



**Nasdaq Global ex-Australia Sector Hedged Indexes  
Methodology  
June, 2016**

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# 1. Introduction

## 1.1 Background

This document specifies the methodology for the Nasdaq Global ex-Australia Index Sector Hedged Indexes.

## 1.2 The Indexes

The Nasdaq Global ex-Australia Index Sector 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 trading 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(es), Nasdaq Global ex-Australia Indexes, please see the "Nasdaq Global ex-Australia Index Methodologies," "Nasdaq Global Ex-Australia Agriculture Companies Index" and "Nasdaq Global Ex-Australia Gold Miners Index"

## 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<sup>1</sup>. SIX Financial Information Intraday Spot Rates are applied to the real time Index calculations during the trading day.

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<sup>1</sup> 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

### 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: NQXAUAGRAUD is calculated in AUD by converting the component securities from USD into AUD using the AUDUSD spot rate. NQXAUAGRAUDH is the hedged version of NQXAUAGRAUD.

**Step 1:** Determine Home and Foreign Currency. NQXAUAGRAUD is calculated in AUD for Australian investor so home currency is AUD. Foreign currency are the currencies of the underlying components of NQXAUAGRAUD which in this example is USD.

**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:

**Step 3:** Calculate weights for each foreign currency in the unhedged underlying index by aggregating the Market Cap weight of each security quoted in that currency.

**Step 4:** Calculate Hedge Impact based on AUD Spot and Forward Rates and foreign currency weights between each currency pair (eg AUDUSD, AUDEUR, AUDHKD, etc)

**Step 5:** Calculate the Hedged Index value, NQXAUAGRAUDH, by combining the unhedged underlying index, NQXAUAGRAUD, 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 Global ex-Australia Index Sector Hedged Indexes uses a hedge ratio of 1 (100%).

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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

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## 2.2 Hedge Impact Calculation

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

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

Where;

*HI<sub>t</sub>* = The Hedge Impact (profit or loss) for the currency/ies *i* on the calculation day *t*

*Weight<sub>i,m-1</sub>* = Weight of the currency *i* in the unhedged underlying index one day prior to the last business day in the previous month<sup>2</sup>

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

*SR<sub>i,m-1</sub>* = Spot rate at the close for currency *i* one day prior to the last business day in the previous month

*FR<sub>i,m</sub>* = 1 – month Forward rate at the close for currency *i* on the last business day in the previous month

*FIR<sub>i,t</sub>* = 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

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

Where;

*FIR<sub>i,t</sub>* = The Forward Interpolated Rate of the currency *i* on the calculation day *t*

*SR<sub>i,t</sub>* = The Spot Rate of the currency *i* on the calculation day *t*

*FR<sub>i,t</sub>* = The Forward Rate of the currency *i* on the calculation day *t*

*DaysLeft<sub>i,t</sub>* = Number of days from calculation date *t* (not counting *t*) until the last business day of the month

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<sup>2</sup> taking into account any changes in the composition of the index implemented as of the close of the last business day of the month

*TotDaysMonth = Total number of days in month until 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:

$$HIX_t = HIX_m \times \left( \frac{UNHIX_t}{UNHIX_m} + HI_t \right)$$

Where;

*HIX<sub>t</sub> = The Hedged Index value on the calculation day t*

*HIX<sub>m</sub> = The Hedged Index value on the last calculation day in the previous month*

*UNHIX<sub>t</sub> = The Underlying Unhedged Index value on the calculation day t*

*UNHIX<sub>m</sub> = 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
NQXAUAGRAUDMH	Nasdaq Global ex-Australia Agriculture Companies Hedged AUD Index	AUD
NQXAUAGRAUDTMH	Nasdaq Global ex-Australia Agriculture Companies Total Return Hedged AUD Index	AUD
NQXAUAGRAUDNMH	Nasdaq Global ex-Australia Agriculture Companies Net Total Return Hedged AUD Index	AUD
NQXAUGLDAUDMH	Nasdaq Global ex-Australia Gold Miners Hedged AUD Index	AUD
NQXAUGLDAUDTMH	Nasdaq Global ex-Australia Gold Miners Total Return Hedged AUD Index	AUD
NQXAUGLDAUDNMH	Nasdaq Global ex-Australia Gold Miners Net Total Return Hedged AUD Index	AUD
NQXAUBAUDMH	Nasdaq Global ex-Australia Banks Hedged AUD Index	AUD
NQXAUBAUDTMH	Nasdaq Global ex-Australia Banks Total Return Hedged AUD Index	AUD
NQXAUBAUDNMH	Nasdaq Global ex-Australia Banks Net Total Return Hedged AUD Index	AUD
NQXAUEAUDMH	Nasdaq Global ex-Australia Energy Companies Hedged AUD Index	AUD
NQXAUEAUDTMH	Nasdaq Global ex-Australia Energy Companies Total Return Hedged AUD Index	AUD
NQXAUEAUDNMH	Nasdaq Global ex-Australia Energy Companies Net Total Return Hedged AUD Index	AUD
NQXAUHAUDMH	Nasdaq Global ex-Australia Healthcare Hedged AUD Index	AUD
NQXAUHAUDTMH	Nasdaq Global ex-Australia Healthcare Total Return Hedged AUD Index	AUD
NQXAUHAUDNMH	Nasdaq Global ex-Australia Healthcare Net Total Return Hedged AUD Index	AUD

