

# **Tactical Asset Allocation to Gold**

Ryan Daly<sup>\*</sup>  
May 2005

## **ABSTRACT**

This paper finds a strong correlation between deviations in the once widely popular Fed model to the price of gold. A simple tactical asset allocation strategy can be implemented. Empirical test of the model show the implicit timing signals to be statistically significant. The degree of accuracy, including the month gold peaked in 1980, can be an extremely valuable asset for portfolio managers looking for positive alphas. Of course, building an investment theory based on one component (Fed model) can be perilous; this paper will also look at the DJIA to gold ratio as a relative value assessment.

---

<sup>\*</sup> The author is currently enrolled in the evening MBA program, University at Albany SUNY, and is a Client Analyst employed at AYCO/Goldman Sachs. Comments are encouraged. Phone: 518-505-4855. Email: RDALY62@NYCAP.RR.COM

## Introduction

The quest for the “holy grail” of portfolio management, alpha, has been the new mantra of the investment industry. As such, the pursuit has resulted in aggressive, over leveraged portfolios adding significant risk and volatility. The term alpha has been commoditized by the investment industry and often the lines between risk-adjusted and valued added returns have been distorted. The key challenge for portfolio managers is to be careful in balancing alpha maximization and risk control. Historically, portfolio managers have invested primarily in traditional financial assets such as stocks and bonds. However, most recently, this search for alpha has lead managers to contemporary asset classes such as real estate, hedge funds, and commodities. In this research I ask the question, can gold add alpha?

Gold has long been viewed as a useful diversification tool for equity investors due to its low or negative correlation with most investment classes. Ciner (2001) showed how gold holdings lead to a more balanced portfolio by reducing volatility. Gold has also been a great inflation hedge. Davidson, Faff and Hillier (2003) showed empirically how gold can be an efficient hedge against inflation. The quandary is when to invest in gold. By the time inflation is noticed in the market place gold has already substantially increased in price. This study will look at use of the Fed model to time such a move.

The Fed model, popularized by Dr. Ed Yardeni<sup>1</sup>, is believed by many economists to mimic calculations that the Federal Reserve relies on to assess the health of the markets and thus the broad economy as a whole. This study examines the empirical benefits of adding gold in an asset allocation model that uses the Fed model. Market signals, derived

---

<sup>1</sup> Dr. Yardeni derived the Fed model from a paragraph of a Federal Reserve report to Congress in 1997. The Fed has never officially endorsed the model.

from the Fed model, are shown to give accurate signals about when to invest in gold. The main take away of this model is its predictive and value added power. However it's imperative to understand "why" the Fed model gives accurate timing signals for gold. Some answers may be the results of the implied readings of inflation within the Fed model.

The influence of inflation on the market continues to be a mystery within the investment community. Modigliani and Cohn (1979) illustrated a behavioral model that predicted mis-pricing of stocks in the presence of inflation. The study suggests investors may irrationally discount real cash flows using nominal rates, which would lead to valuation errors. An analysis of stock returns by Barnes, Boyd and Smith (1999) conclude that expected inflation predicts low stock returns. This is consistent with the views of this paper, as expected inflation enters the market place a redistribution of wealth and flight to gold emerges in response to fears of negative real and nominal returns in the stock and bond markets. Through the Fed model association we can determine undervalued readings, due to expected inflation, which can be used to signal a move to gold. In fact, Faugere and Van Erlich (2005) developed theoretical and empirical linkages between gold price and broader equity valuations demonstrating that the timing signals found in this study may not be coincidental.

This paper is outlined as follows: Section 1 will take a look at gold's historical returns. Section 2 will study the value added benefits of holding gold in a portfolio. Section 3 and 4 will highlight the Fed model and its tactical benefits in portfolio management. Lastly, section 5 will analyze the Dow/Gold ratio.

## GOLD

In the long run, gold has been very effective for preserving purchasing power. Studies have shown that one ounce of gold has bought about 400 loaves of bread for the last 3,000 years. Gold has been held throughout history as a form of protection against inflation and uncertainties such as war, political unrest, and financial dilemmas. As an investment class gold has been highly speculative. Returns have been exceedingly variable, and for the most part, investment managers have been unable to add gold within an optimal asset allocation. Historically, investing in gold has had excess returns similar to equities. What has also been widely noted by academics is gold's low to negative correlation to the market and thus beta. Accordingly, gold acts as a great diversifier for managers looking to decrease risk and protect a portfolio in times of uncertainty. Table 1 presents the performance results of gold from 1968 to today.

**TABLE 1**

<b>1/1968 - 7/2004</b>	<b>S&amp;P market return</b>	<b>DJIA return</b>	<b>GOLD return</b>
Average return (annual)	1.75%	1.72%	2.67%
Standard deviation (annual)	15.53%	15.65%	21.43%
Correlation with mkt	1.00	0.95	-0.01
R-square	1.00	0.90	0.00
Slope (beta)	1.00	0.96	-0.01
Sharpe Ratio	0.11	0.11	0.12
Alpha	0.00	0.00	0.03

\* Returns in excess of risk free rate

However, since 1979, just prior to the all time high, gold has performed poorly.

**TABLE 2**

<b>1/1979 - 7/2004</b>	<b>S&amp;P market return</b>	<b>DJIA return</b>	<b>GOLD return</b>
Average return (annual)	4.5%	4.9%	-2.4%
Standard deviation (annual)	15.4%	15.5%	19.0%
Correlation with market return, r	1.00	0.94	0.04
R-square	1.00	0.89	0.00
Slope (beta)	1.00	0.95	0.05
Sharpe Ratio	0.29	0.32	-0.12
Alpha	0.00	0.01	-0.03

\* Returns in excess of risk free rate

Going back to 1968, when gold began trading, the returns outpaced the equity market as measured by the S&P 500 and Dow Jones Industrial Average (DJIA). Conversely, the returns from 1979 to 2004 would have produced a negative average annual return. The reason for the negative returns is that gold quickly advanced from \$35 an ounce in 1968 to close over \$800 in 1980. Since 1980 gold has been in a steady decline and the highs have yet to be surpassed. The 25-year bear market in the price of gold has left portfolio managers no choice but to ignore gold as an asset class. Gold's dismal performance the past 25 years combined with no interest or income payments makes the pitch for gold a tough sell.

### **Value-added look**

Gold can play an important role as a diversifier due to its low or negative correlation to other asset classes. This highlights the important role gold may play in the asset allocation mix as it protects the portfolio from undesirable moves in the equity market. Indeed, Sherman (1982) illustrated that an allocation of 5% to 10% holding in gold can lower volatility and improve returns. However, Sherman's study was conducted in 1982. An analysis of the value added benefits today do not produce similar results. The results on the next page are produced from adding 10% and 20% gold to the S&P500 without rebalancing. Over the last 10 to 30 years adding gold to a portfolio did not generate alpha. As seen from table 3, although risk and volatility are reduced, returns are not enhanced and the value-added benefits of gold are not produced.

TABLE 3

	Last 30 years			Last 20 years			Last 10 years		
	S&P market return	90% S&P 10% Gold	80% S&P 20% Gold	S&P market return	90% S&P 10% Gold	80% S&P 20% Gold	S&P market return	90% S&P 10% Gold	80% S&P 20% Gold
Average return (annual)	4.6%	4.0%	3.4%	6.4%	5.5%	4.6%	7.2%	6.3%	5.4%
Standard deviation (annual)	15.2%	13.8%	12.8%	15.4%	13.7%	12.1%	15.5%	14.0%	12.6%
Correlation with market return, r	1.00	0.99	0.95	1.00	0.99	0.97	1.00	0.99	0.98
R-square	1.00	0.97	0.90	1.00	0.99	0.95	1.00	0.99	0.95
Slope (beta)	1.00	0.90	0.80	1.00	0.88	0.77	1.00	0.89	0.79
Sharp Ratio	0.30	0.29	0.26	0.42	0.40	0.38	0.46	0.45	0.43
Alpha	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\* Returns in excess of risk free rate

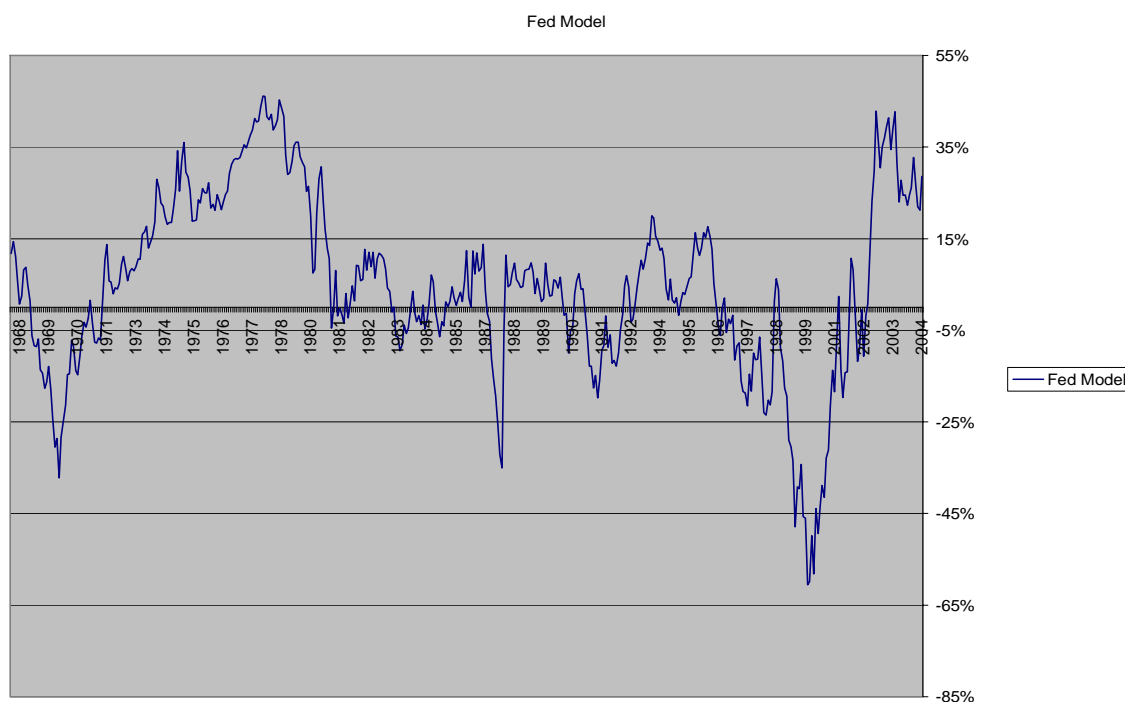
A challenge for analysts trying to evaluate gold is that most portfolio modeling techniques require a discount cash flow analysis. Various studies have concluded that gold is under priced. A plethora of arguments can be found including comparisons between oil, money supply (M3), US dollar, deficits, supply and demand, etc. Although each argument has its own merit, finding a reliable indicator to time such a move into gold is hard-pressed. This study believes the use of the Fed model can accurately predict when to invest in gold as investors begin to exit both stocks and bonds.

### Fed Model

The Fed model illustrates a relationship between stocks and bonds to judge whether the U.S. stock market is fairly valued. The Fed model compares the stock's forward earnings yield (E/P), to the yield on 10-year government bond. Historically, there has been a strong correlation between the S&P 500 earnings yield and the 10-year Treasury note.

The theory is that, if the forward earnings yield (inverse of P/E) of the S&P 500 is higher than the 10-yr, stocks are undervalued and vice versa. The idea is that stocks and bonds are competing assets and stocks are fairly valued when the two are equal. Use of the Fed model formula produces a “fair value” reading. Taking this fair value number and subtracting it from the current S&P500 price generates overvalued and undervalued signals. A graph, plotting the deviations is shown below:

**Exhibit 1**



Historical analysts estimates for the subsequent year date back to 1978. In order to back test the Fed model prior to 1978 this study does not use actual earnings. Instead, the year ahead reported earnings are used. For example, the January 1969 reported earnings are used as a “consensus estimate” for January 1968 in the calculation. This method best fits the true Fed model calculation.

The negative readings such as in 1987 (prior to the crash) and 1999 (Internet bubble) indicate an overvalued market and vice versa. The model is accurate at showing that the S&P500 was undervalued during periods of high-expected inflation (such as the 1970s

and early 1980s) and overvalued during periods of low expected inflation (such as the late 1990s and early 2000).

There are a variety of rebuttals to the Fed model, including market pundits Asness (2003) and Riter and Warr (2002) who conclude that comparing a real valuation number like earnings yield (inverse of P/E ratio) to a nominal bond yield is theoretically flawed.<sup>2</sup> Although this is true from an efficient stock market theory, the Fed model may accurately show the behavior of irrational investors.

### **Tactical Study**

The Fed model is rational due to the resulting flow of funds between stocks and bonds. This paper believes there is a redistribution of wealth to a third constituent of the model, which is gold during inflationary or expected inflationary time periods. Faugere and Van Erlach (2005) noted the linkages that if inflation expectations push up bond yields, then through the Fed model the E/P must rise, thus pushing the P/E of the market down. With gold having a strong negative correlation to equity valuations (PE) then gold prices will rise along with E/P, bond yields and inflation. However, it has already been noted that gold rises with inflation, the conundrum is identifying when to enter and exit. This paper takes the above relationship a step further to identify enter and exit points. For the model

---

<sup>2</sup> Although beyond the realm of this paper, the two aforementioned practitioners have seemed to build a case around the simplicity of the Fed model. Although they do not disagree with the results post 1970s their studies extend to the long term. They seem perplexed by the disconnect of the earnings yield and nominal bond yields prior to the 1970s and thus conclude the long-term results prove the model spurious. However, their studies do not look at the Fed's management or the markets view of interest rates under a gold standard based currency. Prior to the 1970s comparing the earnings yield to the bond yield concludes very little. Under a gold standard there is no bond speculation. Bond rates for this period were more or less controlled at extremely low levels (<3%). Bond speculation began as soon as the U.S. cut the gold standard in 1971. Therefore, it is theoretically flawed to back test the Fed model prior to the 1970s.



to have credence it should be able to deliver excess returns when used a tactical asset allocation tool. Use of the Fed model produces the following results:

**TALBE 4**

	<b>GOLD return - month after Fed Model shows S&amp;P undervalued</b>	<b>DJIA return - month after Fed Model shows S&amp;P undervalued</b>	<b>GOLD return - month after Fed Model shows S&amp;P overvalued</b>	<b>DJIA return - month after Fed Model shows S&amp;P overvalued</b>	<b>GOLD return - month after Fed Model shows S&amp;P undervalued by 15%+</b>	<b>DJIA return - month after Fed Model shows S&amp;P undervalued by 15%+</b>	<b>DJIA return</b>	<b>GOLD return</b>
<b>1/1968 - 7/2004</b>								
Average return (annual)	8.48%	6.70%	-7.45%	-6.96%	26.95%	-0.02%	1.72%	2.67%
Standard deviation (annual)	24.81%	15.21%	13.27%	16.13%	29.63%	16.52%	15.65%	21.43%
Correlation with mkt	0.01	0.95	-0.13	0.94	-0.04	0.95	0.95	-0.01
R-square	0.00	0.91	0.02	0.88	0.00	0.90	0.90	0.00
Slope (beta)	0.02	0.97	-0.11	0.94	-0.07	0.99	0.96	-0.01
Sharpe Ratio	0.34	0.44	-0.56	-0.43	0.91	0.00	0.11	0.12
Alpha	0.08	0.05	-0.07	-0.09	0.27	-0.02	0.00	0.03

\* Returns in excess of risk free rate

The tables above and below illustrate the results of going long the DJIA or gold based on readings from deviations in the Fed model. Noted from the chart above going long gold when the Fed model shows the market undervalued produces an excess return of 8.48%. The most significant results are produced when the Fed model indicates the market is undervalued by 15%+. This seems to be the “magic number” as the average excess return is about 27%. More impressive is the below table from 1978 where going long gold according to the 15% rule produces an average excess return of over 39%. To add a dose of realism, all calculations are assumed to go long the subsequent month after the signal is produced. For example, if the Fed model indicates the market is undervalued by 16% then the hypothetical portfolio would go long the first trading day of the following month, then it is assumed no change in investment policy is made until the 15% rule is violated. Additional deviation numbers such as 10% or 20% can be used, however, the results are less significant than 15%.

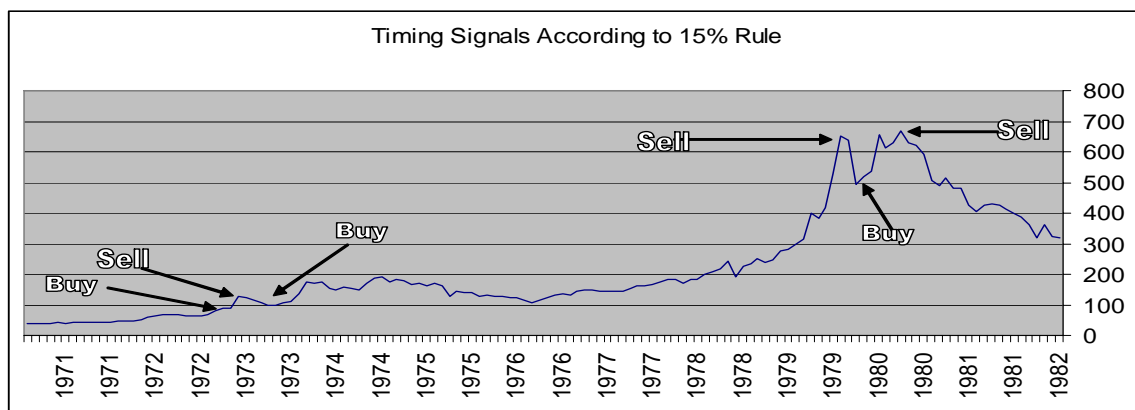
TABLE 5

1/1979 - 7/2004	GOLD return - month after Fed Model shows S&P undervalued	DJIA return - month after Fed Model shows S&P undervalued	GOLD return - month after Fed Model shows S&P overvalued	DJIA return - month after Fed Model gives overvalued signal	GOLD Return - month after Fed Model shows S&P undervalued BY 15%+	DJIA Return - month after Fed Model shows S&P undervalued by 15%+	DJIA return	GOLD return
Average return (annual)	1.9%	12.7%	-8.3%	-6.1%	39.1%	9.3%	4.9%	-2.4%
Standard deviation (annual)	21.8%	14.3%	13.9%	16.6%	25.8%	14.4%	15.5%	19.0%
Correlation with market return, r	0.12	0.95	-0.15	0.93	0.01	0.95	0.94	0.04
R-square	0.01	0.90	0.02	0.87	0.00	0.89	0.89	0.00
Slope (beta)	0.18	0.96	-0.13	0.95	0.03	1.04	0.95	0.05
Sharpe Ratio	0.09	0.89	-0.60	-0.37	1.52	0.65	0.32	-0.12
Alpha	0.01	0.08	-0.08	-0.10	0.39	0.05	0.01	-0.03

\* Returns in excess of risk free rate

The results and accuracy of this study are remarkable. Not only are the calculations significant but also the degree of precision in which the model can predict enter and exit points is amazing based on past results. In fact, by using the 15% rule, an investor would have gone long gold in 1973 at \$97 and sold 7 years later in 1980 at \$637. A modest 551% total return! The model then gives a buy signal 3 months later at \$518 and a sell signal the exact month gold peaks at \$666. The below and exhibit 4 further illustrates the results.

#### Exhibit 2



Price of gold is plotted above using monthly closing prices from 1/68- 7/82. The buy and sell signals are generated using the 15% rule.

The previous simulation was done assuming a 100% shift in portfolio allocation.

Gambling on one investment class or sector is not practical for investment managers.

Nevertheless, the aforementioned results indicate the potential tactical benefits of gold. A shrewd illustration would be to add gold into a more reasonable portfolio mix using the 15% signals. Below are the results:

**TABLE 6**

<b>1/79 - 7/2004</b>	<b>20% Gold + 80% DJIA when Fed shows market Undervalued By 15%</b>	<b>DJIA return</b>
<b>Average return (annual)</b>	<b>15.46%</b>	<b>4.93%</b>
<b>Standard deviation (annual)</b>	<b>12.04%</b>	<b>15.51%</b>
<b>Correlation with mkt</b>	<b>0.894</b>	<b>0.947</b>
<b>R-square</b>	<b>0.800</b>	<b>0.897</b>
<b>Slope (beta)</b>	<b>0.835</b>	<b>0.954</b>
<b>Sharp Ratio</b>	<b>1.284</b>	<b>0.318</b>
<b>Treynor's Reward-to-Volatility Ratio</b>	<b>0.185</b>	<b>0.052</b>
<b>Alpha</b>	<b>0.117</b>	<b>0.006</b>

**\* Returns in excess of risk free rate**

Returns are calculated using the 15% rule. When the 15% rule is not in effect no investment is assumed. The DJIA return is assumed to be long the DJIA continuously.

Simply going long the DJIA along with a 20% allocation to gold produces over 15% annualized excess returns. Not only is alpha produced but also risk and volatility are significantly reduced. This demonstrates the powerful tactical benefits of gold.

Returns in a portfolio, consisting of a tactical allocation to gold, are largely driven by the choice of weighting schemes. The table below is a hypothetical portfolio. The first column shows the results of the DJIA since 1979. The next few columns are assumed to be long the DJIA and then add gold to the allocation mix according to the 15% rule. Different weighting schemes are used to illustrate the empirical benefits. In each portfolio, again, alpha is generated and risk and volatility are reduced.

TABLE 7

		Add 20% Gold to DJIA when Fed shows market Undervalued By 15%+	Add 30% Gold to DJIA when Fed shows market Undervalued By 15%+	Add 40% Gold to DJIA when Fed shows market Undervalued By 15%+
<b>1/79 - 7/2004</b>	<b>DJIA return</b>			
Average return (annual)	4.93%	5.86%	6.27%	6.80%
Standard deviation (annual)	15.51%	15.24%	15.18%	15.12%
Correlation with mkt	0.947	0.940	0.924	0.908
R-square	0.897	0.884	0.855	0.825
Slope (beta)	0.954	0.931	0.912	0.908
Sharpe Rtio	0.318	0.385	0.413	0.442
Treynor's Reward-to- Volatility Ratio	0.052	0.063	0.069	0.075
Alpha	0.006	0.016	0.021	0.023

\* Returns in excess of risk free rate

### Comments on Results

Determining how inflation affects the valuation process is imperative. Empirical studies have shown that during periods of high inflation and expected inflation (1970s and early 1980s) the S&P 500 index tends to be undervalued. This correlates with the Fed model readings. Modigliani and Cohn (1979), claim that stock market investors (not bond market investors) are subject to inflation illusions. Investors form distorted growth forecasts by extrapolating past nominal rates without adjusting for inflation. Efficient market supporters argue that a real valuation number like the E/P ratio should not move at all in response to changes in the nominal bond yield. This paper believes this is not irrational behavior on part of investors. Changes in nominal bond yields are the result of expected inflation, which often lead changes in actual inflation. Thus, market participants rationally advance the earnings yield above the nominal bond yields in fear of negative real returns in the market. As the illusion of positive returns in the market place is shattered, money begins to flee stocks and bonds into the safety of gold. Not all

participants leave the market at once. As skepticism builds, money slowly leaves stocks and bonds into the safety and reliability of gold to maintain their total purchasing power. For example, in 2003 CPI inflation was 3% while T-Bills were yielding about 1%. The net result for investors was a loss of 2% of their purchasing power. Bond market and stock market participants understand this so they gradually defect from bonds into stocks and gold when real rates become too low or negative.

Gold appreciates during inflationary periods to compensate for decreasing purchasing power but also due to the uncertainty around such an occurrence. Economist Ludwig von Mises put forth a theory that inflation leads to consequences that are not, or at least are not always, part of its aim. Thus believing that policy makers can control inflation without suffering undesirable consequences is unlikely. Market participants understand this theory that as inflation builds it becomes difficult for the Federal Reserve to control it. Inflation increases the uncertainty and hence the risk premium so increasing inflation decreases stock valuations by driving up the equity premium. Therefore the reliability and safety of gold becomes attractive.

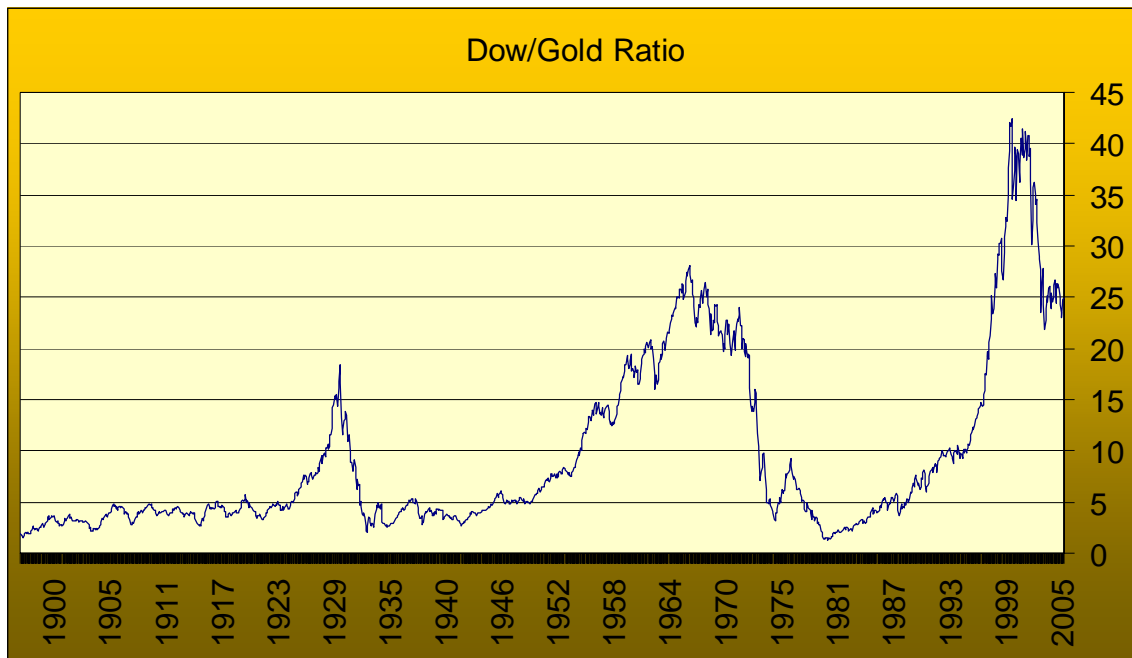
### **Dow/Gold Ratio**

Financial markets are characterized by cycles. Understanding these cycles, whose trend and amplitude change over time, is what distinguishes the best investment managers. The key is to identify and understand major trends in the markets, understand why they are occurring, and know when to enter and exit. Although investment managers would like to believe the market has always trended higher, this is not the case. For example, in August of 1929 the DJIA stood at 380 and 25 years later in September of 1954 the index

was practically flat at 386. As well, in January of 1966 the DJIA was 983 and over 16 years later in September of 1982 the DJIA stood at 896. This highlights the importance of cycles because there has been extended periods when the stock market did not produce positive returns.

The peaks in 1929, 1965 and 1999 (or “boom”) in the below chart<sup>3</sup> are the results of massive Federal Reserve credit expansion that ultimately lead to a “bust”. The late Mises (1981) put it best when he wrote about the wavelike movements affecting the economic system and the recurrence of periods of boom, which are followed by periods of depression. He goes on to state that there is no means of avoiding the final collapse of a boom brought about by credit expansion.

**Exhibit 3**



Alongside Mises, Alan Greenspan (current Federal Reserve Board Chairman) understands this relationship of economic excess and bust. Before he became Chairman

<sup>3</sup> Although the chart is relatively unknown, it is not the author's original. The thoughts and analysis are.

he wrote an article called “Gold and Economic Freedom” (The Objectivist, July 1966). He highlights the excess credit of 1929 that spilled into the stock market and became unmanageable by the Fed. The Dow/Gold chart graphically illustrates this relationship in 1929 as well as 1970s and today. Greenspan goes further and writes about; “In the absence of the gold standard, there is no way to protect savings from confiscation through inflation.” He states that the “shabby secret” of governments is that deficit spending is a “scheme for the hidden confiscation of wealth”. Advanced market participants understand these cycles of boom and bust and the confiscation of wealth as described by Alan Greenspan. They also understand the mega trends that develop as a result. In 2000 the third mega trend peaked. We have witnessed the Dow under perform gold since year 2000. The trend is telling us gold, not stocks, is where the investment focus should be. Each period of excess resulted in a bust that brought the Dow/Gold ratio to 1 or 2. Of course predicting the future ultimately leads to embarrassment, but if the history should repeat itself, we should once again witness the Dow and gold trading at parity. 3000 Dow and 3000 gold, 10,000 Dow and 10,000 gold, perhaps?

## **Conclusion**

The Fed model has been widely used as a measure to describe whether stocks are overvalued or undervalued. This paper has extended this valuation metric to gold and implemented it as a trading strategy. The trading rule based on the deviations from a presumed equilibrium between forecasted earnings yields and bond yields correctly identifies which months to be in and out of the gold market. Since timing any market is notoriously difficult, this study suggests use of both the Fed model and Dow/Gold ratio to determine where we are in the current big picture.

No one knows what the stock, bond or gold market will do in the coming years. Markets are inherently cyclical and what lies ahead in the next paradigm is unknown. However, given that the Fed model has been forecasting low valuations, thus possibly inflation, and the Dow/Gold ratio in a downtrend, caution is warranted.



## Reference:

Asness, Clifford, 2003, Fight the Fed Model: The relationship between future returns and stock and bond market yields, *Journal of Portfolio Management*, Fall 2003, pp. 11-24

Barnes, Michelle, John H. Boyd, Bruce Smith, 1999, Inflation and Assets Returns, *European Economic Review* 43, 737-754

Ciner, C., 2001, On the Longrun Relationship between Gold and Silver: A Note, *Global Finance Journal* 12, pp. 299-303

Davidson, S., Robert Faff and David Hillier 2003, Gold Factor Exposures in International Asset Pricing, *International Financial Markets, Inst. and Money* 00, pp. 1-19

Faugere, C. and Van Erlach, J., 2005, The Price of Gold: A Global Required Yield Theory, *The Journal of Investing*, 14 (1), 99-111

Mises, Ludwig von, 1981, *Human Action*, San Francisco, p. 572

Modigliani, F., and R.A. Cohn, 1979, Inflation, Rational Valuation and the Markets, *Financial Analysts Journal* 35, pp. 24-44

Ritter, Jay, Richard S. Warr, 2002, The Decline of Inflation and the Bull Market of 1982-1999, *Journal of Financial and Quantitative Analysis*, Vol. 37, No. 1, pp. 29-61

Sherman, E, 1982, Gold: A Conservative, Prudent Diversifier, *Journal of Portfolio Management*, Spring, 21-27

## Exhibit 4

The below table are the results of the 15% rule.

<b>Date</b>	<b>Enter</b>	<b>Exit</b>	<b>Total Gain</b>
<b>May 1973</b>	<b>90.7</b>		
<b>August 1973</b>		<b>115.6</b>	<b>27.45%</b>
<b>October 1973</b>	<b>97.75</b>		
<b>February 1980</b>		<b>637.00</b>	<b>551.66%</b>
<b>May 1980</b>	<b>518.00</b>		
<b>September 1980</b>		<b>666.75</b>	<b>28.72%</b>
<b>October 1993</b>	<b>355.50</b>		
<b>December 1993</b>		<b>390.50</b>	<b>9.85%</b>
<b>July 1995</b>	<b>387.05</b>	<b>383.35</b>	
			<b>-0.96%</b>
<b>November 1995</b>	<b>382.65</b>		
<b>February 1996</b>		<b>400.65</b>	<b>4.70%</b>
<b>June 2002</b>	<b>318.50</b>		
<b>As of May 05</b>		<b>433</b>	<b>35.95%</b>

September 1980 marks the peak closing month price