NBI Liquid Alternatives ETF
(NALT)

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 in finding the perfect balance between:

› The quality of services

› The level of availability

› 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 steep.

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.

Without compromising on the investment strategy's quality, the low fee is made possible by fully automating the portfolio construction process, which consists 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

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The main difference is rather than portfolio analysts and managers, we utilize their computerized equivalents. This quantitative approach with QI models enables the processing of much more data and isn't subject to emotions and biases that often distort human investment decisions.

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

First, we incorporated strict quality controls on data input to ensure that every bit of data processed by NALT's QI models is included 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 operational risks, the models can be run on geographically separated computers and contain multiple redundancies.

Thirdly, when rebalancing the portfolio (every week or more frequently in abnormal market conditions), a special module within the computer program and the investment specialists will scrutinize the proposed portfolio as well as the trade blotter before sending 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 last important quality control task to further prevent any possible errors in the output. Here is where human intervention adds value: quality assurance based on sound judgment.

How does the quantitative investment process work?

The QI models can be described as composed of 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 of 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 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 one of these "Level 1" QI models as different portfolio analysts making recommendations based on their own views.

Level 1: Allocation Model
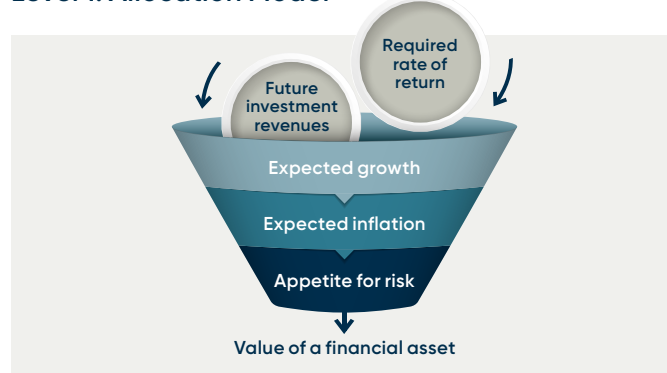
Level 2: Aggregation Model

The second layer is a QI model that aggregates the portfolios originated 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 that improves the risk-return profile of NALT.

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

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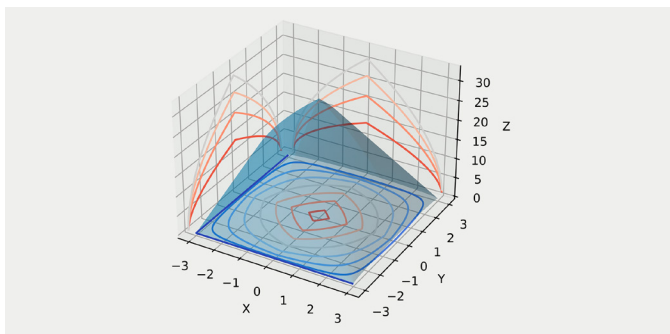
Optimization models have been used in portfolio construction since the early 1960s. The strengths and weaknesses of these models are well documented. We have an abundance of resources and experience on how to properly design and implement them.

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

> ## "Diversification is the only free lunch in finance."
> ### —Harry Markowitz
> Nobel Prize laureate in economics and father of modern portfolio construction

This type of model was developed more than 50 years ago and has a large variety of applications in scientific fields. One of its most well-known uses is in missile interception systems, which track a 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 can demonstrate this idea with some help from the beautiful city of Venice. One can easily get lost in its many canals. The best way to avoid that situation is to use the following five-step process:

1 Identify the target destination and your current location.

2 Walk 100 metres in the assumed good direction, then relocate your new position.

3 Confirm that you are now located where you intended to go.

4 If you are in the right spot, then decide on the direction of the next 100 metres. Otherwise, return to your previous location.

5 Repeat from Step 1.

If you understand this five-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 contract positions that tracks the target risk (10% annual volatility) and decorrelates to equity (as close to zero as possible).

The third Level 1 QI model is called **Time-Series Momentum Strategy (TSMOM thereafter)**. Momentum is a very well-studied and persistent factor that drives excess returns. A simple yet potentially efficient momentum strategy is to hold a long (or short) position in an asset that recently had a consistent increase (or decrease) in its price.

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 simple approach does not consider statistical properties or the strength of the price path. In other words, instead of having either a 100% (long) or a –100% (short) position, TSMOM spans for any value in between based on the strength of the signal.

Another improvement was made to the risk component since the above strategy had not yet taken volatility into account. We thus incorporated NALT's target volatility within TSMOM, as well as a correlation adjustment, to improve the ETF's risk-return characteristics.

We initiated NALT by introducing these three 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 constraint that keeps NALT compliant with National Instrument 81-102 regulations, then, a dynamically adjusted risk-taking level to maintain the volatility of the portfolio around the target of 10% per year. Furthermore, concentration limits are built into the strategy to make sure the portfolio does not invest too much in too few instruments.

Lastly, the quantitative investment process underlying NALT and its 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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