



## Stock Return Forecasting with Metals: Sentiment versus Fundamentals

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*This article documents empirically that precious metals contain economically valuable predictive information for stock returns. The authors show for each of the G7 countries that the stock return forecasts based on precious metals information enable certainty equivalent gains through a market-timing strategy. These gains remain after considering reasonable transaction costs, and are large enough to potentially make active portfolio management attractive, even for individual investors.*

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### Introduction

This paper studies the fundamental question of whether future stock returns can be accurately forecasted using metal returns. It extends the prior literature which focuses on in-sample predictability in this context (Jacobsen *et al.*, 2015; Jahan-Parvar *et al.*, 2012). In contrast, this paper studies the out-of-sample (OOS) predictability of stock market returns employing equity indices for each of the G7 countries. The authors examine the predictive content of precious metals (gold or silver) versus industrial metals (aluminum, copper, nickel and platinum) and combinations thereof.

The paper provides fresh evidence on whether the economic value of forecasts is robust to trading costs. For this purpose, the methodology employed does not just consider a specific trading cost level but accommodates a wide range of trading costs. The findings indicate that economic gains from active management are potentially available to a wide range of investors, including small investors.

### Why the Paper's Research Question is Important

Firstly, prior OOS studies generally do not consider commodities in general, or metals specifically, as return predictors; this applies both to U.S. studies and international studies. The focus has been on macro variables and fundamental variables based on dividends and earnings; this literature generally finds that OOS predictability does not lead to large economic gains. However, commodities could be a strong forecaster, which has thus far been overlooked. An exception is Fernandez-Perez *et al.* (2017) who demonstrate that commodity portfolios that capture the backwardation-contango phases exhibit OOS predictive power for the first two moments of long-horizon aggregate equity market returns.

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Secondly, the channel through which stock returns are predictable is important since it sheds light on what drives equity markets. If precious metals forecast stock returns then this suggests an important role for investor sentiment. If, in contrast, industrial metals better forecast stock returns then this suggests that economic fundamentals are a stronger driver of the primary financial markets.

Thirdly, there is much debate over the extent to which investors can benefit from implementing trading strategies. In particular, for many strategies such as those exploiting the day-of-the-week anomaly, trading profits would be completely wiped out by the transaction costs incurred. Hence, it is important to examine the level of trading costs over which a strategy remains profitable. This paper provides evidence on this issue by plotting the economic gains generated across a wide range of trading costs.

### Information Channels from Metals to Equities

Metal returns can broadly impact stock returns via two channels. First, they could impact industry costs if an industrial metal (such as aluminum or copper) is used as an input. For example, metal commodity price movements could be timely indicators of global supply and demand for raw materials or production activity. A second potential impact mechanism for metals is that precious metal commodity price movements could contain information about time-variation in investor risk preferences (or sentiment). That is, metals, such as gold or silver, are an important asset class for investors; therefore commodity returns could reflect changes in investor preferences. It has been theoretically demonstrated that metal prices signal the strength of the global economy. With the growth in exchange traded funds (ETFs), which must purchase and hold the commodities backing traded units, speculative demand and investor preferences could affect price. For example, silver held by ETFs has grown from around 100 tons in 2006 to over 1000 tons by 2011. Recent studies find some evidence of in-sample stock return predictability by using commodity returns; however, little evidence on out-of-sample predictability has been provided.

### Empirical Findings

The empirical analysis is based on weekly data from January 1985 until December 2011; the last ten years of data are used as the OOS forecasting (or evaluation) period. First, the authors examine the forecast accuracy of G7 market index returns when metals are included into the information set. Accuracy is assessed relative to an AR(1) model benchmark. In almost all countries, apart from Japan, improvements over the benchmark are possible via precious metals. In contrast, industrial metals perform poorly.

Second, the paper provides evidence from equity trading strategies that are based on incorporating information from commodity markets, such as precious and industrial metal returns, into a forecasting model for equity returns. The analysis is aimed at assessing if equity return forecasts can help improve the asset allocation decision (between the equity market and the risk-free asset). Particularly, the authors estimate the economic value to investors and practitioners by implementing the manipulation proof measure of certainty equivalent gains proposed by Goetzmann *et al.* (2007).



Thirdly, the authors explore how robust forecast gains are to transaction costs. This is especially important since much of the predictability documented in the short-horizon forecasting literature appears not to be exploitable once transaction costs are incorporated (Moreno and Olmeda, 2007). The few studies that do model costs tend to simply provide a point estimate of the break-even costs (e.g. Della Corte *et al.*, 2010) or estimate results for a specific level of costs (e.g. Driesprong *et al.*, 2008). In contrast, this paper examines how economic gains fluctuate as transaction costs vary across a wide range. This cost implementation strategy accounts for the fact that an investor will trade less under higher transaction costs. Thus, it is possible for the strategy to be more profitable with higher transaction costs if the number of trades are reduced and on average more profitable trades remain. Considering how gains are influenced by the cost of an investment strategy is important as it determines which investor classes could profitably use the strategy. Once transaction costs are incorporated, there is evidence that silver and gold provide substantial gains for an investor that engages in market timing. Thus, substantial economic value can be earned via dynamic trading strategies relative to the benchmark by incorporating recent past return information from precious metals. These economic gains are robust to the imposition of reasonable transaction costs. The authors find that the economic evidence on the merit of forecasts is stronger than the purely statistical evidence based on reductions in the standard mean square forecast error (MSFE) measure.

Finally, the authors find that combining information from more commodities does not necessarily improve forecast accuracy nor economic gains. More specifically, three of the industrial metals (copper, nickel and platinum) provide no additional information beyond that contained in silver or gold, respectively (i.e., the industrial metals are encompassed).

## Conclusions

This paper provides evidence that the returns from precious metals (gold and silver) enable consistent and substantial improvements in the OOS forecast accuracy of stock returns, in contrast with industrial metals. The hypothesis at work is that precious metal returns are impacted by variation in investor risk aversion and thus could contain information about expected future equity returns. The findings provide some validation for this hypothesis by reporting that precious metals forecast almost all G7 country market returns (with the exception of Japan). In contrast, most industrial metals do not provide significant gains.

By considering a wide range of trading costs, the paper demonstrates empirically that the net economic value of forecasting stock market returns can be substantial. The dynamic cost methodology is implemented for an asset allocation strategy (between equity and debt) and the empirical results indicate that within a realistic transaction cost range, forecasts from precious metals may prove useful to a wide spectrum of investors. Small investors including those using a tax-deferred account (for instance, a retirement account) could benefit from active management.

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## Endnote

The [author](#) of this digest article is also a member of the Editorial Advisory Board (EAB) of the *Global Commodities Applied Research Digest (GCARD)*. The GCARD's EAB membership is listed here: <http://jpmcc-gcard.com/editorial-advisory-board/>.



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## Keywords

Return forecasting, G7, commodities, transaction costs, forecast combinations.