

The Interest-Rate Outlook

How much gold it takes to immunize a bond portfolio against inflation

Although there is very little perception of it on Wall Street, our indicators are flashing a definite inflation warning. Gold is up 25 % in the last twelve months, and the dollar continues to slide. If, as we expect, inflation accelerates over the next few years, plan sponsors will be scrambling to find investment instruments with which they can immunize their portfolios from its pernicious effects.

One candidate is a bond with principal and coupons that escalates with inflation. In past publications we explored the ability of the U.S. version of such bonds, Treasury Inflation Protected securities (TIPs), to act as an inflation hedge. Research conducted using data on British index-linked gilts suggested that these instruments, while providing protection from the inroads of inflation on their own returns, show no ability to extend that protection to the other assets in a portfolio.¹ In any case, the total quantity of index-linked bonds issued to date by the U.S. Treasury in the form of TIPs is only a small fraction of the assets that the plan-sponsor industry would need to protect the fixed-income portion of their portfolios.

What we did find was that gold held as an asset is far more sensitive to inflation than indexed debt. In fact, the power of gold to immunize a portfolio against loss in an inflationary environment is several times greater—so great, in fact, that it can easily offset the losses that bonds regularly sustain during such periods.

In this report:

we calculate how much gold to include in a bond portfolio to protect it from capital loss due to an acceleration of CPI inflation.

The relationship between consumer prices and bonds and gold.

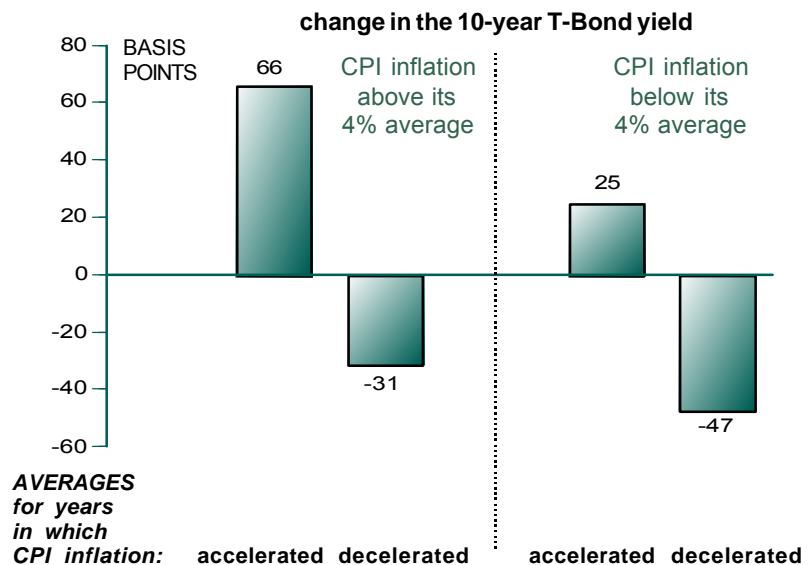
Investors are well aware of the harm that inflation does to bond-market

performance, but the exact nature of the relationship is less clearly understood. Our analysis of the historical data shows that *accelerations in the inflation rate do more damage to the bond market than inflation per se*. The bar chart in Figure One illustrates this point. It compares the results of a change in CPI inflation when inflation is above and below its historical average.

Least-squares analysis confirms the impression derived from Figure One. We estimate that, point for point,

Figure One

**It's Not So Much the Rate of Inflation Itself that Kills Bonds—
It's Mainly the Rate at Which Inflation Accelerates
1955 to date**



Data: Calendar-year averages of the monthly price index for all urban consumers (Bureau of Labor Statistics) and daily yields on ten-year Treasury bonds (Federal Reserve Board).

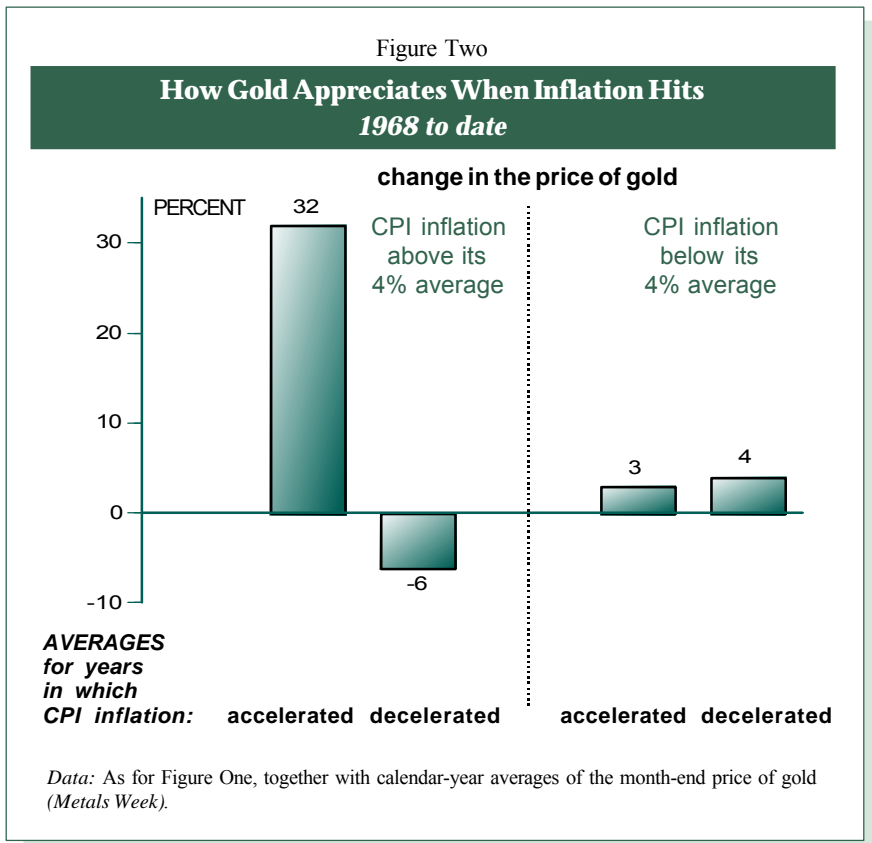
1. "How best to immunize a portfolio against inflation: TIPs or gold?" *The Interest-Rate Outlook*, H.C. Wainwright & Co., Economics Inc., June 29, 2001.

the bond market is several times more sensitive to *accelerations* in CPI inflation than to the inflation rate itself. Our interpretation is straightforward: most of the impact of inflation is felt by markets before it shows up in the CPI and therefore should already be “in the price” of bonds. If inflation merely continues at the same rate, there is little further damage. Increases and declines in the inflation rate trend, however, are not identified until after the fact and thus cannot be already in the price. In other words, it is the “inflation surprise” rather than continuation of the inflation trend that packs most of the punch.

Least-squares calculations show that an increase of one percentage point in the CPI inflation rate from one year to the next produces a 2.8 % pts. reduction in the annual return from ten-year Treasuries. But on average the difference in annual bond returns when inflation is (say) 5 % as opposed to 6 % is only 0.5 % pts.

The good news is that at the same time that accelerating inflation reduces the return on a bond portfolio, it *increases* the return on holding gold (although, as we explain later, the timing is not quite the same). Figure Two illustrates how the price appreciation of a gold investment is related to changes in the CPI inflation rate. It also shows that gold is much more sensitive to these changes when inflation is above average.

The power of gold in a bond portfolio. According to least-squares analysis, a one percentage-point acceleration of the CPI inflation rate results in an 8.8 % pts. increase in the return from owning gold. That is several times greater than the 2.8 % pts. negative effect of the same inflation change on the return from bonds. The ratio between 8.8 and 2.8 is 3.1 to 1. This provides a rough estimate of what portfolio mix of gold and bonds would provide immunization to a CPI inflation



“surprise”: namely, 24 % gold and 76 % bonds.

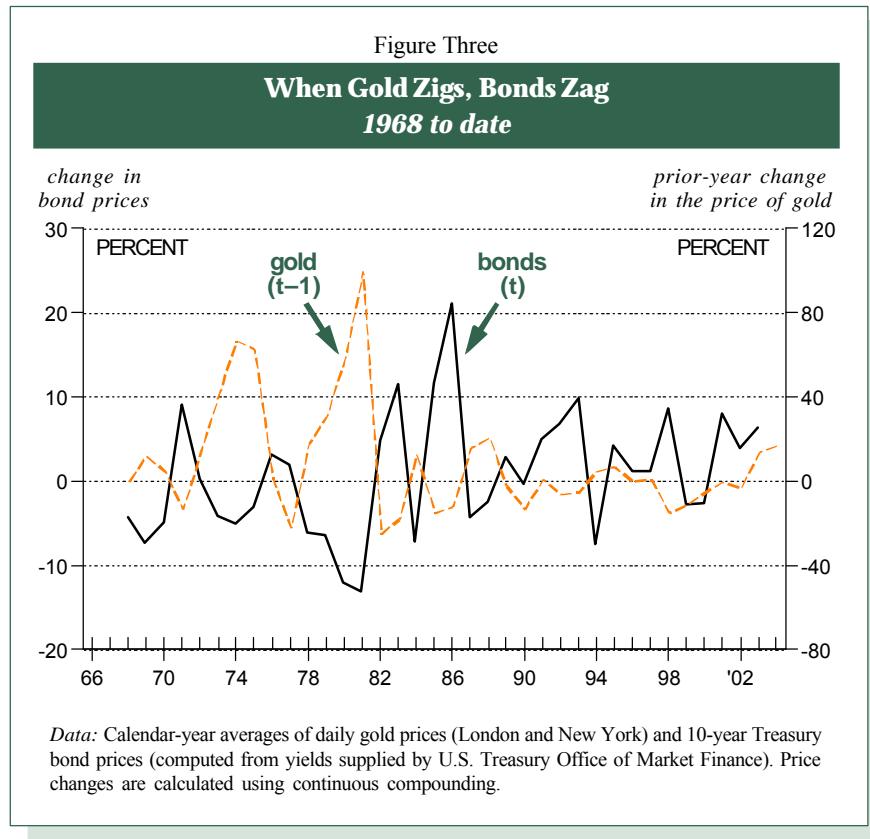
But this estimate does not adequately reflect the necessary gold content of a portfolio, because it takes into account only the contemporaneous relationships between CPI movements and returns from the two assets. It ignores the significant additional immunizing power that arises from the fact that movements in the gold price reflect changes in inflation much quicker than bonds—so much so that gold moves ahead of the bond market by a full year. *Wainwright* identified the direct relationship between gold and bonds, illustrated in Figure Three, more than fifteen years ago and found that it is very strong statistically.

Failure to allow for this difference in timing would result in a significant understatement of the immunizing power of gold. In order to take it into account it is necessary to recalculate

the impact of inflation changes by looking at the returns from gold and bonds in consecutive years rather than in the same year. In other words, when expressing the return each year on the portfolio, the bond portion is marked immediately to market, but the gold portion is priced as it was one year in the past.

When calculated on this basis, the ratio between the increase in the return on gold and the decrease in the return on bonds climbs to 4.7 to 1. Based on this ratio, we calculate that a portfolio consisting of 18 percent gold and 82 percent bonds would be insensitive to a change in the CPI inflation rate.

Figure Four illustrates this result by simulating a set of portfolios consisting of various mixtures of gold and bonds, allowing for the one-year difference in timing. In each case we use least-squares analysis to estimate the effect of a one percentage-point



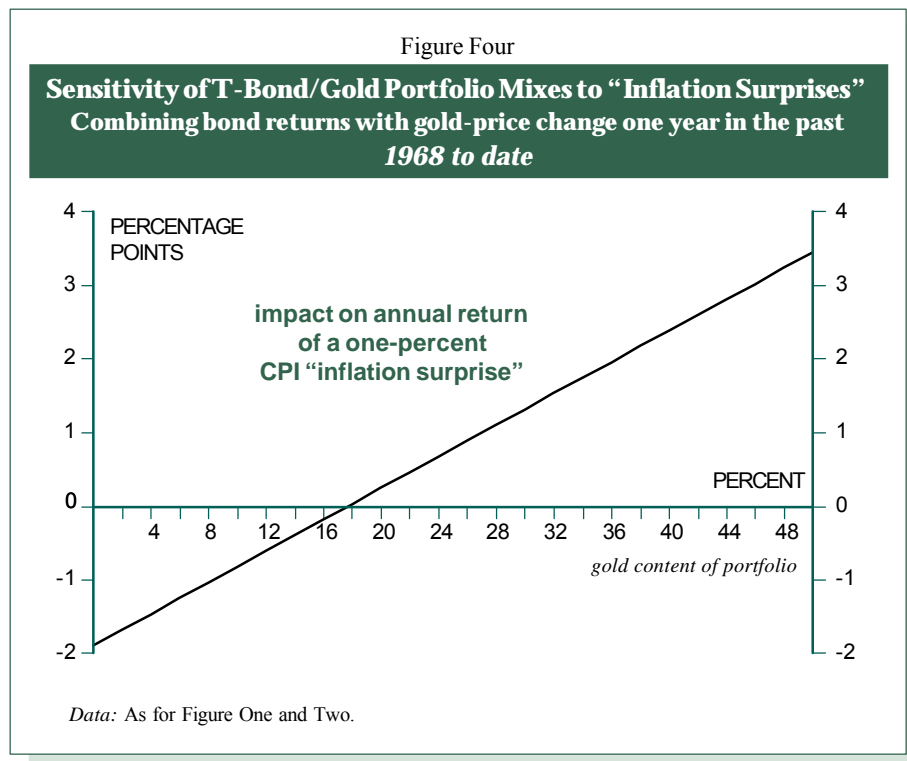
But there are a couple of important caveats. First, the correlation between gold prices and T-bond prices is very close, but gold leads bonds by a year. In order to take full advantage of the immunizing properties of gold, the investor must have invested in gold a year before inflation shows up in the CPI data. Second, holding gold in a portfolio as inflation decelerates would be damaging, because the price of gold is leveraged on the downside as well as the upside.

Still, given our confidence that the U.S. has now entered a period of rising inflation, the time is right for investors to consider including gold in some form in their portfolios. This will minimize the damage that increased inflation is sure to do to their bond returns. Complete protection implies a portfolio mix of 18 percent gold and 82 percent bonds. The introduction of any percentage of gold, however, can do nothing but help.

acceleration in CPI inflation on portfolio return.

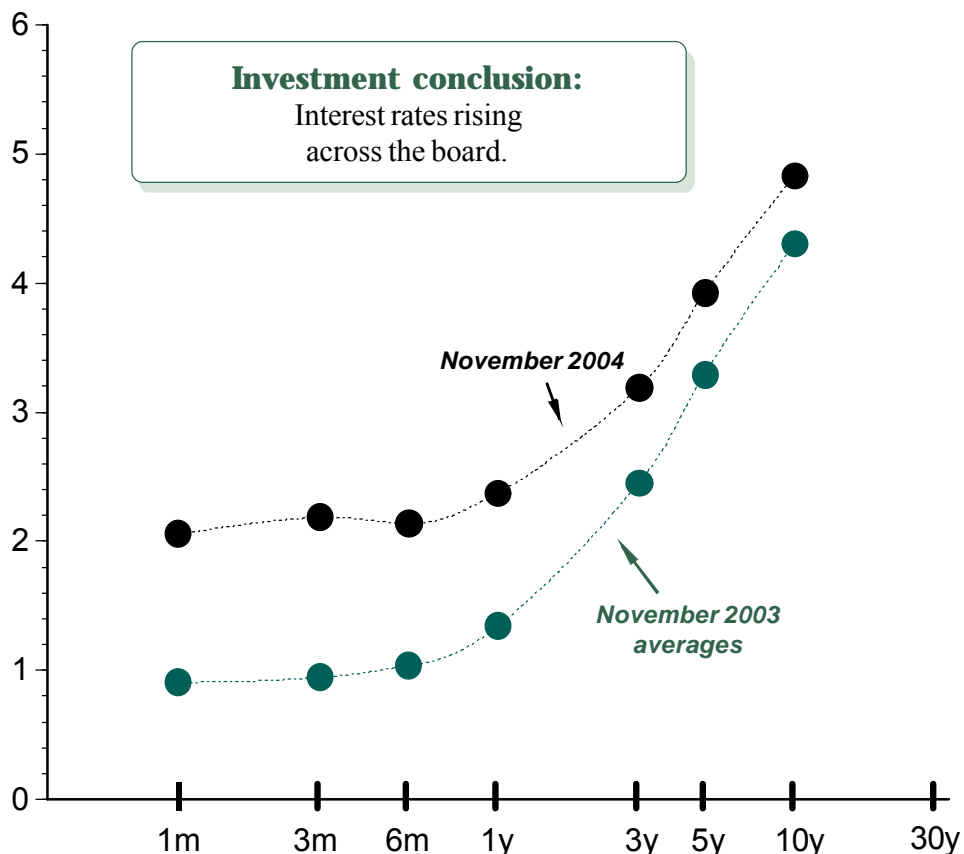
Figure Four shows clearly where the balance lies between the boost to gold and the damage to T-bonds. It is easy to visualize that a 18:82 mix of gold and ten-year T-bonds would produce returns that are immune to changes in CPI inflation.

Investment conclusion. T-bond prices tend to fall prey to accelerations in the rate of inflation as measured by the consumer price index. But the price of gold is several times more sensitive on the upside. Thus including gold in a bond portfolio is an effective way to immunize portfolio returns against rising inflation.



The U.S. Treasury Yield Curve

“Market forecasts” of change 12 months ahead



maturity	bond-equivalent yield		confidence		forecast price change	income	forecast total return
	11/03 yield	forecast change	increase	decline			
10 years	4.30%	53 b.p.	76%	n.a.	-4.1%	4.3%	0.1%
5	3.29	63	76		-2.9	3.3	0.4
3	2.45	74	76		-2.1	2.4	0.4
1	1.34	103	78		-1.0	1.3	0.3
6 months	1.04	110	78		1.6	0	1.6
3	0.95	124	80		1.6	0	1.6
1	0.91	114	78		1.5	0	1.5
overnight*	1.02	169	83				

*federal funds

Note: 30-year bond yield data no longer available from the Fed.

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