NASDAQ AlphaDEX® Hedged Index Methodology

October 5, 2015

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1. Introduction

1.1 Background

This document specifies the methodology for the NASDAQ AlphaDEX® Hedged Indexes

1.2 The Indexes

The NASDAQ AlphaDEX Hedged Indexes (the "Hedged Indexes") are designed to represent returns for global investment strategies that involve hedging currency risk, but not the underlying constituent risk. The currency hedged strategy indexes aims to eliminate the effect of currency fluctuations in the index. By factoring the impact of selling foreign currency forwards at the one month forward rate, the Hedged Indexes mitigate the currency exposures in the index compared to the 'home' currency. The amount of forward return per currency applied to the index level corresponds to the percentage weight of the securities traded in each currency in the underlying unhedged index as of the close of two trading days before the first trading day of the new month but taking account any following month end changes implemented as of close of the last btrading day of the month. The currency weights used to generate the daily forward return are then kept constant over the full month.

By selling foreign exchange forward contracts, global investors are able to lock in current exchange forward rates, and manage their currency risk. Profits (losses) from the forward contracts are offset by losses (profits) in the value of the currency, thereby negating exposure to the currency.

The Hedged Indexes are calculated as daily return indexes and hedged on a monthly basis.

The Hedged Indexes can be constructed for any developed and emerging market index. However, for some currencies, especially emerging market currencies, the hedged impact cannot be calculated due to data unavailability. In such cases, the affected currency weight is set to zero.

For specific information related to the underlying reference index, Nasdaq AlphaDEX Indexes, please see the "Nasdaq AlphaDEX Index Methodology."

1.3 Currency Data Definitions

1.3.1 Closing Spot Rates

Nasdaq uses the WM Company, Closing Spot Rates at 16:00:00 UK time in the calculation of the closing Index Values[1]. SIX Financial Information Intraday Spot Rates are applied to the real time Index calculations during the trading day.

[1] The WM/Reuters Spot Rates and Forward Rates provided by The World Markets Company plc ("WM") in conjunction with Reuters. WM shall not be liable for any errors in or delays in providing or making available the data contained within this service or for any actions taken in reliance on the same, except to the extent that the same is directly caused by its or its employees' negligence

1.3.2 Closing Forward Rates

Nasdaq uses the WM Company, Closing Forward Rates at 16:00:00 UK time in the calculation of the closing Index Values. WM 1-month Intraday Forward Rates are applied to the real time Index calculations during the trading day.

1.3.3 Missing Spot or Forward Rates

In the case WM/Reuters does not provide a Spot or a Forward rate for specific markets on given days the previous business day's rates will be used.

2. Index Calculation

There are two components to a Hedged Index return:

+ The performance of the unhedged underlying index in the portfolio home currency
+ The Hedge Impact (aimed to represent the profit or loss on the forward contracts) in the portfolio home currency

Home Currency: Home Currency=Index Currency (currency of the country of the investor)

Foreign Currency: Foreign currencies= all currencies in the underlying index that is a non-home currency

Example: NQDXEURO is calculated in USD by converting the component securities from EUR into USD using the EURUSD spot rate. NQDXEUROH is the hedged version of NQDXEURO.

Step 1: Determine Home and Foreign Currency. NQDXEUR is calculated in USD for US investor so home currency is USD. Foreign currency are the currencies of the underlying components of NQDXEUR which in this example is EUR.

Step 2: Combine **Home Currency** and **Foreign Currency** to create the spot rate for Hedge Impact calculation as the amount of foreign currency worth of one unit home currency: **USDEUR**

Step 3: Calculate weights for each foreign currency in the unhedged underlying index by aggregating the Market Cap weight of each security quoted it that currency. In the example EUR will have 100% weight .

Step 4: Calculate Hedge Impact based on USDEUR Spot and Forward Rates and foreign currency weights

Step 5: Calculate the Hedged Index value, NQDXEUROH, by combining the unhedged underlying index , NQDXEURO , return with the Hedge Impact

2.1 Hedge Ratio

The hedge ratio is the proportion of the portfolio's currency exposure that is hedged. The standard NASDAQ AlphaDEX Hedged Indexes uses a hedge ratio of 1 (100%).

2.2 Hedge Impact Calculation

The Hedge Impact, *HI*, expressed in percent, is calculated as follows:

$$HI_t = MAF * \sum_{i=1}^{n} Weight_{i,m-1} \ x \ HR \ x \ (\frac{SR_{i,m-1}}{FR_{i,m}} - \frac{SR_{i,m-1}}{FIR_{i,t}})$$

Where;

HI_t $= The \ Hedge \ Impact \ (profit \ or \ loss) \ for \ the \ currency/ies \ i \ on \ the \ calculation \ day \ t$

$Weight_{i,m-1}$ $= Weight \ of \ the \ currency \ i \ in \ the \ unhedged \ underlying \ index \ one \ day \ prior$ $to \ the \ last \ business \ day \ in \ the \ previous \ month$[2]

HR $= The \ Hedge \ Ratio \ assigned \ for \ currency \ i \ (100\% \ in \ the \ Nasdaq \ standard \ indexes)$

$SR_{i,m-1}$ $= Spot \ rate \ at \ the \ close \ for \ currency \ i \ one \ day \ prior \ to \ the \ last \ business \ day$ $in \ the \ previous \ month$

$FR_{i,m}$ $= 1 - month \ Forward \ rate \ at \ the \ close \ for \ currency \ i \ on \ the \ last \ business \ day$ $in \ the \ previous \ month$

$FIR_{i,t}$ $1 - month \ Forward \ Interpolated \ Rate \ of \ the \ currency \ i \ on \ calculation \ day \ t$ $(see \ details \ in \ 2.1.2)$

MAF $= Monthly \ Adjustment \ Factor \ which \ is \ calculated \ as \ \frac{Hedged \ Index_{,m-1}}{Hedged \ Index_{,m}}$

2.2.1 Forward Interpolated Rate Calculation

The 1-month Forward Interpolated Rate is calculated by using a linear interpolation between the Spot Rate and the Forward Rate

$$FIRi_{,t} = SR_{i,t} + \left[\left(FR_{i,t} - SR_{i,t} \right) x \frac{Days \ Left_{i,t}}{TotDaysMonth} \right]$$

Where;

$FIR_{i,t}$ $= The \ Forward \ Interpolated \ Rate \ of \ the \ currency \ i \ on$ the $calculation \ day \ t$

$SR_{i,t}$ $= The \ Spot \ Rate \ of \ the \ currency \ i \ on \ the \ calculation \ day \ t$

$FR_{i,t}$ $= The \ Forward \ Rate \ of \ the \ currency \ i \ on \ the \ calculation \ day \ t$

$DaysLeft_{i,t}$ $= Number \ of \ days \ from \ calculation \ date \ t \ (not \ counting \ t) \ until \ the \ last \ business \ day$ $of \ the \ month$

$TotDaysMonth = Total \ number \ of \ days \ in \ month \ until \ the \ last \ business \ day \ of \ the \ month$

[2] taking into account any changes in the composition of the index implemented as of the close of the last business day of the month

2.3 Hedged Index Calculation

The Hedged Index, HIX, is the combination of the Unhedged Underlying Index return and the Hedge Impact and is calculated as follows:

$$HIX_t = HIX_m \; x \; (\frac{UNHIX_t}{UNHIX_m} + HI_t)$$

Where;

HIX_t	$= The\ \ Hedged\ Index\ value\ on\ the\ calculation\ day\ t$
HIX_m	$= The\ \ Hedged\ Index\ value\ on\ the\ last\ calculation\ day\ in\ the\ previous\ month$
$UNHIX_t$	$= The\ \ Underlying\ Unhedged\ Index\ value\ on\ the\ calculation\ day\ t$
$UNHIX_m$	$= The\ \ Underlying\ Unhedged\ Index\ value\ on\ the\ last\ calculation$ $day\ in\ the\ previous\ month$

3. Disclaimer

Nasdaq may, from time to time, exercise reasonable discretion as it deems appropriate in order to ensure Index integrity including but not limited to quantitative inclusion criteria. Nasdaq may also, due to special circumstances, if deemed essential, apply discretionary adjustments to ensure and maintain the high quality of the index construction and calculation. Nasdaq and its affiliates do not guarantee the accuracy or completeness of any Index or of the data used to calculate the Index or determine the Index components, or the uninterrupted or undelayed calculation or dissemination of any Index. Nasdaq and its affiliates do not guarantee that any Index accurately reflects past, present, or future market performance.

4. Limitation of Liability

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Appendix 1. List of Calculated Indexes

Ticker	Index Name	Currency
NQDXJPMH	NASDAQ AlphaDEX Japan Hedged USD Index	USD
NQDXJPTMH	NASDAQ AlphaDEX Japan Hedged USD TR Index	USD
NQDXJPNMH	NASDAQ AlphaDEX Japan Hedged USD NTR Index	USD
NQDXJPEURMH	NASDAQ AlphaDEX Japan Hedged EUR Index	EUR
NQDXJPEURTMH	NASDAQ AlphaDEX Japan Hedged EUR TR Index	EUR
NQDXJPEURNMH	NASDAQ AlphaDEX Japan Hedged EUR NTR Index	EUR
NQDXEUROMH	NASDAQ AlphaDEX Eurozone Hedged USD Index	USD
NQDXEUROTMH	NASDAQ AlphaDEX Eurozone Hedged USD TR Index	USD
NQDXEURONMH	NASDAQ AlphaDEX Eurozone Hedged USD NTR Index	USD