



Article from

## **Risk Management**

January 2016

Issue 34

# The Longer-Term Investment Implications of the C-ROSS Regime

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*The introduction of China's Risk Orientated Solvency System (C-ROSS) focuses insurance companies on linking assets and liabilities to improve capital efficiency. This will require sophisticated risk management tools set in improved decision making frameworks. This innovation occurs as the insurance industry is growing quickly, positioning China as the third largest insurance market globally. In this article we take a look at some of the requirements practitioners will need to consider as they implement a framework for managing the long-term implications of C-ROSS as they pursue their capital efficiency agenda.*

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The Asian insurance industry continues to see unprecedented growth, even as the overall economic growth in the Asian market is slowing. Developing markets in Asia such as China, India and Indonesia, while very different in their application of insurance and their regulations, are experiencing an expanding middle class and changing demographics pushing growth to double digit rates. China's forecasted 6.3 percent economic growth in 2016 is the lowest in two decades, while its insurance industry continues its growth at more than double this rate.

The investment market in China has gone through a period of turbulence over the past year starting with nearly a 40 percent decrease in the equity market price levels during the earlier half of the year followed by a 3 percent drop in the currency in August. On the interest rate side, the policy rate in China was cut by 25bps with expectation of further cuts, while the U.S. interest rate hike still looms.

The dynamics of the market coupled with the push for sustained industry growth has led China to implement a re-valuation of risk. The CIRC is a key component of this revaluation and will eventually lead to fundamental shifts in the allocation of insurance company portfolios.

China's ability to adapt and incorporate global best practices and innovations, whether it be new investment classes, risk management processes or insurance products, continues at pace.

## MAJOR REFORMS IMPLEMENTED

Most recently, China's insurance and market regulators have implemented major reforms that have been the catalyst for a

significant paradigm shift for insurance companies. Two of the policy changes that carry the most fundamental implications to the insurance company investment operations are: (1) easing of restrictions for investment into alternatives and overseas asset classes and (2) growth of domestic markets through creation of new asset classes and expansion of existing asset classes, such as derivatives. This acceleration of market liberalization is allowing Chinese insurance companies to build globally diversified balance sheets with the added benefit of enhanced return through global alternatives and reduced duration gap through access to longer duration debt instruments.

As the currency depreciates, insurance companies that have robust frameworks for foreign investment will be in an advantageous position. We are also expecting a narrowing of the interest gap between China (expected to cut rates) and the United States (expected to hike rates), which will ultimately lower the relatively higher reward when investing in domestic markets vs. foreign markets.

Given this expanding list of market variables, insurance companies in China have realized that an integrated framework for risk management and strategic asset allocation will be necessary in order to allow them to make decisions to optimize their projected capital under the C-ROSS regime

## COMPANIES ARE ENHANCING ERM AND SAA FRAMEWORKS

In the midst of this new frontier of investment, C-ROSS introduces an expansive solvency framework that will require insurance companies to calculate their capital position using a holistic methodology covering both sides of the balance sheet.

At the cross between market liberalization and heightened capital guidelines, companies are enhancing their Enterprise Risk Management (ERM) and Strategic Asset Allocation (SAA) frameworks that allow them to take advantage of growing opportunities in the market while managing enterprise risks.

The key component in a well formed and robust ERM/SAA framework is its ability to bridge the gap between the business units by capturing the overall mission statement of the insurance company and transforming it into a quantifiable and transparent set of decision making metrics. This framework will allow a wider and deeper view of the company dynamics with respect to the investment portfolio and allow senior management to make key decisions.

Using sophisticated stochastic modeling techniques, companies can explore the impact of C-ROSS projected forward in time, in order to determine how to make investment decisions today to maximize their expected benefit tomorrow.

### MODELING THE “TAIL” IS AN ESSENTIAL REQUIREMENT FOR TODAY’S RISK MANAGEMENT

As seen in other markets as recently as in the 2008 Financial Crisis, asset classes tend to “influence” one another through stronger correlations during tail events, ultimately causing a domino effect across the balance sheet. The ability for the modeling framework to produce this dynamic stress analysis is essential.

In developing markets, the lack of historical data on investment classes tends to make it difficult to model future tail behavior. However, the fact that these markets exhibit more volatility than developed markets makes these models even more essential. As such, it is important to incorporate the expertise of market practitioners and asset managers in order to supplement the historical data available. Equally important is the ability to conduct stress tests on the tail in order to understand the sensitivities to the portfolio and ultimately to the overall capital position.

Stochastic projection of the capital into the future allows companies to make decisions today for a higher level of capital efficiency tomorrow

### ADVANCED MODELING FRAMEWORK TO SUPPORT IN-DEPTH ANALYSIS

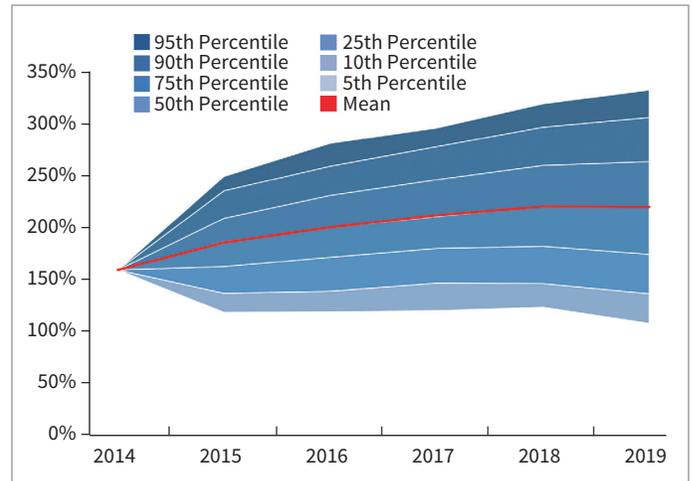
Modeling C-ROSS into future time periods stochastically involves building a sophisticated model capable of incorporating both sides of the balance sheet by connecting the assets to the liabilities. It also involves having a framework that is able to factorize the C-ROSS specifications so that the calculation can be re-done over projected scenarios and over future time periods. This ability to “factorize” is a key consideration so that the calculation is still consistent with the core principles of C-ROSS.

Another fundamental aspect of the model is having a robust Economic Scenario Generator (ESG) that has enough flexibility to incorporate the specific market variables in China which has the market dynamics calibrated properly and validated through actual market practitioners. The Chinese market is in a state of growth and liberalization, which requires an ESG capable of evolving through the projection horizon as the market is expected.

### PROJECTING SOLVENCY RATIOS

Figure 1 shows the projections of C-ROSS over a five year horizon using such a model. The mean shows the expected reported solvency position over five years. An important issue being outlined in the projection is that the tail (bottom 5th percentile) moves very close to 120 percent (down from 170 percent). Analyzing the multiple scenarios and their projected asset/liability interactions which caused this level of capital deficiency would lead to the basis of a risk appetite statement and a market based trigger system used in our monitoring of market risks.

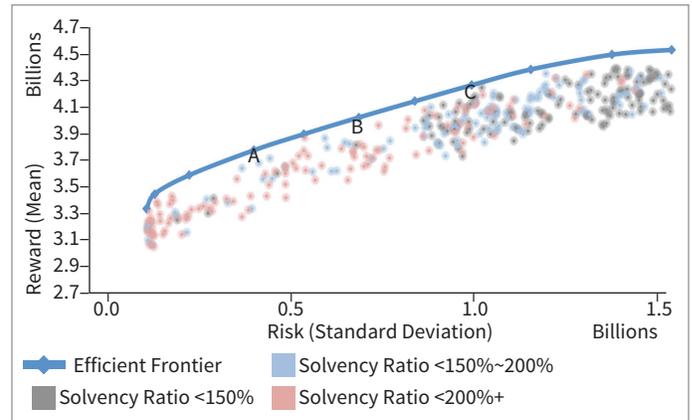
**Figure 1**  
Solvency Ratio – Current Investment Strategy



### OPTIMIZE C-ROSS USING THE EFFICIENT FRONTIER

In order to analyze multiple investment strategies applied within the C-ROSS projected framework we utilize an advanced genetic search algorithm which seeks to maximize the effective area of the convex hull in order to draw the Efficient Frontier (EF). The figure shows how various investment strategies plot in terms of their risk/reward trade-off under the C-ROSS regime.

**Figure 2**  
C-ROSS ALM Efficient Frontier - Profit in 5 Year



### TAIL ANALYSIS TO IDENTIFY THE SAA

Once the EF is identified a key focal point is the tails of the capital projection. As the allocation to higher risk asset classes increases we see that the tail risk also decreases to a certain point before the expected benefit no longer outweighs the increased risk. This allows us to choose our “risk limit” and identify the corresponding investment strategy.

**Figure 3**  
Tail Analysis

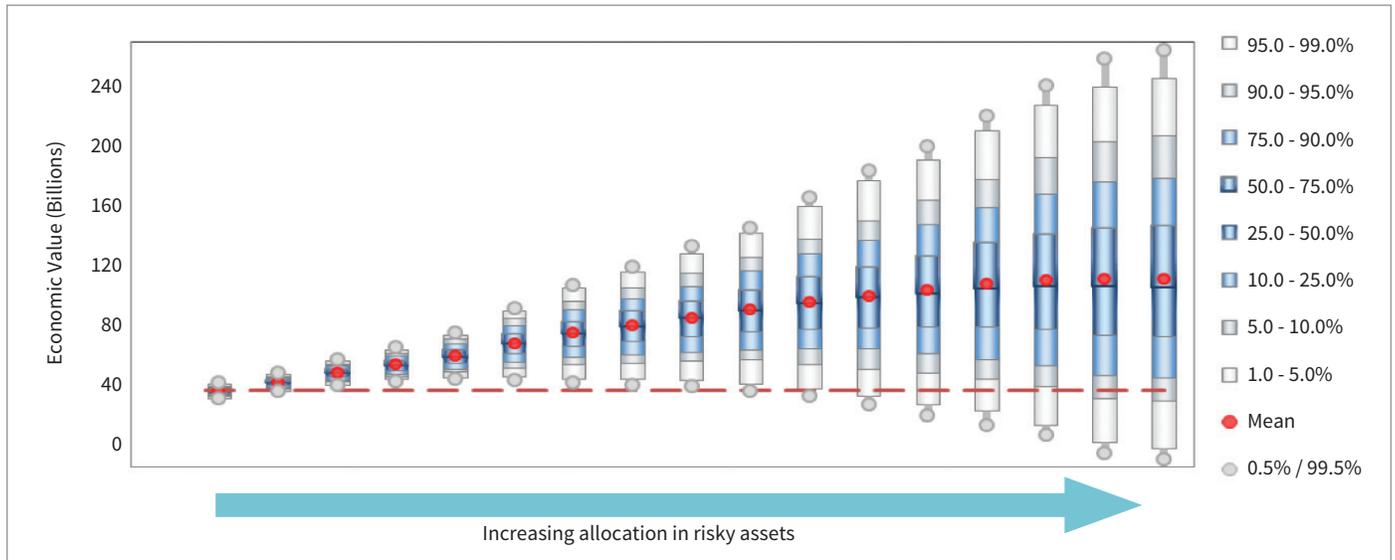
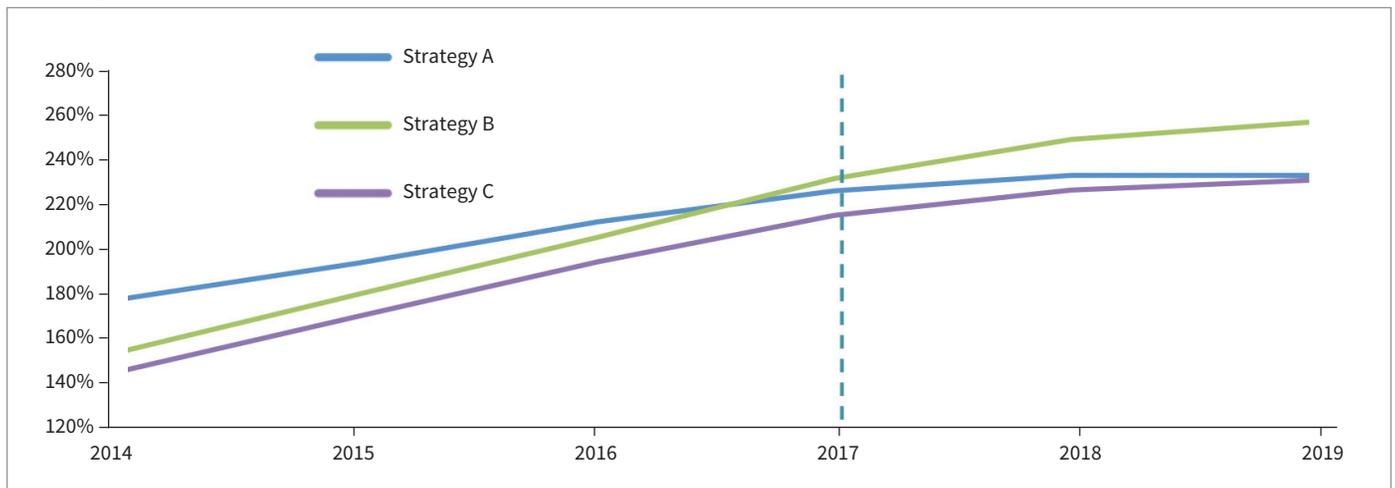


Figure 4 goes deeper into the analysis and plots the mean of the solvency ratio over time for three investment strategies. In the figure, strategies B and C are both subject to a lower solvency ratio starting position than strategy A because of the increasingly higher exposure to foreign assets and the higher initial equity hedging cost. However, strategy B has a higher solvency ratio

than strategy A in three years as it is utilizing the benefits of the foreign investment strategy being applied to the portfolio. This illustrates that the incremental risk taken at the initial time period is eventually overcome later in the projection. The same cannot be said for strategy C which cannot overcome the higher costs for hedging and the increased foreign currency risk.

**Figure 4**  
Solvency Ratio



**Table 1**  
Asset allocation of investment strategies  
in Figure 2 & Figure 4

Strategy	A	B	C
Fixed Income	79 percent	74 percent	68 percent
Stock	7 percent	7 percent	7 percent
Foreign Assets	4 percent	9 percent	15 percent
Others	10 percent	10 percent	10 percent
Percent of Equity Hedged by Derivatives	0 percent	25 percent	75 percent
Solvency Ratio (initial)	180 percent	156 percent	148 percent
Solvency Ratio (in 5 years)	235 percent	259 percent	233 percent

**A STRATEGIC FRAMEWORK THAT CONNECTS AND ENHANCES THE DECISION MAKING FRAMEWORK**

The advent of C-ROSS will have fundamental long-term implications to how insurance companies manage their businesses on both sides of the balance sheet. Market uncertainty still prevails and the globalization of the market expands the list of variables that need to be accounted for when building an efficient/well-diversified portfolio. As in developed markets, the ability to make decisions today to enhance the available capital of the

The dynamics of the market coupled with the push for sustained industry growth has led China to undergo a revaluation of risk which in turn has led to higher level of market uncertainty.

insurance company in the future will form the basis for success and growth in an already rapidly growing and competitive market. The incorporation of advanced modeling techniques and sophisticated frameworks that model both sides of the balance sheet in a holistic and connected way is increasingly necessary and will allow senior management to make the critical decisions to achieve success in this dynamic and innovative market. ■



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