

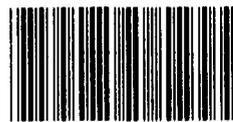
GAO

Report to the Honorable
Gerald D. Kleczka, House of
Representatives

March 1991

HOMEOWNERSHIP

Loan Policy Changes Made to Strengthen FHA's Mortgage Insurance Program



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**Resources, Community, and
Economic Development Division**

B-242320

March 1, 1991

The Honorable Gerald D. Kleczka
House of Representatives

Dear Mr. Kleczka:

This report responds to your request that we analyze various policy changes to the Federal Housing Administration's (FHA) single-family mortgage insurance program. Specifically, it summarizes testimonies we provided before House and Senate subcommittees on housing (see app. I) last year and in late 1989. We testified on our analysis of the future cash position of FHA's Mutual Mortgage Insurance Fund (the Fund) if certain policy changes were made to the program. These changes were: raising the mortgage ceiling, reducing the down payment required, and increasing the adjustable-rate mortgage (ARM) interest limits. In addition, the report provides information on assistance we provided to the House-Senate Conference Committee on Housing Legislation as it attempted to enact housing legislation.

Results in Brief

Our analyses showed that the cash position of the Fund over the next 10 years would depend heavily on the actual economic conditions that prevail, particularly house price appreciation rates. Of particular concern is that the Fund would not perform well if house prices appreciated at only a 2- to 4-percent rate per year. We concluded that if this economic picture materialized, then U.S. Treasury assistance would likely be needed even if overall economic conditions were generally favorable.

In June 1990, an actuarial study performed by Price Waterhouse concluded that the Fund was not actuarially sound. As a result, the Department of Housing and Urban Development (HUD), within which FHA programs exist, proposed to the Congress various program reforms to address this problem. The Congress considered HUD's proposals as part of the 1990 housing legislation debate to put the Fund back on an actuarially sound basis.

In September 1990, we assisted the House-Senate Conference Committee on Housing Legislation in analyzing financial and budgetary impacts of seven alternative reforms. The conferees used our analysis in reaching agreement on what reforms should be in place to put the Fund on an actuarially sound basis. These reforms were incorporated in P.L. 101-625, the Cranston-Gonzalez National Affordable Housing Act enacted on

November 28, 1990. The reforms included setting an annual risk-related premium structure, with higher premiums for new mortgage loans with lower down payments. We estimated that the reforms should result in a budgetary savings of about \$2.5 billion over a 5-year period.

Background

The primary purpose of FHA's Mutual Mortgage Insurance Fund is to provide insurance on mortgages for one to four housing units. To cover losses on these mortgages, FHA deposits insurance premiums from participating homebuyers (3.8 percent of the original amount of each insured loan) in the Fund. The latest available information shows that as of September 30, 1989, the Fund had insurance-in-force valued at \$271 billion. The Fund remained relatively healthy until the 1980s, when losses were substantial primarily because of high foreclosure rates in economically stressed regions, particularly the Rocky Mountain and Southwest regions. For example, the latest available information shows that in fiscal year 1988, the Fund lost \$1.4 billion. If the Fund were to become exhausted, the U.S. Treasury would have to provide direct assistance.

Cash Projection Policy Analysis

In late 1989 and early 1990, we analyzed the cash position of the Fund under different economic scenarios. Under all scenarios, the proposal to increase FHA's mortgage ceiling had the greatest positive effect on the Fund's cash balances. However, of equal importance to the overall cash position of the Fund was the question of the Fund's actuarial soundness. Our analysis showed that the future cash position of the Fund and the effect of the mortgage ceiling, down payment, and ARM policy changes would depend heavily on the actual economic conditions that prevail in this decade, particularly house price appreciation rates. Appendix II summarizes the policy options by economic scenario and the cash balances resulting for each.

Our analysis of cash flow for various policy proposals showed that increasing the mortgage ceiling to 95 percent of a state's median house price would have had the greatest positive effect on the Fund's cash balance and would also have assisted in generating the most new business. The increased cash balances under this proposal would occur largely for two reasons: first, increased business would occur because of the expanded range of houses for which homebuyers can obtain FHA insurance and, second, the additional higher valued loans would likely have slightly lower claim and loss rates than the Fund experiences on loans below the existing ceiling. The reduced down payment and ARM

proposals would have had a relatively small effect on the Fund's cash position.

Under generally favorable overall economic conditions and annual house price appreciation rates of 7 to 9 percent, the 95-percent mortgage ceiling proposal would have resulted in a cash balance of \$14.4 billion by 1998. This would have been an increase of \$8.2 billion in the Fund's present cash balance, which is \$5.7 billion higher than the balance we estimated if the mortgage ceiling rose only at the annual rate of house price appreciation. Because the 95-percent ceiling is a substantial increase in the FHA mortgage ceiling, the amount of insurance-in-force would have more than tripled to \$886 billion by 1998.

The Fund would not have performed nearly as well if the recent trend toward lower house price appreciation rates continued through the 1990s. Under economic scenarios having generally favorable economic conditions but lower house price appreciation rates, the Fund would likely insure fewer loans and the average loan amount would be lower. Therefore, it would receive less income from premiums. At the same time, lower house price appreciation rates result in higher claim and loss rates for the Fund. As a result, its cash balances would decline—in some cases, they would have become negative by the end of fiscal year 1998. For example, at an annual 2- to 4-percent house price appreciation rate, the Fund would be unable to maintain a positive cash balance without Treasury assistance if no policy change were made or if any of the proposals reviewed were adopted, even if economic conditions remain generally favorable.

In addition, the Fund's cash balances would decline if FHA's maximum loan limit is not increased. For example, if the Congress had decided not to raise FHA's mortgage ceiling above the \$101,250 limit in effect before 1990, we estimated that the Fund's cash balance would decline to an estimated \$3 billion in 1998 from the September 30, 1988, level of \$6.2 billion, even under favorable economic conditions and rapidly appreciating house prices. This would occur because FHA's share of the mortgage market, under a constant loan limit, decreases as house prices appreciate above FHA's maximum limit. The decreased market share, in turn, would add less premium income to the Fund to cover future potential claims. Without increases in the maximum allowable loan limit, both the Fund's cash balance and home purchase options for homebuyers will decrease.

The Fund's 1998 cash balance would be less than \$3 billion—and might even disappear altogether—if the recent trend toward lower house price appreciation rates were to continue through the 1990s and FHA's maximum loan limit were not increased. This would occur because less premium income would be added to the Fund as FHA's share of the mortgage market decreases as discussed above and lower home price appreciation rates result in higher claim and loss rates.

Actuarial Soundness of the Fund

While our cash analysis focused on the revenue and expenses of the Fund on an annual basis, it did not provide insight into the Fund's ability to support potential losses over the entire life of the insured mortgages. An actuarial analysis focuses on whether the Fund has enough reserves to cover future losses from insurance currently in force and new insurance written. The volume of loans insured and anticipated future losses must be considered to determine if policy changes are preferable from an actuarial standpoint. To evaluate the actuarial soundness of the Fund, HUD contracted with Price Waterhouse for an independent actuarial study. At congressional hearings in June 1990, the Secretary of HUD announced that the Fund, while then financially solvent, had been steadily eroding from a net worth in constant 1989 dollars of \$7.8 billion in 1980 to \$2.6 billion in 1989 and eventually would have a negative net worth unless the Fund's reserve could be replenished on a continuing basis. The Secretary reached this conclusion on the basis of the results of the actuarial study conducted by Price Waterhouse for FHA.

Corrective Actions Proposed

To address the actuarial soundness problem, HUD proposed several reforms to its single-family mortgage insurance program. Subsequently, the House and Senate passed legislation with different specific reform measures aimed at increasing the Fund's capital reserves—establishing minimum capital standards for the Fund and a premium structure sufficient to cover expected and normal operating losses. The Senate-passed legislation, among other items, retained FHA's current 3.8-percent up-front insurance premium but (1) added an annual risk-related premium, with higher premiums for loans with lower down payments, and (2) limited the principal obligation for FHA loans to no more than 98 percent of the appraised value of the property or 97 percent in the case of an appraised value in excess of \$50,000. Limiting the principal obligation for FHA loans would in effect increase the amount borrowers must pay in cash at closing by about \$1,235 on a \$65,000 house financed with a minimum down payment. The House-passed legislation, among other items, left unchanged the amount of cash needed at closing but (1) reduced the

3.8-percent up-front premium slowly over a 5-year period and (2) added an annual premium for all mortgages.

In our July 1990 testimonies, we supported the efforts to restore financial health to the Fund. The central issue before the Congress in our opinion was whether FHA could operate an actuarially sound single-family mortgage insurance program at reasonable costs and risks and still serve low- and moderate-income homebuyers, particularly first-time homebuyers, without substantially increasing their burdens. However, substantial financial and social consequences are inherent in any policy changes to the Fund's insurance criteria. Thus, we suggested that the Congress carefully balance desires to assist homebuyers with its expectations of the housing market's future performance, the federal government's potential financial risk from the additional insurance-in-force that such changes can generate, and the possible need for U.S. Treasury assistance in the Fund's survival.

We also pointed out that the proposed policy change requiring, in effect, that borrowers pay more in cash at closing could help improve the Fund's actuarial soundness. But it could also mean that a number of potential FHA homebuyers may be forced out of the market or it could delay their home purchases. For example, when buying a \$65,000 home, an FHA borrower must currently have a minimum of about \$2,848 in cash (assuming that a portion of the total closing costs, equal to about 3 percent of the purchase price, is financed in the mortgage). However, as proposed by HUD and the Senate, the buyer would be required to pay two-thirds of the closing costs in cash; hence, the total amount needed at settlement would increase by \$1,235—43 percent over the current amount needed. Estimates of the number of potential buyers that could be eliminated from obtaining an FHA mortgage because of the additional cash needed at settlement ranged from 35,000 estimated by HUD to 100,000 estimated by the National Association of Realtors.¹

Agreement Reached on Reform

In September 1990, the Chairman of the Conference Committee on Housing Legislation requested that we (1) assist in the conferees' understanding of the Price Waterhouse model and (2) analyze the analytical effect of alternative reform proposals as they were generated by the Conference Committee. The Committee requested that the analyses be

¹The National Association of Realtors is an organization representing residential and commercial real estate development, mortgage banking, home building, property management, and other businesses related to real estate.

conducted using the economic model developed for FHA by Price Waterhouse. One key result to be obtained by any policy change was that it had to meet the 5-year deficit reduction target of \$2.5 billion set for the Fund.

We provided the conferees with analyses of the financial and budgetary impacts of seven alternative reforms. Each proposed reform analyzed represented an alternative way available to the Congress to reform FHA within the parameters established by the House-Senate-passed legislation. We set five separate but interrelated objectives as criteria for the proposals relating to insurance premiums charged, the amount of cash paid by borrowers at closing, default rates, and capital reserve requirements. The fifth criterion was that a federal budgetary savings of \$2.5 billion was to be achieved over the next 5 years.

For each reform, we provided information on the financial impact on the Fund's net worth, capital reserve, and default rates; federal budgetary savings for a 5-year period; amount of cash required at closing; and monthly mortgage payment amounts. The conferees used these analyses to reach a compromise agreement whose purposes were to restore the Fund to actuarial soundness, minimize the reforms' impact on homebuyers, and realize \$2.5 billion in federal budgetary savings. Subsequently on November 28, 1990, the FHA reform measures were enacted into law by the Cranston-Gonzalez National Affordable Housing Act.

The 1990 act, among other things, requires FHA borrowers after issuance of regulations before the end of February 1991, to pay more in insurance premiums over the life of the loans and in cash at the time of loan origination. The act effectively raises the present value of the insurance premium from the current 3.8 percent of the loan amount to from 5.5 to 7.3 percent, depending on the amount of the down payment made. It accomplishes this with two actions: lowering the up-front premium gradually from 3.8 to 2.25 percent of the loan amount over a 4-year period and, during the same period, phasing in a new annual premium of 0.5 percent of the loan balances, with borrowers who make higher down payments paying the annual premium for a shorter period. It also requires that the principal obligation on an FHA mortgage be limited to no more than 98.75 percent of the appraised value on properties appraised at less than \$50,000 and 97.75 percent in the case of a home with an appraised value in excess of \$50,000. This requirement in effect increases the amount of cash needed at closing by about \$564 on a \$65,000 house financed with a minimum down payment.

The first part of our analysis focused on the Fund's cash position at the end of each fiscal year from 1989 to 1998. To conduct this analysis, we developed (with the assistance of Price Waterhouse) econometric models based on historical trends in FHA mortgages originated during fiscal years 1979 through 1988. These econometric models identified the relationships between mortgage insurance claim and nonclaim terminations and a variety of explanatory variables, including loan-to-value ratios, loan amounts, and the rate of house price appreciation. We then combined the results from these models with a cash-flow model to project the Fund's cash position over the 10-year period. Our analysis did not project the Fund's cash position for the policy changes made to FHA's program by the National Affordable Housing Act. A detailed discussion of our methodology for projecting the Fund's cash balances as well as analyzing alternative reform measures requested by the Conference Committee is presented in appendix III.

HUD was provided copies of our testimonies as well as our analyses of the financial and budgetary impacts of the alternative reforms to FHA's program. However, as agreed with your office, we did not obtain official agency comments on a draft of this report. We performed our review in accordance with generally accepted government auditing standards.

As requested, we plan no further distribution of this report until 10 days from the date of this letter. At that time, we will send copies to the appropriate congressional committees, the Secretary of HUD, and other interested parties. We also will make copies available to others upon request.

If I can be of further assistance to you, please contact me at (202) 275-5525. Major contributors to this report are listed in appendix IV.

Sincerely yours,



John M. Ols, Jr.
Director, Housing and
Community Development Issues

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Abbreviations

ARM	adjustable-rate mortgage
DRI	Data Resources, Inc.
FHA	Federal Housing Administration
GAO	General Accounting Office
HUD	Department of Housing and Urban Development

GAO Testimonies on FHA Loan Policy Reforms

House of Representatives

Before the Subcommittee on Housing and Community Development,
Committee on Banking, Finance, and Urban Affairs:

Impact of FHA Loan Policy Changes (GAO/T-RCED-90-17, Nov. 16, 1989).

Impact of FHA Loan Policy Changes on Financial Losses and Homebuyers
(GAO/T-RCED-90-95, July 10, 1990).

United States Senate

Before the Subcommittee on Housing and Urban Affairs, Committee on
Banking, Housing, and Urban Affairs:

Impact of FHA Loan Policy Changes on Its Cash Position (GAO/T-
RCED-90-70, June 6, 1990).

Impact of FHA Loan Policy Changes on Financial Losses and Homebuyers
(GAO/T-RCED-90-94, July 24, 1990).

Summaries of Cash Flow Policy Options by Economic Scenario and Economic Variable

Table II.1: Summary of Cash Flow Policy Options by Economic Scenario, End of Fiscal Year Cash Balance

Dollars in millions

Economic scenario/ policy option	Fiscal year									
	1988	1990	1991	1992	1993	1994	1995	1996	1997	1998
Trend economics										
FHA maintains 1988 market share	\$5,586	\$5,800	\$5,361	\$5,457	\$6,443	\$6,970	\$7,192	\$7,585	\$8,186	\$8,770
FHA increases loan ceiling	5,608	6,525	6,784	7,493	9,149	10,254	10,983	11,940	13,182	14,437
FHA reduces downpayment requirement	5,586	5,789	5,309	5,345	6,269	6,704	6,800	7,048	7,484	7,879
FHA provides 2/6 ARMs	5,589	5,806	5,401	5,492	6,384	6,895	7,184	7,645	8,307	8,959
1980s economics										
FHA maintains 1988 market share	5,586	5,555	6,058	7,070	8,095	8,506	7,258	7,181	6,527	3,767
FHA increases loan ceiling	5,609	6,152	7,078	8,418	9,690	10,269	8,729	8,727	7,999	4,464
FHA reduces downpayment requirement	5,586	5,544	6,021	7,003	7,999	8,351	6,977	6,786	5,975	2,962
FHA provides 2/6 ARMs	5,589	5,560	6,009	6,800	7,477	7,355	6,126	6,079	5,560	3,420
Medium house price appreciation										
FHA maintains 1988 market share	5,586	5,779	5,139	4,789	5,324	5,275	4,775	4,382	4,159	3,863
FHA increases loan ceiling	5,608	6,491	6,523	6,734	7,859	8,277	8,134	8,123	8,321	8,435
FHA reduces downpayment requirement	5,586	5,769	5,085	4,671	5,140	4,990	4,356	3,807	3,406	2,900
FHA provides 2/6 ARMs	5,589	5,785	5,179	4,824	5,253	5,177	4,740	4,416	4,256	4,030
Low House Price Appreciation										
FHA maintains 1988 market share	5,586	5,748	4,705	3,674	3,479	2,376	456	(1,510)	(3,230)	(5,045)
FHA increases loan ceiling	5,608	6,440	6,032	5,489	5,768	4,956	3,138	1,179	(768)	(2,923)
FHA reduces downpayment requirement	5,586	5,737	4,649	3,548	3,279	2,063	(100)	(2,198)	(4,062)	(6,041)
FHA provides 2/6 ARMs	5,589	5,753	4,747	3,711	3,394	2,249	391	(1,498)	(3,147)	(4,886)

Note: End of fiscal year 1988 cash balance was approximately \$6.2 billion. Appendix III contains a description of the various policy options.

**Appendix II
Summaries of Cash Flow Policy Options by
Economic Scenario and Economic Variable**

Table II.2: Summary of Economic Variable

Economic scenario/economic variable	Fiscal year									
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Trend economics										
Mortgage interest rate	9.88	9.44	9.66	10.26	10.02	9.74	9.66	9.61	9.56	9.49
Median house price	\$97	\$104	\$112	\$121	\$130	\$141	\$153	\$166	\$181	\$198
Unemployment rate	5.23	5.50	5.40	5.22	5.39	5.37	5.28	5.17	5.19	5.23
Average nominal loan value	\$74	\$80	\$85	\$91	\$99	\$107	\$117	\$127	\$138	\$151
1980s economics										
Mortgage interest rate	9.88	10.92	12.95	15.12	15.38	12.85	12.49	11.74	10.25	9.28
Median house price	\$97	\$107	\$117	\$125	\$128	\$134	\$139	\$145	\$155	\$168
Unemployment rate	5.23	5.83	7.16	7.78	9.87	9.33	7.41	7.20	7.06	6.05
Average nominal loan value	\$74	\$81	\$89	\$95	\$97	\$102	\$106	\$110	\$118	\$128
Medium house price appreciation										
Mortgage interest rate	9.88	9.44	9.66	10.26	10.02	9.74	9.66	9.61	9.56	9.49
Median house price	\$97	\$103	\$107	\$113	\$120	\$128	\$137	\$146	\$156	\$168
Unemployment rate	5.23	5.50	5.40	5.22	5.39	5.37	5.28	5.17	5.19	5.23
Average nominal loan value	\$74	\$78	\$82	\$86	\$92	\$98	\$104	\$111	\$119	\$128
Low house price appreciation										
Mortgage interest rate	9.88	9.44	9.66	10.26	10.02	9.74	9.66	9.61	9.56	9.49
Median house price	\$97	\$100	\$101	\$104	\$107	\$111	\$115	\$119	\$124	\$130
Unemployment rate	5.23	5.50	5.40	5.22	5.39	5.37	5.28	5.17	5.19	5.23
Average nominal loan value	\$74	\$76	\$77	\$79	\$82	\$84	\$88	\$91	\$95	\$99

Note: Rates are expressed in percents. Prices and values are expressed in thousands of dollars.

Scope and Methodology

Our work focused on the (1) 10-year impact on the cash position of the Federal Housing Administration's (FHA) Mutual Mortgage Insurance Fund (the Fund) of three proposed legislative policy changes—raising mortgage limits, reducing down payment requirements, and allowing FHA to insure adjustable-rate mortgages with higher interest rate caps and (2) financial impacts of seven alternative proposals to reform FHA for the Conference Committee on Housing Legislation.

Analysis of Cash Balances

Our work focused on the Fund's cash balance at the end of each fiscal year from 1989 through 1998. With the assistance of Price Waterhouse, a major public accounting and consulting firm, we conducted our analysis using econometric and cash-flow models. Our analysis of the Fund's cash position under the assumption of having no policy change during this time period, except for increasing FHA's loan ceiling at the same rate as forecasted increases for house prices, serves as a base case against which we measured the effects of the proposed changes. We projected the Fund's balance under several sets of economic assumptions. We did not calculate the future adequacy of the Fund's loss reserves for its insurance-in-force, the government's future equity in the Fund, or the cash balances for the Fund resulting from the policy reforms to the FHA program made by the Cranston-Gonzalez National Affordable Housing Act of 1990. We also did not perform our analysis on an accrual basis, which would be necessary to assess the future actuarial soundness of the Fund rather than its cash balance. FHA performed such an analysis.

Method of Analysis

We estimated the impact of the proposed policy changes on the Fund in a two-phase process. In the first phase, we developed econometric models to estimate relationships between both claim rates (the rate at which claims resulting from foreclosure are made against the Fund) and nonclaim terminations (usually occurring as a result of the sale of the house without mortgage assumption or refinancing of the loan) and a variety of other variables that might influence claim rates and nonclaim terminations. In the second phase, we used the estimates of claim and nonclaim termination rates in a cash-flow model to project the Fund's cash position over fiscal years 1989 through 1998 for the proposed policy changes and our base case.

To identify the effects of various factors on claim rates, we conducted a regression analysis. Because FHA's data base contains millions of individual mortgages, we aggregated the data for the regression analysis into groups of mortgages, classified on the basis of year of origination,

size of loan, loan-to-value ratio, and HUD region (10 groups of states). Unemployment rates and house price appreciation rates used as explanatory variables were calculated at the HUD regional level. We defined the claim rate in any calendar year for a group of mortgages as the ratio of the dollar value of claims made on these loans in that year to the dollar value of those loans at origination.¹ For example, if \$100 million in mortgages valued between \$78,000 and \$101,000 were written in 1985 in New England with loan-to-value ratios between 90 and 95 percent, and these loans experience \$2 million in claims in 1988, the claim rate for this category in 1988 would be 2 percent (\$2 million/\$100 million). We used the following explanatory variables in the final model:

- The ratio of the previous year's interest rate on mortgages to the interest rate at origination of the mortgages.
- The interest rate on the mortgages at origination.
- The ratio of the previous year's estimated house prices to house prices in the year the mortgages were made.
- The previous year's unemployment rate.
- A function of the loan-to-value ratio.
- A function of the loan-to-value ratio times the previous year's unemployment rate.
- An indicator of a loan greater than \$101,000.
- An indicator of whether or not the loan was an investor loan.
- A series of 10 variables which take on the value of the loan (in inflation-adjusted dollars) in the year the loans were written, and zero otherwise; the value of the loan in the year after, and zero otherwise; the value of the loan 2 years after, and zero otherwise; etc.
- Indicators for the year the mortgages were written and for the year after the mortgages were written.

We used the previous year's values as explanatory variables because we focused on claims, which occur several months after borrowers defaulted on their loans. Default, in turn, generally occurs months after the onset of a "shock," such as a job loss or decline in property value.

The ratio of mortgage rates captured the assumption that borrowers are less likely to default if the interest rate on their mortgages is significantly less than the rate on mortgages currently available, and more

¹In these regressions, the actual dependent variable was the natural logarithm of the claim or non-claim rate. Predicting the logarithm of the rate allowed the prediction equation to be a smooth curve instead of a straight line.

likely to default if their rates are above current rates. We used the original mortgage interest rate to capture the higher payment to income stress that results from high-mortgage interest rates. The ratio of original to current house price captured the effect of increasing equity, which should lead to lower probability of default, or decreasing equity, which leads to an increase in default probability. The rate of unemployment measures the number of borrowers who may have problems meeting mortgage payments, the function of loan-to-value captures the fact that loans made to borrowers with little equity have higher default rates, and the multiplication of the loan-to-value ratio and the previous year's unemployment rate was designed to capture the presumption that in times of high unemployment, borrowers with little initial equity are the ones most likely to be affected. The indicator for loans above \$101,250 captures the higher claims from loans written above the FHA ceiling, and the Investor loan indicator captures the higher claim rates associated with these loans.

The loan value variables capture the effect of loan size on default rates. It shows that higher valued loans (but those still smaller than FHA's loan ceiling) have lower default rates and that default rates are somewhat lower 7 or more years after mortgages are written. The indicators for the year the mortgages were written, and the year after, show that claim rates are very low in the first 2 years of the mortgages (claims occur with some lag after defaults).

All of the explanatory variables appeared significant in the expected direction at the 1-percent level,² except for one of the series of variables that identify both loan amount and the number of years from loan origination to the current date (that variable was insignificant).

To identify the effects of various factors on the nonclaim termination rate, we conducted a similar regression analysis. We again grouped mortgages into categories based on the year of loan origination, mortgage size, and loan-to-value ratio. In this model, however, mortgages were not classified by region, and all data used as explanatory variables were national. As in the claim rate model, we define the nonclaim termination rate for a group of mortgages as the ratio of the dollar value of loans prepaid in a calendar year to the dollar value of loans at origination.

²This means that there is less than a 1-percent chance that the variable does not influence claim or nonclaim terminations, or influences terminations in a direction opposite to what was estimated.

We used the following explanatory variables in the final model:

- The ratio of this year's interest rate on mortgages to the actual interest rate on the mortgages.
- The ratio of this year's estimated house price to the house price in the year the mortgage was made.
- This year's unemployment rate.
- The loan-to-value ratio.
- An indicator of a loan greater than \$101,250.
- An indicator of whether or not the loan was an Investor loan.
- A series of nine variables which indicate the year of the loans relative to the year the loans were originated.

The ratio of mortgage rates captured the assumption that borrowers were less likely to prepay (and more likely to have the buyer assume the mortgage if selling) if the interest rates on their mortgages were significantly less than the rate on mortgages currently available, and more likely to refinance if the rates on their mortgages were above current rates. The ratio of original-to-current house price captured the effect of increasing equity, which should lead to lower probability of default, and to a higher probability of refinancing to tap the increased equity. The rate of unemployment measures the number of borrowers who may have problems meeting mortgage payments, and the ratio of loan-to-value captures the fact that loans made to borrowers with little equity have higher default rates, hence lower prepayment rates. The indicator for loans above \$101,250 captures the higher claims from loans written above the FHA ceiling, and the investor indicator allows investors to behave differently (in this case, refinancing more often). The 9-year indicators trace the time profile of refinancings, showing them to be high in the first years of a mortgage, and lower in the later years. All variables were significant at the 1-percent level, except the indicators for loans above the ceiling and for investors. The loans above the ceiling indicator were not significant, and the investor indicator was significant at the 5-percent level.

In the second phase for our cash-flow model, we used our estimates of the relationship between the explanatory variables and claim and non-claim termination rates and forecasted values of the explanatory variables to estimate claim and nonclaim termination rates for various categories of loans for each year of the forecast period. We combined

these estimates with estimates of FHA's loss rate per loan³ and the demand for new FHA loans⁴ to estimate FHA cash flow models due to claim and nonclaim terminations for both FHA's existing portfolio and of loans originated in 1989 and beyond. We used a table provided by HUD officials to account for refunded premiums.

Cash inflows to the Fund during the forecast period will depend heavily on the amount and size of the new loans FHA makes. To predict loan originations over the 10-year forecast period, we made a simple baseline assumption and modified it to analyze different policy scenarios. For the base case, we assumed that FHA loan limits would rise with appreciation in home prices, and that FHA's share of the mortgage business would remain constant, along with the distribution of loan sizes (adjusted for changes in house prices) and loan-to-value ratios. We modified these assumptions when policy changes in the kinds of loans written by FHA or in the determination of high-cost-area ceilings were considered. We multiplied forecasts of mortgage originations for the next 10 years by the average of FHA's share of mortgages over the last 3 years to predict the number of new loans written in a year, and then combined that estimate with the assumption of a constant distribution of loan sizes, and a constant 3.8-percent insurance fee to forecast revenues flowing into the fund from new business.

A cash inflow is also generated when FHA disposes of property acquired in settling a claim. To predict the cash inflows from property disposition, we multiplied the rate of recovery on foreclosed property (1 minus the loss rate) by the dollar value of claims in a category. On the basis of historical averages, we assumed cash from property disposition would flow in for 3 years after a claim.

We used forecasts of interest rates to predict interest income on the Fund's balance. We assumed that very small outflows, such as salary and overhead, would fluctuate with dollar volume when net flows were calculated and added to the fund balance.

³We define losses as the amount the FHA pays to the mortgage holder plus holding costs and disposition costs for the property, minus the proceeds from the sale of the property. The loss rate is the loss divided by the amount of the mortgage. The forecast loss rate was the average loss rate for each loan size/loan-to-value category over the last 3 years, 1986-88.

⁴Although loan demand primarily affects the Fund's cash inflows during the forecast period, it also affects outflows because there will be claim and nonclaim terminations associated with the loans originated in the forecast period.

The Base Case

We defined the base case for the forecast period (1989-98) to be one in which no policy changes occur, but FHA's share of the overall mortgage market remains constant at its 1988 level of approximately 8.5 percent. To achieve this, we assumed that FHA's loan ceiling increases at the same rate as forecasted increases in house prices. We believe that allowing FHA to maintain its market share is a realistic representation of maintaining existing policy because several times in the past, the Congress has increased the maximum allowable loan to reflect higher house prices. An alternative assumption—that FHA's ceiling would stay fixed at \$101,250 throughout the forecast period, causing FHA's market share to erode as house prices rose—would not be consistent with past congressional practice.

For the period January 1990 through September 30, 1990, the Congress raised the maximum insured loan limit to \$124,875.⁵ Because of the higher loan limit's introduction late in the period of our review, we have used the \$101,250 loan limit in our base calculations throughout this report and our four testimonies.

The Proposals

After preliminary work and discussions with the requester, in addition to reviewing the base case, we focused our work primarily on proposals to

- raise FHA's mortgage limit annually to 95 percent of a state's median home price;
- reduce the down payment requirements from 3 percent of the first \$25,000 of a mortgage⁶ and 5 percent on the remainder above \$25,000 to 3 percent of the first \$50,000 and 5 percent on the remainder—reducing down payments for loans in excess of \$50,000 by \$500; and
- allow adjustable rate mortgages (ARMs) with a 2-percent annual cap on interest rate increases or decreases and a 6-percent lifetime cap, the format most frequently used by private lenders.

The proposal to set the FHA loan limit at 95 percent of a state's median home price is directed at keeping FHA's criterion more in line with recent and expected future increases in home prices in many parts of the nation. The proposal would set a higher loan ceiling and consequently

⁵The maximum insured loan limit of \$124,875 was made permanent by the Cranston-Gonzalez National Affordable Housing Act of 1990.

⁶Under FHA policy, if the appraised value of the home is less than \$50,000, the required down payment is 3 percent.

allow FHA to insure additional loans in those areas of 10 states⁷ and the District of Columbia with higher priced homes where FHA loans are not always possible because of FHA's current loan limit. In these 10 states and the District of Columbia, the 1988 median home price exceeded the then-current FHA loan ceiling.

The proposal to lower the down payment requirement for FHA-insured mortgages is directed at increasing the opportunity for individuals with limited resources to become homeowners. Currently, the down payment for FHA-insured mortgages is generally lower than that required for conventional mortgages—3 percent for the first \$25,000 and 5 percent for the remainder of the home's sales price for FHA-insured loans. The proposal to further reduce the down payment to 3 percent of the first \$50,000 of an FHA-insured mortgage would in effect lower a homebuyer's required down payment by \$500 for a mortgage over \$50,000.

The proposal to allow FHA to insure commonly used ARMs having 2- and 6-percent annual and lifetime caps, respectively, is aimed at making FHA ARMs more desirable to lenders. Currently, FHA-insured ARMs may have only 1- and 5-percent annual and lifetime caps, which many lenders do not offer.

For the down payment and ARM proposals, as with the base case, we also assumed that the loan ceiling increased with the annual appreciation in home prices. Therefore, when comparing a proposed change with the base case, the effects of the specific change can be isolated.

Economic Assumptions

For each proposed policy change, as well as the base case, we estimated the future impact on the Fund's cash balance under four different sets of assumed values for key economic variables during the forecast period:

- A generally favorable economic forecast, commonly known as "a trend forecast."
- Two variations of the trend forecast, which assume lower rates of house price appreciation.
- A repeat of the economic conditions of the 1980s.

⁷California, Connecticut, Hawaii, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Virginia.

The trend economic forecast, developed by Data Resources, Inc. (DRI), projects generally favorable economic conditions, e.g., mortgage interest rates ranging from 9.4 to 10.3 percent, an unemployment rate averaging 5.25 percent, and home prices appreciating from 7 to 9 percent annually. Because some analysts believe that housing prices will rise less rapidly than DRI has forecast, we tested the sensitivity of our results by substituting two lower annual home price appreciation rates—2-4 percent and 5-7 percent—into our model while retaining the other forecast values. To test how well the Fund might perform under substantially less favorable conditions, for the fourth set of calculations, we estimated the Fund's cash balance under a duplication of the economic conditions of the 1980s, a particularly volatile period: house price appreciation, until 1986, stayed below 3 percent; interest rates of mortgages rose to 15 percent; and unemployment levels reached 10 percent.

Purpose of Analysis on an Accrual Basis

The Fund is required, by 12 U.S.C. 1709, to be actuarially sound, that is, it must provide sufficient reserves and funding for estimated future losses resulting from claim payouts. Such a determination, which requires the use of an accrual basis of accounting,⁸ was the purpose of the FHA analysis performed under contract with Price Waterhouse. The accrual basis of accounting will consider the full life spans, up to 30 years, of the insured mortgages.

A primary objective of accrual accounting is to report the financial position and results of operations of an entity based on the occurrence of measurable events, regardless of whether cash has changed hands. This concept is particularly important for an entity such as FHA (or any insurance enterprise) because the actual payout or collection of cash may precede or follow the event that gave rise to the cash transaction by a substantial time period. Thus, a favorable cash position, or positive cash flow, at any given point may not be reflective of the true financial position of the entity.

In contrast, our analysis of the future impact on the Fund's cash balance of implementing any of the three proposed changes was made using the cash basis of accounting.⁹ This accounting method provides an indication of the cash position of the Fund—representing the Fund's cash

⁸An accrual basis of accounting matches, or recognizes, revenue and the expenditures made to produce that revenue in the same fiscal time period rather than when they actually occur, which may be in different fiscal years.

⁹A cash basis of accounting recognizes cash receipts and expenditures when they actually occur.

available to cover losses and expenses—at a particular time. It is not appropriate for determining the Fund's actuarial soundness.

Data Sources

Price Waterhouse obtained some of the information used for this study during its contractual audit for us of FHA's consolidated Statement of Financial Position as of September 30, 1987.¹⁰ The firm also used data from a study of (1) various aspects of the financial condition of FHA's Mutual Mortgage Insurance Fund and its major program, the Section 203(b) Insurance Program; (2) a comparison of accounting principles and practices used in FHA's financial statements with generally accepted accounting principles; and (3) the potential impact of FHA's cash flow on the federal budget.¹¹ To gain additional insight into the likely impact of increasing FHA's loan ceiling, we also looked at data on claim rates for loans made above the current ceiling that are either insured by private mortgage insurers or partially guaranteed by the Veterans Administration.

To supplement our analysis, we discussed the impact of the proposed changes with several government and industry organizations: the Enterprise Foundation, Federal Home Loan Mortgage Corporation, Federal National Mortgage Association, Government National Mortgage Corporation, Mortgage Bankers Association, Mortgage Insurance Companies of America, National Association of Realtors, National Council of Savings Institutions, and U.S. League of Savings Institutions.

We also discussed various aspects of the approach and methodology of the review with Patric H. Hendershott, a well-known housing economist and Chairman, Department of Real Estate Finance, Ohio State University. Dr. Hendershott provided us with his comments on the estimated future impacts from implementing the proposed policy changes.

Analysis for Conference Committee

As requested on September 25, 1990, by the Chairman of the Conference Committee on Housing Legislation, we assisted the Committee in its understanding of the Price Waterhouse actuarial model and analyzed the financial impacts of seven alternative proposals to reform FHA. At the Chairman's request, we used the economic model that Price

¹⁰See Financial Audit: Federal Housing Administration Fund's 1987 Statement of Financial Position (GAO/AFMD-89-3, May 12, 1989).

¹¹See Financial Management: Federal Housing Administration's Accounting Methods and Section 203(b) Program (GAO/AFMD-89-26BR, May 5, 1989).

Waterhouse developed for FHA for these analyses. A complicating factor was that any agreement reached by the conferees had to meet the 5-year deficit reduction target of \$2.5 billion set for the Fund. We contracted with Price Waterhouse to perform the modeling analyses.

Working with the requester, we set five separate but interrelated objectives as criteria for the proposals. These objectives were that (1) insurance premiums charged were to have some degree of risk differentiation; (2) the amount of cash paid by borrowers at closing was to increase above the then-current requirement; (3) the default rate was to be lowered; (4) a capital reserve of 1.25 percent of insurance-in-force was to be accumulated within 2 years, with 2 percent by the year 2000; and (5) a budgetary savings of \$2.5 billion was to be achieved through increased revenues over the next 5 years.

For each proposal, we provided information on the proposals' financial impact on the Fund's net worth, capital reserve, and default rates; federal budgetary savings for a 5-year period; amount of cash required at closing; and monthly mortgage payment amount.

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