



INDEX METHODOLOGY

NASDAQ-100 AGILE INDEXES

INDEX DESCRIPTION

The Nasdaq-100 Agile Indexes, each an “Index” and collectively the “Indexes”, are designed to provide exposure to the Nasdaq-100 Total Return Index® (XNDX) while targeting a specified level of volatility. The Indexes use Nasdaq-100 Index (NDX) intraday values (the open, high, low, and close) to estimate volatility with the aim of capturing significant intraday swings that might not be reflected in close-to-close observations.

Each Index is evaluated daily and rebalances on days where the deviation of its volatility measure from the target volatility exceeds the Rebalance Hurdle (see *Index parameters* below). Although the Indexes are designed to target a specific level of volatility, there is no guaranty the Indexes will achieve these results.

Unless stated otherwise, all capitalized terms used in this document are defined in Appendix A: Definitions.

INDEX CALCULATION

For each Index, the Index value is equal to the Index Base Value on the Index Base Date. Thereafter, for each Index Day, the value of an Index is calculated in accordance with the following formula:

$$I_t = I_{t-1} + U_{t-1} \times (P_t - P_{t-1}) - FC_t$$

where:

t = an Index Day t .

$t - 1$ = the Index Day immediately preceding Index Day t .

I_x = the value of the Index for Index Day x .

U_x = the number of units of the Component for Index Day x (see *Rebalancing process* section below for more details).

P_x = the daily closing price of the Component for Index Day x (rounded to two decimal places).

FC_t = the estimated funding costs for the Component for Index Day t as determined in accordance with the following formula:

$$FC_t = |U_{t-1}| \times P_{t-1} \times RF_{t-1} \times \frac{Days_{t-1,t}}{360}$$

where:

RF_{t-1} = the Effective Federal Funds Rate published by the Federal Reserve Bank of New York for Index Day $t - 1$. If such rate is unavailable, then the rate shall be the most recent rate available on an Index Day preceding Index Day $t-1$.

$Days_{t-1,t}$ = the number of calendar days from Index Day $t - 1$ (inclusive) to Index Day t (exclusive).

Index values are rounded to four decimals places.

If the value for an underlying Component is unavailable on a given Index Day t , then such value shall be the last available value for that Component, as determined by the Index Administrator.

INDEX CONSTRUCTION

Index parameters

The table below details parameters specific to the construction and calculation of each Index.

Index (Symbol)	Component (Symbol)	Component Exposure		Target Volatility (TV)	Rebalance Hurdle (RH)	Alpha (α)	Reference Component (Symbol)
Maximum	Minimum						
Nasdaq-100 Agile 15% Index (XNDXAG15)	Nasdaq-100 Total Return Index (XNDX)	150%	0%	15%	7.5%	4	Nasdaq-100 Index (NDX)

For information on the Component and Reference Component, please refer to the [Nasdaq-100 Index Methodology document](#).

Index components and weighting

Each Index may only include the Component as detailed in the *Index parameters* section above.

For each Evaluation Date, an Index's estimated volatility measure is determined and evaluated against its Rebalance Hurdle. If the Rebalance Hurdle is satisfied, then a rebalance is triggered and the Index rebalances on the following Index Day (see *Rebalancing process* section below). If the Rebalance Hurdle is not satisfied, no rebalance is triggered and units do not change.

Rebalancing process

Subject to a Hedge Delay, each Index is rebalanced as of the market close on each Rebalance Day. The number of units of the Component is determined in accordance with the following formula:

$$U_t = \frac{I_{t-1} \times ER_{t-1}}{P_{t-1}}$$

where:

U_t = the number of Units of the Component for Index Day t .

ER_{t-1} = the exposure ratio for the Component for Index Day $t - 1$ (see *Appendix B: Exposure Determination Process*).

I_{t-1} = the Index value on Index Day $t - 1$.

P_{t-1} = the daily closing price of the Component for Index Day $t - 1$ (rounded to two decimal places).

For non-Rebalance days, the units do not change.

$$U_t = U_{t-1}$$

For the Index Base Date (t_0), the initial Units of the Component are determined based on information from the Index Day prior to the Index Base Date and calculated in accordance with the following formula:

$$U_{t_0} = \frac{100 \times ER_{t_0-1}}{P_{t_0-1}}$$

Units are rounded to eight decimal places.

INDEX CALENDAR

Holiday schedule

The Indexes are calculated Monday through Friday, except on days when the Nasdaq Stock Exchange is scheduled to be closed and the underlying Component is not scheduled to be calculated (the “Holiday Schedule”).

Index calculation and dissemination schedule

Index values are made available after the market close on each Index Day via the [Nasdaq Global Index Watch \(GIW\) website](#).

ADDITIONAL INFORMATION

Announcements

Nasdaq announces Index-related information via the [Nasdaq Global Index Watch \(GIW\) website](#).

For more information on the general Index Announcement procedures, please refer to the [Nasdaq Index Methodology Guide](#).

Recalculation and restatement policy

For information on the Recalculation and Restatement Policy, please refer to the [Nasdaq Index Recalculation Policy](#).

Contact information

For any questions regarding an Index, please contact the Nasdaq Index Client Services team at indexservices@nasdaq.com.

Index dissemination

Where applicable, Index values and weightings information are available through the [Nasdaq Global Index Watch \(GIW\) website](#) as well as the Nasdaq Global Index FlexFile Delivery Service (GIFFD) and Global Index Dissemination Services (GIDS). Similar to the GIDS offerings, Genium Consolidated Feed (GCF) provides real-time Index values and weightings for the Nordic Indexes.

For more detailed information regarding Index Dissemination, please see the [Nasdaq Index Methodology Guide](#).

Website

For further information, please refer to the [Nasdaq Global Index Watch \(GIW\) website](#).

FTP and dissemination service

Where applicable, Index values and weightings are available via FTP on the Nasdaq Global Indexes FlexFile Delivery Service (GIFFD). Index values are available via Nasdaq's Global Index Dissemination Services (GIDS).

GOVERNANCE

Index governance

All Nasdaq Indexes are managed by the governance committee structure and have transparent governance, oversight, and accountability procedures for the index determination process. For further details on the Index Methodology and Governance overlay, please refer to the [Nasdaq Index Methodology Guide](#).

APPENDIX A: DEFINITIONS

Term	Description
Calculation Disruption Event	In respect of an Index, the occurrence of one or more of the following events that affects a Component of that Index, or any underlying instrument of such Component, and that the Index Administrator deems to be material to the Index: • Price Failure: Any event that impairs or prevents the ability of the Index Administrator to obtain a relevant price, level, rate, value or any other information from an exchange or other source necessary, on a timely basis and in a manner acceptable to the Index Administrator, in order to perform the calculation of the Index. • Inaccurate Data: The price or value of a component, or other input data, used directly or indirectly in the Index that, in the determination of the Index Administrator, is inaccurate, incomplete and/or does not adequately reflect the true market price or value of such component or input data. • Force Majeure: Any event or circumstance (including, without limitation, a systems failure, natural or man-made disaster, act of God, armed conflict, act of terrorism, riot or labor disruption or any similar intervening circumstance, or restrictions due to emergency powers enforced by federal, state or local government agencies), that is beyond the reasonable control of the Index Administrator and that the Index Administrator determines, in its sole discretion, affects the Index, a Component of the Index, any input data required to calculate the Index, or that prevents the ability of the Index Administrator to calculate the Index. • General Moratorium: the Index Administrator observes on any day that there has been a declaration of a general moratorium in respect of banking activities in any relevant jurisdiction.
Component	In respect of an Index, the Component as detailed in the <i>Index parameters</i> section.
Consequences of a Market Disruption Event or a Calculation Disruption Event	In respect of an Index, if a Market Disruption Event or a Calculation Disruption Event occurs or is occurring on an Index Day that the Index Administrator determines materially affects the Index, the Index Administrator may: • Delay the calculation of the Index and halt the dissemination of the value of the Index and /or other information relating to the Index until such time, which may be a subsequent Index Day, that the Index Administrator determines that such Market Disruption Event or Calculation Disruption Event is no longer occurring. • Determine a good faith estimate of any affected or missing input data required to calculate the Index or the value of the Index for such Index Day or time for such Index Day.
Disrupted Day	In respect of an Index and a Component, an Index Day on which there is a Market Disruption Event.
Evaluation Date	In respect of an Index, each Index Day.
Hedge Delay	In respect of an Index and a Component, if a Market Disruption Event occurs on a scheduled Rebalance Day for such Component, then no change of units of that Component shall occur on that day.

Index Administrator	Nasdaq, Inc.
Index Base Date	May 7, 1999
Index Base Value	100.00
Index Day	In respect of an Index and starting with the Index Base Date, each weekday that is not a scheduled holiday according to the Holiday Schedule as defined in the <i>Index Calendar</i> section.
Market Disruption Event	In respect of an Index and a Component, the occurrence of one or more of the following events that affects that Component, or any underlying instrument of that Component, and that the Index Administrator deems to be material to the Index: • Trading Disruption: Any unscheduled closure of the relevant exchange; a material suspension, limitation or disruption of trading on such exchange; a failure of such exchange to publish the relevant price, level, value or other information; a halt in trading, such as a circuit breaker or other exchange imposed halt, including an exchange imposed daily “limit price”; or any other event that materially affects the ability of market participants to trade, effect transactions in, maintain or unwind positions in that Component or any underlying instrument of that Component. • Exchange Disruption: Any exchange related event on a relevant exchange that disrupts or impairs the ability of market participants to effect transactions or obtain market values or price discovery of a component used directly or indirectly in the Index.
Rebalance Day	In respect of an Index, a Component, and an Evaluation Date, the Index Day after that Evaluation Date that is not a Disrupted Day for that Component and where the Rebalance Hurdle has been satisfied.
Rebalance Hurdle	In respect of an Index, a Component, and an Evaluation Date, the percentage (see <i>Index parameters</i> section) that the deviation of the Index’s volatility measure from the target volatility must exceed.

For additional key terms not defined above, please refer to the [Nasdaq Index Methodology Guide](#).

APPENDIX B: EXPOSURE DETERMINATION PROCESS

For each Evaluation Date t , an Index's estimated volatility measure (VM_t) is determined and evaluated against its Rebalance Hurdle (RH). If the Rebalance Hurdle is satisfied, the exposure ratio (ER_t) will be determined and that Index will rebalance the following day. This evaluation process uses specified intraday values and the index dividend points of the Reference Component. The steps are as follows:

1. Determine the estimated variance (V)¹ of the Reference Component for Evaluation Date t in accordance with the following formula:

$$V_t^n = V_{t,O} + k \times V_{t,C} + (1 - k) \times V_{t,RS}$$

where:

$$V_{t,O} = \frac{1}{n-1} \times \sum_{i=0}^{n-1} \left(o_{t-i} - \frac{1}{n} \times \sum_{j=0}^{n-1} o_{t-j} \right)^2$$

$$V_{t,C} = \frac{1}{n-1} \times \sum_{i=0}^{n-1} \left(c_{t-i} - \frac{1}{n} \times \sum_{j=0}^{n-1} c_{t-j} \right)^2$$

$$V_{t,RS} = \frac{1}{n} \times \sum_{i=0}^{n-1} (u_{t-i} \times (u_{t-i} - c_{t-i}) + d_{t-i} \times (d_{t-i} - c_{t-i}))$$

$$o_x = \ln \left(\frac{PO_x + IDP_{x-1,x}}{PC_{x-1}} \right)$$

$$u_x = \ln \left(\frac{PH_x}{PO_x} \right)$$

$$d_x = \ln \left(\frac{PL_x}{PO_x} \right)$$

$$c_x = \ln \left(\frac{PC_x}{PO_x} \right)$$

n = the number of observation days (either 2, 3, or 11).

$$k = \frac{\alpha - 1}{\alpha + \frac{n+1}{n-1}} \quad \text{where } \alpha \text{ is as detailed in the } \textit{Index parameters} \text{ section.}$$

PC_{t-1} = the closing price of the Reference Component for Evaluation Date $t - 1$ (rounded to two decimal places).

$IDP_{t-1,t}$ = the total index dividend points of the Reference Component (rounded to six decimal places) from Evaluation Date $t - 1$ (exclusive) to Evaluation Date t (inclusive).

¹ Dennis Yang and Qiang Zhang, "Drift-Independent Volatility Estimation Based on High, Low, Open, and Close Prices," *The Journal of Business* 73, no. 3 (July 2000): 447-492, <https://www.jstor.org/stable/10.1086/209650>.

PO_t = the opening price² of the Reference Component for Evaluation Date t (rounded to two decimal places).

PH_t = the highest price of the Reference Component for Evaluation Date t (rounded to two decimal places).

PL_t = the lowest price of the Reference Component for Evaluation Date t (rounded to two decimal places).

PC_t = the closing price of the Reference Component for Evaluation Date t (rounded to two decimal places).

2. Calculate the estimated volatility measure (VM_t) in accordance with the following formula:

$$VM_t = \sqrt{252 \times \max(V_t^2, V_t^3, V_t^{11})}$$

3. Evaluate the Rebalance Hurdle (RH). If, on Evaluation Date t , the deviation of the volatility measure (VM) from the target volatility (TV) exceeds the Rebalance Hurdle, then the Rebalance Hurdle is deemed to be satisfied, and the Index will rebalance on the following Index Day. Otherwise, the Rebalance Hurdle is deemed to be not satisfied. The Rebalance Hurdle will be satisfied on Evaluation Date t if the following statement is true:

$$\left| \frac{VM_t \times EW_t}{TV} - 1 \right| > RH$$

where:

$$EW_t = \frac{U_t \times P_t}{I_t}$$

RH = Rebalance Hurdle as detailed in the *Index parameters* section.

And I_t , U_t , P_t have the same meanings ascribed to them in the *Index Calculation* section.

4. Determine the exposure ratio (ER_t). If, on Evaluation Date t , the Rebalance Hurdle is satisfied, then the exposure ratio is determined in accordance with the following formulas:

$$ER_t = \min\left(\frac{TV}{VM_t}, Exp_Cap\right)$$

where:

TV = the Target Volatility as detailed in the *Index parameters* section.

VM_t = the volatility measure for Evaluation Date t , as determined in step 2 above.

Exp_Cap = the maximum exposure to the Component as detailed in the *Index parameters* section.

The exposure ratio is rounded to four decimal places.

² Opening price refers to the Nasdaq-100 Index final settlement value, symbol XQO, calculated at the open of trading based on the Nasdaq Official Opening Price (NOOP) that day for each of the Nasdaq-100 Index component securities. Please note that for backtest history prior to April 20, 2009, the first tick price for the Nasdaq-100 Index was used.

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 does not guarantee that any Index accurately reflects future market performance.

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