Some Empirical Foundations for Tactical Asset Allocation

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Certain price “signals” produced by financial markets appear to contain substantial information about future asset returns and macroeconomic behavior. Recognizing and exploring this opportunity, this article proposes and illustrates a simple model for anticipating the absolute and relative performance of the major asset classes. It reviews evidence for the broad predictive power of two particular market signals, credit spreads and the price of gold, building on a series of research publications written for the clients of H.C. Wainwright & Co. Economics over the past several years. The reader should bear in mind that the model is one that is derived from the evidence, rather than a model that the evidence is used to test.

RISK, MARKET SIGNALS, CAPITAL FLOW, AND ECONOMIC SCENARIOS

The rationale was not immediately obvious a priori, but natural explanations quickly became apparent as evidence accumulated. The flow of capital is the central player in the economic rationale adopted here.

In the real world, there could be many different market signals, but this article uses only two in order to keep the number of distinct economic scenarios to a minimum. These are defined by viewing each signal as an on–off switch. Credit spreads represent risk, that is, economic uncertainty or anxiety, which might have increased or declined; a rise in economic uncertainty is anti-growth. Movements in the price of gold are interpreted as representing instability in the national currency; currency weakness is inflationary, and currency strength is counter-inflationary.

As outlined in Exhibit 1, the four on–off combinations define just four economic scenarios. Each scenario is identified with one asset class that is favored by both signals. To give just one example: when economic anxiety has been on the decline and the dollar has been getting stronger, conditions are most favorable for investing in the domestic stock market.

The rationale for the model is as follows. The propensity of capital to be motivated to flow in response to economic anxiety and currency instability is what makes these the central causative factors. Economic vitality and investment performance both depend principally on the direction in which capital chooses to flow. Capital in this general sense includes human and other forms of capital, and not merely financial capital. If capital flows out of a country, its economy and its markets sag. If capital flows into a country, its economy speeds up and its markets advance. Capital may also flow back and forth among economic regions, and into or out of economic sectors and industries. In the asset market, it also flows between one class of assets and another.
So when equities do well, it’s likely to be because capital is flowing into stocks, and out of other assets such as bonds. The economic rationale summarized in Exhibit 2 can provide a simple background to the remainder of the article.

If we could explain what causes capital to flow from one place to another, it would go a long way toward explaining under what conditions some markets perform well, while others perform indifferently or poorly. Moreover, it could help us anticipate at what particular times these performance patterns occur. The flow of capital is not easy to measure comprehensively, accurately, or promptly. But experience suggests that it is quite sufficient instead to find in market signals easily quantifiable data that represent the forces that motivate capital to flow in one direction or another—for example, away from or toward safety. Those data are a predictive basis for asset allocation.

The answer to the critical question, what triggers capital to flow, has been familiar to economists for more than two centuries. It is such bedrock that it is less commonplace to hear it discussed than to recognize it as having been forgotten. One of the first to lay out the idea was Adam Smith in *The Wealth of Nations*. In modernized language, he simply pointed out that resources flow in response to market signals from the price system. Smith cited cases in which, for example, high prices imply a shortage and attract resources, while low prices imply a glut and push resources away. He did not speak of capital markets. But in that domain, the parallel would be that capital flows into investment vehicles that investors believe will reward them for risk taking when economic circumstances are favorable—or for risk avoidance when circumstances are unfavorable.

**ECONOMIC SCENARIOS AND ASSET CLASSES**

How do particular asset classes line up with economic scenarios? Growth can be on the way up or on the way down; and inflation can be on the way up or on the way down. We need no more than the same four basic economic scenarios introduced in Exhibit 1, and named in the left panel of Exhibit 3.

The right panel defines *haven assets* as those that perform best when growth is slowing. They are placed in the upper half, or “north,” of the chart. *Risky assets* are those that produce their best performance when growth is accelerating, and they appear in the south. *Hard assets*, or physical assets, perform best when inflation is rising, on the east side of the chart. Financial assets that perform best when inflation is declining, on the west side, can be called *soft assets*. So, for example, we expect domestic equities to belong in the southwest quadrant—soft and risky.

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**EXHIBIT 1**

Two Market Signals and Four Primary Asset Classese

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**EXHIBIT 2**

The Central Role of Capital Migration in Economic and Investment Success

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Commodities belong in the southeast quadrant—hard and risky. Gold (hard) and bonds (soft) are investment havens. Foreign assets tend to correlate with hard assets. A series of simple exhibits serves to illustrate how historical returns from four popular asset classes actually do line up with growth, with inflation, and with market signals of growth and inflation. First, Exhibit 4 shows observed relationships between growth and the performance of four key asset classes. Accelerating growth favors U.S. stocks and commodities, while decelerating growth favors Treasury bonds (T-bonds) and gold. Aggregating the data to calendar-year averages, all these relationships are roughly linear and statistically significant.

The yield spread between Baa and Aaa corporate bonds (published by Moody’s) is the best empirical market signal documented so far to express economic anxiety, or the ambient business risk environment. Among economic indicators, it enjoys a nearly unique advantage in having a history that dates back to 1918. And indeed, the left panel of Exhibit 5 shows that a widening of spreads anticipates much weaker growth than a narrowing of spreads. Empirically, it turns out that the right time horizon is two years. Reflecting this lag, past HCWE papers have mostly featured changes in this indicator on a year-to-year basis. But its maximum impact on asset prices occurs over a six-month time frame.
The right panel of the bar chart shows the performance responses of the four asset classes over subsequent six-month periods. Wider spreads favor T-bonds and gold, while narrower spreads favor stocks and commodities. According to these data, the asset class whose performance is most sensitive to movements in credit spreads is commodities. Gold is the least sensitive.

Turning now to observed relationships between inflation and the performance of the same set of asset classes, the table in Exhibit 6 shows that accelerating inflation favors commodities and gold. Decelerating inflation favors domestic stocks and bonds. The data are again aggregated to calendar-year averages; on this basis, all four relationships shown here are statistically significant as well.

Gold plays a double role in the model. It is one of the four asset classes that correspond to the four quadrants of Exhibit 3. Expressed in terms of local currency, it is also a highly predictive signal for inflation. The price of gold can also be interpreted as an indicator of the weakness or strength of the currency, lining up with the theory that the dominant cause of inflation is currency depreciation. That’s another motivating force in capital flowing out of or into the domestic economy. We find that the maximum impact on asset prices occurs over a one-year time frame, though in most cases it does keep going for a second year. The left panel of Exhibit 7 shows that an advance in the gold price foretells higher inflation than a decline. The right panel shows the performance responses of the four asset classes over the subsequent year.

A decline in the gold price favors domestic stocks and quality bonds, while a rise in the gold price favors commodities and gold itself. According to these data, the asset class whose performance is most sensitive to movements in the price of gold is gold itself, reflecting...
E X H I B I T 6
CPI Inflation and Asset Returns

Calendar-Year Average Data from 1969

<table>
<thead>
<tr>
<th>Years in Which Real CPI Inflation</th>
<th>Average Return from Stocks (% pts.)</th>
<th>Average Return from T-bonds (% pts.)</th>
<th>Average Price Change in Gold (% pts.)</th>
<th>Average Price Change in Commodities (% pts.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerated (22 years averaging 1.3% pts.)</td>
<td>-2.8</td>
<td>-3.0</td>
<td>+6.3</td>
<td>+8.5</td>
</tr>
<tr>
<td>Decelerated (23 years averaging -1.5% pts.)</td>
<td>+3.6</td>
<td>+3.3</td>
<td>-5.8</td>
<td>-9.3</td>
</tr>
</tbody>
</table>

Data: Calendar-year real gross domestic product (Bureau of Economic Analysis), together with month-end return indices for the S&P 500 companies and long Treasury bonds (University of Chicago/Dimensional Fund Advisors) and month-end prices for spot gold (Metals Week) and non-precious commodities (Reuters Bridge Commodity Research Bureau). Crude oil, industrial metals, foodstuffs and textiles are given equal weight, and the index is rebalanced monthly, together with calendar-year averages of the headline consumer price index for all urban consumers (Bureau of Labor Statistics).

E X H I B I T 7
Gold as a Market Signal

Calendar-Year Average Data from 1969

Panel A: For Consumer Price Inflation

<table>
<thead>
<tr>
<th>Percent</th>
<th>19.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVERAGES for years in which the Price of Gold:</td>
<td></td>
</tr>
<tr>
<td>Increased (10 years averaging 48%)</td>
<td>12.0</td>
</tr>
<tr>
<td>Increased (17 years averaging 11%)</td>
<td>11.1</td>
</tr>
<tr>
<td>Fell (16 years averaging -10%)</td>
<td></td>
</tr>
</tbody>
</table>

Panel B: For Asset-Classification Performance

AVERAGE one-year total return following years in which the price of gold fell.

<table>
<thead>
<tr>
<th>Percent</th>
<th>S&amp;P 500</th>
<th>Long T-bonds</th>
<th>Commodities</th>
<th>Gold</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.9</td>
<td>14.4</td>
<td>14.3</td>
<td>12.3</td>
<td>17.7</td>
</tr>
</tbody>
</table>

Data: Monthly consumer price index for all urban consumers (Bureau of Labor Statistics), together with month-end return indices for the S&P 500 companies and long Treasury bonds (University of Chicago/Dimensional Fund Advisors) and month-end prices for spot gold (Metals Week) and non-precious commodities (Reuters Bridge Commodity Research Bureau). Crude oil, industrial metals, foodstuffs and textiles are given equal weight, and the index is rebalanced monthly.
the intense serial correlation in annual movements in the gold price. U.S. stocks appear to be the least sensitive asset class.

**POLAR-OPPOSITE ASSET CLASSES**

The next three exhibits identify pairs of assets that logic suggests should perform oppositely. One pair is U.S. equities and gold, the other is T-bonds and commodities. One asset in each pair relates to growth and inflation in ways that are opposite to the way the other relates. Exhibit 8 presents this visually, especially for stocks and gold in the left panel, where there are large price swings over multiyear periods. Price swings for bonds are much smaller, but an inverse relationship with commodities is perceptible, too.\(^4\) Both are quickly confirmed by least squares analysis.

Another way to see the inverse correlation between opposite assets is to compare their returns year by year. The performance correlation between T-bonds and commodities shows up dramatically in Exhibit 9, although it is difficult to see in the previous exhibit. The correlation between year-over-year percentage returns is $-0.52$.

One of the most powerful asset-allocation consequences of the existence of polar-opposite assets is the diversification that can be achieved by including both members of a pair in a portfolio. Exhibit 10 illustrates one of the simplest examples, a portfolio consisting solely of U.S. stocks and gold.\(^5\)

Owing to the inverse correlation between returns on stocks and gold, adding gold to a stocks portfolio cuts the standard deviation of annual returns sharply without much affecting its average return. This is visible in the left panel of Exhibit 10. Indeed, it’s even possible for the return to increase when a second asset is mixed in. Actually, the benefit from mixing the two assets is a lot greater than the left panel suggests. Investors are naturally more concerned with drawdown risk than with volatility as such. That is measured by the “downside volatility” indicator plotted in the right panel, referring to the left tail of the performance distribution. The reduction of downside volatility achieved by asset mixing is dramatic.

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**EXHIBIT 8**

Returns from Polar-Opposite Asset Classes

Data: Month-end total-return indices for the S&P composite and long Treasury bonds (University of Chicago/Dimensional Fund Advisors), month-end prices for spot gold (Metals Week/Wall Street Journal), and a month-end index of spot prices for industrial metals, foodstuffs, crude oil and textiles and fibers, rebalanced monthly (Reuters Bridge Commodity Research Bureau). The four commodity groups are given equal weight in the commodities price index.
FURTHER EXAMPLES OF ASSET ALLOCATION DECISIONS BASED ON THE GOLD-SPREADS MODEL

With minimal modification, the model applies to asset-allocation decisions in non-USD currency regimes such as the Eurozone. For this purpose, of course, the price of gold must be expressed in terms of the local currency. We don’t have comprehensive credit spread data for these countries, but there’s a great deal of commonality in credit conditions between the United States and other developed countries. And in any case, the U.S. corporate bond market is dominated by multinational companies. So our spread data are not merely a U.S. market signal of business risk, but a global signal. Business risk that is unique to a specific country lies outside the scope of the model.

The left column of the table in Exhibit 11 shows how changes in the price of gold expressed in local currency are related to the following year’s performance in domestic stocks, domestic bonds, gold, and commodities.

EXHIBIT 9
Returns from Polar-Opposite Asset Classes

In the year-to-year performance of bonds and commodities, the model shows how changes in the price of gold expressed in local currency are related to the following year’s performance in domestic stocks, domestic bonds, gold, and commodities.

EXHIBIT 10
Returns from Polar-Opposite Asset Classes

Data: Calendar-year averages of month-end total return indices from the S&P 500 companies (University of Chicago/Dimensional Fund Advisors) and spot prices for gold (Metals Week).
Just as in the United States, foreign stocks and bonds respond negatively to a rise in the price of gold, while gold and commodities respond positively. The right column of the exhibit shows that commodities and foreign stocks respond negatively to a widening of spreads, while gold and foreign bonds respond positively, again just as in the United States.

At this point, let’s return to the U.S. tactical asset-allocation picture to illustrate how market signals are used in practice. At this stage, we can also split asset classes into specific assets that empirically belong within each class. Exhibit 12 is a diagram designed to show which of a number of important investment vehicles are favored, neutral, or out of favor in any given scenario, which is to say at any given time.

**E X H I B I T  1 1**

**Annual Returns from Assets in Different Currency Zones Correlations with Prior-Year Changes in Gold and Spreads**

<table>
<thead>
<tr>
<th>Annual Return From</th>
<th>Correlation with Prior-Year Change in Gold</th>
<th>Correlation with Prior-Year Change in Spreads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Equities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>U.K.</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Government Bonds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>U.K.</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>Gold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>U.K.</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Commodities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>U.K.</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Positive</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Data: Calendar-year averages of month-end total return indices for (Morgan Stanley Capital International), government bonds (Bank of America Merrill Lynch), and of spot prices for gold (Metals Week) and commodities (Reuters Bridge Commodity Research Bureau/HCWE & Co.). Indices are converted where necessary to local currency using month-end market exchange rates (www.oanda.com). The constituents of the commodity index are the same for each currency zone: industrial metals, foodstuffs, crude oil and textiles & fibers, with equal weight rebalanced monthly.

This exhibit can be called the “compass diagram” because the user can predict the outlook for different assets by identifying each with one of the eight different compass points around the circle. For example, stocks fall definitively in the southwest segment of the circle, being promoted by narrowing spreads and a falling gold price. But commercial real estate (as measured by the National Council of Real Estate Investment Fiduciaries (NCREIF) transactions-based index) falls in the eastern segment; it is promoted by a rising gold price and is almost indifferent to spreads.

Underlying the compass diagram is a grid, explicitly revealed in Exhibit 13. The change in the price of gold from one year earlier is plotted along the horizontal axis of the grid. The change in the Baa–Aaa spread is plotted along the vertical axis. Pairs of coordinates depict where the U.S. markets have found themselves on this grid at the end of March 2016 and at recent past year-ends.

The more each indicator has changed, the more potent the information and the higher the conviction with which an investor can draw asset-allocation conclusions. If readings from both indicators are small (say, less than the historical median), then the information is relatively unhelpful and the signal should be considered neutral. The boundary of this zone is shown by the ellipse in the middle.

**E X H I B I T  1 2**

**An Asset-Allocation “Compass”**
The diagram in Exhibit 14 reflects the same grid, but makes the distinction between high-conviction and low-conviction forecasts based on how predictable the performance of each asset has been historically according to least-squares analysis.

In December 2015, the price of gold was down 12% from the previous December, and the Baa–Aaa spread was up 54 basis points. Both signals were large enough (comfortably beyond the median) to give a high-conviction forecast for calendar-year 2016. The diagram shows three assets as highly favored: long T-bonds, mortgage-backed bonds, and other quality bonds such as triple-A corporates. Assets to be avoided include nonprecious commodities, adjustable-rate debt, emerging markets, and real estate investment trusts (REITs). With less confidence, the gold-spreads signal has already been pointing northwest during the last couple of years, and capital-market outcomes have since mostly endorsed its implications, as can be seen in Exhibit 15.

The diagram is a post-mortem on the asset choices that were implied at the end of 2014. At that time, the compass pointed toward the segment in which Aaa-grade and T-bonds are favored. It was a year of low returns for assets across the board. But the pattern of results around the circle shows that gold and spreads had told broadly the right story. Northwest was indeed a good place to be in 2015, and southeast emphatically the place not to be. Although the S&P 500 Index did slightly outperform T-bonds, with much turbulence in the interim, it was by less than the average historical margin. The year could better be described as one of success by avoiding the wrong assets, rather than success by choosing the right assets.

The next three illustrations, beginning with Exhibit 16, return to the circular compass format. They illustrate how the same market signals have historically anticipated performance differences among subassets within an asset class.
In the case of Exhibit 16, the investment choices are the traditional stock-market sectors. Sectors are classified empirically according to the financial conditions in which each has performed best relative to the stock market as a whole. The northwesterly tilt of the compass favored technology and consumer stocks at the end of 2014, and indeed they outperformed. And the tilt away from the southeast suggested that energy stocks would do badly in 2015, which of course they did.

Exhibit 17 shows U.S. stock-market style bets such as value/growth and small cap/large cap. Here, also, 2015 was a success; as anticipated, growth outperformed value, and the Nasdaq beat the S&P 500.

Exhibit 18 shows country-selection bets within the emerging equity markets universe. The gold-spreads model enables us to group emerging markets together on the basis of economic likeness rather than the crude geographical basis usually followed.

In 2015, the most-favored countries outperformed the MSCI index by margins ranging from 6.5 percentage points (India) to 18.7 percentage points (Israel).
E X H I B I T 16
Stock-Market Sectors Classified Empirically by Response of their Relative Return to Market Indicators of Economic Uncertainty and Currency Depreciation

E X H I B I T 18
Emerging Markets Classified Empirically by Response of their Relative Return to Market Indicators of Economic Uncertainty and USD Depreciation

E X H I B I T 17
Stock-Market Style Bets Classified Empirically by their Response to Market Indicators of Economic Uncertainty and Currency Depreciation

YEAR-BY-YEAR HISTORY OF ASSET-CLASS SELECTIONS

Exhibit 19 is a detailed illustration of the way the gold-spreads model anticipated the performance of the four primary asset classes one year ahead since 1969. For simplicity, asset allocation decisions are assumed to have been made at the beginning of each calendar year based on market signals from the prior behavior of credit spreads and the gold price.

The time span runs from the beginning of 1970, when gold was volatile for the first time, to the end of 2015. Year by year, in the first four columns, we see what the market signals were at the time. The filled bar on the left indicates that gold was up over the past year, and the filled bar on the right indicates that it was down. The same applies to spreads in the next two columns. To the right of that, there’s one bar in each line to show the chosen asset class each year. This is a challenging exhibit, as a lot of information is squeezed into a single page. But it’s easy to pick out the years in which the market signals let us down: 1975, 1981, and 2000, for example.
The performance of the model can also be evaluated from the last column on the right. A success for any year is measured by the extent to which the return from the chosen asset relative to the other three was positive. The result failed to be positive on only 8 occasions out of 46, so overall the record is a good one. How good is visible in the last illustration, Exhibit 20.

I call the sequence of 46 single asset choices the high-return strategy, and it’s shown in the red upper line of Exhibit 20, with a compound average return of 14.4 percent. A completely neutral strategy would be an equal mix of the four assets, rebalanced at the end of each year. That’s the blue lower constant mix line, with a 9.9 percent compound return but much lower volatility. The purple line in the middle reflects an intermediate low-volatility strategy. In this strategy, the asset most out of favor each year gets zero weight, while the asset most in favor gets double weight. The results are intermediate in both return and volatility.

Notice in all three strategies that returns between 2010 and 2015 have been way below average. Further research suggests that this occurs from time to time when the dollar is unusually strong—a sign that nominal returns expressed in dollars may tend to understate real returns. Symmetrically, when the dollar is depreciating, all strategies tend to produce higher than average returns.

CONCLUSIONS

The findings of this article are enumerated as follows:

1. Asset returns relate closely to the way an economy behaves—notably its rates of growth and inflation.
2. The key to asset allocation success is to choose assets toward which capital is beginning to flow and to avoid assets from which capital is escaping.
Financial markets issue signals that motivate and guide the direction in which capital chooses to flow. As a result, market signals such as credit spreads and currency fluctuations have predictive power for (initially) the price performance of assets and (later) growth and inflation. Assets can be classified, and their performance predicted, according to the direction and sensitivity of their response to market signals. Two market signals, spreads, and the gold value of the currency define four economic scenarios and therefore four primary asset classes: domestic stocks, domestic bonds, commodities, and gold. Predictive success is found not only in the U.S. capital markets, but also in those of other currency zones, such as sterling and the euro.