NBI Liquid Alternatives ETF (NALT)

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NALT: What's under the hood

HIGHLIGHTS

- Brief Introduction of the implemented QI models and how they work together
- NALT's QI models are designed to control risks and maintain a low correlation to equity indices
- NALT uses quantitative investment (QI) models to determine the most suitable long and short positions on a wide variety of asset classes

INTRODUCTION

NALT implements what is called a Systematic Global Macro investment strategy. The quantitative models aim to potentially achieve the best performance given the investment objective, while avoiding emotional and irrational human reactions.

In the case of NALT, different types of quantitative models recommend investments in 22 futures contracts on the five following asset classes: 5 U.S. government bonds, 4 currencies, 3 metal commodities, 5 agricultural commodities and 5 energy commodities. The absence of equity index futures contracts contributes to NALT's decorrelation to these indices.

On top of the asset allocation functions, different types of risk-controls are also embedded in the QI models to maintain the highest possible level of consistency for NALT's risk-return-decorrelation profile.

In this document, we look at what's under NALT's hood by first presenting the portfolio construction process and then explaining the QI models that drive NALT's momentum.

PORTFOLIO CONSTRUCTION PROCESS

Imagine yourself as the minister of health. Your mandate is to design the best possible public health system, which basically consists of finding the perfect balance between:

- **the quality of services**
- **the level of availability**
- **and the cost**

The challenge is that you would like to have the best of all three features, but you must make some compromises. For instance, if you insist on top quality services that are rapidly available everywhere, then the bill will be inevitably high.

Designing an alternative investment strategy has a lot in common with this public health system trilemma. One must choose the best combination between risk, return, and correlation.

For NALT, we decided not to compromise on risk control and decorrelation from equity returns. One key component of our proposition is to offer a unique and truly alternative investment strategy at a low cost for investors.

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Without compromising on the investment strategy's quality, such a low fee is made possible by fully automating the portfolio construction process which consisting of the three following simple steps:

1. **Data input and quality control**

2. **Quantitative investment models processing the data and coming up with a proposed portfolio**

3. **Review of the proposed portfolios before sending trade instructions to the broker**

The main difference is rather than portfolio analysts and managers, we utilize their computerized equivalents.

This quantitative approach with QI models enables the process of much more data and isn't subject to emotions and biases that often distort the human investment decision.

Of course, when relying on models to take investment decisions, one must be very prudent. When we designed and programmed the QI models underlying NALT, we made emphasis on rigor.

First, we incorporated strict quality controls on data input to ensure that every bit of data processed by NALT's QI models are present and reliable.

Secondly, relying on our 10+ years of experience in purely quantitative investing, the programmed QI models are reliable, robust, and incorporate different risk controls. To minimize operation risks, the models run on a geographically separated network of computers and the outputs are cross-checked to be identical.

Thirdly, when it comes time to rebalancing the portfolio (every week or more frequent in abnormal market conditions) a special module within the computer program as well as the investment specialists will scrutinize the proposed portfolio and trade blotter before passing them to the broker.

Even though we are highly confident in our QI models and the quality of the computer code that implements them, we still perform this important last resort quality control to further prevent any possible error in the output. Here is where humans have a value added: quality assurance based on sound judgement.

WHAT DOES THE QUANTITATIVE INVESTMENT PROCESS LOOK LIKE

The QI models can be considered as a two-layer structure. Together, they construct the portfolio of long and short positions on futures contracts within the investment universe of NALT.

The first layer consists of a series in different QI models where each proposes a portfolio with respect to their own investment objective. These distinctive, well calibrated models combine power to help NALT to perform in different market conditions.

Additionally, it is also a way to diversify the model risk. Within our team's decade of experience in implementing such quantitative investment models, diversification has proven to be very beneficial. Think of each of these "Level 1" QI models as a different portfolio analyst, making recommendations based on their own views.

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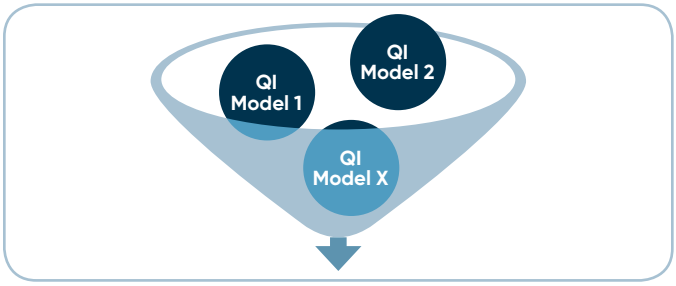
Level 1: Allocation Model



Level 2: Aggregation Model

The second layer is a QI model that aggregates the originated portfolios from Level 1 models. Think of this "Level 2" QI model as a Chief Investment Officer who allocates capital to the different portfolios.

Since the Level 1 QI models are different in nature, the proposed portfolios do not resemble each other. Hence, the Level 2 Aggregation QI model generates a portfolio diversification effect which improves the risk-return profile of NALT.

"Diversification is the only free lunch in finance"

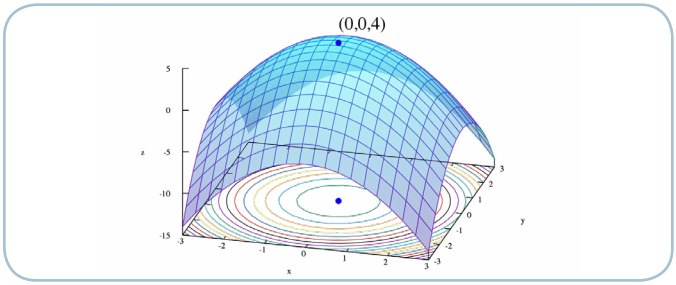
Harry Markowitz
Nobel Prize in Economics and Father of modern portfolio construction

Taking a closer look at the engines of NALT, we developed five Level 1 QI models, two of which are currently implemented.

First up is an advanced ***Optimization Model*** seeking to generate the best expected returns given various risk constraints.

This model determines the exposure mix of the long and the short futures contracts that meets all constraints and provides the highest possible expected return.

The expected return of each instrument is based on the assumption that its current "momentum" will persist until the next rebalancing. In the following illustration, the vertical axis is the expected return and the horizontal axes correspond to two different risk constraints.[1]



Optimization models have been used in portfolio construction since the early 1960s. Strengths and weaknesses of the model are well documented. We have abundance of resources and experience on how to properly design and implement them.

The second Level 1 QI model is called ***Filter***. Filters are somewhat similar to regression models, but they are much more responsive to abrupt changes in market prices.

1. In reality NALT's optimization model incorporates more than two risk constraints but displaying all of them in a graph is not possible.

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This type of model was developed more than 50 years ago and has a large variety of application in scientific fields. One of the most well-known uses is missile interception system which track the target (e.g. a fighter jet or another missile) until it gets close enough to be intercepted.

Even though the mathematics of filters may appear complicated to most investors, the underlying algorithm is quite simple.

We demonstrate this idea with some help from the beautiful city of Venice. One can easily get lost in the city of Canals. The best way to avoid that situation is to apply the following 5-step procedure:

1. **Identify the target destination and your current location.**
2. **Walk 100 meters in the assumed good direction, then re-locate your new position.**
3. **Confirm you currently are located where you were supposed to.**
4. **If you are at the right place, then decide on the direction of the next 100 meters. Otherwise, return to your previous location.**
5. **Repeat from Step 1.**

If you understand the 5-step process, then you have a good idea of how a filter works.

In our application to portfolio construction, the filter model determines the combination of long and short futures contracts positions that tracks the target risk (10% annual volatility), decorrelates to equity (as close as possible to zero).

We initiate NALT by introducing these two QI models together because of our long-term experience with using similar versions in other in-house institutional investment strategies.

All the current and coming Level 1 QI models incorporate market risk constraints and controls. Starting with a strict leverage of constraint that keeps NALT compliant with the new National Instrument 81-102 regulation. Then a dynamically adjusted risk-taking level to maintain the volatility of the portfolio around the target of 10% per year. Furthermore, the concentration limits are built in the strategy to make sure the portfolio does not invest too much in too few instruments.

Lastly, the quantitative investment process underlying NALT and the investment universe are subject to a well-defined research and development agenda that seeks to improve the risk-return profile without compromising its robust equity decorrelation foundation.

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NALT has been launched on February 8, 2019. Before that date, we base our analysis on a historical simulation of past returns. We believe the calculation of the historical simulation of returns is reliable, but we can't guarantee that these would have been NALT's actual returns had it existed at these dates. Please refer to the full Disclaimer and Disclosures.

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