# An Impressionistic View of the "Real" Price of Gold Around the World

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The "real" price of gold in the US is historically high, relative to its history as an actively tradable asset. But what about the real price of gold in other countries? It turns out that, in our impressionistic sample of 23 countries, the real price of gold is high everywhere. The real price of gold is high in "troubled" countries as well as in "safe" countries. If the real price of gold is a barometer of perceived troubles then there is trouble everywhere. Or, alternatively, gold is just expensive everywhere.

This research is motivated by our earlier paper, Erb and Harvey (2012), The Golden Dilemma, <a href="http://papers.ssrn.com/sol3/papers.cfm?abstract\_id=2078535">http://papers.ssrn.com/sol3/papers.cfm?abstract\_id=2078535</a>

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Historically, the "real" price of gold, the inflation-adjusted price of gold, has been predictive of future inflation-adjusted gold returns. <u>Erb and Harvey</u> (2012)<sup>1</sup> noted that in the United States, since 1975, when the real price of gold was above its historical average, future real returns were below average. Subject to many caveats, it is seems reasonable to ask if the real price of gold can be thought of as something like the "PE ratio" of the gold market. It may be a coruscatingly insightful question to ask, or it may be a horrible question to ask. But how can it hurt to ask? Investors in gold should determine for themselves if gold is like most other assets, where valuation matters, or if the price of gold is free of any valuation concerns. Just as the nominal and real yields of bonds differ from one country to another, and just as stock market price-earnings ratios differ from one country to country. The focus of our paper is to move beyond a US-centric vision of the real price of gold and to analyze how the real price of gold has behaved from the perspective of investors in different countries around the world.

By examining the real price of gold in 23 countries, it is possible to form an impressionistic sense of the answers to a few questions:

- Is the real price of gold historically high in some countries and historically low in others?
- Across countries, what does the historical price of gold look like when adjusted for inflation?
- Across countries, does the inflation adjusted price of gold have a trend?

There are close to 200 countries in the world, so examining 23 leaves most countries unexamined. The 23 countries are listed in Table 1. Cumulatively, these countries have a population of about 4.4 billion people, or about 62% of the total population of the world. The real price of gold is not directly observable. It must be estimated. We take the approach that it should be possible to describe a procedure in which anyone should be able to calculate the real price of gold. To do this we:

- i. Look at the price of gold in terms of a country's local currency
- ii. Where necessary we use "old" currencies such as the Deutsche mark, French franc and Italian lira<sup>2</sup>
  - iii. Divide the local currency gold price by that country's inflation index

<sup>&</sup>lt;sup>1</sup> Erb and Harvey (2012), The Golden Dilemma, at <u>http://papers.ssrn.com/sol3/papers.cfm?abstract\_id=2078535</u>

<sup>&</sup>lt;sup>2</sup> The exhibits use currency exchange rates provided by Bloomberg. Prior to the introduction of the euro, the national currency in Germany was the mark. At the time of the conversion of the mark to euros, Bloomberg uses the official conversion rate of 1.95583 marks per euro. This process makes it possible to maintain a history of Deutsche mark prices as well as other "old" currencies.

#### Table 1: Countries and Inflation and Currency Tickers

						Approximate
	Inflation		Currency		Index=	Population
Country	<u>Ticker</u>	<u>Name</u>	<u>Ticker</u>	<u>Name</u>	<u>100</u>	<u>(millions)</u>
1. US	CPLINDX	US CPI Urban Consumers SA	USD	US DOLLAR SPOT	Aug-83	311
2. Canada	CACPI	STCA Canada CPI NSA 2002=100	CAD	Canadian Dollar Spot	Jul-02	34
3. Mexico	2736639	IMF Mexico CPI	MXN	Mexican Peso Spot	Sep-05	117
4. Brazil	2236639	IMF Brazil CPI	BRL	Brazilian Real Spot	Jul-05	196
5. Argentina	2136639	IMF Argentina CPI	ARS	Argentine Peso Spot	Jul-05	41
6. UK	UKRPI	UK RPI All Items NSA	GBP	British Pound Spot	Jan-87	63
7. France	1326639	IMF France CPI	FRF	French Franc Spot	Aug-05	66
8. Germany	1346639	IMF Germany CPI	DEM	German Mark Spot	Jul-05	82
	GRCPI	West Germany CPI 1995=100	DEM	German Mark Spot	Jun-95	82
9. Switzerland	SZCPII	Switzerland CPI 2010 = 100	CHF	Swiss Franc Spot	Dec-10	8
10. Spain	1846639	IMF Spain CPI	ESP	Spanish Peseta Spot	May-05	47
11. Italy	1366639	IMF Italy CPI	ITL	Italian Lira Spot	Jul-05	61
12. Denmark	1286639	IMF Denmark CPI	DKK	Danish Krone Spot	Apr-05	6
13. Sweden	1446639	IMF Sweden CPI	SEK	Swedish Krona Spot	Jun-05	9
14. Russia	9226639	IMF Russia CPI	RUB	Russian Ruble Spot	Jun-05	142
15. Turkey	1866639	IMF Turkey CPI	TRL	Old Turkish Lira Spot	Aug-05	74
16. Egypt	4696639	IMF Egypt CPI	EGP	Egyptian Pound Spot	Jul-05	83
17. South Africa	1996639	IMF South Africa CPI	ZAR	S. African Rand Spot	Jul-05	51
18. India	5346639	IMF India CPI	INR	Indian Rupee Spot	Jul-05	1,241
19. China	ICPECHN	IMF China Inflation End of Per	CNY	China Renminbi Spot	Dec-95	1,344
20. Japan	1586639	IMF Japan CPI	JPY	Japanese Yen Spot	Apr-93	128
21. Indonesia	5366639	IMF Indonesia CPI	IDR	Indonesian Rupiah Spot	Oct-05	242
22. Australia	AUCPI	Australia CPI All Groups Goods	AUD	Australian Dollar Spot	Mar-90	23
23. New Zealand	1966639	IMF New Zealand CPI	NZD	New Zealand Dollar Spot	Sep-05	4

#### Data source: Bloomberg

Exhibits 1-46 present the results for the 23 countries. There are two exhibits for each of the countries. For instance, Exhibit 1 shows the real price of gold from the standpoint of a U.S. investor. Starting in January 1975, when gold futures contracts commenced trading on the COMEX, the "spot" price of gold is divided by the level of the U.S. Consumer Price Index (base year 1982-84=100). Using the U.S. Consumer Price Index is not an endorsement of the accuracy of the CPI. Nor is the use of any widely available inflation index for any country an endorsement of the accuracy of that inflation index. Exhibit 1 is simply an illustration of a process using widely available data.

As noted by <u>Erb and Harvey (2012)</u>, the real price of gold has fluctuated significantly. The real price of gold in the U.S. today is almost as high as its level in 1980. This is simply an observation. Exhibit 1 is a simple at-a-glance way to assess if real gold prices are historically high or low within a country. Exhibit 2 shows the actual, nominal, price of gold in U.S. dollars over time as well as the inflation-adjusted price of gold. The inflation adjusted price of gold simply multiplies today's nominal gold price by the magnitude of inflation between today and some point in the past. As a result, the inflation adjusted price of gold and the nominal price of gold converge at the end of the sample. Note that the nominal price of gold has risen substantially over time. The inflation-adjusted price of gold does not have a trend, though it is volatile.

Exhibits 3-46 provide a tour of the real price of gold in the other 22 countries, starting with the Americas, moving to Europe and then on to Asia.

Given the number of local currency units per ounce of gold varies across countries and "base dates" vary across countries (the date when an inflation index is set to a value of 100), these real price ratios are not directly comparable across countries. It is, of course, possible to compare the real price of gold at different points of time within a country. Though the level of the real price of gold across countries is not comparable, it is possible to examine all 23 countries to ascertain if the real price is historically high, relative to each country's own history, across countries or if the real price of gold is historically high in some countries and historically low in others.

Our analysis shows that the real price of gold is historically high in all 23 countries.<sup>3</sup> It is possible that the high real prices of gold are more apparent than real.

One of the reasons suggested for investing in gold is a belief that the interests of those who govern and those who are governed are not aligned. For instance, it has been asserted that actual inflation in Argentina is much higher than reported inflation<sup>4</sup>. In a world in which informed investors and consumers could detect the difference between real and reported inflation, underreporting the "official" level of inflation could result in what seems to be a high real price of gold relative to under reported inflation (but not relative to "real" inflation). The challenge is in the interpretation. It is possible that the real price of gold is high across all 23 countries and that inflation is broadly correctly reported across all 23 countries. Or it is possible that the high real price of gold across the 23 countries is a sign that informed investors have seen through the efforts of 23 sovereign states to under-report inflation.

The nominal gold price and inflation adjusted gold price charts for the various countries seem to echo the experience of the US. Nominal prices have risen over time and inflation adjusted prices seem to be trendless, though volatile.

It is important to recognize that even though the estimated value of all the gold that is thought to exist in the world is about \$10 trillion, very little of that gold trades in any year<sup>5</sup>. The fact that gold is a large market with relatively little liquidity was alluded to by investor Ray Dalio (2012) who recently remarked that "...the capacity of moving money into gold in a large number is extremely limited....the players in the world...that move that money....really don't view gold as an effective alternative.....but it could be a barometer...and it is an alternative for smaller amounts of money". Gold may be a barometer, but a barometer of what? Is the high real price of gold a barometer of the ability of investors to "see though" inaccurate official inflation reports? Or is the high real price of gold a barometer of irrational pessimism?

<sup>&</sup>lt;sup>3</sup> One concern is that our sample is relatively short only beginning with the advent of gold futures trading in 1975. In unpublished work, we use a time series of the real price of gold from Measuringworth.com that spans 1257-2012. We find a significant negative relation between current real gold prices and both future 10-year and 100year real gold returns.

<sup>&</sup>lt;sup>4</sup> For instance see David Schweimler (2011), "<u>Argentina's inflation rate: High, but just how high?"</u>

<sup>&</sup>lt;sup>5</sup> In "<u>Clash of the Cultures</u>", investor John Bogle observes that U.S. stock market turnover is greater than 200% a year. The effective "free float" of the gold market is small compared to most equity and fixed income markets.

Take a look at Table 1. Using one's own assessment of how the future might unfold, classify each of the countries as "troubled" or "safe". Many will classify the U.S. as a "troubled" country and Switzerland as a "safe" country. Exhibit 1 shows that the real price of gold is historically high in the U.S. From a U.S. perspective, it is possible to assert that the real price of gold is high because the US is a "troubled" country with many perceived financial problems. And as a result, even if the real price of gold is high, gold may seem to offer investors in the U.S. a way to possibly deal with a "troubled" and possibly inflationary future. Exhibit 17 shows that the real price of gold is historically high in Switzerland. In fact, the progression over time of the real price of gold in Switzerland looks much like the progression over time of the real price of gold in the U.S. If a high real gold price in the U.S. makes sense to some because of the problems the U.S. faces, is it really possible that the real price of gold is high in Switzerland because of the many troubling financial problems facing Switzerland? Switzerland is supposed to be free of many of the financial ills that plague the U.S. In fact it is possible to ask which is preferable: a cache of gold or a cache of Swiss francs in a Swiss account.<sup>6</sup> Hopefully Exhibits 1-46 will assist investors in individually solving what Erb and Harvey (2012) referred to as the "Golden Dilemma".

The real price of gold is high in the United States. The real price of gold is high in at least 22 other countries. If the real price of gold is a useful long-run valuation metric, then it is most likely useful in thinking about long-horizon rather than short-term real gold returns. A casual, visual inspection of Exhibits 1-46 suggests that, in the past, the real price of gold mean reverted<sup>7</sup> over a roughly decade long time span. A high real price of gold suggests the possibility of a long-term real return headwind, not a portent of an imminent crash. There is no shortage of examples of expensive asset markets becoming even more expensive. For instance, on December 6, 1996 former Federal Reserve Board chairman Alan Greenspan referred to an "irrational exuberance" which "unduly escalated" the value of the U.S. stock market. Yet the US stock market continued to rally through early 2000. Could the nominal and real prices of gold continue to rise to levels not seen before? Of course.

The American philosopher and essayist George Santayana once suggested that historical curiosity might have some value:

"Those who cannot remember the past are condemned to repeat it".

The American journalist H.L. Mencken once supposedly<sup>8</sup> commented:

"For every complex problem there is an answer that is clear, simple and wrong".

Valuation is a complex problem. If valuation matters for gold, then remembering the past is a way to attempt to avoid future missteps.

<sup>&</sup>lt;sup>6</sup> There is disagreement. For example, in a <u>recent interview</u>, Zug Switzerland-based investor Felix Zulauf opined that the "...fiat currency, paper currency standard, is in the final stage of a super cycle". Seeing the very real possibility of a systemic failure of the global banking system, Zulauf advocates owning physical gold.

<sup>&</sup>lt;sup>7</sup> Mean reversion in a historical sample is easy to estimate precisely, after the fact. How mean reversion will play out in the future is a guess.

<sup>&</sup>lt;sup>8</sup> The original quote (slightly different from the above) is in Mencken (1917).

#### References

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Exhibit 1: USA, The Real Price of Gold



Data source: Bloomberg, IMF. U.S. CPI Urban Consumers, SA. Index=100 in August 1983. Local currency is the U.S. dollar.

Exhibit 2: USA, Actual and Inflation Adjusted Gold Price



Data source: Bloomberg, IMF. U.S. CPI Urban Consumers, SA. Index rescaled=1.0 in August 2012. Local currency is the U.S. dollar.

Exhibit 3: Canada, The Real Price of Gold



Data source: Bloomberg, IMF. Statistics Canada, CPI NSA. Index=100 in July 2002. Local currency is the Canadian dollar.





Data source: Bloomberg, IMF. Statistics Canada, CPI NSA. Index rescaled=1.0 in August 2012. Local currency is the Canadian dollar.

Exhibit 5: Mexico, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Mexico CPI. Index=100 in September 2005. Local currency is the Mexican Peso.





Data source: Bloomberg, IMF. IMF Mexico CPI. Index rescaled=1.0 in August 2012. Local currency is the Mexican Peso.

Exhibit 7: Brazil, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Brazil CPI. Index=100 in July 2005. Local currency is the Brazilian Real.





Data source: Bloomberg, IMF. IMF Brazil CPI. Index rescaled=1.0 in August 2012. Local currency is the Brazilian Real.



Exhibit 9: Argentina, The Real Price of Gold

Data source: Bloomberg, IMF. IMF Argentina CPI. Index=100 in July 2005. Local currency is the Argentinian Peso.

## Exhibit 10: Argentina, Actual and Inflation Adjusted Gold Price



Data source: Bloomberg, IMF. IMF Argentina CPI. Index rescaled=1.0 in August 2012. Local currency is the Argentinian Peso.





Data source: Bloomberg, IMF. UK RPI All Items, NSA. Index=100 in January 1987. Local currency is the British Pound.





Data source: Bloomberg, IMF. UK RPI All Items, NSA. Index rescaled=1.0 in August 2012. Local currency is the British Pound.

Exhibit 13: France, The Real Price of Gold



Data source: Bloomberg, IMF. IMF France CPI. Index=100 in August 2005. Local currency is the French Franc, 6.55958 for 1 Euro.



## Exhibit 14: France, Actual and Inflation Adjusted Gold Price

Data source: Bloomberg, IMF. IMF France CPI. Index rescaled=1.0 in August 2012. Local currency is the French Franc, 6.55958 for 1 Euro.

Exhibit 15: Germany, The Real Price of Gold



Data source: Bloomberg, IMF. West Germany CPI Index rescaled to splice with IMF Germany CPI. CPI Index=100 in July 2005. Local currency is the German Mark, 1.95583 for 1 Euro.



# Exhibit 16: Germany, Actual and Inflation Adjusted Gold Price

Data source: Bloomberg, IMF. West Germany CPI Index rescaled to splice with IMF Germany CPI. Index rescaled=1.0 in August 2012. Local currency is the German Mark, 1.95583 for 1 Euro.

Exhibit 17: Switzerland, The Real Price of Gold



Data source: Bloomberg, IMF. Swiss CPI. Index=100 in December 2010. Local currency is the Swiss Franc.





Data source: Bloomberg, IMF. Swiss CPI. Index rescaled=1.0 in August 2012. Local currency is the Swiss Franc.

Exhibit 19: Spain, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Spain CPI. Index=100 in May 2005. Local currency is the Spanish Peseta, 166.386 for 1 Euro.



#### Exhibit 20: Spain, Actual and Inflation Adjusted Gold Price

Data source: Bloomberg, IMF. IMF Spain CPI. Index rescaled=1.0 in August 2012. Local currency is the Spanish Peseta, 166.386 for 1 Euro.

Exhibit 21: Italy, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Italy CPI. Index=100 in July 2005. Local currency is the Italian Lira 1936.27 for 1 Euro.

#### Exhibit 22: Italy, Actual and Inflation Adjusted Gold Price



Data source: Bloomberg, IMF. IMF Italy CPI. Index rescaled=1.0 in August 2012. Local currency is the Italian Lira 1936.27 for 1 Euro.



Exhibit 23: Denmark, The Real Price of Gold

Data source: Bloomberg, IMF. IMF Denmark CPI. Index=100 in April 2005. Local currency is the Danish Krone.





Data source: Bloomberg, IMF. IMF Denmark CPI. Index rescaled=1.0 in August 2012. Local currency is the Danish Krone.

Exhibit 25: Sweden, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Sweden CPI. Index=100 in June 2005. Local currency is the Swedish Krona.





Data source: Bloomberg, IMF. IMF Sweden CPI . Index rescaled=1.0 in August 2012. Local currency is the Swedish Krona.

Exhibit 27: Russia, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Russia CPI. Index=100 in June 2005. Local currency is the Russian Ruble.

## Exhibit 28: Russia, Actual and Inflation Adjusted Gold Price



Data source: Bloomberg, IMF. IMF Russia CPI. Index rescaled=1.0 in August 2012. Local currency is the Russian Ruble.



#### Exhibit 29: Turkey, The Real Price of Gold

Data source: Bloomberg, IMF. IMF Turkey CPI. Index=100 in August 2005. Local currency is the old Turkish Lira.



#### Exhibit 30: Turkey, Actual and Inflation Adjusted Gold Price

Data source: Bloomberg, IMF. IMF Turkey CPI . Index rescaled=1.0 in August 2012. Local currency is the old Turkish Lira.

Exhibit 31: Egypt, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Egypt CPI. Index=100 in July 2005. Local currency is the Egyptian Pound.





Data source: Bloomberg, IMF. IMF Egypt CPI. Index rescaled=1.0 in August 2012. Local currency is the Egyptian Pound.



Exhibit 33: South Africa, The Real Price of Gold

Data source: Bloomberg, IMF. IMF South Africa CPI. Index=100 in July 2005. Local currency is the South African Rand.





Data source: Bloomberg, IMF. IMF South Africa CPI. Index rescaled=1.0 in August 2012. Local currency is the South African Rand.

Exhibit 35: India, The Real Price of Gold



Data source: Bloomberg, IMF. IMF India CPI. Index=100 in July 2005. Local currency is the Indian Rupee.

## Exhibit 36: India, Actual and Inflation Adjusted Gold Price



Data source: Bloomberg, IMF. IMF India CPI. Index rescaled=1.0 in August 2012. Local currency is the Indian Rupee.

Exhibit 37: China, The Real Price of Gold



Data source: Bloomberg, IMF. IMF China CPI. Index=100 in December 1995. Local currency is the Chinese Renminbi.

#### Exhibit 38: China, Actual and Inflation Adjusted Gold Price



Data source: Bloomberg, IMF. IMF China CPI. Index rescaled=1.0 in August 2012. Local currency is the Chinese Renminbi.

Exhibit 39: Japan, The Real Price of Gold



Data source: Bloomberg, IMF. IMF Japan CPI. Index=100 in April 1993. Local currency is the Japanese Yen.





Data source: Bloomberg, IMF. IMF Japan CPI. Index rescaled=1.0 in August 2012. Local currency is the Japanese Yen.



Exhibit 41: Indonesia, The Real Price of Gold

Data source: Bloomberg, IMF. IMF Indonesia CPI. Index=100 in October 2005. Local currency is the Indonesian Rupiah.



#### Exhibit 42: Indonesia, Actual and Inflation Adjusted Gold Price

Data source: Bloomberg, IMF. I IMF Indonesia CPI . Index rescaled=1.0 in August 2012. Local currency is the Indonesian Rupiah.

Exhibit 43: Australia, The Real Price of Gold



Data source: Bloomberg, IMF. Australia CPI All Groups Goods. Index=100 in March 1990. Local currency is the Australian Dollar.





Data source: Bloomberg, IMF. Australia CPI All Groups Goods. Index rescaled=1.0 in August 2012. Local currency is the Australian Dollar.



Exhibit 45: New Zealand, The Real Price of Gold

Data source: Bloomberg, IMF. IMF New Zealand CPI Index=100 in September 2005. Local currency is the New Zealand Dollar.



Exhibit 46: New Zealand, Actual and Inflation Adjusted Gold Price

Data source: Bloomberg, IMF. IMF New Zealand CPI. Index rescaled=1.0 in August 2012. Local currency is the New Zealand Dollar.