Managing inflation
Its drivers and eight early warning signs

August 2012

IN BRIEF
• Somewhat surprisingly, inflation has remained steady in the U.S. and most developed countries; deflation has failed to take hold despite low levels of economic activity and high unemployment.
• Although central banks’ easy monetary policies have prompted concern about the possibility of a new acceleration in inflation, that risk looks remote due, in part, to well-anchored inflation expectations.
• However, two risks—some type of shock or monetary policy mistake—could potentially spur significant and sustained increases in inflation.
• We believe there are eight early warning signs to monitor that will detect growing imbalances that could ultimately lead to upward pressure on prices. As a group, this panel of indicators—ranging from surveys that track inflation expectations and labor market dynamics, to indexes that track and capture global trends in available resources—is flashing green, suggesting there is little cause for concern.

The so-called “Great Moderation” in economic performance in the years leading up to the 2008-2009 recession featured broadly stable inflation at satisfactory levels in the U.S. and other developed countries. Somewhat surprisingly, inflation has remained steady in the aftermath of the crisis, as deflation failed to take hold (except, of course, in Japan) despite low levels of economic activity and high unemployment rates.

Several years into the new expansion, extremely easy monetary policy stances by major central banks, including the Fed, have caused some observers to wonder about the
possibility of a new acceleration in inflation. At the moment, that risk looks remote, though higher inflation down the road could occur if the Fed misjudges the degree of slack in the economy and maintains stimulative policy for too long.

Investors can monitor a set of indicators, chosen from both historical experience and theory, that collectively should provide early warning of a developing inflation problem. For now, these signals are flashing green.

Stylized facts about the inflation record

In the postwar U.S., one big inflation cycle
The United States has essentially experienced one lengthy up-and-down cycle in inflation since 1950, bookended by periods of stability (Exhibit 1). Inflation did gyrate sharply in the years after the Second World War, partly because of the end of wartime price controls as well as the advent of the Korean War (which caused commodity prices to soar), and partly because the monetary policy framework of the day emphasized long-term interest rate steadiness at a time of wide fluctuations in economic activity. After the Korean War, inflation settled into a decade of modest increases with limited volatility that lasted until about 1966. At that point, inflation began to drift higher. Although the early 1970s brought some relief, inflation remained above 2% until the mid-1980s, with spikes into double-digit territory during the 1973 and 1979 oil shocks. Thanks to a significant tightening in monetary policy, inflation began decelerating in 1980 and remained broadly on a downward track—a pickup at the end of the 1980s notwithstanding—until the mid-1990s, since which time core inflation has generally remained close to 2%.

While the U.S. has experienced many business cycles during the postwar era, it has gone through one dominant inflation cycle. Understanding the drivers of the 1960s acceleration can help in understanding the risks of high inflation in the future. At the same time, the limited number of true inflation episodes in the recent past makes it difficult to generalize about the historical experience or draw strong conclusions about likely developments down the road.

A fairly similar picture internationally
Other major economies have broadly mirrored the U.S. inflation path over the past 50 years (Exhibit 2). The U.K., Germany and Canada also experienced generally stable inflation in the early 1960s, giving way to higher rates later that decade and through the 1970s, with a subsequent return to low single-digit inflation by the 1990s. The U.K. experienced somewhat more volatility than the other two, thanks in part to wider currency swings. By contrast, German inflation never hit double-digit territory, even in the wake of the collapse of the Bretton Woods monetary system and the 1973 oil shock, reflecting, in part, the Bundesbank’s more hawkish policy stance. Japanese inflation ran above other major economies’ rates in the 1960s, during that country’s phase of rapid growth, and then mirrored the others until the 1990s, when mild deflation began. In general, though, all four countries experienced one major inflation cycle that ran from the late 1960s to the early 1990s, with more stable and fairly low inflation rates on either side of that period.

Source: JPMSI; data through June 2012.

EXHIBIT 1: U.S. CONSUMER PRICES (% Y/Y)

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<tr>
<th>Year</th>
<th>Overall</th>
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<tr>
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</tr>
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Source: JPMSI; data through June 2012.

EXHIBIT 2: CONSUMER PRICES (% Y/Y)

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<th>Germany</th>
<th>Japan</th>
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<td>0.0</td>
</tr>
<tr>
<td>1989</td>
<td>0.0</td>
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<tr>
<td>1996</td>
<td>0.0</td>
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<td>2003</td>
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<td>0.0</td>
</tr>
</tbody>
</table>

Source: JPMSI; data through June 2012.
Before the recession, persistently higher headline than core inflation
Beginning in 2003, overall or “headline” inflation ran faster than core inflation, measured in year-on-year terms, for the vast majority of the time until the Great Recession began (Exhibit 3). This divergence reflects the large rise in commodity prices during that period, which put upward pressure on the food and energy components of the CPI but did not greatly affect core rates, which strip out those two categories. It also illustrates a difference in the way that economists and monetary policymakers tend to think about inflation, compared with the way many consumers look at the issue. For the former, a rise in the CPI that owes entirely to a jump in, say, the oil price does not really constitute “inflation,” which instead consists of a generalized, ongoing increase in prices. It is this latter phenomenon that central banks wish to guard against. In cases of relative price changes (again, the oil price represents a common example), central banks typically display more leniency, partly on the assumption that changes in domestic monetary policy will do little to affect the prices of internationally traded commodities.

Since the recession, surprising resilience in core inflation
The depth of the economic downturn in 2008-2009 and the softness of the recovery initially sparked deflation fears. And the still-high unemployment rate, which strongly suggests persistent slack in the economy, implies ongoing downward pressure on inflation. Instead, after moving lower in 2009 and early 2010, core inflation rebounded, returning to the roughly 2% pace that had characterized the pre-recession period and which the Fed has adopted as its goal (Exhibit 4). The “output gap” (the difference between the current level of GDP and the economy’s potential output if resources were fully used) thus does not appear to be leaning against inflation, and indeed never seriously threatened to send inflation below the zero mark. Instead, the Fed’s 2% informal inflation target seems to be exerting a strong pull on actual inflation.

Thinking about the inflation outlook
As mentioned above, economists—and policymakers—draw a distinction between generalized and relative price changes, with only the former truly representing “inflation” in their minds. For example, a jump in the gasoline price, with all other prices unchanged, will push up the reported CPI but would not qualify as inflation. While this difference may seem academic, it carries three important implications for investors. First, a broad-based pickup in inflation will more likely persist, whereas commodity price shocks tend eventually to revert. Second, the Fed will likely react to an increase in inflation but not to a change in relative prices, implying very different paths for short-term interest rates in the two scenarios. Third, a broad-based acceleration in prices warrants a different investment strategy than a relative price change, which is likely to be focused in one or more commodities. Asset allocators may be able to prepare for the latter phenomenon with commodity-specific investments, whereas a generalized rise in inflation might require a broader-based approach that likely would involve a carefully chosen mix of equities, real assets, Treasury Inflation-Protected Securities (or inflation swaps) and other fixed income strategies. In other words, generalized inflation represents a broader challenge for both investors and policymakers than a spike in a handful of prices, even if the short-run effect on the published consumer price index looks similar.
What can we learn about inflation prospects from recent experience? Inflation's resilience in the face of the deep recession and sluggish recovery, not only in the U.S. but also in other developed countries, likely stems from two factors. First, downward nominal rigidities make it difficult for inflation to fall further once it has arrived at very low levels. For example, wages—a crucial driver of inflation trends—tend not to drop in nominal terms, even at very high unemployment rates. In other words, deflation does not develop easily, and likely requires significant help from structural or demographic factors, such as Japan's population decline.

Second, inflation expectations, a major ingredient in most forecasting models, including those based on variations of the Phillips curve, appear to have become quite well-anchored in the course of the past two decades or so. Inflation expectations matter enormously for actual inflation because they help determine behavior by companies in setting prices and by workers in wage bargaining. Both theory and econometric evidence strongly suggest that stable inflation expectations tend to promote stable inflation. At the moment, price- and wage-setters seem to gravitate to a fairly stable consensus outlook for price increases, which in the case of the United States, stands quite close to the Fed's implicit 2% medium-term target. Central bank credibility, which suffered in the Great Inflation episode of the 1970s, has grown stronger in recent years, thanks to a variety of factors, including the tight monetary policy stances of the 1980s; increasing transparency about central bank aims, forecasts and methods; and perhaps, in some cases, the adoption of explicit inflation targets. Expectations have become so well entrenched that they do not react significantly to short-run blips in inflation in either direction. They thus act as a kind of gravitational pull on inflation, bringing it back to the 2% area even when other forces, like slack in the economy, are pushing it the other way. To the extent that inflation's steadiness in the past few years has highlighted this anchoring of expectations, it sends a soothing message about the future: Just as the large output gap today has proven incapable of putting the economy into deflation, brisker growth down the road, within reason, will also likely be associated with fairly steady inflation, rather than out-of-control acceleration.¹

Risks that could accelerate inflation

Of course, a likelihood that inflation stays stable does not amount to a guarantee. Where do the risks lie? Two broad categories present themselves: some kind of a shock, and a monetary policy mistake. Both appear to have figured in the Great Inflation of the late 1960s and 1970s.

On the shock front, the most obvious candidate would be a jump in a crucial commodity price, such as oil. The surge in the oil price associated with the 1973 embargo helped ignite what was already a fairly strong inflationary flame. Another spike in the oil price, associated with geopolitical developments, could occur at any moment. From an inflation perspective, though, this seems like less of a risk today than in the 1970s, for several reasons. First, with inflation expectations better anchored today, price-setters would be more willing to look through a jump in one price, like oil, expecting it not to pass through into prices more generally.² Second, the economy's dependence on oil has shrunk (thanks to both more energy efficiency and the relative shrinkage of the manufacturing sector), lessening the direct impact of an oil price spike on prices. Third, while strength in the oil price in the mid-2000s and during the current expansion falls short of the 1973 and 1979 incidents in percentage terms, oil has indeed moved up in price sharply on more than one occasion in recent years, without significantly affecting core consumer price inflation on an ongoing basis—empirical support for the previous two points. Meanwhile, no other single price in the economy appears to possess the wide importance of oil. The emerging economies do, however, stand as partial exceptions to this general rule, given the importance of food staples (e.g., pork in China) in EM consumer price indices and the likelihood that inflation expectations are more fluid in such countries. Food price shocks in these economies could potentially exercise long-lasting effects on overall inflation. Reassuringly, though, the past few years have brought several very large moves in food commodity prices that do not appear to have influenced medium- to long-term inflation in the developing world.

In thinking about the possibility of monetary policy mistakes, many observers focus on the enormous expansion of the Fed's balance sheet. This factor in itself, though, seems like a red herring. First, while the Fed and its counterparts in several other developed economies have added massive amounts of


reserve or high-powered money to their financial systems, broader measures of the money supply have increased much less. Indeed, central bankers are pursuing the extremely easy policies of today precisely because transmission mechanisms from narrow to broad money have become impaired and because previously lengthy collateral chains have shortened significantly. Second, the Fed seems to face little risk of losing control of its balance sheet. It possesses and has tested a range of tools with which to shrink the base money supply (a liability on its balance sheet and a quantity that it controls fully) when such action becomes appropriate. Moreover, while Fed capital impairment (a possibility as long as the Fed includes some private-sector assets among its holdings) could, under some circumstances, become inflationary, academic research suggests that full backing of the central bank by the fiscal authorities—a condition that almost certainly applies in the U.S.—greatly diminishes this risk.  

If central bank balance sheet expansion itself poses little inherent risk, however, a monetary policy error more broadly defined does represent a threat. This problem essentially boils down to the monetary authority misjudging the slack present in the economy and running an inappropriate policy stance as a result. Something of the kind likely happened in the 1960s. In retrospect, the Fed displayed too much confidence in its estimate of the “neutral” rate of employment (or NAIRU in the lexicon of the day), which it thought was roughly 4%, and attempted to fine-tune the economy with the idea of putting the actual jobless rate around that level. In reality, slowing productivity growth and other factors had raised the neutral rate, and Fed policy promoted overheating that ultimately led to the Great Inflation. Political pressure on the Fed, a somewhat less mature institution then than now, may have exacerbated the problem.  

Could a mistake like this happen again? Nothing absolutely prohibits such an outcome, though much was learned from that experience, including the dangers of overconfidence in economic forecasts. At the moment, with inflation quiescent, the Fed is privileging the “full employment” part of its mandate, displaying a strong focus on the path of the unemployment rate. In maintaining very easy policy, and indeed taking steps to ease its stance further, the Fed is relying on an assumption that the neutral rate of unemployment lies well below the current actual level of joblessness. Its medium-term unemployment rate forecast, which probably represents its guess about that neutral level, stands at 5.2-6.0%, roughly 2.5 percentage points beneath recent observations. In other words, the Fed believes that considerable slack exists in the labor market. Other analysts’ estimates vary, but few would claim today that the economy is operating close to full employment.  

Fed behavior will matter  

What will matter, assuming that the economy continues to expand at a reasonable pace and that the unemployment rate falls, will be two forms of behavior by the Fed. First, it will need to display less confidence in its neutral rate estimate as the actual jobless rate draws closer to that level. Estimation errors matter little when the gap between the assumed neutral rate and the current jobless rate is very high. In other words, a very stimulative monetary policy stance makes sense today even if the neutral rate is actually 6.6%, instead of 5.6%. But the Fed will need to back away from very supportive policies as that gap narrows, in order to lessen the risk of slipping into a fine-tuning mistake. Second, the Fed will need to incorporate any unexpected information from incoming data into its medium-term views. For example, accelerating wage inflation, or anecdotal evidence of widespread worker shortages, might constitute evidence that the economy is indeed bumping up against resource constraints, even if the jobless rate still lies above what the Fed had believed was a neutral level. Humility in forecasting, and sensitivity to the data flow, will greatly lessen the risk of a policy mistake.  

Although economists have made great strides in understanding past inflation episodes and in explaining the drivers of price increases, forecasting inflation continues to pose a challenge. Significant and sustained increases in inflation, though, are unlikely to come from nowhere. A developing inflation problem should create traces in a range of indicators. The next section describes several carefully chosen data series, based in large part on historical experience and economic theory, that should provide hints about possible deterioration in inflation performance ahead of the fact.  

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What to watch: Eight early warning indicators

As the economy continues its gradual recovery, the current preoccupation with disinflation will likely give way to more two-sided views of risk. The eight indicators listed below should function, as a group, as an early warning system that will detect growing imbalances or strains that could ultimately lead to upward pressure on prices. At the moment, this panel of indicators does not suggest any cause for concern. We will, however, attentively monitor the evolution of these series over time. Exhibit 5 summarizes these indicators and provides, where applicable, suggested trigger points for increased worry.

1. The 5y5y forward inflation breakeven

In the previous section, we discussed the importance of inflation expectations and the likelihood that inflation will stay contained over time as long as inflation expectations remain “anchored” around the Fed’s target. The first two indicators on our list therefore track inflation expectations, one derived from market prices and the other from a survey. The Fed’s preferred market-based measure of expectations is the “breakeven” rate, or the distance between real interest rates in the TIPS market and nominal interest rates on regular U.S. Treasuries. The Fed particularly watches the 5y5y forward breakeven rate as a gauge of medium-term expectations. Since 2000, this breakeven has averaged 2.7%, somewhat higher than the 2% inflation target—partly because it measures expectations for overall CPI inflation, which typically runs slightly higher than the core PCE rate that the Fed uses, and partly because nominal Treasury yields incorporate an inflation risk premium on top of the market’s forecast for inflation. At the moment, the 5y5y forward breakeven is running at roughly 2.5%, below its medium-term average. A sustained move significantly above 2.7%—say, to 3.0% or higher—would signal a possible de-anchoring of inflation expectations in the market, with a rise beyond 3.3% putting this indicator in “red” territory (Exhibit 6).

2. Long-term inflation expectations from the University of Michigan consumer survey

Meanwhile, inflation expectations can be measured via surveys that ask economic agents what they are looking for. A number of such surveys focus on “experts,” meaning professional economists or market professionals. By contrast, the monthly consumer confidence survey conducted by the University of Michigan includes questions about short- and long-term inflation expectations, thus capturing forecasts made by ordinary households. The 5- to 10-year ahead expectations survey (Exhibit 7) has displayed broad stability around an...
average of 2.9%. The most recent observation, 3.0% in August 2012, stood slightly above that mean. This series has not registered a reading of 3.2% or higher for more than five consecutive months since 1995. A move to the 3.2% area that lasts for six months or more, then, would suggest that expectations are coming unglued, with readings of 3.6% or higher generating even more concern (Exhibit 7).

3. Employment Cost Index

The next two indicators relate to labor market dynamics. In order for a true inflationary process to become entrenched in the economy, wage growth needs to participate (otherwise, as prices rise, real incomes will fall, and consumer spending will suffer, slowing overall growth). Tracking wage increases therefore represents an essential component of inflation-watching. Although the Employment Cost Index (ECI) appears only quarterly, in contrast with some other measures of wage inflation (such as average hourly earnings from the monthly labor market report), its broad coverage makes up for any loss in timeliness. The ECI, for example, includes benefit costs along with wages and salaries. In any case, wage inflation will not develop from one month to the next, meaning the quarterly frequency is perfectly adequate for spotting turning points. The most recent ECI reading stood at roughly 2% in both year-on-year and quarter-on-quarter annualized terms; bearing in mind the Fed’s inflation target and labor productivity growth (which absorbs a portion of wage increases without creating inflation pressure), the ECI would likely need to accelerate to a 3.5-4.25% pace before triggering significant concern (Exhibit 8).

4. The Fed’s long-run forecast for the unemployment rate

In its quarterly projections for various economic variables (along with the likely path of the funds rate), the Federal Open Market Committee (FOMC) includes forecasts for each of the following three years as well as an estimate for the “longer run.” Just as the number for inflation in this “longer run” column corresponds to the Fed’s inflation goal, the longer run unemployment rate outlook can be taken as an estimate of a “neutral” jobless rate (often known in the past as the “NAIRU,” and defined as the level of joblessness consistent with stable inflation). If this estimate begins creeping up, the Fed will be signaling a belief that the economy has less spare capacity than it previously thought. Alternatively, market participants who think the neutral unemployment rate stands at a higher level than the Fed’s own estimate might fear that the Fed will maintain easy policies for too long—somewhat similar to the experience of the late 1960s. Having learned from that period, the Fed seems unlikely to stick dogmatically with a too-low estimate of the neutral jobless rate for an extended period, in part because economists now understand that the neutral rate is less stable than once was thought. Still, investors should monitor the relationship between the actual unemployment rate, the Fed’s neutral-rate estimate and other indicators of labor market slack (including measures of wage inflation) for signs that pressures are building. At the moment, with the unemployment rate above 8%, compared with the Fed’s long-run jobless rate projection of 5.2-6.0%, there seems little doubt that the labor market is operating with significant spare capacity.
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5. ISM non-manufacturing survey prices component

Inflation rates for goods tend to cluster fairly closely together across countries. Inflation in services, by contrast, primarily reflects local conditions. Central banks pay especially careful attention to services inflation, on the grounds that this category of the CPI is most susceptible to influence by domestic growth and monetary developments. The ISM non-manufacturing survey, published each month a few days after the higher-profile manufacturing version, includes a question about price developments. While history for this series dates back only to 1997, since that time the prices component has done reasonably well at capturing inflection points in core inflation, and with a considerable lead time. For this indicator, a large and sustained increase would trigger concern, rather than the achievement of a particular level. Most recently, the ISM non-manufacturing prices component has ticked up, but remains below its six-month-earlier level, consistent with an “all clear” signal for now (Exhibit 9).

6. Overall commodity price indices

The remaining three indicators all capture global trends, in particular as they relate to pressure on available resources. Broad measures of commodity prices provide one window onto these dynamics. Individual commodities have not done well historically in presaging broad inflation trends—including gold, which since the 1980s actually has shown a very small negative correlation with future U.S. core consumer price developments. In a test of 14 commodities, comparing their price movements with subsequent trends in core inflation, only soft logs carried significant explanatory power, and even in this case the relationship was slight (with the connection most likely due to the relationship between soft logs and housing activity, which tends to heat up when the overall economy is booming and pressing up against resource constraints—though in any set of 14 statistical tests, one might easily come up significant through pure chance). Overall indices can provide a broader snapshot of global capacity pressures in general, rather than reflecting relative price changes caused by, say, an oil embargo or an individual crop failure. Unfortunately, each of the major commodity price indices possesses strengths and weaknesses. The widely followed CRB index, for example, assigns oil a lighter weight than other indices and thus allows a broader range of commodities to influence the overall figures, but only includes W.T.I. crude oil, which has lost its formerly close connection both to global trends and to U.S. gasoline prices. Looking at trends in three or four high-profile indices can provide a good aggregate view of the sector. At the moment, commodity indices are signaling little or no pressure on global prices. The CRB index, for example, has dropped 0.3% thus far in 2012 (Exhibit 10).

7. The Baltic Dry Index

This indicator tracks global freight shipping costs and thus provides a real-time reading on trade activity and by extension the relationship between economic growth and available resources (in this case, specifically ships). It generally has done well at capturing inflection points in the global cycle, though it does also get pushed around by specific developments in shipping capacity that may diverge from broader economic trends, basically because of the very long lead times involved in ordering and building new ships. In early 2012, for example, the index dropped sharply, in part, because fresh shipping capacity became available that had been ordered before the recession—a different dynamic than was unfolding for overall global industrial capacity, for example. Even on this occasion, though, the index accurately signaled that the acceleration in global growth evident at the start of 2012 was not

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Source: JPMSI; data through June 2012.

**Exhibit 9: ISM Non-Manufacturing Prices Paid Component and Core CPI**

![ISM Non-Manufacturing Prices Paid Component and Core CPI](image1)

Source: JPMSI; data through June 2012.

**Exhibit 10: Commodity Price Indices**

![Commodity Price Indices](image2)

Source: JPMSI; data through July 13, 2012.
straining available resources; other than for oil, which was also responding to a fairly narrow set of stimuli, prices in general did not come under significant upward pressure. The Baltic Dry Index has stabilized since its early-2012 plunge but remains far below its 2011 average (Exhibit 11).

8. Chinese renminbi (CNY)

China’s rise to global prominence as a manufacturing exporter and commodity importer has exercised significant influence over global inflation trends in recent years. The incorporation of its large labor force into the worldwide pool helped restrain wage costs during the years of strong global growth, and the country’s rapid, commodity-intensive development has pushed up prices of a range of raw materials, affecting reported inflation rates. Since 2005, the appreciation of the nominal CNY exchange rate has partly compensated for low domestic wages, boosting the cost of Chinese goods in dollar terms. But Chinese labor costs now appear to have risen sufficiently to make China much less of a force for global disinflation than was the case in the past. Stability in CNY during the course of 2012 likely reflects in part the fact that the economy is no longer so overwhelmingly competitive as to glide through episodes of global weakness undamaged. In addition to its small but direct influence on inflation in the U.S. and elsewhere (as CNY appreciation implies dollar depreciation), movements in CNY can serve as a summary measure of China’s role in the world as well as of the global economy itself. CNY appreciation will likely occur when Chinese policymakers feel comfortable with both international and local economic conditions—circumstances more likely to generate upward pressure on inflation.

Conclusion

At the moment, with the global and U.S. economies mired in sluggish growth and suffering high unemployment rates, inflation poses only a remote threat. Moreover, the anchoring of inflation expectations may make the economy less inflation-prone than in the past, while also dampening the effect of one-time shocks, such as jumps in the oil price. Nonetheless, investors cannot afford to lose sight of the topic entirely. Central banks have made policy mistakes in the past and could do so again. Experience suggests that a group of indicators, such as those identified above, should signal any developing inflation problem, and investors can monitor this information for early warning signs. In future papers, we will explore the investment implications of inflation concern, focusing on asset classes that may provide protection against not only the steady erosion of real value by ongoing inflation but also against inflation surprises.

Source: Bloomberg; data through July 16, 2012.
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