Gold: how we value the precious metal

Published 25 November 2019

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Gold is a unique asset class. Indeed, many investors even question whether it is an asset class. Is it a commodity, or a currency? What's also interesting about gold is that even though it has been viewed as a form of investment for several millennia, there's little consensus on how to actually value it.

In this article, we'll look at how we value gold at WisdomTree and explain how we use historic price behaviour to generate gold price forecasts for the future.

The difficulty in valuing gold

It's easy to understand why valuing gold is complex.

For a start, gold does not generate cash flow like other assets do, so traditional valuation techniques such as discounted cash flow (DCF) models don't work.

Another complication lies in the fact that there have been many regime shifts in relation to the precious metal over the years. For example, between 1933 and 1974, investment in gold bullion was all-but barred in the US after President Franklin D. Roosevelt signed Executive Order 6102[1]. Similarly, in China, gold bullion investment was effectively prohibited between 1950 and 2004[2]. Today, these two countries are among the largest bullion investing nations in the world. So, clearly, using extremely long timeseries of data to calibrate a gold valuation model is not appropriate.

With little consensus on valuation methods, financial commentators are often quite emotive in their projections for the metal. There are the 'gold bugs,' who tend to be perma-bulls, while there are also gold bears who believe that the metal has little value.

The WisdomTree gold model

At WisdomTree, our goal has been to develop a robust, impartial gold model.

We recognise that many factors affect the price of gold, so we have modelled the precious metal in a multivariate fashion. We have been able to build a basic model with four key explanatory variables and our gold price forecasts can be positive, negative, or neutral, depending on the direction of these underlying variables. Notably, our model describes gold as more of a monetary asset than a commodity.

In our gold model, we show that changes in US Dollar gold prices are driven by (direction in parenthesis):

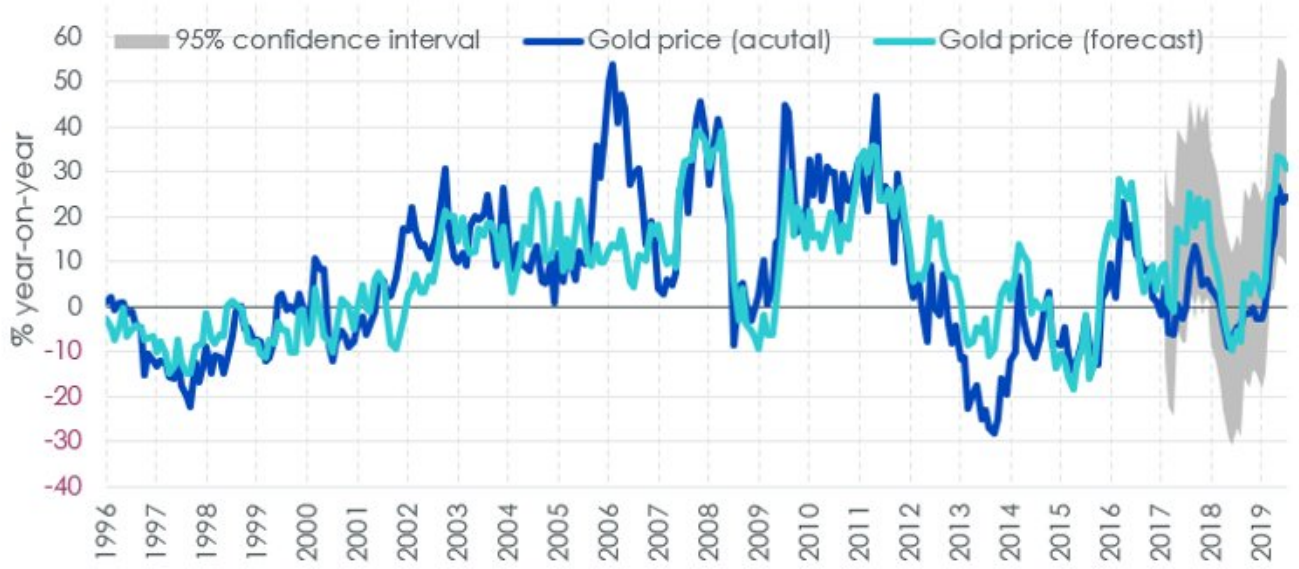
- Changes in the US Dollar basket (-)
- Consumer Price Index (CPI) inflation (+)

- Changes in nominal yields on 10-year US Treasuries (-)
- Investor sentiment (measured by speculative positioning in the futures market) (+)

We chose to put both inflation and nominal yields into the model as a proxy for real yields, rather than real yields directly so that we could use a longer data set (Treasury Inflation Protected Securities have only been around since 1997), and our model goes back to 1995 when Commodity Futures Trading Commission (CFTC) data on speculative futures market positioning first starts.

Figure 1 shows forecasts when calibrating our model using data from April 1996 to April 2017.

Figure 1. Gold price model in "out of sample" test



Source: Bloomberg, WisdomTree, data available as of close 19 November 2019 Model calibration: April 1996 to April 2017. Out of sample period: May 2017 to October 2019.

Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.

As you can see, our model tracks the actual price of gold quite well. However, we have also added new variables to the model to see if they enhance its explanatory power.

Additional variables

To this base model we added a number of extra variables over the April 1995 to April 2018 period. Here's what we found:

- Equity markets: Year-on-year changes in gold prices were negatively related to year-on-year changes in the S&P 500 and including the equity market indicator in the model weakened the significance of nominal yields. So, we chose not to include an equity market factor in our final model.

- Volatility: Changes in the option implied volatility of the S&P500 (CBOE Volatility Index, VIX) did not help explain gold prices. Many people regard gold as a hedge against surprises, but we found that the VIX didn't have a significant impact in our model. This may have been related to the monthly frequency of our model as surprises are often too short-lived to be picked up in a monthly model.
- ETP assets: Gold prices appeared to be negatively associated with changes in gold exchange traded product (ETP) assets under management (measured in ounces) and the results cast doubt on the popular assertion that rising gold ETP demand has been responsible for higher gold prices.
- US Federal Reserve (Fed) balance sheet: Changes in the Fed's balance sheet size and changes in US M2 money supply growth were also not a significant factor in explaining gold prices. This was a surprising result, given the focus on monetary expansion in the context of gold price movements. However, it could just be the case that the US Dollar basket picks up most of the relationship. Changes in the combined balance sheets of the Fed, European Central Bank, Bank of Japan and Swiss National Bank were also not significant.

Does physical demand matter?

We also looked at whether non-ETP demand for gold (jewellery, technology, bullion, and central bank purchases) can explain gold price movements. To do this, we switched to a quarterly model of gold prices in order to incorporate the quarterly gold demand data from the World Gold Council, and shortened the span of the model to 2005 due to data limitations.

Here, our research indicated that physical gold demand is also not a relevant factor in explaining gold prices.

What has been the most important driver of gold prices in the past?

This is a question that comes up regularly and unfortunately, it's not a simple question to answer. This is because, as shown in Figure 2, at times a variable can have a large impact on the price of gold and at other times its impact can be minimal.

Figure 2. The impact of each variable: attribution of fitted results vs. actual price

Source: Bloomberg, WisdomTree data available as of close 19 November 2019. Speculative positioning as reported by Commmodity Futures Trading Commisssion, Treasury yields are based on US 10 year government bonds, US Dollar basket is based on fixed weights against major trading partners, inflation is based on the US consumer price index, actual gold prices from Bloomberg. The fitted gold price is the price the model would have forecast. The constant does not have economic meaning, but is used in econometric modeling to capture other terms. It can be thought of as how much gold prices would change if all other variables are set to zero (although that would be unrealistic).

Historical performance is not an indication of future performance and any investments may go down in value.

How we use our gold model

Ultimately, understanding gold's historic behaviour allows us to make future gold price forecasts, as long as we have a view on the explanatory variables.

By analysing key macroeconomic factors, including Federal Reserve policy, Treasury yields, and exchange rates, our gold model can be used to produce gold price forecasts.

For those interested, we will shortly be releasing our updated outlook for gold prices up to Q2 2020.

1 https://americanliterature.com/history/franklin-d-roosevelt/legislative/executive-order-6102

2 World Gold Council, China's gold market: progress and prospects, 2018

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