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Enterprise Regulatory Capital Framework

Preserving the safety and soundness of Fannie Mae and Freddie Mac is the essential task of FHFA. Towards that pursuit, FHFA has issued a revised capital proposal which attempts to align capital requirements with prudent risk taking in order that the GSEs can successfully achieve their mission of providing a secondary market for mortgage lending for the preservation of mortgage credit availability under all economic conditions.

After more than eight years since the housing finance crisis of 2006 through 2012, FHFA has put together two capital proposals designed to sharply reduce the risk to taxpayers of another bailout of the GSEs required to maintain a functioning secondary mortgage market. The failure of the GSEs during that period was three-fold: there was insufficient capital relative to risk; risk was under-priced; and old established underwriting guidelines were abandoned to allow for higher risk profile products during an economic expansion.

The latest FHFA Capital proposal maintains several concepts it presented in its previous one. Risk-based capital was set by a grid of LTV by FICO ranges representing the worst vintage loss rate averages of the two GSEs, for 30-year fixed rate owner-occupied purchase loans. All other risk factors would be accounted for by application of factor multipliers. Per many comments on its previous proposal FHFA did amend the multipliers to avoid adverse consequences on single borrower families and lower priced homes. Unfortunately, FHFA maintained no recognition of the flow of g-fee revenue flows under stress that would help to cover substantial amounts of stress loan losses. The new proposal addresses the pro-cyclical nature of its initial proposal that adjusted capital required on seasoned loans by limiting changes to “current LTV” calculations only when home values changed in excess of 5% either up or down. While it dampens the pro-cyclical effect, it greatly takes away recognition of lower losses generated by seasoned loans. Other more important changes add even greater conservatism to the point that the revised plan could jeopardize the GSEs’ ability to serve its mission. First of all, it sets a new credit risk capital floor of 1.2% for each credit segment under its Standard Approach risk-based capital assignments. While it removes the “going-concern” credit risk capital buffer of 75 basis points, it also adds two additional credit risk buffers: a Stability Stress Capital Buffer (which for Fannie Mae, because of its relative market share amounts to 105 basis points extra) and a Stress Capital Buffer of 75 basis points. For Fannie Mae’s 2019 single-family mortgage credit risk exposure, required capital would be 4.06%. The goal of the proposal appears to be to raise GSE capital to levels equal that of commercial banks. While FHFA would have GSEs hold bank-like capital, it would prefer that they not operate like banks, but rather serve primarily as guarantors of mortgage credit risk. GSEs would no longer be able to decide to hold large portfolios of mortgage loans and enjoy the full interest rate spread as do banks, but rather settle for a slice of the mortgage coupon.

GSEs are not commercial banks. The nature of their operation is to simply guarantee timely payment of principal and interest. With most of their exposure in the form of mortgage-backed securities, they do not retain the same types of risks as do banks. Funding risk, interest rate risk, and prepayment risk are all passed on to the investors of such securities. The remaining risks are credit loss and operational risk. Therefore, the requirement of bank-like capital is inappropriate for a such a guaranty business. It is reasonable, however, to assign a level of 4% capital on the balances of mortgage loans held in portfolio.

The addition of 1.2% credit risk floors by risk segment and two additional capital buffers distorts the relationship between credit risk and capital and may make it difficult for the GSEs to serve its mission effectively if it cannot compete with other competitors for better quality loans during good times and be able to diversify risk over many vintages as it may need to remain an efficient guaranty operation.

The purpose of this comment letter is to illustrate the importance of the relationship between capital and pricing, and demonstrate how guaranty revenues ease the burden on capital usage during a stress. In addition, the paper will examine different capital requirements to see whether a GSE had sufficient capital to not only cover its current exposure but also enough capital to allow it to safely continue to take on additional exposure over the course of a stress in order to serve its mission.

**About the Author**

Michael F Molesky is a financial economist who has specialized in mortgage credit risk and capital. He has worked for both Moody’s Investor Service and Standard & Poor’s rating agencies where he developed two separate mortgage credit risk models used in the analysis of capital adequacy of private mortgage insurers and the setting of credit enhancement requirements for private mortgage-backed securities. He served as Vice President of Risk at Fannie Mae between 1987 and 1994, and as Vice President of Mortgage Capital Research at GE Mortgage Insurance. In 1999, while at GE he led an MI industry team that duplicated the OFHEO capital model from which he prepared critical responsible comments. He also assisted the development of Government regulatory mortgage insurance capital models for Australia, Canada, and Mexico. He provided analytical comments on behalf of GE on the Basel Accord proposals. As a private consultant, he has worked with the Center for Responsible Lending in preparing their comments on both the previous and current FHFA Capital proposals.

**Stress Testing FHFA’s Capital Proposal**

It is interesting that FHFA puts the GSEs through Dodd-Frank Act Stress Test for major US commercial banks. This test not only stresses the mortgage credit risk exposure, but it also takes into account all spread income, guaranty fees, interest income, interest expenses, foreclosure costs, and all other expenses. It calculates gains and losses on investment securities and assets. It also includes the firm’s nine-month planning process. As such, it clearly recognizes the benefit of guaranty income over a severe stress situation.

 Last year, FHFA released a report of such a test on Fannie Mae’s projected 2019 portfolio. It took Fannie Mae ‘s position as of the first quarter of 2019 and its plans through December 2019. The results of the run-off stress test estimated charge-offs net of property expenses equaling $7.2 billion and provisions for additional credit losses of another $26 billion. But because the test includes all net revenues over the same time frame, the test estimated a total comprehensive loss of only $9.5 billion. Given that the bulk of the Fannie Mae single-family risk exposure is on loans originated after 2009, the MBS loans reflect the LLPA pricing that was instituted in 2009, while loans held on portfolio reflect the net interest earned between the mortgage coupon, costs of financing and other expenses.

 It would be helpful for discussions regarding the need for bank-like capital for the GSEs if the Dodd-Frank Stress Test were run on that same portfolio, but this time reflect guaranty pricing implied by the proposed FHFA capital rule. It would also be helpful to see what would happen at lower capital requirements, and lower guaranty revenue.

The stated reason given by FHFA for the higher capital buffer requirements is that it wants to be sure that the GSEs can continue to operate during a severe stress in order to fulfill its operating mission of maintaining access to mortgage credit under all market circumstances. No one should disagree with that objective. This paper would attempt to discern whether 4% capital is needed to accomplish FHFA’s objectives of safety and soundness and also maintain the GSEs’ mission statement.

The answers to these questions all center on the relationship between stress credit losses, guaranty revenue, and capital. Mortgage credit guaranty premium is a function of long-run average annual loss rates, cost of capital, annual expenses and the corporate tax rate. Assuming that expenses, average losses, and tax rates are a given, the only element that can be changed by choice is level of capital. Cost of capital is determined by a reasonable rate of return related to investors expected risk of loss and the amount of capital required. If too much capital is required, guaranty premium will be very high and, even under a stress situation, significantly reduce the risk of loss of capital. That would mean that the rate of return is too high relative to the risk. In a competitive market either the rate of return would need to go down, or the amount of required capital would need to be reduced.

To test out the implications of the FHFA proposal on capital adequacy, this paper would examine the Fannie Mae the single-family credit risk exposure treating that entire exposure as an MBS operation only. The data utilized is taken from the Fannie Mae Data Dynamics Dashboard. The outstanding unpaid balances of the fixed rate single-family exposure as of December 31, 2019 was $1.893 trillion. The data base did not include adjustable rate loans. From this body of loans the analysis excludes 15year purchase loans, loans with terms-to-maturity other than 15 year or 30 year, 15 year refinanced loans with LTVs greater than 80%. This left the data used covering 94.6% of the total outstanding at the end of 2019. For each risk bucket combination by seven LTV ranges, ten FICO ranges, 3 occupancy choices, 3 loan purposes, 2 term of loan categories, the analysis required calculation of annual average net loss rates, FHFA standard capital requirements, and implied guaranty fee pricing. Actual annual losses paid and annual loan terminations were calculated for each risk bucket vintage using data on prepayments, repurchases, short sales, third party sales, and REO charge-offs. These data formed the base stress tests and confirmed that the 2006 vintage endured the highest net loss rates by risk bucket.

 In a run-off stress test, the most recent vintage is generally considered to be the worst performing vintage. For the purposes of the analysis performed on the 2019 portfolio, the 2019 vintage was assumed to perform like the 2006 vintage. Each risk segment would have the same termination patterns and losses centered as did the same risk buckets originated in 2006. All of the vintages previous to 2019 would terminate and have loss rates like the vintages preceding the 2006 vintage. Each of risk buckets by vintage age would perform exactly the same as the loans that existed prior to 2006 and originated in 2006. Any new business written after 2019 would perform exactly like the individual vintages following 2006.

Two types of tests were utilized. The first test would be a Static Stress test which would stress the GSE portfolio exposure without adding any new business beyond 2019 originations. In this manner, it mirrors that of the Dodd-Frank Stress Test. It will be different in that it excludes multifamily loan revenues and credit losses and expenses. I also assume that all of the single-family exposures are contained in MBS. However, while the Dodd-Frank test guaranty revenues were based primarily on LLPA pricing for the bulk of Fannie’s 2019 single-family exposure, this test will assume that each segment is priced in accordance with the assigned capital. It also does not examine interest owed or interest income on assets held. In addition, the test does not include the costs nor potential benefits of CRT contracts. So, its more of a pure test on single-family exposures as a guaranty operation.

 The second type of test is a Dynamic Stress test which assumes the inclusion of new business over time. This is important for two reasons. One, while the 2006 vintage had the worst net loss rates, it was followed by nearly as bad vintages in 2007 and 2008. It would be prudent to cover all vintages with above average loss rates in a stress test. In addition, it is important to see whether there is sufficient revenue and capital to allow Fannie Mae to continue to write new business under specified requirements. Given that Fannie Mae’s publicly available data Is limited to volumes that only meet today’s acceptable standards, for many of the risk buckets there was an appreciable increase in “vanilla” volumes from 2008 going forward. As a consequence, the analysis repeats actual new business pattern growth by bucket, but such growth was also limited by the average growth rates between 2012 and 2018. This Dynamic stress test is intended to test for capital adequacy for new business, and to also show the benefits of risk diversification of new business (writing one’s way out of the storm).

**The Static Stress Test Runs**

In the Static Stress Test the model assumes that there is no new business. The test wants to know whether there is sufficient revenue and capital to cover existing exposures, and how much of that capital will be drawn down or used. Here our analysis examines two different sets of assumptions regarding capital and implied guaranty revenue over the stress. The model assumes that all of the individual risk segments are priced according to the set of capital and pricing assumptions.

Under the first set of assumptions utilizing all of the new FHFA proposal to set implied pricing on all of the loans within the Fannie Mae single-family exposure at the end of 2019, the portfolio starts off with 4.06% capital amounting to $72.7 billion. Because this is a government sponsored operation and the risk profile of the single-family exposure is of high quality, this analysis assumes a reasonable after-tax rate of return target of 9%. The weighted average guaranty rate implied by the 9% cost of capital and the full FHFA capital proposal is 60.5 basis points. The implied guaranty revenue under the same loan termination patterns witnessed in 2006 through 2017 was more than sufficient to cover all run-off expenses and losses paid each and every year from 2019 through 2030. The full capital revenue stream as indicated by the blue line remains above the annual losses paid and expenses.

This single-family 2006 Static Stress test estimates total losses paid to be $29.1 billion. Under the Dodd-Frank Stress of Fannie Mae’s exposure to both single and multifamily exposures total credit losses plus provisions for losses amounted to $33.2 billion. It would appear that both the Static Stress Test and the Dodd-Frank test have very similar stress losses. However, there is a huge difference in revenues less all expenses. The Dodd-Frank Stress Test revenue was determined largely by the LLPA pricing system put into effect in 2009. The Dodd-Frank Test also took account of interest income on assets held less interest expenses, while our Static Stress test did not. So while the Dodd-Frank Test registered a capital loss for Fannie Mae of $9.5 billion, the significantly higher flows of guarantee revenue produced by pricing implied by the FHFA proposal capital requirements, resulted in zero risk of loss of capital, even under the worst housing market conditions since the Great Depression.

The second set of capital assumptions is more aggressive. With no risk of loss to capital under the Full FHFA capital assumptions, the second Static Stress Test examines what would happen if the stress capital buffer and stress stability capital buffers were reduced to zero, leaving only the operations risk buffer, the market risk buffer and the standard approach risk-based capital requirements. This would mean the capital rate would fall to 2.26% or $40.5 billion in capital at the end of 2019. The assumption of a targeted return of 9% remains the same, but with lower capital required, the weighted average guaranty fee is reduced from 60.5 basis points to 39.7 basis points. All losses and expenses and termination rates remain the same. Only the revenue stream has been altered by the reduction in the costs of capital. The alternate revenue stream is shown by the gray line. For the years 2023 through 2026, the run-off revenues are insufficient to cover all losses and expenses. Capital must be drawn down to cover the deficits amounting to a total of $4.9 billion. This amount is only 12.2% of the $40.5 billion of capital required at the end of 2019. This means that 77.8 percent of capital remains unused. There is no need for a bailout. Investors have suffered a loss, but only a mild loss under very severe conditions.

 Without the special stress capital buffers, there appears to be more than sufficient capital to cover existing exposures. Just as the Dodd-Frank Stress Test displayed, the flow of guaranty revenue is extremely important in determining the amount of capital likely to be used under stress conditions. In terms of a run-off stress test, the added capital buffers (except for operations risk and market risk) were not relevant or necessary to cover losses in a repeat of the 2006-2012 housing crisis. Indeed, of the $29.1 billion in run-off losses paid, $24.177 billion was covered by g-fees. There remained $35.539 billion unused of the original $40.485 billion.

A primary reason for the ability of the lower capital implied g-fee revenue to cover so much of the stress run-off losses was the lower loss performance of seasoned loans which allowed revenues in excess of seasoned loan losses to cross-subsidize the newer vintage losses. The current FHFA capital proposal does not account for such benefits in setting its capital requirements by risk segment. Recognition of revenue flow, especially from seasoned loans needs to be addressed in FHFA’s final rule, not after the fact but at the point of pricing. Under stress there is only one vintage that will suffer the worst loss rate, while most of the others will have substantially lower rates of loss.

The next question is what amount of capital would be needed if new originations are added over the stress in roughly the same relative amounts as was the case between 2006 and 2017?

**The Dynamic Stress Tests**

The Dynamic Stress Tests are set up similar to those of the Static Stress Tests. As explained previously, attempts were made to estimate similar patterns in origination growth or declines by individual risk bucket combinations, but limited by average annual growth rates experienced between 2012 and 2018.

The first Dynamic Stress Test assumes all of the recently proposed capital assumptions. Single-family capital on the Fannie Mae Exposure as of December 2019 is set at 4.06%, or $72.7 billion. The stress assumes that the 2019 will perform as the 2006 vintage and each new set of originations guaranteed will perform the same as the individual risk combination buckets performed that followed the 2006 vintage. Vintages prior to 2019 will perform as the vintages prior to 2006.

Under the full FHFA capital proposal and assuming a 9% targeted rate of return, and an average g-fee rate of 60.5 basis points, the flow of revenue (depicted by the blue line in the above graph) is sufficiently large enough to cover all annual expenses and losses paid. There is zero risk of loss of capital even under the same loan performance patterns endured under the 2006 through 2017 period. Therefore, after-tax profits are available to cover not just the pattern of growth witnessed during the previous actual stress event, the flow of funds could accommodate an even larger losses and an even larger volume of new originations per year. Losses under the Dynamic Stress Test are substantially higher than in the Static Stress Test, because besides the highest vintage losses from the 2019 vintage, vintages 2020, 2021, and 2022 also carry losses higher than average losses. Total losses paid for the 2019 through 2030 period now total $43.93 billion with $21.021 billion for expenses.

With zero risk of loss to investors under the full FHFA capital assumptions, the capital buffer requirements appear to be higher than necessary to enable Fannie Mae to maintain a significant presence in the market during as bad a stress situation as the 2006-2012 recession.

Like the Static Stress Tests, the alternative capital assumptions for the Dynamic Stress Test remove the capital buffers leaving only the standard approach risk -based capital requirements plus the operations risk and market risk capital requirements. The targeted rate of return remains at the 9% level and combined with lower capital imply an average g-fee of 39.7 basis points. The alternate assumptions also maintain the same expenses, losses, and new business assumptions.

Under the lower capital assumptions, starting capital in 2019 is set at 2.26%. Because the starting “acceptable” level of capital is set at 2.26%, and because the results of the Static Stress on similarly reduced capital requirements showed that there remained a large amount of unused capital on the existing exposures, this Dynamic Stress set of assumptions would also lower the minimum leverage requirement from 2.5% to 2%.

The capital rate rises in the early years even with the growth of new business, but then falls due to the growth and diminishing net income. Nevertheless, the benefit from older seasoned loans as witnessed under the Static Stress tests is also bolstered by the infusion of new written business, especially new originations from 2023 going forward. The diversification of risk across vintages both prior to and after the worst performing vintages serves to reduce risk of capital losses. The lower capital implied annual guaranty revenue (as presented by the grey line) still covers the bulk of all losses and expenses. Indeed, the total amount of capital draws under the assumptions excluding the stress and stability capital buffers totaled only $559 million. The g-fee revenue covered all expenses and $43.4 billion of the $43.9 billion in total losses paid. The reason for the better performance with lower capital under the Dynamic Stress Test is due the in large part to diversification of risk from vintages both preceding and following the worst performing vintage.

With the FHFA approach focus tied to setting capital as if each vintage risk segment is a stand-alone risk, it ignores the very important effect of diversification of risk across vintages of such risk segments. In stressing the Fannie Mae 2019 single-family mortgage portfolio exposure, the patterns of loss rates by vintage from the start of the stress in 2019 through 2030 are given in the graph below.

The pattern of losses and loss rates based on Fannie Mae’s experience for the 2006 through 2017 experience is very much like the pattern of vintage loss rates experienced prior to and after the 1980-1981 recession. The graphic below shows the relative size of vintage loss rates to the 1981 vintage as worst vintage loss rate of that period. Both recessions depict low loss rates prior to the peak rate, largely due to a sharp run-up in home prices above long-run averages. There are two vintages prior to the worst vintage that are well above average and then there are two poor vintages following the worst one. The third vintage after the worst performs very well, as do vintages following thereafter.

Under the Dynamic Stress Test using the 2006-2017 patterns, average vintage loss rates both prior to and following the worst vintage loss rates are all significantly lower than the 2019 stress levels. And while the loss rates on the older vintages between 2006 2009 appear to be a bit high, there remain only small volumes still remaining from these vintages. So, when one looks at the total losses paid by vintage under the Dynamic stress, especially by the vintages following 2019, you see how different losses can be.

Then of course, the portfolio mortgage losses develop not all at once but over time. Indeed, losses paid do not peak on an annual basis until the fifth year of the stress. This means that four additional vintages have been added by that time, of which only two have considerable loss potential. Guaranty revenue under the Static Stress showed that the low losses from vintages 2012 through 2016 allowed excess guaranty revenue to offset losses from the 2017 through 2019 vintages. Under the Dynamic Stress Test, losses are recognized as they were paid over time. With the addition of more guaranty income from the 2022 vintage onward, there was even greater revenue at the peak loss years.

In both situations, diversification of risk by previous vintages and those following serve to offset the higher than average losses in between. Failure to recognize this effect will always result in over-estimation of mortgage credit risk on a portfolio basis, and result in higher than necessary capital requirements.

**Conclusions**

1. Guaranty revenue is a substantial factor in measuring actual need for capital. That fact is demonstrated in the Dodd-Frank Stress Tests of Fannie Mae, and in both the Static and Dynamic Stress Tests presented in this paper. The pricing of risk and the flow of revenue under stress need to be recognized in setting levels of capital with an acknowledgement of the direct relationship between capital and revenue in covering losses under stress conditions and maintaining sufficient resources for new growth.
2. The current FHFA proposal would have the GSEs hold the equivalent of bank capital. Under such assumptions, this paper assumed the 2019 Fannie Mae single-family exposure to be solely a guaranty operation, and stress tested under duplicate termination and loss rate patterns experienced in the recent Great Recession. The tests resulted with zero risk of loss of capital for investors, assuming guaranty rates implied by the capital proposal and a reasonable 9% rate of return target. Such levels of capital greatly over-state the nature of the risks presented by the GSE guaranty operations. Under substantially lower capital requirements, the GSEs would remain financially sound as a mortgage guaranty operation. A 4% capital assessment would be appropriate only on any exposure of held mortgages.
3. The results of the second Dynamic Stress Test which excluded the two capital buffers (but maintained the market and operations risk requirements) clearly demonstrated those buffer amounts were totally unneeded to cover the annual stress losses over the stress period. Nor were they required to bolster capital in order to maintain a strong GSE presence in the market under stress conditions. Only $559 million of capital was called on to cover all losses and expenses along with lower implied guaranty revenue based on the lowered capital assumptions. These results demonstrate that by recognizing revenue streams consistent with actual stress conditions, the GSEs would do extremely well with significantly lower levels of required capital, and pose no threat to taxpayers. Bank-level mortgage asset capital for GSE guaranty operations is totally inappropriate. These results also suggest that a lower minimum leverage ratio between 1.5% and 2% would also be more appropriate.
4. The current FHFA risk-based capital proposal is focused on vintage exposure as a stand-alone risk, totally ignoring the benefits gained from diversifying risk across vintages. Such diversification provides substantial protection under periods of economic distress. By focusing on vintages as a stand-alone exposure, the credit-risk capital assigned by FHFA is overstated and raises the costs to consumers unnecessarily. Such overstatements and the lack of credit for stress condition revenue disproportionately affect lower FICO, higher LTV borrowers, but also over-price borrowers with lower credit risk. Over-pricing risk will lead to loss of good business during favorable economic conditions. The loss of such loans will weaken the GSEs ability to benefit from risk diversification across vintages, increasing the risk to rather than protecting the safety and soundness of the enterprises.
5. Instead of requiring additional capital buffers, reinsurance through a government backstop in the form of an excess of loss contract would be a cheaper way of ensuring continued GSE market presence under extreme stress, and also serve to instill greater market confidence in the new GSE capital structure and management.

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