



THE CAPITAL EFFICIENCY OF CONVERTIBLES FOR GLOBAL INSURANCE FIRMS

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EXECUTIVE SUMMARY

In 2016, Europe adopted the Solvency II regulatory framework for determining capital requirements for insurance providers. At that time, Advent Capital Management released a white paper demonstrating the capital efficiency of the convertible asset class as an investment for insurance firms subject to these capital controls. It concluded that insurers could increase return on regulatory capital by allocating to convertibles in place of equity or in place of core-fixed income. These were prescient and valuable recommendations as convertibles significantly outperformed equity and core fixed income risk-adjusted performance ratios (see RORAC in Table A).

Many of the considerations of that paper remain true today. This white paper reviews convertibles' performance and continued capital efficiency relative to other investments since Solvency II became effective in 2016 to the present and looks at the expected performance and efficiency over the next ten years. Furthermore, we also review changes to the regulatory landscape. Our key takeaways include:

1. Since Solvency II took effect in 2016, global convertibles have continued to deliver strong risk-adjusted returns and return on regulatory capital, as evidenced by their higher Sharpe ratios, Sortino ratios, and Return on Regulatory Risk Adjusted Capital (RORAC) versus government and corporate bonds and global equities.
2. Solvency II and other regulatory frameworks (i.e. Solvency UK, NAIC) continued to give insurance companies credit for the risk-reducing beneficial characteristics of convertibles in their risk-weighted capital calculations. This is particularly true in the way equities, spreads, and rates are stressed, and in the way the stresses are combined into the Solvency Capital Requirement (SCR).
3. The regulatory landscape has changed in four primary ways, and as it continues to evolve it is likely to become even more favorable for convertible investments. The four relevant areas of change since 2016 relate to:
 - The evolution of Solvency II Market Risk calculations,
 - Brexit, the departure of the U.K. from the Solvency II regime, and the creation of Solvency U.K.,
 - Increased adoption of internal models versus standard models, and
 - Authorization of non-Solvency II regulated insurers' participation in local markets.
4. Most widely followed long-term capital market actuarial forecasts overlook the convertible asset class – including the widely followed Horizon Actuarial annual survey. Modeling the return of convertibles relative to the forecasts of asset classes that are included shows that convertibles should continue to deliver strong economic and regulatory returns on capital over the next 10 years. An allocation to convertibles could be a highly capital-efficient way to gain the market exposures you seek.

The original Solvency II rules and subsequent changes matter because greater efficiency on the asset side of the balance sheet impacts the business that can be written on the liability side of the balance sheet. ***Therefore, investing in capital efficient investments like convertibles can increase the competitiveness of insurers.***



1. PERFORMANCE (RISK AND RETURN) SINCE SOLVENCY II TOOK EFFECT

The adoption of Solvency II in 2016 represented a move toward standardization of risk-based capitalization rules for European Insurers. At the time of adoption Advent published a review of the rules and concluded that convertibles were a regulatory capital efficient investment. Our recommendation was to substitute global convertibles for global equity, and global investment-grade convertibles for global core fixed income. Since then, **the convertible asset class has been, and continues to represent an attractive and capital-efficient investment for insurers operating in Europe and the UK** (see Table A).

Equity Portfolio Comparison

From 2016 to the present, global convertibles have captured most of the return of global equities, but with significantly less volatility – particularly during periods of market decline. This favorable profile helped to drive convertibles substantially higher Sharpe and Sortino ratios than global equity. Furthermore, since the risk capital weighting using the Solvency II methodology resulted in a 40% lower risk weight for convertibles, the return on regulatory capital (“RORAC”) was 30% higher than that of global equity.

Fixed Income Portfolio Comparison

Global convertibles significantly outperformed global government bonds and global corporate bonds over the entire period. Convertibles outperformed these two asset classes by 652 and 539 basis points per year respectively. This resulted in a 27.4% return on regulatory capital for convertibles versus just 1.6% for global government bonds and 10.5% for global corporate bonds.

Table A. Convertibles Prove to be a Strong Alternative to both Equity and Fixed Income
1/1/2016 - 8/31/2023

	Equity Alternative			Fixed Income Alternative			
	Global Convertibles	Global Equity	Difference vs. Convertibles	Global Govt. Bonds	Difference vs. Convertibles	Global Corp. Bonds	Difference vs. Convertibles
Total Return	6.7%	8.5%	1.8%	0.2%	-6.5%	1.3%	-5.4%
Volatility	9.8%	14.2%	4.3%	4.1%	-5.7%	6.0%	-3.9%
SCR Capital Risk Wt. Est.	24.4%	40.3%	15.9%	10.1%	-14.3%	12.3%	-12.1%
RORAC (Solvency II)	27.4%	21.1%	-6.3%	1.6%	-25.8%	10.5%	-16.9%
Sharpe Ratio	0.56	0.52	(0.04)	(0.24)	(0.81)	0.02	(0.54)
Sortino Ratio	0.94	0.84	(0.10)	(0.41)	(1.35)	0.03	(0.91)

Source: Bloomberg, ICE Data Services, Advent Capital Management. Returns presented are of GBP hedged versions of the respective indices.

2. RISK CAPITAL RULES FOR INVESTMENTS

The common principle of insurance regulation across jurisdictions is to ensure that insurers have sufficient capital to withstand severe financial stress. In the European Union this was defined as a once in two-hundred year event. To evaluate capital sufficiency and to determine capital requirements, regulators require the modeling of risks and stress-testing of existing assets, liabilities, and expected new business within the next 12 months. An important metric in the evaluation is the “Solvency Capital Requirement” or “SCR” which is calculated according to a standard formula for most insurers. Some insurers have been approved for the use of their own “internal models” but many of the same principles apply. In the Solvency II process standard formula investment capital risk weights are calculated in the market risk module using seven sub-modules which apply a series of stress tests. The three most relevant for our analysis are those pertaining to Equity Risk, Spread Risk, and Interest Rate Risk. The primary reason that convertibles are capital efficient from the perspective of regulatory capital is that the way the stress methodology is advantageous to the asset class.



Equity Risk Module

- **Same stress to all equities, regardless of volatility or beta** – As convertibles are typically issued by more volatile companies, this reduces the SCR of convertibles.
- The equity stress **only applies to the equity option portion** of a convertible – which is on average about 20-30% of the value of a convertible.
- The equity stress allows for a “full revaluation” which **incorporates the full benefit of the positive convexity of convertibles - which reduces downside participation**. A “Delta Equivalent Stress” (used prior to Solvency II) assumes that equity sensitivity is static and therefore would not credit convertibles for their downside protection.
- The basic stress of 39% for EEA and OECD countries, and 49% for other countries is adjusted higher or lower by 10% depending on recent equity market returns. **The more severe the equity stress, the more value there is in the positive asymmetry of convertibles, therefore increasing the relative efficiency of capital versus equity.**

Spread Risk & Interest Rate Risk Modules

- Both spread and interest rate stresses are a function of credit rating and duration. **Convertibles have short duration**. While the bond portion has positive duration (like other bonds), the equity option has negative duration – increasing in value as interest rates rise due to the effect of leverage implicit in an option. **This results in lower capital requirements relative to other debt investments.**
- In the spread stress Non-Rated securities are treated as if they are only slightly more risky than BB-rated bonds. A large percentage of convertibles are not agency rated, but are below BB credit quality, which means the stress is less severe than if they had agency ratings.
- Both of these stresses apply only to the bond portion of a convertible, which is on average about 70-80% of the value of a convertible.

Aggregating the individual market risk stress tests into a single market risk value is performed using a correlation matrix approach with fixed correlations between the tests. This implementation tends to undervalue the protection typically afforded to a portfolio of long-duration instruments during periods of equity decline – as the coefficient used between equity and rates is zero when equities are stressed, and rates are decreased. **This under-representation of this risk-mitigating factor means that other risk mitigants – such as convertible convexity, become relatively more important.**

In contrast to the stress testing approach in Europe and the UK, in the United States, the National Association of Insurance Commissioners (NAIC) have published a schedule of risk-based capital requirements by asset class and rating (see Table B). Convertibles and other forms of fixed income are all subject to risk weights based on the rating of the security, regardless of the amount of equity sensitivity. Convertibles, which can have as much equity sensitivity as common stocks, have significantly lower capital weights. This makes convertibles a more capital efficient way of adding equity exposure to the investment portfolio – particularly for US life insurers since the capital requirement for convertibles is 85% less than that of equity.

Table B. The NAIC Also Gives Favorable Risk Weight to Convertibles

NAIC Risk-Based Capital Requirements				
		Life Insurers	Property & Casualty	Health
U.S. Government Bonds		0.00%	0.00%	0.00%
Fixed Income (Including Convertibles)	AA Rated	0.42%	0.60%	0.80%
	A Rated	0.82%	1.30%	1.60%
	BBB Rated	1.52%	2.10%	2.50%
	BB Rated	4.54%	6.00%	7.60%
	B Rated	9.54%	7.70%	9.70%
Common Stock		30.00%	15.00%	15.00%

Source: NAIC as of December 31, 2022.

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3. THE EVOLVING REGULATORY LANDSCAPE

The adoption of Solvency II in 2016 represented a move toward standardization of risk-based capitalization rules for European Insurers. Since then, many changes in the insurance regulation landscape have led to greater variation among market participants. The movement toward a differentiated framework in the UK, ongoing changes in the Solvency II regulation, increasing approval of ‘internal models’ by regulators, and the authorization for participation in European markets of non-European insurers, have all led to less standardization. **Nevertheless, the convertible asset class has been and continues to be an attractive and capital efficient investment for insurers operating in Europe and the UK.**

a. The Evolution of Solvency II Market Risk Calculations

The Transforming “Transitional” Measures - When Solvency II came into effect, some provisions were scheduled to be phased in over several years. This was referred to as Transitional Measures or “TMTP”. Included in this was the stress testing of some equities deemed to be long-term holdings. This particular category of equity holdings was subject to a reduced stress testing schedule with initially about half the severity of non-long term equity holdings. However, this measure is only temporary, and was scheduled to gradually phase out over 16 years. So far, approximately half of the relief from this measure has been unwound. **As the phase-out of TMTP continues and long-term equity holding stress test severity increases, convertibles will become a more capital-efficient investment relative to this temporarily protected category.**

In September 2021 the European Commission released proposals to reform Solvency II rules. These include changes to prudential rules requiring enhanced liquidity testing. This favors convertibles which are measurably more liquid than straight debt with consistently higher trading volumes per unit of bond outstanding, and narrower bid-ask spreads than high-yield debt – particularly in times of market stress. Other changes include the use of a Dynamic Volatility Adjustment (DVA) which can dampen credit spread volatility, and the incorporation of climate change risk which could favor convertibles which have many “green” issuers.

b. Brexit and the Subsequent creation of a Solvency UK regime

Following “Brexit” British Insurers will **not be subject to Solvency II, but rather a Solvency UK regulatory regime** which came into partial effect in November 2022 and will be completed by December 2024. While Solvency U.K. has some similarities to Solvency II key differences include 1) a reduction of the risk margin (capital required above best estimate of liabilities) which was reduced by 65% for life insurers and 30% for other insurers, 2) a softening of the treatment of non-investment grade bonds which is a significant benefit to convertibles of which only 20% are investment grade, and 3) changes to the “Fundamental Spread” stress testing rules to increase spread sensitivity. As a result of these changes, shorter-term and more liquid assets such as convertibles should serve to provide benefits.

c. Increased Adoption of Internal Models

Solvency II specifies a “standard model” to calculate the SCR. It also allows companies to use “internal models” after review and approval by the regulator. Initially, relatively few European insurers were approved for the use of internal models. Over time, approval and use has increased. Nevertheless, the principles of the standard model must be evident in the internal model to receive regulatory approval. Furthermore, since convertible returns are as efficient from an economic perspective as they are from a regulatory perspective, internal models are just as likely to assign efficient capital risk weights to the asset class as does the standard model.



d. Authorization of non-Solvency II Regulated Insurers

In September 2017, a bilateral agreement was signed between the United States and the European Union regarding the insurance industry. The agreement allowed U.S. insurers with EU operations to avoid what it describes as “burdensome worldwide group capital, governance, and reporting requirements under the EU’s “Solvency II” prudential regulatory system for insurers, as well as EU local presence and collateral requirements for U.S. reinsurers.”

This is significant because it means that US insurers, which have even more favorable capital efficiency treatment of the convertible asset class than does Europe, are able to compete in local European markets against Solvency II regulated businesses. **If the regulatory capital requirements on an investment portfolio affect the competitiveness of the overall firm, it makes sense for European insurers to take advantage of capital efficient investments, including convertibles.**

4. PROSPECTS FOR CAPITAL EFFICIENT RETURNS OVER THE NEXT 10 YEARS

We believe convertibles should continue to deliver strong capital efficient returns. In August 2023, Horizon Actuarial, a U.S.-based actuarial consulting firm, released its annual survey of 42 investment consultants and advisors long-term capital market assumptions (see Table C). This is a widely followed survey which informs the actuarial return expectations for investment portfolios across the insurance industry. While the survey does not include the convertible asset class, it is possible to model convertible returns relative to the other asset classes covered by the survey. Our approach to doing so was to estimate the three primary components of the return of convertibles: the equity sensitivity return, the yield-advantage, and the asymmetry-dispersion yield. The equity sensitivity component is derived from the Horizon Actuarial survey equity index returns while the two yield components are based on long-term averages. A brief explanation of this model can be found in Appendix A.

The analysis shows that convertibles are expected to provide long-term equity-like returns with substantially less volatility. This makes both the economic and regulatory return on risk adjusted capital stronger than any category of equity. Furthermore, Horizon also publishes 25th and 75th percentile forecasts which it describes as “conservative” and “optimistic” (see Table D). Under both conservative and optimistic assumptions, convertibles are expected to provide better risk adjusted returns.

Table C. 2023 Horizon Actuarial Survey of 10 Year Capital Market Forecasts And Modeled Convertible Performance (2023-2032)

	Global Convertibles (ACM Estimate)	U.S. Equity Large Cap	Non-U.S. Dev. Equity	Emerging Market Equity
Average Total Return	6.42%	6.90%	7.49%	7.30%
Volatility	12.7%	16.6%	18.3%	23.9%
Std. SCR Est. Risk Wt.	24.0%	39.0%	39.0%	49.0%
Sharpe Ratio	0.42	0.35	0.35	0.26
RORAC (Solvency II)	0.27	0.18	0.19	0.15

Source: Horizon Actuarial, Advent Capital Management.

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**Table D. Horizon Actuarial “Conservative” (25th Percentile) and “Optimistic” (75th Percentile)
10-Year Capital Market Forecasts and Modeled Convertible Performance**

	Global Convertibles (ACM Estimate)	U.S. Equity Large Cap	Non-U.S. Dev. Equity	Emerging Market Equity
"Optimist" Return	6.8%	7.7%	8.1%	9.3%
"Conservative" Return	6.1%	6.2%	6.8%	7.5%
"Optimist" Sharpe	0.44	0.39	0.38	0.34
"Conservative" Sharpe	0.39	0.30	0.31	0.27
"Optimist" RORAC	0.28	0.20	0.21	0.19
"Conservative" RORAC	0.25	0.16	0.17	0.15

Source: Horizon Actuarial, Advent Capital Management.

CONCLUSION

- Since Solvency II took effect, global convertibles have continued to deliver **strong risk-adjusted returns and return on regulatory capital**. This includes higher Sharpe ratios, Sortino ratios, and Return on Regulatory Risk Adjusted Capital (RORAC) as compared to government and corporate bonds and global equities.
- Solvency II and other regulatory frameworks continue to **give credit for the risk-reducing and beneficial characteristics of convertibles** in their risk-weighted capital calculations.
- Since 2016 the regulatory landscape has changed in four primary ways, and as it continues to evolve it is likely to become **even more favorable for convertible investments**.
- The Horizon Actuarial annual survey of long-term capital market assumptions from 42 leading investment consultants and advisors implies that convertibles should **continue to deliver strong economic and regulatory returns on capital over the next 10 years**.



**Appendix A: Horizon Actuarial Long-Term Capital Forecast Survey and
ACM Model of Convertible Returns Based On Horizon Actuarial Survey**

10-Year Horizon Survey				
	Average Expected Annualized Return	25th Percentile Expected Return	75th Percentile Expected Return	Expected Annualized Volatility
US Equity - Large Cap	6.90%	6.20%	7.70%	16.64%
US Equity - Small/Mid Cap	7.38%	6.40%	8.10%	20.51%
Non-US Equity - Developed	7.49%	6.80%	8.10%	18.26%
Non-US Equity - Emerging	8.21%	7.50%	9.30%	23.87%
Broad US Equity (ACM Aggregated)	6.97%	6.23%	7.76%	17.21%
Global Equity (ACM Aggregated)	7.67%	6.98%	8.41%	19.69%
Global Convertibles (ACM Modeled)	6.42%	6.08%	6.79%	12.67%
US Corporate Bonds - Core	4.71%	4.40%	5.10%	5.85%
US Corporate Bonds - Long Duration	4.80%	4.10%	5.40%	10.91%
US Corporate Bonds - High Yield	6.43%	6.10%	6.80%	10.01%
Non-US Debt - Developed	3.42%	2.80%	4.00%	7.31%
Non-US Debt - Emerging	6.29%	5.90%	7.00%	10.93%
US Treasuries (Cash Equivalents)	3.38%	2.80%	3.80%	1.09%
TIPS (Inflation-Protected)	4.07%	4.00%	4.30%	6.17%

ACM Convertible Return Model				
	Model	Global Convertibles Average (ACM Estimated)	Global Convertibles 25th Percentile	Global Convertibles 75th Percentile
H.A. Risk Free Rate Estimate		3.38%	2.80%	3.80%
Global Equity Risk Premium	Equity Return - Risk Free	4.29%	4.18%	4.61%
H.A. Global Equity Return Estimate		7.67%	6.98%	8.41%
Convertible Equity Beta to Equity Index		1.14	1.14	1.14
Convertible Equity Risk Premium	Global ERP x Cnv. Eq. Beta	4.91%	4.77%	5.26%
Global Convertible Equity Return Estimate	Risk Free + Cv. ERP	8.29%	7.57%	9.06%
Cvt. Beta to Underlying Equity		0.48	0.48	0.48
Convertible Beta Return	Cv. Beta x Cv. Eq. Return Est.	3.94%	3.60%	4.31%
LT Median Yield Advantage		0.54%	0.54%	0.54%
LT Median Asymmerty Yield		1.94%	1.94%	1.94%
Convertible Total Return	Cv. Beta Return + LT Y.A. + LT A.Y.	6.42%	6.08%	6.79%

Source: Horizon Actuarial, Advent Capital Management.

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