

EQUITY

RESEARCH:

UNITED STATES

Investment Policy

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Inflationary Icons

War and Oil

- **Over the entire history of the United States, very low inflation (under 2%) is the norm. High inflation and strong deflation are both anomalies.**
- **Nearly every period of high inflation in the U.S. was associated with a war.**
- **Recent economic reports confirm that inflation has begun to accelerate since troughing in November of last year.**
- **Besides energy prices, some key inflation issues today include the U.S. dollar and the U.S. budget deficit.**
- **The direct cost of higher oil prices (gasoline, home heating oil, jet fuel, etc.) is not the only inflationary factor. The longer-term indirect costs of redirecting investment to adjust to higher energy prices siphon off innovation that might have otherwise produced more output per man hour, rather than per BTU. Those costs can create the basis for multiple years of low productivity and underpin inflation.**
- **Has the disinflationary experience of the past two decades created a mood of complacency vis-à-vis inflation? Once again the U.S. is engaged in a war, albeit a new kind of war. Which raises the obvious question: Will the war in Iraq/War on Terrorism create the same inflationary pressures that earlier wars did?**

United States

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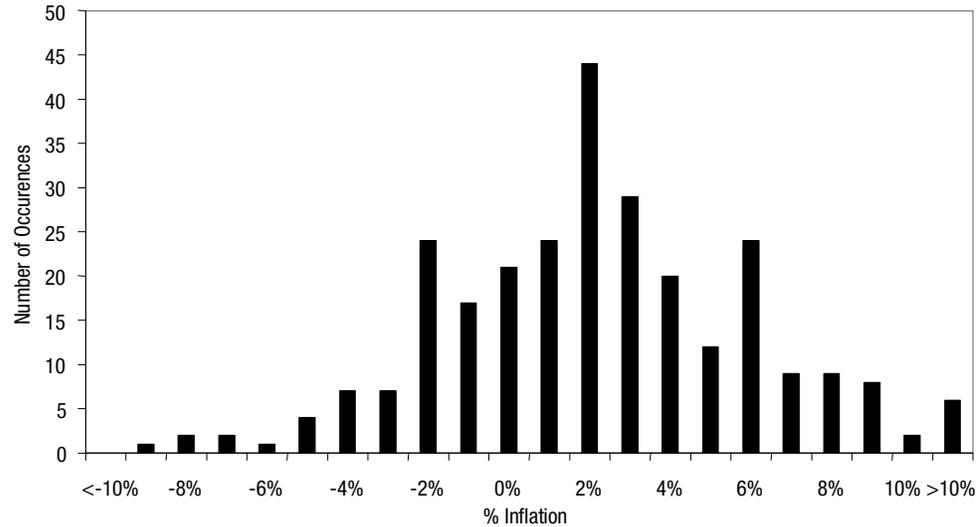
Inflation and War

While inflation has, and likely will continue to, oscillate cyclically, driven by supply demand constraints (pressures, which are largely absent today), over the entire history of the United States, very low inflation is the norm, and high inflation and strong deflation are both anomalies (see Figure 1).

Very low inflation is the norm.

Figure 1. Frequency Distribution of Inflation

(ten-year moving average of inflation as measured by the Wholesale Price Index, 1720–Present)



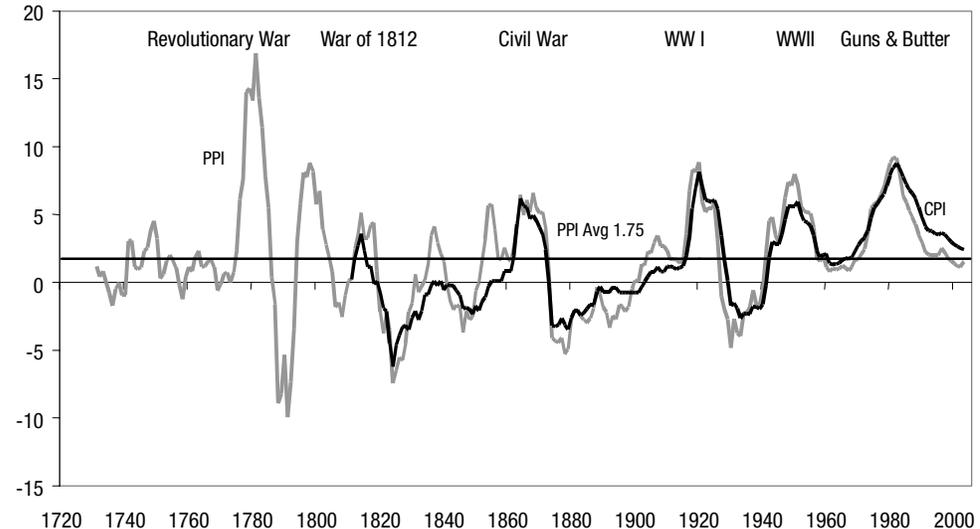
Source: 1947–2004, Bureau of Labor Statistics: PPI — Finished Goods (SA, 1982=100); 1890–1946, BLS: Wholesale Price Indexes, Handbook of Labor Statistics, 1950 edition; 1749–1890, Wholesale Price Indexes (Warren and Pearson), by Major Product Groups: 1749–1890; Historical Statistics of the United States; 1720–1748, Wholesale Price Indexes (Bezanson) for Philadelphia: Historical Statistics of United States

Until the post–WW II period, nearly every period of high inflation in the U.S. was associated with a war: the Revolutionary War, the War of 1812, the Civil War, and World Wars I and II (see Figure 2).

Nearly every period of high inflation in the U.S. was associated with a war.

Figure 2. Wholesale Price Index and Consumer Price Index

(ten-year moving average)



Source: PPI: Same as Figure 1; CPI: BLS

At the same time that the economy's productive capacity is reduced, demand increases rapidly as the war effort is ramped up.

During wars, production is restricted as workers join the armed forces, businesses are focused on producing war material, and the economic infrastructure is adversely affected by the war itself (which disrupts transportation by road, rail, water, etc.). Everyday necessities such as food and fuel rise in price. Just as the economy's productive capacity is reduced, demand increases rapidly as the war effort is ramped up.

Concomitant with the inflationary impact of the shift to a wartime economy, government policy is usually inflationary too. To finance a war, a government has four main options:

- 1 *Borrow domestically.* While borrowing raises interest rates and reduces funds for consumption (and, therefore, is initially destimulative/deflationary), the resultant budget deficit creates the underpinnings for a longer-term inflationary problem.
- 2 *Get funds from foreign nations.* This approach weakens the country's currency, making imports more dear, and is therefore inflationary.
- 3 *Print money.* By definition, printing money is inflationary.
- 4 *Raise taxes.* While this approach is deflationary, it is a politically difficult option given that citizens are already burdened by the exigencies of war.

While the early data are sketchy at best, the rate of wholesale inflation was over 160% between 1776 and 1778; 43% between 1812 and 1814; 116% between 1862 and 1864; 89% between 1916 and 1918; and 46% between 1945 and 1948. But the inflation that sticks in the memories of those alive today was that of the late 1970s—between 1973 and 1981 inflation rose 130%, with two “wars” largely being responsible.

Guns, Butter, and Inflation

In the late 1960s, a combination of factors led to secular inflation. President Johnson attempted to fight both the war on poverty and the war in Vietnam without raising taxes — even though the unemployment rate was only 4% in 1965. With the economy already booming, the twin wars against poverty and the Viet Cong stoked pricing pressures. At the time, there was a dearth of foreign competition to dissuade U.S. firms from raising prices to meet the demands of increasingly militant labor unions

In the late 1970s, the overwhelming bulk of leading economists argued that Americans should learn to live with high inflation.

Nevertheless, inflation was not considered a problem, or at least so the popular opinion was at the time. Given the choice between the widely remembered deflationary depression of the 1930s and rising inflation, the latter choice seemed more palatable. Moreover, as economist Michael Boskin pointed out, in the late 1970s “the overwhelming bulk of leading economists argued that we should learn to live with this high inflation, indexing more contracts and government programs, and attempt to stabilize the inflation rate at around 10%. The thinking at the time was that the substantial cost of disinflation was unbearable¹.”

¹ Luncheon address to the American Economic Association/American Finance Association Annual Joint Meeting, January 4, 1997, New Orleans, Louisiana.

A series of oil price shocks, including OPEC quadrupling prices in 1974, helped fuel higher inflation. By the winter of 1979, the Consumer Price Index (CPI) was advancing at a 13% annual rate. Curbing that rampant inflation became a mandate for two newcomers to Washington D.C.: Paul Volcker (appointed Federal Reserve chairman in the autumn of 1979) and Ronald Reagan (elected president a year later).

A change in monetary policy (Volcker) and in fiscal policy (Reagan) proved to be disinflationary.

Mr. Volcker’s tight monetary policy caused a sharp but short recession in 1980. When that failed to curb inflation, Mr. Volcker tightened once again, leading to a much longer downturn that began in July 1981 and did not end until November 1982. As for President Reagan, the central tenets of Reaganism were reducing regulation (key industries — notably, trucking, railroads, airlines, telecom and financial services — were all deregulated), cutting taxes (federal income taxes were cut in 1983), and trimming government spending (except defense).

Two Decades of Disinflation

Reaganomics put severe pressure on many corporations that had grown accustomed to raising prices at will. Adding to disinflation were the high real interest rates of the mid-1980s, the strong dollar of 1983–85, and intense competition from industrializing countries in Asia.

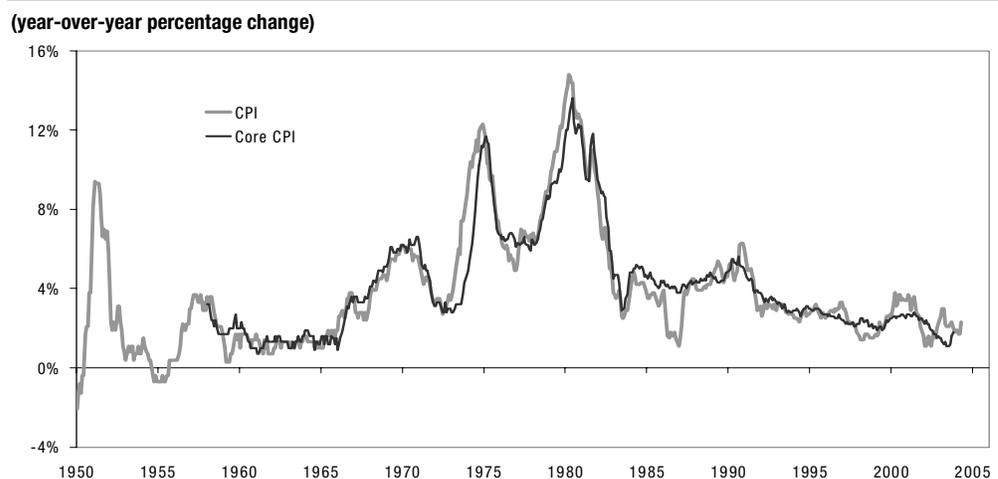
Corporate America moved to adjust to the harsh competitive climate of the 1980s by slashing headcount, spinning off less profitable businesses, and using new technology to reengineer operations. These initiatives only added to the disinflationary pressures. In the 1990s, declining technology costs drove strong productivity gains, which also helped keep inflation low.

2004: Mounting Evidence of Inflation

Recent economic reports confirm that inflation has begun to accelerate since troughing in November of last year.

Recent economic reports confirm that inflation has begun to accelerate since troughing in November of last year. The headline Consumer Price Index (CPI) rose 2.3% (year over year) through April, compared to a 1.7% rise through March; core CPI (excluding food and energy) posted a 1.8% year over year gain in April compared to 1.6% though March (see Figure 3). Since the beginning of the year, core CPI has risen at a 3.3% annualized pace.

Figure 3. Nominal CPI and Core CPI (ex Food and Energy)



Source: Bureau of Labor Statistics

CPI, which monitors price changes of a fixed basket of goods and services each month, is the most common way to gauge inflationary pressure and is typically tied to inflation-linked products (such as Treasury Inflation Protected Securities, or “TIPS”). Its largest single component is “owners equivalent rent” (OER), which attempts to impute the rental value of a home. OER represents 22% of nominal CPI and 28% of core CPI. Given that low mortgage rates have substantially increased home ownership during the last few years, median home prices have risen approximately 7.0% (year over year) through April while OER has risen only 2.3%. While OER has recently risen at a faster rate than the overall index, its disparity with rising housing prices is significant. Consequently, some forecasters contend that CPI may be actually be understating true inflationary pressures.

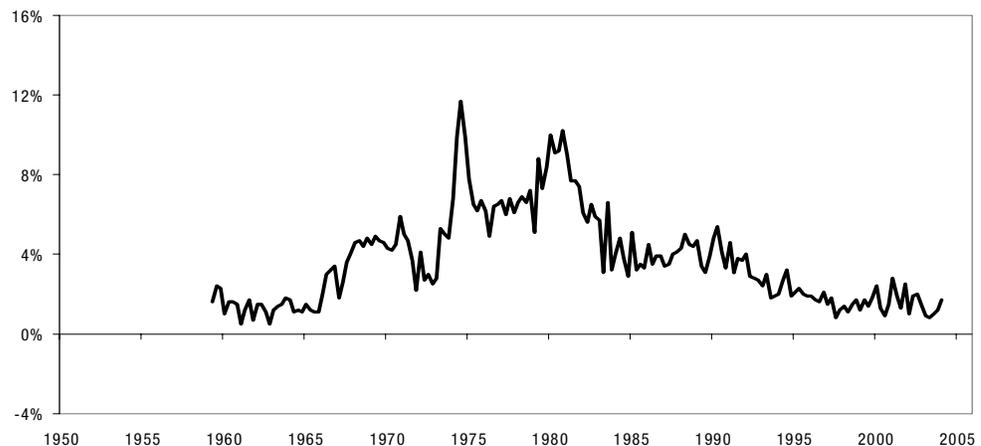
The PCE deflator is the Fed’s preferred inflation measure.

The personal consumption expenditure (PCE) index is another way to track inflation. Fed policymakers tend to favor PCE since it tracks a broader range of products and services than CPI and uses a constantly adjusting (or “chain-weighted”) approach rather a fixed basket. This allows PCE to measure what is actually sold within a particular timeframe.

CPI and PCE measures usually differ due to differences in the relative weights included in each index. For example, the energy component is approximately 7.0% of CPI but represents only 5.0% of personal consumer spending. Essentially, this has contributed to higher recent CPI readings compared to PCE readings. PCE core measures have also been relatively lower (see Figure 4). For instance, the core PCE deflator rose 0.1% in April compared to a 0.3% rise in core CPI. Moreover, core PCE was 1.4% higher (year over year) in April compared to a 1.8% rise in core CPI.

Figure 4. Core PCE Deflator (ex Food and Energy)

(year-over-year percentage change)



Source: Bureau of Labor Statistics

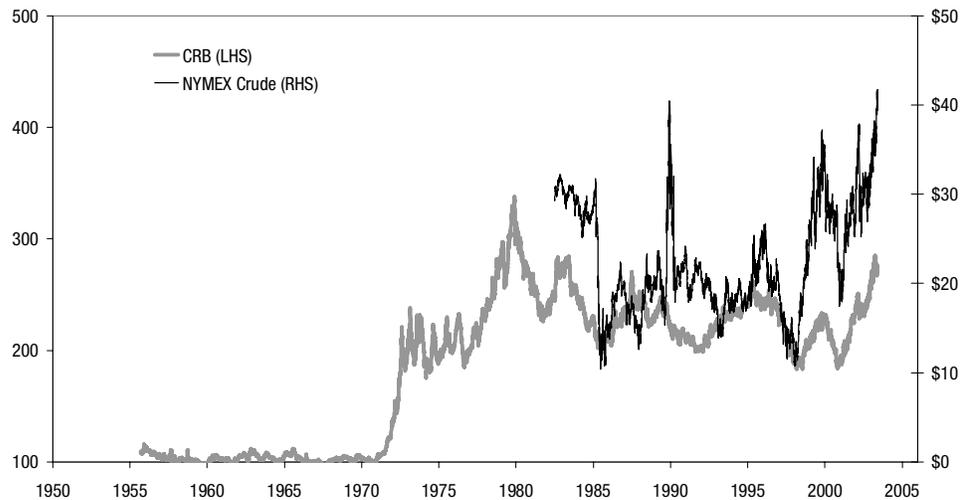
Wholesale prices have also moved sharply higher.

Wholesale prices have also moved sharply higher. The Producer Price index (PPI) was 3.7% higher in April than it was one year ago, compared to the 1.4% year-over-year rise reported in March. Of course, rising input costs are relevant to consumers only to the extent that they affect retail prices. Fortunately, until recently, the lack of pricing power has supported a relatively muted impact on inflation.

Higher Commodity Prices

The recent rise in inflationary pressure has partly been due to higher commodity prices driven by outsized demand. In fact, the benchmark CRB (Commodities Research Bureau) Index reached a 20-year high in March due to sharply higher industrial prices that have been accelerating since last year (see Figure 5).

Figure 5. CRB Index and Crude Oil Prices



Source: StockVal

Commodity prices overall are still hovering at 20-year highs.

Continued robust growth in the U.S. and in fast-developing countries (particularly China) is sparking some rebound in pricing power. Until recently, producers had been willing to absorb additional input costs, partly due to fear of losing market share in a highly competitive climate. To be sure, commodities prices have begun to recede (with the notable exception of the energy complex) as government efforts to cool down China’s economy proceed, but prices overall are still hovering at 20-year highs.

Although investors typically link rising commodity prices with inflation, concerns about the potential impact are commonly overdone. As Fed Governor Santomero recently observed, “Commodity price pressures are rarely sustained and often reversed” and “represent a relatively small share of final product prices.” Indeed, even though commodity prices have risen substantially in the last few years, CPI and PCE (excluding food and energy) have been relatively muted.

Commodity inflation represents transitory, not permanent, price shifts.

Importantly, investors should also keep in mind that commodity inflation represents transitory, not permanent, price shifts. This is why investors and economists often have different views about what should be characterized as “inflation.” Consumers contend that any rise in the price level is inflationary. That may be true, but economists are principally concerned with components that cause a long-term *sustainable* rise in prices. For that reason, whether interpreting CPI, PCE, or PPI, forecasters tend to focus on the *core* reading rather than the more popularly reported *nominal* (or headline) measure.

Core readings essentially exclude the more volatile food and energy components. That may seem counterintuitive, especially since consumers are directly affected by food and energy prices every day. However, just like prices of other commodities, food and energy prices more closely reflect temporary conditions associated with supply and demand than they do a sustained rise in the price level. As a result, a food or energy price spike that has an impact on nominal inflation is generally considered a short-term phenomenon and is not integrated into longer-term fundamental forecasts.

Economists characterize higher gas prices as a “consumption tax” instead of inflation.

Of course, focusing on core indexes may not make it any easier to digest elevated prices at the pump, but it does explain why economists regularly characterize higher gas prices as a “consumption tax” instead of inflation.

Oil Impact

Some might consider characterizing crude oil as a “consumption tax” as nothing more than a semantic exercise. After all, labeling it as a “consumption tax” changes nothing — oil prices have still risen steadily since last September. In fact, crude oil prices have risen more than 50% since last September and recently reached a record high in excess of \$42 per barrel. Since energy price gains are likely to be passed onto consumers via transportation and production costs, they should remain a significant contributor to headline inflation.

Moreover, as we discuss below, the surge in oil prices that occurred in the late 1970s and early 1980s preceded a direct slowdown in business productivity. Although evidence of this trend has not yet surfaced in the current recovery (instead, nonfarm productivity accelerated to record highs), a sustained rise in energy prices would most likely produce a similar effect. That, in turn, would foster further inflationary pressures.

We expect oil prices to remain elevated (and possibly reach new highs) in coming months.

Given the ongoing turmoil in the Middle East, the onset of the summer driving season, and the low odds of a significant decline in global demand, we expect oil prices to remain elevated (and possibly reach new highs) in coming months. We maintain this view despite recent pronouncements from Saudi Arabia promising to increase production and entreaties to other OPEC members. No matter the intentions, it appears unrealistic to assume that producers could generate enough additional supply or new capacity to restrain prices given current and expected high levels of demand.

Managing Expectations

CPI and other common inflation measures are lagging — not leading — economic indicators.

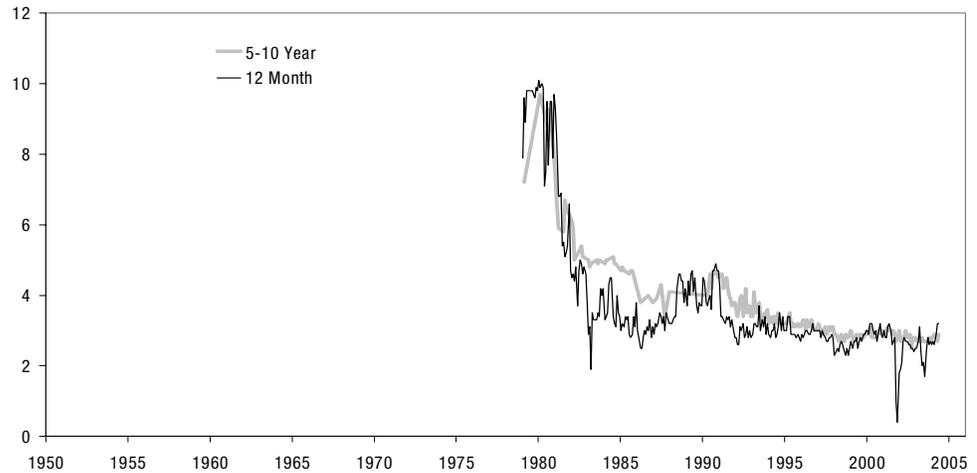
Perhaps just as important as the effect the price of oil has on actual inflation is the impact it has on expectations. Remember, CPI and other common inflation measures are lagging — not leading — economic indicators. Consequently, forward-looking gauges that measure expectations have a critical role in guiding monetary policy and determining inflation forecasts. Inflation expectations are important because they typically become self-fulfilling. In other words, once consumers believe inflation is imminent, it becomes easier for producers to regain pricing power and more likely that workers will demand higher wages.

The University of Michigan (UM) Survey of Consumer Confidence suggests near-term inflation expectations have doubled in the last 12 months (see Figure 6). This

is not surprising given the sharp rise in energy prices and the heightened geopolitical concerns persisting in the Middle East. The good news is that medium- and long-term inflation expectations have remained fairly stable and well within their historical range. For instance, medium-term expectations have been between 2.7% and 2.9% since 1997, and five-year expectations have ranged from 3.0% to 3.5% since 1998.

Figure 6. University of Michigan Survey of Consumer Confidence: Inflation Expectations

(in percent)



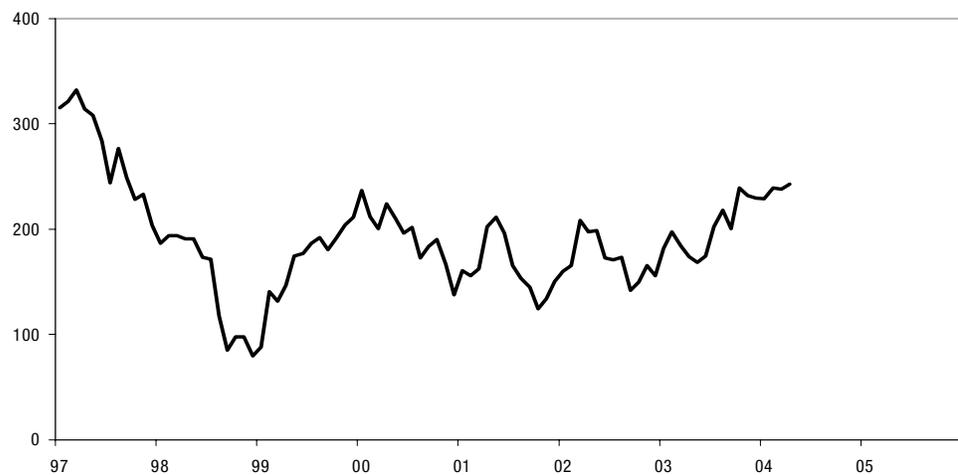
Source: University of Michigan

Long-term inflation expectations appear to have remained well contained.

This can be interpreted to mean that consumers view current inflationary pressures as temporary. Indeed, the May 4 FOMC statement noted that “Although incoming inflation data have moved somewhat higher, long-term inflation expectations appear to have remained well contained.”

Figure 7. Ten-Year TIPS Break-Even Spreads

(in basis points)



Source: Bloomberg

That being said, inflation fears are present in the bond market. For example, Treasury Inflation Protected Securities (TIPS) break-even spreads have steadily risen since July of last year, from 165 basis points (bps) to a seven-year high of 276 bps on May 19. See Figure 7. (The median long-term spread is 227 bps.) To be sure, these break-even spreads are not considered accurate indications of expected inflation since they are distorted by relatively lower liquidity (compared to nominals) and outsized current demand. However, the impressive rapid widening that has recently occurred is clearly a reflection of increased inflation fears.

Weak Dollar, Wide Deficits

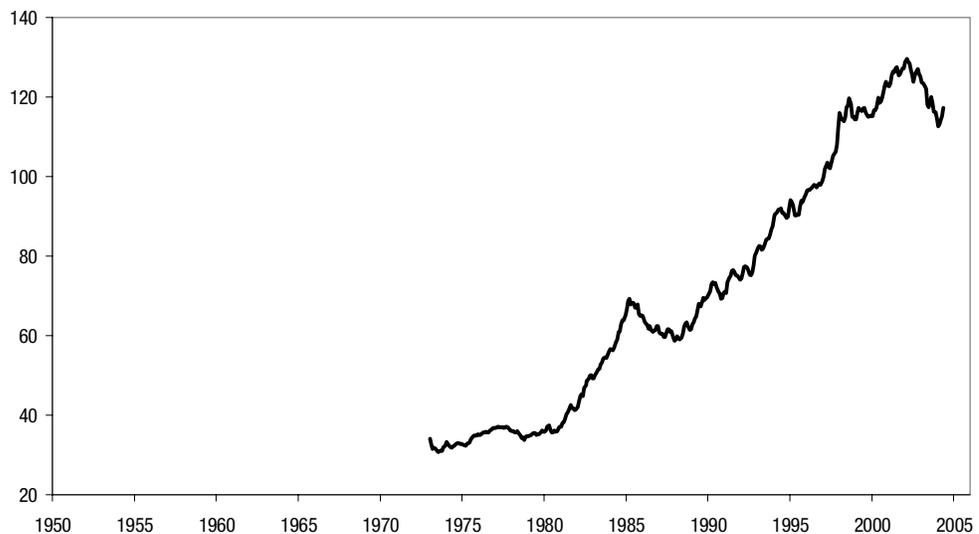
Besides energy prices, some key issues today are concerns about the U.S. dollar and the size of U.S. budget deficits.

Myriad factors shape inflationary expectations, depending on the nature of presiding economic conditions. Besides energy prices, some key determinants of inflationary expectations today include concerns about the U.S. dollar (USD) and the size of U.S. budget deficits.

U.S. dollar weakness (see Figure 8) has contributed to recent inflation pressures and fostered higher inflation forecasts. Indeed, the trade-weighted USD has declined by 11.5% since its peak in early 2002 and approached a seven-year low in January. In addition, the USD drifted to a four-year low against the yen on March 31.

Figure 8. U.S. Dollar Index

(weighted average of foreign exchange values of \$ against currencies of major trading partners)



Source: Federal Reserve

U.S. dollar weakness stokes inflation fears since weaker currencies typically portend higher import prices. Surprisingly, these fears have been overstated until recently due to the willingness of foreign producers to forgo price hikes to avoid losing market share. For example, while import prices (excluding food and energy) rose by 2.4% (year over year) through April, core imports posted only a 1.0% year-over-year gain through March.

The USD should weaken further.

The dollar has regained some strength in the last two months due to rising expectations for an earlier-than-expected Fed rate hike after the next FOMC meeting in late June. However, given a record U.S. current account deficit, an extraordinary

(and growing) appetite for foreign goods, and an apparent resurgence of pricing power, stagnant prices are unlikely to continue. In addition, the USD should weaken further since current expectations for Fed tightening appear extreme (fed fund futures imply a 100 bps rise by year-end) and concerns about the looming current account deficit should persist.

The relative strength of the dollar has important implications for global energy prices since crude oil is universally traded in U.S. dollars. In fact, OPEC members are more inclined to support higher prices since a weaker USD essentially produces lower oil revenues. This, in turn, produces additional inflationary pressures.

The massive federal budget deficit compounds these concerns.

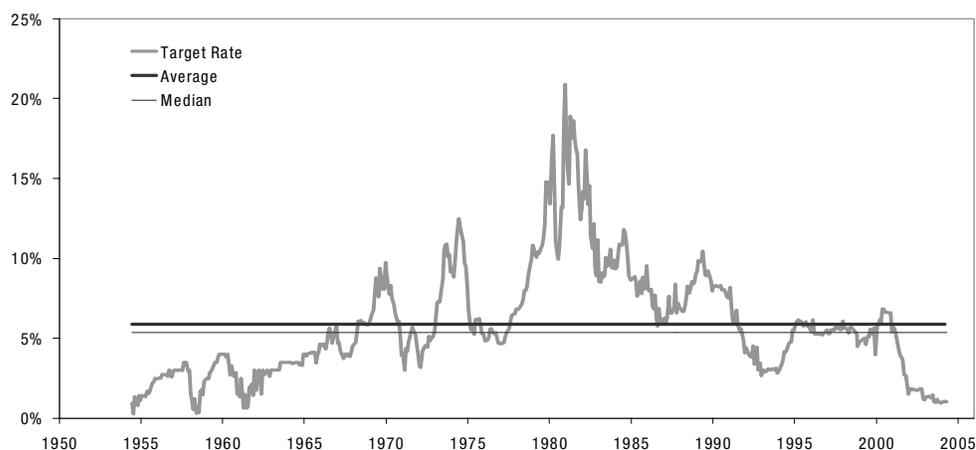
The massive federal budget deficit compounds these concerns. Lower tax receipts, increased government spending, and recently implemented federal tax cuts caused the deficit to rapidly expand in the last few years. Indeed, the Congressional Budget Office now estimates it should approach \$500 billion in the current fiscal year. Given that military spending and homeland security costs are not poised to decline, the U.S. could also confront a strain on resources that fosters inflation akin to that experienced in past wartimes.

Focus on the Fed

The Fed is being scrutinized — and increasingly criticized — for maintaining an easy monetary policy.

Heightened market sensitivity to inflationary pressures has magnified attention on the words and actions (or inactions) of Federal Reserve policymakers. The Fed is being scrutinized — and increasingly criticized — for maintaining an easy monetary policy. Namely, critics are vexed by the central bank’s decision to retain a 1.0% funds rate (its lowest target since 1958; see Figure 9) despite concrete evidence of above-trend economic growth that commenced in the second half of last year.

Figure 9. Fed Funds Target Rate



Source: Federal Reserve

Of course, investors should keep in mind that rising inflation is a natural byproduct of improving economic growth. Nevertheless, fears have grown that the Fed is behind the curve and that the extraordinary level of accommodative policy may cause an unintended spike in consumer prices. The Fed continues to contend that core inflation is “likely to remain in the zone of price stability” through next year.

In their last FOMC statement, policymakers acknowledged that inflation data have moved somewhat higher.

To be sure, in their last FOMC statement, policymakers acknowledged that inflation data have moved somewhat higher and that “risks to the goal of price stability have moved into balance.” In other words, the deflationary concerns that had been mentioned as recently as December had been diminished. Moreover, Fed governors clearly suggested that the first rate hike in four years will likely be announced after their next meeting on June 29–30. Given a median 5.36% fed funds rate since 1954, the probable 25 bps rate hike expected in June can hardly be characterized as “tight” monetary policy. Less accommodative, perhaps, but the slightly increased rate would be a far stretch from “normalized” levels estimated to be in the 3.5%–4.0% range.

Policymakers have maintained a 1.0% fed funds rate for two principal reasons: 1) anemic job creation and 2) evidence of dormant core inflation. Weak labor conditions and muted inflationary pressures have been particularly surprising given the huge uptick in demand growth. For instance, real GDP grew by 4.2% in the first quarter of this year, following impressive 8.2% and 4.1% growth rates during the last two quarters of 2003.

The Fed views inflation as “well-contained” due to the impressive burst in productivity.

Fed governors are fond of characterizing inflation as “well-contained” due to the impressive burst in productivity, even as the economy slowed. Perhaps most significant has been the unprecedented three-year decline in unit labor costs since rising wages are largely viewed as the greatest threat to price stability. After all, approximately two-thirds of final goods prices can be attributed to employee wages. Consequently, unit labor costs are a key determinant of inflation forecasts.

Improved corporate efficiencies have significantly inhibited labor costs. Essentially, companies have raised profitability while lowering headcount and without materially lengthening workweeks or boosting wages. Of course, this advantageous growth/inflation trade-off is likely to diminish as productivity slows.

In addition, policymakers like to refer to the so-called output gap — or difference between actual and potential economic output — which suggests that overall resource slack has not significantly diminished. This gap essentially restrains inflation by moderating wage increases and pricing power. Given that inflation is muted, capacity utilization remains low, and employment conditions are only just beginning to improve, the Fed believes that “... policy accommodation can be removed at a pace that is likely to be measured.”

War and Oil Again?

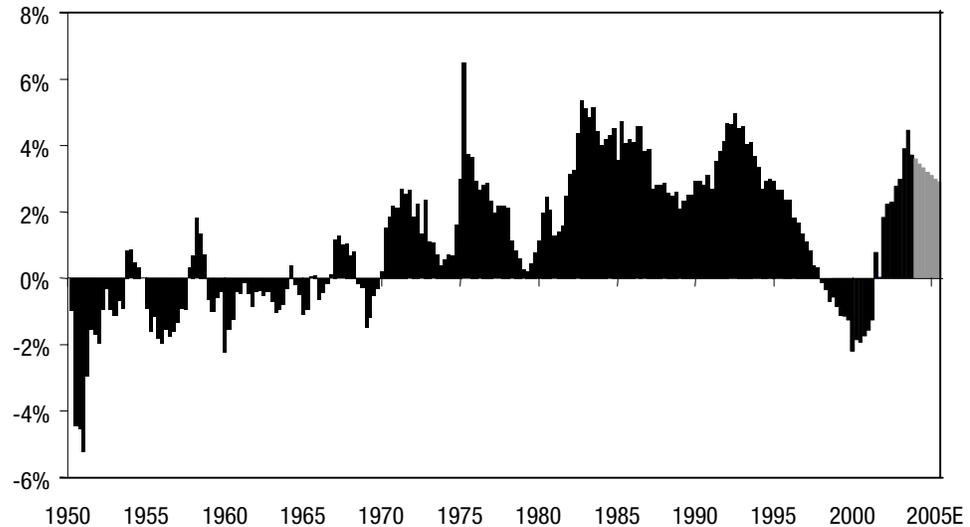
Has the disinflationary experience of the past two decades created complacency vis-à-vis inflation?

Has the disinflationary experience of the past two decades created complacency vis-à-vis inflation? Once again the U.S. is engaged in a war, albeit a new kind of war. Which raises the obvious question: Will the war in Iraq/War on Terrorism create the same inflationary pressures that earlier wars did?

While a direct impact — i.e., production being restricted as workers join the armed forces, businesses being focused on producing war material, and the economic infrastructure being adversely affected by the war itself — seems unlikely, the question is whether there will be an inflationary policy bias to fund the war? Specifically will there be an increase in the government budget deficit (see Figure 10) and a further weakening in the dollar (see Figure 8), both of which are

underpinnings of inflation? Also, while it seems that 21st century wars are not man- and material-intensive (relying more on technology), a prolonged drain on manpower (e.g., a call up of the National Guard) could produce some of the “direct” causes of inflation.

Figure 10. U.S. Budget Deficit as a Percentage of GDP



Source: StockVal and Smith Barney

Thus far, all we have seen is an end to disinflation.

It would seem that we are not there — yet. Thus far, all we have seen is an end to disinflation, a disinflation that very recently engendered fears of outright deflation. However, this new war, like those before it, has the potential to unleash inflationary forces. Moreover, there may not be the resolute anti-inflationary agenda that the 1980s and 1990s saw. Then, the memory was fresh of the inflationary impact of “guns and butter”— the cost of simultaneously fighting the war in Vietnam and the war on poverty — exacerbated by a series of oil price shocks out of the Middle East.

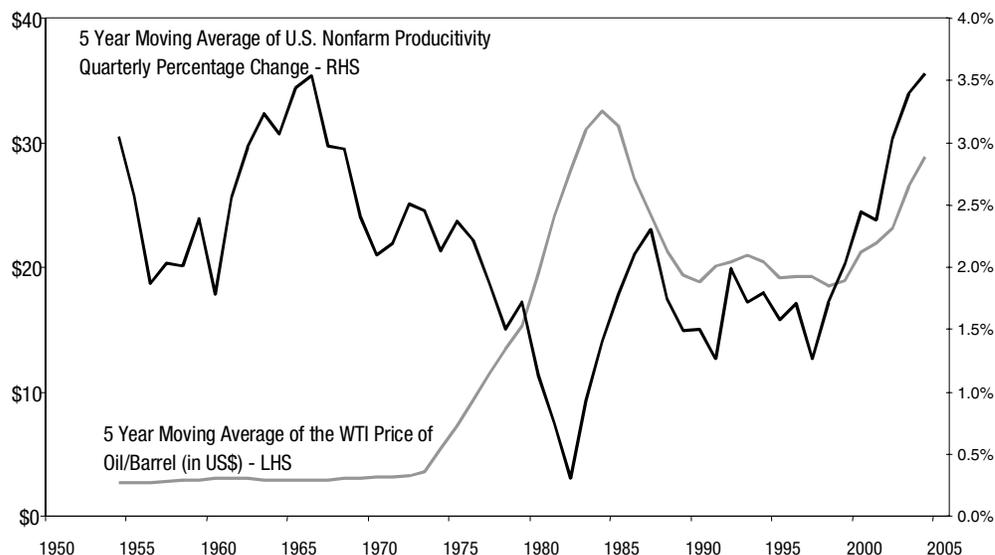
In large part, it was the redirection of investment and technology to adjust the economy to \$30/barrel oil (1980) from \$3/barrel oil (1973) — from insulating homes to reengineering machinery — that lead to a dearth of productivity as this effort siphoned off innovation that might have otherwise produced more output per man hour, rather than per BTU.

The direct cost of higher oil price is not the only inflationary factor.

In other words, the direct cost of higher oil prices (gasoline, home heating oil, jet fuel, etc.) is not the only inflationary factor. The longer-term indirect cost of redirecting productivity and innovation to adjust to higher oil prices also contributes to inflation. Those costs create the basis for multiple years of low productivity (in GDP/man hours terms), which underpins inflation. The surge in oil prices in the late 1970s/early 1980s was accompanied by a sustained period of declining productivity (see Figure 11).

Figure 11. Productivity and Oil Prices

(five-year moving averages)



Source: StockVal

The Fed is viewed as not predisposed to policies that support high inflation.

Today the “recent memory” is the deflation fear of 2003. Indeed, reflation has, thus far, been welcomed. But the Fed is viewed as not predisposed to policies that support high inflation. So recent reflationary policies, which removed the deflationary forces that were so vivid just a few months ago, should not be confused with inflationary policies.

All in all, the question remains whether, despite the intentions of the Federal Reserve’s monetary policy, the fiscal policy that is financing the war, and/or exogenous forces vis-à-vis energy prices, will bring about a period of uncomfortably high inflation.

Risks

The U.S. economy has been “demand strong, supply light.”

The risk to the “inflationary icons” scenario outlined above is that the current inflationary spike will not last. This is the opinion of Citigroup Economist Steven Wieting, who argues that the U.S. economy has been “demand strong, supply light” over the last four years, as production and investment corrected lower following the investment-led expansion of the 1990s. The imbalance between constrained supply and persistent demand has resulted in spot shortages. However, a supply rebound appears to be under way, and this rebound should eventually help stabilize pricing.

Rising production will likely follow higher profits.

While both real disposable income and spending have risen at a stable pace — just over 3% per year over the past four years — both domestic production and business inventories (including imported inventories) have shown no net growth. However, the sharp rise in profits for many industries suggests that rising production will likely follow those profits higher. A production response will rebalance supply and demand, stemming further price increases, *even as rising production adds to demand for labor raw materials, and other inputs.* Rebounding production is one of the reasons that economic recoveries have been associated with *decelerating inflation*, while recessions have been associated with pricing spikes.

***Citigroup economists
expect the Fed to remain
vigilant.***

Citigroup economists expect the Fed to remain vigilant, raising short-term rates as needed to forestall any pickup in inflation expectations and, thereby, in behavior that fuels inflation, longer term. They assume that a combination of higher oil prices and tighter monetary policy/financial conditions will help keep growth at the type of moderate levels that would not lead to overheating during this cycle. Consequently, inflation should remain extremely well behaved, peaking at a 2.3% average rate this year before easing to below 2% for the remainder of the five-year measurement period.

ANALYST CERTIFICATION**Appendix A-1**

We, Edward Kerschner and Michael Brandes, hereby certify that all of the views expressed in this research report accurately reflect our personal views about any and all of the subject issuer(s) or securities. We also certify that no part of our compensation was, is, or will be directly or indirectly related to the specific recommendation(s) or view(s) in this report.

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Investment ratings are a function of Smith Barney's expectation of total return (forecast price appreciation and dividend yield within the next 12 months) and risk rating.

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For securities in emerging markets (Asia Pacific, Emerging Europe/Middle East/Africa, and Latin America), investment ratings are: Buy [1] (expected total return of 15% or more for Low-Risk stocks, 20% or more for Medium-Risk stocks, 30% or more for High-Risk stocks, and 40% or more for Speculative stocks); Hold [2] (5%-15% for Low-Risk stocks, 10%-20% for Medium-Risk stocks, 15%-30% for High-Risk stocks, and 20%-40% for Speculative stocks); and Sell [3] (5% or less for Low-Risk stocks, 10% or less for Medium-Risk stocks, 15% or less for High-Risk stocks, and 20% or less for Speculative stocks).

Investment ratings are determined by the ranges described above at the time of initiation of coverage, a change in risk rating, or a change in target price. At other times, the expected total returns may fall outside of these ranges because of price movement and/or volatility. Such interim deviations from specified ranges will be permitted but will become subject to review by Research Management. Your decision to buy or sell a security should be based upon your personal investment objectives and should be made only after evaluating the stock's expected performance and risk.

Between September 9, 2002, and September 12, 2003, Smith Barney's stock ratings were based upon expected performance over the following 12 to 18 months relative to the analyst's industry coverage universe at such time. An Outperform (1) rating indicated that we expected the stock to outperform the analyst's industry coverage universe over the coming 12-18 months. An In-line (2) rating indicated that we expected the stock to perform approximately in line with the analyst's coverage universe. An Underperform (3) rating indicated that we expected the stock to underperform the analyst's coverage universe. In emerging markets, the same ratings classifications were used, but the stocks were rated based upon expected performance relative to the primary market index in the region or country. Our complementary Risk rating system -- Low (L), Medium (M), High (H), and Speculative (S) -- took into account predictability of financial results and stock price volatility. Risk ratings for Asia Pacific were determined by a quantitative screen which classified stocks into the same four risk categories. In the major markets, our Industry rating system -- Overweight, Marketweight, and Underweight -- took into account each analyst's evaluation of their industry coverage as compared to the primary market index in their region over the following 12 to 18 months.

Prior to September 9, 2002, the Firm's stock rating system was based upon the expected total return over the next 12 to 18 months. The total return required for a given rating depended on the degree of risk in a stock (the higher the risk, the higher the required return). A Buy (1) rating indicated an expected total return ranging from +15% or greater for a Low-Risk stock to +30% or greater for a Speculative stock. An Outperform (2) rating indicated an expected total return ranging from +5% to +15% (Low-Risk) to +10% to +30% (Speculative). A Neutral (3) rating indicated an expected total return ranging from -5% to +5% (Low-Risk) to -10% to +10% (Speculative). An Underperform (4) rating indicated an expected total return ranging from -5% to -15% (Low-Risk) to -10% to -20% (Speculative). A Sell (5) rating indicated an expected total return ranging from -15% or worse (Low-Risk) to -20% or worse (Speculative). The Risk ratings were the same as in the current system.

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