The gold-to-silver ratio

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Abstract

In this paper, I describe the gold-to-silver ratio.
The paper ends with "The End"

Introduction

Gold and **silver** have been in use as both **reserves** and for **coinage** since antiquity.
As of this writing, the price of silver has been **volatile**, but the price of gold has been **less** volatile than silver, thereby making silver the metal of choice for coinage and gold the metal of choice for reserves.
In this paper, I describe the gold-to-silver ratio.

The gold-to-silver ratio

The gold-to-silver ratio is given by the following two (2) (II) equations:

$$P_{Au}(t) = \rho P_{Ag}(t) + \alpha(t)$$

$$P_{Au}(t_2) - P_{Au}(t_1) = \rho(P_{Ag}(t_2) - P_{Ag}(t_1)) + \beta(t_2, t_1)$$

where

$P_{Au}(t)$ is the price of 1 gram of gold at time t
$P_{Ag}(t)$ is the price of 1 gram of silver at time t
$t_2 > t_1$ are any two points in time
ρ is **the gold-to-silver ratio**
$\alpha(t)$ is the **residual of the gold-to-silver ratio** at time t
$\beta(t_2, t_1)$ is the **residual of the historical gold-to-silver ratio** between time t_2 and t_1

Correct pricing of gold and silver

When $\alpha(t) = 0$, we have **correct pricing** of **both** gold and silver at time t.
When $\beta(t_2, t_1) = 0$, we have **correct historical pricing** of **both** gold and silver at times t_2 and t_1.

The End