Troubled Assets Relief Program

Financial Guarantee Transactions – A Principles Guide

RangeMark

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The following is a response to the Department of Treasury request for comments concerning a possible guarantee program for troubled assets.

Question 1: *What are the key issues the Treasury should address in establishing the guarantee program for troubled assets?*

The respondent believes the five key issues the Treasury needs to address with respect to the program are:

1. What are the essential elements that should determine the premium charged by the Government for providing financial guarantees?
2. How should a loss distribution for a security be estimated?
3. What are the information requirements necessary to adequately perform necessary analytics?
4. How transparent do the analytics need to be?
5. How will the Treasury maintain adequate surveillance and remediate positions?

The respondent sets out below its views with respect to these fundamental issues. The respondent will address specifically insurance for RMBS and CDOs of RMBS, but the essential points may be applied more broadly. In summary, the respondent believes the Government must charge an insurance premium that, at minimum, covers expected losses and overhead. A *no-arbitrage premium* would also include a risk component that may be sized by reference to market prices. The no-arbitrage premium makes the holder of a security indifferent to either selling the security or insuring it (as the realized cash-flows have the same value assuming there is no credit risk associated with the Government's commitment). Essentially, the analytics associated with the determination of the no-arbitrage insurance premium for an exposure are derivative of, and need to be consistent with, the analytics involved in determining the price the Government would pay for the exposure. To the extent the Government wishes to promote a premium below the no-arbitrage level, it should consider the potential impact of its decisions on financial institution risk taking.

Expected losses should be calculated using the maximum possible information available about the underlying assets backing a security being considered for insurance, as well as the structure of payments allocating the cash-flow derived from the collateral assets to the security in question. The respondent believes loan level data that includes detailed information about respective loan obligors, the respective specific types of loan obligations and collateral (including e.g. lien priority, initial interest rate, rate resets, home location, documentation quality, loan purpose, and property type) are very important in generating reasonable estimates of collateral pool cash-flow expectations. Similarly, details concerning the liability capital structure and priorities of payment are essential in transforming asset cash-flow estimates into estimates of the time specific performance of an RMBS security which may be under consideration for insurance. In the respondent's experience, fully assessing the nature and performance profile of a collateral pool entails combining rigorous quantitative methods and metrics to describe risk (conventional ratings are insufficient and reliance upon them lead to systematic misdiagnosis and poor strategic decisions) and qualitative study of the pool's composition – results of the two should be consistent.

Procedures used to determine premia should be fully transparent and broadly accepted.

The Treasury will need to create an organization with capabilities to originate/evaluate insurance proposals, negotiate terms, transact and document contracts, process premia collections and disburse payments, incorporating the necessary expertise and systems while maintaining appropriate separations of functions for risk management and control purposes. Part of the operation will require a surveillance function that receives Trustee information, follows asset performance, makes projections, and generates reports about the expectations for payments. The surveillance function may also make recommendations and enforce actions in the Treasury's interests with respect to the subject insured transactions, consistent with the Treasury's control rights. It will also receive information concerning the exercise of the rights of other parties connected to the insured transaction. The Treasury will need to consider to what extent it wishes to take exposure to securities where it will be exposed to the control decisions of other parties.

Question 1.1: *Should the program offer insurance against losses for both whole loans and individual MBS?*

There are three basic applications of insurance in mortgage markets: a) primary mortgage insurance, b) pool insurance, and c) bond insurance. The different products require different, if related, disciplines, and are transacted by different providers. The Government would not be able to provide primary mortgage insurance since this product is generated at the time a mortgage is originated. The essential question is consequently, should the Government insure the performance of some proportion of residential mortgage assets supporting an MBS security or should it wrap the liabilities (i.e. the RMBS security supported by the mortgage loans). The respondent believes it is more useful for the Government to insure the liabilities (i.e. the RMBS securities) rather than some proportion of the asset pool for two reasons: a) operational difficulties in insuring asset pool performance, and b) efficiency in promoting market liquidity. Wrapping loan asset performance will require operational attention at very granular levels including close work with Servicers which may be more or less responsive. The number of servicers is considerable and mortgage loan volume is enormous (see Serviced Loan Universe Slide in the Attachment). While granular information will be essential to the effective insurance of RMBS securities, granular *operational activity* is not likely to be necessary in the case of insuring RMBS securities. Moreover, asset guarantees are not necessarily helpful in promoting liquidity. Consider what is more liquid, a Sallie Mae security in which the Government insures 98.5% of the asset pool, or a GNMA security backed by the full faith and credit of the federal Government?

Question 1.2: *What is the appropriate structure for such a program? How should the program accommodate various classes of troubled assets? Should the program differ by degree to which an asset is troubled?*

The program ought to have an adequate structure; this structure is somewhat general to the assets though some of the components to the structure could have asset specific substructures. In general, one would expect the structure to require the following departments: a) Front Office, b)Analytics/Quantitative Modeling, c)Legal/documentation/transactions, d) Credit review and approval, e) Surveillance, f)Accounting, and g) Treasury/Payments.

Question 1.2.1: *What are the key questions to consider with respect to guaranteeing whole first mortgages?*

NSM models mortgage asset performance in the following way. 1) a time projection of state-specific HPA is established; 2) a time path of interest rates is generated; 3) the HPA time path is used to generate a conditional Severity time path giving mortgage loan Loss Given Default (LGD); 4) loan level information involving obligor characteristics (e.g. FICO, DTI), loan characteristics (e.g. LTV, location, initial interest rate, interest rate reset, extent of documentation, property type…) are used in a transition model giving the probabilities of transitioning from various states at the beginning of the month (e.g. current or at various stages of delinquency) to another state (e.g. current, some stage of delinquency, default, prepayment). The transition model, in combination with the HPA projections and the Severity time path, can be used to generate a stochastic projection of individual loan performance. Simulations can be used to generate distributions of performance of loans and asset pools.

Question 1.2.2: *What are the key issues to consider with respect to guaranteeing HELOCs and other junior liens?*

The procedure for estimating loan performance of subordinated lien positions is similar to first lien. The legal position of junior lien holders is far worse, however, and the impact on severity due to weaker economic circumstances will be greater. Moreover, HELOCs also embeds borrower options to draw and severity outcomes are much more extreme and modeling error will be appreciably greater.

Question 1.2.3: *What are the key issues with respect to guaranteeing MBS?*

The key issues involve the determination of an appropriate premium and non-economic issues revolving around surveillance and control. With respect to the non-economic issues, the Government will want to be subrogated into the control and reporting rights of the beneficiary. The Government will wish to consider to what extent it is willing to take positions in which it is not the controlling party and, in particular, has no control over acceleration of obligations upon a default trigger and the subsequent disposition of assets.

The key economic issues begin with the performance properties of the assets (see above) but must also include a detailed deal specific modeling of the allocation of time-specific asset pool cash-flows to respective liability holders. The modeling must incorporate contractual priority of payments documentation, cash-diversion triggers, step-up and other structural pay provisions. Payment profiles will also be contingent on the course of interest rates. An insufficiency of funds to meet scheduled interest payments represents a time specific credit loss. The projection of such shortfalls in time as well as a projection of ultimate principal loss can be generated through time projections of: a) interest rates, b) asset prepayments and defaults, c) the allocation of asset cash-flows to the periodic payment of liabilities. A distribution of simulated interest rate and asset performances will generate a distribution of loss outcomes.

Question 1.2.4: *What are the key issues associated with guaranteeing financial instruments other than mortgage related assets originated or issued before March 14, 2008 that could be important for promoting financial market stability?*

This is an important and interesting issue, but time requires the respondent to limit the scope to residential mortgages and related securities.

Question 1.3: *What are the key issues to consider with respect to setting the payout of the guarantee?*

The key consideration is whether the Government, under the insurance plan, can be compelled to pay upon acceleration. It would be best if the Government structured its insurance to pay timely interest and scheduled principal with the option to accelerate according to the Government's interests.

Question 1.3.1: *Should the payout be equal to principal and interest at the time the asset was originated or to some other value? What should that value be? What would the impact of offering less than 100 percent of original principal and interest?*

The Government could consider offering something other than full timely interest and scheduled full principal. For example, it could consider providing excess of loss insurance. The fundamental principles of pricing would still apply though it might be somewhat more difficult to implement them in practice. A simple exploration of excess of loss insurance is provided in material presented below.

Question 1.3.2: *Should payout vary by asset class? If so, please describe using the same asset classes as enumerated under 1.21-1.24.*

If the concern of the Government is to promote liquidity, it should simplify the payout provisions as much as possible.

Question 1.4: *What event should trigger the payout under the guarantee? Should the holder be able to present the claim at will or should there be a set date? Should this date differ by asset class? Should this date differ by degree to which the asset is troubled?*

The Government should limit its guarantee to timely interest and scheduled principal. It should pay claims upon notice that a payment default has occurred with documentation showing the shortfall. As much as possible, the Government should avoid obligating itself to pay upon acceleration (except, perhaps, at its option).

Question 1.5: *Should the holder be permitted to sell the troubled asset with the program guarantee? If appropriate, should asset sales be restricted to eligible financial institutions or should there be no restrictions to promote liquidity in the market.*

If the point of the insurance program is to stabilize and liquefy troubled balance sheets, then permitting the sale of Government insured securities is very important. If the Government under-prices its insurance, the sale of insured product will facilitate the realization of arbitrage profit. The Government needs to be mindful of this when it considers premium pricing policy. In the event of a sale of insured asset, alienation of the insurance from such asset should not be permitted. If an insured asset is sold without the guarantee, the guarantee should lapse. An asset with a guarantee of full and timely payment of scheduled interest and ultimate principal should be saleable generally. More complicated insured products should be restricted to transactions among eligible financial institutions.

Question 1.6: *What are the key issues the Treasury should consider in determining the possible losses to which the Government would be exposed in offering the guarantee? What methodology should be used to determine possible losses? Does it differ by asset class? If so, please describe using the same asset classes enumerated under 1.21-1.24. Does it differ by the degree to which the asset is troubled?*

The estimation of losses is linked essentially to the estimation of cash-flow and value and these two projections should be consistent. The estimation of the time projection of RMBS losses detailed in 1.2.3 above can be used to generate a projection of time-specific liability cash payments which, properly discounted, can be used to create an estimate of fair value price.

The material presented above represents a program for calculating RMBS loss distributions or RMBS security prices. They involve particularities which are special to the asset class. Each asset class will have its own particularities which will necessitate loan level information, appropriate asset performance modeling systems, and detailed liability-specific cash-flow models.

Question 1.7: *What are the key elements the Treasury should consider in setting premiums for this program? Is it feasible or appropriate to set premiums reflecting the prices of similar assets purchased under Section 101 of the EESA?*

The material below assumes that the premium charged by the Government is paid up-front. If the Government wishes to collect premia over time, it will need to assess the consequences of a premium payment default. It may also require the acceleration of premia payments if the underlying security accelerates. The material below assumes that the Government will insure timely payment of interest and principal and will pay as losses occur on a non-accelerated basis.

The essential point to keep in mind is that the process by which a no-arbitrage premium is determined is the same process by which a fair value asset price is determined. The no arbitrage premium is (abstracting from interest rate risk) equal to (Par – the security price). The security price is the immediate market recovery value. Par – recovery is equal to the loss which the premium must cover.

More particularly:

1) Premiums collected by the Government to insure residential mortgage backed securities should be sufficient to cover expected losses, expense overheads, and an appropriate risk charge which is a function of tail risk (as described below). The premium charged for each insured exposure should be set no lower than the transaction expected loss plus some imputed overhead charge. The number of exposures insured by the program should be sufficiently large that actuarial calculations are meaningful and that premium overcharges and undercharges have a chance to balance. A larger volume of insured transactions will also help reduce the proportional overhead.

2) Any person or entity performing the expected loss calculations needs to be a disinterested party free from conflicts of interest.

3) It is essential that a credible distribution of loss outcomes be estimated for any instrument for which insurance is being considered. Without knowledge of the potential distribution of outcomes, a loss expectation cannot accurately be calculated and tail risk cannot be analyzed.

4) A distribution of time dependent loss projections for a residential mortgage-backed security under consideration for insurance should be calculated using intensive information about both assets

and liabilities. On the asset side, default propensities and losses should be estimated from loan level details. On the liability side, contract details such as cash-diversion triggers and priority of payment waterfalls need to be incorporated. Calculations will require a projection for LIBOR which should be conducted using a well regarded and accepted interest rate generator or an acceptable assumption for rates.

5) Expected loss calculations need also to account for supplemental third party enhancement of either assets or liabilities where such enhancement is present as well as the credit risks associated with such enhancements. An appropriate correlation between underlying transaction default risk and the risk of default of the support provider needs to be included in the estimate of expected loss of the exposure which the premium payment to the Government needs to cover.

6) The premium can be no lower than the expected loss. In general, it must be greater, since different instruments will exhibit greater or lesser variability of loss around the mean. Insurance needs to price the differences in risk in order to preclude adverse selection and to maintain proper incentives for taking/controlling risk.

7) Assuming that the debt instrument under consideration for insurance pays a coupon equivalent to the risk free rate, and abstracting from overhead costs, a no-arbitrage condition is:

$$\text{Par} - \text{Insurance Premium} = \text{Market Price of the Bond}$$

If the coupon is different from the risk free rate, the formula above may be modified without difficulties. If the general relationship represented by the formula above does not hold, an arbitrage possibility will present itself; if the insurance premium is too low, a market agent will buy the bond, ask for insurance and make a profit. At the same time:

$$\text{Insurance Premium} = \text{Expected Loss of the exposure being insured} + \text{Risk Surcharge}$$

The risk surcharge should be a function of the distribution of loss in excess of the expected loss:

$$\text{Risk Surcharge} = R(L-\mu_L)$$

8) The functional relationship determining the Risk Surcharge can be difficult to determine. However, the risk surcharge can be imputed using intensive loan level asset data and detailed liability priority of payments information (to make credible estimates of the asset performance distribution and ultimately, a mean expected loss) on the one hand, and market pricing information on the other.

9) NSM uses observed relationships between portions of RMBS liability cash-flow distributions (constructed using a loan level based asset model and liability specific cash-flow models) and observed ABX prices to determine risk premia for discounting and pricing purposes. Using these relationships, estimates of market prices are generated which (by construction) conform well to transaction observations and the ABX.

10) With a fair value Market Price observable or reasonably estimable, and with a credible estimate for transaction expected loss, the equations above can be used to generate a reasonable estimate for a market based insurance risk surcharge and a no-arbitrage insurance premium.

11) Relationships above may make use of the risk free rate for discounting purposes since they are based on market relationships which can be arbitraged and either observed market prices or market implied prices.

12) The Government may affect bond prices in the market by charging an insurance premium with an embedded risk surcharge which is less than the going market implied rate. While this will create a short-term arbitrage, presumably bond prices will rise in response to the arbitrage demand. The Government, in no case should charge a price below the expected loss. The Government should consider what risk surcharge it feels is appropriate in order to maintain a proper risk/return profile.

An example of calculations used to determine the components to premium pricing can be found in the attachment. We consider an RMBS security supported by a pool of second lien loans. The CUSIP is 43709RAA2. Using HPA projections driven by material on page 5, loan-level information was used to an asset performance distribution. This in turn, is used to generate a distribution of credit losses which appears on page 4. The mortgage pool characteristics are described on sheets 6 and 7. While these characteristics are fairly disaggregated, it is important to say that loss calculations have been estimated using behavior generated on a loan-by-loan basis. Discounting the losses at a risk-free rate and expressing the losses as a proportion of par generates and averaging generates an expected proportional loss of 47.03%. Note, please, that the distribution of losses around the mean is fairly wide. Using the same information to generate a distribution of security cash-flows and discounting by a risk premium estimated from market price observations generates a fair value estimate of the price at $34.41. This price, which was determined by adjusting for the implied risk premium in today's market, derived from trading levels of ABX indices, suggests the insurance premium would be 65.59. This represents the upper insurance premium bound; a premium between this and 47.03, in our example, would provide an incentive for arbitrage activity.

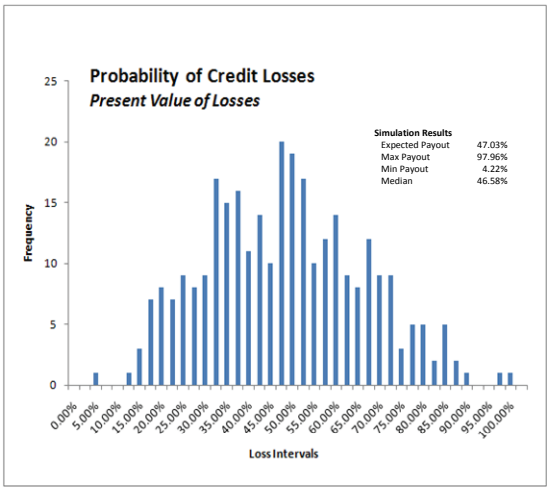
Setting Lower Limit on Premium

Pricing Matrix: INDS 2006-3 A

Retained Risk	Expected Loss on Retained	Expected Loss on Ceded
0%	0.00%	47.03%
10%	0.05%	46.98%
15%	0.24%	46.79%
20%	1.13%	45.90%
25%	2.34%	44.69%
30%	3.94%	43.09%
35%	7.42%	39.61%
40%	10.79%	36.25%
45%	14.18%	32.85%
50%	20.35%	26.68%
55%	25.05%	21.98%
60%	30.06%	16.97%
65%	33.60%	13.43%
70%	38.34%	8.69%
75%	41.24%	5.79%
80%	43.84%	3.19%
85%	45.80%	1.23%
90%	46.70%	0.33%

Modeling Assumptions:
Projected collateral and bond performance based upon proprietary loan-level credit model
Cash flow for each scenario (300) discounted at the risk-free rate associated such scenario
HPA assumptions:
Index - *Case Shiller Composite 20*
Expected case - further decline of 15% over 18 months, returning to long-run trend over 10 years (Exhibit 2)
Volatility - Near-term (next 2 years) based recent (last 2 years) actual, long-term based upon last 10 years

Source: Structured Credit Solutions LLC, LoanPerformance



The distribution was generated by a run of 300 performance scenarios. The lower bound for insurance premia associated with an excess of loss product can be seen on page 3. If the Government covers the entire distribution of loss, the expected loss of the exposure the Government insures is 47.03. If the Government insures only losses in excess of 50% of par, the expectation of loss of the Government exposure is only 26.68%. The expected loss of the risk retained by cedant is 20.35%. Note that if the cedant pays a premium equal to the expected loss of ceded risk, the expectation of loss the cedant faces in all the listed excess of loss scenarios is the same but the risk features are different. In the case of insuring losses in excess of 50% of par, if the Government prices insurance at expected loss, the expectation of loss remains 47.03. Note, however, that in such a case, the cedant can lose a maximum of 76.68 and a minimum of 26.68 (the insurance premium). By purchasing excess of loss insurance, the cedant will reduce its insurance payments but retain some risk.

Question 1.7.1: *If use of prices of similar assets purchased under Section 101 of the EESA are not feasible or appropriate, should premiums be set by market mechanisms similar to (but different from) those contemplated for the troubled assets purchase program? How should this be implemented? If not feasible or appropriate, what methodologies should be used to set premiums?*

Market prices for troubled assets are difficult to observe because (particularly in the current market) these assets seldom trade. Where they do, they often transact at forced sale prices (which are inappropriate for the determination of fair value). For this reason, modeled prices, informed by market observations as well as detailed information on asset and liability features, are a reasonable approach to the estimation of fair prices. As detailed above, the process of determining fair value prices on the one hand, and security expected losses with associated no-arbitrage insurance premia on the other are two sides of the same coin and should be consistent.

Question 1.81.: *How and in what form should payment of premiums be scheduled?*

The payment of premiums is best scheduled as an up-front payment. If a term payment is permitted, the Government will need to consider how it wishes to handle a premium payment default. It will also need to consider how to handle the payment of premia under conditions of insured obligation default and acceleration.

Question 2: *How should the guarantee program be designed to minimize adverse selection, given that the program must be voluntary? Is there a way to limit adverse selection that avoids individually analyzing assets?*

Every secondary market financial insurance program is exposed to adverse selection. The peculiar advantage to the TARP is that it is known in advance that the asset under consideration is in some condition of distress. It should be assumed that the assets presented for insurance are no different. The

best way to limit adverse selection is to price insurance near the no-arbitrage price. As market prices are difficult to determine, an intensive analysis of the asset is absolutely required to obtain a good estimate of expected loss, fair market price, or no-arbitrage premium.

Question 3: *What legal, accounting, or regulatory issues would such a guarantee program raise?*

This is an important question and deserves due consideration. Respondent would be happy to discuss this separately.

Question 4: *What administrative and/or operational challenges would such a guarantee program create?*

The insurance program would require documentation and transaction of guarantees which must be serviced for many years (indeed decades). Program policies would need to be developed and enforced, insurance terms would need to be negotiated, transaction documentation would need to be created and standardized, closed transaction documents would need to be stored, premium payments would need to be registered, claims would need to be verified and paid, payment procedures would have to be implemented to resist fraud, analytics would need to be developed and reviewed, insured transactions would need to be monitored and remediation would need to be enacted where possible.

Question 4.1: *What expertise would Treasury need to operate such a guarantee program? Please describe all facets of the program?*

This is an important question and deserves due consideration. Respondent would be happy to discuss this separately.

Question 5: *What are the key issues to be considered in determining the eligibility of a given type of financial institution to participate in this program? Should these eligible provisions differ from those of the troubled asset purchase program?*

This is an important question and deserves due consideration. Respondent would be happy to discuss this separately.

Question 6: *What are the key issues to be considered in determining the eligibility of a given asset to be guaranteed by this program? Should eligibility provisions of assets to be guaranteed under this program differ from those of the troubled asset purchase program?*

This is an important question and deserves due consideration. Respondent would be happy to discuss this separately.

Question 7: *Assuming the guarantee is priced to cover expected claims, are there situations (perhaps created by regulatory or accounting considerations) in which financial institutions would prefer this program to the troubled asset purchase program? Please describe.*

If the premium is set at the no-arbitrage price, there is no effective difference between TARP and an insurance program. Under TARP, a participating institution sells its asset, realizes a known and determined loss, and receives a cash recovery value. Under an insurance program where all losses are fully covered, the participating institution pays a known and fixed loss in the form of a premium and has a liquid asset it can now sell for par. Upon a sale, it has received a net payment amount of recovery, the same as the institution under TARP.

The Treasury might prefer the insurance plan since it does not need to fund it. On the other hand, the administrative efforts might be more daunting.

If the premium is set at the expected loss, in general, the Government will be under-pricing insurance and institutions are likely to arbitrage the program.

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