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Introducing the CIO Autocallable Methodology

Derivatives Strategy

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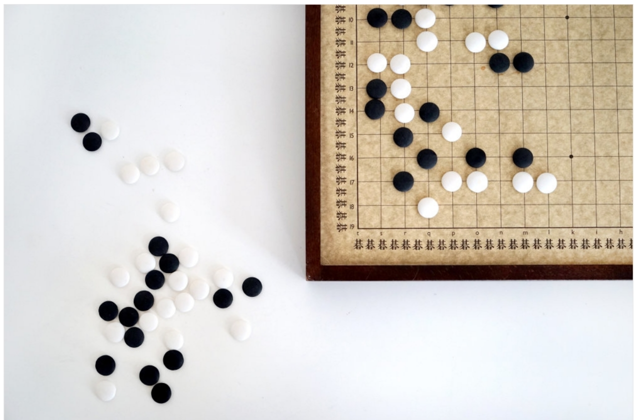
- **Focus:** Autocallable Reverse Convertible Notes (RCNs) are an interesting way to generate income in low yield environments.
- **Conclusion:** The methodology presented in our publication "Investing in Autocallables" can be applied to select stocks for Autocallable RCNs.
- **You should read this report if...** you are seeking exposure to yield enhancement instruments.



Introduction

The low interest environment has pushed yields lower across asset classes, making it increasingly difficult for investors to achieve their return objectives. Structured solutions offer investors alternative approaches for yield generation compared to traditional instruments, such as bonds.

Autocallble RCNs are a type of structured solution which generates yield by selling equity volatility and are typically structured on stocks or equity indexes. While such products usually generate above-market yields, they can also expose investors to downside in equity markets.

We believe that applying a systematic approach to select stocks can significantly increase the odds of a successful outcome. In our publication "Investing in Autocallables" we laid out a methodology to select stocks for Autocallable RCNs. We also plan to publish regular updates on stocks which screen well in our methodology.

To further improve the quality of our selection we add two additional screening layers. We use the fundamental equity view of UBS equity analysts, as well as the volatility and market capitalization of selected stocks. In this note we give a short summary of our methodology on how we identify our favored stocks for Autocallable RCNs.

Methodology

In our analysis we build a model which selects the stocks suited best for Autocallable RCNs. First, we start with selecting the variables which have the highest explanatory power from an initial set of 40 different variables. Figure 1 illustrates the 12 variables used to build our models.

We use fundamental data, such as the return on equity or the Altman Z-score, as well as market-based data, such as momentum or the skewness of the implied volatility. Note that we normalize our data by sector, such that we do not favor one sector over another.

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Figure 1 - Selected variables

Selected variables can be separated by return driver (return or risk) and by data type (fundamental or market-based).

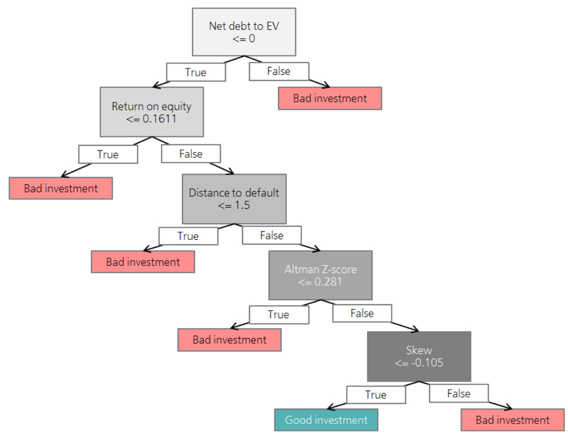
	Return drivers	
	Performance & profitability	**Risk measures & leverage**
Fundamental	• Return on equity • Return on capital • 5 year dividend growth • Sales to total assets	• Altman Z-score • Distance to default
Market-based	• Long term momentum • Price to book • Price to sales	• Skewness (80 to 100 implied volatility) • Implied CDS spread • Net debt to Enterprise value

Source: UBS, as of March 2020

Second, we use the 12 variables to build a model. The goal of our model is to predict whether a stock is "good", meaning that an Autocallable RCN on the stock has a top 25% annualized return compared to the universe at a given date in the analysis period. We use a random forest, a machine-learning technique, which in short builds different decision trees to predict whether a stock is suitable for Autocallable issuance. Figure 2 illustrates an exemplified decision tree within the model. Using all different trees our model predicts how likely a stock will be a "good" underlying for Autocallable issuance.

Figure 2 - Illustration of decision tree in model

For every stock the decision tree will determine if the stock is suitable for an autocallable or not. In the example below there is only one leaf for which trades are classified as a good investment. Note that this does not have to hold for every tree.



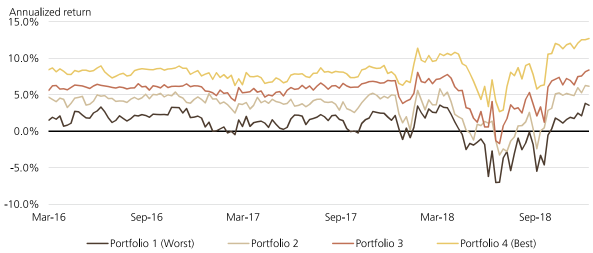
Source: UBS, Bloomberg, as of March 2020

Third, we rank the stocks according to the probability of being a good underlying for an Autocallable product. We then group the stocks into four equal-sized portfolios depending on the probability. Portfolio 1 contains the stocks least suited for Autocallable issuance and portfolio 4 contains the best suited stocks. This can be repeated for every day in our analysis period. For each portfolio we can then calculate the performance of the Autocallables RCNs in the portfolio. We train our model for the data period 2008 to 2016.

Figure 3 shows the performance of the four portfolios built with our methodology for the time period 2016 to 2019, i.e. data the model has not been trained on. The portfolio of Autocallable RCNs on the stocks which we identified as suited the best (portfolio 4) performed comparatively well and outperformed all three other portfolios in upward trending markets, such as 2017, as well as in choppier environments, e.g. in the fall of 2018. This gives us confidence that our model does a good job in picking stocks for Autocallable RCNs. For further details on our model and the methodology please have a look at our publication "Investing in Autocallables" published on 30 November 2019.

Figure 3 - Performance of the different portfolios

Illustration of the research process to identify stocks suitable for autocallable issuance. Note that performance figures do not include any costs incurred.



Source: UBS, Bloomberg, as of March 2020

Bottom-Up Analysis

Our model is a quantitative, top-down approach to identifying suitable stocks. We enhance this approach with a bottom-up view, effectively incorporating the UBS GWM Chief Investment Office (CIO) recommendations and UBS Group Research, which is written by UBS Investment Bank, analyst ratings. Within the 25% stocks that screen well according to our universe we only consider those that are either selected as "Most preferred" by CIO or "Buy" by Group Research.

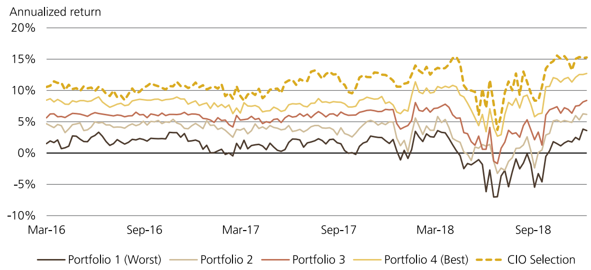
Operational Filter

With the market capitalization and implied volatility we use two additional measures to arrive at a more efficient portfolio. We only consider companies with a market capitalization in excess of USD 30bn for companies listed in the US and EUR 10bn for companies listed in Europe. Stocks with a lower market capitalization often have less liquid option markets as there is less interest from investors. Additionally, we only include stocks with a three-month implied volatility above 20%. We do this to filter out stocks with a very low implied volatility. Such stocks may be attractive candidates, but an Autocallable RCN investment might not be lucrative after accounting for transaction costs.

In order to test the feasibility of our operation filters we have integrated them into our back-test analysis. Figure 4 shows the performance of the strategy if the operational filters are applied to portfolio 4.

Figure 4 - CIO Selection has performed well

Including the operational filter improves performance in our back-test. CIO Selection refers to the portfolio selected by our methodology and the operational filter.



Source: UBS, Bloomberg, as of March 2020

Conclusion

Structured products, such as Autocallable RCNs, can be an interesting source of yield, especially in environments where yields are low. Our approach tries to identify stocks which are suitable for Autocallable RCNs within a large universe of single stocks. We do this with a machine learning model which identifies stocks with above average default and valuation metrics compared to peers within the same sector, making drawdowns less likely. Additionally, we look for relative high skewness, indicating that investors can earn a comparably attractive coupon. We regularly publish updates on stocks that screen favorably in our methodology.

Appendix

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