



Uncovering the Mayhem in 2008 in the TIPS Market

By Robert Huebscher

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If the current fiscal and monetary stimuli prove effective, Yale endowment manager David Swensen said two weeks ago, “it’s hard to see an environment where we are not dealing with substantial inflation.” If they don’t work, Swensen said we will face deflation.

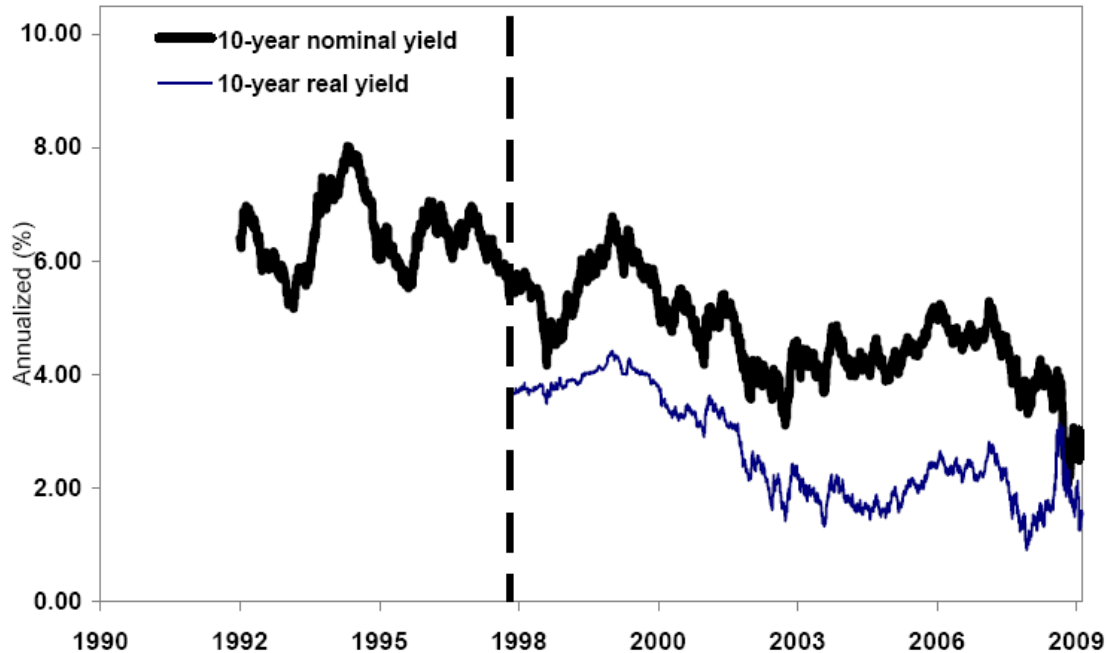
Swensen went on to say that Treasury Inflation Protected Securities (TIPS) are well-positioned to deliver superior performance under either scenario. Understanding the drivers of their performance is essential to sound portfolio construction.

Three well-known researchers – John Campbell of Harvard, Robert Shiller of Yale, and Luis Viceria of the Harvard Business School – have authored what is surely the most comprehensive historical [study](#) of the inflation-indexed bond markets. They document several noteworthy trends in the US and UK markets that highlight both the risks and opportunities in TIPS, which are summarized below with a focus on explaining the spike in TIPS volatility as the financial crisis escalated in 2008.

Real yields declined... until 2008

The graph below shows that real yields declined until 2008, when they spiked during the worst of the financial crisis:

US Real and Nominal Yields



The vertical dashed line represents the introduction of TIPS in the US markets in 1997.

From 2000 to 2007, real yields on TIPS declined from slightly over 4% to just over 1%, which coincided with a decline in nominal yields from 7% to 4%.

The common explanation for the decline in TIPS yields as the 2008 financial crisis began to unfold was a “flight to safety” as market participants became increasingly panicked. But this explanation is inconsistent with the surge in TIPS yields in the fall of 2008.

That surge coincided with the Lehman bankruptcy on September 15. While it is possible that Lehman’s bankruptcy signaled unanticipated stress in the US economy and pending deterioration of the government’s financial position, the authors offer a more likely explanation for the surge. They cite research that shows Lehman held TIPS through repurchase (“repo”) trades and as collateral for other transactions. Lehman became a forced seller of TIPS, depressing TIPS prices.

Commodity prices were also falling at the time, and the authors believe some commodity funds were forced to sell TIPS to maintain their target weightings.

To confirm their explanation, the authors studied the behavior of the inflation swaps market following the Lehman bankruptcy. Swaps are transactions used primarily by



levered investors, such as hedge funds, where one party pays the other an amount tied to the CPI rate in exchange for receiving a fixed payment. The swaps market confirmed this explanation – a “liquidity” event, with more sellers than buyers, drove down prices.

The authors summarize their findings about the 2008 TIPS episode:

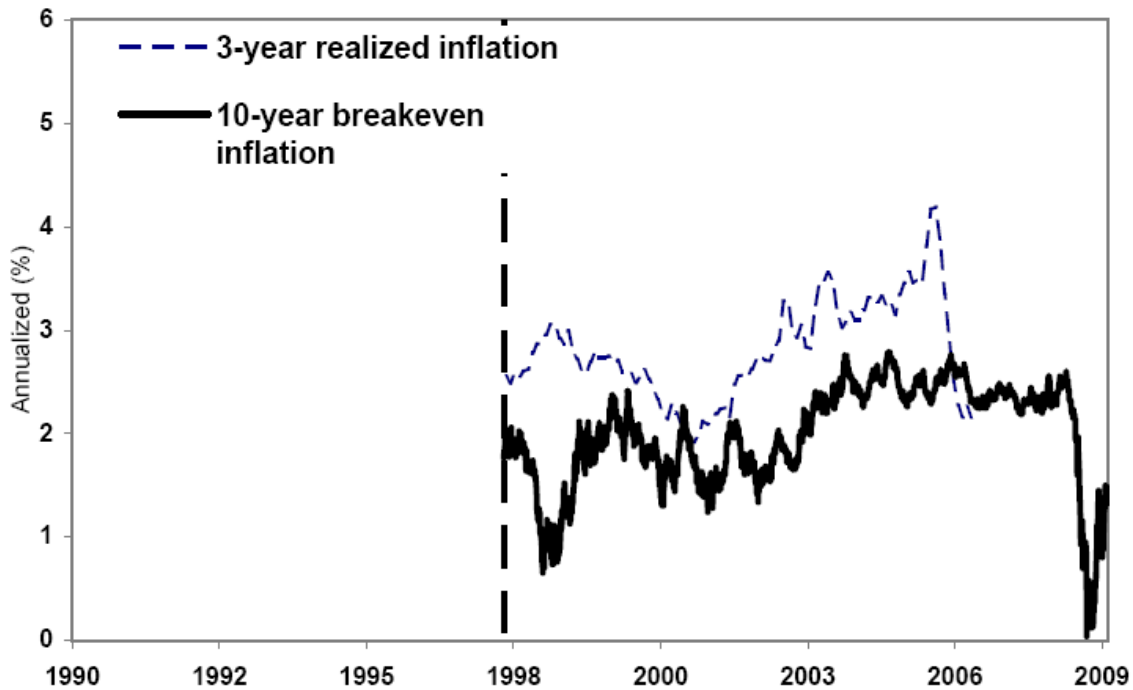
“We view the experience with TIPS yields after the Lehman bankruptcy as the sign of a highly abnormal market situation, where liquidity problems suddenly created severe financial anomalies. This may seem to imply that we can take the recent episode as unrepresentative, and ignore the observations from these dates. And yet, investors in TIPS who would like to regard them as the safest long-term investments must consider the extraordinary short-term volatility that such events have given their yields.”

The 10-year breakeven rate was stable ... until 2008

The 10-year breakeven rate represents the difference in yield between nominal and inflation-indexed bonds. If investors anticipate inflation greater than the breakeven rate over the 10-year time horizon, they should hold TIPS; otherwise, they should hold nominal bonds.

The breakeven rate was unstable in the year following the introduction of TIPS, but from 1999 through of the first half of 2008 it was relatively stable, around 2%. It plummeted during the financial crisis, reaching nearly zero at the end of the year – a breakeven rate that reflects an expected lack of inflation over the ensuing 10 years.

US Realized and Breakeven Inflation Rates

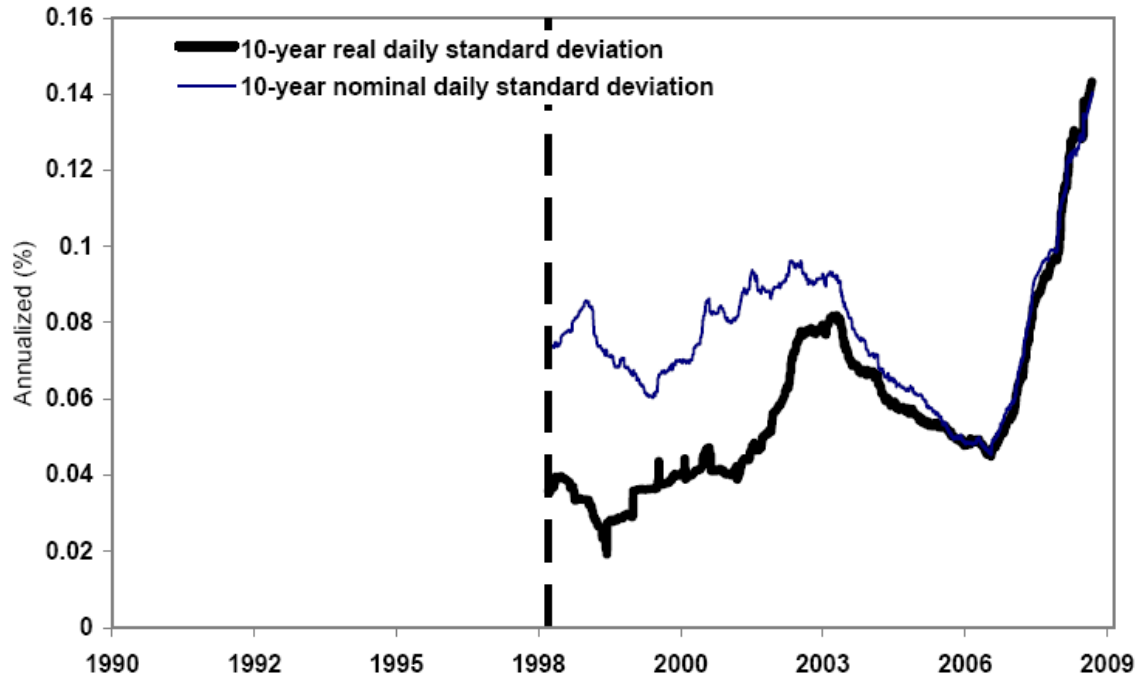


This graph also shows the subsequently realized 3-year inflation rate in the blue dashed line. Excepting a drop in realized inflation at the beginning of 2006, these actual inflation rates had tracked fairly closely the anticipated (TIPS) inflation rates since 1999.

TIPS volatility has increased in the last two years

The graph below shows the annualized standard deviation of 10-year real and nominal daily prices.

Standard Deviations of US Daily Bond Returns Over 1-Year Moving Window

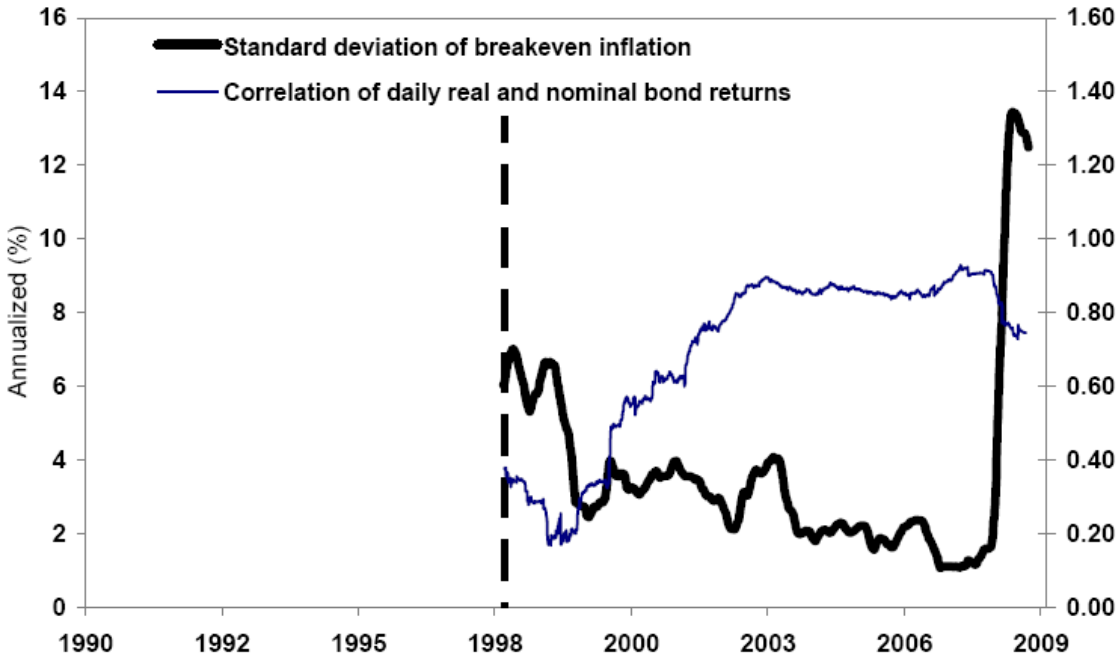


TIPS prices have become far more volatile in the last several years, matching almost exactly the volatility of nominal bonds. Price volatility is due to volatility in the underlying yields of bonds and to the bonds' durations. (Duration is a measure of the sensitivity of bond prices to changes in yields.) The authors explain that the duration of TIPS has increased as real yields have declined, but this explains very little of the increase in TIPS volatility; TIPS volatility is due to the increased volatility of real yields.

The volatility of the breakeven inflation rate has spiked

The graph below shows the volatility (annualized standard deviation) of the breakeven inflation rate (10-year nominal rate minus 10-year TIPS rate):

US Breakeven Inflation Volatility and Nominal/Real Correlation



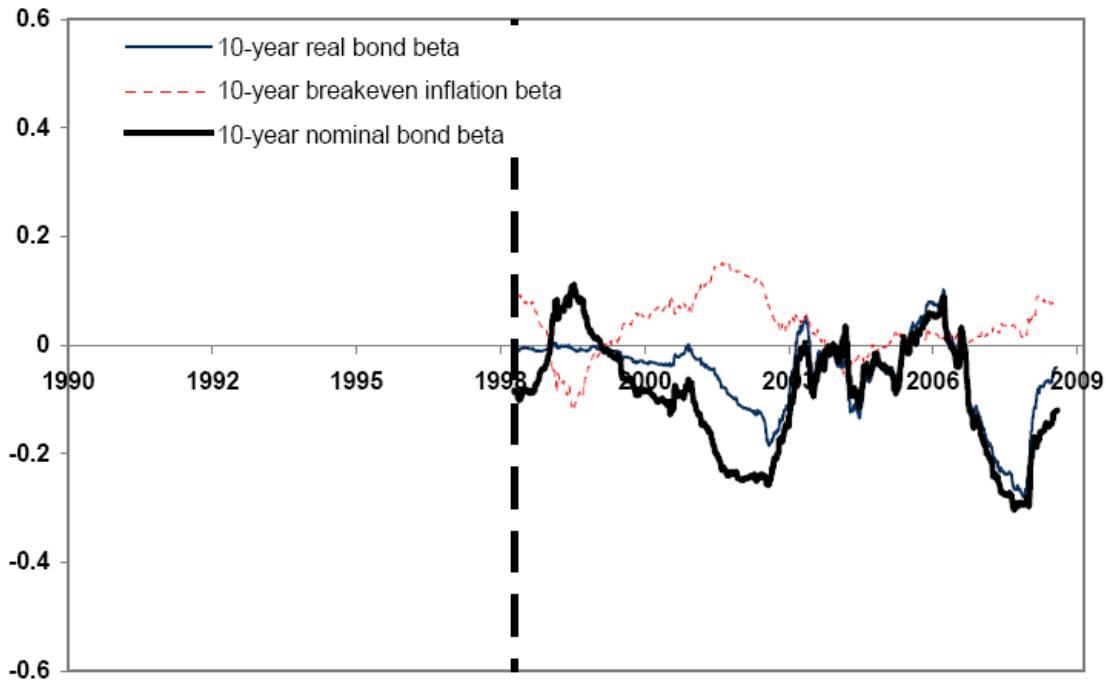
The spike in breakeven volatility reflects inflation expectations that became dramatically more uncertain.

This graph also shows the one-year correlation between nominal and real bond prices. Since 2002, these markets have been tightly coupled, although that relationship broke down in 2008.

TIPS have been a good hedge against the equity markets

The graph below plots the betas of real, nominal, and breakeven returns against the US equity market. (Beta is a measure of systematic risk – risk which cannot be diversified away. It is determined by a statistical regression procedure.)

US Betas of Daily Bond Returns with Equity Returns



Betas of TIPS (the 10-year real bond beta) have been predominantly negative over the last decade, implying that they are a good hedge against the systematic risks of the US equity market. The same is true of nominal bonds.

Implications for advisors

TIPS are the safest way to protect against inflation, and they are arguably the safest investment in the market, assuming one holds individual TIPS bonds to maturity. Investors who need liquidity before maturity face additional risks, as the authors outline in their study. TIPS funds present additional risks, which we highlighted in a previous [article](#).

If you are dead-set against TIPS, you can try to hedge against inflation by rolling over Treasury bills at a short interval, perhaps monthly. This strategy offers inflation protection provided that real interest rates are stable but, as we saw during 2008, such is not always the case.

The authors also note that if central bankers are able to establish an environment where inflation expectations are stable (and the breakeven rate is constant), then nominal bonds will offer the same inflation protection as TIPS. But such a “nirvana” seems highly unlikely.



One risk the authors do not address is that TIPS returns are dependent on the government's calculation of inflation through the CPI-U rate. The government has changed its methodology for these calculations a number of times in the past, most notably during the Clinton administration. Some, including John Williams of [Shadow Government Statistics](#), argue that the government's incentive to keep down the costs of entitlement programs such as Social Security motivated these changes to the CPI calculations. Nonetheless, while institutional investors may be able to employ superior inflation-hedging vehicles like swaps, TIPS remain the best inflation hedge for retail investors.

One of the most interesting findings in this study concerns the diversification value of TIPS. The authors studied the behavior of a portfolio composed of US stocks, nominal 5-year Treasury bonds, and 3-month Treasury bills. They examined data from 1953 to 2008, segmenting their analysis to pre- and post-1973, since the process for fighting inflation changed in the seventies.

By adding TIPS to their hypothetical portfolio, they were able to reduce substantially risk (volatility) for long-term investors. Moreover, the reduction in risk is greatest when TIPS prices are most volatile. Their explanation for that paradoxical result is that "it follows directly from the fact that inflation-indexed bonds are needed for long-term safety when real interest rates vary persistently over time."

Investors should not be deterred by the argument that TIPS are unattractive because the market may be illiquid. TIPS may be less liquid than the highly liquid nominal bond market, but long-term buy-and-hold investors will incur very little in the way of transaction costs, so liquidity should not be a concern.

"Low inflation-indexed yields and high short-term volatility of inflation-indexed bond returns do not invalidate the basic case for these bonds," the authors conclude. "They provide a safe asset for long-term investors."

TIPS have surged in popularity this year among advisors. The Vanguard Inflation Protected Securities fund (VAIPX) now ranks as the sixth most popular fund in the [Advisor Perspectives universe](#), up from 19th at the start of this year. This universe consists of approximately \$50 billion in high- and ultra-high net worth assets managed by investment advisors.

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