

Passing Stress Tests With Convertible Bond Strategies

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Solvency II has been a challenging regulation for European insurers, who are trying to balance a worst-case industry risk scenario while trying to maintain healthy returns on invested assets. The Solvency Capital Requirement (SCR) includes a series of stress tests that themselves can be stressful to prepare for. Insurers need to look at a variety of investment strategies that can help them perform well on these stress tests and stay in line with regulatory requirements.

Convertible bonds are among the strategies that can be particularly helpful in this kind of regulatory environment, and they're perfect for helping insurers pass stress tests. In this paper, we'll present analysis that demonstrates the comparative efficiency of convertible bond strategies in the SCR framework. We'll also provide sample rebalancing allocations that can increase expected returns and reduce both economic and regulatory risk. And we will focus primarily on the benefits of the following three strategies: long defensive convertibles, long balanced convertibles and long-short "hedged" convertibles.

SCR Stress Test: Market Risk Asset Stress Tests

For the purposes of evaluating investment capital requirements, the only relevant SCR stress test category is market risk. There are six modules within the market risk category, four of which are relevant for our analysis: equity, spread, interest rate and concentration. The structure of these four stress modules give regulatory capital credit to convertible bonds' risk mitigating properties.

The Equity Stress Test

Equity investments receive the most significant stress. Some equities are stressed by almost 65 percent depending on the country of risk, and whether equities are rich or cheap. Although there is a "transitional measure" whereby equities held prior to Jan. 1, 2016, receive favorable treatment, this will disappear over time as equity portfolios turn over. Equities domiciled in countries belonging to either the Organization for Economic Co-operation and Development (OECD) or the European Economic Area (EEA) are stressed at an unadjusted rate of 49 percent, while non-OECD/EEA equities are stressed at an unadjusted rate of 56.5 percent.



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An adjustment factor of up to +/- 7.5 percent is then applied to the stress test rate. This is called the cyclical adjustment (CA) and it is calculated and posted on the EIOPA website. As of the end of April 2017, the CA was negligible.

Equity-linked assets, such as options and convertible bonds, are re-valued assuming a drop in the underlying equity price as prescribed in the aforementioned rules. EIOPA guidance is vague as to whether simultaneous changes to equity volatility are permitted. Therefore, we performed the stress test inclusive and exclusive of shocks to equity volatility. Allowing shocks to volatility is necessary because it is unlikely that equity prices could drop to 65 percent without significant increase in equity volatility.

Equity Stress Impact Model By Asset Characteristics				
	Equity	Convert.	Convert.	Convert.
Initial Delta	1.00	0.85	0.55	0.25
Initial Gamma	-	0.006	0.007	0.006
PnL on 39% Stress	-39%	-28.6%	-16.1%	-5.2%
Intermed. Delta	1.00	0.62	0.28	0.02
Intermed. Gamma	-	0.005	0.006	0.005
PnL on addl. 15% Stress	-15%	-7.1%	-4.8%	-1.0%
Participation rate on 39%	100.0%	73.3%	41.4%	13.3%
Participation rate on addl. 15%	100.0%	47.4%	32.2%	6.8%
Instantaneous Equity Module Stress (Delta, Gamma, and Vega Effects)				
	Equity	High Delta Convert.	Balanced Convert.	Defensive Convert.
Initial Vega		0.002	0.003	0.002
PnL on 39% Stress	-39.0%	-25.6%	-11.6%	-2.2%
PnL on addl. 15% Stress	-15.0%	-4.1%	-0.3%	0.0%
Participation rate on 39%	100.0%	65.6%	29.8%	5.6%
Participation rate on addl. 15%	100.0%	27.4%	2.2%	0.0%

Equity risk sub module calibration documentation describes a relative equity volatility increase of 50 percent as equities decline. For convertible bonds, which typically have an implied volatility of 30 percent, this translates into a 15 point increase in volatility.

The Equity Stress Test is Structured Favorably for Convertible Strategies

The structure of the equity test makes convertibles a favorable strategy for several reasons. First, the stress is applied as a function of country and market cycle, not beta or volatility of the equity. Since the convertible asset class historically holds a high percentage of higher beta and volatility constituents, the regulatory capital test is less severe than is implied by the economic risk.

Secondly, the equity stress penalizes non-OECD/EEA issued equities. The global convertible asset class has been underweight in these countries versus the MSCI World equity index, resulting in a somewhat

less severe stress than global equity.

Additionally, there is no risk parameter in the Solvency II test for the richness or cheapness of the convertible market (versus theoretical value). Convertible bonds tend to cheapen slightly in a crisis, but because there is no parameter to model this effect, regulatory capital penalty is applied to convertibles strategies.

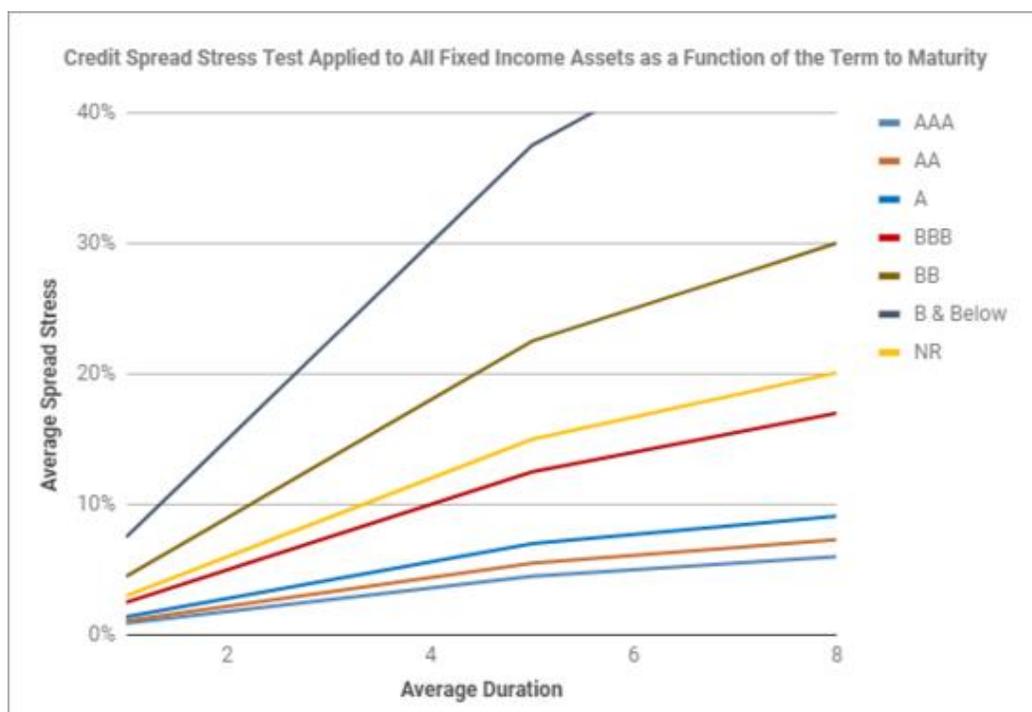
Finally, the cyclical adjustment, which creates a 38 percent swing in equity stress severity, works to the significant advantage of convertible strategies. Convertibles possess a property known as gamma, the change in delta or sensitivity to the underlying equity price. This refers to the asymmetry of returns caused by a convertible bond price approaching its “bond floor,” or the price at which the convertible would trade if the equity warrant was worthless.

When the effect of a stress in equity prices on equity volatility is taken into consideration, the downside participation rate falls even further. Because the Solvency II equity stress test recognizes these effects, the cyclical adjustment has a very favorable effect on the regulatory capital cost of convertible bonds relative to equity.

The Credit Spread Test

The spread stress test is applied to all fixed income investments and is primarily based on the credit quality and duration of the investment. It treats spreads relatively mildly, and nonrated securities stress levels are just slightly higher than BBB. This fairly represents the convertible asset class where investment grade issuances represent a significant percent of nonrated securities.

A severe equity stress, combined with a moderate spread stress, is especially favorable to the hedged convertible strategy. Long convertible “bond floors” generally hold up well with moderate spread stress, while short equity positions do extremely well given the severe equity stress.

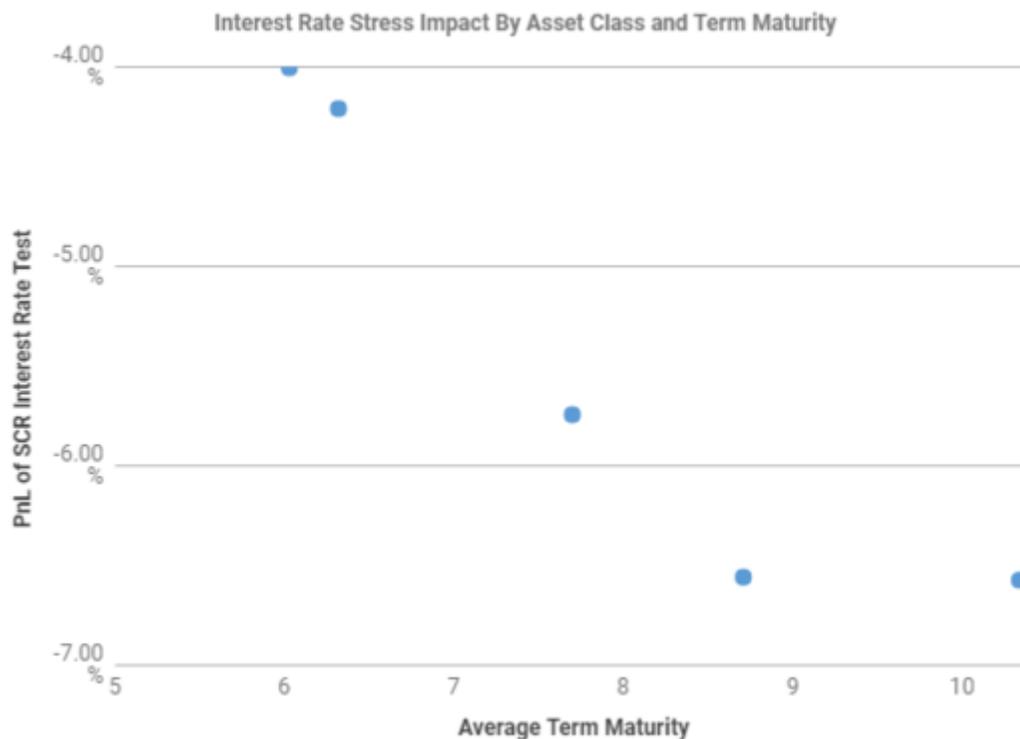


The Interest Rate Test

Interest rates are stressed up and down, and the minimum of the two is used. For most rate sensitive assets, this would be the up stress. Except where rates are already higher (emerging markets, Australia, longer term U.S. bonds) the minimum rate stress of 100 basis points is the applicable stress for most assets.

Convertible bonds would perform relatively well under this test due to shorter durations and positive convexity. As rates increase in the future, the rate stress on many OECD and EEA bonds will increase. For convertible bonds, with a low duration to maturity ratio, the rate stress increase should not be as significant.

While European issuers are generally well-matched in terms of asset-liability durations, information provided in the October 2016 EIOPA stress test review suggested there could be pockets of duration mismatch. Reducing interest rate sensitivity can be achieved by re-allocating from longer duration straight debt into convertible bonds, which historically have much lower effective duration due to the negative duration of the embedded equity option.



The Issuer Concentration Test

The concentration test favors convertible strategies because issuer group concentrations above 1.5 percent of assets receive severe treatment in this stress test.

Because there is little overlap between convertible bond issuers and high yield or large cap equity index issuers, convertible allocations can help reduce overall issuer concentration, which provides significant relief to the capital requirement implications of this rule.

The Hedged Convertible “Paradox”

Combining all stresses of the capital requirement test, equities lose 48 percent, hedged convertibles gain 15 percent, and high yield loses 6 percent. Since hedged convertibles perform better than many other asset classes in the stress tests, they can be used to reduce risk on the overall portfolio. A 10 percent reallocation from equity to hedged converts hypothetically reduces regulatory capital by 13.2 percent. A similar substitution from equity to high yield would result in a much smaller reduction of regulatory capital (8.7 percent).

The paradox is that hedged convertibles would have a higher capital requirement than high-yield bonds if the test calculated each asset class separately. In theory, the capital requirement of a single investment is effectively the absolute value of the stress test result. However, the regulatory test gives full credit to the downside protection offered by hedged convertibles when they are blended in an equity portfolio. Even if regulators chose to treat short equity separately from long convertibles, the capital requirement relief can still be achieved by placing both legs in total return swaps.

Risk Reducing and Return Enhancing Substitutions

A capital constrained insurer can certainly reduce capital requirements and boost upside returns significantly by substituting convertibles for either equity or fixed income assets. To close, here are some examples of how insurers can do this depending on their portfolio makeup:

- In a 60/40 portfolio, substituting 10 percent balanced convertibles for 5 percent investment grade corporate bonds and 5 percent equity, potentially reduces capital requirements on the whole portfolio by 133-155 basis points (around 5 percent) and can boost total portfolio upside returns by 86-128 basis points (around 4 percent).
- For an equity portfolio, a 10 percent substitution to hedged convertibles can reduce capital requirements by 717 basis points (~13 percent), while a 10 percent substitution to balanced or defensive convertibles can reduce capital requirements by 400-459 basis points (8 to 9 percent) respectively without significantly affecting upside return (-183 basis points to -304 basis points).
- For a fixed income portfolio, a 10 percent substitution to investment grade defensive convertibles can reduce capital requirements by 20 basis points (4 percent) while potentially boosting upside return by 252 basis points; and a 10 percent substitution to hedged convertibles can potentially boost upside return by 309 basis points for the same level of capital. A 10 percent substitution from investment grade to a blend of convertible strategies can reduce capital requirements by 31 basis points (6 percent), while increasing the upside return by 295 basis points.

In conclusion, it's clear that Solvency II represents a major change in how insurers need to approach asset risk. The SCR stress tests represent a critical component of Solvency II for which insurers need to thoroughly prepare. Over time, the stress can become more severe as equity portfolios turnover and the cyclical adjustment waxes and wanes. Insurers should rely on different strategies, including some that are overlooked like convertible bonds, which can better position them to pass the stress tests, providing significant capital requirement relief without sacrificing return on invested assets.

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