

## Methodology: Gold correlations

### 1. Introduction

#### 1.1 What is this data set?

This data set provides correlation metrics for gold and various relevant asset classes in multiple currencies.

Users can customise:

- **Country:** select from a series of country tabs that show the most relevant regional, as well as global, asset classes using relevant benchmark indices measured in the chosen currency
- **Assets:** select from various benchmark indices representing a range of asset classes
- **Time period:** select from a list of pre-established time periods with the option of setting a start and end date for your choice
- **Return frequency:** measure asset performance using daily, weekly, or monthly returns.

#### 1.2 Why is this data important?

Correlations are a key component for effective portfolio allocations. As such, we publish performance metrics (returns, volatilities and correlations) for gold and various relevant asset classes in multiple currencies. This brief note summarises the relevance, contents and methodology of our Gold Performance Analytics.

### 2. Process

#### 2.1 How is the data compiled?

We compare the correlation between gold and other assets typically held by investors – cash, domestic and foreign stocks and bonds, commodities and other alternatives – using relevant benchmark indices in various currencies including the US dollar, euro, pound sterling, yen, Chinese renminbi and Indian rupee.

#### 2.2 How are the benchmark indices selected?

The most commonly used benchmark indices have been selected to represent the various assets and asset classes. Wherever possible, various options are included for each asset class. Total gross returns indices are used unless otherwise specified.

#### 2.3 Where is the data sourced?

Data is sourced primarily via Bloomberg, but the original source will vary depending on the asset class. Data sources used for our calculations include Bloomberg Barclays, MSCI, S&P, and MCX, among others. For a comprehensive list of sources please refer to the notes at the bottom of each respective chart as well as the detailed benchmark index descriptions.

#### 2.4 How often is the data updated?

Daily, weekly, and monthly returns will normally be updated one business day after the end of each month.

#### 2.5 How are performance metrics computed?

For each given period (e.g. 1 year, 10 years, 20 years, etc.) correlation is measured using natural log (LN) returns and the formula:

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Where:

|           |   |  |
|-----------|---|--|
| $r$       | = | <i>correlation coefficient</i>                                   |
| $x_i$     | = | <i><math>i_{th}</math> observaton of variable <math>x</math></i> |
| $\bar{x}$ | = | <i>mean of all <math>x_i</math></i>                              |
| $y_i$     | = | <i><math>i_{th}</math> observaton of variable <math>y</math></i> |
| $\bar{y}$ | = | <i>mean of all <math>y_i</math></i>                              |

## 2.6 How are revisions to data handled?

Revisions usually result from backfilling missing or incorrect values. The calculation process is fully automated and therefore any revisions to the underlying data will automatically be captured every time the data is updated from its original source.

## 2.7 How is the data checked or verified?

Before publication the data is thoroughly reviewed to ensure quality by:

- **Cross-checking raw data with secondary sources:** by cross-checking with secondary sources we can identify any potential issues with the data
- **Manual review:** both the data and the process used to collect it are regularly reviewed to minimise the possibility of error.

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