THETICA SOLUTIONS™

Regulatory Capital Case Analysis
by Jack S. Broad

"In order to determine with complete, and on a dynamic, on-going, basis, what your Real-Time Regulatory Capital Requirements are, it is essential to have three primary components."

Do you know what those three primary components are?

Find out inside this Case Study.

Call for your comprehensive phone consultation!

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Innovative Solutions to Structured Finance Problems

With state-of-the-art proprietary software, Thetica ABS Analytics™, and over 25+ years experience on Wall Street, **Thetica Solutions** offers expertise in Regulatory Capital, Litigation Support and Business Training.

Regulatory Capital Calculations – With **Basel II.5** coming into effect, banks are looking to minimize put-aside requirements. With **Thetica Solutions** you can get automatic calculations of minimum rating for the exposure and find out if it is a **re-securitization** (such as a Re-Remic, CDO, NIM and so forth), if it has a **granular** enough level of collateral backing it, and easily determine data on an on-going basis.

Data Analysis – You can **automatically** CALCULATE Regulatory capital in real time. You can IDENTIFY securitization exposure as part of an originating bank or investment bank. You can ASSESS whether to use a "Ratings Based Approach" (**RBA**), "**MaxCap**", or "Supervisory Formula Approach" (**SFA**). Our analytics creates immediate determination of impact that new potential trades may have on Reg Cap, determine overall capital requirements on single name CDS on ABS, and generate MaxCap for low-rated exposures and SFA for unrated exposures.

Case Study - Real-Time Bank Regulatory Capital for Structured Securities

Situation: One of the top internationally active banks was only able to calculate their regulatory capital three months after the fact. By that time, the composition of much of the banks' portfolios had shifted, and the trading desks were being managed against stale regulatory capital numbers. What was needed was for the trading desks to know what their regulatory capital was in real-time.

Thetica Solutions: After analyzing the systems and processes in place at the bank, meeting with the bank executives, financial controllers, trading desk personnel, IT teams and others, Thetica Solutions created a process of **on-demand** calculations of Real-Time Bank Regulatory Capital versus positions as of close of business of the prior evening. This includes performing the calculations again all securitization asset types (RMBS, CMBS, Consumer ABS, CDOs, CLOs, Re-Remics etc.)

The bank then wanted to see how the calculated regulatory capital figures – capital and risk weighted assets (RWA) – rolled up into a wide variety of summary reports, such as:

A. Regulatory Capital Treatment Type

RBA - using External Rating Agencies ratings and related risk weightings – those rated >=BB-

Maximum Capital (MaxCap) for low rated securities – those rated <BB-

Supervisory Formula Approach (SFA) for unrated securities – unrated securities

B. Summarizations by: Account, Trader, Head trader, Desk, Division, Legal Entity, Holding Company.

C. Derivatives for a dealing desk, netting by cusip/termination date across all "street-facing" trades.

There was an allocation of dealing desk's capital and RWA into various other divisions within the firm that had done trades with the dealing desk (aka "internal trades"), to show to which trading groups the regulatory capital should actually be assigned.

Roll-up reports into derivative trade types such as ABX Indices, CMBX Indices, Single Name CDS on ABS, CMBS, and on CDOs were created.

Inclusion of fees, such as upfront fees, write-downs, write-down reimbursement amounts and so forth, relating to each of the trades, was noted, so as to obtain a clean "Mark-to-Market" (MTM) value against which to calculate the derivatives regulatory capital requirements.

What is Required

In order to calculate the various components of regulatory capital on a bank's securitization exposures, it is imperative to be able to dynamically, on an on-going basis, calculate various attributes about the securitized deals and bonds. *Some* of the key attributes needed are enumerated in the following:

Originating Bank or Investing Bank - Is the Deal part of one which the bank itself had something to do with originating? If so, the bank is considered to be an "Originating Bank".   If it is an originating bank, then a minimum of two rating agency ratings are required for the security to be considered rated; otherwise, the security is put into a bucket called "unrated". The bond would be considered one in which the bank has **invested** and had no influence over the selection of the assets, nor the issuance of the deal itself, nor was the bank involved in the investment banking process relating to the bond issuance – therefore, can be considered an "Investing Bank" for Regulatory purposes. For "Investing Banks", there must be a minimum of one rating for the security to be considered **rated**.

Minimum Rating – A Bank has to obtain the external ratings from data sources for the various rating agencies, such as Moody's, S&P, Fitch, DBRS etc. Procedure includes calculating the Minimum Rating of the rating agency's ratings provided, and mapping those into RBA, MaxCap or SFA categories mentioned earlier in this case study.

For those securities qualifying for **RBA** treatment (Minimum Rating >=BB-), then one determines other crucial attributes, such as:

a. **Re-securitization** - Is the security part a tranche of a re-securitization (CDO, Re-Remic etc).

b. **Granularity** - If it is not a re-securitization tranche, then determining whether the deal that the security is part of contains assets at a sufficient level of granularity. This means determining if the security has "retail assets" (residential mortgages, credit cards, autos, student loans etc), "commercial assets," and that the number of assets in those deals is greater than 25 and so on. Otherwise, if less than 25 assets, one calculates "N" (granularity) according to Basel rules.

c. **Seniority** - If the security is not a re-securitization and is also granular, OR if it is a re-securitization tranche, then it must be determined if the tranche is the "senior-most" tranche (a tranche which has a first claim on assets according to Basel rules) in the deal. This particular attribute can be the most difficult to accurately determine, because of the fact that, *over time*, tranches which start out as **non**-senior *become senior-most* as the tranches above them in the capital structure pay down.

We can take the example of a last pay, originally-rated AAA security that has two AAA securities above it in the capital structure. When this deal starts off, the very first AAA at the top of the cash flow waterfall would be the senior-most tranche in the deal; but over time, when the first-pay AAA and the penultimate (next to last-pay AAA tranche) bonds are both paid down, then the last-pay AAA bond **becomes** the senior-most bond at that point in time, and therefore should qualify for a lower Basel risk weight percentage than was previously.

Data vendors state that all three AAA bonds are a "senior" type of bond in the capital structure; but this categorization has no thought of the Basel definition of "senior-**most**" or "the tranche which has a first claim on assets." We go deeper into the capital structure, to determine the current "senior-most" bond.

For this, one needs to perform an analysis of the full capital structure of the deal, to see if there are bonds ABOVE the bond being considered, which have *not paid down,* and which are "*more senior*". If there are, then the bond we are considering is NOT the senior-most bond, and should get the appropriate Basel risk-weighting based on it being non-senior.

This also emphasizes the fact that you cannot do the "senior-most" calculation just once at the beginning of the deal's life, and then forget about it. It is a dynamic, on-going process.

Maximum Capital Calculations (MaxCap) – for "low rated" securities (those rated less than BB-), determining the maximum amount of capital that would have been needed to be set aside, assuming that the deal assets had never been securitized in the first place, is an essential ingredient for MaxCap calculations. Working out probabilities of default (PD), loss given default (LGD) and exposure at default (EAD) for both defaulted assets and non-defaulted assets, are key to this process. **Thetica Solutions** worked closely with the bank to generate these key figures and integrated the processes in real-time.

Supervisory Formula Approach (SFA) – for "unrated" securities, calculating the Kirb% figure is one of the primary elements that are needed for this formula.

The **SFA** formula for unrated securities requires the on-going calculation of the following ***dynamic*** elements:

> **Kirb** - the capital charge, had the underlying exposures not been securitized
> **L** = Credit Enhancement levels
> **T** = Thickness of the tranche being considered
> **N** = Effective number of exposures (aka "granularity")
> **EWALGD** – Exposure Weighted Average Loss Given Default.
> **TP** = % of the Tranche owned by the bank

As deals age, these inputs need to be calculated as the collateral composition changes via pay-downs, delinquencies, foreclosures, bankruptcies, loan modifications, bond write-downs and so forth. Without these key inputs being able to be kept up-to-date in real-time, a bank is not capable of performing the **SFA** calculation dynamically on their unrated securitization assets, thereby resulting in a full deduction of the security from capital – a most punitive form of regulatory capital.

Conclusions – The results of ***accurate*** and ***on-going*** determination of all of the above attributes leads to being able to use the ***correct*** risk weights from the standard Basel risk weights table of risk weight percentages, and to perform the calculations necessary for securities qualifying for MaxCap and SFA. Being unable to correctly and dynamically identify all of the above attributes results in incorrect regulatory capital figures being applied to securities.

When you add in the need to be able to not only run "***real-time*** regulatory capital", but to also be able to run the entire set of processes and calculations against historical dates (such as quarter-end or year-end dates for corporate reporting purposes), it becomes clear that something new is required.

The bank where we have implemented this approach gets its real-time regulatory capital calculations in real-time on its entire portfolio of thousands of trading book assets in ***one and one half minutes*** after the user has clicked on a button to refresh the entire portfolio. In addition, users can request specific portions of the portfolio be run, thereby permitting individual segments of the trading operation to see how their specific contributions are relating to Reg Cap figures.

Some additional benefits of the above are:

1. Immediately knowing which securities are currently generating the largest regulatory capital requirements, thereby assisting in the identification of likely candidates for potential unwinding.
2. Being able to perform "what-if" analyses related to potential new trades, in order to automatically calculate the impact on Reg Cap figures. If a particular new security were to show a lot of Regulatory Capital, then it can give pause to the trade -- unless there is a compelling economic reason to purchase the security.

Primary Components - It was found that in order to determine the above with complete accuracy and on a dynamic, on-going basis, it was essential to have three primary components:

1.   **Structured Products Database** - A high integrity structured products database that would form the essential backbone of such a system.

2.   **Key Attributes** - Bolted onto such a system would be added the necessary process that would dynamically derive the various important attributes mentioned earlier.

3. **Rapid Integration** - A rapid integration of the bank's internal position that keeps systems for cash and derivatives securities along with the various characteristics that enable summary reports, such as those mentioned earlier in this case study.   Armed with these, one is able to generate accurate regulatory capital calculations.

How Thetica Solutions Solves the Primary Components

For #1 above, Structured Products Database, such a system already exists. It is known as the Thetica Structured Products Database™. Thetica Systems, Inc. is a sister company of **Thetica Solutions, LLC** and is known for providing high level analytics technology. It is used by various financial institutions already, to assist them with trading and pricing ABS bonds. You can read about this system at: www.TheticaSystems.com.   We can arrange a demonstration of this core system for you.

For #2 above, Key Attributes, **Thetica Solutions** has already implemented this at a large internationally active bank, and this solution is available to be implemented as part of the overall project of integration mentioned in 3 above.

For #3 above, Rapid Integration, **Thetica Solutions** has personnel who have decades of experience with the financial markets, integrating mission-critical systems. In this economic environment, we would be hard put to find a more mission-critical system than the proper assessment of a bank's regulatory capital for its securitization exposures. As part of the delivery of this overall Reg Cap system, **Thetica Solutions**, after consultation with the bank, would assemble a team of professional consultants to come in and cooperatively work with the bank, to rapidly integrate the components.

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Now it's your turn to reap the benefits of **Real-Time Reg Cap™!**
Have your analysis, service and data provided
by Thetica Solutions.

Jack Broad, Founder and President of **Thetica Solutions, LLC** brings over twenty five years of experience on Wall Street designing and building systems that address the needs of Wall Street dealers and traders. He has worked in some of the most demanding markets, including Convertible Bond and Risk Arbitrage and he was there during the explosion of the Corporate CDS market and the start of the CDS on ABS market.

Jack has designed and built full blown trade capture and valuations systems for two major Wall Street dealers which have become integral to their operations and risk assessment for the ABS markets at these firms. He is an expert business analyst who works very closely with end users.

Jack Broad has been a pioneer in rapid application development and agile technologies throughout his career. His focus has always been on getting sound technology solutions rapidly into place in fast changing markets and in assisting clients to maximize their returns.

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