

Impact

A regulatory impact analysis must accompany every economically significant federal rule or regulation. The Office of Policy Development and Research performs this analysis for all U.S. Department of Housing and Urban Development rules. An impact analysis is a forecast of the annual benefits and costs accruing to all parties, including the taxpayers, from a given regulation. Modeling these benefits and costs involves use of past research findings, application of economic principles, empirical investigation, and professional judgment.

The Impacts of More Rigorous FHA Underwriting Guidelines

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Summary of Impact Analysis

The Federal Housing Administration's (FHA's) authorizing statute for insurance authorities, the National Housing Act, clearly states that the U.S. Department of Housing and Urban Development (HUD) will adjust program standards and practices to operate the Mutual Mortgage Insurance Fund (MMIF) on a self-sustaining basis. In the Notice "Federal Housing Administration Risk Management Initiatives: Reduction of Seller Concessions and New Loan-to-Value and Credit Score Requirements,"¹ FHA proposes to tighten portions of its underwriting guidelines that present an excessive level of risk to both homeowners and FHA. The benefit of the set of actions outlined in the Notice will reduce the net losses resulting from high rates of insurance claims on affected loans, and the cost of the action will be the value of the loan opportunity denied to the excluded borrowers. The total transfer to FHA would be \$96 million, and the net cost of excluding borrowers could be as high as \$85 million.

Need for Policy Change

FHA has resumed a countercyclical position, supporting private lending for homeownership when access to private sources of capital for credit enhancements is otherwise constrained by the recent financial crisis. This state of affairs is most evident in the rapid increase in the volume of FHA

¹ "Federal Housing Administration Risk Management Initiatives: Reduction of Seller Concessions and New Loan-to-Value and Credit Score Requirements," FR-5404-N-01. *Federal Register*, July 15, 2010. Available at <http://federalregister.gov/a/2010-17326>.

insurance as private sources of mortgage finance retreated from the market. The growth in the MMIF portfolio over a 2-year period coincides with a set of difficult economic conditions, namely, continued housing price declines and increasing levels of unemployment. Together, these external conditions increase the risk of additional losses to FHA.

A recently issued independent actuarial study² shows that the MMIF capital ratio has fallen below its statutorily mandated threshold of 2 percent. The study reported that FHA would likely sustain significant losses from mortgage loans made before 2009 due to the high concentration of seller-funded downpayment assistance mortgage loans and declining real estate values nationwide.

FHA can implement four primary policy changes to replenish the MMIF capital reserve account: (1) increase premium rates to raise income, (2) reduce losses on new business by tightening underwriting guidelines, (3) strengthen enforcement measures to reduce unwarranted claim payments, and (4) avoid claims through enhanced loss mitigation efforts. FHA is engaged in efforts on all these fronts, exercising its full authority under the terms of the National Housing Act, including new authorities provided in recently enacted legislation. This Notice further complements the underwriting approach to strengthening FHA's fiduciary responsibilities.

Summary of Notice

First, FHA proposes to reduce the amount of financing costs that the property seller or other interested party may pay on behalf of a homebuyer using an FHA-insured mortgage. This proposed cap on seller concessions would more closely align FHA's single-family mortgage insurance programs with standard industry practice and minimize FHA exposure to the risk of insuring borrowers most likely to default. When a homeseller or interested third party pays all or part of the buyer's cost of financing, the payments are commonly referred to as *seller concessions*. Although HUD previously allowed seller concessions up to 6 percent of the sales price, conventional mortgage lenders have capped seller concessions at 3 percent of the sales price on loans with loan-to-value (LTV) ratios similar to FHA standards. FHA proposes to cap the seller concession in FHA-insured single-family mortgage transactions at 3 percent of the lesser of the sales price or appraised value for purposes of calculating the maximum mortgage amount. Although seller concessions above 3 percent would not be prohibited under this proposal, concessions that exceed FHA's 3-percent cap would require a dollar-for-dollar reduction in the sales price for the purposes of calculating the maximum FHA loan amount. One reason for this change is that borrowers who received more than 3 percent in seller concessions had a significantly higher risk of losing their homes. This proposed cap will not only align FHA's single-family mortgage insurance programs to private industry practice but also will help ensure that borrowers who rely on FHA-insured financing have a sufficient investment in their home, thereby making them less likely to default on the mortgage.

Second, FHA proposes to introduce a two-part credit-score threshold, with a lower threshold for loans with LTV ratios of 90 percent or less and a higher threshold for those loans with higher LTV ratios. This will be the first time that FHA has ever instituted an absolute lower threshold for borrower credit scores (as measured by FICO). Borrowers with low credit scores present higher risks

² See IFE (2009).

for defaulting and filing a mortgage insurance claim. FHA is proposing to introduce a minimum decision credit score of no less than 500 to determine eligibility for FHA financing and to also reduce the maximum LTV for all borrowers with decision credit scores of less than or equal to 579. Maximum FHA-insured financing (96.5-percent LTV for purchase transactions and 97.75-percent LTV for rate-and-term refinance transactions) would be available only to borrowers with credit scores at or above 580. All borrowers with decision credit scores between 500 and 579 would be limited to a maximum 90-percent LTV.

Although today FHA is serving very few borrowers with credit scores below 500, as shown in exhibit 1, the performance of these borrowers is clearly very poor, as reflected in exhibit 2. Borrowers with credit scores below 500 struggle to meet their mortgage obligations. The percentage of borrowers who ultimately lose their homes is twice as high for borrowers with lower credit scores. Similarly, FHA data demonstrate that borrowers with decision credit scores below 580, who invest only a minimal amount of funds into the transaction, struggle to make their mortgage payments and ultimately lose their homes at a rate that is unacceptable to FHA. The borrowers affected by this Notice have seriously delinquent rates that are four to five times higher than those who remain eligible.

Third, FHA will tighten underwriting standards for mortgage loan transactions that are manually underwritten. The purpose of mortgage underwriting is to determine a borrower's ability and willingness to repay the debt and to limit the probability of default. For cases in which the borrower has a very limited or nontraditional credit history, the credit bureaus may not be able to calculate a credit score. Mortgage loans for borrowers in this category will need to be manually underwritten. These categories of borrowers present a higher level of risk and, as a result, manual underwriting guidelines, in general, are more stringent to address that higher risk level.

Costs and Benefits

Given the importance of maintaining a viable MMIF for existing and future homeowners, it is FHA's intent to focus only on particular practices that have been found to result in extremely poor mortgage loan performance.

Aggregate Loans Affected

The highlighted portion of exhibit 1 indicates the proportion of borrowers expected to be immediately excluded from the FHA guarantee by the Notice, relative to the total FHA portfolio. This policy is still important to FHA because HUD's expectation are that, after the conventional mortgage market recovers and lenders again loosen underwriting standards, FHA could be adversely selected with larger shares of these higher risk loans. As late as fiscal year (FY) 2008, loans that would be newly excluded under this proposed policy accounted for more than 8 percent of all loans insured by FHA (excluding streamline refinancing).

Exhibit 2 clearly indicates through the performance data provided that these borrowers are at a significantly greater risk of losing their homes than are other FHA-insured borrowers. The seriously delinquent rate of borrowers subject to the proposed restrictions (weighted average across the three cells in exhibit 2) is 30.6 percent, while the rate for all other mortgage loans is 6.4 percent.

Exhibit 1

FHA Single-Family Insurance Endorsement Shares in Calendar Year 2009

Loan-to-Value Range	Credit Score Ranges					
	None	300-499	500-579	580-619	620-679	680-850
Up to 90%	0.03	0.01	0.12	0.48	2.28	3.51
Above 90%	0.34	0.02	1.39	7.24	35.80	48.77

FHA = Federal Housing Administration.

Source: U.S. Department of Housing and Urban Development/FHA; "Federal Housing Administration Risk Management Initiatives: Reduction of Seller Concessions and New Loan-to-Value and Credit Score Requirements," Table A, FR-5404-N-01, Federal Register, July 15, 2010, available at <http://federalregister.gov/a/2010-17326>

Exhibit 2

FHA Single-Family Mortgage Insurance: Seriously Delinquent Rates by LTV and Credit Scores

Loan-to-Value range	Credit Score Ranges					
	None	300-499	500-579	580-619	620-679	680-850
Up to 90%	13.3	35.4	22.4	15.7	6.1	1.5
Above 90%	20.9	43.3	30.4	19.6	8.6	2.3

FHA = Federal Housing Administration. LTV = loan to value.

Note: Seriously delinquent rates measure the sum of cases that are 90 days or more delinquent, in foreclosure, and in bankruptcy as a percent of all actively insured loans on a given date.

Source: U.S. Department of Housing and Urban Development/FHA; "Federal Housing Administration Risk Management Initiatives: Reduction of Seller Concessions and New Loan-to-Value and Credit Score Requirements," Table B, FR-5404-N-01, Federal Register, July 15, 2010, available at <http://federalregister.gov/a/2010-17326>

In 2008, FHA endorsements numbered 1.4 million and were, as of the third quarter of 2009, approaching an annual level of approximately 2 million (U.S. Housing Market Conditions, November 2009). Current endorsement levels are likely to be a historic maximum. In normal years, endorsement levels are closer to 1.5 million. In our modeling, we used 1.5 million as the default, 2 million as a maximum, and 1 million as minimum. Multiplying these endorsement numbers by the current share of subprime loans—1.42 percent—yields an assumed total of loans affected by the Notice of 21,300, with a maximum of 28,400 and a minimum of 14,200.

Benefit of Policy Change

The direct purpose of the policy change outlined in this Notice is to achieve the statutorily mandated minimum capital reserve ratio of 2 percent. The broader purpose of the policy change, however, is to ensure the survival of the FHA so that it can continue to provide mortgage loans when private markets fail. The current financial crisis has led to a credit crunch in which FHA has been a lender of last resort to low-income and risky borrowers. Today, FHA's share of the single-family mortgage market is approximately 20 percent, up from 2 percent in 2007, and the dollar volume of insurance written has jumped from just \$56 billion in 2007 to more than \$300 billion in 2009. Facilitating the provision of credit during a liquidity crisis is a welfare-enhancing activity, and FHA provides such a public benefit. Quantifying this benefit would involve measuring the extent to which this Notice increased the survival of the FHA and multiplying this probability by an estimate of the public benefit of FHA endorsement activities.

The current financial crisis has been attributed to many different causes—from government failure to a natural readjustment of markets. Many good arguments, however, support the theory that a financial crisis is the result of inefficiencies caused by imperfect information and perverse incentives. For example, Stiglitz, Jaramillo-Vallejo, and Park (1993) describe a negative selection externality that “bad” financial firms have on “good” financial firms during a credit crunch. The mere perception of a troubling credit market can affect investors’ willingness to provide equity to good firms. Because bad firms’ actions have spoiled the market, investors will not provide an efficient level of capital to the financial market. Cassidy (2009) explains in great detail how this scenario fits the current financial crisis. Large financial institutions have borrowed from others to make bets on risky assets using complex financial instruments. Given the complexity of these financial arrangements, it is difficult, even for well-informed insiders, to gauge the value of the firms holding these risky assets on their balance sheets. After housing price appreciation began to slow down and the value of the financial institutions investing subprime mortgage-backed securities (MBS) became uncertain, lenders were unwilling to provide credit to these large institutions because they feared that the borrower would not be able to repay. The result was an economy-wide credit crunch in which ordinary borrowers were not able to acquire a loan at a reasonable cost.

In another example of a market failure, the monitoring of financial firms is a public good that is undersupplied (Stiglitz, Jaramillo-Vallejo, and Park, 1993). Institutional banks will not decrease their leverage ratios to a point that reduces systemic risk for the entire financial market. Within a financial institution, management has the ability to limit its firm’s risk to decrease the likelihood that their firm collapses. The benefit from a firm lowering its risk, however, will have spillover benefits to all the financial market stakeholders by lowering the chance of contagion. As a result, a financial institution will not receive enough compensation to lower its leverage ratio to the efficient level. In hindsight, many of the financial institutions originating MBS can be considered to have become overleveraged during the years preceding the financial crisis of 2007–2010.

FHA loans are now in higher demand as a result of the failure or withdrawal of private investors from the mortgage market. Thus, the primary contribution of FHA to the public welfare is to facilitate the transition to sustainable homeownership for low-income or credit-constrained individuals when the market is not achieving this goal on its own. Because both private and public benefits (described in the next section) are associated with homeownership, a postponement of those benefits, as a result of a poorly functioning credit market, would represent a reduction in welfare.

Cost of Excluding Borrowers

The goal of FHA is to promote a national housing policy by providing access to mortgage credit for first-time homebuyers and others with limited financial wealth. Tightening underwriting guidelines will cause excluded households to delay their transition to homeownership status (or perhaps never make the transition). For refinance loans, the proposed restrictions will cause higher housing costs until such time as when the excluded households can improve their credit histories and gain more home equity through general market-level house price appreciation. A few analytical options estimate the gains to FHA loan program participants (and thus the cost of being excluded).

Costs of a Different Mortgage Loan

One approach to measuring the advantages of an FHA loan is to estimate the private gain to the household of an FHA loan by deriving an estimate of the additional costs a borrower would have to pay to receive a similar loan not insured by FHA. FHA does not earn a profit as a private mortgage insurer would. The average gain would be what the borrower would have had to pay for the same insurance on the private market. The disadvantage of this approach is that it is no longer current practice to insure borrowers with low credit scores. The private mortgage insurance market has never served the segment of borrowers who would be eliminated from FHA eligibility by this Notice, and the subprime market where they previously could have turned for home financing no longer exists. Although the FHA guaranty has value, it would be impossible to measure it through such a method.

Private Benefits of Homeownership

A second approach is to compare the private benefits of renting with the benefits of homeownership. Given the state of the market, an FHA-guaranteed loan may represent the only path to homeownership for low-income households. Those households that apply for a loan clearly believe that ownership is the optimal financial decision. Some of the potential benefits of homeownership would be a lower quality-adjusted price for housing, higher satisfaction, and wealth creation.³

A tenant could be expected to pay less for the same unit of housing as an owner occupant than as a renter. Higher costs for renters arise because of an information asymmetry. A landlord does not know in advance of extending a lease to what extent a tenant will inflict damage, make an effort to take care of the property, or report urgent problems. An owner occupant, on the other hand, has a financial interest in taking care of the property. Thus, both the depreciation and maintenance costs of rental housing can be expected to be higher—a market imperfection that will create an incentive for transition to owner-occupied housing. The difference in owner-occupant and renter behavior would also lead to a difference in the type of housing offered; in general, owner-occupied housing is of a higher quality.

Higher satisfaction from owner occupancy stems from the greater freedom to alter the property to suit one's taste and from not being subject to variable housing costs (when the alternative is a fixed-rate mortgage). It is also possible that owner occupancy provides access to neighborhoods and municipalities where long-term rental housing is hard to find.

A frequently perceived benefit of ownership is one of wealth creation. The federal government encourages investment in residential real estate by, in most cases, not taxing the capital gains from selling one's home. The asset-building advantage of homeownership materializes only when housing prices appreciate. The downside of homeownership, of course, is the risk of investing most of one's wealth into a single asset. Foreclosure would represent a greater hardship than eviction from a rental property. In the current market, it is unlikely that investment opportunity is the primary motive for becoming a homeowner.

Homeownership also has significant upfront costs. Becoming a homeowner entails paying upfront costs, such as realtor, settlement, and lender fees. A household could easily spend 10 percent of

³ For a good literature review of both the private and public benefits of homeownership, see Dietz and Haurin (2003).

the purchase price on transaction costs. A lower bound estimate would be 3 percent (see Dietz and Haurin, 2003). Given the fixed costs, households for whom owning is a better choice would not expect to move soon after purchasing. The transition to homeownership is associated with expected low mobility and, thus, a higher age, family size, and income.

The dollar value of the reduction in housing costs can be estimated with census data. The average income of households excluded by the Notice is \$70,000. For households of this income, the rent-to-income ratio is 14.90 percent, which translates to \$10,430 in annual rent payments. Suppose that becoming an owner leads to a reduction in housing cost for a unit of comparable quality. The benefit can be measured as a percentage reduction of the annual rent payments. For example, a sizeable 4-percent reduction leads to \$417 annual benefit to households (4 percent x \$10,430).

The total value of the annual reduction in housing costs will be affected by the number of years that the benefit is denied and by the discount rate. We assume that the effect of denying the opportunity of an FHA loan to the population in question will be to delay homeownership. As the length of the delay increases, so does the loss in consumer benefits. With higher discount rates, the present values of future years are reduced and thus the private opportunity cost of delay is diminished. Households that find the transition to homeownership a beneficial decision will work to repair their credit score. Most of the negatives will be removed from a credit report after 7 years, and it is possible to increase credit scores significantly after 3 years by better managing consumer debt. A reasonable outside estimate of the number of years homeownership would be delayed is 5 years. We choose 3 percent as our default discount rate given the similarity of that rate to what was used in the FHA actuarial model. This calculation is shown in exhibit 3, column 2.

The size of the rental externality also plays a role. It can be seen as the difference between the sum of the depreciation and maintenance rates of rental housing and owner-occupied housing. Conventional wisdom among lenders is that households should budget from 1 to 3 percent of the original purchase price for annual maintenance to prevent significant depreciation.⁴ If the rental depreciation rate were twice that of owner-occupied housing, the range for rental housing maintenance costs would be 2 to 6 percent, making 4 percent a plausible outside estimate of the size of the rental externality. Given the annual benefit of \$417 (based on an externality of 4 percent), a delay of 5 years, and a discount rate of 3 percent, the present value of the loss would be \$1,922.

Although the argument of Henderson and Ioannides (1983) has great theoretical validity, not much empirical work supports the claim that renters pay more than homeowners for constant-quality housing. Evidence exists, however, that rental housing does depreciate at a greater rate than owner-occupied housing. Iwata and Yamaga (2004) estimated the probability of a house being in “sound” condition, depending on whether it was owner-occupied housing, tenant-occupied housing, or landlord-owned housing. They found that the probability of a house being in sound condition decreases by 6 percent if a house is landlord-owned housing compared with owner-occupied housing. Wang, Grissom, and Webb (1991) estimated the price difference of a single-family home, depending on whether it was renter occupied or owner occupied. If the house had been a rental property, its selling price would have decreased by \$2,428, which is approximating 3.7 percent of

⁴ See Riha (2010).

the price of a “standard house.” This 3.7-percent decline in value is roughly equal to our estimate of the rental externality derived using assumptions concerning the differences in maintenance and depreciation rates. Shilling, Sirmans, and Dombrow (1991) found that renter-occupied housing depreciates 1.9 percent more each year than owner-occupied housing. Using repeat sales data, Gatzlaff and Green (1998) found that the difference is very small, only 0.16 percent. This negligible difference in housing value may reflect that landlords are using the additional revenue collected through the rental externality to invest in their property.

The reduction in housing costs through homeownership is considered a benefit to society because the source of the reduction is a decline in the cost of supplying the housing. If it were only a transfer between consumers (renters who become homeowners) and producers (landlords), then the transition to homeownership would represent a zero-sum gain for society. A social gain exists, however, because the removal of the rental externality is equivalent to a reduction in the cost of supplying housing services for the household that made the transition to ownership. Landlords charge a rental premium to compensate them for the damage that occurs to their property given the incentives that renters face. Transition to homeownership changes those incentives and generates net benefits for society.

A final and important point to make concerning consumer benefits is that not all borrowers excluded by the Notice would have realized the benefits of homeownership. Some of those who receive a loan will default and be foreclosed upon. To accurately measure the private benefits of homeownership, we need to account for the chance that not all households who become owners will remain owners. The probability that a homeownership will survive until a specific year without a foreclosure is equivalent to 1 less the probability that the household will not be foreclosed upon, or the cumulative claim rate for that year. Cumulative claim rates increase over time with the greatest increase occurring in the third or fourth year, yielding an S-shaped survival curve. Using the cumulative claim rates for the excluded group in the fifth year of approximately 11.1 percent, the estimate of the expected private loss is \$1,709 per household (88.9 percent x \$1,922).

Public Benefits of Homeownership

A third approach to measuring the advantages of an FHA loan would be to evaluate the social benefits of a household becoming a homeowner. The traditional argument for homeownership is that a homeowner will invest more in his or her community because a financial incentive exists to improve the quality of the neighborhood and thus home values. Maintaining properties will also have positive spillover effects to neighboring property values. In addition, an engagement by homeowners will lead to greater political activity, a more amenable urban environment, and less crime. A literature exists that also links housing tenure with child outcomes (health and education). One negative social effect of homeownership is reduced mobility, which leads to rigidity in the labor market and thus lengthens economic downturns.

This type of empirical research has some obvious methodological challenges. Disentangling the explanatory variable (tenure status) with other characteristics of the household is difficult when the path to ownership depends on credit score, which depends on the stability and thrift of the household. Strong empirical evidence has been found, however, for the positive effect on child outcomes, political activity, and wealth accumulation and for the negative effect on mobility.

Homeownership seems to have both social costs and benefits, and the empirical evidence for some of the most compelling arguments for encouraging homeownership is weak. A new wave of empirical research has generated much more modest estimates of the social value of homeownership. For the sake of argument, however, we choose one study by Coulson and Li (2010) that does not focus on the cause of the benefits but produces an empirically rigorous estimate of the impact of adding a homeowner to a neighborhood.

Coulson and Li (2010) used data from the American Housing Survey and analyzed housing clusters that included between 6 and 16 single-family homes. They found that a 100-percent increase in the homeownership rate in a cluster raises the price of a housing unit by 40 to 50 percent. In one example, they calculated that the transition of an additional unit would raise the value of other units by 4.1 percent. If the average price per unit is \$170,000, this calculation signifies an increase of \$6,970 per unit. Therefore, the externality benefit of ownership for the rest of the typical cluster of 9 homes is \$62,370 (9 x \$6,970). The value of 1 year of public benefits is the discount rate times the total stream of benefits, or \$1,882 (3 percent x \$62,370). The opportunity cost to the public of preventing transition to homeownership is the loss of the present value of the stream of public externalities. If a household's transition were delayed for 5 years, the present value of the stream of lost public benefits would be \$8,673 (at a 3-percent discount rate and \$1,882 annually) as shown in exhibit 3.

The expected loss from delay is equal to the dollar amount of the lost benefit times the probability that the household would remain as owner occupants. This probability is equal to 1 less the cumulative claim rate. With a delay of 5 years, the expected loss from delay would be \$7,711. As shown in exhibit 3, the sum of the private and public costs is \$10,595 and the expected total cost is \$9,419.

In the previous estimate of the expected cost to society of excluding a household from homeownership, we assume that the only effect of excluding a household is the denial of the benefits of homeownership. We did not account for the possible social costs of foreclosure for every homeowner created. Sizeable losses exist, however, from a foreclosure borne by consumers, lenders, property markets, and local governments. An estimate of the deadweight losses (social costs)

Exhibit 3

Net Expected Opportunity Cost of Delaying Households From Transition to Homeownership (3-Percent Discount Rate)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Delay in Years	Claim Rate (Cum.)	Private Cost of Delay (2)+(3) (\$)	Public Cost of Delay (\$)	Total Cost of Delay (\$)	Expected Cost of Delay (1-(1))x(4) (\$)	Cost of Foreclosure (\$)	Expected Cost of Foreclosure (\$)	Net Expected Cost of Delay (5)-(7) (\$)
1	0.14	417	1,882	2,299	2,296	52,190	72	2,224
2	1.88	810	3,656	4,466	4,382	49,194	929	3,453
3	5.60	1,192	5,378	6,570	6,201	47,761	2,743	3,458
4	8.61	1,562	7,050	8,612	7,870	46,370	4,221	3,649
5	11.1	1,922	8,673	10,595	9,419	45,020	5,446	3,974
6	13.1	2,271	10,249	12,521	10,879	43,708	6,436	4,442
7	14.6	2,610	11,780	14,390	12,284	42,435	7,178	5,106

from a foreclosure would include transaction costs, the distress discount on the property, and the negative effect on the value of surrounding properties.

To calculate transaction costs, we sum broker and legal fees. Broker fees are 6 percent of the property value ($\$10,200 = 6 \text{ percent} \times \$170,000$) and legal fees are 2 percent of the loan value ($\$2,720 = 2 \text{ percent} \times \$136,000$, assuming an 80-percent LTV ratio). Total transaction costs are $\$12,920$.

The reduction in property value from the investor being forced to sell a home because it is foreclosed upon (stress discount) is a second source of deadweight loss. It is not obvious, however, whether the stress discount should be counted as a cost rather than a transfer. Although the seller will lose from a reduction of property value, the buyer may gain from the opportunity to purchase at a lower price. Pennington-Cross (2006) found that Real Estate Owned (REO) properties suffer a 22-percentage point discount in appreciation rates compared with the metropolitan average appreciation rates. Union Bank of Switzerland (UBS, 2008) uses a stress factor of 15 percent to estimate the additional decrease in value from selling a foreclosed property. One obvious explanation for this result is one of reverse causation; a default may occur because appreciation in a particular submarket lags behind the metropolitan average. Negative price appreciation may result in rational default by the borrower once the value of the loan exceeds the value of the home.

Two other theoretical explanations for this empirical result provide insights into economic behavior. The first explanation is the possibility that in an environment of asymmetric information a foreclosure is a signal of a “lemon” property, in which case the buyer is compensated through a lower purchase price for taking a risk. A second explanation of the stress discount to the values of foreclosed homes involves behavior that creates a deadweight loss to society. Frequently, before owners sell a home, they invest a great deal into the structure, at least into the cosmetic aspects of the property. An owner who knows that he or she will default will cease to maintain and upgrade the property and may even actively disinvest (sell appliances or fixtures, for example). The depreciation to the property is structural and real; the new owner must invest resources to restore the property to its preforeclosure state. Harding et al. (2000) found evidence of this externality: borrowers with high LTV ratios spend, on average, 19 percent less on maintenance than those with lower LTV ratios. Knowledge of impending default would increase the overuse of housing. We assume that this structural damage is equivalent to the entire value of the UBS estimate of the stress discount on the property, which yields $\$25,500$ ($15 \text{ percent} \times \$170,000$).

Foreclosures resulting in long-term vacancies have a negative effect on the value of neighboring properties by reducing the physical appearance of the neighborhood, attracting crime, and depressing the local economy. The study of Immergluck and Smith (2006) reports a reduction of 0.9 percent of value for all properties within one-eighth of a mile. One approach to using the results from this literature would be to limit the negative externalities to close neighbors (ones directly adjacent and across from the foreclosed property: two on each side of the property and five across the street). Doing so would limit the aggregate effect to $\$13,770$ ($0.9 \text{ percent} \times \$170,000 \times 9$).

The total social cost per foreclosure would be $\$52,190$ ($\$12,920 + \$25,500 + \$13,770$). The expected social cost of foreclosure is the sum divided by the length of the delay of the probabilities of a foreclosure occurring in a particular year (the conditional claim rate) times the discounted value of the social cost of the foreclosure. With our assumed cumulative claim rates, a delay of

5 years, and a discount rate of 3 percent, the expected social cost of a foreclosure is \$5,446. As shown in exhibit 3, column 8, the net expected cost of excluding a borrower is thus: $(1 - \text{probability of foreclosure}) \times \text{opportunity cost of preventing ownership} + \text{probability of foreclosure} \times \text{cost of foreclosure}$. With a 5-year delay, the net expected cost of excluding a borrower is \$3,974.

Transfers to FHA

When FHA tightens its underwriting guidelines, it will reduce the net claim expense associated with loans for which delinquency leads to an insurance claim. HUD bases its proforma budget accounting on forecasts of claim and prepayment rates calculated using the forecasting model from the independent actuarial study of the MMIF (IFE, 2009), but using the economic projections of the President's Budget. The actuarial models rely on 30 years of actual FHA experience and are calibrated to produce loan-performance outcomes using forecasts of future economic conditions. The following equation represents the expected net claim expense associated with any given loan, in any given year:

Expected claim amount = claim rate x (loss rate x unpaid loan balance).

The claim rate is the number of claims during a particular time period divided by the total number of loans endorsed when an annual insurance cohort was underwritten. For the FY 2011 cohort, the most recent budget forecasts a 19.63-percent cumulative claim rate. The time trend of the claim rates over 30 years is estimated using the predicted cumulative claim rates from the actuarial review (IFE, 2009: page F-7). The cumulative claim rates from the actuarial review were inflated by a factor of 2.76 to account for the higher claim rate predicted among the higher risk, excluded group (19.63 percent/7.11 percent).

The loss rate is the net loss after property-sale recoveries, as a percentage of the unpaid loan balance on the defaulting loan. Exhibit E-1 of the actuarial review provides a time series of loss rates. The 2000s began with loss rates as low as 32 percent but reached 56 percent by 2008. Current estimates by FHA for the 2011 cohort is that the loss rate on average is 47.64 percent and that the loss rate for the excluded borrowers will be higher at 51.22 percent.

Using recent FHA data, we found that the average loan originated to the group of individuals affected by the Notice is smaller than the global average: \$153,000 as opposed to \$176,600. Using \$150,000 as our default and assuming an interest rate of 6 percent, the annual mortgage payment would be \$10,987. The decline in the unpaid balance is slow at first, decreasing approximately \$2,000 in the first year, because mortgage payments consist of primarily interest at the beginning of the repayment; by the end of the loan's 30 years, the decline reaches \$10,000.

For example, in the second year, the unpaid balance on the \$150,000 loan would be \$148,103. The claim amount, therefore, would be \$75,858 (51.22 percent x \$148,103). Using an annual unconditional claim rate of 1.74 percent,⁵ the expected claim amount would be \$1,295. The present value of the expected claim paid in the second year would be \$1,258 (when the discount rate is approximately 3 percent).⁶

⁵ The unconditional claim rate is an annual rate consistent with the annual change in the cumulative claim rate.

⁶ The time series of discount rates is those used in the actuarial review.

Next, we summed the present values of the expected claims paid over all years to arrive at an estimate of the expected claim. For our parameters, the expected claim amount is \$10,268. We multiplied this amount by the original number of endorsements to arrive at a total across all loans. Whether FHA should expect a gain or loss depends on the mortgage insurance premium income:

Expected loss per loan = expected claim amount – upfront premium – periodic premium income.

The upfront mortgage insurance premium is equal to 2.25 percent of the original loan balance, or \$3,375, when the loan balance is \$150,000. For LTVs greater than 95 percent, which represent approximately 40 percent of the affected borrowers, the annual premium is 0.55 percent of the unpaid loan balance and is collected until the unpaid balance reaches 78 percent of the original loan amount. In a specific year, the proportion of loans that pays the periodic premium is assumed to be (1 – unconditional claim rate) plus one-half the prepayment rate (to reflect that prepayers would have paid one-half per year). The expected net present value of the premium income (upfront + annual) is \$5,777 (\$3,375 + \$2,402). The net loss per loan to FHA is \$4,491.

A reduction of net losses from the subject loans provides a direct benefit to the financial status of the MMIF. Over time, it is also possible that this reduction of FHA losses could lead to benefits to remaining FHA-insured borrowers through lower premium rates. The annual aggregate benefits would be approximately \$96 million when FHA endorses 1.5 million loans annually and the size of the group affected is 21,300.

Aggregate Impact

When FHA endorses 1.5 million loans and this Notice excludes 21,300 loans, the total transfer to FHA would be \$96 million and the (net) cost of excluding the borrowers would be \$85 million. To generate an estimate of the net public benefit of the policy change would also entail attaching a value to the qualitative argument concerning the public benefit of FHA in providing liquidity. The aggregate impacts of the program in the base case are summarized in exhibit 4 below.

Exhibit 4

Costs and Benefits of Notice

Per-Loan Transfer—Avoided FHA Loss			
(1) Expected claim	\$10,268		
(2) Premium income	\$5,777		
(3) Expected FHA gain	\$4,491	(1) – (2)	
Per-Loan Cost—Cost of Delaying Transition to Ownership			
(4) Expected total cost	\$9,419		
(5) Expected cost of foreclosure	\$5,446		
(6) Expected net costs	\$3,974	(4) – (5)	
Total Costs and Benefits			
(7) Loans endorsed in year 1	1.5 million		
(8) Loans affected by the Notice	21,300	0.0142 x (8)	
(9) FHA losses avoided	\$96 million	(3) x (8)	
(10) Costs of exclusion	\$85 million	(6) x (8)	

FHA = Federal Housing Administration.

Sensitivity Analysis

A sensitivity analysis is merited because the parameters of this model are difficult to predict. The number of loans endorsed, average amount of the loan, loss rate, claim rate, and capitalization rate all are subject to trends in the real estate and credit markets. The number of loans endorsed does not affect the per-loan net benefits, but it will affect the aggregate costs and benefits proportionally. In exhibit 5, the aggregate costs and transfers are shown for different numbers of loans affected by the rule. The number could vary for two reasons: (1) total endorsements vary or (2) the proportion of riskier loans varies. For example, when the Notice was first considered, low FICO (credit-scoring model) and high LTV borrowers constituted a greater share of FHA borrowers than they do now. It is difficult, however, to predict trends in credit scores. We used the scenario of 21,300 loans excluded throughout the analysis. It is reasonable to assume that loans of those characteristics would be 50 percent lesser or higher in volume.

Exhibit 5

Aggregate Costs and Transfers of the Notice by Loan Endorsements

Loans affected	14,200	21,300	28,400
Transfer to FHA	\$64 million	\$96 million	\$144 million
Costs-surplus lost	\$57 million	\$85 million	\$127 million

FHA = Federal Housing Administration.

Alternatives Considered

As mentioned previously, this Notice is only one approach to restoring the MMIF capital reserve account. To a large extent, many of the alternative policies are currently being pursued. This Notice is focused on riskier borrowers. One way in which this particular Notice could vary is by the stringency of the underwriting standards. Consider, for example, a Notice that excluded borrowers with a FICO score below 620, a floor that is commonly used by private lenders. There are three parameter changes from this alternative. The first is the number of loans affected (9.26 versus 1.42 percent of all loans endorsed); the second is the cumulative claim rate, which would be slightly lower; and the third is the loan size, which would be higher—\$159,000 as opposed to \$153,000. The net effect is that the transfer per loan of the alternative drops by approximately \$1,000 to \$3,336. In addition, the average social cost of excluding a borrower rises by approximately \$900.

The change in the claim rates will affect whether the net benefit per loan is positive or negative, the size of loan will affect the size of the transfer benefit per loan, and the number of loans will affect the aggregate impact of the Notice. The lower claim rates lead to a lower transfer to FHA—\$3,336 as opposed to the base case estimate of \$4,491 of this Notice. Although the aggregate transfer to FHA would be greater (\$460 million) because of the higher number of loans, so would be the aggregate net expected cost of delaying homeownership (\$668 million). Furthermore, the portion of loans excluded under this alternative would be disproportionately composed of borrowers belonging to protected classes under the Fair Housing Act of 1968.

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References

Cassidy, John. 2009. *How Markets Fail: The Logic of Economic Calamities*. New York: Farrar, Straus and Giroux.

Coulson, Edward, and Herman Li. 2010. Measuring the External Benefits of Homeownership. Working paper. <http://econ.la.psu.edu/~ecoulson/ownex.pdf> (accessed June 25, 2010).

Dietz, Robert, and Donald Haurin. 2003. "The Social and Private Micro-Level Consequences of Homeownership," *Journal of Urban Economics* 54: 401–450.

Gatzlaff, Dean, Richard Green, and David Ling. 1998. "Cross-Tenure Differences in Home Maintenance and Appreciation," *Land Economics* 74: 328–342.

Harding, John, Thomas Miceli, and C.F. Sirmans. 2000. "Do Owners Take Better Care of Your Housing Than Renters?" *Real Estate Economics* 28 (4): 663–681.

Henderson, Vernon J., and Yannis M. Ioannides. 1983. "A Model of Housing Tenure Choice," *American Economic Review* 73 (1): 98–113.

Immergluck, Daniel, and Geoff Smith. 2006. "The External Costs of Foreclosure: The Impact of Single-Family Mortgage Foreclosures on Property Values," *Housing Policy Debate* 17 (1): 57–80.

Integrated Financial Engineering, Inc. (IFE). 2009. *Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund (Excluding HECMs) for Fiscal Year 2009*. Report prepared for the U.S. Department of Housing and Urban Development. Washington, DC: U.S. Department of Housing and Urban Development. Available at http://hud.gov/offices/hsg/comp/rpts/actr/2009actr_exhecm.pdf.

Iwata, Shinichiro, and Hisaki Yamaga. 2004. Rental Externality, Tenure Security, and Housing Quality. Working paper. http://www.asres.org/2004Conference/papers/51_Iwata%20&%20Yamaga.pdf (accessed July 1, 2010).

Pennington-Cross, Anthony. 2006. "The Value of Foreclosed Property," *Journal of Real Estate Research* 28 (2): 193–214.

Riha, John. 2010. "The Value of Home Maintenance." March 9, 2010. <http://www.houselogic.com/articles/value-home-maintenance/> (accessed July 2, 2010).

Shilling, James D., C.F. Sirmans, and Jonathan F. Dombrow. 1991. "Measuring Depreciation in Single-Family Rental and Owner-Occupied Housing," *Journal of Housing Economics* 5 (1): 1–17.

Stiglitz, Joseph, Jaime Jaramillo-Vallejo, and Yung Park. 1993. "The Role of the State in Financial Markets." In *World Bank Research Observer* (Annual Conference on Development Economics Supplement): 19–61. Available at <http://www.econ.uoa.gr/UA/files/1924580762.pdf>. (accessed July 1, 2010).

Union Bank of Switzerland (UBS). 2008. "Severity: Where Does It Come From?" *UBS Mortgage Strategist*, August 12.

U.S. Department of Housing and Urban Development (HUD), Office of Policy Development and Research (PD&R). 2009. *U.S. Housing Market Conditions*, 3rd Quarter (May). Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Available at <http://www.huduser.org/portal/periodicals/ushmc/winter09/index.html>.

Wang, Ko, Terry V. Grissom, James R. Webb, and Lewis Spellman. 1991. "The Impact of Rental Properties on the Value of Single-Family Residences," *Journal of Urban Economics* 30: 152–166.
