

Approaching TIPS Allocations in the World of “The New Normal”

Passive Versus Active Management: Helping Investors Obtain the Best Exposure to TIPS

Introduction

Following the financial and systemic crises of 2008–2009, the subsequent flood of fiscal and monetary stimulus and the perceived potential for future inflation, investor interest in TIPS (Treasury Inflation-Protected Securities) and other real assets has increased in the context of forward-looking allocation shifts. At PIMCO, we agree with this shift in strategic focus. At our 2009 Secular Forum, in which we developed our longer-term three- to five-year outlook, one of our conclusions was that the domestic economy will likely have to deal with heightened inflation expectations, with the longer-term balance of inflation risk biased to the upside.

In addition, recent volatility in markets has motivated many investors to reassess their current asset allocations, independent of their views on future inflation. These risk management efforts often reveal the existence of less risk diversification than what is desired, including a noticeable lack of protection against inflation risk. This is particularly troublesome for institutions and individuals whose future spending needs grow with inflation (i.e., they have real, not nominal, financial liabilities).

Naturally, this brings the relevance of real assets – asset classes whose returns are either explicitly or implicitly linked to inflation – to the fore, particularly relative to other financial assets

grounded in nominal returns. Chief among these has been renewed interest in TIPS. Many view TIPS as the “core” real asset given their explicit link to inflation. Others simply view TIPS as the true “risk-free” asset, a Treasury bond that also has inflation protection.¹

Making Allocations to TIPS

When making allocations to TIPS, we have seen different groups of investors select either passive indexing or active management, each for logical though conflicting reasons. Investors who select passive indexing typically view TIPS as an efficient, Treasury-only asset class that offers limited active alpha opportunities. These investors also want to avoid tactical non-TIPS holdings for fear that such active index deviations may dilute the unique characteristics of TIPS just when they are needed most. Given this premise, they either buy-and-hold TIPS internally or seek managers who simply replicate the specified TIPS index at very low management fees, believing that the TIPS index is a good representation of the TIPS market.

The second group has opted for active management, believing that the TIPS market is not perfectly (or even near-perfectly) efficient. They see the TIPS market as having non-trivial transaction costs that are disproportionately borne by passive indexers. They also see the TIPS market as having other inherent inefficiencies that can weigh on rules-based index returns relative to

the exposure obtained by more flexible market participants. They may also recognize that the TIPS market does indeed present additional opportunities to express conventional active fixed income views, such as duration and curve management. Therefore, these investors hire active managers, first with the goal of obtaining more cost efficient exposure to the TIPS market than can be obtained by passive, rules-based indexing within a somewhat inefficient market. Second, they may also seek additional real returns by allowing conventional active management views to be expressed, beyond simply obtaining more efficient exposure to the asset class.

Realities of the TIPS Market

At PIMCO, even though we primarily earn our revenues through active management of investor assets, we also manage several billion dollars of passive exposures. To that end we regularly advise our clients regarding the potential costs and benefits of pursuing active or passive management in different markets. Part of that advice also involves identifying for our clients those markets that may be well suited for passive management. We believe markets that are well suited for passive management are characterized by the following:

- Deep and consistent liquidity in the secondary trading market
- Very low transaction costs

¹ All investments carry risks. For a more detailed description of TIPS and how they work, please see Appendix A.

- An absence of recurring structural risk premiums (a tightly arbitrated market)
- An absence of active managers with records of long-term outperformance

If the above conditions are met, then indeed the given market is likely well suited for low cost passive management. However, our assessment of the TIPS market points to opposite conclusions on each of these four points:

- TIPS trading liquidity lacks depth and consistency as compared to other major markets like nominal Treasuries
- TIPS transaction costs are non-trivial
- The TIPS market exhibits multiple recurring risk premiums
- A select group of active managers have demonstrated long-term outperformance versus the TIPS index

Given these factors, our bottom-line is simple. Investors looking to make TIPS allocations should consider active management, in an effort to gain the most cost efficient exposure to the asset class.

Understanding Inefficiencies in the TIPS Market

The TIPS market is characterized by a number of inefficiencies that present potential hidden costs to passive indexers and concurrently

opportunities to add value for more skillful active TIPS managers. The effect of these hidden costs is that passive indexers typically pay far more in total execution costs than what is implied by the low fees charged by their passive manager. Worse still, this lost wealth is typically transferred from them to more flexible active market participants (including hedge funds and market makers), who profit at the passive investors' expense. We summarize these inefficiencies as follows:

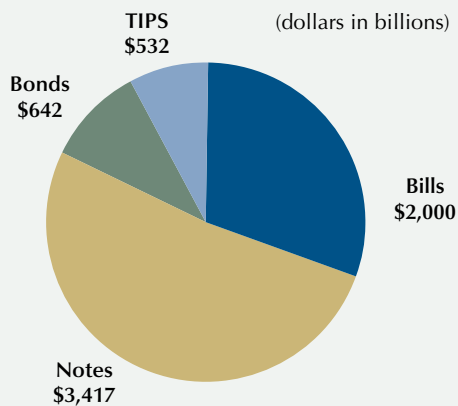
- Transaction Costs: Though large, the TIPS market remains much smaller than the overall Treasury market, both in terms of total market value (\$532 billion, or 8% of total marketable U.S. debt outstanding)² and total trading volume (\$5.6 billion/day, or 3% of the transaction volume of nominal Treasuries)³. As a result, typical bid-ask spreads for the average market participant are around 5 to 10 basis points (bps) of the quoted real yield. By contrast, a typical bid-ask spread for most nominal Treasuries is just 0.5 bps. So, if we assume a 10-year TIPS with 8 years of real duration has a bid-ask spread of 8 basis points, this translates into 64 bps

² As of June 30, 2009, TIPS outstanding was \$532 billion, versus total marketable U.S. debt of \$6.592 trillion. Source: U.S. Treasury, Bureau of the Public Debt.

³ From January 7, 2009, through June 24, 2009, average daily transaction volume with primary dealers and intra-dealer brokers was \$5.6 billion for TIPS and \$196.1 billion for Treasury notes with 3 to 30 years to maturity. Source: Federal Reserve Bank of New York

of execution costs simply to buy and eventually sell the position (8 years of duration \times 8 bps spread).⁴ If we further assume a four-year holding period for the position, then that implies an additional 16 bps in annual expenses (64 bps \div 4 years), above and beyond the passive management fees.

U.S. Treasury Marketable Securities



As of June 30, 2009
Source: U.S. Treasury, Bureau of the Public Debt

By contrast, active managers who look to use scale and skill to improve liquidity (because they have a clear incentive to achieve best execution) may transact well inside the typical bid-ask range. For instance, if an active manager is able to transact the same position at a bid-ask spread of 3 bps, they will have saved 10 bps per year relative to the passive manager's execution (64 bps - (8 years of duration \times 3 bps spread) \div 4 years).

- **Funding/Liquidation Costs:** Though often overlooked, a structure of the TIPS market that is particularly expensive to passive indexers relates to the "market on close" trade order used by passive managers. TIPS indexes use market close prices to compute their index levels and daily returns. Market on close orders provide trade execution that in nearly all cases perfectly matches the market close prices used in TIPS indexes. While this is beneficial for passive managers or Wall Street dealers since it reduces their risk of not tracking the client-specified index, it can be very costly for the TIPS investor.

Knowing that passive indexers require end-of-day pricing to track the TIPS index, which means they will effectively act as price indiscriminate buyers/sellers at or near market close, active market participants will typically richen/cheapen the TIPS market into the close in order to profit at the indexers' expense. This can be a significant cost to the passive investor, both upon funding and liquidating TIPS positions.

For example, it is not uncommon to see the TIPS market richen by as much as a "half-point," and in extreme cases by a

⁴ In order to estimate the price impact of transaction costs, multiply the cost in basis points of real yield by the real duration of the bond. Real duration is a measure of the bond's price sensitivity to a change in real interest rates.

“point,” just before market close on a day when there is a large passive inflow (e.g., TIPS priced at 100 move to 100.5 or 101). This means the index-tracking investor needlessly pays more to gain their passive TIPS exposure. Meanwhile, active market participants, who have acquired bonds earlier in the day at a lower price, can deliver those bonds through the market on close order at the higher end-of-day index value. In so doing, the active investors capture profit directly at the passive indexers’ expense. If we assume a \$100 million inflow and a half-point price increase in TIPS near the close, then the indexer would have paid an additional 50 basis points in costs just to put on their exposure, despite thinking they were receiving low cost passive management. In dollar terms, that equates to \$500,000 of lost capital, which would be reflected in the account’s value on the following day when the artificial price increase reverts.

Furthermore, this cost is quite pernicious since it is a *hidden cost*; the “at close” trading activities also drive the index prices higher/lower, which means the passive investor may not even recognize that they have lost money.

Conceptually, an investor who wants “true passive” – that is, exposure that

truly reflects all aspects of the given market – would employ an investment approach that mimics the broad market not just in issue composition, but also in trading volume, and thus seek the volume-weighted average trading price when putting on their TIPS exposure. This practice of gaining exposure is not uncommon in the equity and commodity markets. *However, by trading only at or near the market close, or by deferring to a passive manager who hedges their risk by doing the same, the passive TIPS investor is actually making an active decision relative to the market to trade at a different and somewhat arbitrary time (to follow the index rules).* That decision produces trade execution that is likely to be more expensive than what the broad market pays, because of less liquidity at day’s end and because other market participants, knowing this rules-based dynamic, can trade against the buyer to richen/cheapen the market at their expense.

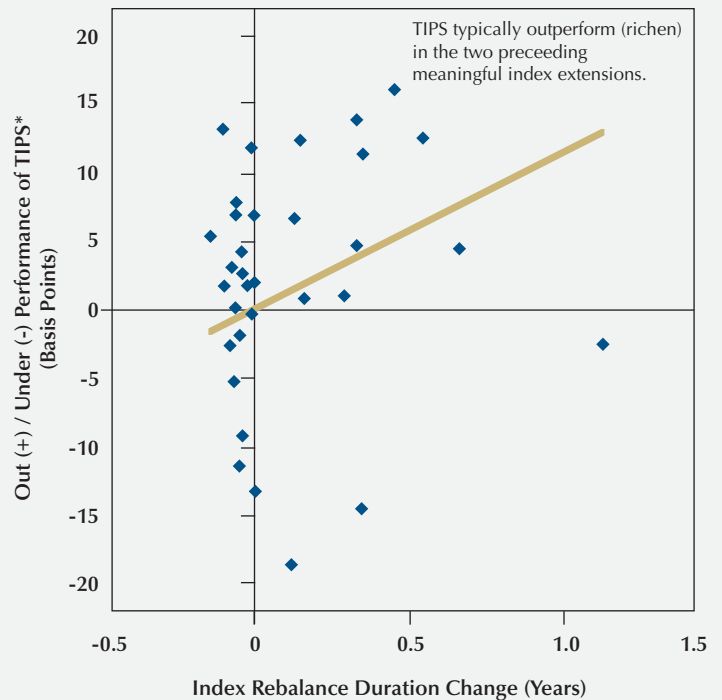
By contrast, an active manager has a strong incentive to navigate around the adverse pricing dynamics that occur near the market close and provide the best execution intra-day, based on their assessment of liquidity within the TIPS market. This presents a structural opportunity for active managers to

provide more cost efficient TIPS exposure to their clients, even inclusive of higher management fees.

- **Index Rebalancing:** When new TIPS issues are added to the index post-auction, or when existing issues drop from the index as they near maturity, the composition and duration of the index changes. Per index rules, these changes take effect at the end of the month, and are predictable far in advance. Knowing that rule-following indexers will be buying or selling certain bonds at month-end, active managers may buy or sell TIPS in advance and reverse the trade to the indexers at month-end. Thus the passive investor ends up buying at elevated prices or selling at depressed prices while still exactly matching the index's performance. This presents another potential hidden cost that passive TIPS investors repeatedly pay to more active participants in the market.

As the chart indicates, TIPS have historically outperformed (richened) in the two weeks preceding a month-end duration extension of the index, reflective of this trading dynamic. For active investors, this recurring structural inefficiency represents an attractive risk-adjusted opportunity to add value relative to the passive index.

TIPS Performance Before Index Extensions



*TIPS performance is shown relative to Treasuries (using 10 year break-even inflation rates) to factor out extraneous price moves and isolate those specific to TIPS.

Source: PIMCO, Bloomberg
Dates: Jan. 2000 through Feb. 2009

- **TIPS Auction Dynamics:** TIPS are issued by the U.S. Treasury at recurring auctions as part of the U.S. government's overall funding program. At present, there are eight TIPS auctions each year: two for five-year TIPS, four for 10-year TIPS and two for 20-year TIPS. In 2008 approximately \$62 billion of new TIPS was issued through Treasury auctions.

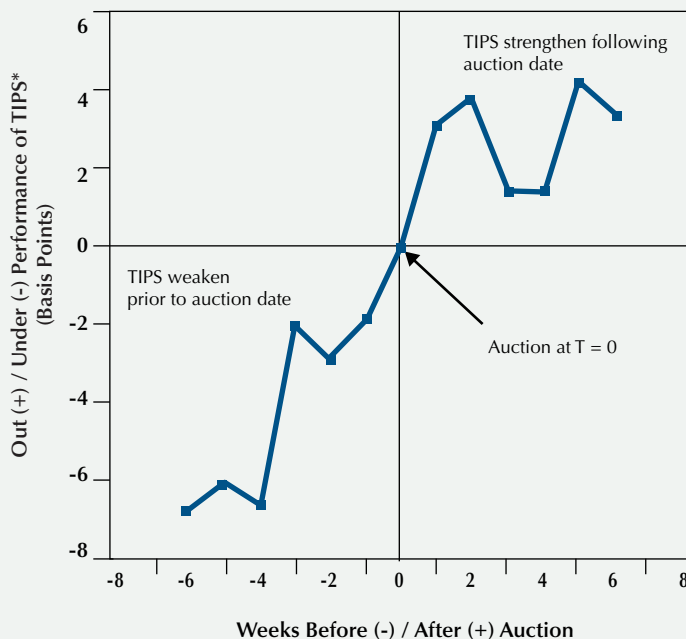
Due to inconsistent liquidity in the TIPS market, auctions are treated as key liquidity events for market participants and consequently create temporary structural distortions in TIPS valuations. Specifically,

and as shown in the following chart, TIPS show a recurring pattern of cheapening in the weeks preceding a TIPS auction and richening post-auction as the market corrects. Active TIPS managers looking to make portfolio adjustments will typically sell in the weeks before the auction so as not to compete with the auction supply, thereby driving down TIPS prices pre-auction. Post-auction, the reverse effect occurs. While this auction cheapening-richening dynamic may not present a net cost to TIPS investors who passively hold their TIPS throughout this entire period, it does represent a potential cost to investors who fund new positions in the weeks

following auctions, when TIPS valuations are rich. A skillful TIPS manager would have an incentive to advise their clients against such timing. In addition, an active TIPS manager would also seek to exploit this recurring structural inefficiency by accommodating the liquidity requirements of less flexible market participants around TIPS auctions, thereby adding value versus the passive index.

- **Inflation Seasonality and TIPS Pricing:** TIPS show a recurring pattern of richening and cheapening at various points during the calendar year, consistent with the underlying seasonality patterns in U.S. inflation.⁵ TIPS are linked to the non-seasonally adjusted consumer price index (NSA CPI-U), which exhibits predictable and therefore exploitable seasonal patterns. The seasonal patterns of the inflation accrual mean that TIPS typically outperform fixed-rate nominal Treasuries during the first half of the calendar year and underperform during the latter half. This relationship is shown in the following chart.

TIPS Performance Around Auctions



*TIPS performance is shown relative to Treasuries (using 10 year break-even inflation rates) to factor out extraneous price moves and isolate those specific to TIPS.

Source: PIMCO, Bloomberg
Dates: Jan. 2000 through Feb. 2009

⁵The recurring seasonal patterns of inflation in the U.S. are caused by the combined effects of climate and institutional events that repeat more or less regularly each year. Specific factors include seasonality of production cycles, demand due to school year or holidays, rental rate increases at the beginning of the year, and peak energy usage for summer cooling or winter heating.

Even though these seasonal pricing inefficiencies are well-documented, the existence of passive investors plus the behavioral dynamics of other investors skews marginal supply and demand so that TIPS continue to exhibit the seasonal pattern of relative outperformance/underperformance. For a skillful active manager, these seasonality patterns represent a recurring structural opportunity to capture attractive risk-adjusted incremental return by anticipating and positioning for seasonal effects by tactically adjusting exposure to TIPS and nominal Treasuries.

Additional Opportunities to Improve Investors' Exposure to TIPS

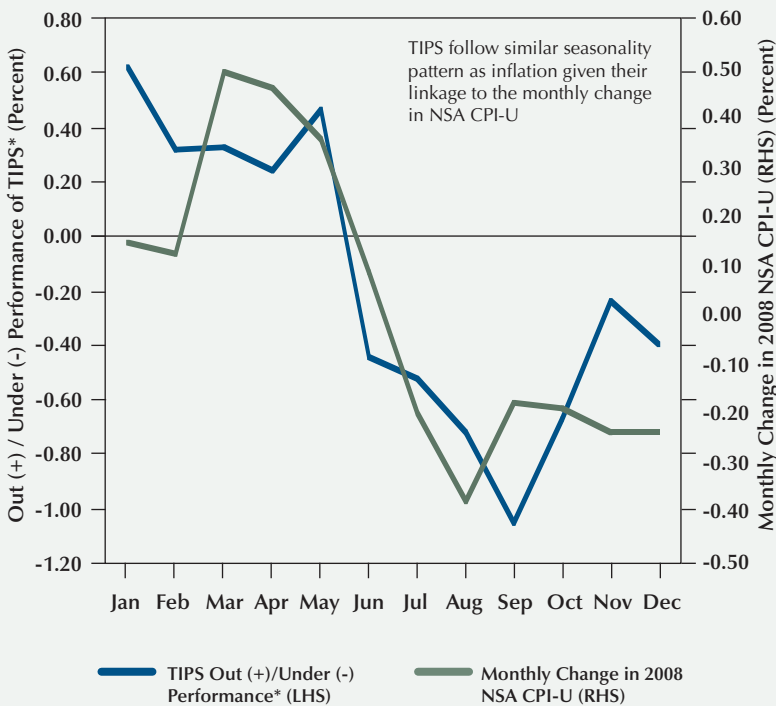
In addition to the above examples of structural inefficiencies that characterize the TIPS market, there are also the more conventional strategies through which active managers can add value in TIPS allocations. To further enhance potential returns, active managers can express "top down" macroeconomic views and more micro "bottom up" views that are nuanced to the TIPS market. "Top down" strategies include the following:

- Duration positioning (both on the real and nominal yield curves)
- Yield curve steepening /flattening views (both on the real and nominal yield curves)
- Relative value vs. nominal Treasuries, based on rising/falling inflation expectations
- Country rotation among developed inflation-linked bond issuers
- Limited sector rotation among high-quality non-government sectors

"Bottom up" strategies include the following:

- "Inflation capture," or managing the mix of short and long TIPS in advance of expected near-term surprises in realized CPI

Seasonality in Inflation and TIPS Performance



*TIPS performance is shown relative to Treasuries (using 10 year break-even inflation rates from 1997 to 2009) to factor out extraneous price moves and isolate those specific to TIPS.

Source: PIMCO, Bloomberg

- Issue selection (both on the real and nominal yield curves)
- Relative value trading based on the implied option value of receiving not less than original principal value upon maturity (i.e., the embedded deflation put)⁶
- Relative value trading based on on-the-run / off-the-run liquidity premia

PIMCO's active management approach seeks to maximize risk-adjusted real returns for our clients in a manner that both tracks the TIPS index and is consistent with the client-specified guidelines. While the majority of clients allow the full range of "top down" and "bottom up" strategies described above, we also work with clients to tailor guidelines to more bespoke risk/return objectives.

Summary

As allocations to TIPS continue to rise, due to both increased understanding of this relatively new asset class and an increased need for inflation-hedging strategies, investors have to decide how to best obtain that exposure. Regarding the TIPS market, PIMCO's belief is clear – active management can provide more efficient exposure for investors. Said differently, the existence of structural and exploitable market inefficiencies and a robust set of "top down" and "bottom up" strategies means that

active TIPS management can provide not only a more efficient way to gain exposure to the TIPS market, but also a compelling opportunity to generate incremental alpha, contrary to the perception held by some.

Furthermore, we expect these structural inefficiencies to persist, despite the fact that they are known by market participants. The TIPS market is disproportionately held by passive and buy-and-hold investors, which dilutes the efficient market hypothesis and inhibits the recurring price patterns discussed here from being arbitrated away. As long as the market is characterized by a large number of passive or risk averse investors who trade in predictable ways at predictable times, there will always be attractive opportunities for active managers to deliver relative outperformance for their clients.

Finally, beyond the structural inefficiencies within the TIPS market that we believe make passive indexing sub-optimal, we would also like to stress the point that "passive TIPS investing" as it is commonly understood actually involves making active, arbitrary trading deviations from what defines the market. Employing a systematic trading pattern to follow an index that specifies exposures be implemented in the last few minutes of

⁶ For a more detailed explanation of the deflation put, please see Appendix A.

the trading day is not passive in any sense of the word. Worse yet, it can be very costly. Therefore, active management in TIPS should be used to gain asset class exposure that is more efficient than what “passive” investing can provide, and to seek incremental real return consistent with the risk/return preferences of the investor.

John R. Cavalieri
Senior Vice President
Product Manager

Gang Hu
Senior Vice President
Portfolio Manager

Mihir Worah
Managing Director
Portfolio Manager

July 24, 2009

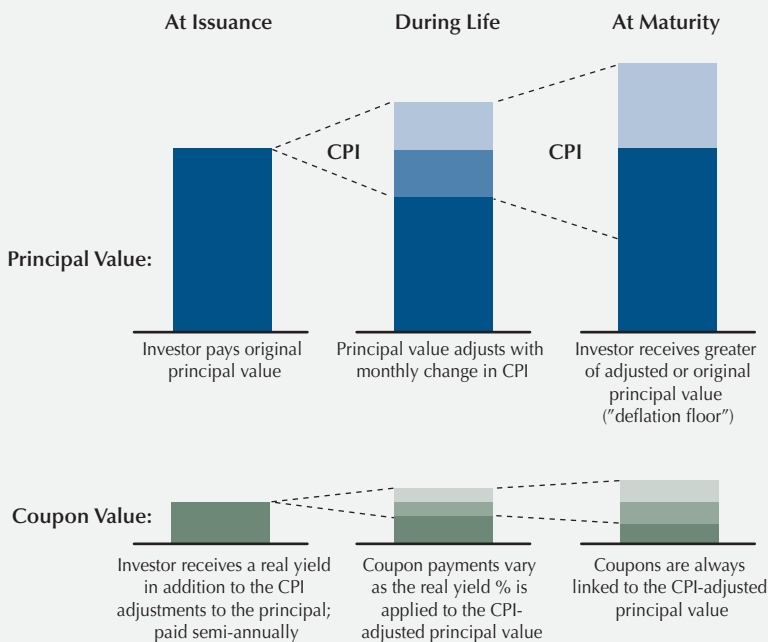
Appendix A

TIPS, which stands for Treasury Inflation-Protected Securities, are Treasury bonds that have a unique feature: their returns are linked to actual future inflation. Typically, inflation is thought of as a risk to bond investors, since higher realized inflation reduces the after-inflation yield (i.e., the real return) of the bond. Also, higher inflation expectations can cause nominal interest rates to rise, creating price losses for fixed-rate bonds. In contrast, TIPS benefit when actual inflation rises.

When held to maturity, TIPS provide two sources of return. The first is the accrual of actual inflation. Specifically, the principal value of TIPS is adjusted by the monthly change in the Consumer Price Index (to be exact, the Consumer Price Index for All Urban Consumers Non-Seasonally Adjusted, or CPI-U NSA). Monthly CPI changes can be positive or negative based on intra-year seasonal factors or broader macroeconomic conditions. The second source of return is the coupon payment, which is calculated by multiplying a fixed real yield percentage by the inflation-adjusted principal value of the bond. Therefore, the size of the coupon payment moves up or down based on the cumulative inflation accrual applied to the principal. In combination, the hold-to-maturity investor receives a total return equivalent to actual inflation over the life of the bond plus an incremental rate of return, which is the real yield.

At maturity, the TIPS investor receives the greater of the inflation-adjusted principal value or the original principal value. This means the TIPS investor does not bear the risk of cumulative deflation (negative inflation) over the life of the bond. This feature is often called the “deflation floor” or the “deflation put” because it effectively represents an option, held by the TIPS investor, to put cumulative deflation risk back to the U.S. government upon maturity of the bond.

The following diagram illustrates the mechanics of TIPS.



Investors who sell TIPS before maturity face two potential risks. First is the risk of cumulative deflation over the holding period, as the deflation put only applies at maturity. This would result in a decrease in the dollar value of the principal, although the real (or inflation-adjusted) value of

the principal remains constant. Second is real interest rate risk, or the risk that real yields rise over the holding period. This would result in a price loss on the TIPS, although should real rates fall investors would benefit from a price gain.

Investors generally identify three key benefits of TIPS:

- **Inflation-Hedging:** TIPS are unique in that they provide a return that is explicitly linked to actual future inflation. This may provide a hedge to inflation risk, or said differently, more predictable real (after inflation) returns.
- **Lower Risk:** TIPS are Treasury bonds and are therefore backed by the full faith and credit of the United States government. In addition, because TIPS do not bear inflation risk in computing their market prices, they are typically less volatile than comparable maturity nominal Treasuries.
- **Diversification:** TIPS may provide a correlation benefit versus other investments that respond negatively to rising inflation or to falling real yields. Therefore, including TIPS in an overall asset allocation may improve the efficiency (return/risk trade-off) of the total portfolio.

P I M C O

840 Newport Center Drive

Newport Beach, CA 92660

949.720.6000

pimco.com

Past performance is not a guarantee or a reliable indicator of future results. This report contains the current opinions of the manager and such opinions are subject to change without notice. Statements concerning financial market trends are based on current market conditions, which will fluctuate. This report has been distributed for informational purposes only and should not be considered as investment advice or a recommendation of any particular security, strategy or investment product. Information contained herein has been obtained from sources believed to be reliable, but not guaranteed.

Investing in the bond market is subject to certain risks including market, interest-rate, issuer, credit, and inflation risk; investments may be worth more or less than the original cost when redeemed. There is no guarantee that these investment strategies will work under all market conditions and each investor should evaluate their ability to invest for a long-term especially during periods of downturn in the market. No representation is being made that any account, product, or strategy will or is likely to achieve profits, losses, or results similar to those shown.

Inflation-indexed bonds issued by the U.S. Government, also known as TIPS, are fixed-income securities whose principal value is periodically adjusted according to the rate of inflation. Like any other bonds, TIPS are subject to capital gains or losses in the marketplace prior to maturity; TIPS may be particularly sensitive to capital losses during deflationary environments. Interest payments on TIPS are based on the inflation adjusted principal value of the bond, which can adjust below the bond's face value before maturity for the purpose of calculating interest payments, potentially causing decreasing interest payments in deflationary environments. The U.S. Government guarantees repayment of either the inflation adjusted or original principal amount (whichever is greater) at maturity. Neither the current market value of inflation-indexed bonds nor the value a portfolio that invests in inflation-indexed bonds is guaranteed, and either or both may fluctuate. The Consumer Price Index (CPI) is an unmanaged index representing the rate of inflation of the U.S. consumer prices as determined by the U.S. Department of Labor Statistics. There can be no guarantee that the CPI or other indexes will reflect the exact level of inflation at any given time.

No part of this material may be reproduced in any form, or referred to in any other publication, without express written permission of Pacific Investment Management Company LLC, 840 Newport Center Drive, Newport Beach, CA 92660. ©2009, PIMCO.