GSE Reform: Diversification is Critical in Sizing the Capital Requirement in the New Regime

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Abstract

The GSE Reform Debate has thus far succeeded in building a broad (though not universal) consensus that Freddie and Fannie should be replaced by a system in which private capital bears the first loss, with a catastrophic government guarantee behind it taking the residual risk. Investors would continue to have access to mortgage backed securities with a full faith and credit guarantee, but, in contrast to the current situation, the bulk of the credit support would come from private capital. The Corker-Warner proposal, S. 1217, for example, has this structure.

The consensus ends there. There is a considerable question about how much capital is necessary to support such a system and what form it should take. For example, in a system in which bond insurers stand in front of the government, there is little question that a 5 percent capital requirement would have been sufficient in the aggregate to allow the insurers to sustain the losses on the 2007 book of business, the most stressed vintage in recent years. As we discussed at length in our recent issue brief, for the 2007 Freddie Mac book of business, the aggregate default rate (defined as loans going 6 months delinquent or terminating due to a short sale, REO sale, or deed-in-lieu) is 10.22 percent; it is 13.6 percent for Fannie Mae's 2007 book. We can translate this into losses by multiplying these default rates by a 40 percent severity; obtaining a capital need of 4 to 5 percent. (Note that 40 percent is the severity applied to high default rates by both Freddie and Fannie in their recent risk sharing deals; it captures the probability that a loan which is six months delinquent will liquidate times the loss if it does). While 4-5 percent capital may have been sufficient to enable an insurer with a large, diversified book of business to sustain the 2007 experience, some advocate a cushion in excess of this amount to further protect the government against more extreme events, a lack of diversification of the insurer's book, and other types of counterparty risk (such as operational failures).

While many of the proposals include (and some are limited to) delivering private capital through insurers (called bond guarantors in Corker-Warner), others also allow for a pool level capital markets execution.

In any system that is based on a pool-level capital requirement, the diversification of the underlying pool is critical. At the extreme, even with a 10 percent capital requirement, as is proposed with Corker-Warner, if the pool is only one loan, with no ability to access capital supporting other loans, then the government's catastrophic commitment is quite high. Conversely, 10 percent capital on a pool consisting of all loans from a given vintage would bring the government's catastrophic commitment to near zero.

In figure 1, we look at 1,000 Freddie Mac pools of different sizes of 30-year fully documented self-amortizing loans from the 2007 vintage. The pools are randomly drawn from the newly released loan level credit database. Recall that the average default rate for the 2007 vintage was 10.22 percent. The first chart (upper left) shows that for 1,000 draws of 100 randomly selected loans, the default rate ranged from .05 percent to 22 percent. For 1,000 draws of 500 loans each (upper right chart), the distribution is much narrower, ranging from just over 5 percent to just over 15 percent. Finally, if we increase the number of loans to 2,500 (bottom chart), the distribution narrows further from 8.25 percent to just over 12 percent, not much different from the 10.22 percent default rate for the vintage as a whole.

Figure 1. Simulation results for Freddie Mac's Aggregate 2007 Portfolio
This analysis actually understates the extent of the problem of non-diversification, as we have randomly drawn loans from the whole vintage. If a pool is limited to a single state—say, Arizona—the dispersion of results is even greater. The upper left chart in figure 2 shows the default distribution of 1,000 pools of 100 Arizona loans originated in 2007. The default distribution ranges from 11 percent to 40 percent, averaging 23 percent. For the same 2007 vintage, the default distribution of 1,000 pools of 500 Arizona loans ranges from 17 percent to 31 percent (upper right chart); for 1,000 pools of 2,500 Arizona loans (bottom chart), the default distribution ranges from 20 percent to 26 percent, still much higher than the average for the whole vintage of 10.22 percent.

We could have looked at this on a number of other dimensions, but the point would be the same. A loan pool exclusively from Arizona, or any other state for that matter, no matter the pool size, is going to need more credit enhancement than a more geographically diversified pool. And smaller pools are going to have a greater variability of returns and therefore will require more capital to protect the government, the catastrophic risk provider.

Figure 2. Simulation results for Freddie Mac’s Arizona 2007 Portfolio
Thus, it is clear that the amount of capital needed to ensure that the government’s guarantee is indeed limited to catastrophic conditions is highly dependent on diversification. But it is also dependent on the form in which capital is provided ahead of the government. In an insurance execution, the insurer is itself diversified (although the degree of diversification is important), and the larger issue is how to provide the government protection against counterparty risk, such as operational or liquidity failure. In a capital market execution, diversification must occur at the pool level; smaller pools and less-diversified pools magnify the government's potential for losses. Thus, in any future state, if capital markets executions are permitted, we would expect that the government would require large, diversified pools. A likely corollary of the preference for large, diversified pools is that loan-level risk-based pricing would become more difficult because there would be little transparency concerning the contribution of a given loan to the cost of capital for the pool.

Other Publications by the Authors

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