies provided us with guidance to identify the month of first payment using information on other related date fields.

Modeling Considerations

Explanatory Variables

We included a variety of loan, borrower, and other characteristics as explanatory factors in our statistical analyses of mortgage performance. Because of our focus on comparing RHS and FHA loan performance, we developed a modeling approach that would allow us to estimate the effects of a set of explanatory variables separately for RHS and FHA loans as well as pooled together. To accomplish this, we needed the same set of explanatory factors for RHS and FHA loans. Information describing key loan and borrower characteristics was available in both the RHS and FHA data. Key static information at loan origination includes borrower income, credit score, loan-to-value (LTV) ratio, loan amount, debt-service-to-income (DTI) ratio, mortgage interest rate, and an indicator for whether the borrower was a first-time homebuyer. These characteristics are associated with loan performance, as follows.

- Borrowers with higher credit scores are less likely to have missed payments than borrowers with lower credit scores.
- Equity, which is defined as the value of the property minus the balance of the mortgage, is associated with better loan performance. The LTV ratio measures initial equity; larger down payments at loan origination are associated with better loan performance.

- Larger loan amounts require larger payments, which can put more financial stress on households struggling to fulfill various financial commitments.
- DTI ratio is a measure of how stretched a household may be to make scheduled mortgage and other debt payments.
- Higher interest rates are associated with larger payments, and a mortgage rate with a large spread over a reference rate may represent the lender's assessment that the borrower presents higher risk of troubled loan performance. Rather than incorporating the mortgage interest rate directly, we calculate the spread of the mortgage rate over the constant maturity 10-year Treasury rate in the month of loan origination.
- First-time homebuyer status can be a risk factor, potentially reflecting a new homeowner's limited experience with the risks and costs of homeownership.

A borrower can build equity over time if housing values appreciate or by paying down their mortgage balance. We used data from a Federal Housing Finance Agency house price index to develop a house price appreciation measure, using state-level indexes of house prices for the nonmetropolitan portions of each state (or a neighboring state in three instances) over the specific interval linking a loan's origination to a specific payment anniversary. We also included a set of census division dummy variables, a set of first payment quarter dummy variables, and a set of "community type" dummy variables based on USDA's Rural-Urban Commuting Area code construct.³ These dummy variables may help control for other factors not directly measured by the other explanatory factors listed, including any that may have varied by region of the country, time of loan origination, or community type.

We also included information for RHS borrowers on the amount of liquid assets available to the borrower at loan origination. This permitted us to explore the effects of a financial cushion at the time of loan origination for

³Rural-Urban Commuting Area codes are census-tract-based measures developed by the Economic Research Service of USDA and U.S. Health Resources and Services Administration. Census tracts are placed into community-type categories based on population density, urbanization, and commuting patterns.

RHS Program Considerations and Comparable FHA Loans

RHS loans, but not for FHA loans separately or for the model using RHS and FHA data pooled together.

To present an appropriate comparison group of FHA loans, we considered other issues related to RHS program features so that we could exclude FHA loans that would not qualify for the RHS program. First, RHS has a rural focus, and its loans are available only in specific mapped (RHS-eligible) areas. FHA loan availability is not restricted by geography. To avoid comparing RHS loans to FHA loans outside of RHS-eligible areas, which may perform differently from loans in RHS-eligible areas, we excluded from our analysis FHA (and RHS) loans in census tracts for which less than 95 percent of the tract’s land area is in an RHS-eligible area. As shown in table 43, this excluded most FHA loans but relatively few RHS loans.⁴

Table 43: Number and Percentage of Home Purchase Loans RHS and FHA Guaranteed in Fiscal Years 2010–2011 and RHS Program Eligibility as Measured by Census Tract Land Area

Share of census tract land area that is RHS-eligible	Rural Housing Service (RHS)-guaranteed loans		Federal Housing Administration (FHA)-guaranteed loans	
	Number	Percentage	Number	Percentage
At least 95 percent of area	187,467	87.3	203,319	19.4
Between 5 and 95 percent of area	21,888	10.2	111,558	10.6
Less than 5 percent of area	5,435	2.5	734,758	70.0

Source: GAO analysis of U.S. Department of Agriculture and FHA data. | GAO-16-801

Second, to qualify for an RHS loan, a borrower’s household income may not exceed 115 percent of the area median income, a threshold that varies across the country and over time. FHA borrowers are not subject to income restrictions. Thus, there will be FHA borrowers with incomes exceeding the RHS program limits in RHS-eligible areas. To avoid comparing RHS loans to FHA loans that went to higher-income borrowers, we excluded borrowers with incomes that exceeded the RHS

⁴We used the statutory definition of RHS-eligible areas in place as of 2014. Because the definition changes periodically, approximately 5 percent of the loans RHS guaranteed in 2010–2014 were not located in the updated RHS-eligible areas.

program limits.⁵ For instance, the borrowers who received the 203,319 FHA loans in table 43 that were made in RHS-eligible areas also had incomes that met the RHS program limits. The number of FHA loans in RHS-eligible areas without regard to borrower income limits was 276,933.⁶ We also present results for a subset of loans that are in communities in RHS-eligible areas considered to be the most rural, as defined using the Rural-Urban Commuting Area codes.

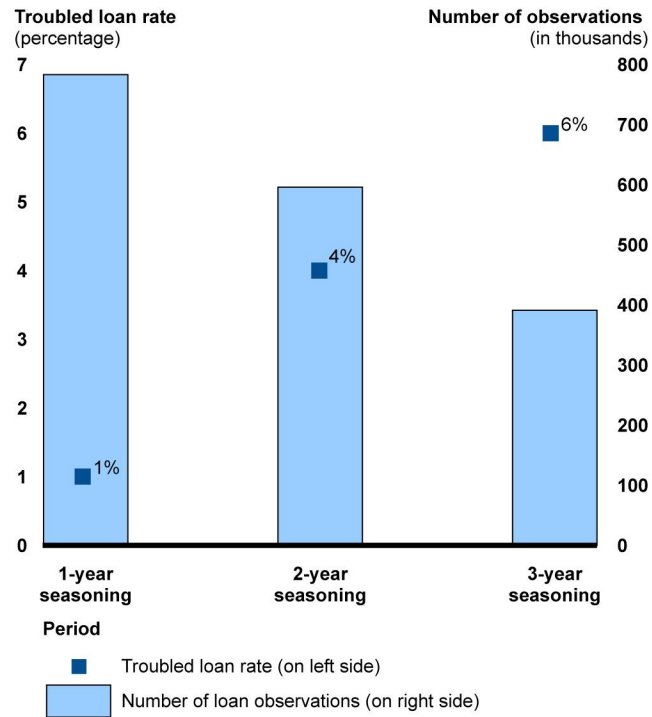
Selection of Anniversary Month and Performance Status

We faced a trade-off between the number of loans we could include in the statistical analysis and the degree of loan seasoning we could select. September 2014 is the last month for which we could determine status for any loan, and the earliest loans in our data set were originated in the beginning of fiscal year 2010. As a general approximation, no loan originated after fiscal year 2011 will have a 36-month (3-year) anniversary by the end of fiscal year 2014. In contrast, all loans originated before fiscal year 2014 will have a 12-month (1-year) history available by the end of fiscal year 2014. Typically, relatively few loans exhibit troubled performance early in their history (for instance, at their 1-year anniversary). Thus, more seasoned loans are likely to provide a better indicator of the ultimate performance of a group of loans. Figure 18 shows the relationship between the numbers of loans that would be available for our analysis given the selection of alternative anniversary periods. For illustration, the number of loans refers to the number of loans that would have the requisite history given a choice of anniversary month. Performance of these loans is defined in terms of the share of loans that are troubled. Less than 1.5 percent of loans show troubled performance at 1 year, while more than 6 percent of loans show troubled performance by 3 years.

⁵As a sensitivity analysis, we present results in which we do not restrict incomes.

⁶Applying the same restriction to RHS loans resulted in less than a 2 percent reduction in the number of loans.

Figure 18: Relationship between the Number of Seasoned RHS- and FHA-Guaranteed Home Purchase Loans and Troubled Loan Rates



Source: GAO analysis of Rural Housing Service (RHS) and Federal Housing Administration (FHA) loan-level data. | GAO-16-801

We chose to measure status as of the 3-year anniversary period to model loan performance, although we do present some results in which we use the 2-year anniversary period.

Functional Form

In terms of functional form, we express each continuous variable as a series of dummy variables that exhaust the continuous variable's range. For example, the borrower credit score range was split into nine dummies, most containing 20-point portions and others containing 40-

point portions of the 850-point credit score range.⁷ This permitted flexibility in determining the effects of changes in the value of an explanatory factor on changes in performance, and for comparing the effects as estimated on the set of RHS loans to the effects as estimated on the set of FHA loans. We used this feature to trace the relationship between changes in an explanatory factor across its range and the expected probability of troubled performance.

We provide a table of mean values for this specification later, but table 44 presents information on the distribution of these variables in a more conventional form.⁸ These values are for the specification using a 3-year anniversary period, loans in the RHS-eligible areas, and borrowers with incomes meeting the RHS program limits.

⁷Specifically in the case of credit scores, the range dummies are less than 620; greater than or equal to 620 but less than 640; greater than or equal to 640 but less than 660; greater than or equal to 660 but less than 680; greater than or equal to 680 but less than 700; greater than or equal to 700 but less than 720; greater than or equal to 720 but less than 760; greater than or equal to 760 but less than 800; and 800 or greater. For instance, if a borrower had a credit score of 690 at the time of loan origination, the value of the dummy variable indicating credit scores ranging from 680 to (less than) 700 would take on a value of 1, while all other credit score categorical variables would take on a value of 0.

⁸See appendix VII for additional information.

Appendix VI: Description of Our Statistical Model Comparing the Performance of Home Purchase Loans Guaranteed by RHS and FHA

Table 44: Distribution of Values of Explanatory Variables for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011

Variable name	Agency	Values			
		25th percentile	Median	75th percentile	Mean
Debt-service-to-income ratio (percentage)	RHS	30.6	37.0	42.5	36.5
	FHA	34.6	41.8	47.8	40.8
Credit score	RHS	654	689	734	692.7
	FHA	650	685	734	693.3
First-time homebuyer	RHS	1	1	1	0.85
	FHA	1	1	1	0.76
House price appreciation (percentage)	RHS	-3.00	0.70	3.80	0.24
	FHA	-4.30	-0.50	3.20	-0.37
Income	RHS	34,707	44,929	57,870	46,792
	FHA	36,713	49,392	64,274	50,771
Loan amount	RHS	90,144	125,255	161,664	130,747
	FHA	95,014	134,480	178,378	144,007
Loan-to-value ratio (percentage)	RHS	97.0	100.6	102.0	98.3
	FHA	96.5	96.5	96.5	95.4
Interest rate spread (percentage)	RHS	1.52	1.79	2.10	1.82
	FHA	1.50	1.79	2.08	1.80

Source: GAO analysis of data from Rural Housing Service (RHS), Federal Housing Administration (FHA), Federal Housing Finance Agency, and Department of the Treasury. | GAO-16-801

Notably, and as discussed elsewhere in this report, the distributions of some key characteristics are quite similar between the two sets of loans—particularly credit score and interest rate spread values. RHS borrowers had lower incomes, smaller loan amounts, and lower DTI ratios.⁹ House price appreciation was slightly more favorable for RHS than for FHA. A greater share of RHS borrowers were first-time homebuyers.

⁹We adjusted dollar-denominated explanatory variables (loan amount and income) to late 2014 values using the Bureau of Economic Analysis' Core Personal Consumption Expenditures price index. According to the Bureau, this index measures the prices paid by consumers for goods and services without the volatility caused by movements in food and energy prices to reveal underlying inflation trends.

Both the RHS and FHA programs feature low or no down payments. However, the programs have different down-payment requirements, which affect the distribution of LTV ratios. FHA loans are concentrated at an LTV value of 96.5 percent, while many RHS loan amounts exceed the value of the property at loan origination—that is, have an LTV ratio exceeding 100 percent. The dummy variable construct helps to model LTV effects given the skewed distribution of values.

We developed two sets of dummy variables to capture LTV effects: one with three categories in which the top category includes all loans with LTV values at or above 96, and the second with four categories in which the top category includes all loans with LTV values at or above 100 and the next-to-top category includes LTV values at or above 96 but less than 100. Most loans for both agencies exceed an LTV value of 96, but the three-category model does not distinguish a value of 102 from a value of 98. The four-category model makes this distinction, but given the nature of the two programs, almost all of the loans that have LTV values exceeding 100 are RHS loans.

The model includes only fixed-rate loans with 30-year terms for home purchases.¹⁰ In addition, we excluded loans for units in condominiums and cooperative developments; observations with missing or extreme values of explanatory variables; observations for which certain date values seem inappropriate—for example, mortgages that appear to terminate before they originate; and observations for which we could not determine an unambiguous measure of the performance status.¹¹

Performance Comparison Using Agency-Specific Model Results

We compared the performance of RHS loans to that of FHA loans by first examining agency-specific model results. We present a series of charts that support the view that the two agencies share a similar loan performance model structure. We then used the pooled set of loans to calculate the expected probability of troubled loan performance represented by loans with particular values of the explanatory characteristics. In particular, we compared the predicted performance of a loan with average RHS characteristics to a loan with average FHA

¹⁰RHS does not guarantee loans with shorter terms or adjustable interest rates.

¹¹FHA does not guarantee loans for cooperatives and guaranteed few loans for condominiums under its 203(b) program in 2010–2012.

characteristics for particular characteristics of interest. Our assumption that loan performance for the two programs could be evaluated using a similar model structure is also supported by the fact that the loan underwriting processes for the two programs share common elements.

We present our primary results for a model specification in which we

- select an anniversary duration of 3 years;
- classify our binary measure of loan performance so that troubled loans are those with anniversary month status of 90 days delinquent or worse (including loans in foreclosure or terminated with a claim);
- approximate RHS program income requirements by imposing borrower household income limits;
- restrict property locations to those in census tracts with at least 95 percent of land area in RHS-eligible areas; and
- select a four-category LTV ratio dummy variable structure.

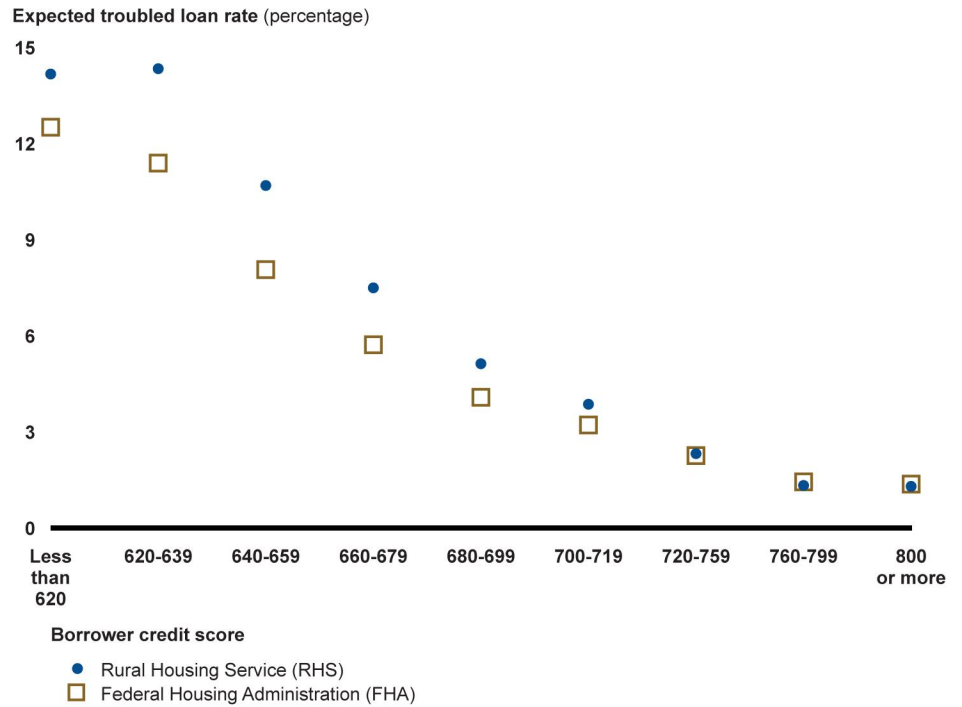
We also present some alternative specifications to highlight the sensitivity of various factors on the results (see tables 45–49 in app. VII for additional information).

In general, our estimates suggest that across all samples and specifications, certain consistent patterns are present for RHS and FHA borrowers. At the same time, there are some differences. For instance, increases in borrower credit scores decrease the expected probability of a loan being troubled by the 3-year anniversary, and there are dramatic declines as credit scores increase from the lower to the higher portions of the credit score range for both RHS and FHA loans (see fig. 19). However, at the lower portions of the range, RHS loans have a higher probability of being troubled, holding other factors constant, than FHA loans. But in both cases these probabilities decrease rapidly throughout the credit score range and converge by the high end of the range.¹² Differences between RHS and FHA estimated coefficients are statistically significant except at the high end of the credit score range, suggesting that loans to RHS borrowers with low credit scores are somewhat more

¹²In both the RHS and FHA estimates, the difference in probability in moving from the omitted category (credit scores from 760 to 799) were not statistically different from those in the category with credit scores above 800.

likely to perform worse, other factors held constant, than loans to FHA borrowers with low credit scores.

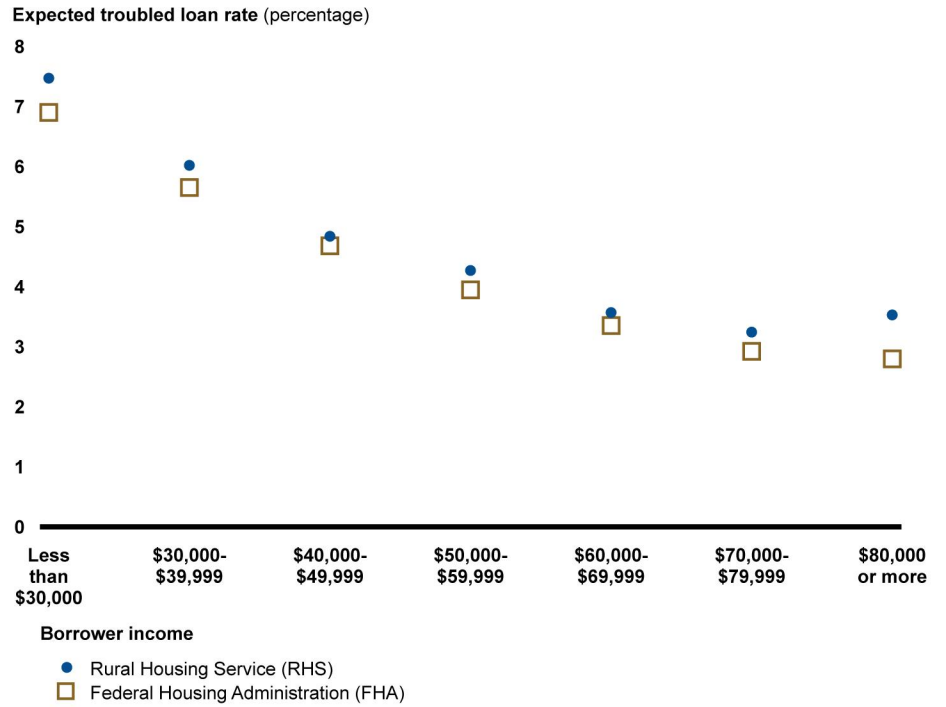
Figure 19: Relationship between Borrower Credit Score and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011



Source: GAO analysis of loan-level data from RHS and FHA. | GAO-16-801

Increases in borrower income were associated with decreased probability of a loan being troubled by the 3-year anniversary (see fig. 20). There were no significant differences between the estimated RHS and FHA coefficients.

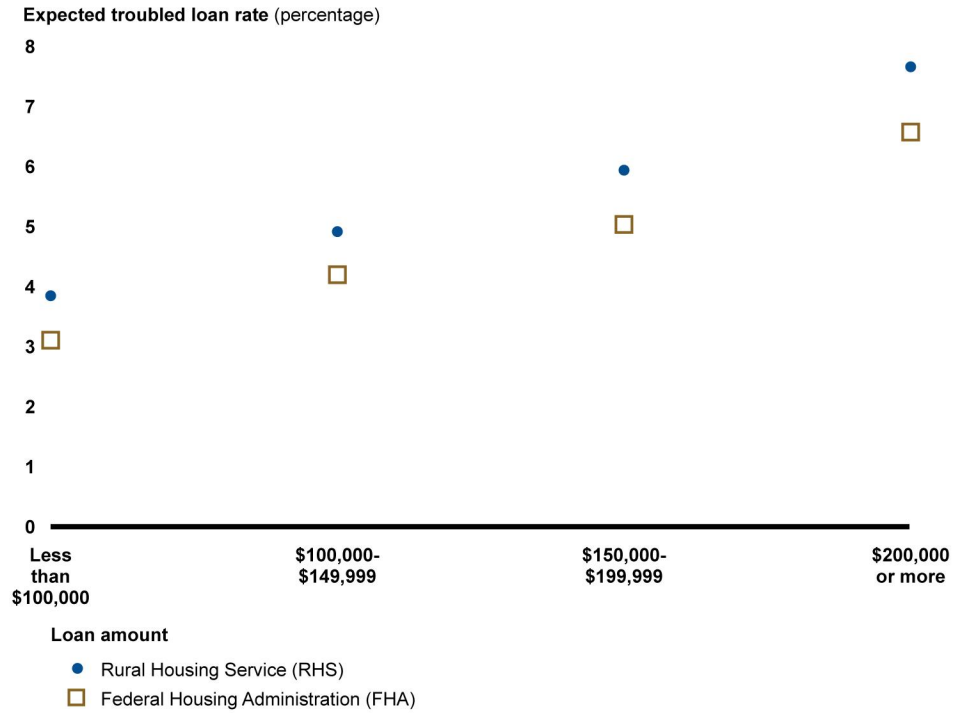
Figure 20: Relationship between Borrower Income and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011



Source: GAO analysis of loan-level data from RHS and FHA. | GAO-16-801

As shown in figure 21, larger loan amounts were associated with higher probabilities of troubled performance by the 3-year anniversary. There were no significant differences between the estimated RHS and FHA coefficients.

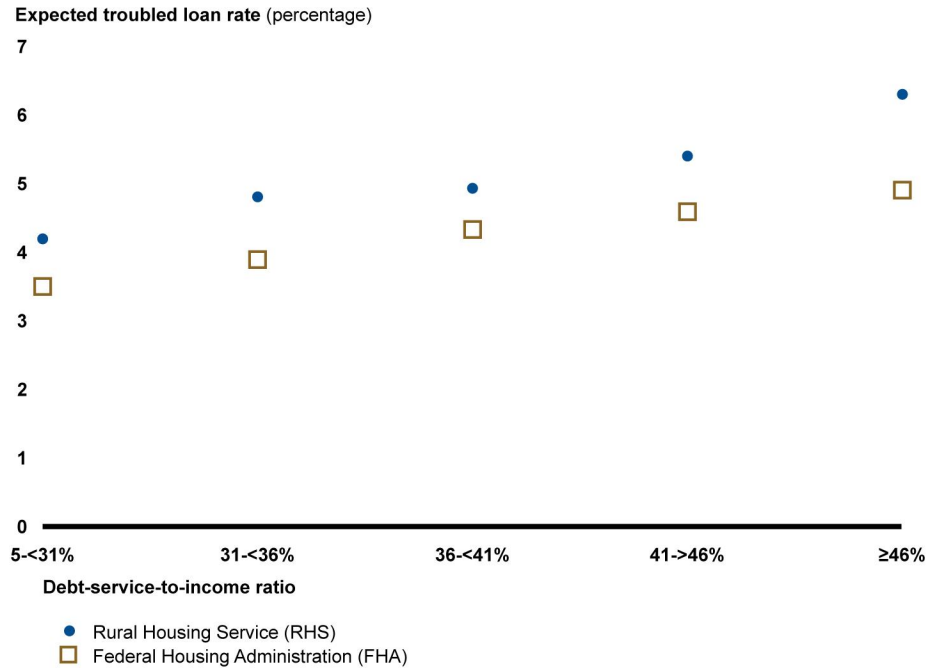
Figure 21: Relationship between Loan Amount and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011



Source: GAO analysis of loan-level data from RHS and FHA. | GAO-16-801

As shown in figure 22, increases in the DTI ratio were associated with modest increases in the probability of troubled performance by the 3-year anniversary. The differences in the estimated coefficients in the greater-than-31-to-36 category and the greater-than-46 category were statistically significant (although relatively few RHS borrowers were in the latter category).

Figure 22: Relationship between Debt-Service-to-Income Ratio and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

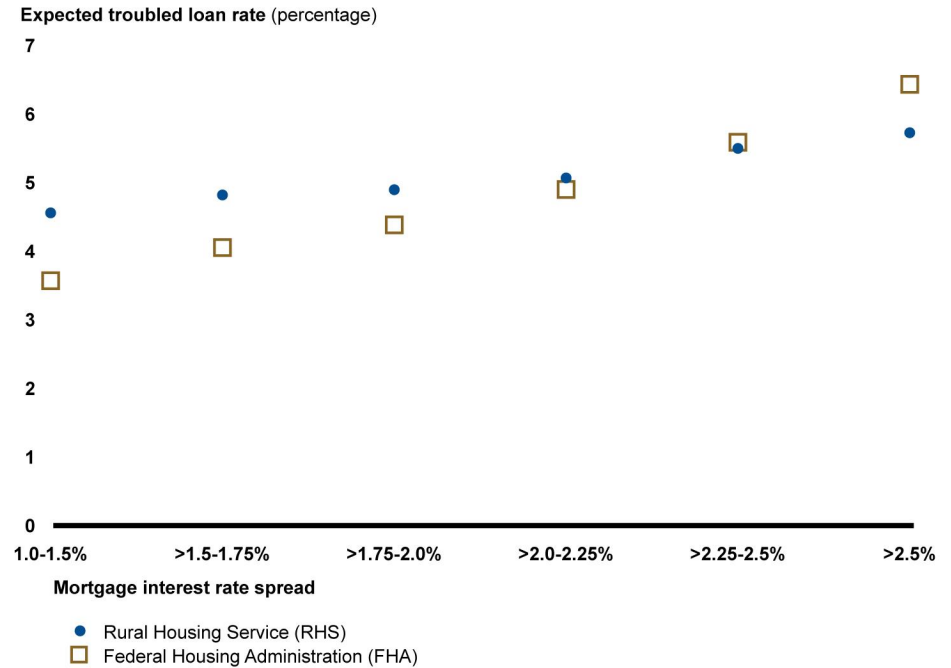


Source: GAO analysis of loan-level data from RHS and FHA. | GAO-16-801

There were some differences between the agencies in the estimated effects of mortgage rate spread (see fig. 23). For both agencies, higher spreads were associated with higher estimated probabilities of troubled performance by the 3-year anniversary. However, the estimates for RHS exhibit a relatively flat pattern (that is, the probability of troubled performance was not as sensitive to changes in the mortgage rate spread) compared with the FHA estimates.¹³

¹³For some spread categories in the middle of the range for the RHS estimates, the estimated coefficients were not significantly different from one another, confirming the observed flatness. This was not the case for the FHA estimates.

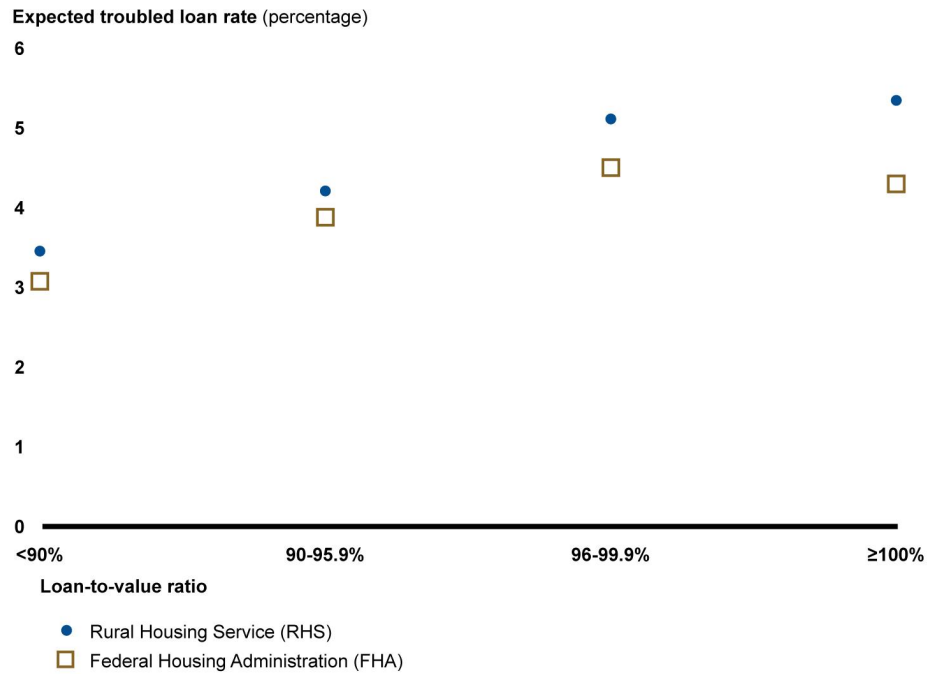
Figure 23: Relationship between Mortgage Rate Spread and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011



Source: GAO analysis of U.S. Department of the Treasury data and loan-level data from RHS and FHA. | GAO-16-801

As previously noted, both the RHS and FHA programs have low or no down-payment features, and more than one-half of RHS borrowers had LTV ratios at origination that exceeded 100 percent. However, fewer than 1 percent of FHA loans had LTV ratios exceeding 100 percent, which provides little rationale for modeling FHA loan performance on a stand-alone basis using a four-category LTV specification—that is, using a specification with a separate category for loans with LTVs of 100 percent or more. The four-category specification is more appropriate for modeling RHS loan performance. For both agencies, the expected probability of a loan being troubled by the 3-year anniversary increases with LTV values, with the exception of the top category for FHA loans. Our results show that for RHS loans, moving to the LTV category with values at or exceeding 100 percent was associated with an increase in the probability of a loan being troubled by the anniversary date (see fig. 24). The differences between the RHS and FHA coefficient estimates were not statistically significant.

Figure 24: Relationship between Loan-to-Value Ratio and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

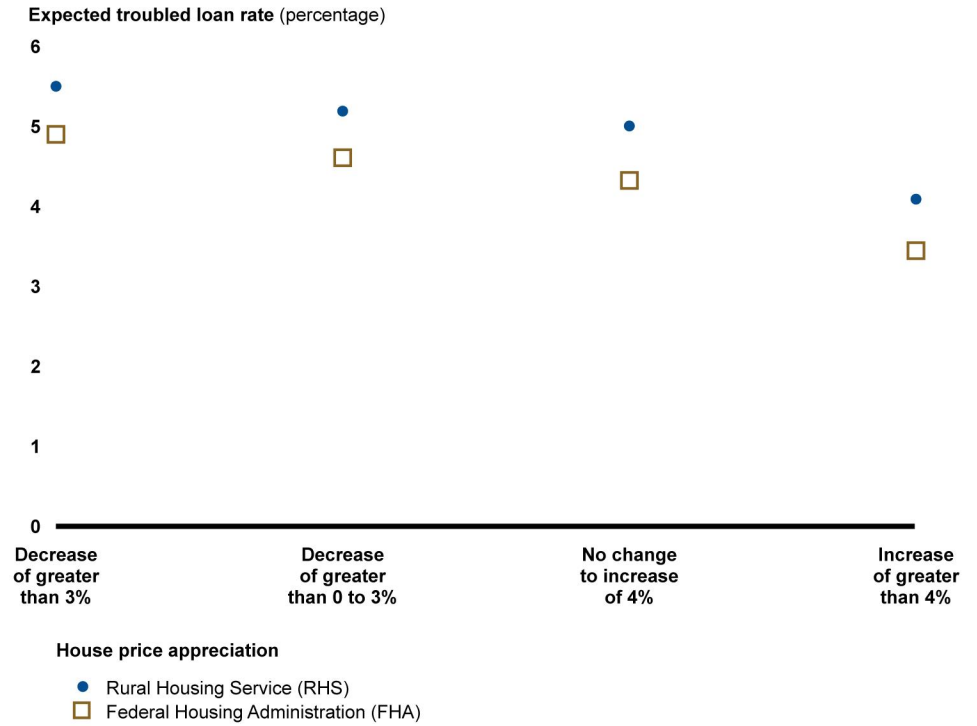


Source: GAO analysis of loan-level data from RHS and FHA. | GAO-16-801

As shown in figure 25, the influence of house price appreciation was modest for RHS and FHA loans, possibly in part because overall rates of house price appreciation were moderate during the period covered by our analysis.¹⁴ The differences between the estimated RHS and FHA coefficients were not statistically significant.

¹⁴According to data from the Federal Housing Finance Agency’s Expanded-Data House Price index, average house prices appreciated less than 10 percent at the national level from fiscal years 2010 through 2014, or an average of less than 2 percent annually.

Figure 25: Relationship between House Price Appreciation and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011



Source: GAO analysis of Federal Housing Finance Agency data and loan-level data from RHS and FHA. | GAO-16-801

The estimated effects of first-time homebuyer status differed in the agency-specific regressions. Both programs are attractive to first-time homebuyers because of the low (or no) down-payment requirements. In our data set, 85 percent of RHS borrowers and 76 percent of FHA borrowers were first-time homebuyers. However, the share of FHA borrowers who were first-time homebuyers was greater in locations that are not eligible for the RHS program. In the FHA regression, the estimated coefficient for first-time homebuyer status is positive (it is associated with a higher expected probability of troubled loan performance) and statistically significant. In the RHS regression, the estimated coefficient is not statistically significant at the 10 percent level. This suggests that non-first-time homebuyer status is not associated with better loan performance.

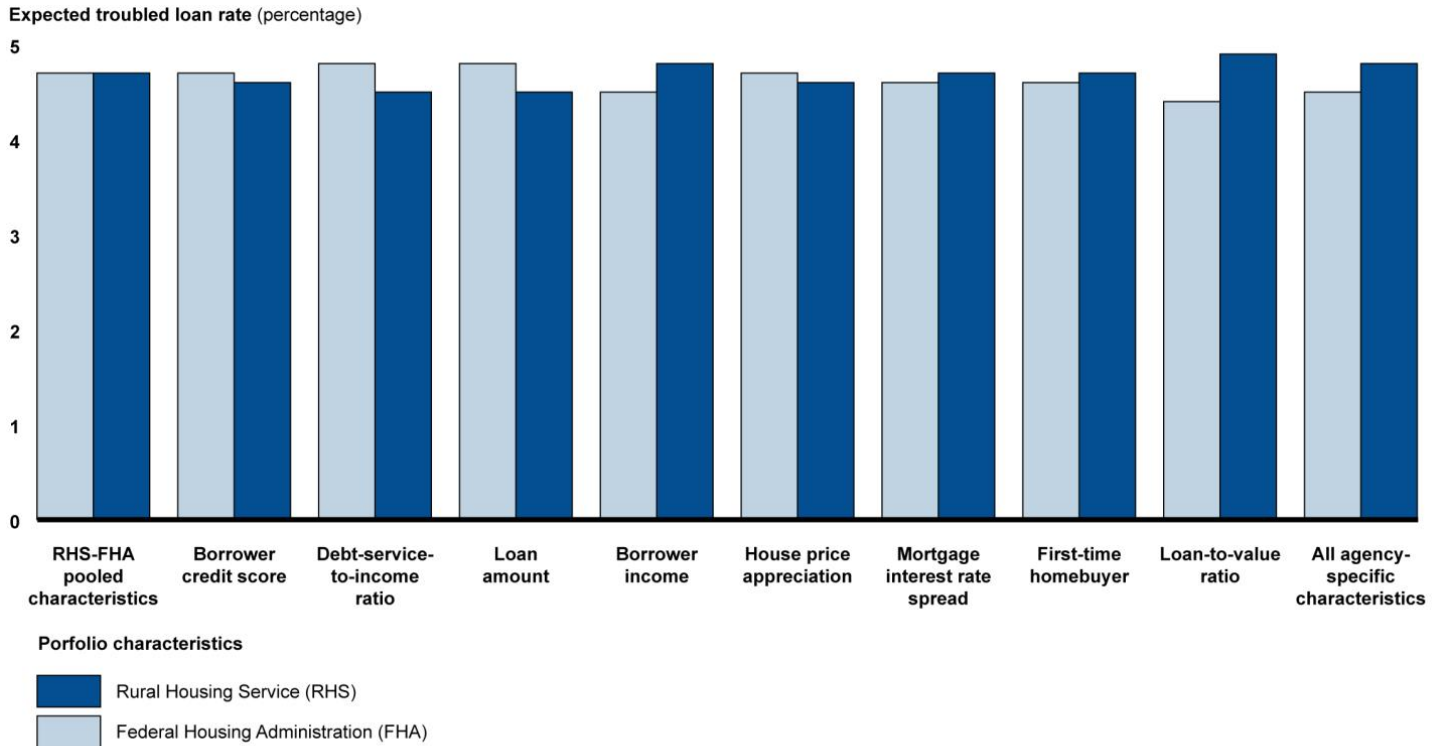
Performance Comparison Using Pooled Agency Data

In general, we believe that the performance of RHS and FHA loans is well explained by the model. Additionally, given the similar patterns of association between key explanatory characteristics and the expected probability of troubled loan performance, we believe it is reasonable to use the model and a pooled data set—that is, data from both agencies combined—to investigate how differences between the portfolio characteristics of the two agencies influence loan performance. The presence of a similar underlying model structure is evidenced by the RHS and FHA stand-alone regressions, which showed similar decreasing relationships between borrower credit scores and the expected probability of troubled loan performance (that is, high expected values at low credit scores and steep declines in expected values as scores increase). While the estimates were significantly different across portions of the credit score range, for other important characteristics the similarity of the underlying model structure was confirmed by similarities in the association with troubled loan status and the absence of statistically significant differences between the two agencies. In particular, we observed similar decreasing relationships between borrower income and the expected probability of troubled loan performance and similar increasing relationships between loan amount and expected troubled loan performance.

The advantage in assuming a common model structure and using a pooled data set is that we can use the estimated coefficients to calculate the expected probability of a loan with particular characteristic values being in a troubled status by the 36th month anniversary. One comparison is to calculate these probabilities using the mean values for the entire set of explanatory characteristics observed for each agency (agency-specific mean values). Another method of comparison is to calculate these probabilities using the mean values of the pooled characteristics (pooled mean values) to provide a base value, and then to substitute agency-specific mean values for particular characteristics. For example, if RHS borrowers had riskier characteristics than FHA borrowers, then given the set of coefficient estimates for the pooled data, the expected probability of a loan being troubled by the anniversary period would be higher for RHS than for FHA. To the extent that each agency's borrower characteristics are similar, the expected probabilities for each agency will be similar. To the extent that the characteristics diverge, the probabilities will diverge. Figure 26 shows the expected

troubled loan rate for each agency using the pooled coefficients and the pooled or agency-specific mean values for the various characteristics.¹⁵

Figure 26: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011



Source: GAO analysis of Federal Housing Finance Agency and U.S. Department of the Treasury data and loan-level data from RHS and FHA. | GAO-16-801

Alternative Model Specifications

We estimated four alternative specifications of the model to determine the extent to which our results varied depending on plausible changes in assumptions and to examine the effect of particular factors relevant to RHS program features.

- First, we estimated a specification in which we did not restrict borrower incomes based on RHS household income limits. This had

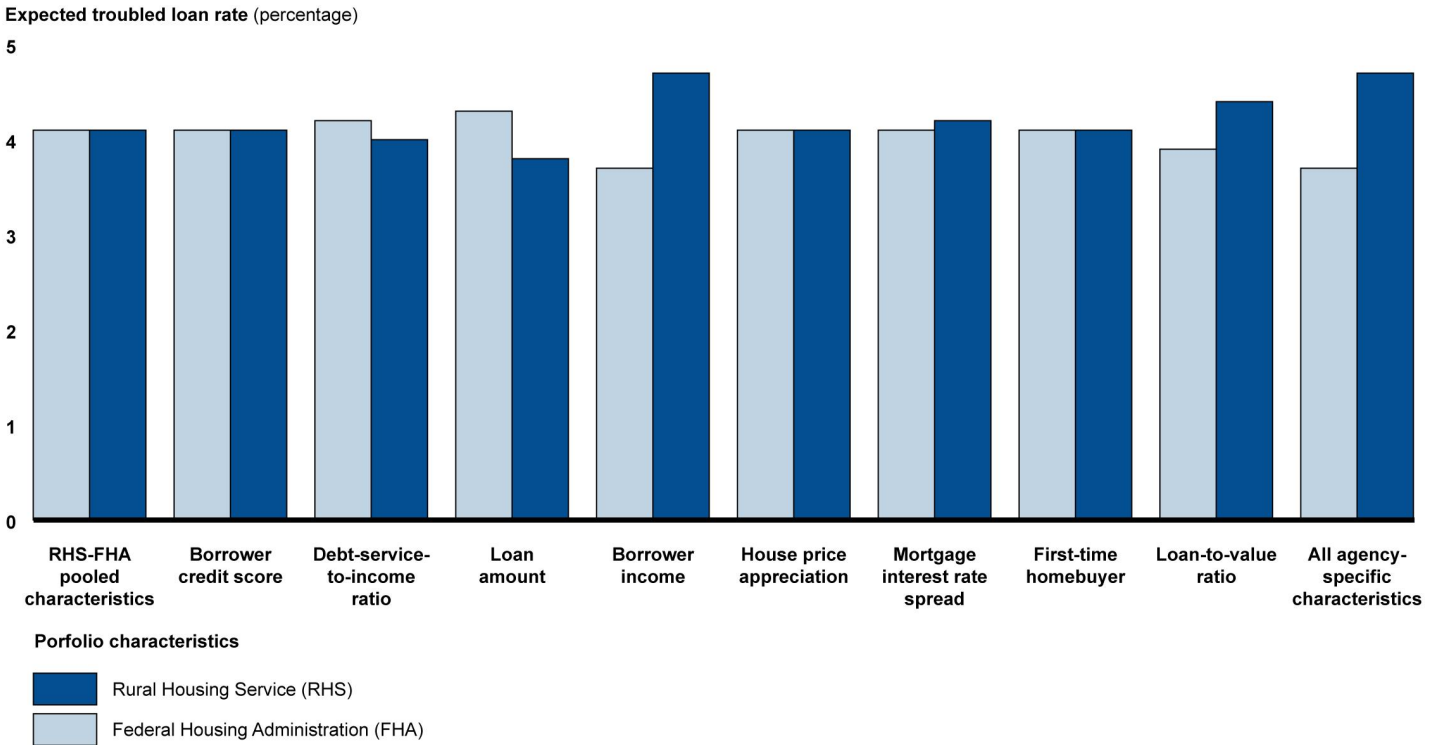
¹⁵See tables for mean values in appendix VII.

the effect of including many more FHA observations with relatively higher incomes—improving expected FHA performance—and serves to highlight the importance of borrower income.

- Second, we also estimated a model specification with three LTV ratio categories instead of four. That is, we combined the top two categories of the range, so that the top category included all LTV ratio values greater than or equal to 96 percent. Given the categorical nature of the way variables are defined, in this specification it becomes impossible to distinguish between LTV ratio values that are slightly less than 100 percent from those that are slightly above. In contrast to the primary specification, this specification predicts better performance for RHS than for FHA for reasons described below.
- Third, we also chose a specification in which we included only those locations that were the most rural in character (large rural towns and small town and isolated rural areas) on the basis of the Rural-Urban Commuting Area codes. This permitted us to analyze loan performance in the more rural portions of the RHS-eligible areas. This specification produced similar results to the primary specification in terms of the two agencies' relative loan performance.
- Finally, we chose a specification that used a 2-year anniversary period. This specification produced almost identical expected performance for both agencies.

Under the first alternative model specification, many FHA borrowers within RHS-eligible areas have incomes exceeding RHS income limits. Since higher incomes are associated with a lower risk of a loan being troubled, actual and predicted FHA performance improves when these observations are not excluded from the estimation. Figure 27 shows the results of this first alternative specification. Compared with the results for the primary model specification (see fig. 26 above), the expected probability of a loan becoming troubled by its 3-year anniversary is lower with all characteristics at their pooled mean values. Additionally, the expected probability of troubled loan performance is considerably higher with all characteristics at RHS-specific mean values than it is with all characteristics at FHA-specific mean values. Borrower income is particularly important to this outcome, suggesting that the inclusion of higher-income borrowers in RHS-eligible areas is associated with better FHA performance.

Figure 27: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011, Using a Model Specification with No Income Restriction



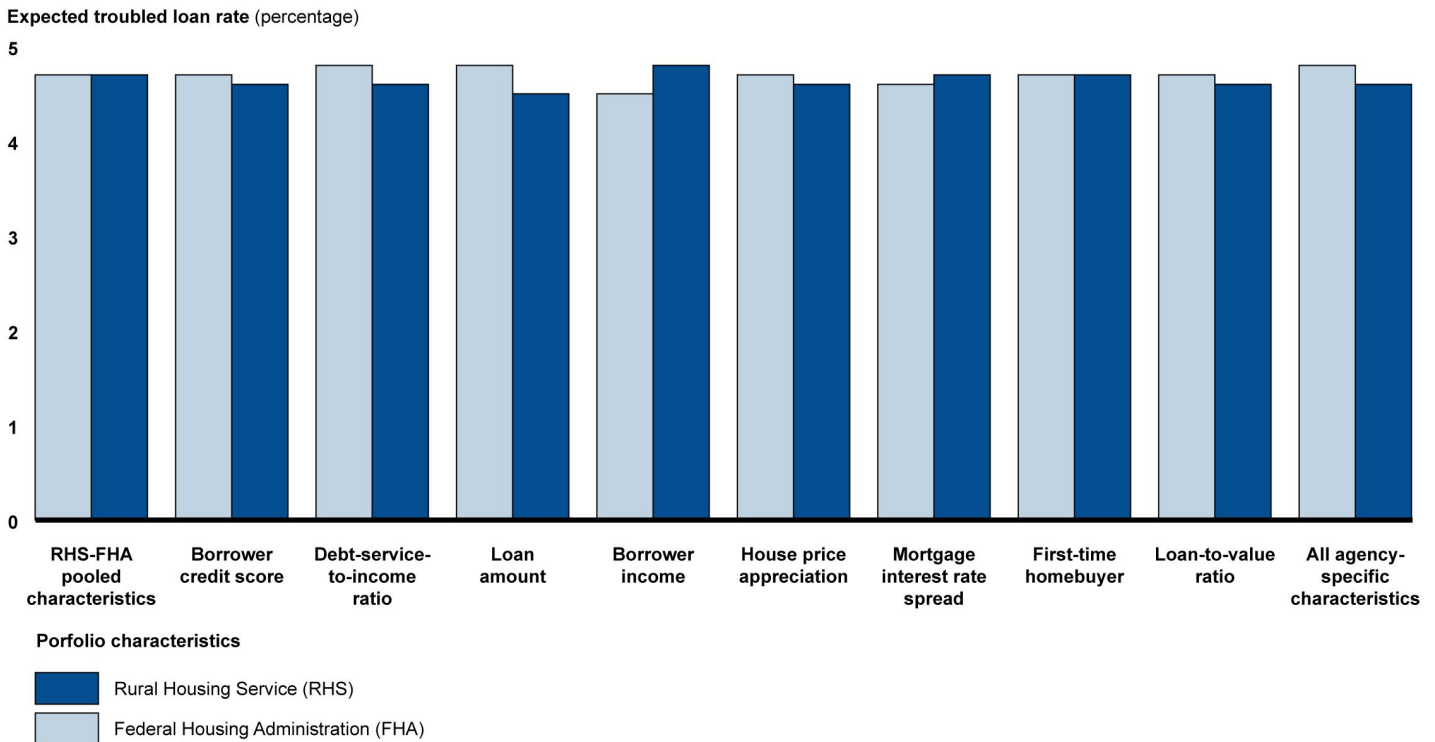
Source: GAO analysis of Federal Housing Finance Agency and U.S. Department of the Treasury data and loan-level data from RHS and FHA. | GAO-16-801

Under the second alternative model specification, we examined the importance of the top end of the LTV ratio range. While few FHA loans had an LTV ratio exceeding 100 percent, many RHS loans did. Within the RHS stand-alone regression, moving from an LTV ratio below 100 percent to one above 100 percent has a positive and significant effect on the probability of troubled loan performance. The second alternative specification uses only three categories of LTV ratio (rather than the four categories used in the primary specification), with the highest category starting at 96 percent.

Figure 28 shows the results of this second alternative specification. In contrast to the results for the primary specification (see fig. 26 above), the expected probability of troubled loan performance is lower with all characteristics at RHS-specific mean values than it is with all characteristics at FHA-specific mean values. In particular, the contribution

of LTV ratio appears to favor rather than disadvantage RHS performance because FHA has a larger proportion of loans than RHS in the highest category (which does not distinguish between LTV ratios of 96 to 99.9 percent and those of 100 percent or more). Taken together, our analyses suggest that for RHS borrowers, beginning homeownership with negative equity is associated with a higher probability of troubled performance than beginning with low but positive equity.

Figure 28: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011, Using a Model Specification with Three Loan-to-Value Ratio Categories

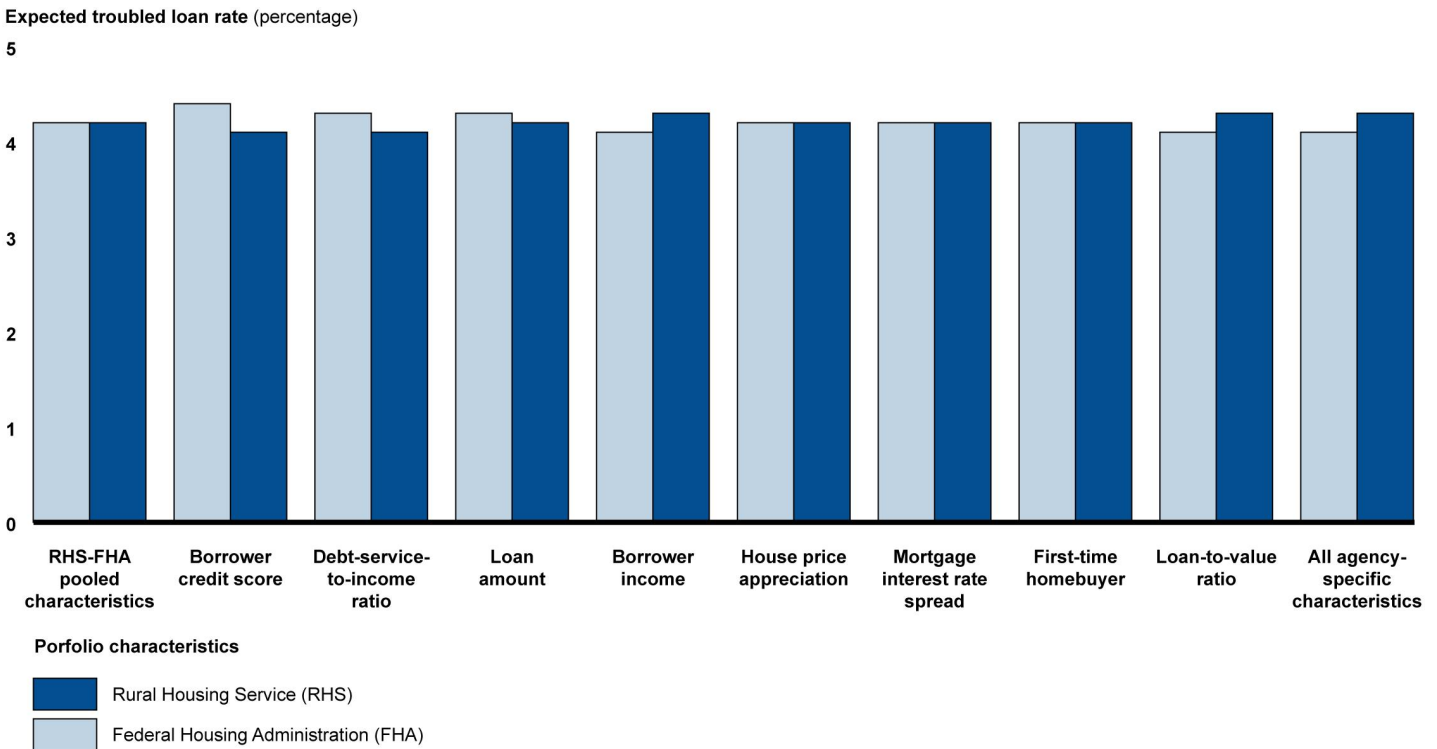


Source: GAO analysis of Federal Housing Finance Agency and U.S. Department of the Treasury data and loan-level data from RHS and FHA. | GAO-16-801

Under the third alternative specification, we focused on the possibility that loan performance may be different in the most rural parts of RHS-eligible areas. In this specification, we included only observations corresponding with Rural-Urban Commuting Area codes for locations less integrated into urban areas. Commuting-to-work patterns are an important component of the Rural-Urban Commuting Area classification scheme so that, for example, if a rural area is close enough to an urban area to be attractive

to commuters, housing market transactions in those areas may be more standardized than in more rural areas with fewer employment opportunities. There also may be differences in the characteristics of RHS and FHA borrowers in these areas. When we restricted our analysis to observations in large rural towns and small town and isolated rural areas within RHS-eligible areas, we found that the overall incidence of troubled loans was lower in these more rural areas. However, the effects of portfolio characteristics on expected probabilities of troubled loan status were generally similar to those we found in RHS-eligible areas overall (see fig. 29). As a result, figure 29 resembles figure 26 (which does not impose the additional geographic restriction) in many respects.

Figure 29: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in More Rural Parts of RHS-Eligible Areas, Fiscal Years 2010–2011



Source: GAO analysis of Federal Housing Finance Agency, U.S. Department of the Treasury, and U.S. Department of Agriculture, and loan-level data from RHS and FHA. | GAO-16-801

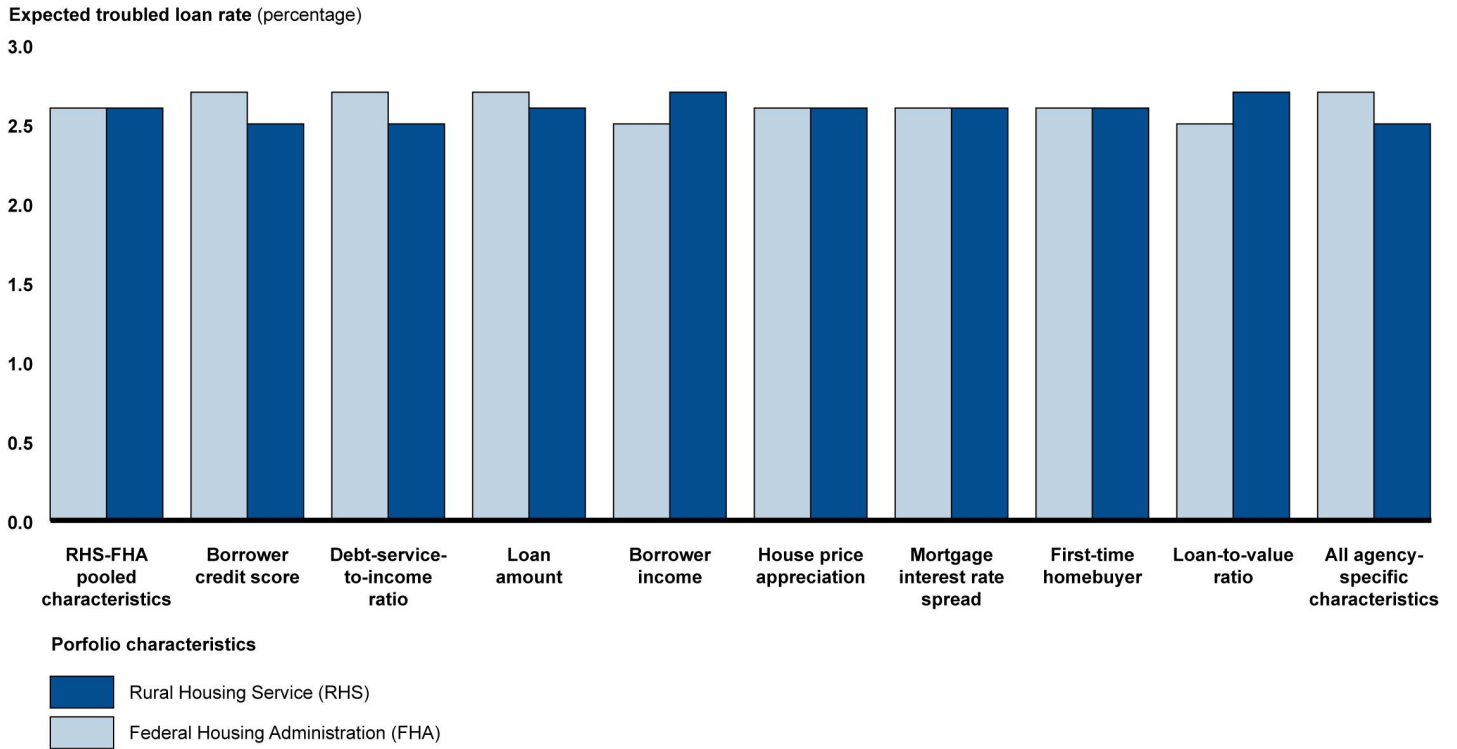
Note: The analysis is limited to loans for properties in large rural towns and small town and isolated rural areas, as defined by Rural-Urban Commuting Area codes, within RHS-eligible areas.

Finally, we estimated a fourth alternative specification that is the same as our primary specification except that it focuses on a 2-year anniversary period. As with the case of the 3-year specification, we believe that stand-alone estimates for each agency suggest a common underlying structure. Fewer loans are troubled after 2 years than after 3 years; however, we were able to increase the number of observations because more loans had 2 years of history available by the end of fiscal year 2014 than had 3 years of history. In contrast to the 3-year actual troubled loan rates, we found that the agencies had almost identical 2-year actual troubled loan rates (3.8 percent for RHS and 3.9 percent for FHA).

Using the pooled data set, the effects of particular characteristics after 2 years of performance were similar to those observed in the 3-year case (see fig. 30). In contrast to figure 26 above (which describes the results of our primary 3-year specification), the expected probability of troubled performance is slightly lower with all characteristics at RHS-specific mean values than with all characteristics at FHA-specific mean values. This result is consistent with the fact that the actual RHS troubled loan rate, although quite similar to FHA's, was slightly lower. However, income and LTV ratio characteristics associated with the RHS portfolio disadvantaged RHS performance.

Appendix VI: Description of Our Statistical Model Comparing the Performance of Home Purchase Loans Guaranteed by RHS and FHA

Figure 30: Estimated Influence of Portfolio Characteristics on 2-Year Performance of RHS- and FHA Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2012



Source: GAO analysis of Federal Housing Finance Agency and U.S. Department of the Treasury data and loan-level data from RHS and FHA. | GAO-16-801

Appendix VII: Results of Statistical Model Comparing the Performance of Home Purchase Loans RHS and FHA Guaranteed in RHS-Eligible Areas in Fiscal Years 2010–2012

This appendix describes the results of our statistical model comparing the performance of single-family home purchase loans guaranteed by the Rural Housing Service (RHS) and the Federal Housing Administration (FHA) in fiscal years 2010–2012 in RHS-eligible areas after 2 and 3 years of performance.¹ We analyzed performance for RHS and FHA loans separately and for RHS and FHA loans combined using various model specifications. For example, under one specification, we limited the borrowers to those with incomes within the county-level household income limits set by RHS. We restricted the data in this way to account for the absence of FHA limits on borrower household income, which resulted in FHA serving some borrowers with higher incomes than RHS is allowed to serve. Additionally, we analyzed 3-year performance using a specification with four loan-to-value ratio categories and another specification using three loan-to-value ratio categories.

¹We analyzed loan-level data on the performance of 30-year, fixed-rate loans (excluding those for units in condominium and cooperative developments). For the purpose of comparing performance, we limited the FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas. For our analysis of loan performance, we used this stricter threshold to help ensure that our statistical model did not include FHA loans that may have different performance attributes by virtue of being just outside of RHS-eligible areas (for example, due to different house price or employment patterns). Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans after 2 years of performance (that is, loans that were guaranteed in fiscal years 2010–2012), we focused on loans with first payment months from December 2009 through October 2012. Similarly, to examine the performance of loans after 3 years of performance (loans guaranteed in fiscal years 2010–2011), we focused on loans with first payment months from December 2009 through October 2011.

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
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Table 45: Mean Values under Various Model Specifications for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011

	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b		
	RHS	FHA	RHS-FHA combined ^c	RHS	FHA	RHS-FHA combined ^c	RHS	FHA	RHS-FHA combined ^c
Number of observations	190,924	276,933	467,857	187,467	203,319	390,786	59,601	43,689	103,290
Troubled loan rate after 3 years	0.068	0.051	0.058	0.068	0.059	0.063	0.061	0.054	0.058

Mean values

Category	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b		
	RHS	FHA	RHS-FHA combined ^c	RHS	FHA	RHS-FHA combined ^c	RHS	FHA	RHS-FHA combined ^c
Quarter of first payment by fiscal year									
First quarter of 2010	0.070	0.058	0.063	0.070	0.058	0.064	0.073	0.052	0.064
Second quarter of 2010	0.173	0.129	0.147	0.174	0.130	0.151	0.173	0.121	0.151
Third quarter of 2010	0.175	0.136	0.152	0.175	0.134	0.154	0.172	0.122	0.151
Fourth quarter of 2010	0.066	0.207	0.149	0.066	0.215	0.143	0.069	0.226	0.135
First quarter of 2011	0.088	0.139	0.118	0.088	0.140	0.115	0.097	0.148	0.119
Second quarter of 2011	0.097	0.057	0.073	0.097	0.059	0.077	0.096	0.060	0.081
Third quarter of 2011	0.113	0.107	0.109	0.113	0.104	0.108	0.108	0.103	0.106
Fourth quarter of 2011	0.157	0.131	0.142	0.158	0.126	0.141	0.153	0.133	0.145
First quarter of 2012	0.060	0.037	0.046	0.060	0.035	0.047	0.058	0.036	0.049
Census divisions									
Middle Atlantic	0.050	0.112	0.087	0.050	0.108	0.081	0.030	0.063	0.044
East North Central	0.195	0.128	0.155	0.195	0.137	0.165	0.227	0.158	0.198
West North Central	0.116	0.076	0.093	0.117	0.084	0.100	0.197	0.166	0.184
South Atlantic	0.196	0.205	0.201	0.197	0.204	0.201	0.078	0.101	0.088
East South Central	0.105	0.096	0.100	0.106	0.102	0.104	0.129	0.128	0.129
West South Central	0.149	0.143	0.146	0.149	0.131	0.140	0.110	0.105	0.108
Mountain	0.075	0.074	0.075	0.075	0.074	0.075	0.128	0.143	0.134
Pacific	0.079	0.118	0.102	0.078	0.115	0.097	0.065	0.101	0.080
New England	0.035	0.048	0.043	0.035	0.045	0.040	0.036	0.036	0.036

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
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	Category	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b		
		RHS	FHA	RHS- FHA combine d ^c	RHS	FHA	RHS-FHA combined ^c	RHS	FHA	RHS- FHA combine d ^c
Borrower credit score	Less than 620	0.020	0.035	0.028	0.020	0.039	0.030	0.025	0.040	0.032
	620–639	0.113	0.118	0.116	0.113	0.129	0.121	0.107	0.127	0.116
	640–659	0.160	0.151	0.154	0.159	0.157	0.158	0.150	0.157	0.153
	660–679	0.147	0.139	0.143	0.147	0.140	0.143	0.146	0.140	0.144
	680–699	0.128	0.123	0.125	0.129	0.120	0.124	0.128	0.121	0.125
	700–719	0.110	0.103	0.106	0.110	0.100	0.105	0.111	0.101	0.107
	720–759	0.185	0.176	0.179	0.185	0.167	0.176	0.190	0.167	0.180
	760–799	0.117	0.132	0.126	0.117	0.124	0.120	0.121	0.121	0.121
	800 or more	0.020	0.023	0.022	0.020	0.024	0.022	0.021	0.026	0.023
Debt-service- to-income ratio (percentage)	5–<31	0.265	0.187	0.219	0.263	0.158	0.208	0.314	0.200	0.266
	31–<36	0.189	0.143	0.162	0.189	0.135	0.161	0.194	0.144	0.173
	36–<41	0.233	0.175	0.198	0.233	0.175	0.203	0.226	0.178	0.206
	41–<46	0.180	0.195	0.189	0.181	0.207	0.195	0.160	0.196	0.175
	≥46	0.133	0.299	0.231	0.134	0.325	0.233	0.106	0.282	0.181
Loan amount (in dollars)	Less than 100,000	0.326	0.214	0.260	0.331	0.276	0.302	0.478	0.420	0.454
	100,000–149,999	0.349	0.274	0.305	0.352	0.325	0.338	0.317	0.320	0.318
	150,000–199,999	0.219	0.232	0.227	0.217	0.229	0.224	0.144	0.170	0.155
	200,000 or more	0.107	0.279	0.209	0.100	0.169	0.136	0.060	0.090	0.073
Borrower income (in dollars)	Less than 30,000	0.144	0.095	0.115	0.147	0.129	0.137	0.193	0.169	0.183
	30,000–39,999	0.229	0.137	0.174	0.233	0.186	0.209	0.252	0.205	0.232
	40,000–49,999	0.224	0.143	0.176	0.228	0.195	0.211	0.216	0.194	0.207
	50,000–59,999	0.172	0.128	0.146	0.176	0.175	0.175	0.159	0.172	0.165
	60,000–69,999	0.122	0.108	0.114	0.125	0.148	0.137	0.109	0.139	0.122
	70,000–79,999	0.073	0.092	0.084	0.073	0.118	0.096	0.061	0.105	0.080
	80,000–89,999	0.022	0.079	0.056	—	—	—	—	—	—
	90,000 or more	0.013	0.218	0.134	—	—	—	—	—	—
	80,000 or more	—	—	—	0.019	0.049	0.035	0.009	0.015	0.012
	First-time homebuyer	0.847	0.694	0.756	0.852	0.761	0.804	0.845	0.741	0.801
USDA's Rural-Urban Commuting	Urban	0.283	0.388	0.345	0.282	0.370	0.328	—	—	—
	Suburban	0.400	0.407	0.404	0.400	0.416	0.408	—	—	—
	Large rural town	0.097	0.062	0.076	0.097	0.066	0.081	0.304	0.308	0.306

**Appendix VII: Results of Statistical Model
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Area codes ^a	Category	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b		
		RHS	FHA	RHS- FHA combine d ^c	RHS	FHA	RHS-FHA combined ^c	RHS	FHA	RHS- FHA combine ed ^c
	Small town and isolated rural area	0.221	0.143	0.175	0.221	0.149	0.184	0.696	0.692	0.694
House price appreciation after 3 years (percentage)	Decrease of greater than 3	0.249	0.316	0.288	0.249	0.315	0.283	0.202	0.249	0.222
	Decrease of greater than 0 to 3	0.190	0.201	0.196	0.191	0.210	0.201	0.201	0.230	0.213
	No change to increase of 4	0.346	0.269	0.300	0.346	0.269	0.306	0.368	0.286	0.333
	Increase of greater than 4	0.215	0.215	0.215	0.214	0.206	0.210	0.230	0.235	0.232
Mortgage rate spread over 10-year Treasury rate (percentage)	1–1.5	0.235	0.256	0.247	0.235	0.240	0.238	0.227	0.220	0.224
	>1.5–1.75	0.198	0.224	0.213	0.198	0.217	0.208	0.192	0.211	0.200
	>1.75–2	0.227	0.238	0.234	0.228	0.240	0.234	0.227	0.239	0.232
	>2–2.25	0.163	0.161	0.162	0.163	0.170	0.166	0.170	0.180	0.174
	>2.25–2.5	0.106	0.076	0.088	0.106	0.082	0.093	0.111	0.093	0.104
	>2.5	0.071	0.046	0.056	0.071	0.050	0.060	0.073	0.057	0.066
Loan-to-value ratio (percentage)	<90	0.092	0.051	0.068	0.093	0.055	0.073	0.106	0.055	0.084
	90–95.9	0.119	0.094	0.104	0.120	0.087	0.103	0.131	0.081	0.110
	96–99.9	0.220	0.849	0.593	0.221	0.850	0.548	0.231	0.859	0.496
	≥100	0.569	0.006	0.236	0.567	0.008	0.276	0.532	0.005	0.309
Months of liquid assets	No liquid assets	0.306	—	—	0.307	—	—	0.287	—	—
	1 or 2 months	0.129	—	—	0.129	—	—	0.118	—	—
	More than 2 month	0.195	—	—	0.195	—	—	0.197	—	—
	No information	0.370	—	—	0.369	—	—	0.398	—	—

Legend: — = not calculated because it was not applicable or no data were available; > = greater than; < = less than; ≥ = greater than or equals

Source: GAO analysis of Federal Housing Finance Agency, U.S. Department of the Treasury, U.S. Department of Agriculture (USDA), and RHS and FHA loan-level data. | GAO-16-801

Notes: The performance analysis focuses on 30-year, fixed-rate loans guaranteed Rural Housing Service (RHS) and Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas. For parts of the analysis, we also limited the set of FHA-guaranteed loans to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2011, we focused on loans with first payment months from December 2009 through October 2011. Troubled loan rate represents the share of loans that were 90 or more days delinquent, in the foreclosure process, or terminated with a claim.

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^aFor a number of possible reasons, some RHS loans dropped out of the analysis once we imposed the RHS income limits. For example, in cases where the loan processing period spanned changes in the income limit, it is possible that we applied the new limit when the lender used the prior limit.

^bWe analyzed performance by degree of rurality using USDA’s Rural-Urban Commuting Area codes, which classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations (urban, suburban, large rural town, and small town and isolated rural area).

^cA data set that included both agencies’ loans.

As shown in the following tables, we estimated coefficients for the different categories that comprise each explanatory variable. The coefficient for a particular category is an estimate of the effect of being in that category as distinct from the omitted category. The omitted categories are as follows: borrower credit score (760–799); debt-service-to-income ratio (36 percent to less than 41 percent); loan amount (\$100,000–\$149,999); borrower income (\$50,000–\$59,999); first-time homebuyer (non-first-time homebuyer); house price appreciation (decrease of greater than 0 to 3.5 percent for the 2-year performance analysis and decrease of greater than 0 to 3 percent for the 3-year performance analysis); mortgage spread over 10-year Treasury rate (greater than 2 percent to 2.25 percent); loan-to-value ratio (96 percent to 99.9 percent); and months of liquid assets (1 or 2 months).

Table 46: Performance Simulation Results after 3 Years under Various Model Specifications for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011, Using a Four-Category Loan-to-Value Ratio Variable

	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b			All RHS-eligible areas, with RHS income limits and RHS borrower liquid asset variable (RHS loans only) ^c
	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS
Number of observations	190,924	276,933	467,857	187,467	203,319	390,786	59,601	43,689	103,290	187,467
Troubled loan rate after 3 years (percentage)	6.82	5.09	5.8	6.82	5.88	6.33	6.14	5.38	5.82	6.82
Concordant pairs (percentage)	72.8	73.8	73.4	72.9	72.4	72.5	73.2	72.8	72.9	73.2

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b			All RHS-eligible areas, with RHS income limits and RHS borrower liquid asset variable (RHS loans only) ^c	
	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS	
-2Log likelihood	86,905.50	101,536.60	188,895.70	85,286.70	83,702.60	169,336.30	25,098.50	16,803.80	42,009.10	85,004.30	
Coefficient and statistical significance											
	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b			All RHS-eligible areas, with RHS income limits and RHS borrower liquid asset variable (RHS loans only) ^c	
	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined ^d	RHS	FHA	RHS-FHA combined	RHS	
Borrower credit score	Less than 620	2.517 **	2.286 **	2.377 **	2.507 **	2.280 **	2.381 **	2.256 **	2.252 **	2.248 **	2.468 *
	620–639	2.523 **	2.173 **	2.320 **	2.520 **	2.174 **	2.335 **	2.320 **	2.201 **	2.265 **	2.468 *
	640–659	2.191 **	1.806 **	1.977 **	2.185 **	1.792 **	1.986 **	1.935 **	1.799 **	1.877 **	2.119 *
	660–679	1.804 **	1.405 **	1.587 **	1.795 **	1.423 **	1.610 **	1.619 **	1.448 **	1.554 **	1.740 *
	680–699	1.405 **	1.067 **	1.218 **	1.390 **	1.067 **	1.228 **	1.176 **	1.163 **	1.169 **	1.348 *
	700–719	1.093 **	0.800 **	0.929 **	1.093 **	0.821 **	0.955 **	0.893 **	0.902 **	0.897 **	1.060 *
	720–759	0.582 **	0.438 **	0.496 **	0.568 **	0.458 **	0.507 **	0.441 **	0.495 **	0.461 **	0.549 *
	800 or more	- / 0.011	- / 0.080	- / 0.056	- / -0.022 *	- / 0.052 *	- / 0.038	- / 0.076	- / 0.097	- / 0.071	- / 0.04
Debt-service-to-income ratio (percent)	5–<31	- ** 0.172	- ** 0.256	- ** 0.199	- ** -0.170 **	- ** 0.222	- ** 0.183	- ** -0.216 **	- ** 0.262	- ** 0.229	- ** 0.158 *
	31–<36	- / 0.028	- ** 0.133	- ** 0.072	- ** -0.027 *	- ** 0.112	- * 0.059	- / 0.011	- * 0.116	- / 0.026	- / 0.024

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b			All RHS-eligible areas, with RHS income limits and RHS borrower liquid asset variable (RHS loans only) ^c			
	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combine d	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS
Age)	36–<41	0.098 **	0.057 *	0.069 **	0.096 **	0.061 *	0.072 **	0.065 /	0.083 **	0.070 *	0.089 *	0.089 *	0.089 *
	41–<46	0.263 **	0.138 **	0.157 **	0.260 **	0.130 **	0.153 **	0.220 **	0.107 **	0.124 **	0.240 *	0.240 *	0.240 *
Loan amount (in dollars)	Less than 100,000	- 0.255 **	- 0.306 **	- 0.293 **	- 0.256 **	- 0.312 **	- 0.295 **	- 0.260 *	- 0.249 **	- 0.266 **	- 0.254 *	- 0.254 *	- 0.254 *
	150,000 – 199,999	0.197 **	0.170 **	0.192 **	0.200 **	0.191 **	0.204 **	0.271 *	0.267 **	0.273 **	0.203 *	0.203 *	0.203 *
	200,000 or more	0.472 **	0.473 **	0.491 **	0.473 **	0.474 **	0.486 **	0.495 *	0.268 **	0.395 **	0.480 *	0.480 *	0.480 *
Borrower income (in dollars)	Less than 30,000	0.591 **	0.579 **	0.605 **	0.594 **	0.590 **	0.609 **	0.749 *	0.788 **	0.782 **	0.855 *	0.855 *	0.855 *
	30,000–39,999	0.360 **	0.371 **	0.383 **	0.362 **	0.377 **	0.385 **	0.439 *	0.473 **	0.470 **	0.585 *	0.585 *	0.585 *
	40,000–49,999	0.131 **	0.176 **	0.161 **	0.131 **	0.178 **	0.162 **	0.165 *	0.334 **	0.243 **	0.128 *	0.128 *	0.128 *
	60,000–69,999	- 0.186 **	- 0.167 **	- 0.186 **	- 0.187 **	- 0.169 **	- 0.187 **	- 0.164 *	- 0.102 **	0.144 *	- 0.185 *	- 0.185 *	- 0.185 *
	70,000–79,999	- 0.290 **	- 0.313 **	- 0.326 **	- 0.286 **	- 0.311 **	- 0.320 **	- 0.345 *	- 0.440 **	0.417 *	- 0.283 *	- 0.283 *	- 0.283 *
	80,000–89,999	- 0.158 *	- 0.392 **	- 0.389 **	- /	- /	- /	- /	- /	- /	- /	- /	- /
	90,000 or more	- 0.087 /	- 0.689 **	- 0.718 **	- /	- /	- /	- /	- /	- /	- /	- /	- /
	80,000 or more	- /	- /	- /	0.198 *	0.356 **	- 0.337 **	- 0.075 /	- 0.202 **	0.163 *	- 0.198 *	- 0.198 *	- 0.198 *
First-time homebuyer		- 0.033 /	0.098 **	0.065 **	- 0.040 *	0.079 **	0.043 **	- 0.099 *	0.024 **	0.023 *	- 0.068 *	- 0.068 *	- 0.068 *

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

	All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b			All RHS-eligible areas, with RHS income limits and RHS borrower liquid asset variable (RHS loans only) ^c		
	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined
House price appreciation (percentage)	Decrease of greater than 3	0.062 **	0.051 /	0.057 **	0.061 *	0.065 *	0.063 **	- / 0.017	- / 0.090	-0.054 /	0.059 *	
	No change to increase of 4	- * 0.038	-0.078 **	- ** 0.059	- / 0.038	- * 0.067	- * 0.053	- * 0.114	- * 0.021	- / -0.081 *	-0.038 *	
	Increase of greater than 4	- * 0.245	-0.307 **	- ** 0.289	- ** 0.250	- ** 0.303	- ** 0.285	- ** 0.342	- ** 0.256	-0.320 *	-0.251 *	
Mortgage rate spread over 10-year Treasury rate (percentage)	1–1.5	- ** 0.100	-0.345 **	- ** 0.263	- ** 0.111	- ** 0.330	- ** 0.249	- * 0.128	-0.328 **	-0.236 *	-0.094 *	
	>1.5–1.75	- / 0.050	-0.218 **	- ** 0.166	- / 0.053	- ** 0.198	- ** 0.149	0.006 /	-0.255 **	-0.124 *	-0.046 /	
	>1.75–2	- / 0.031	-0.107 **	- ** 0.091	- / 0.036	- ** 0.117	- ** 0.094	- / 0.035	-0.091 /	-0.076 /	-0.037 /	
	>2.25–2.5	0.091 *	0.143 **	0.142 **	0.086 *	0.139 **	0.135 **	0.118 *	0.150 *	0.156 *	0.085 *	
	>2.5	0.129 *	0.296 **	0.240 **	0.129 *	0.288 **	0.229 **	0.242 **	0.293 **	0.288 *	0.129 *	
Loan-to-value ratio (percentage)	<90	- ** 0.408	- ** 0.422	-0.327 **	-0.409 **	- ** 0.396	- ** 0.319	- ** 0.445	- ** 0.350	-0.409 **	- * -0.400 *	
	90–95.9	- ** 0.204	- ** 0.163	-0.104 **	-0.204 **	- ** 0.155	- ** 0.099	- ** 0.237	- ** 0.126	- / -0.139 /	- * -0.202 *	
	≥100	0.042 *	- / 0.031	0.246 **	0.047 *	- / 0.049	0.231 **	0.030 /	-0.147 /	0.180 *	0.046 *	
Months of liquid assets	No liquid assets	- /	- /	- /	- /	- /	- /	- /	- /	- /	0.253 /	
	More than 2 months	- /	- /	- /	- /	- /	- /	- /	- /	- /	-0.234 *	

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

All RHS-eligible areas, without RHS income limits			All RHS-eligible areas, with RHS income limits ^a			Large rural towns, small town and isolated rural areas, with RHS income limits ^b			All RHS-eligible areas, with RHS income limits and RHS borrower liquid asset variable (RHS loans only) ^c			
RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	RHS	FHA	RHS-FHA combined	
No information	— /	— /	— /	— /	— /	— /	— /	— /	— /	— /	— /	0.048 * *

Legend: — = not calculated because it was not applicable or no data were available; > = greater than; < = less than; ≥ = greater than or equals; * = statistically significant at 10% level; ** = statistically significant at 1% level; / = not statistically significant at 1% or 10% level

Source: GAO analysis of Federal Housing Finance Agency, U.S. Department of the Treasury, U.S. Department of Agriculture (USDA), and RHS and FHA loan-level data. | GAO-16-801

Notes: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by the Rural Housing Service (RHS) and the Federal Housing Administration (FHA) for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas. For parts of our analysis, we also limited the set of FHA-guaranteed loans to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2011, we focused on loans with first payment months from December 2009 through October 2011. Troubled loan rate represents the share of loans that were 90 or more days delinquent, in the foreclosure process, or terminated with a claim. The columns “RHS-FHA combined” used a data set that included both agencies’ loans.

^aFor a number of possible reasons, some RHS loans dropped out of the analysis once we imposed the RHS income limits. For example, in cases where the loan processing period spanned changes in the income limit, it is possible that we applied the new limit when the lender used the prior limit.

^bWe analyzed performance by degree of rurality using USDA’s Rural-Urban Commuting Area codes, which classify all census tracts in the United States on a continuum from rural to urban based on daily commuting patterns and population density. Areas can be classified into four types of locations (urban, suburban, large rural town, and small town and isolated rural area).

^cData on liquid assets were available for approximately 80 percent of RHS borrowers.

Table 47: Performance Simulation Results after 3 years for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011, Using a Three-Category Loan-to-Value Ratio Variable

	Rural Housing Service (RHS)- guaranteed loans	Federal Housing Administration (FHA)- guaranteed loans	RHS and FHA guaranteed loans combined ^a
Number of observations	187,467	203,319	390,786
Troubled loan rate after 3 years (percentage)	6.82	5.88	6.33
Concordant pairs (percentage)	72.9	72.4	72.4
-2Log likelihood	85,290.8	83,702.8	169,545.6

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

Coefficient and statistical significance

	Category	Rural Housing Service (RHS)- guaranteed loans		Federal Housing Administration (FHA)- guaranteed loans		RHS and FHA guaranteed loans combined ^a	
Borrower credit score	Less than 620	2.508	**	2.280	**	2.353	**
	620–639	2.521	**	2.174	**	2.328	**
	640–659	2.186	**	1.792	**	1.986	**
	660–679	1.796	**	1.423	**	1.613	**
	680–699	1.391	**	1.067	**	1.233	**
	700–719	1.094	**	0.821	**	0.961	**
	720–759	0.569	**	0.458	**	0.513	**
	800 or more	-0.022	/	-0.052	/	-0.044	/
Debt-service-to-income ratio (percentage)	5–<31	-0.170	**	-0.222	**	-0.173	**
	31–<36	-0.027	/	-0.112	**	-0.057	**
	36–<41	0.096	**	0.061	*	0.055	*
	41–<46	0.259	**	0.130	**	0.113	**
Loan amount (in dollars)	Less than 100,000	-0.257	**	-0.312	**	-0.311	**
	150,000–199,999	0.201	**	0.191	**	0.217	**
	200,000 or more	0.474	**	0.474	**	0.503	**
Borrower income (in dollars)	Less than 30,000	0.592	**	0.590	**	0.620	**
	30,000–39,999	0.361	**	0.376	**	0.396	**
	40,000–49,999	0.131	**	0.178	**	0.169	**
	60,000–69,999	-0.186	**	-0.169	**	-0.195	*
	70,000–79,999	-0.285	**	-0.311	**	-0.339	**
	80,000 or more	-0.197	**	-0.356	**	-0.365	/
	First-time homebuyer	-0.039	*	0.079	**	0.054	**
House price appreciation after 3 years (percentage)	Decrease of greater than 3	0.062	*	0.065	*	0.066	*
	No change to increase of 4	-0.038	/	-0.067	*	-0.045	*
	Increase of greater than 4	-0.249	**	-0.303	**	-0.286	**
Mortgage rate spread over 10-year Treasury rate (percentage)	1–1.5	-0.111	**	-0.330	**	-0.275	**
	>1.5–1.75	-0.053	/	-0.198	**	-0.168	**
	>1.75–2	-0.036	/	-0.117	**	-0.105	**
	>2.25–2.5	0.086	*	0.139	**	0.148	**
	>2.5	0.130	*	0.288	**	0.242	**
Loan-to-value ratio (percentage)	<90	-0.205	**	-0.240	**	-0.219	**
	≥96	0.237	**	0.155	**	0.180	**

Legend: > = greater than; < = less than; ≥ = greater than or equals; * = statistically significant at 10% level; ** = statistically significant at 1% level; / = not statistically significant at 1% or 10% level.

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

Source: GAO analysis of Federal Housing Finance Agency, U.S. Department of the Treasury, and RHS and FHA loan-level data. | GAO-16-801

Notes: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by RHS and FHA for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas. For this analysis, we also limited the set of FHA-guaranteed loans to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the performance of loans that were guaranteed in fiscal years 2010–2011, we focused on loans with first payment months from December 2009 through October 2011. Troubled loan rate represents the share of loans that were 90 or more days delinquent, in the foreclosure process, or terminated with a claim.

^aA data set that included both agencies' loans.

Table 48: Mean Values for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2012

	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans	RHS and FHA guaranteed loans combined ^a
Number of observations	300,276	296,141	596,417
Troubled loan rate after 2 years	0.038	0.039	0.039

Mean values

	Category	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans	RHS and FHA guaranteed loans combined ^a
Quarter of first payment by fiscal year	First quarter of 2010	0.044	0.040	0.042
	Second quarter of 2010	0.108	0.089	0.099
	Third quarter of 2010	0.109	0.092	0.101
	Fourth quarter of 2010	0.041	0.148	0.094
	First quarter of 2011	0.055	0.096	0.075
	Second quarter of 2011	0.060	0.040	0.050
	Third quarter of 2011	0.071	0.071	0.071
	Fourth quarter of 2011	0.098	0.087	0.093
	First quarter of 2012	0.104	0.081	0.093
	Second quarter of 2012	0.076	0.072	0.074
	Third quarter of 2012	0.084	0.076	0.080
	Fourth quarter of 2012	0.109	0.087	0.098
First quarter of 2013	0.040	0.023	0.031	
Census divisions	Middle Atlantic	0.055	0.108	0.081
	East North Central	0.188	0.136	0.162
	West North Central	0.116	0.082	0.099
	South Atlantic	0.196	0.203	0.199

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

	Category	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)- guaranteed loans	RHS and FHA guaranteed loans combined^a
	East South Central	0.108	0.101	0.105
	West South Central	0.143	0.135	0.139
	Mountain	0.076	0.076	0.076
	Pacific	0.081	0.114	0.097
	New England	0.037	0.044	0.041
Borrower credit score	Less than 620	0.016	0.038	0.027
	620–639	0.089	0.120	0.104
	640–659	0.165	0.166	0.166
	660–679	0.153	0.146	0.150
	680–699	0.134	0.123	0.128
	700–719	0.114	0.100	0.107
	720–759	0.191	0.164	0.178
	760–799	0.118	0.119	0.119
	800 or more	0.020	0.023	0.022
Debt- service-to- income ratio (percentage)	5–<31	0.269	0.160	0.215
	31–<36	0.194	0.135	0.165
	36–<41	0.234	0.177	0.206
	41–<46	0.186	0.208	0.197
	≥46	0.117	0.320	0.218
Loan amount (in dollars)	Less than 100,000	0.326	0.282	0.304
	100,000–149,999	0.356	0.326	0.341
	150,000–199,999	0.216	0.228	0.222
	200,000 or more	0.102	0.165	0.133
Borrower income (in dollars)	Less than 30,000	0.148	0.130	0.139
	30,000–39,999	0.237	0.186	0.212
	40,000–49,999	0.227	0.194	0.211
	50,000–59,999	0.175	0.175	0.175
	60,000–69,999	0.123	0.149	0.136
	70,000–79,999	0.070	0.118	0.094
	80,000 or more	0.019	0.048	0.034
	First-time homebuyer	0.854	0.758	0.806
USDA's Rural-Urban Commuting Area codes	Urban	0.289	0.367	0.328
	Suburban	0.400	0.415	0.408
	Large rural town	0.094	0.067	0.081
	Small town and isolated rural area	0.216	0.150	0.183
House price	Decrease of greater than 3.5	0.161	0.221	0.191

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

	Category	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans	RHS and FHA guaranteed loans combined ^a
appreciation after 2 years (percentage)	Decrease of greater than 0 to 3.5	0.264	0.269	0.267
	No change to increase of 2.5	0.293	0.256	0.275
	Increase of greater than 2.5	0.281	0.254	0.267
Mortgage rate spread over 10-year Treasury rate (percentage)	1-1.5	0.149	0.167	0.158
	>1.5–1.75	0.163	0.186	0.175
	>1.75–2	0.227	0.238	0.232
	>2–2.25	0.245	0.224	0.234
	>2.25–2.5	0.146	0.114	0.130
	>2.5	0.070	0.072	0.071
Loan-to-value ratio (percentage)	<90	0.088	0.052	0.070
	90–95.9	0.118	0.085	0.102
	96–99.9	0.221	0.854	0.536
	≥100	0.573	0.008	0.293
Months of liquid assets	No liquid assets	0.345	—	—
	1 or 2 months	0.149	—	—
	More than 2 month	0.231	—	—
	No information	0.275	—	—

Legend: — = not calculated because no data were available; > = greater than; < = less than; ≥ = greater than or equals

Source: GAO analysis of Federal Housing Finance Agency, U.S. Department of the Treasury, U.S. Department of Agriculture (USDA), and RHS and FHA loan-level data. | GAO-16-801

Notes: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by RHS and FHA for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas. For this analysis, we also limited the set of FHA-guaranteed loans to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the 2-year performance of loans that were guaranteed in fiscal years 2010–2012, we focused on loans with first payment months from December 2009 through October 2012. Troubled loan rate represents the share of loans that were 90 or more days delinquent, in the foreclosure process, or terminated with a claim.

^aA data set that included both agencies' loans.

Table 49: Performance Simulation Results after 2 Years for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2012

	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans	RHS-FHA guaranteed loans combined ^a
Number of observations	300,276	296,141	596,417
Troubled loan rate after 2 years (percentage)	3.83	3.90	3.87
Concordant pairs (percentage)	74.1	74.2	74.0

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans	RHS-FHA guaranteed loans combined ^a
-2Log likelihood	89,276.6	89,040.5	178,542.2

Coefficient and statistical significance

	Category	Rural Housing Service (RHS)-guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans	RHS-FHA guaranteed loans combined ^a
Borrower credit score	Less than 620	2.674 **	2.563 **	2.619 **
	620–639	2.664 **	2.449 **	2.546 **
	640–659	2.335 **	2.074 **	2.202 **
	660–679	1.897 **	1.619 **	1.760 **
	680–699	1.450 **	1.220 **	1.336 **
	700–719	1.094 **	0.889 **	0.992 **
	720–759	0.587 **	0.555 **	0.566 **
	800 or more	-0.377 *	0.103 *	-0.075 *
Debt-service-to-income ratio (percentage)	5–<31	-0.233 **	-0.229 **	-0.225 **
	31–<36	-0.027 /	-0.058 *	-0.037 *
	36–<41	0.110 **	0.112 **	0.105 **
	41–<46	0.265 **	0.225 **	0.215 **
Loan amount (in dollars)	Less than 100,000	-0.247 **	-0.345 **	-0.302 **
	150,000–199,999	0.202 **	0.219 **	0.217 **
	200,000 or more	0.551 **	0.539 **	0.553 **
Borrower income (in dollars)	Less than 30,000	0.638 **	0.646 **	0.655 **
	30,000–39,999	0.368 **	0.391 **	0.392 **
	40,000–49,999	0.145 **	0.200 **	0.178 **
	60,000–69,999	-0.161 **	-0.166 **	-0.171 **
	70,000–79,999	-0.211 **	-0.297 **	-0.278 **
	80,000 or more	-0.201 **	-0.354 **	-0.328 **
	First-time homebuyer	0.023 /	0.117 **	0.091 **
House price appreciation (percentage)	Decrease of greater than 3.5	0.139 *	0.121 **	0.132 **
	No change to increase of 2.5	-0.004 *	-0.040 **	-0.025 **
	Increase of greater than 2.5	-0.070 *	-0.182 **	-0.128 **
Mortgage rate spread over 10-year Treasury rate (percentage)	1–1.5	-0.260 **	-0.355 /	-0.320 **
	>1.5–1.75	-0.138 **	-0.242 **	-0.203 **
	>1.75–2	-0.110 **	-0.080 **	-0.102 **

**Appendix VII: Results of Statistical Model
Comparing the Performance of Home
Purchase Loans RHS and FHA Guaranteed in
RHS-Eligible Areas in Fiscal Years 2010–2012**

Category	Rural Housing Service (RHS)- guaranteed loans	Federal Housing Administration (FHA)-guaranteed loans	RHS-FHA guaranteed loans combined ^a
>2.25–2.5	0.077 *	0.147 **	0.120 **
>2.5	0.118 **	0.309 **	0.213 **
Loan-to-value ratio (percentage)			
<90	-0.283 **	-0.412 **	-0.292 **
90–95.9	-0.135 **	-0.188 **	-0.117 **
≥100	0.043 *	-0.152 *	0.129 **

Legend: > = greater than; < = less than; ≥ = greater than or equals; * = statistically significant at 10% level; ** = statistically significant at 1% level; / = not statistically significant at 1% or 10% level
Source: GAO analysis of Federal Housing Finance Agency, U.S. Department of the Treasury, U.S. Department of Agriculture (USDA), and RHS and FHA loan-level data. | GAO-16-801

Notes: The performance analysis focuses on 30-year, fixed-rate loans guaranteed by RHS and FHA for purchasing single-family homes (excluding loans for units in condominium and cooperative developments). We limited the set of FHA-guaranteed loans to those for properties in census tracts that were at least 95 percent in RHS-eligible areas. For this analysis, we also limited the set of FHA-guaranteed loans to borrowers with incomes within the county-level household income limits set by RHS. Because the analysis focuses on the payment status of the loans, we used the first payment month as the starting point for measuring performance. The first payment month may be up to 2 months after the month the loan is guaranteed. Therefore, to examine the 2-year performance of loans that were guaranteed in fiscal years 2010–2012, we focused on loans with first payment months from December 2009 through October 2012. Troubled loan rate represents the share of loans that were 90 or more days delinquent, in the foreclosure process, or terminated with a claim.

^aA data set that included both agencies' loans.

Appendix VIII: GAO Contact and Staff Acknowledgments

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Staff Acknowledgments

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Appendix IX: Accessible Data

Data Tables

Data Table for Figure 3: Geographic Distribution of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

	Urban	Suburban	Large town rural	Small town rural	Missing
Rural Housing Service-(RHS) guaranteed loans	211.533	232.067	118.614	51.633	0.301
Federal Housing Administration-(FHA) guaranteed loans	404.36	321.473	108.557	45.718	0.186

Data Table for Figure 4: Distribution of Credit Scores for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

Credit Score	RHS	FHA
Less than 580	0	0
580-639	9	14
640-699	50	47
700-719	11	10
720-759	18	16
760-799	11	11
800 or more	2	2

Data Table for Figure 5: Distribution of Payment-to-Income Ratios for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

Payment-to-income(PTI) ratio	RHS	FHA
<=20%	31	34
>20%-25%	27	22
>25%-29%	19	15
>29%-31%	7	6
>31%-35%	10	10
>35%-40%	4	8
>40%	1	6

Data Table for Figure 6: Distribution of Debt-Service-to-Income Ratios for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

Debt-service-to-income(DTI) ratio	RHS	FHA
<=30%	24	17
>30%-35%	19	14
>35%-41%	29	21
>41%-43%	9	8
>43%-50%	18	26
>50%	2	15

Data Table for Figure 7: Distribution of Annual Borrower Incomes for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

Annual income	RHS	FHA
Less than \$20,000	2	2
\$20,000-\$39,999	39	24
\$40,000-\$59,999	39	28
\$60,000-\$79,999	16	20
\$80,000-\$99,999	2	13
\$100,000 or more	0	14

Data Table for Figure 8: Distribution of Origination Loan Amounts for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

Loan amount	RHS	FHA
Less than \$49,999	2	2
\$50,000-\$99,999	30	21
\$100,000-\$149,999	37	30
\$150,000-\$199,999	21	23
\$200,000-\$299,999	9	19
\$300,000 or more	1	6

Data Table for Figure 9: Distribution of Loan-to-Value Ratios for RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2014

Loan-to-value ratio	RHS	FHA
<=80%	2	5
>80%- 85%	2	4
>85%- 90%	4	8
>90%- 92%	3	6
>92%- 96.5%	11	29
>96.5%- 98.5%	9	44
>98.5%- 100%	13	4
>100%- 102%	29	0
>102%	28	0

Data Table for Figure 11: Estimated Number and Percentage of RHS Borrowers Who Could Have Met Individual Criteria for FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2014

	Borrower credit score of 580 or above	Payment-to-income ratio of 31% or less	Debt-service-to-income ratio of 43% or less	Loan amount within loan limits	Down payment of at least 3.5 percent ^a
RHS home purchase borrowers who could not have met FHA criteria	0.6	15.4	20.6	1	49
Rural Housing Service (RHS) home purchase borrowers who could have met Federal Housing Administration (FHA) criteria	99.4	84.6	79.4	99	51

Data Table for Figure 13: Estimated Percentage of FHA Borrowers in RHS-Eligible Areas Who Could Have Met Individual Criteria for RHS-Guaranteed Home Purchase Loans in Fiscal Years 2010–2014

	Borrower credit score of 640 or above	Payment-to-income ratio of 29% or less	Debt-service-to-income ratio of 41% or less	Borrower income within household income limits
FHA home purchase borrowers who could not have met RHS criteria	14.5	29.2	48.6	27.6

	Borrower credit score of 640 or above	Payment-to-income ratio of 29% or less	Debt-service-to-income ratio of 41% or less	Borrower income within household income limits
Federal Housing Administration (FHA) home purchase borrowers who could have met Rural Housing Service (RHS) criteria	85	70.8	51.4	72.4

Data Table for Figure 15: Status of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010 and 2011, after 3 Years of Performance

	Prepaid	30–89 days delinquent	90 or more days delinquent or in foreclosure	terminated with a claim	Current
Rural Service Housing (RHS)-guaranteed loans	9	7	5	2	78
Federal Housing Administration (FHA)-guaranteed loans	16	5	5	1	73

Data Table for Figure 16: Estimated Influence of Portfolio Characteristics on Differences in 3-Year Performance of Home Purchase Loans RHS and FHA Guaranteed in RHS-Eligible Areas in Fiscal Years 2010 and 2011

Portfolio characteristics	Associated with higher expected troubled loan rate for RHS relative to FHA
All portfolio characteristics	6
Loan-to-value ratio	11
Income	6

Portfolio characteristics	Associated with lower expected troubled loan rate for RHS relative to FHA
Debt-service-to-income ratio	5
Loan amount	5
Credit score	3

Data Table for Figure 18: Relationship between the Number of Seasoned RHS- and FHA-Guaranteed Home Purchase Loans and Troubled Loan Rates

Period	Number of observations	Percentage of troubled
1-year seasoning	783.164	1
2-year seasoning	596	4
3-year seasoning	391	6

Data Table for Figure 19: Relationship between Borrower Credit Score and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

Borrower credit score	RHS troubled loan	FHA troubled loan
Less than 620	14.1708	12.5087
620-639	14.337	11.3906
640-659	10.6909	8.06511
660-679	7.49599	5.72108
680-699	5.12778	4.07804
700-719	3.86248	3.21474
720-759	2.32138	2.25951
760-799	1.32844	1.4409
800 or more	1.29981	1.36853

Data Table for Figure 20: Relationship between Borrower Income and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

Borrower income	RHS troubled loan	FHA troubled loan
Less than 30,000	7.47124	6.90057
30,000-39,999	6.02014	5.65024
40,000-49,999	4.8387	4.68108
50,000-59,999	4.2691	3.94729
60,000-69,999	3.56859	3.35264
70,000-79,999	3.24282	2.92331
80,000 or more	3.52908	2.79826

Data Table for Figure 21: Relationship between Loan Amount and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

Loan amount	RHS troubled loan	FHA troubled loan
Less than 100,000	3.84754	3.10728
100,000-149,999	4.91541	4.19636
150,000-199,999	5.93882	5.03363
200,000 or more	7.66081	6.57214

Data Table for Figure 22: Relationship between Debt-Service-to-Income Ratio and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

Debt-service-to-income ratio	RHS troubled loan	FHA troubled loan
5-<31%	4.19456	3.49904
31-<36%	4.80669	3.89125
36-<41%	4.93173	4.33079
41-<46%	5.40139	4.5901
>46%	6.30154	4.90408

Data Table for Figure 23: Relationship between Mortgage Rate Spread and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

Mortgage interest rate spread	RHS troubled loan	FHA troubled loan
1.0-1.5%	4.55988	3.57139
>1.5-1.75%	4.82095	4.05434
>1.75-2.0%	4.89722	4.38413
>2.0-2.25%	5.0686	4.90017
>2.25-2.5%	5.49977	5.5897
>2.5%	5.72797	6.43326

Data Table for Figure 24: Relationship between Loan-to-Value Ratio and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

Loan-to-value ratio	RHS troubled loan	FHA troubled loan
<90%	3.45493	3.07616
90-95.9%	4.20971	3.87987
96-99.9%	5.113	4.50277
>100%	5.34578	4.29831

Data Table for Figure 25: Relationship between House Price Appreciation and Troubled Loan Performance after 3 Years for RHS- and FHA-Guaranteed Home Purchase Loans in Fiscal Years 2010–2011

House price appreciation	RHS troubled loan	FHA troubled loan
Decrease of greater than 3%	5.50123	4.90091
Decrease of greater than 0 to 3%	5.19062	4.60741
No change to increase of 4%	5.00517	4.32362
Increase of greater than 4%	4.09001	3.4454

Data Table for Figure 26: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011

Portfolio characteristics	FHA	RHS
RHS-FHA pooled characteristics	4.7	4.7
Borrower credit score	4.7	4.6
Debt-service-to-income ratio	4.8	4.5
Loan amount	4.8	4.5
Borrower income	4.5	4.8
House price appreciation	4.7	4.6
Mortgage interest rate spread	4.6	4.7
First-time homebuyer	4.6	4.7
Loan-to-value ratio	4.4	4.9
All agency-specific characteristics	4.5	4.8

Data Table for Figure 27: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011, Using a Model Specification with No Income Restriction

Portfolio characteristics	FHA	RHS
RHS-FHA pooled characteristics	4.1	4.1
Borrower credit score	4.1	4.1
Debt-service-to-income ratio	4.2	4
Loan amount	4.3	3.8
Borrower income	3.7	4.7
House price appreciation	4.1	4.1
Mortgage interest rate spread	4.1	4.2
First-time homebuyer	4.1	4.1
Loan-to-value ratio	3.9	4.4
All agency-specific characteristics	3.7	4.7

Data Table for Figure 28: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2011, Using a Model Specification with Three Loan-to-Value Ratio Categories

Portfolio characteristics	FHA	RHS
RHS-FHA pooled characteristics	4.7	4.7
Borrower credit score	4.7	4.6
Debt-service-to-income ratio	4.8	4.6
Loan amount	4.8	4.5
Borrower income	4.5	4.8
House price appreciation	4.7	4.6
Mortgage interest rate spread	4.6	4.7
First-time homebuyer	4.7	4.7
Loan-to-value ratio	4.7	4.6
All agency-specific characteristics	4.8	4.6

Data Table for Figure 29: Estimated Influence of Portfolio Characteristics on 3-Year Performance of RHS- and FHA-Guaranteed Home Purchase Loans in More Rural Parts of RHS-Eligible Areas, Fiscal Years 2010–2011

Portfolio characteristics	FHA	RHS
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Portfolio characteristics	FHA	RHS
RHS-FHA pooled characteristics	4.2	4.2
Borrower credit score	4.4	4.1
Debt-service-to-income ratio	4.3	4.1
Loan amount	4.3	4.2
Borrower income	4.1	4.3
House price appreciation	4.2	4.2
Mortgage interest rate spread	4.2	4.2
First-time homebuyer	4.2	4.2
Loan-to-value ratio	4.1	4.3
All agency-specific characteristics	4.1	4.3

Data Table for Figure 30: Estimated Influence of Portfolio Characteristics on 2-Year Performance of RHS- and FHA Guaranteed Home Purchase Loans in RHS-Eligible Areas, Fiscal Years 2010–2012

Portfolio characteristics	FHA	RHS
RHS-FHA pooled characteristics	2.6	2.6
Borrower credit score	2.7	2.5
Debt-service-to-income ratio	2.7	2.5
Loan amount	2.7	2.6
Borrower income	2.5	2.7
House price appreciation	2.6	2.6
Mortgage interest rate spread	2.6	2.6
First-time homebuyer	2.6	2.6
Loan-to-value ratio	2.5	2.7
All agency-specific characteristics	2.7	2.5

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