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»Convertible Bonds: Key Features & Solvency II Considerations

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Executive Summary

The goal of this paper is to study the asset class of Convertible Bonds ("CBs") from the perspective of Solvency II. This is of particular relevance for insurance companies seeking capital efficiency for their investments and with whom (as existing or potential investors of our firm) we are in regular dialogue on this topic.

The first part of this document outlines the key features of convertible bonds, which offer a meaningful and credible alternative to equities, bonds and also to blended equity and bond exposure. Over the long-term this asset class has delivered equity-like returns at a substantially higher Sharpe ratio. We highlight a number of unique features of convertibles that have contributed to this superior risk-adjusted performance.

As a second step we assess the opportunity for insurance companies to include convertibles in their Solvency II considerations. Convertibles receive particularly beneficial treatment under Solvency II capital guidelines. Nevertheless, a modification of the EIOPA Standard Model in order to capture the convex behaviour of convertibles can lead to a further reduction of Solvency II capital requirements.

Introduction

In the context of Solvency II, this paper is intended to set out arguments of relevance for institutional investors considering the relative attractiveness of convertible bonds within their asset allocation.

At the heart of our analysis is a performance comparison of the convertible bond asset class to both the MSCI World and a 50:50 composite of MSCI World/Bloomberg Barclays Global Aggregate bond index.

There are idiosyncratic features of the CB asset class that are not always fully understood which serve to highlight why CBs may be an attractive asset class in the current market environment.

Convertible Bond Performance Analysis

For the sake of simplicity, we have calculated returns based on a 50:50 composite calculated monthly of the MSCI World Index (Total Return in USD – ticker: NDDUWI) and the Bloomberg Barclays Global Aggregate USD Hedged bond index (ticker: LEGATRUH). For convertible bonds, we use the Thomson Reuters Global Vanilla Hedged CB Index (USD). We believe this index best represents the asset class of convertibles as it includes all CBs within the universe but excludes mandatory CBs (which have no bond floor). These indices allow for an analysis back to December 1993, with all returns and volatilities based upon monthly data up to August 2019.

We have used the **total return** version of the MSCI World Index. Where CBs are analysed in comparison with equity price indices (rather than total return), their outperformance is materially more pronounced than shown here. We have analysed a variety of time periods, and highlight below some of the key themes arising from the data.

Long-term outperformance and context

Convertibles versus equities

As the primary driver of CB returns is the performance of the underlying equities, the starting point for any analysis is to review the performance of CBs versus equities. The longest run data available (more than 25 years) shows **comparable returns for CBs and equities**. CBs are also ahead over 20 years, with returns almost identical since the trough of the markets in October 2008.

However, the average annual **volatility of CBs is 5 percentage points lower** than that for equities.

In the past few years, the performance of equities has generally been ahead of CBs, albeit with daily volatility around 50% higher. In a bull market, this is exactly as would be expected given that the CB asset class typically has an equity exposure of 40-50%.

The paradox, therefore, is why CBs perform so comparably to equities in the long run, when theory suggests that they should achieve only 40-50% of equity returns. The key to resolving this apparent paradox lies both in the nature of CBs as a financial instrument together with factors relating to the evolution of the global CB market, as explained later in this paper.

Our analysis suggests that the relative out- or under-performance of equities versus CBs is broadly mean reverting, and therefore that the period of recent relative CB underperformance is likely to be followed by a period of outperformance.

The empirical evidence also confirms the asymmetric return characteristics of CBs over shorter time periods. Throughout the past 25 years, in months when the MSCI has risen (an average of +3.1%), CBs have captured 65% of this upside (+2.0%). In contrast, in months when the MSCI has fallen (an average of -3.5%) CBs have lost only 49% (-1.7%).

Convertibles versus 50:50 composite

Convertible bonds outperformed the 50:50 composite over the longest time period for which data is available, more than 25 years from end-1993 to end August 2019, with an annualised return of 7.4% versus 6.5%. Convertibles also outperformed on a 20, 15 and 10 year basis.

Sometimes, the picture is less clear-cut, such as in 2017 when the composite outperformed. This stemmed from a variety of factors, such as the lack of representation of mega-cap FAANG stocks in the CB universe, or CB market specific factors such as the poor performance of serial CB-issuer Steinhoff dragging down benchmark index performance for calendar year 2017, while simultaneously generating opportunities for significant outperformance for managers (like Fisch) that were not exposed.

Furthermore, convertible bond markets feature their own ebbs and flows in valuation, measured in terms of whether CBs trade rich or cheap in relation to their theoretical value. These changes are largely a function of net issuance and fund flows, and tend to mean revert. Valuations are currently around fair value to slightly cheap for US, European and Japanese CBs, and cheap for Asian CBs.

Performance in times of rising rates

The past 30 or more years have seen a secular downward shift in USD interest rates (albeit with plenty of ups and downs along the way), which have given bond returns particularly strong returns which may not be repeated in the coming years, not least given the falls in rates seen in 2019.

We have identified 11 periods in the past 20 years where interest rates moved up materially. **In 10 out of 11 cases, CBs outperformed** the composite. There are various reasons for this, including the relatively low sensitivity of CBs to interest rates (relatively short duration and offsetting benefit of rising rates increasing option value), together with generally positive equity market performance in periods of rising rates.

US region outperforms

From a regional CB market perspective, in line with the underlying equity markets, the US region has performed more strongly than other regions, particularly in recent years. This in part reflects the greater share of high growth companies in the US CB market, particularly from the technology sector.

On the flipside, this segment of the market is more volatile, has experienced higher drawdowns in weaker markets, and contains CBs of weaker credit quality than a broader global portfolio.

A comment on 2008

Detractors of CBs often point to the performance of the asset class in 2008. It is undeniable that CBs were somewhat at the centre of the storm, as the CB asset class at that time was

dominated by leveraged hedge funds. As a consequence, CBs sold off aggressively and traded well below their theoretical bond floors.

We would counter that the price dislocation was short-lived and what was experienced was a temporary drying up of liquidity and price discovery. CBs recovered to pre-crisis levels in just 13 months, versus 28 months for the MSCI World. The make-up of the CB investment community has shifted and today the majority of investors are long-only, with hedge funds still involved with an important role to play in providing liquidity and maintaining valuations.

Rationale for Investment in CBs

Ironically, it may be argued that the biggest single challenge for the CB asset class is not demonstrating its role in a diversified asset allocation, but 'finding a home' within narrowly defined asset allocation buckets.

Despite the undoubted benefits of CBs as a defensive alternative to equities, its hybrid nature means it may not fit neatly into an equity bucket. Likewise, it is neither pure fixed income nor obviously 'alternative'. While the CB asset class should ideally have its own place in a strategic asset allocation, those investors with the flexibility to see through these classification issues are well placed to benefit from the unique features of this asset class.

In order to understand the apparent paradox of why CBs as an asset class have performed so well historically despite their typical 40-50% exposure to equities, we need to look at the features and characteristics of CBs. There are various features of CBs that are not always well understood, which together help to explain why the performance characteristics of the product cannot be replicated with a combination of other instruments.

These features can be split broadly into two groups, namely those arising from the very nature of convertible bonds as a financing instrument, and those that have arisen as a result of the evolution of the global CB market over the past 25 years.

Features relating to CBs as a financing instrument

Built-in market timing: A convertible bond by its very nature increases in exposure to equities as the underlying stock price rises, while providing increased protection as stock prices fall if the bond floor is solid.

Lower sensitivity to rate rises: CBs have relatively low exposure to interest rises compared to other fixed income instruments, owing to relatively short duration and the compensatory effect on the CB embedded equity option value of rate rises.

Volatility cushion: In times of stock market weakness, stock volatility tends to increase. The price of a CB may therefore increase as a result of its underlying equity option increasing in response to higher stock volatility, serving to cushion the impact of a weaker share price.

Portfolio effects: While the 'best of both worlds' combination of exposure to upside potential together with downside protection from a bond floor is well understood, the portfolio benefits of CBs are less often articulated. A set of CBs of different maturities with different technical features, together with a flow of new issuance, helps to lock in gains during rising markets and reduce downside risks in times of weakness.

A unique package: The equity option within a CB can only be exercised by delivering the bond in its entirety. Hence the exercise price (what is given up in order to exercise the option) is in effect floating as it is the value of the bond, which itself moves with interest rates and credit spreads. This differentiates it from a classic bond plus options strategy. Indeed, CBs are the only way in public markets to gain access to liquid corporate volatility in size.

Dynamic market: By its nature, a CB that begins its life as a balanced instrument will, at the point of maturity, either redeem or convert. Put simply, CBs will tend from a 50 delta exposure at issue to either a 0 or 100 delta exposure at maturity. Therefore, the flow of new issues over time ensures that the CB market has scope for re-invention despite the effects that long market cycles might impose upon the asset class.

Features related to CB market evolution

Primary market: Issuers value the unique combination of low cost debt while monetising equity volatility and thus often revisit the market. As a result they tend to leave some alpha 'on the table' in the form of new issue cheapness.

Diversification: At any given time, the CB market will have a make-up by region, sector and single security exposure that differs from global equity markets, providing additional investor diversification.

Prospectus features: Takeover ratchets and dividend protection are just two examples of features written into the terms and conditions of convertibles which can add significant value if triggered by corporate actions such as M&A.

Not a passive market: Only a tiny proportion of the global CB universe can be accessed in passive form owing to the skills and knowledge required to trade the instrument in different regional markets. Ironically, anecdotal evidence indicates that fees for passive investment are higher than those for active management. The lack of passive flows means CB valuations are less influenced by 'blind' flows.

Capital structure: Most CBs are senior unsecured obligations of the issuer, and therefore the capital protection provided by the asset class is further up the capital structure than a combination of different bond exposures plus equity.

Inefficient corporate actions: CB issues tend to be callable subject to certain conditions, but many companies choose for strategic reasons to leave CBs outstanding, which makes them more valuable than models would suggest.

Convertible Bond Benchmark Indices

The Thomson Reuters CB index family is by far the most widely used convertible bond performance benchmark.

Global CB strategies (and thus global CB benchmark indices) tend to be favoured over US-only owing to their diversification, lower volatility, lower drawdown, greater credit quality and broader opportunity set. Nevertheless, Thomson Reuters provides comprehensive regional CB indices, including the US.

Thomson Reuters provides a full suite of indices both globally and in the US to cover the range of different types of CB fund, including those investing primarily in all CBs, balanced convertibles or those focused on investment grade issues.

We believe the level of data availability, calculation methodology, support, governance, pricing quality, staff experience and overall resourcing committed to the indices to be the best in the market. This is reflected in the almost universal usage of Thomson Reuters CB Indices by global CB funds.

Our white paper “A Review of Convertible Bond Indices”, published in 2016, explains the landscape and history of CB indices in more detail and is available upon request.

Convertible Bonds and Solvency II

Summary

I. Convertible Bonds receive particularly beneficial treatment relative to equities under the Solvency II Solvency Capital Requirement ("SCR").

This is a function of:

— Equity delta of convertibles reduces equity risk component

— Interest rate exposure of convertibles is modest

— Credit risk factor benefits from shorter duration of convertibles

— FX risk exposure for a convertible portfolio tends to be limited

II. Convertible Bonds can deliver a further reduction of Solvency II capital requirement for a given asset allocation owing to:

— Convexity/asymmetry

— Long volatility investment

III. These beneficial effects relating to capital requirement reduction can only be achieved or reported if the Solvency II Standard Model is structurally modified in order to:

— Capture convex behaviour of an option/conversion right in the event of market stress

  — Convexity = automatic and non-linear decreasing equity exposure during market corrections

— Implement "volatility" as an instrument/asset class

  — Isolation of effects of volatility changes on liabilities and investments

IV. Existing and commonly used methods to achieve these requirements are:

— Monte-Carlo Simulation instead of "Standard Model Stress Values"

— Adjusting the equity exposure in order to reflect gamma coming from options, or perform a revaluation of options under various scenarios

— Revaluation of individual convertible bonds under various scenarios

— Replication portfolios for liabilities to implement volatility impact amongst other factors

Fisch Asset Management can provide further input to address these model requirements.

The EIOPA Standard Model

The European insurance industry must now report on their financial investments, risks and numerous significant business activities in accordance with a harmonised regulatory framework. Solvency II is intended to be both a regulatory framework and an early warning system so that insurers do not get into difficulty in the face of possible new crisis events.

A key regulatory target level for the required capital buffer within Solvency II is the Solvency Capital Requirement (SCR). The Solvency II standard model from EIOPA requires stress test scenarios for several risk factors on the asset and liability side of the insurer's balance sheet.

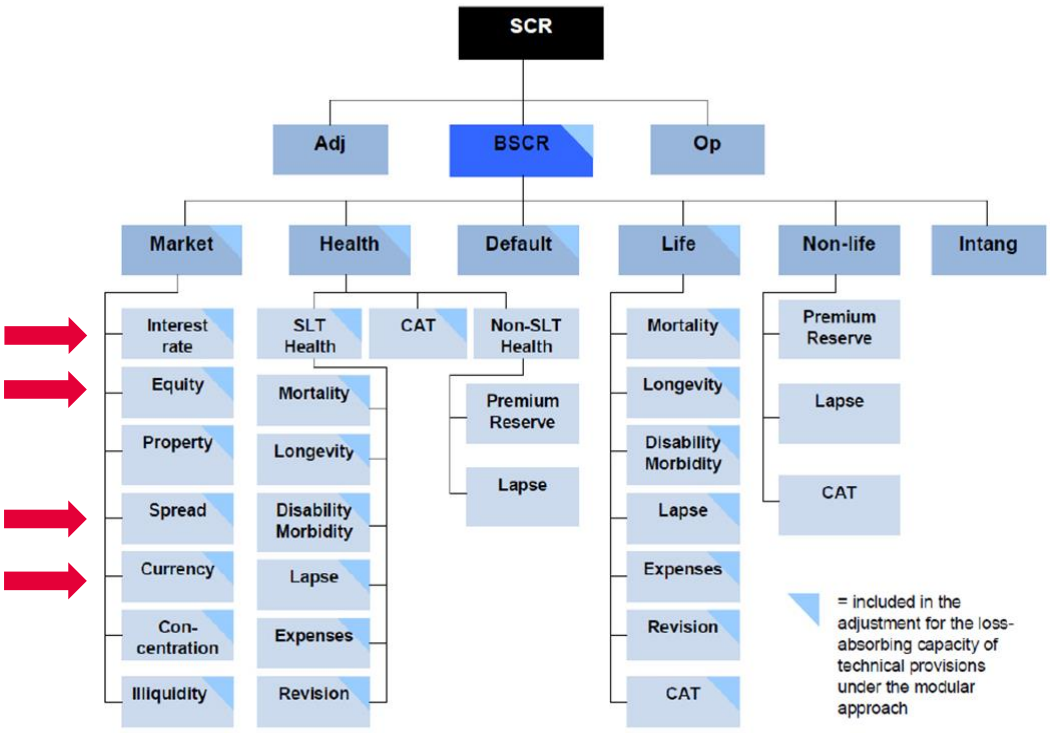
The main market risk factors are equity, interest rate, credit spread and currency with the following parameters in the Standard Model:

— Equities from OECD countries require a capital charge of 39%, rising to 49% for equities from non-OECD countries. In view of the dampener rule, according to which the performance of the equity market over the past three years is taken into account (symmetric adjustment), the capital charge can vary by up to plus or minus 10%.

— The interest rate charge is determined by shifting the interest rate curve from +70%/-75% on the short end of the curve to +25%/-30% for longer maturities.

— The credit spread charge depends on rating and duration and varies from 0% to 63.5% plus multiplier.

— The currency charge is +/- 25%.

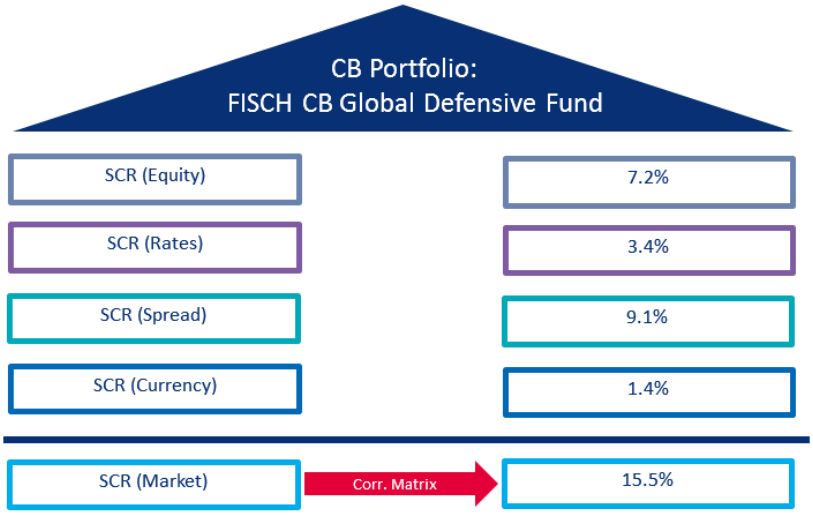


Source EIOPA AM AG, SCR synonymous use for BSCR (Market)

Implication of Convertible Bonds in the Standard Model

To find out how much solvency capital is required for a convertible bond portfolio in the standard model, we analysed various convertible and corporate bond portfolios based on our Solvency II calculator. For the convertible bond SCR calculation, four stress factors are key: equity risk, interest rate risk, spread risk and currency risk. Volatility remains outside the standard model. The main drivers are equity and spread risks. Interest rate risk is relatively subordinate since convertible bonds typically have a short duration and are less sensitive to rate movements than straight bonds. Currency risk only applies to convertible bonds where the underlying equity and the bond are denominated in different currencies.

For a BBB+ rated portfolio consisting solely of investment grade bonds, with an equity delta of 44, an average credit spread of 90 basis points and a duration of 4.5, the total SCR amounts to 15.5%. This is significantly less than the capital requirements for a comparable pure equity portfolio composed of 90% OECD shares and 10% from other countries, which would have an SCR of over 40%.



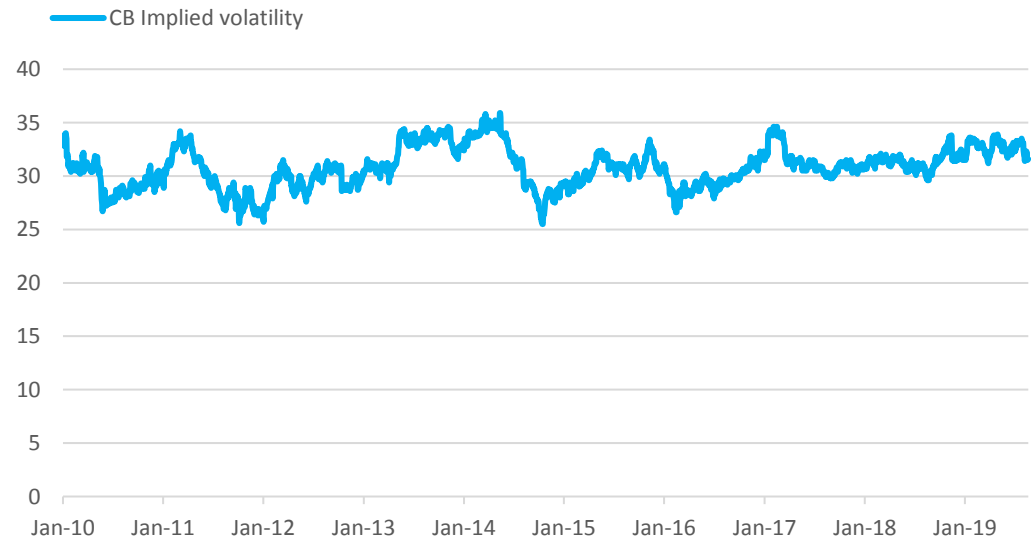
Source FISCH AM Tool, 20 September 2019

If the credit risk is sharply increased, the changes to the SCR are modest. Indeed, for convertible bonds, credit risk is not so strongly penalised in view of the low interest rate sensitivity and an anomaly in the 'non-rated segment' – about 40% of convertible bonds in the investment universe are unrated. Unrated corporate bonds attract a capital charge in the rating range between BBB and BB. This benefits bonds in the high yield segment.

Features of Convertible Bonds not covered by the Standard Model

For convertible bonds, the Solvency II standard model only takes into account the equity, interest rate, credit quality and currency risk factors. Larger insurers often employ internal models which also consider the risk factor of volatility in the case of assets. Hence, with an attractively priced and long-term option component (volatility) together with an actively managed stable delta, a convertible bond portfolio offers the ideal investment instrument to offset the volatility exposure of the liabilities of insurers.

The chart below shows the trends in convertible bond implied volatility within the Thomson Reuters Global Focus Convertible Bond Index. This volatility trend is a function of a number of factors, including but not limited to, the volatility of the individual underlying shares. Other factors include net funds flows and net issuance dynamics taken in the context of the model inputs used by the index provider. The trend is typically mean reverting and stable over the longer term, but captures shorter term movements in volatility patterns.



Source Thomson Reuters

Owing to the large equity stress factors, the SCR (Equity) for a convertible bond portfolio has to be modelled with care in order to maximise the advantage of the convexity of the delta (equity sensitivity). One approach is to adjust the delta with its second derivative, gamma. A more accurate approach is to re-value each convertible bond adjusted by the stress factors.

Last but not least, convertible bonds are interesting not only from a regulatory perspective but also for performance reasons. This is illustrated by long-term comparison with equities and corporate bonds, as illustrated earlier in this paper.

Convertible bonds are an asset class of around US$450 billion currently outstanding with an active new issues market. The asset class is global, with regional and sectoral diversity and widespread liquidity provided by leading market makers. Convertible bonds are an ideal tool to help insurance companies optimise their Solvency II capital requirements.

About the author

Martin Haycock
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Martin Haycock is a member of the Investment Office. He supports the Convertible Bond portfolio management and Clients & Markets teams as a senior product specialist, leveraging his broad experience of the convertible bond asset class. Before joining Fisch Asset Management in 2015, he worked at UBS for 20 years. Upon joining UBS in 1995, he spent 6 years as a member of the convertible bond origination team. In 2001 he was appointed head of convertible bond research and thereafter head of convertible bond marketing. In 2012, Martin Haycock was appointed global head of the newly-formed UBS Index Group. He also served as global COO for the cash equities business, and in 2014 led the sale of the UBS Convertible Indices to Thomson Reuters. He holds an MA and BA (Hons) in Land Economy from Cambridge University.

Fisch Asset Management

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