

WHITE PAPER
BASEL CAPITAL ACCORDS - REGULATORY CAPITAL REQUIREMENTS

**Securitization Positions and the SSFA -
"Simplified Supervisory Formula Approach"**

Recently the NY Federal Reserve put out an NPR (Notice of Proposed Rulemaking) with a new way of calculating capital on securitization positions that banks hold in their trading book.

<http://www.federalregister.gov/articles/2011/12/21/2011-32073/risk-based-capital-guidelines-market-risk-alternatives-to-credit-ratings-for-debt-and-securitization#h-29>

At the above link, search for "7. Securitization Positions".

The comment period ends on Feb 3, 2012, so it is a good idea to understand what the new approach is all about and the impact it may have on securitization positions, assuming it becomes law and banks will be required to adopt the new approach.

This new calculation for securitization positions is known as the "**Simplified Supervisory Formula Approach**" (SSFA), and is being considered as a complete replacement for the Basel IIa external ratings-based approach. The Dodd-Frank regulations essentially eliminated the banking industry's over-reliance on rating agencies "opinions" regarding the credit-worthiness of securities. Outlawing ratings presents a real problem for banks as to what approaches can be used instead. After watching the global financial meltdown of recent years and the ongoing debacle in Europe shaking up the financial world right now, reasonable alternatives are required. The SSFA may be just such replacement.

In this article we'll cover the basic calculations for SSFA residential mortgage-backed securities, where the loan-level data is available.

First a few definitions:

1. The letter "**K**" is the usual letter designation for "Capital". It is sometimes expressed as dollars, which we will refer to as "**K\$**," or can also be expressed as a percentage "**K%**."
2. "**Kg%**" is the weighted average collateral risk weight % calculated based on the loans in a deal, *as if the collateral had never been securitized in the first place*, and is done in accordance with the "general risk- based capital rules" for residential mortgages, directly from the Basel I regulations. For any loans that meet "prudent underwriting standards" (ie. less risky), a 4% risk weight is assigned to those loans. Those not meeting the criteria for what is also known as a "Qualified Mortgage" are assigned an 8% risk weight. The letter "g" in "Kg" stands for "Weighted Average."

PHASE I

The first phase of the new SSFA calculations is to determine the **SSFA Floor %**. This is a minimum risk weight below which a final risk weight % for an asset is not permitted to go. The "**Kg% as of the origination data of the deal**" is used in conjunction with a few other basic calculations given below, to determine the new SSFA "floor" Risk Weight %'s for any particular securitization. This floor figure, expressed as a %, represents the minimum amount of capital that would need to be set aside against any given securitization position, regardless of whether further SSFA calculations (described later in this document) might suggest a lower percentage than the SSFA floor.

Four Steps to Determine the New SSFA Floor%:

Step 1. Calculate the "Kg% at Origination" (OrigKg%)

The criteria for Qualified Residential Mortgages for SSFA purposes are:

1. 1st Lien
2. Original LTV <=80%
3. Fully Documented
4. Less than 90 days delinquent
5. Front End DTI < 31% and Back-End DTI < 45%
6. Cannot be a modified loan
7. Cannot be an Interest Only loan
8. Cannot be a negatively amortizing loan.

Assuming a loan meets ALL of the above criteria; it is considered a "Qualified Mortgage" and gets a **4% risk weight** assigned to that individual loan. If a loan fails any of the above tests, then it gets an 8% risk weight assigned to it. These risk weight %'s of 4% and 8% are derived from the Basel I "general risk-based capital rules" for residential mortgages.

Any given deal, therefore, may be a blend of some loans that have a 4% risk weight and others that have an 8% risk weight

Example 1: If an entire deal is made up of 2nd liens only, then every single loan in that deal would fail the above tests and would get assigned to them an 8% risk weight percentage. Performing a simple Weighted Average Calculation based on the Current Balance of the loans at the time of deal closing would give us an **Original Kg%** of 8% for this particular deal.

Example 2: Deals that have a mix of loans with 4% and 8% would have, therefore, an Original Kg% of somewhere between 4% and 8%. Typically sub-prime deals would have many loans that failed at least one of the above criteria, so it's not uncommon to see Risk Weight %'s for these deals around 7% or 8%.

Example 3: Prime deals might get as low as 4.5% or 5% - but even many prime deals have loans that don't meet all of the above criteria, and so end up with a Kg% of greater than 4%.

Step 2. Calculate the "Kg Dollars at Origination" (OrigKg\$) - Multiply the OrigKg% obtained in Step 1 above by the *original collateral balance* of the deal (as of the closing date of the deal.)

Step 3. Obtain the "**Cumulative Loss in Dollars**" (**CumLoss\$**) as of the latest date for the securitization. Note that for steps 1 & 2 the calculations are done as of the origination date of the deal, whereas the CumLoss\$ figure is the most recent cumulative losses *to-date* for the securitization.

Step 4. Divide CumLoss\$ by OrigKg\$ to obtain a ratio.

That ratio should be compared against the following table to determine the floor:

1. From 0% to 50% = 1.6% floor
2. From 50% to 100% = 8.0% floor
3. From 100% to 150% = 52% floor
4. From 150% and beyond = 100% floor

Example 1:

- A. **OrigKg%** = 8% A 2nd lien deal where all the loans in the deal are 2nd liens, ie. NONE of the loans are qualified mortgages.
- B. **OrigKg\$** = 80,000,000 Original Deal Collateral Balance = 1,000,000,000 multiplied by 8% OrigKg%
- C. **CumLoss\$** = 60,000,000 (obtained from servicer reports or a data vendor such as Intex)
- D. **CumLoss\$ / OrigKg\$** = 75% (60,000,000 / 80,000,000)

Because 75% is > 50% and less than 100% (item 2 in the table just above), then the SSFA floor for this deal is 8%. This 8% is the minimum capital % charge that would be required *for any bond in this deal*. Therefore, if the market value of a bond were to be \$4,000,000, then the minimum capital set aside amount would be 4,000,000 * 8% = \$320,000.

Example 2:

- A. **OrigKg%** = 4% A prime deal and all the mortgages are qualifying.
- B. **OrigKg\$** = 40,000,000 Original Deal Collateral of 1,000,000,000 times 4% (OrigKg%)
- C. **CumLoss\$** = 15,000,000 (obtained from servicer reports or a data vendor such as Intex)
- D. **CumLoss\$ / Orig Kg\$** = 37.5% (15,000,000 / 40,000,000)

Because 37.5 is greater than 0% and less than 50% (item 1 in the table above), then the SSFA floor for this deal is 1.6%. This would be the floor (minimum) for every bond in this deal. Assuming a bond from this deal has a market value of 10,000,000 then the required minimum capital set-aside would be \$160,000.

PHASE II

The next phase involves calculating the "**Kssfa**" - the capital based on a new SSFA formula which utilizes information regarding the **current** capital structure of a particular securitization. The results of this calculation may, at times, be less than the SSFA floor given in Phase 1 above. It is here where credit is given to bonds further up in the capital structure, which may never take losses or which may take only partial losses. The Kssfa formula attempts to adjust the risk weight % based on where the bond is in the capital structure.

Step 1. CurrKg% Calculate the **Current Kg%** by running all of the loans through the 8 criteria mentioned earlier, to determine which ones are NOW still considered "Qualified Mortgages". Several of the criteria will remain the same, such as 1st Lien, or Full Doc. But some of the criteria may have changed since the origination date of the loan. For example, a loan

may have been modified since its origination date; it may now be 90 days or more delinquent (or in foreclosure or REO); it may no longer be an “Interest Only” loan; and so forth. Many loans may have deteriorated regarding their credit quality, and so we need to determine the **CurrKg%** for use in the Kssfa formula.

Step 2. Determine “A” (the “attachment point” of the bond being evaluated.) The attachment point is a % figure giving the point at which the bond will start taking writedowns – which is an indication that the tranches below the bond have been written down already, and this bond is now taking losses. Note that **Intex** gives the attachment point of a tranche as its “**Current Credit Enhancement %**” – this is also known as the tranche’s **Current CE**. If a deal’s collateral losses, expressed as a % of the original collateral balance of the deal, are greater than the attachment point of the bond we’re evaluating then this bond will be partially written down. It may be fully written down but that is determined by Step 3.

Step 3. Determine “D” (the “detachment point” of the bond being evaluated). The detachment point of a tranche gives you the point at which the bond will be fully written off. The detachment is dependent on how large (or “thick”) is the particular bond within the capital structure, as well as being dependent on “A” (the attachment point given in step 2 above). Given an attachment point (A) and the “Thickness” (T) of the tranche, the detachment point can be calculated as simply: **A + T**. Note that **Intex** gives the Thickness of a tranche. Simply adding the **CurrentCE** to the **Thickness** gives you the **Detachment** point.

Step 4. Determine “p” – this is a “supervisory calibration parameter.” For resecuritization positions “p” is set to **1.5**, and for non-resecuritization positions, it is set to **0.5**. A resecuritization deal is one which has at least one collateral position in a tranche of another securitization. CDO’s can often be resecuritizations, but not always. If a CDO has only corporate loans, then none of those loans are considered tranches of another securitization deal, and, therefore, would not be a resecuritization deal. CDOs which contain tranches of other RMBS, CMBS, CDOs, Student Loan, Credit Card ABS deals would definitely be resecuritization deals.

Step 5. Now let us put the pieces together to obtain Kssfa:

$Kssfa = (Exp(a*u) - Exp(a*l)) / a(u-l)$

1. calculate “a” which is equal to: $-(1/p * CrntKg\%)$
2. calculate “u” which is equal to: $D - CrntKg\%$
3. calculate “l” which is equal to: $A - CrntKg\%$
4. calculate Kssfa
5. use the constant “e” 2.71828

(Note that the Excel function EXP utilizes the constant “e.”)
The result is known as the “**Kssfa**” risk weight %.

PHASE III

In this phase we bring phase 1 (**SSFA Floor**) and phase 2 (**Kssfa**) together and take the maximum of the two results.

$RiskWeight\% = Max(SSFA_Floor, Kssfa)$

That all appears simple enough except for the following facts:

1. For any tranche of a Non-Agency RMBS deal, in order to accurately determine **CurrKg%** and **OrigKg%**, you need a database of loan-level information and perform the calculations of Kg% as of **origination** of the deal as well as **current**. Each month, as new remittance reports come out, the CurrKg% will shift, as more loans change as to their credit quality (such as credit deterioration as in more loans becoming greater than 90 days delinquent) or as more loans are paid off (leaving less loans remaining in the pool to back the bonds).
2. Similarly, the attachment and detachment points shift over time. One needs a solid database of deal information in order to keep calculations up-to-date.
3. The current cumulative loss dollar amount must also be kept up-to-date monthly.

The Federal Register Document states the following about data requirements:

“A bank may use the SSFA to determine its specific risk-weighting factor for a securitization position only if it has information to assign each of the parameters for the positions. In particular, if the bank does not know Kg for a position, because it lacks the necessary information on the underlying exposures, the bank may not use the SSFA to determine its specific risk-weighting factor. Rather, then banks must apply a specific risk-weighting factor of 100 percent. The agencies believe that for most securitizations, the inputs to the SSFA are readily available from prospectuses for newly-issued securitizations and from servicer reports for existing securitizations.”

In short, if you can't get the data for the above parameters, you have to take a 100% risk weighting = full deduction from capital. It means that you must have the technology that will give you the above parameters routinely. Therefore, technology becomes very important.

Further:

1. Many bonds do NOT have the above parameters. For example, many “Interest Only” tranches do not have an attachment / detachment point, yet are rated AAA currently. These, under the former Basel IIa ratings-based rules, would receive a 0.56% risk weight; but now, they will take a 100% risk weight. Very punitive indeed.
2. The calculation of the attachment/detachment points for CDO tranches is so complex that Intex does not even provide it. If Intex won't calculate it, because of the varying nature of the structures of CDOs, then it would be up to a bank itself to work out what the attachment and detachment points are.
3. Some Student Loan deals which are guaranteed by the US government do not display an attachment/detachment point from Intex, but these are normally rated very high currently. Should these also suffer because there is no readily available credit enhancement information available? These are basically government guaranteed loans therefore the tranches are extremely safe as well.
4. There are many deals that simply do not report cumulative losses from any of the major data services (Intex, Bloomberg and so forth). This would necessitate a time consuming and

manually-intensive data gathering process for all tranches where the cumulative loss figures are not available.

5. There is the question of what should be done for OrigKg% for Non-RMBS deals (CDOs, Autos, Cards, Student Loans and so forth)? The “Qualified Mortgage” criteria given earlier are fine for RMBS, but what do you do for OrigKg% for all the other asset classes?

The above list represents a sampling of issues that should be discussed with the fed and to obtain more sensible ways of handling such situations which would not represent a failure of a bank to be able to collect the data but that data “lacks” exist which would need to be resolved otherwise many bonds that formerly received good capital treatment will now receive very punitive treatment thereby encouraging banking institutions to sell out of those positions thereby unnecessarily creating downward pricing pressures on certain segments of the markets where the economics of the bonds simply would not call for sale of those assets.

In our initial analysis, with 8% OrigKg% and CurrKG% for all non-RMBS deals and calculating the appropriate OrigKg% and CurrKg% for all RMBS deals -- and performing the above calculations for the bonds that had sufficient information available for A, D, and p, **it was generally highly beneficial from a capital perspective on our sample portfolio, in the order of hundreds of millions of dollars in reductions.**

However, without resolution to the above problems, where sufficient information is NOT easily available for the other bonds, that benefit was offset by the punitive nature of capital requirements for the rest of the bonds in the sample portfolio. The benefits were so great for those where the data exists suggest that putting facilities in place to work out the missing data would be extremely important, potentially providing a means of decreasing the amount of capital to be set aside against non-agency structured finance securitizations.

Thetica Systems, Inc., sister company to Thetica Solutions, provides a Structured Products Database™ (SPD) and a high level analytics technology. It is used by various financial institutions already, to assist them with trading and pricing ABS bonds (www.theticasystems.com for a demonstration). With this technology, much of the information that is not normally available to assess Reg Cap is now readily obtainable. By integrating a wide array of data from third party providers and holding that data in its SPD, this technology gives Thetica Solutions the ability to minimize or eliminate the punitive percentages mentioned above - by being able to access relevant data necessary to adjust Reg Cap set-asides.

For more information and to schedule an initial consultation, contact www.theticasolutions.com/ or call Dr. Michael Bloomfield, Director of Business Development, at 727-804-2660.