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Mortgage Reform and the Countercyclical Role of the Federal Housing Administration's Mortgage Mutual Insurance Fund

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On February 11, 2011, the Treasury Department, along with the Department of Housing and Urban Development (HUD) released a white paper to Congress outlining the administration's proposals for reforming the housing finance market. The plan calls for private markets to serve as the primary sources of mortgage credit and bear the burden for losses, while requiring financial institutions to adhere to more conservative underwriting standards that require homeowners to hold more equity in their homes. The plan also calls for restructuring the government's long-term role in the housing finance system and ensuring access to quality, affordable housing for the underserved.

The white paper lays out three different reform options. In the first option, the government creates a reinsurance program that guarantees mortgage-backed securities (MBS) during a crisis. Under this approach, a group of private mortgage companies provides guarantees for MBS that meet certain strict underwriting criteria. The government charges a premium for its reinsurance that is used to offset losses, guarantees only the MBS after the mortgage

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entities take losses, and does not backstop the entities' debt. In this model, the federal government still provides the backstop for the private guarantors.

In a second option, the government stays out of the mortgage market almost entirely, retaining the Federal Housing Administration (FHA) in support of housing programs for low-income households. A third option also reduces the government's role, but maintains a guarantee mechanism that expands in down markets to serve as a backstop if private capital withdraws.

Despite their substantial differences, all three proposals retain a significant role for the FHA. Indeed, in the recent crisis, the FHA played a major countercyclical role in mortgage lending; its share of purchase mortgage loans increased from 4 percent of the market in 2005 to more than 23 percent in June 2010 (U.S. Department of Housing and Urban Development 2010a).[1] For this reason, it is vital that discussions surrounding mortgage finance reform consider what role the FHA will play in the new regime.

The goal of this article is to make two points relevant to assessing what role the FHA should play. First, when the national housing market declines, the federal government typically supports mortgage lending and, since the FHA is part of the federal government, it will in all likelihood play a major role in this effort. Second, one of the FHA's missions is to lend to low- and moderate-income households, and it does this partly by allowing for low down payments. When house prices drop, many of these loans will end up with negative equity, that is, a borrower will owe more than his house is worth, and it is well documented that negative equity is the most important factor in default. Consequently, the FHA's exposure to risk will increase. Whether countercyclical mortgage lending by the federal government is good policy is an open question and one that I do not take a stand on. Nevertheless, it should be clear that if such a lending policy permits low down payments during a declining housing market, the costs of such a policy may be significant.

The next section provides a brief description of the FHA and its Mutual Mortgage Insurance fund (MMI fund). Section 2 illustrates the risks to countercyclical lending by providing estimates of negative equity in a sample of FHA-endorsed mortgages from Florida. Florida is *not* representative of the rest of the country; indeed, its housing market is in significantly worse shape than many other states, but it is a useful case study because house price dynamics are very strong there and the availability of public house price data allows me to estimate county-level price indexes. Section 3 concludes with a discussion of policy implications.

[1] In that same month (June 2010), FHA mortgages accounted for more than 47 percent of new home purchase lending.

1. THE COUNTERCYCLICAL ROLE OF THE FHA AND READING THE TEA LEAVES OF RISK IN THE MMI FUND

Background on the FHA

The FHA provides mortgage insurance on loans made by FHA-approved lenders for single-family and multifamily homes, including manufactured homes, along with hospitals. The most popular program—known as Section 203(b)—offers 15- and 30-year fixed-rate mortgages for single-family dwellings. Since the focus of this program is creating access for underserved or targeted populations, FHA loans go to low- or moderate-income borrowers and those with insufficient or poor credit to qualify for prime loans. Given the targeted population, Congress limits the size of mortgages the FHA can insure based on an area's median home price. The main advantages of a FHA versus prime rate conventional loan with private mortgage insurance is that the credit-qualifying criteria for a borrower are not as strict as the criteria required to qualify for conventional loan financing, and the down payment or equity requirements can be significantly lower. FHA mortgage insurance provides lenders with protection against losses resulting from homeowner defaults. The cost of the mortgage insurance is borne by the homeowner and typically is included in the monthly payment. In most cases, the insurance cost is eliminated after five years or when the loan-to-value ratio falls to 78 percent of the value of the property.

The FHA was created in 1934 to deal with the decline in the housing market. A series of events that led to the banking crises of the 1930s, coupled with high unemployment, resulted in widespread housing foreclosures in a fashion similar to what has been experienced recently. For example, the collapse of the housing market was so severe that new construction starts decreased from more than 700,000 per year throughout the 1920s to only 93,000 in 1933 (Vandell 1995).

This countercyclical role for the FHA is also evident in events of the 1980s. As home values fell and private mortgage insurers pulled back, the FHA served as a backstop by providing loans. As a result, in the 1980s the fund lost close to $6 billion, and its economic value declined from 5.3 percent of insurance-in-force to less than 1 percent (Henderschott and Waddell 1992). Much of this loss can be attributed to the FHA's response to an anemic housing market and a persistent recession. The FHA's policies to stimulate residential mortgage activity can be allocated into three categories. First, there was a shift from the traditional annual insurance premium to a one time upfront premium that the borrower could amortize into the mortgage. Second, the FHA lowered the down payments on qualifying loans from 10 percent to 3 percent. Third, the FHA relaxed underwriting standards on the borrower and the property. In all three cases the safety of the loans was reduced, stimulating the probability of increased defaults in a sluggish market. The increase in defaults raised concerns of possible insolvency in the MMI fund at that time.

In response to the deterioration of the MMI fund, Congress passed the Cranston-Gonzalez National Affordable Housing Act (NAHA) in 1990. Among other things, this act mandated that the MMI fund maintain a capital ratio of at least 2 percent. The capital ratio, as defined in NAHA, is the ratio of the fund's capital or economic net worth to its unamortized insurance-in-force.

During the 1990s, the FHA retained a significant market share (Ambrose and Pennington-Cross 2000). Afterward, however, its share dramatically declined from 19 percent in 1996 to 4 percent in 2005, with most of the decline occurring after 2001 (U.S. Department of Housing and Urban Development 2010a). During this period its market share was taken by the large increase in high-risk private lending (e.g., Alt-A, interest only, subprime, etc.), as well as partially by Fannie Mae and Freddie Mac (Jaffee and Quigley 2010).

In the last few years, as high-risk private lending collapsed, the FHA's market share dramatically rose; in 2010 it was more than 33 percent (U.S. Department of Housing and Urban Development 2010b). As in the 1980s, underwriting criteria were relaxed in response to the downturn in the market. For example, in 2008, mortgage loan limits were increased by at least 25 percent, with high cost areas (e.g., Hawaii, California) increasing to as high as $729,750 (U.S. Department of Housing and Urban Development 2008).

As a consequence of these policies, the FHA has experienced credit losses in recent vintage of loans. HUD's budget for the FHA for 2008–2011 included shortfalls stemming from the FHA insurance program. This was the first time in three decades that HUD made a request to Congress for taxpayer support of the FHA (U.S. Department of Housing and Urban Development 2010b).

The Government Accountability Office is projecting taxpayer funded subsidies of half a billion dollars through 2011 (U.S. Government Accountability Office 2010). For 2009, the FHA's budget includes expenses related to defaulted loans in excess of receipts from borrowers' insurance premiums in 2010, requiring additional appropriations for operations. The next section provides more details on the operation of the MMI fund. As the FHA continues to expand its presence and likewise its portfolio of insurance endorsements, it is useful to examine the threats to future solvency as both market recovery and legislative reform of mortgage markets appear to be on a slow trajectory.

The State of the MMI Fund and Threats to FHA Solvency

The MMI fund insures mortgages on single-family homes consisting primarily of detached houses and townhouses (Herzog 2010).[2] The largest portion of the MMI fund consists of mortgage insurance provided under the FHA's

[2] In October 2008, insurance on new originations for condominium units was added to the MMI fund.

Section 203(b) program, which is for one- to four-family residences. Under the 203(b) program, any person able to meet the cash investment, mortgage payments, and credit requirements may obtain a loan insured by the FHA from a private lending institution to purchase a home. The MMI fund also contains other single-family mortgage programs like condominium endorsements issued after 2008 but previously insured under Section 234(c), Section 203(k) purchase and rehabilitation, and Section 255 home equity conversion mortgages.

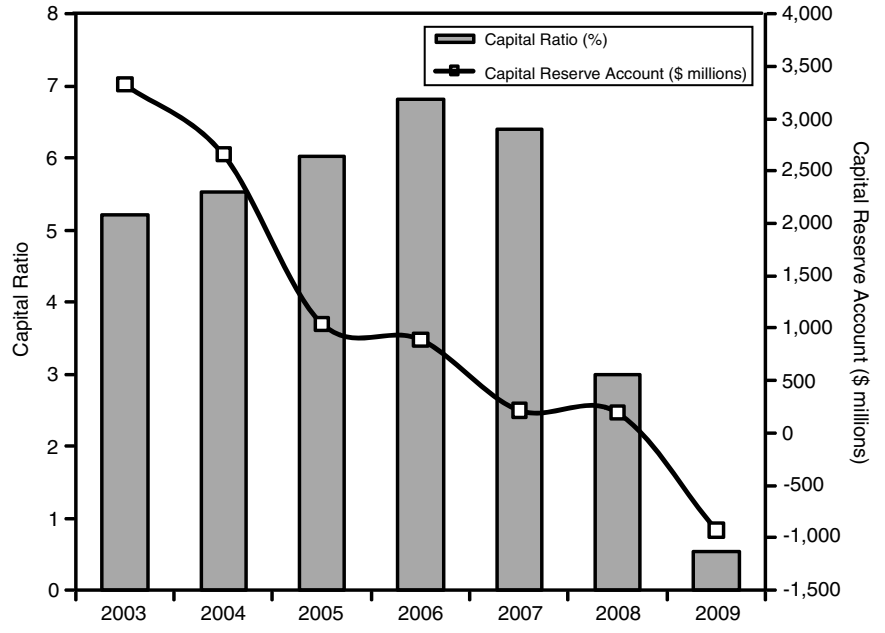
While the FHA has other insurance funds, the bulk of FHA mortgage endorsements are insured under its MMI fund.[3] As of January 2011, the FHA insured more than 6.8 million mortgages with an outstanding balance of $947.8 billion (U.S. Department of Housing and Urban Development 2011). The MMI fund maintains liquidity in its insurance programs primarily by generating premium, fee, and interest income, but also through U.S. Treasury borrowing and Congressional appropriations if needed.

The MMI fund is comprised of two core accounts: a financing account and a capital reserve account. The financing account is the main reserve account and is required to hold reserves equal to the present value of net losses projected over the next 30 years. To the extent the reserves exceed the net present value cost of the loan guarantees, these excess funds are paid to the capital reserve account. If the present value estimated net losses exceed the reserves, funds are paid from the capital reserve account to make up the difference. This is somewhat analogous to a checking and savings account. The financing account holds reserves, pays default claims or other losses, and receives any payments received from the public; the capital reserve account holds surplus cash (Stevens 2009; Sullivan 2010). The needed reserves are estimated annually based on a yearly review of economic conditions and projections. Then the cost of outstanding loan guarantees are reevaluated, and the amount of reserves held in the financing account are adjusted to ensure there are sufficient resources to cover the net present value of estimated costs of outstanding guarantees.

The accounting for the MMI fund uses the term "economic value" of the fund. Economic value is a combination of the current cash available to the fund, plus the net present value of all future cash inflows and outflows expected to result from the outstanding mortgages in the fund. Current capital resources are largely composed of nonmarketable Treasury securities, cash flows into the fund from premiums, and the sale of foreclosed properties. Outflows include claims on foreclosed mortgages, premium refunds, and administrative expenses. Estimating the net present value of future cash flows is an actuarial

[3] The FHA operates five insurance funds. The other funds are the General Insurance fund, the Special Risk Insurance fund, the Cooperative Management Housing Insurance fund, and the Hope for Homeowners fund.

Figure 1 The Erosion of the Reserve Account



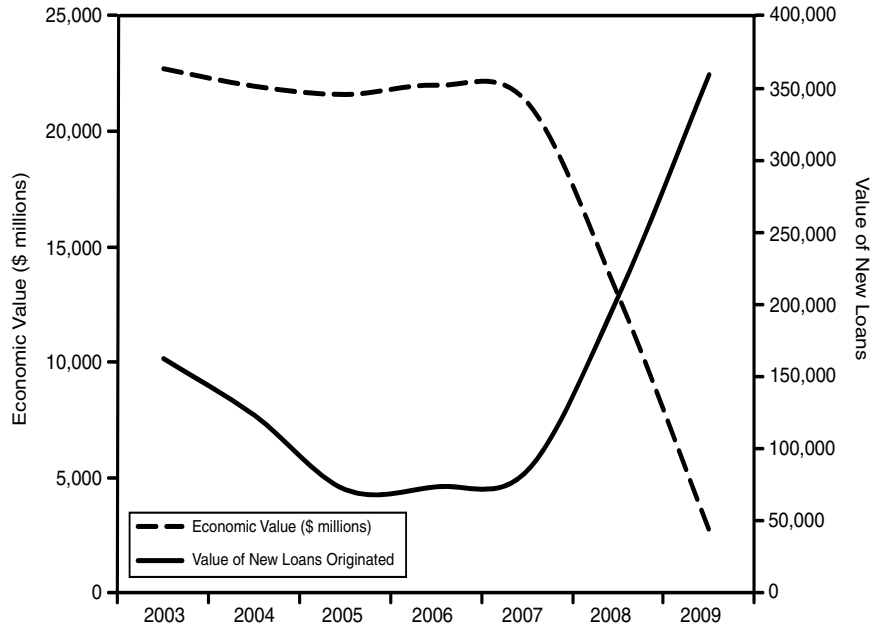
Notes: The data for this chart have been extracted from the FHA actuarial reviews from 2007–2009, and from the FHA Fiscal Year 2009 Annual Management Report (Integrated Financial Engineering, Inc. 2007, 2008, 2009). The capital ratio (left y axis), or reserve ratio, is the Congressionally restricted (2 percent minimum) reserve requirement representing the percent of the MMI fund's amortized insurance-in-force that is available for covering claims. The bars represent the dollar value of the capital reserve account. The MMI fund, statutorily bound to solvency, carries a deficit as of 2009.

exercise based on assumptions about future economic conditions, including predictions of mortgage foreclosures and prepayment.[4]

The law requires the capital ratio to be at least 2 percent in order for the MMI fund to be considered actuarially sound. Figure 1 indicates that, over the observation period, the capital ratio reached as high as 7 percent. The capital reserve account, however, has been depleted from more than $3.1 billion to deficit levels as of 2009, and continued deficits are projected through 2011. Excessive defaults threaten the capital ratio and will likely result in HUD submitting additional requests to Congress for appropriations to stabilize the

[4] Capital in this context refers to the economic net worth of the MMI fund, as determined by the annual audit.

Figure 2 The Economic Value of Insurance-in-Force

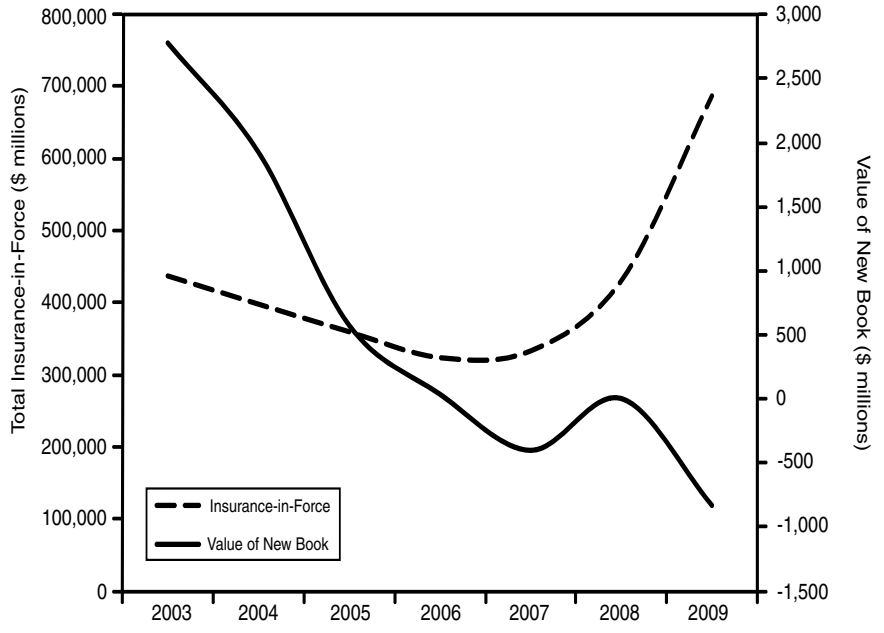


Notes: The data for this chart has been extracted from the FHA actuarial reviews from 2007–2009 (Integrated Financial Engineering, Inc. 2007, 2008, 2009). The economic value (left y axis) represents an estimated present value of the expected cash flows to be derived from the outstanding insurance-in-force at the end of each fiscal year. This estimate accounts for prepayment and default projections, the calculations of which are provided in the actuarial report for 2009. The value of new loans (right y axis) is the total endorsements for each year based on the appraised value at origination.

MMI fund. In fact, projections from the FHA indicate the 2 percent threshold will not be attainable before 2012, and this estimate is based on a model predicting a modest recovery pace (U.S. Department of Housing and Urban Development 2010b).

Figure 2 further suggests that the recent expansion of business for the FHA has increased the instability of the MMI fund. The nominal or appraised value of new loans originated is plotted against the economic value of the MMI fund. During the growth period of the subprime market, the economic value of the fund was relatively unchanged (there was a low level of insurance claims during the period), while the value of new endorsements fell (as volume fell). In 2007, however, the value of new loans grew with the expansion of new endorsements. The economic value of the fund, composed of the discounted value of the expected cash flows, fell dramatically. This is in response to the

Figure 3 Economic Value of New Business



Notes: The data for this chart has been extracted from the FHA actuarial reviews from 2007–2009 (Integrated Financial Engineering, Inc. 2007, 2008, 2009). The total insurance-in-force (left y axis) represents the total exposure of the MMI fund to claims. The value of new book (right y axis) represents the estimated value of the current endorsements. Clearly the trend for value is downward, while the exposure is increasing rapidly as the FHA assumes a renewed presence in the mortgage market.

increased threat from defaults and the inclusion of lower quality (higher risk) loans.

One measure of the fund's financial soundness is the MMI capital ratio, which is the ratio of the economic value of the MMI fund to the balance of the MMI insurance-in-force (Figure 3). In fiscal year 2008, the estimated economic value of the MMI fund decreased with the forecast of expected housing value declines. Conversely, the total MMI insurance-in-force increased significantly because of the value of new endorsements. The combination of these factors resulted in the decrease in the capital ratio previously illustrated. This is expected as the volume of loans is increasing. More seriously, the expected value of new loans made during declining property values, particularly in 2009, has a negative cumulative value. Taken together, these first

three figures illustrate an account that is under financial stress because of countercyclical lending.

2. RISK IN THE FHA POOL AT THE LOCAL LEVEL

It is well documented that house values impact default rates. Epperson et al. (1985) initiated a long discussion of the influences that changing house values and the loan-to-value (LTV) ratio had on the decision of the borrower to exercise the default option. In this initial study, the authors looked backward to the point of origination and identified changes in both the interest rate charged and the house price as the two most important variables outside of the borrower's asset position. In a study of the recent housing bubble, Gerardi, Shapiro, and Willen (2007) find that, despite the increasing prevalence and availability of subprime loans in Massachusetts from 2004–2006, the main factor in the increase in foreclosures was the drop in house prices. In more recent work, Archer and Smith (forthcoming) confirm that the put option, the option of defaulting on a mortgage with negative equity, is the most significant factor in models of default. They also observe that the marginal effect of LTV on default potential increases by factors as high as four depending on the level of LTV.

The recent large drop in house prices and the FHA's policy of allowing low down payments means that a sizable number of recent FHA mortgages have negative equity and are then more likely to default. The quantitative size of this effect is a subject of some debate.

Every year, the FHA commissions an actuarial report on the financial status of the MMI fund and reports its results to Congress (Integrated Financial Engineering, Inc. 2010). The 2009 report estimated that the FHA would not need any form of government support. Aragon et al. (2010) criticized the actuarial study, arguing that it underestimated future losses to the MMI fund. One of their key criticisms is that, for various methodological and data reasons, the actuarial review underestimated the number of borrowers who had negative equity and were subject to economic shocks like unemployment, particularly from "streamline" refinances. A FHA streamline refinance is essentially a modification of an existing FHA loan into a lower interest rate and extended term. There may be good reasons for doing this since the FHA already owns the credit risk, but in terms of estimating default rates, the actuarial review treated the original loan as paid in full and the refinance as a fresh loan. Aragon et al. (2010) rightfully argue that this procedure is subject to significant selection biases in the estimation. The 2010 report corrects for some, but not all, of their criticisms. The 2010 numbers report substantial losses on loans originated when house prices were dropping, namely in 2006, 2007, and 2008. The actuarial review still estimates that the fund is solvent, but a lot of that income comes from loans made in 2010, when house prices had stopped falling, the

Table 1 Estimated LTV Distribution Percentage of Outstanding Loans in Florida Loan Sample by Quarter

Quarter	0–80	81–95	96–100	100–110	Over 110	Index Change
2003:Q1	14.05	35.15	50.80	0.00	0.00	
2003:Q2	15.19	59.17	25.64	0.00	0.00	0.0215
2003:Q3	17.55	61.14	20.66	0.60	0.05	0.0291
2003:Q4	19.13	59.24	21.34	0.25	0.04	0.0369
2004:Q1	12.86	51.45	35.69	0.00	0.00	0.0148
2004:Q2	18.32	66.08	15.60	0.00	0.00	0.0406
2004:Q3	42.04	51.99	5.95	0.00	0.02	0.1263
2004:Q4	42.25	47.97	9.68	0.03	0.07	0.1256
2005:Q1	65.17	25.47	9.36	0.00	0.00	0.1957
2005:Q2	49.47	39.14	11.39	0.00	0.00	0.1622
2005:Q3	28.57	45.38	26.05	0.00	0.00	0.0306
2005:Q4	35.42	48.01	16.49	0.00	0.08	0.0460
2006:Q1	32.08	42.92	25.00	0.00	0.00	0.0257
2006:Q2	30.84	45.87	23.21	0.08	0.00	0.0344
2006:Q3	30.71	36.07	33.22	0.00	0.00	0.0093
2006:Q4	27.67	41.22	28.56	2.55	0.00	0.0054
2007:Q1	22.47	25.99	29.07	12.34	10.13	−0.0407
2007:Q2	19.88	38.64	37.50	2.84	1.14	−0.0062
2007:Q3	19.49	38.24	39.48	2.79	0.00	0.0350
2007:Q4	22.39	33.13	37.47	6.40	0.61	0.0180
2008:Q1	14.13	38.59	43.20	4.08	0.00	−0.0043
2008:Q2	9.60	33.91	37.38	18.00	1.11	−0.0258
2008:Q3	11.45	35.78	40.61	9.30	2.86	−0.0152
2008:Q4	33.30	19.34	13.79	13.57	20.00	−0.0405
2009:Q1	31.63	22.65	13.78	11.27	20.67	−0.0315
2009:Q2	21.82	22.78	16.69	17.76	20.95	−0.0722
2009:Q3	14.99	23.99	23.72	20.46	16.84	−0.0745

Notes: The outstanding loans in the sample (from the LPS database) are distributed across five loan-to-value categories by quarter of observation. The proportion of loans with negative equity clearly expands over the observation period with more than 30 percent of the loans in negative equity territory over the most recent four quarters of observation. The index used to estimate the market value used in computing the LTV will be presented in the next section.

quality of the average FHA borrower was higher, and the FHA had raised its premia (Integrated Financial Engineering, Inc. 2010).

The risks of lending in a market when house prices are declining is enhanced in the current economic environment, where trigger events such as unemployment are more likely. Consider the observations available from Tables 1 and 2.[5]

[5] In recent policy reforms, the challenges posed by Aragon et al. (2010) have been addressed in the annual audit and forecasting of the MMI fund, but there are unresolved obstacles with scale and the conclusions that can be rendered from available data.

In Table 1, a sample of FHA-insured mortgage loans from the state of Florida are distributed across five LTV categories by the quarter of observation.[6] The LTV was estimated by using loan amounts and adjusting house values by county-level price indexes. Details on the LTV estimates are presented in the Appendix. For example, of all the observed FHA loans outstanding in the first quarter of 2003, approximately 51 percent had a LTV ratio between 96 percent and 100 percent. The proportion of loans with negative equity clearly expands over the observation period, with more than 30 percent of the loans in negative equity territory over the most recent four quarters of observation. The last column in the table illustrates this relationship. The mean change in the estimated value of the sample of houses in the mortgage data set indicates that through 2006:Q4 the average price of housing in the sample was increasing. A shift in the trend occurs in 2007:Q1 as average prices fall 4 percent. The fall in prices is expressed in the dramatic increase in loans with LTVs in excess of 100. Refinancing and the initial spate of foreclosures serves to lower the proportion of overleveraged loans in 2007:Q2, but as prices continue to fall and access to refinancing options is reduced, that proportion gradually increases to 37 percent by 2009:Q3.

The expansion of high LTV loans in the first quarter of 2007 occurred for a number of reasons. First, according to FHA Commissioner David Stevens, lenders migrated to the FHA after the subprime mortgage market collapsed. Second, many borrowers looked to the FHA as a way to get out from under their adjustable rate mortgage loans by refinancing into a FHA-insured loan. Third, average house prices across the country were at their height in the first quarter of 2007 and the LTV reflects the current, substantially lower values.

Table 2 provides a telling illustration of the potential threats from negative equity in the FHA loan portfolio, at least in Florida. The table includes only those outstanding loans that have a LTV ratio in excess of 100 percent by vintage (year of origination) and by the quarter when observed (empty cells mean there are no loans from that vintage with LTVs in excess of 100 percent in the quarter observed). For example, by the first quarter of 2007, nearly 66 percent of all FHA-insured loans issued in 2006 that remained outstanding held a mortgage balance in excess of the estimated value of the property. There is clearly an increasing trend in the extent of negative equity. Fifty percent of the loans from 2005 are under water three years post origination in 2008. Additionally, there is no strong evidence of improvement as vintages progress. For example, of the mortgages insured in 2008, more than 60 percent are in excess of the value of the property in 2009. The challenges for the older

[6] The loan data (from LPS Applied Analytics, Inc.) represent the servicing reports on anonymous first mortgage loans insured by the FHA and aggregated to the five-digit zip code. The sample of 88,959 mortgages is restricted to the state of Florida for loans originating between 2003 and 2009.

Table 2 Negative Equity by Vintage Over Post-Crisis Quarters for Florida Loan Sample

Quarter	2003	2004	2005	2006	2007	2008	2009
2007:Q1				65.85			
2007:Q2				62.34	4.50		
2007:Q3				50.00	5.98		
2007:Q4				61.90	11.14		
2008:Q1				67.60	35.48	0.33	
2008:Q2				73.81	65.63	20.47	
2008:Q3		20.00	50.00	80.60	71.14	12.58	
2008:Q4	0.15	9.78	56.23	84.71	76.65	35.61	
2009:Q1	0.45	8.80	53.50	86.87	80.74	36.02	1.16
2009:Q2	1.42	15.37	67.16	86.29	84.87	62.32	24.02
2009:Q3	1.93	21.55	72.75	89.30	88.91	75.87	31.82

Notes: This table shows the fraction of *outstanding* loans that have a loan-to-value ratio in excess of 100 percent by vintage (year of origination) and by the quarter when observed. Loans that pay off are not included in the denominator. For example, by the first quarter of 2007 nearly 66 percent of all FHA-insured loans issued in 2006 that remained outstanding at that point held a mortgage balance in excess of the estimated value of the property. The index used to estimate the market value used in computing the LTV is presented in the Appendix.

vintages (i.e., 2005) are troubling as well given that mortgage default is likely expected to fall dramatically after three years (Ambrose, Buttimer, and Capone 1997).

The probability of default is greater when high LTV ratios are coupled with negative trigger events such as unemployment (Gerardi, Shapiro, and Willen 2007). There has been little effort to evaluate the risk of the FHA portfolio, including current value information and local economic conditions. The actuarial review covering 2009 attempted to measure the change in value via the Federal Housing Finance Agency index and the 2010 review used Moody's Analytics quarterly forecasts for house prices at the metropolitan statistical area (MSA) level. Although a reasonable case can be made for using MSA-level indexes, they will still miss considerable heterogeneity at more localized levels. Aragon et al. (2010) discuss the existence of forecast error, where they utilize a sample of FHA loans and recorded transaction data for Los Angeles County to forecast the potential loss from default in the streamline finance portion of the FHA portfolio. Utilizing the restriction that streamline financing (i.e., FHA to FHA refinancing) can only occur if the value of the property equals or exceeds the new loan amount, Aragon et al. (2010) illustrate the potential for underestimating the threat of default and potential cost to the MMI fund from high LTV loans.

3. CONCLUSIONS

The Federal Housing Administration's insurance-in-force has doubled over the past two years and is projected to approach $1.5 trillion over the next five years (Integrated Financial Engineering, Inc. 2010). Despite clear signs of strain in the FHA's MMI fund, the 2009 and 2010 actuarial reviews indicate that the FHA will not need any form of government support. It is too early to tell whether this forecast will be correct. The future path of house prices is undoubtedly a key factor since it affects the LTV. This article made some simple estimates of negative equity based on estimated county-level house price indexes in Florida. Florida is not a representative state, so these estimates should not be considered as a measure of the negative equity exposure of the entire FHA fund; however, we used it because of our ability to estimate county-level price indexes from public data sources, and it illustrates the risks of lending in a falling market. The analysis gives a very rough sense of the costs of a government agency playing a countercyclical lending role, particularly when the agency traditionally makes low down-payment loans.

Current mortgage market reform proposals focus on the elimination of Fannie Mae and Freddie Mac with the FHA and the private market assuming expanded responsibility. However, the experience of the 1980s and, in particular, the last few years makes it very clear that it is easy for the federal government to grow the FHA; in all likelihood the FHA will serve a similar role in future housing downturns. Countercyclical lending to low down-payment borrowers with weak credit is inherently risky. I do not take a stand on whether this kind of lending is good policy, but I do think people need to be aware of the costs of this role and take them into account when assessing the various reform plans.

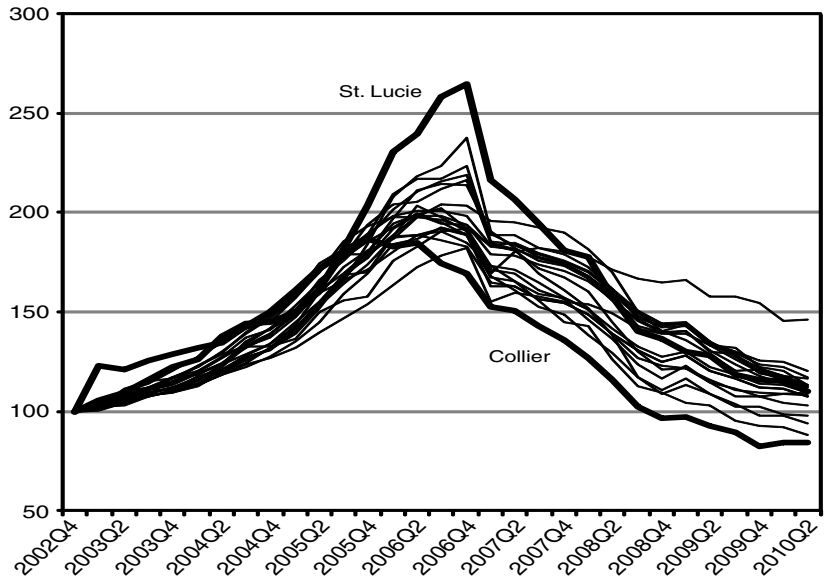
APPENDIX

County-level quarterly price indexes are created from a repeat sales model of transactions recorded with the Florida county property appraisers (assessors) over the observation period. The source for the local house price data is the State of Florida Department of Revenue data files. These files contain data on assessed value and, where appropriate, the last two sale prices for every property in Florida. The loan level data on which LTVs are estimates is from a sample prepared by LPS Analytics, Inc., representing the servicing reports on anonymous, individual loans.

The repeat sales model is of the form

$$\ln(Y_s) = \ln(Y_p) + \sum D_n \gamma_n + e,$$

Figure 4 Quarterly County-Level Repeat Price Trends



Notes: The estimated quarterly sales price index for each county is plotted over the observation period extended to the second quarter 2010 for additional insight. The observed counties in Florida exhibit similar trends, with rapid escalation into 2006 and then an equally abrupt fall from that point forward. The differences in the degree of change provide the variation that is observed in the results for the second model.

where Y_p is the observed purchase price at time p, the initial transaction, and Y_s is the observed sales price at time s, the subsequent transaction, such that $(p < s)$. γ_n is a vector of parameters to be estimated representing the house price index for the nth time period, and D_n is a dummy variable that is zero for all quarters except s and p, and equals 1 for s and -1 for p. e is an observation on a well-behaved disturbance term.

Quarterly indexes are created individually for each of 20 counties, beginning with 2002:Q4 and continuing over the observation period. Figure 4 is the output from the repeat sales model showing the performance for all 20 counties. Although the trends are generally the same for all counties (up through 2006 with aggressive reductions from 2006:Q4), there is clearly variance across the counties. For example, the price index model reveals that St. Lucie County house sales prices increased more than 250 percent between December 2002 and June 2006, while Collier County increased less than 180

percent over the same period. Additionally, prices in five counties observed have fallen below 2003 estimates according to the model.

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