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U.S. TREASURY INFLATION-PROTECTED SECURITIES (TIPS)

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ABSTRACT

1. Ten-year U.S. Treasury Inflation-Protected Securities (TIPS) currently yield 4.3%–the highest yield since they were first issued in January 1997. Based on a longer history of simulated real yields dating back to 1958, real yields have ranged from 2.7% to 4.7%, and exceeded current levels in only two short periods in 1981 and 1984. One reason for today's relatively high real interest rates is the record U.S. current account deficit, now an unprecedented 3.9% of GDP and likely to exceed 4.0% within a few months. Since this deficit must be financed by foreign capital inflows, the supply of which is limited, it has contributed to the recent rise in U.S. interest rates, both nominal and real, and may push real rates to historical extremes before a slowing economy, a weaker dollar, a diminution in imports, and stronger overseas demand for U.S. goods and services turn the tide.

2. With TIPS yields at 4.3%, investors that buy and hold TIPS can lock in a real rate of return of 4.3% over the next ten years. This is a high real return, even when compared to U.S. equities and nominal government bonds, which returned an annual average 7.9% and 2.1%, respectively, in real terms from 1926-99. Furthermore, U.S. equities returned less than 4.3% in 30% of the 65 rolling ten-year periods since 1926, while bonds returned less than 4.3% in 75% of the periods. Looking forward, TIPS should outperform comparable nominal Treasuries during periods of unexpectedly high inflation, while nominal bonds should outperform during periods of disinflation.

3. TIPS represent a better value than nominal bonds for investors who believe inflation over the next ten years will be greater than 2.38%. While the spread between TIPS yields and yields of ten-year nominal Treasury bonds is well above its low of 0.80% at year-end 1998, a 2.38% rate of inflation is still low by historical standards. In fact, the average annual inflation rate for every ten-year period this century is 3.2%, and has exceeded 2.38% in every ten-year period but 12 (periods ending in 1957-68) since the decade ending in 1941. Although deflation is certainly possible, we would regard its persistence for a decade as unlikely, and for this reason characterize TIPS as undervalued.

4. In addition to good strategic reasons for investing in TIPS, there are also important investment policy reasons for adopting a permanent allocation. TIPS are a logical inflation hedge because they are indexed to the CPI. For investors seeking to hedge the value of a portfolio against inflation over the long term, equities would provide a superior hedge; however, in the short term, equities have a negative inflation beta, while inflation-linked bonds by definition have an inflation beta of 1.0 over the life of the bond. This makes them an attractive choice for hedging inflation-linked pension liabilities and for hedging a spending stream against the need to liquidate equities at depressed prices in order to sustain spending during periods of unexpected inflation.

5. Because of the relatively low correlation between inflation-linked bonds and other asset classes, efficient frontier analysis suggests that the inclusion of TIPS in a portfolio—under most reasonable risk, return, and correlation assumptions—would increase portfolio efficiency for lower risk/lower return portfolios.

6. As budget surpluses have been reducing the government's borrowing needs, the Treasury has been cutting back its debt issuance, including issuance of TIPS. After scaling back the TIPS auction size from $7 billion to $6 billion in January, the Treasury announced in February that it would reduce the number of auctions from four per year to three per year, eliminating the April auction of 30-year TIPS. Although future issues could shrink by an additional $1 billion to $2 billion, the Treasury continues to publicly support the TIPS program—although whether this support will outlive Larry Summers' tenure as Secretary of the Treasury is open to question. If the TIPS program were to be eliminated, any policy allocation to TIPS would have to be phased out as TIPS holdings mature.

7. For most institutions adopting a policy allocation to TIPS as an inflation hedge, the challenge is to determine how best to fund that allocation. In theory, the logical answer is that if TIPS are used to protect the fund's equities, funding should come from that source. However, for some investors, the opportunity cost of investing in TIPS is too high to justify the hedging benefits (although at current real yields of 4.3%, opportunity costs now seem minimal, particularly considering the diversification benefits). When the role of conventional bonds is primarily to serve as a hedge against prolonged economic contraction, investors should carefully consider the implications of funding a TIPS allocation out of fixed income, since TIPS will not serve this purpose. However, TIPS could be funded from fixed income without compromising the role of nominal bonds, or increasing total portfolio risk, if the duration of the remaining nominal bonds were extended such that the smaller allocation provided the same degree of hedge against economic contraction. Investors that replace their cash allocation with TIPS need to consider their liquidity needs. Although liquidity has been improving, TIPS are not as liquid as on-the-run Treasuries or cash, but are more comparable to off-the-run Treasuries and intermediate high-quality corporate bonds.

8. To date, most active TIPS managers have been able to add value relative to their passive TIPS benchmarks primarily through sector rotation into non-U.S. inflation-linked bonds and nominal bonds, duration management, and enhanced return strategies such as active management of cash collateral and use of leverage. It remains to be seen whether managers ability to add value will persist as the market matures. Investors should always remember that many of these active strategies also reduce the inflation-hedging characteristics of TIPS portfolios.

SUMMARY

Background

Inflation-protected securities have been issued by more than 15 developed and emerging countries over the last 50 years. Current issuers include the United States, United Kingdom, Australia, Canada, France, and Sweden, with a total of $250 billion issues outstanding.[1] Of this total approximately $112 billion (or 45%) are U.K. inflation-linked gilts (linkers), and $102 billion (or 40%) are U.S. Treasury Inflation Protected Securities (TIPS). The performance history is limited, since all major market participants introduced their inflation-linked bonds in the 1980s and 1990s. The longest track record is that of the United Kingdom, which first issued linkers in 1981, followed by Australia in 1985, Canada in 1991, and Sweden in 1994. TIPS were introduced in the United States in January 1997 and there are now seven TIPS issues outstanding, ranging in maturity from July 15, 2002 to April 15, 2029. Initially packaged in $7 billion tranches, auctioned four times per year, each TIPS auction was subsequently increased to $8 billion, but then scaled back to $7 billion last October and $6 billion this January as a consequence of the Federal Government budget surplus. In February, the Treasury announced that it would reduce the number of auctions to three a year, eliminating the April 30-year TIPS auction. Although future issues could shrink by an additional $1 billion to $2 billion, the Treasury continues to publicly support the TIPS program–although whether this support will outlive Larry Summers' tenure as Secretary of the Treasury is open to question. (See Exhibit 1 for detailed market characteristics.)

Performance of Inflation Linked Bonds

Because they are a new asset class, we can't be sure just how TIPS will perform under various market conditions, nor how their returns will correlate with those of other assets. However, we can extrapolate some logical expectations from the short history that already exists, from the economic basis of their return, and from the longer history of inflation-linked bonds in other countries, especially the United Kingdom. Even this longer history is of limited value, however, because it covers a period of falling global inflation and rising real yields. For example, when U.K. linkers were first issued in 1981, retail price inflation exceeded 12%, but subsequently fell to less than 2% in 1993, and has remained below 4% since 1991. As one might expect, linkers performed poorly as real yields rose in response to a tighter monetary regime and investors' need to hedge against inflation steadily declined. To be confident that we know how inflation-linked bonds would perform in various environments, we would need to examine their behavior over multiple economic cycles-and we have not yet been able to do so. Moreover, structural differences among markets may vitiate comparisons with U.S. TIPS. For example, cash yields

[1] Global government bond issuance as represented by the Barclays Capital Global Inflation-Linked Bond Index. There are only a few corporate, agency, and municipal inflation-linked corporate bonds outstanding, totalling an estimated $2.4 billion.

in the U.K. market have often been higher than those of longer-duration conventional gilts, whereas the U.S. yield curve is rarely inverted in this way. Similarly, the nominal yield of U.K. Treasury bills has been consistently higher than that of linkers, whereas U.S. T-bills have consistently yielded less than TIPS. Finally, U.K. pension plans are virtually required to buy and hold linkers to meet regulatory requirements, which limits that market's liquidity.

Simulated data are also of limited value. The typical approach to modeling real yields is to subtract inflation expectations plus the inflation-risk premium from nominal bond yields to arrive at real yields. Inflation expectations plus the inflation-risk premium are typically estimated by extrapolating the trailing 12-month inflation rate, or by looking at survey-based consensus inflation expectations. However, to assume that real yields equal nominal yields less trailing inflation is to assume that the spread between real and nominal yields inevitably expands and contracts as inflation rises or falls–which may hold true generally, but not necessarily always. Nevertheless, this methodology has proved useful in estimating real yields and in our analyses we use a simulated real yield and performance series based on this approach, provided by Bridgewater, a U.S.-based bond manager. Bridgewater's simulated real yield series has been highly correlated with actual real yields in the United Kingdom since 1981, but has shown virtually zero correlation in the United States, based on very limited data-although it recently improved: for example, the correlation of monthly actual and simulated real yields has been 88% since October 1998.

Expected Returns

In a flat interest rate environment, the expected return on an inflation-linked bond is its yield to maturity, as it is for nominal bonds. However, the yield on an inflation-linked bond is its real expected return, while the yield on a nominal bond is its nominal expected return. In nominal terms, the expected return of an inflation-linked bond held to maturity is the yield to maturity plus inflation over the life of the bond. Additionally, the return will vary as real yields vary because of the changing environment for reinvesting coupon payments (except for zero-coupon securities) and the changing value of the bond during the holding period. Holders of TIPS receive a floating coupon payment based on the fixed coupon percentage multiplied by the inflation-indexed principal and receive the greater of the original principal amount of the bond or the inflation-adjusted principal upon the bond's maturity (see Appendix A for more detail).

In 1997-98, TIPS performed poorly relative to conventional Treasury bonds because inflation was very low, real yields rose, and nominal yields fell. Between January 31, 1997, a few weeks after TIPS were introduced, and December 31, 1998, real yields on ten-year TIPS increased from 3.34% to 3.70%, and nominal yields on ten-year conventional Treasuries decreased from 6.58% to 4.65%, while the CPI averaged only 1.7% over the two years. The total return for TIPS over the two-year period was

7.9%, compared to nearly 25% for conventional ten-year Treasuries. However, in 1999, the market environment was more favorable for TIPS than for conventional Treasuries, as economies around the globe sought to reflate after the collapse of emerging markets in the fall of 1998. For the year, ten-year TIPS returned 4.2%, while conventional ten-year Treasuries returned -3.4%. In contrast to 1997-98, nominal yields rose faster than real yields and inflation climbed above 2.5% (see Exhibits 2-5).

The history of actual TIPS performance is too short to provide a sound basis for future expectations. However, Bridgewater's simulated performance series (with all its drawbacks), does provide further insight into TIPS' performance relative to that of other asset classes. The simulated series provides returns of constant eight-year duration TIPS between 1958 and 1996, with actual data used after TIPS' introduction in January 1997. For the full 42-year period, the average annual compound return of the simulated TIPS series is 8.3%, compared to 12.8% for U.S. equities, 7.0% for U.S. government bonds, and 6.3% for cash. In real terms, TIPS annual return averaged 3.9% over the period.

To evaluate the performance of TIPS relative to nominal Treasuries of comparable volatility, we compare the TIPS series to an intermediate government bond series because the expected variability of TIPS with an eight-year duration is comparable to that of nominal bonds with durations of 1.5 to 3.5 years. This is because the volatility of real yields, to which TIPS prices respond, is anywhere from 20% to 40% that of nominal yields, to which nominal bond prices respond. Consequently, the "effective duration" of eight-year duration TIPS (i.e., their sensitivity to changes in nominal yields) is 1.6 to 3.2 years. Unlike mathematical duration calculations, effective duration calculations do not directly measure the sensitivity of TIPS prices to changes in nominal yields. In fact, at times the relationship between nominal yields and TIPS prices has been negative. Instead, the effective duration provides a means for comparing TIPS to nominal bonds of comparable volatility. From 1977-99, the simulated TIPS series returned 8.5% annually, about the same as a nominal bond with a duration of 2.5 to 3.5 years, and somewhat better than one of shorter duration (see Exhibits 9 and 10). It should be noted, however, that this period is dominated by the extraordinary inflation rates prevailing in the late 1970s. For the period 1997-99, for which there are actual data, TIPS underperformed conventional Treasuries of all durations, which would be expected in a period when nominal yields were generally falling, real yields were rising, and inflation was low.

Although we would expect TIPS to underperform equities over the long term, they could outperform over shorter time horizons–even over periods as long as 20 years. In the period 1958-99, simulated TIPS outperformed U.S. equities in about half the rolling 20-year periods, bonds in about three-quarters of the periods, and cash in every period (see Exhibit 11). The results are similar for rolling ten-year periods (see Exhibit 12). At the end of 1999, real yields on ten-year TIPS were 4.33%–relatively high by historical standards–making the expected return for TIPS over the next ten years relatively high.

Therefore, we also evaluated the number of ten-year periods in which U.S. equities, bonds, and cash would have returned greater than 4.33% in real terms. Equities did so in almost two-thirds of the 33 rolling ten-year periods from 1958-99, but bonds in only one-third, and cash in only two of the 33 periods.

These results suggest that over long periods we should expect TIPS to underperform equities and outperform conventional Treasuries and cash, although there may also be extended periods in which TIPS beat equities. However, the economic basis of returns for TIPS and conventional bonds suggests that nominal bonds should outperform TIPS over most periods because a market as efficient as the Treasury bond market should price inflation expectations accurately most of the time, and add a sufficient premium to compensate investors for the element of uncertainty that investors in TIPS do not incur. This is a very long-term view, however, and does not affect the probability that TIPS should outperform comparable nominal Treasuries during periods of unexpectedly high inflation, while nominal bonds should outperform during periods of disinflation.

Standard Deviations

The volatility of the real returns of TIPS is a function of their duration and of the volatility of the change in real yields. Since TIPS' yields are low relative to nominal bond yields, and the inflation adjustment to the principal results in larger cash flows as TIPS mature (assuming a rising price environment), the duration of TIPS is longer than that of nominal bonds of comparable maturity. Nevertheless, the standard deviation of TIPS returns is generally lower than that of nominal bonds of comparable maturity because real yields tend to be much less volatile than nominal yields. Since TIPS were first issued in January 1997, the ratio of the standard deviation of the annual change in real yields to the change in nominal yields (rolling monthly data) is approximately 14%, which is somewhat lower than the 22% indicated by the simulated series for 1958-99, but covers a very limited time period. In contrast, the historical variability of returns of U.K. linkers has been 35% that of conventional gilts (1981-99). As noted above, these data imply that TIPS' effective duration should be estimated at 20% to 40% of their real duration, or 1.5 to 3.5 years, rather than eight.

As Exhibit 9 shows, the standard deviation of the eight-year duration simulated TIPS return series was 3.4% during 1977-99, or approximately the same as that of a 1.5-year duration conventional Treasury. However, from 1997-99, the eight-year duration TIPS had a standard deviation of 2.5%, which was between that of the 3.5-year duration and 2.5-year duration conventional Treasury over the same period. The real duration of the TIPS market as a whole is currently 9.11 years (or effectively 1.8 to 3.6 years), and that of the aggregate nominal Treasury bond market, as represented by the Lehman Brothers Treasury Index, is 5.3 years. This suggests that the volatility of the TIPS market should be about

30% to 65% that of the Treasury market, which is consistent with the assumptions that most TIPS managers are presenting to prospective TIPS investors.

Correlations

Nominal bond returns are influenced by changes in yields that are in turn influenced by three factors: changes in real yields, changes in inflation expectations, and changes in the inflation premium demanded by bond holders. In contrast, nominal returns on TIPS are influenced by actual inflation and changes in real yields. To the extent that most of the change in nominal yields is driven by the change in real yields, we would expect the correlation between nominal Treasuries and TIPS to be high when inflation expectations priced into nominal bonds approximate actual inflation. However, during periods when nominal yields change due to shifting inflation expectations and/or a shifting risk premium, correlations should be low. Additionally, when inflation is unexpectedly high, we would expect TIPS to perform well and conventional bonds to perform poorly, while the reverse would be true during periods of disinflation or deflation. Furthermore, if the simulated real yield series proves to model reality in the U.S. market, we will find that real yields tend to decline during periods of rising inflation, such that TIPS returns would benefit in this environment both from falling real yields and from rising inflation. Nominal bonds would also benefit from falling real yields, but this would probably be offset by a rise in both inflation expectations and the inflation premium, which would push nominal yields higher.

The correlations between TIPS and other asset classes vary significantly from one period to another. For example, for the period 1958-99, the correlations of quarterly real simulated TIPS returns with real conventional bond returns have been 79%, with equities, 15%, and with cash, 7%. However, correlations based on annual or on rolling three-year return data are quite different–lower between TIPS and nominal bonds and equities. This is because changes in real yields dominate the performance of TIPS over short periods of time, while the inflation-hedge is a more important contributor over longer periods (see Exhibit 18).

As would be expected, correlations also vary depending on the inflationary environment. During the high-inflation period of 1973-81, correlations between simulated real TIPS quarterly returns and real returns of equities and conventional bonds were higher than that measured during low inflation periods. However, the correlation of the nine annual returns–a statistically insignificant sample size–was negative over the same period, which is what one would expect in this type of environment. In short, we would expect the correlation between TIPS and nominal bonds to be about 60%, on average, over the long-term, but with periods of significant divergence from this average in interim periods of extreme economic conditions.

Many participants in the TIPS market assume TIPS have zero or negative correlations to equities. However, it may not be prudent to assume such attractive correlations on the basis of so little live data. Correlations with equities probably will be zero or negative on occasion; however, a more conservative assumption would be a slightly positive relationship, similar to that for cash and equities.

The Rationale for Investing in Inflation-Linked Bonds

Hedge Against Inflation. TIPS are a logical inflation hedge because they are indexed to the CPI. However, their success in this role depends on what an investor is attempting to hedge against-a decline in asset value triggered by rising inflation, or an increase in a specific liability tied to inflation, or the need to liquidate equities at depressed prices in order to sustain spending during periods of unexpected inflation.

Preserve Purchasing Power. Over the long-term, a portfolio primarily invested in equities should exceed the rate of inflation since equities are a claim on real assets. For investors with long time horizons, such as most endowments and foundations, equities are therefore a long-term hedge against a decline in purchasing power. TIPS would also serve this purpose well, provided that the real yield on TIPS is greater than or equal to the rate of endowment spending. However, since the long-term expected return of equities is higher than that of TIPS, and since liabilities have grown faster than the rate of consumer inflation for most institutional investors, equities would fill this hedging role better, for all but the most risk averse. In addition, it should be noted that although reinvestment risk can be eliminated over the maturity of the TIPS for investors that buy and hold zero coupon inflation-linked bonds, there is still the possibility that TIPS yields will not be sufficiently high to support spending without depleting purchasing power when the time comes to roll over the principal.

Hedge a Liability Tied to Inflation. Similar to the way nominal bonds provide a hedge against nominal liabilities, inflation-linked bonds should provide a hedge against inflation-linked liabilities, such as cost-of-living adjustments to benefit payments in pension plans. However, duration-matching strategies of the sort routinely implemented with nominal bonds will not work in the same way because TIPS' inflation hedge is based on the adjustment of coupon payments and principal in response to inflation, rather than on the movement of interest rates. In fact, in the short-term, TIPS' returns are more sensitive to changes in real yields, which will not necessarily move in a favorable direction during inflationary periods. If an institution is buying and holding TIPS until maturity, changes in real yields only affect returns to the extent that coupons are reinvested in higher or lower yielding TIPS. Therefore, inflation-related liabilities would be best hedged by holding TIPS that mature on the date the liabilities are due-and a laddered portfolio would usually serve this purpose best. Alternatively, holding a portfolio of TIPS without regard to matching the specific liabilities could prove to be a successful strategy, but would

involve a higher degree of risk that real yields would increase, depressing TIPS prices when assets are needed to fund the liabilities.

Hedge a Spending Stream. A simple example provides insight into how an allocation to TIPS can hedge spending. Assume that an endowment of $100 million is invested 70% in equities, 20% in nominal bonds, and 10% in TIPS. The endowment spends the greater of 5% of its beginning market value or last year's spending. Further assume a worst-case, two-year scenario in which inflation runs at 6.5% in year one and 10.5% in year two, causing equity returns of -20% and -30%, respectively, and nominal bonds returns of approximately -10% and -4%. The $70 million invested in stocks would have fallen to $57 million and the $20 million invested in nominal bonds would have decreased to $18 million, while the $10 million invested in TIPS would have increased to just over $11 million at the end of the first year before spending and rebalancing. The annual return on the TIPS in a flat interest rate environment would be equal to the real yield of 4% plus the inflation of 6.5% and 10.5%. The income plus appreciation of TIPS totals only $1,076,000 in year one, falling far short of the $5 million required for spending. However, since the total value of the endowment has declined to $81 million after spending, a 10% allocation to TIPS would total approximately $8 million. After selling TIPS to rebalance, nearly $3 million is available for spending without selling any stocks or bonds at depressed prices. Add to this the proceeds from rebalancing nominal bonds, and one is only $350,000 short of the required $5 million. Moreover, during the second year of this extreme scenario, the sale of appreciated TIPS, combined with the sale of nominal bonds to rebalance, would be sufficient to support spending. Additionally, over $1.5 million would be rebalanced into equities in order to restore their allocation to 70% of the portfolio. Although TIPS hedge only approximately 60% of spending needs under these extreme conditions, the outcome is far better for the endowment than would have been the case if no inflation-hedging assets were available (see Exhibit 19).

The inflation adjustment to TIPS will provide the same benefit to investors regardless of the bonds' maturity. However, to the extent that real yields are high, it is beneficial to lock in that favorable rate for the longest possible period. Conversely, investors who believe real yields are low and likely to rise would want to hold shorter maturity TIPS (with the exception of those matching a liability) in order to reinvest in what would be expected to be a more attractive environment. Additionally, shorter-duration TIPS are more attractive when real yields are low since they are less exposed to falling prices occasioned by rising real yields. All of which implicitly presupposes that real yields are mean reverting. Although there are insufficient data to prove or disprove this presumption, economic theory supports the notion that real yields must equal the cost of capital over the long term, and that real interest rates should therefore revert towards a sustainable rate of economic growth.

For most institutions adopting a policy allocation to TIPS as an inflation hedge, the challenge is to determine how best to fund that allocation. In theory, the logical answer is that if TIPS are used to

protect the fund's equities, funding should come from that source. However, for some investors, the opportunity cost of investing in TIPS is too high to justify the hedging benefits (although at current real yields of 4.3%, opportunity costs now seem minimal, particularly considering the diversification benefits). For institutions with relatively low return objectives, under most reasonable assumptions, TIPS would qualify as an efficient allocation, but for institutions with relatively high return objectives, TIPS' inflation-hedging benefits must be weighed against the expected opportunity cost.

Create a More Efficient Portfolio. Because of the relatively low correlation between inflation-linked bonds and other asset classes, efficient frontier analysis suggests that inclusion of TIPS in a portfolio–under most reasonable risk, return, and correlation assumptions-would increase portfolio efficiency for lower risk/lower return portfolios, allowing a higher expected return for a given level of risk, or a lower level of risk for a given expected return. However, since TIPS are so new and their performance characteristics vulnerable to substantial misspecification, it may not be prudent to invest in TIPS purely to increase portfolio efficiency. Nevertheless, the benefits of diversification should be considered in determining the advantages relative to the opportunity costs of investing in TIPS as an inflation hedge. In unconstrained efficient frontier analysis models, TIPS entirely displace conventional bonds, and for all but the lowest risk portfolios they frequently displace cash also. In such models, the inclusion of TIPS also results in higher allocations to higher risk asset classes, such as commodities and venture capital, because this can be achieved without any increase in total portfolio risk. TIPS are excluded from higher risk/higher return portfolios, however, simply because their expected return is too low to justify their inclusion, despite the diversification benefits.

Although efficient frontier analysis is useful in modeling the risk and return tradeoffs of different asset allocations, it does not fully capture the benefits of investing in TIPS in a high inflation environment. The correlation between TIPS and other asset classes would be lowest during periods of rising inflation because financial assets tend to decrease in price most significantly during periods where inflation unexpectedly rises, which is when TIPS' increase in value is most pronounced. Because efficient frontier analysis models only the “average” or long-term expected portfolio performance, it reflects only average, long-term correlations, which are expected to be positive, and ignores the tendency for correlations to turn negative in periods of unexpected inflation.

When the role of conventional bonds is primarily to serve as a hedge against prolonged economic contraction, investors should carefully consider the implications of funding a TIPS allocation out of fixed income, since TIPS will not serve this purpose. Although the Treasury does guarantee that maturing TIPS will be redeemed at least at face value, even if inflation has been negative, coupon payments would decline under conditions of deflation by the rate of inflation, which would be negative. However, TIPS could be funded from fixed income without compromising the role of nominal bonds, or increasing total

portfolio risk, if the duration of the remaining nominal bonds were extended such that the smaller allocation provided the same degree of hedge against economic contraction. Investors employing this strategy should recognize that while risk in terms of standard deviation could remain the same, the exposure to real interest rates would increase as a result both of the new allocation to TIPS (which have a higher duration to real interest rates than do nominal bonds) and of the extended duration of the nominal bond portfolio.

Investors that replace their cash allocation with TIPS need to consider their liquidity needs. Although liquidity has been improving, bid/ask spreads on TIPS are not as low as those for on-the-run Treasuries or cash, but are close to spreads on off-the-run Treasuries or corporate bonds. The daily trading volume of TIPS is lower than that of Treasuries, making it more difficult to make large transactions without moving the market. Consequently, investors who hold cash to satisfy their liquidity needs should not regard TIPS as an adequate substitute. (See Exhibit 20 for bid/ask spreads of TIPS relative to those of other bonds.)

Opportunistically Invest in TIPS. Rather than make a permanent policy allocation to TIPS, investors can opportunistically invest in TIPS when they look attractive relative to nominal bonds, which they do when the yield spread between inflation-linked bonds and nominal bonds is less than the investor's expectations for inflation. As of January 31, 2000, that spread was 2.38% for ten-year bonds, which means that an inflation-linked bond bought and held for ten years will outperform a conventional bond of the same maturity if the rate of inflation is greater than 2.38%–which is low by historical standards. For every ten-year period this century, the average annual inflation rate has been 3.2%, and has exceeded 2.38% in every ten-year period but 12 (periods ending in 1957-68) since the decade ending in 1941. The ten-year average inflation rate was also below 2.38% for the 14-year period of deflation that began with the ten-year period ending in 1928 and extended through 1941. Although deflation is certainly possible, we would regard its persistence for a decade as unlikely, and for this reason view TIPS as attractive relative to nominal Treasuries.

Strategies for Investing in Tips

Since the TIPS market is relatively small, with only seven issues outstanding, there is little scope for active management. While many bond managers invest in TIPS opportunistically in nominal bond portfolios (some after obtaining permission, others without it), a limited number of managers have dedicated TIPS products. A representative listing is included in Appendix B.

Active Management Strategies

Sector Rotation: Sector rotators make opportunistic shifts among corporate, government agency, municipal, and non-U.S. inflation-linked bonds. Although this provides scope for adding value, it also raises benchmarking issues. For example, none of the benchmark providers we examined include corporate, agency, or municipal inflation-linked bonds in their benchmarks. This is not because they explicitly exclude these sectors from their benchmarks, but rather because of their low liquidity. In the United States, only $1.6 billion in corporates, $0.8 billion in agencies, and $0.2 billion in municipal inflation-linked bonds have been issued, with the last issuance of corporates and agencies in March of 1997 and the last issuance of municipals in July of the same year. About a dozen corporations issued inflation-linked debt during the first few months following the Treasury's first TIPS auction; however, all swapped out of their inflation-linked coupon payments. The result was that these corporations achieved a slightly cheaper cost of debt, but similar arbitrage opportunities have not been available since early 1997. Although corporate issuance might increase as the inflation-linked bond market develops, we view this as unlikely since a corporation that indexes its debt payments to inflation runs the risk that interest expenses rise exactly at the same time as earnings come under pressure from rising inflation.

There is some opportunity to add value through opportunistically investing in non-U.S. inflation-linked bonds. As of year-end, there were 27 inflation-linked bonds outstanding for the five major government issuers, other than the United States, included in the Barclays Capital Global Inflation-Linked Bond Index. Of course, if a manager invests in non-U.S. inflation-linked bonds on an ongoing basis, a global inflation-linked bond benchmark would be a more logical choice than a U.S.-only benchmark. However, even with a global benchmark, there is opportunity for a manager to add value by altering country weights relative to the benchmark, and through currency management.

Investors adding inflation-linked bonds to their portfolios as an inflation hedge should consider what exposure they are hedging against before permitting the inclusion of non-U.S. issues. Those specifically concerned about U.S. consumer inflation may want to limit the portfolio to U.S. TIPS. However, since the United States makes up a significant percentage both of the global economy and of global inflation-linked bond indexes, and since U.S. inflation is highly correlated with G-7 inflation, investing in a global portfolio of inflation-linked bonds would still provide something of a hedge against U.S. consumer inflation. And hedging out the currency exposure of non-U.S. inflation-linked bonds would further improve the hedging characteristics of non-U.S. inflation-linked bonds relative to U.S. consumer inflation. It should be noted, however, that U.S. TIPS may be superior to non-dollar inflation-linked bonds as a hedge against commodity-based inflation, since commodities are priced in U.S. dollars.

Some managers include in their definition of sector rotation an allocation to various types of nominal bonds. To the extent that these bonds are allowed in a TIPS portfolio, investors should carefully evaluate the expected increase in return against the diminished inflation hedging, and possibly diminished portfolio efficiency, relative to a 100% inflation-linked bond portfolio.

Duration: Even with only seven TIPS issues outstanding, investors can add value through portfolio duration management and selection of securities along the real yield curve. We anticipate that the ability to add value through duration management will decline over time as the market matures and temporary supply/demand imbalances have a diminishing effect on the real yield curve. However, even after the TIPS market matures, we would expect that some ability to add value through duration bets would persist. We would expect the yield curve to be relatively flat when the market consensus about the direction of real yields is that they will remain constant. This is because the inflation expectations and an inflation premium that generally keep the nominal yield curve positively sloped are not a consideration in pricing real yields. However, when the market consensus is that real yields are likely to decline, we would expect the real yield curve to be inverted, because investors might be willing to pay a premium in order to lock in higher real yields for a longer time horizon and to lengthen their duration to maximize returns in a declining yield environment. Similarly, we would also expect the real yield curve to be positively sloped during periods when real yields are low and expected to rise. However, it will be many years before we will know whether these expectations for real yields are borne out in practice.

Enhanced Return Strategies: Managers may also add value through utilizing derivatives to enhance returns. The two most prevalent strategies employed by active managers are investing in TIPS futures or forwards and actively managing the cash collateral, and leveraging TIPS. Since cash management strategies, such as investing in longer-maturity nominal bonds, may have a negative correlation with inflation, the inflation-hedging capability of a portfolio that includes cash management may be diminished, and this should be weighed against the managers' ability to add value. Moreover, cash management strategies may introduce additional types of risk and credit risk that are not a factor in investing in TIPS.

Leveraging TIPS has several appealing characteristics, but also has some drawbacks, particularly related to the potential for incurring unrelated business income taxes (although some managers offer vehicles for investing in leveraged TIPS that are designed to circumvent this problem) and increased risk. On the other hand, leveraged TIPS may provide a means for hedging against inflation without incurring any opportunity cost relative to equity investments.

The return on leveraged TIPS is comprised of the carry, or the spread between the yield on the bonds and the borrowing costs, and the return on the unleveraged TIPS. When real short-term interest rates, or borrowing costs, rise above inflation-linked bond yields, the carry component of the return becomes negative. This would occur during periods where the yield curve is inverted. However, for inflation-linked bonds leveraged 2:1, real short-term interest rates would have to be twice that of the real yield on the TIPS (assuming no change in real yields) in order for the negative carry to offset the positive return from the TIPS coupons. For example, with a real yield on ten-year U.S. TIPS of 4.0%, short-term interest rates would have to rise to 8.0% before the return on a portfolio leveraged 2:1 would be zero.

Furthermore, the price impact of a change in real yields would be magnified by a leveraged investment in TIPS. For example, an increase of 100 bps in the real yield of ten-year U.S. TIPS would result in a price decrease of approximately 8%. A 2:1 leveraged investment in the same bond would result in a loss of approximately 16%. As with any leveraged investment, leveraged inflation-linked bond investments are subject to cash flow risk when losses result in margin calls, as in the case of derivatives, or when cash flows must be exchanged (in the case of swaps). Leveraged investments are also generally subject to counterparty credit risk.

The nominal value of inflation-linked bonds will tend to rise as borrowing costs rise because nominal cash returns and inflation-linked bond returns are both positively correlated with inflation. If borrowing costs and TIPS returns are positively correlated with inflation, we would expect the value of TIPS to rise at the same time that the carry on the leverage diminishes or turns negative, thereby smoothing out the volatility of leveraged TIPS' returns. On an annual basis, both LIBOR and TIPS returns have been approximately 60% correlated with inflation since 1985, when our LIBOR series begins. However, during shorter-term periods, such as quarterly or monthly, LIBOR and TIPS' correlations with inflation diminishes. For example, since 1985, the correlation between quarterly simulated TIPS' returns and inflation has been 11% and the correlation between LIBOR and inflation has been 36%, leaving significant room for TIPS' returns and borrowing costs to diverge during the short-term. Assuming that one borrows on a rolling quarterly basis to implement the leveraged position, one could have to pay out cash for an extended period in the short term if real yields were to increase during an inflationary period. Over the long-term, borrowing costs and TIPS might be positively correlated, but leverage always compresses an investor's time horizon such that the long term becomes irrelevant when the cash flow from the leveraged investment proves insufficient to finance margin payments, forcing the liquidation of the position at a loss.

Passive Strategies

For institutions that want to take a buy and hold, or laddered approach to TIPS investing, TIPS can be purchased directly from the Treasury by auction. A limited number of managers also offer TIPS index funds.

To date, most active TIPS managers have been able to add value relative to their passive TIPS benchmarks through the strategies described above. It remains to be seen whether this will persist as the market matures, and investors should always remember that many of these active strategies also reduce the inflation-hedging characteristics of TIPS portfolios.

NOTES ON THE DATA

The series used in the exhibits of this report are drawn from a number of sources. The Bridgewater U.S. TIPS Series is based on simulated data from 1958-96. The series uses live data beginning in 1997. The ten-year conventional treasuries and TIPS returns and yields used in Exhibits 2 and 3, as well as the conventional treasuries used in Exhibits 9 and 10, were also calculated by Bridgewater Associates.

The intermediate government bond series is the Ibbotson Associates Intermediate Government Bond series from 1958-98. The Lehman Brothers Intermediate Government Bond Index is used for 1999.

Inflation is measured by the CPI-U, base year 1982-84.

In the exhibits, where sufficient history is available, the standard deviations are annualized and based on quarterly returns. In some instances, where standard deviations are taken for observations between January 1997 and December 1999, the calculations are annualized and based on monthly returns.

Correlations are based on annual returns unless otherwise noted.

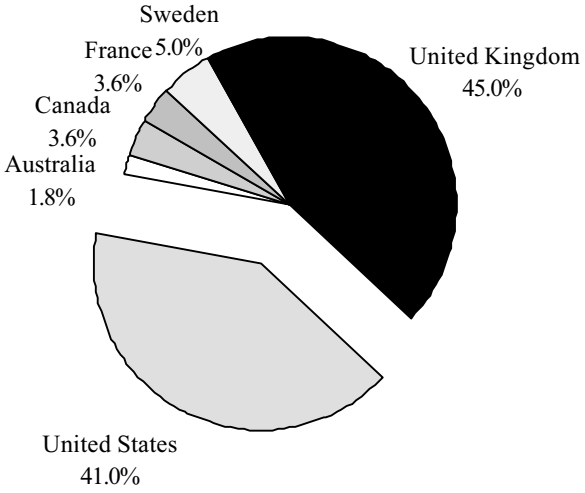
EXHIBITS

Exhibit 1

MARKET VALUE OF GLOBAL GOVERNMENT INFLATION-LINKED BONDS

January 31, 2000

Total Market Value: $249.8 billion



U.S. TIPS Market

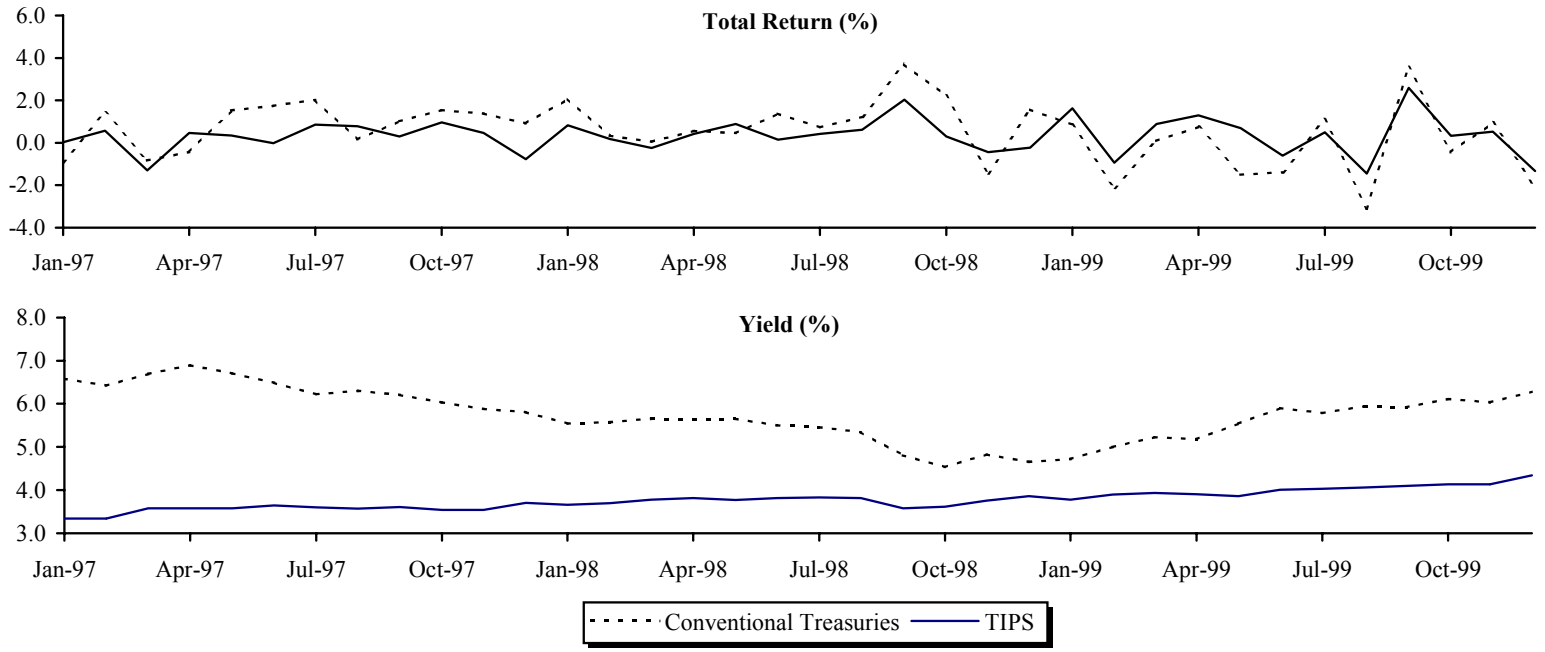
Maturity	Coupon (%)	Real Yield	Market Value ($ Billions)
July 15, 2002	3.625	4.1	17.5
January 15, 2007	3.375	4.3	15.8
January 15, 2008	3.625	4.3	16.7
January 15, 2009	3.875	4.3	15.8
January 15, 2010	4.250	4.3	6.3
April 15, 2028	3.625	4.3	15.9
April 15, 2029	3.875	4.3	14.3

Sources: Barclays Capital and the Bloomberg.

Exhibit 2

CONVENTIONAL 10-YEAR TREASURIES AND TIPS:
YIELDS AND NOMINAL TOTAL RETURNS

January 1, 1997 - December 31, 1999



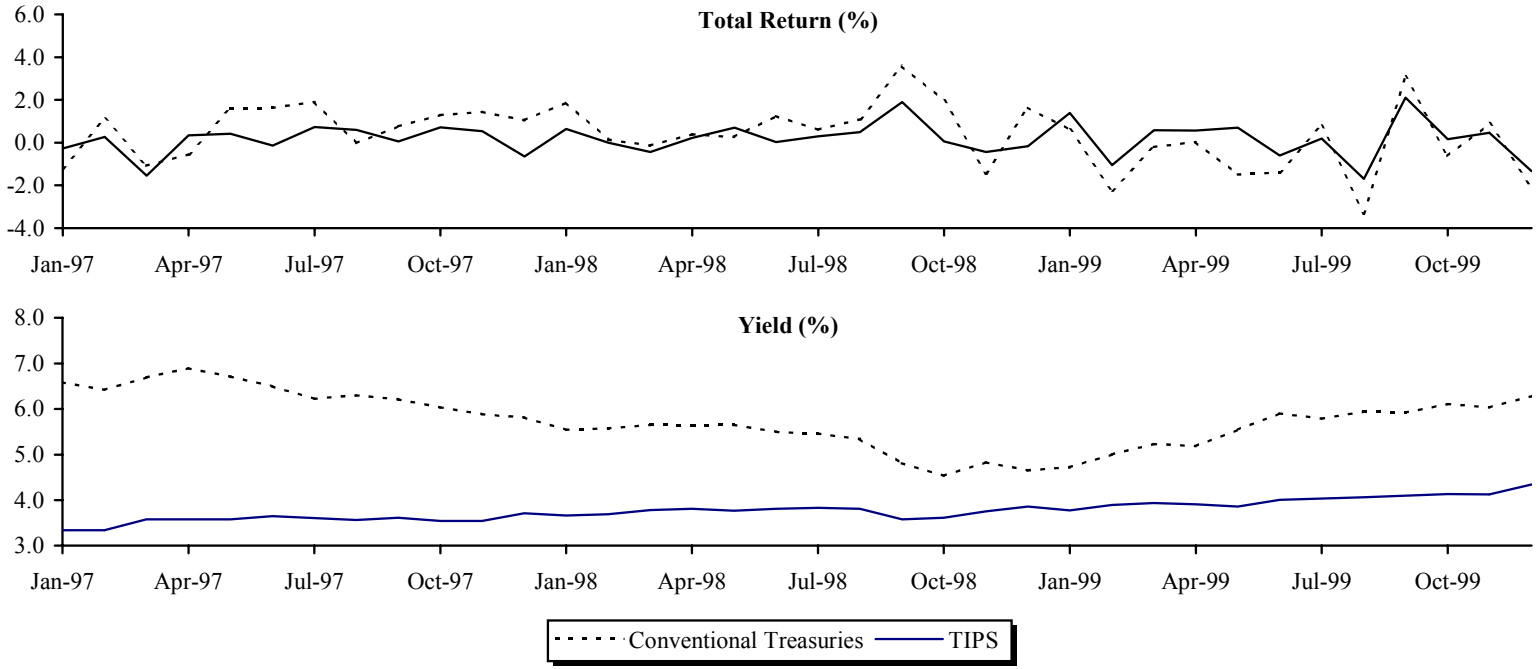
	Conventional Treasuries		TIPS	
	Total Return (%)	Nominal Yield (%)	Total Return (%)	Real Yield (%)
Total Return and Average Yield	20.66	5.75	12.41	3.77
Standard Deviation (%)	5.25	2.14	3.02	0.78
Return/Risk	3.94		4.12	

Source: Bridgewater Associates.

Exhibit 3

CONVENTIONAL 10-YEAR TREASURIES AND TIPS:
YIELDS AND REAL TOTAL RETURNS

January 1, 1997 - December 31, 1999



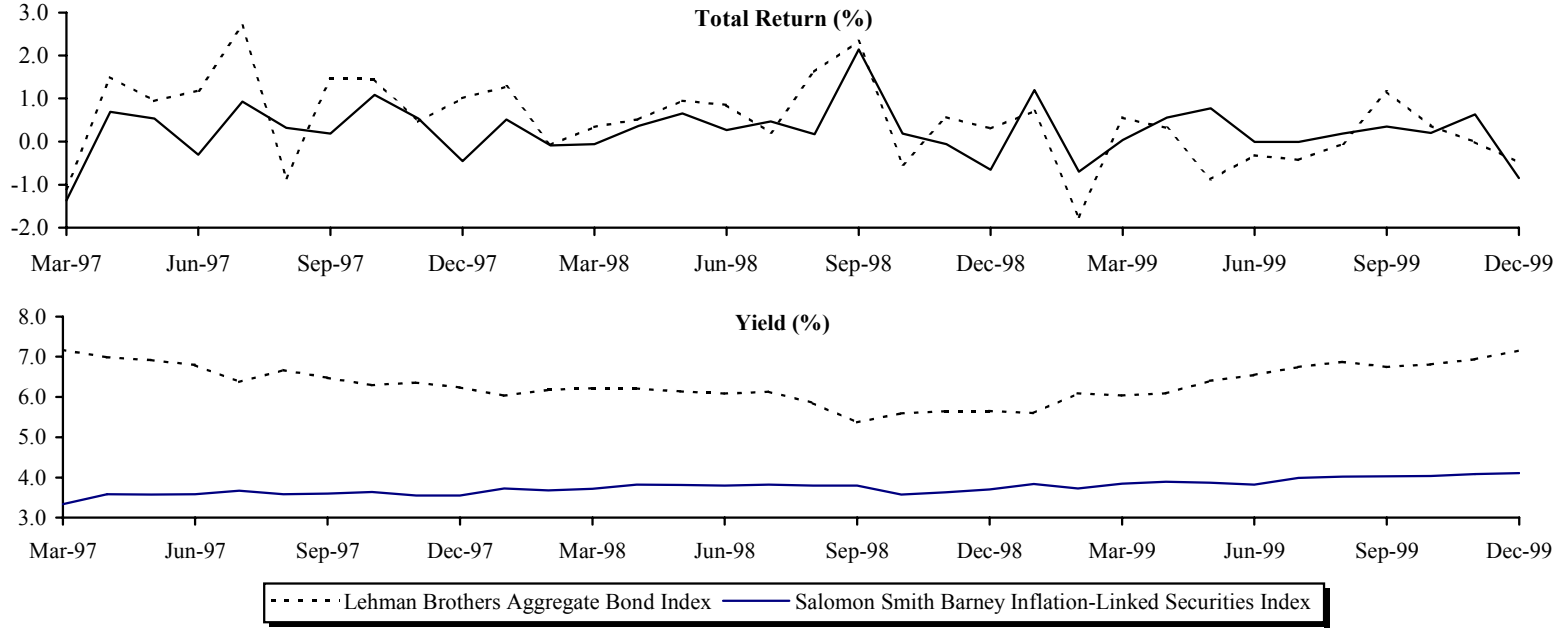
	Conventional Treasuries		TIPS	
	Total Return (%)	Nominal Yield (%)	Total Return (%)	Real Yield (%)
Total Return and Average Yield	13.71	5.75	5.93	3.77
Standard Deviation (%)	5.18	2.14	2.82	0.78
Return/Risk	2.64		2.11	

Sources: Bridgewater Associates and the Bureau of Labor Statistics.

Exhibit 4

CONVENTIONAL TREASURY AND TIPS INDEXES: YIELDS AND NOMINAL TOTAL RETURNS

March 1, 1997 - December 31, 1999



	Lehman Brothers Aggregate Bond Index		Salomon Smith Barney Inflation-Linked Securities Index	
	Total Return (%)	Nominal Yield (%)	Total Return (%)	Real Yield (%)
Total Return and Average Yield	17.55	6.34	8.68	3.76
Standard Deviation (%)	3.34	1.65	2.23	0.62
Return/Risk	5.25		3.89	

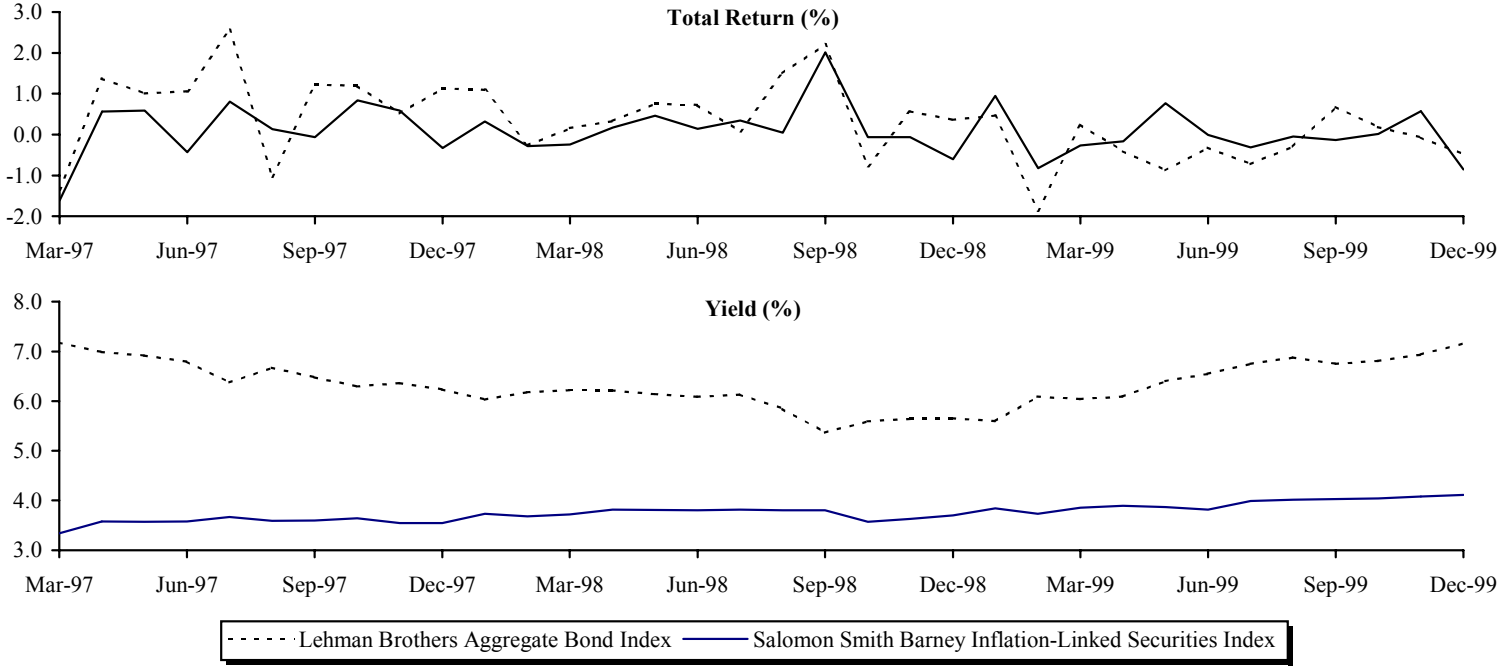
Sources: Lehman Brothers, Inc. and Salomon Smith Barney.

Notes: As of 12/31/99, the bond maturity and duration of the Lehman Brothers Aggregate Bond Index are 8.86 years and 5.38 years, respectively. For the Salomon Smith Barney Inflation-Linked Securities Index, the maturity is 13.89 years and the duration is 9.11 years.

Exhibit 5

CONVENTIONAL TREASURY AND TIPS INDEXES:
YIELDS AND REAL TOTAL RETURNS

March 1, 1997 - December 31, 1999



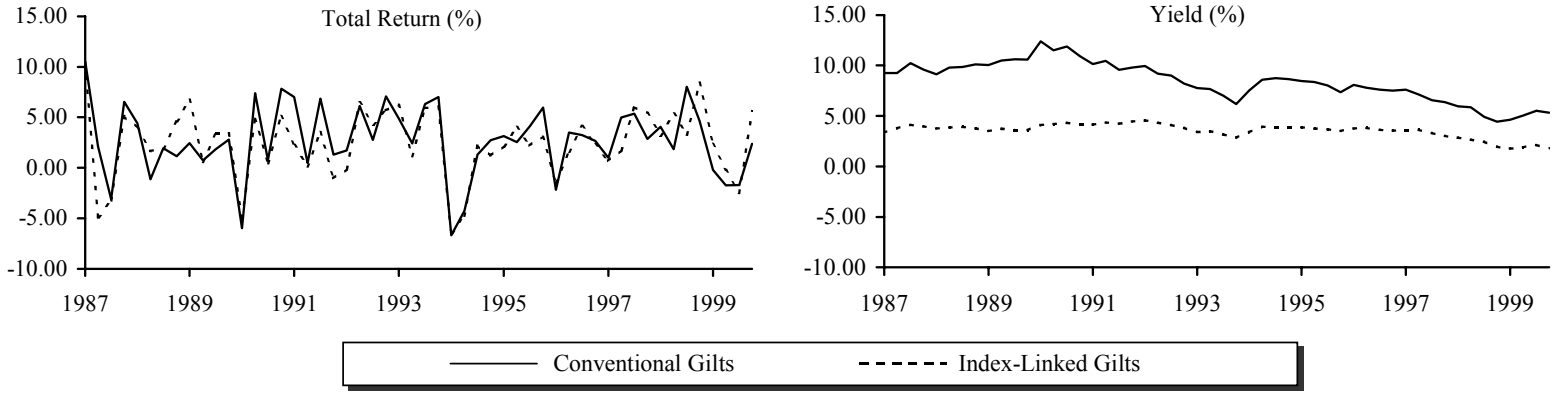
	Lehman Brothers Aggregate Bond Index		Salomon Smith Barney Inflation-Linked Securities Index	
	Total Return (%)	Nominal Yield (%)	Total Return (%)	Real Yield (%)
Total Return and Average Yield	11.47	6.34	3.06	3.76
Standard Deviation (%)	3.37	1.65	2.22	0.62
Return/Risk	3.40		1.38	

Sources: Bureau of Labor Statistics, Lehman Brothers, Inc., and Salomon Smith Barney.
Notes: As of 12/31/99, the bond maturity and duration of the Lehman Brothers Aggregate Bond Index are 8.86 years and 5.38 years, respectively. For the Salomon Smith Barney Inflation-Linked Securities Index, the maturity is 13.89 years and the duration is 9.11 years.

Exhibit 6

CONVENTIONAL AND INDEX-LINKED U.K. GILTS: YIELDS AND NOMINAL TOTAL RETURNS

January 1, 1987 - December 31, 1999



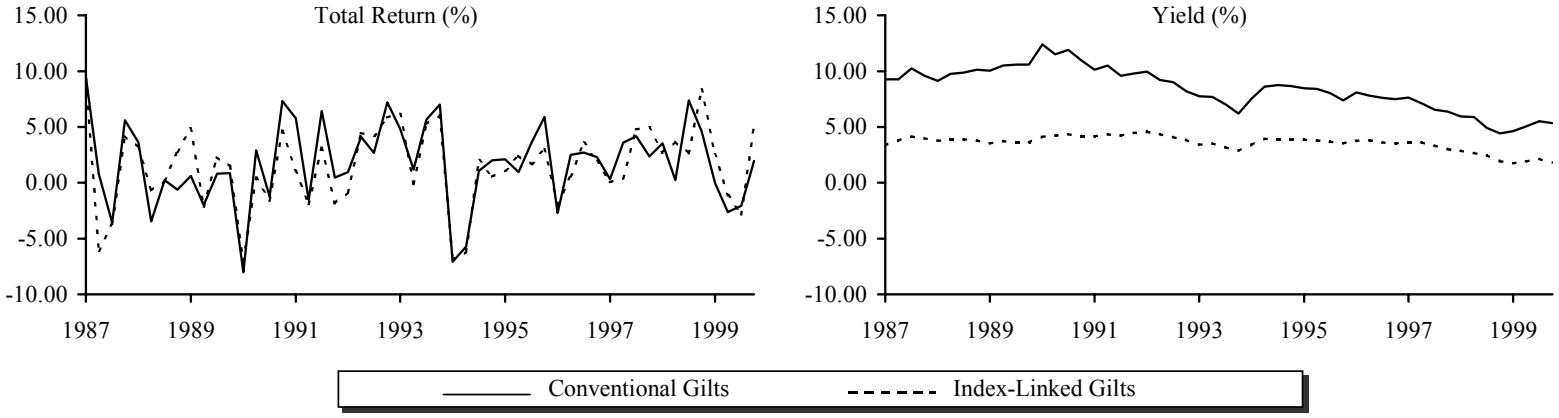
	Conventional Gilts		Index-Linked Gilts	
Year	Total Return (%)	Nominal Yield (%)	Total Return (%)	Real Yield (%)
1987	16.53	9.60	6.77	3.98
1988	6.41	10.13	12.63	3.79
1989	8.02	10.58	14.72	3.61
1990	9.71	10.96	5.15	4.18
1991	16.37	9.80	4.88	4.45
1992	18.72	8.22	17.17	3.83
1993	22.24	6.20	20.65	2.86
1994	-7.03	8.66	-7.84	3.88
1995	16.66	7.37	11.95	3.52
1996	7.34	7.50	6.59	3.53
1997	14.85	6.36	14.45	3.02
1998	19.79	4.43	21.71	1.94
1999	-1.32	5.33	5.17	1.80
Average	11.08	8.41	10.03	3.55
Standard Deviation	7.13	3.90	6.99	1.40
Return/Risk	1.55		1.43	

Sources: Datastream International and J.P. Morgan Securities, Inc.

Exhibit 7

CONVENTIONAL AND INDEX-LINKED U.K. GILTS: YIELDS AND REAL TOTAL RETURNS

January 1, 1987 - December 31, 1999



	Conventional Gilts		Index-Linked Gilts	
Year	Total Return (%)	Nominal Yield (%)	Total Return (%)	Real Yield (%)
1987	12.38	9.60	2.96	3.98
1988	-0.35	10.13	5.49	3.79
1989	0.29	10.58	6.51	3.61
1990	0.33	10.96	-3.84	4.18
1991	11.40	9.80	0.40	4.45
1992	15.73	8.22	14.22	3.83
1993	19.91	6.20	18.36	2.86
1994	-9.64	8.66	-10.43	3.88
1995	13.03	7.37	8.46	3.52
1996	4.76	7.50	4.04	3.53
1997	10.83	6.36	10.44	3.02
1998	16.58	4.43	18.45	1.94
1999	-2.80	5.33	3.60	1.80
Average	6.76	8.41	5.75	3.55
Standard Deviation	7.45	3.90	7.31	1.40
Return/Risk	0.91		0.79	

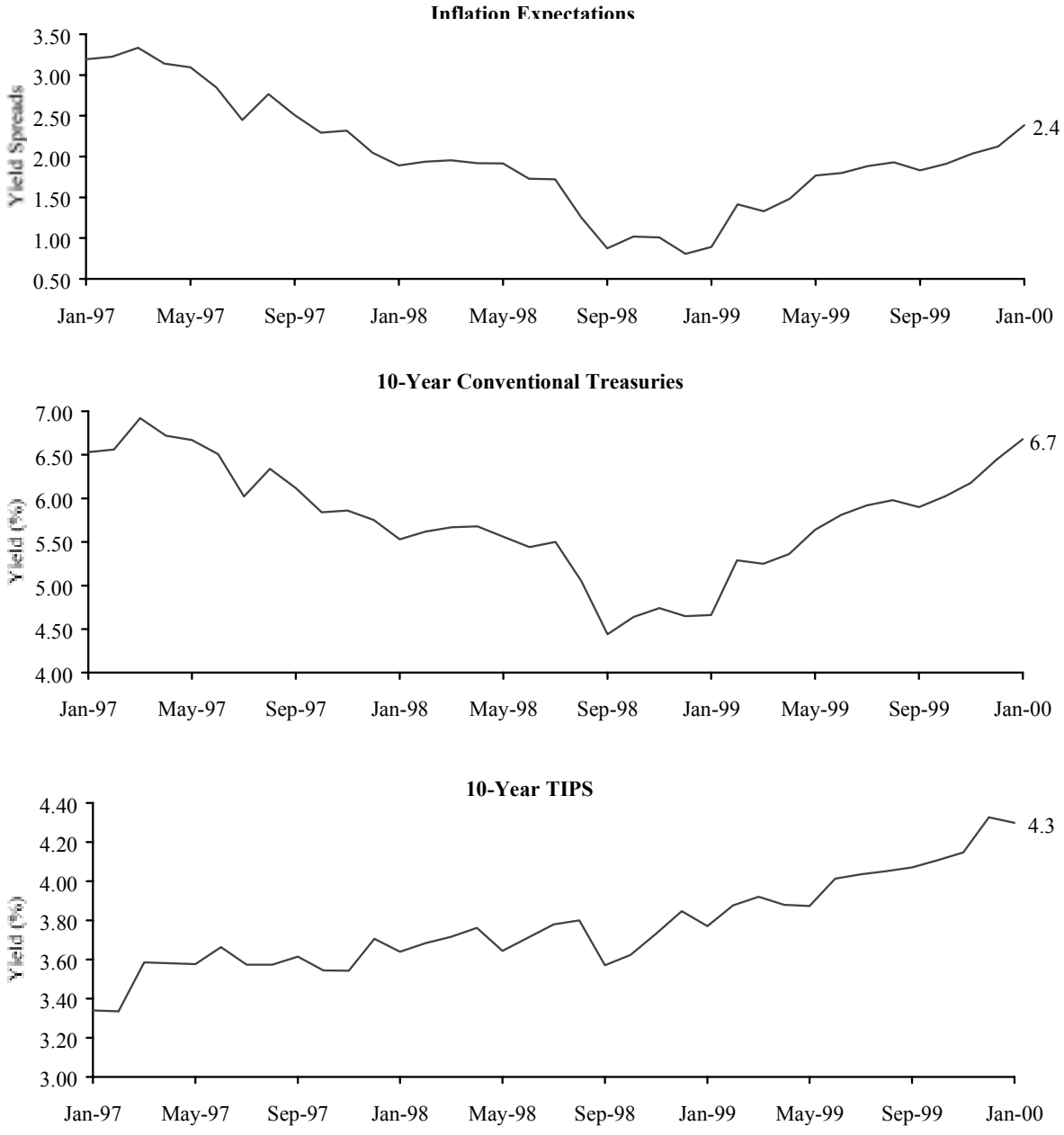
Sources: Datastream International and J.P. Morgan Securities, Inc.

Notes: All returns are in pounds sterling. As of December 31, 1999, the bond maturity and duration of the conventional gilts are 10.47 years and 6.95 years, respectively.

Exhibit 8

INFLATION EXPECTATIONS AND 10-YEAR TREASURY YIELDS

January 31, 1997 - January 31, 2000



Sources: The Bloomberg and Datastream International.

Note: Inflation expectations are based on the yield spreads between 10-year conventional treasuries and TIPs.

Exhibit 9

NOMINAL PERFORMANCE OF TIPS RELATIVE TO NOMINAL BONDS OF VARYING DURATION

		Bridgewater Conventional Treasuries			
	Bridgewater Simulated TIPS 8-Year Duration	8-Year Duration	3.5-Year Duration	2.5-Year Duration	1.5-Year Duration
1977	8.3	3.2	3.7	4.0	4.1
1978	12.5	1.8	1.4	2.5	3.9
1979	17.3	0.9	6.4	7.4	8.4
1980	13.4	-2.5	4.4	7.1	9.3
1981	9.4	1.1	10.8	12.6	14.0
1982	13.1	45.0	30.2	25.5	19.1
1983	3.6	0.6	6.1	7.3	7.9
1984	7.7	16.3	14.8	14.3	12.4
1985	12.3	32.6	19.3	15.6	11.5
1986	6.8	24.3	13.6	11.5	9.0
1987	7.0	-2.2	2.9	4.3	5.3
1988	8.6	9.3	5.0	5.3	5.5
1989	11.0	18.1	13.8	12.4	10.4
1990	10.7	7.1	10.2	10.1	9.2
1991	7.7	16.2	15.4	13.1	10.0
1992	7.2	8.5	5.8	5.6	4.9
1993	9.1	16.3	7.1	5.6	4.0
1994	3.2	-4.0	-3.7	-1.8	0.7
1995	11.1	24.8	16.1	13.1	9.4
1996	6.8	1.9	3.6	4.3	5.0
1997	2.4	13.7	7.8	7.0	6.0
1998	4.8	13.1	9.7	8.3	6.7
1999	3.6	-3.9	-0.1	1.6	3.2
AACR (1977-99)	8.5	9.9	8.6	8.4	7.8
St. Dev	3.4	12.3	7.3	5.6	3.5
Ratio of AACR to St. Dev.	2.5	0.8	1.2	1.5	2.2
Correlation with TIPS	---	0.3	0.4	0.4	0.5
AACR (1997-99)	3.6	7.3	5.7	5.6	5.3
St. Dev	2.5	5.4	3.0	2.1	1.1
Ratio of AACR to St. Dev.	1.4	1.4	1.9	2.7	4.9

Source: Bridgewater Associates.

Notes: The returns for 1977 do not include the month of January. The Bridgewater TIPS series is simulated from 1977-96 and is live from 1997-99.

Exhibit 10

REAL PERFORMANCE OF TIPS RELATIVE TO NOMINAL BONDS OF VARYING DURATION

		Bridgewater Conventional Treasuries			
	Bridgewater Simulated TIPS 8-Year Duration	8-Year Duration	3.5-Year Duration	2.5-Year Duration	1.5-Year Duration
1977	1.5	-2.8	-2.3	-2.1	-2.0
1978	3.2	-6.6	-7.0	-6.0	-4.6
1979	3.6	-10.9	-6.1	-5.2	-4.3
1980	0.8	-13.3	-7.2	-4.8	-2.9
1981	0.4	-7.2	1.7	3.4	4.7
1982	8.9	39.6	25.4	20.8	14.7
1983	-0.2	-3.1	2.2	3.4	4.0
1984	3.6	11.9	10.5	9.9	8.2
1985	8.2	27.8	14.9	11.4	7.4
1986	5.7	23.0	12.4	10.3	7.8
1987	2.5	-6.4	-1.5	-0.1	0.8
1988	4.0	4.7	0.5	0.8	1.0
1989	6.0	12.8	8.8	7.4	5.5
1990	4.4	0.9	3.8	3.8	2.9
1991	4.5	12.8	11.9	9.7	6.7
1992	4.2	5.5	2.8	2.6	2.0
1993	6.2	13.2	4.3	2.7	1.3
1994	0.5	-6.5	-6.2	-4.3	-1.9
1995	8.4	21.8	13.2	10.3	6.7
1996	3.4	-1.4	0.2	1.0	1.6
1997	0.6	11.8	6.0	5.2	4.2
1998	3.1	11.4	8.0	6.6	5.0
1999	0.9	-6.5	-2.7	-1.1	0.5
AACR (1977-99)	3.6	5.0	3.8	3.5	2.9
St. Dev	3.3	12.8	7.7	6.0	3.9
Ratio of AACR to St. Dev.	1.1	0.4	0.5	0.6	0.8
Correlation with TIPS	---	0.8	0.7	0.7	0.6
AACR (1997-99)	1.5	5.2	3.7	3.5	3.2
St. Dev	2.3	5.5	3.1	2.2	1.2
Ratio of AACR to St. Dev.	0.7	1.0	1.2	1.6	2.7

Sources: Bridgewater Associates and the Bureau of Labor Statistics.

Notes: The returns for 1977 do not include the month of January. The Bridgewater TIPS series is simulated from 1977-96 and is live from 1997-99.

Exhibit II

20-YEAR AVERAGE ANNUAL COMPOUND RETURNS OF TIPS RELATIVE TO OTHER ASSET CLASSES

	Bridgewater Simulated TIPS		Ibbotson Intermediate Gov't Bonds		Lehman Aggregate		S&P 500		91-Day T-Bills	
Period Ending	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1977	8.1	4.0	4.7	0.7	---	---	8.1	3.9	4.8	0.8
1978	8.6	4.1	5.0	0.6	---	---	6.5	2.0	5.1	0.8
1979	9.2	4.1	5.2	0.3	---	---	6.8	1.8	5.5	0.6
1980	9.6	3.9	4.8	-0.6	---	---	8.2	2.6	6.0	0.5
1981	9.9	3.8	5.2	-0.6	---	---	6.7	0.8	6.7	0.8
1982	10.2	4.0	6.3	0.3	---	---	8.2	2.1	7.1	1.1
1983	10.1	3.8	6.6	0.4	---	---	8.2	2.0	7.4	1.2
1984	10.2	3.7	7.1	0.7	---	---	7.7	1.4	7.8	1.4
1985	10.6	3.9	8.0	1.5	---	---	8.6	2.1	8.0	1.5
1986	10.5	4.0	8.5	2.1	---	---	10.1	3.6	8.0	1.7
1987	10.5	4.0	8.6	2.2	---	---	9.2	2.7	8.1	1.7
1988	10.5	3.9	8.7	2.3	---	---	9.4	3.0	8.2	1.8
1989	10.6	4.1	9.4	3.0	---	---	11.5	4.9	8.3	2.0
1990	10.5	4.0	9.1	2.7	---	---	11.1	4.5	8.4	2.0
1991	10.4	4.0	9.4	3.0	---	---	11.8	5.2	8.4	2.1
1992	10.4	4.0	9.5	3.1	---	---	11.2	4.7	8.4	2.0
1993	10.1	4.0	9.8	3.7	---	---	12.7	6.4	8.2	2.1
1994	9.3	3.7	9.3	3.6	---	---	14.5	8.6	8.0	2.4
1995	9.5	4.0	9.7	4.2	10.1	4.6	14.5	8.8	8.0	2.6
1996	9.3	3.9	9.1	3.8	9.5	4.1	14.5	8.9	8.0	2.7
1997	9.0	3.9	9.5	4.4	9.8	4.7	16.6	11.1	7.9	2.9
1998	8.6	3.9	9.8	5.1	10.2	5.4	17.7	12.6	7.8	3.1
1999	7.9	3.8	9.7	5.4	10.0	5.8	17.8	13.3	7.5	3.3
Average Return	9.7	3.9	8.0	2.3	9.9	4.9	10.9	5.1	7.5	1.8
St. Dev.	0.8	0.1	1.9	1.8	0.3	0.7	3.5	3.7	1.1	0.8
AACR (1958-99)	8.3	3.9	7.0	2.6	9.2	4.3	12.8	8.1	6.3	1.9
St. Dev. (1958-99)	3.0	2.6	6.1	6.4	7.6	8.1	15.5	15.8	1.5	1.4

Sources: Bridgewater Associates, Bureau of Labor Statistics, Datastream International, Lehman Brothers Inc., and Standard & Poor's. Also used: *Stocks, Bonds, Bills and Inflation 1998 Yearbook* . Ibbotson Associates, Chicago (annually updates work by Roger G. Ibbotson and Rex A. Sinquefield). Used with permission. All rights reserved.

Notes: Standard deviations are annualized and based on quarterly returns. The Bridgewater series is simulated from 1958-96 and is live from 1997-99.

Exhibit 12

TEN-YEAR AVERAGE ANNUAL COMPOUND RETURNS OF TIPS RELATIVE TO OTHER ASSET CLASSES

	Bridgewater Simulated TIPS		Ibbotson Intermediate Gov't Bonds		Lehman Aggregate		S&P 500		91-Day T-Bills	
Periods Ending:	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1967	5.5	3.7	2.9	1.1	---	---	12.8	10.8	3.5	1.7
1968	6.1	4.0	3.5	1.4	---	---	9.9	7.7	3.9	1.7
1969	6.6	4.0	3.5	0.9	---	---	7.8	5.1	4.2	1.7
1970	7.2	4.2	3.9	1.0	---	---	8.1	5.0	4.6	1.6
1971	7.7	4.4	4.6	1.4	---	---	7.0	3.7	4.8	1.6
1972	7.9	4.3	4.6	1.1	---	---	9.9	6.3	5.0	1.5
1973	8.8	4.5	4.9	0.8	---	---	6.0	1.8	5.4	1.3
1974	10.2	4.8	5.1	-0.2	---	---	1.2	-3.8	5.9	0.6
1975	10.4	4.4	5.7	0.0	---	---	3.3	-2.3	6.1	0.3
1976	10.6	4.4	6.5	0.6	---	---	6.6	0.7	6.1	0.2
1977	10.8	4.3	6.6	0.3	---	---	3.5	-2.5	6.2	0.0
1978	11.1	4.1	6.5	-0.2	---	---	3.1	-3.3	6.4	-0.2
1979	11.9	4.2	7.0	-0.4	---	---	5.8	-1.5	6.8	-0.5
1980	11.9	3.6	5.7	-2.1	---	---	8.4	0.3	7.4	-0.6
1981	12.1	3.2	5.8	-2.6	---	---	6.3	-2.1	8.6	-0.1
1982	12.7	3.7	8.0	-0.6	---	---	6.6	-1.9	9.3	0.6
1983	11.5	3.0	8.3	0.1	---	---	10.5	2.2	9.5	1.2
1984	10.3	2.7	9.1	1.7	---	---	14.6	6.8	9.7	2.2
1985	10.7	3.4	10.3	3.1	10.5	3.3	14.1	6.7	9.9	2.7
1986	10.4	3.5	10.5	3.7	10.5	3.6	13.7	6.6	10.0	3.2
1987	10.2	3.6	10.7	4.0	10.4	3.8	15.1	8.2	10.1	3.5
1988	9.9	3.7	11.0	4.7	11.1	4.9	16.2	9.7	10.0	3.9
1989	9.2	4.0	11.9	6.5	12.4	7.0	17.4	11.7	9.8	4.5
1990	9.0	4.3	12.5	7.7	13.1	8.2	13.8	9.0	9.3	4.6
1991	8.8	4.7	13.1	8.9	14.1	9.8	17.5	13.1	8.3	4.2
1992	8.2	4.3	11.0	7.0	11.7	7.6	16.1	11.8	7.5	3.5
1993	8.8	4.9	11.4	7.4	11.9	7.9	14.9	10.8	6.8	3.0
1994	8.3	4.6	9.4	5.6	10.0	6.2	14.3	10.4	6.2	2.6
1995	8.2	4.6	9.1	5.4	9.6	6.0	14.9	11.0	6.0	2.5
1996	8.2	4.4	7.8	3.9	8.5	4.6	15.3	11.2	5.9	2.2
1997	7.7	4.2	8.3	4.8	9.2	5.6	18.0	14.2	5.8	2.4
1998	7.4	4.1	8.7	5.5	9.3	5.9	19.2	15.6	5.6	2.4
1999	6.6	3.6	7.5	4.4	7.7	4.6	18.2	14.8	5.2	2.2
Average Return	9.2	4.0	7.7	2.6	10.7	5.9	11.2	6.0	7.0	1.9
St. Dev.	1.9	0.5	2.9	3.0	1.8	1.9	5.2	5.9	2.0	1.5
AACR (1958-99)	8.3	3.9	7.0	2.6	9.2	4.3	12.8	8.1	6.3	1.9
St. Dev. (1958-99)	3.0	2.6	6.1	6.4	7.6	8.1	15.5	15.8	1.5	1.4

Sources: The Bridgewater Group, Bureau of Labor Statistics, Datastream International, Lehman Brothers Inc., and Standard & Poor's. Also used: *Stocks, Bonds, Bills and Inflation 1998 Yearbook* . Ibbotson Associates, Chicago (annually updates work by Roger G. Ibbotson and Rex A. Sinquefield). Used with permission.

Note: The Bridgewater series is simulated from 1958-96 and is live from 1997-99.

Exhibit 13

U.S. CAPITAL MARKET PERFORMANCE DURING VARYING INFLATION ENVIRONMENTS

January 1, 1958 - December 31, 1999

Return and Risk Performance

	Bridgewater Simulated TIPS		Bridgewater Simulated TIPS 2:1 Leverage		Ibbotson Intermediate Gov't Bonds		S&P 500		91-Day T-Bills	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Low Inflation 1958-72										
AACR	6.8	4.0	8.9	6.0	4.2	1.4	1.4	8.1	4.2	1.5
Std. Dev.	1.8	1.3	3.3	2.8	4.3	4.4	13.7	13.9	0.8	0.7
Return/Risk	3.8	3.0	2.7	2.2	1.0	0.3	0.1	0.6	5.6	2.1
High Inflation 1973-81										
AACR	12.6	3.1	15.9	6.1	5.9	-3.1	5.0	-3.8	9.0	-0.2
Std. Dev.	3.7	3.3	7.6	7.1	8.0	8.2	18.5	18.6	1.7	1.7
Return/Risk	3.4	0.9	2.1	0.9	0.7	-0.4	0.3	-0.2	5.2	-0.1
Low Inflation 1982-99										
AACR	7.6	4.1	8.1	4.7	10.0	6.5	18.5	14.7	6.7	3.3
Std. Dev.	2.9	3.0	5.8	5.8	6.1	6.3	15.1	15.3	1.2	1.2
Return/Risk	2.6	1.4	1.4	0.8	1.6	1.0	1.2	1.0	5.8	2.7
Complete Period 1958-99										
AACR	8.3	3.9	10.0	5.5	7.0	2.6	12.8	8.1	6.3	1.9
Std. Dev.	3.0	2.6	5.7	5.3	6.1	6.4	15.5	15.8	1.5	1.4
Return/Risk	2.8	1.5	1.8	1.0	1.1	0.4	0.8	0.5	4.3	1.4

Exhibit 13 (continued)

U.S. CAPITAL MARKET PERFORMANCE DURING VARYING INFLATION ENVIRONMENTS

January 1, 1958 - December 31, 1999

	Nominal Correlations					Real Correlations				
Low Inflation 1958-72	Bridgewater Simulated TIPS	Bridgewater Simulated TIPS 2:1 Leverage	Ibbotson Intermediate Gov't Bonds	S&P 500	91-Day T-Bills	Bridgewater Simulated TIPS	Bridgewater Simulated TIPS 2:1 Leverage	Ibbotson Intermediate Gov't Bonds	S&P 500	91-Day T-Bills
Bridgewater Simulated Tips	1.00					1.00				
Bridgewater Simulated Tips 2:1 Leverage	0.98	1.00				0.97	1.00			
Ibbotson Intermediate Gov't Bonds	0.62	0.71	1.00			0.76	0.72	1.00		
S&P 500	-0.58	-0.56	-0.37	1.00		-0.61	-0.58	-0.23	1.00	
91-Day T-Bills	0.89	0.79	0.28	-0.52	1.00	0.22	0.01	0.15	-0.14	1.00
High Inflation 1973-81										
Bridgewater Simulated Tips	1.00					1.00				
Bridgewater Simulated Tips 2:1 Leverage	0.90	1.00				0.94	1.00			
Ibbotson Intermediate Gov't Bonds	-0.28	-0.28	1.00			0.00	-0.17	1.00		
S&P 500	-0.42	-0.39	0.26	1.00		-0.52	-0.39	0.36	1.00	
91-Day T-Bills	0.17	-0.26	0.00	-0.01	1.00	-0.60	-0.83	0.40	0.12	1.00
Low Inflation 1982-99										
Bridgewater Simulated Tips	1.00					1.00				
Bridgewater Simulated Tips 2:1 Leverage	0.93	1.00				0.93	1.00			
Ibbotson Intermediate Gov't Bonds	0.73	0.58	1.00			0.79	0.58	1.00		
S&P 500	0.09	0.08	0.41	1.00		0.25	0.14	0.46	1.00	
91-Day T-Bills	0.44	0.09	0.56	0.06	1.00	0.24	-0.12	0.63	0.30	1.00
Complete Period 1958-99										
Bridgewater Simulated Tips	1.00					1.00				
Bridgewater Simulated Tips 2:1 Leverage	0.93	1.00				0.88	1.00			
Ibbotson Intermediate Gov't Bonds	0.34	0.25	1.00			0.61	0.26	1.00		
S&P 500	-0.33	-0.33	0.21	1.00		-0.08	-0.23	0.38	1.00	
91-Day T-Bills	0.57	0.23	0.35	-0.11	1.00	0.06	-0.41	0.64	0.35	1.00

Sources: Bridgewater Associates, Bureau of Labor Statistics, Datastream International, Federal Reserve, Lehman Brothers, and Standard & Poor's.
Also used: *Stocks, Bonds Bills and Inflation 1998 Yearbook* . Ibbotson Associates, Chicago (annually updates work by Roger G. Ibbotson and Rex A. Sinquefield). Used with permission. All rights reserved.
Notes: The Bridgewater series is simulated from 1958-96 and is live from 1997-99. Correlations are based on annual data.

Exhibit 14

U.K. CAPITAL MARKET PERFORMANCE DURING VARYING INFLATION ENVIRONMENTS

January 1, 1982 - December 31, 1999

Return and Risk Performance

	Equities		Conventional Gilts		Index-Linked Gilts		Cash	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
Low Inflation 1982-86								
AACR	27.5	21.5	17.0	11.5	5.8	0.9	11.6	6.3
Std. Dev.	13.5	14.2	9.8	10.2	7.2	7.6	0.7	1.6
Return/Risk	2.0	1.5	1.7	1.1	0.8	0.1	16.2	4.0
High Inflation 1987-90								
AACR	10.3	3.2	9.9	2.9	9.7	2.6	12.9	5.6
Std. Dev.	24.3	24.1	7.6	8.0	7.7	7.9	1.3	1.8
Return/Risk	0.4	0.1	1.3	0.4	1.3	0.3	9.9	3.1
Low Inflation 1991-99								
AACR	18.0	14.8	11.3	8.3	9.7	6.7	7.4	4.5
Std. Dev.	13.9	14.2	6.2	6.4	5.9	6.2	1.1	1.3
Return/Risk	1.3	1.0	1.8	1.3	1.6	1.1	7.1	3.4
Complete Period 1982-99								
AACR	18.8	13.9	12.6	7.9	8.6	4.1	9.8	5.2
Std. Dev.	16.6	16.8	7.7	8.0	6.6	7.0	1.5	1.5
Return/Risk	1.1	0.8	1.6	1.0	1.3	0.6	6.4	3.4

Exhibit 14 (continued)

U.K. CAPITAL MARKET PERFORMANCE DURING VARYING INFLATION ENVIRONMENTS

January 1, 1982 - December 31, 1999

	Nominal Correlations				Real Correlations			
Low Inflation 1982-86	Equities	Conventional Gilts	Index-Linked Gilts	Cash	Equities	Conventional Gilts	Index-Linked Gilts	Cash
Equities	1.00				1.00			
Conventional Gilts	0.15	1.00			0.10	1.00		
Index-Linked Gilts	0.37	0.85	1.00		0.42	0.82	1.00	
Cash	-0.63	0.63	0.47	1.00	-0.29	0.43	0.60	1.00
High Inflation 1987-90								
Equities	1.00				1.00			
Conventional Gilts	-0.26	1.00			0.01	1.00		
Index-Linked Gilts	0.89	-0.66	1.00		0.92	0.02	1.00	
Cash	-0.05	-0.39	0.02	1.00	0.16	0.29	-0.21	1.00
Low Inflation 1991-99								
Equities	1.00				1.00			
Conventional Gilts	0.64	1.00			0.63	1.00		
Index-Linked Gilts	0.66	0.89	1.00		0.67	0.89	1.00	
Cash	0.18	0.50	0.19	1.00	0.24	0.48	0.26	1.00
Complete Period 1982-99								
Equities	1.00				1.00			
Conventional Gilts	0.37	1.00			0.42	1.00		
Index-Linked Gilts	0.38	0.63	1.00		0.45	0.66	1.00	
Cash	0.01	0.27	0.01	1.00	0.17	0.37	0.02	1.00

Source: Datastream International.
Note: Correlations are based on annual data.

Exhibit 15

RETURNS AND STANDARD DEVIATIONS OF BARCLAYS CAPITAL GLOBAL INFLATION-LINKED BOND INDEX

U.S. Dollars

Annual Total Returns (%)

		Country Constituents				
	Global Index	Canada	France	Sweden	U.K.	U.S.
1997	5.1	0.1	---	-5.8	10.0	---
1998	12.5	-1.2	---	1.4	20.7	4.0
1999	1.3	14.1	-14.4	-4.4	1.4	2.2
Standard Deviation	6.1	9.5	5.9	9.0	8.9	2.2

Average Annual Total Returns (%)

3 Years	6.2	4.1	---	-3.0	10.4	---
2 Years	6.7	6.2	---	-1.5	10.6	3.1
1 Year	1.3	14.1	-14.4	-4.4	1.4	2.2

Local Currency

Annual Total Returns (%)

		Country Constituents				
	Global Index*	Canada	France	Sweden	U.K.	U.S.
1997	5.1	4.7	---	8.4	13.9	---
1998	12.5	5.9	---	3.9	19.9	4.0
1999	1.2	7.8	0.1	0.6	4.3	2.2
Standard Deviation	6.1	6.3	3.7	4.4	4.7	2.2

Average Annual Total Returns (%)

3 Years	6.1	6.1	---	4.3	12.5	---
2 Years	6.7	6.9	---	2.2	11.9	3.1
1 Year	1.2	7.8	0.1	0.6	4.3	2.2

Source: Barclays Capital.

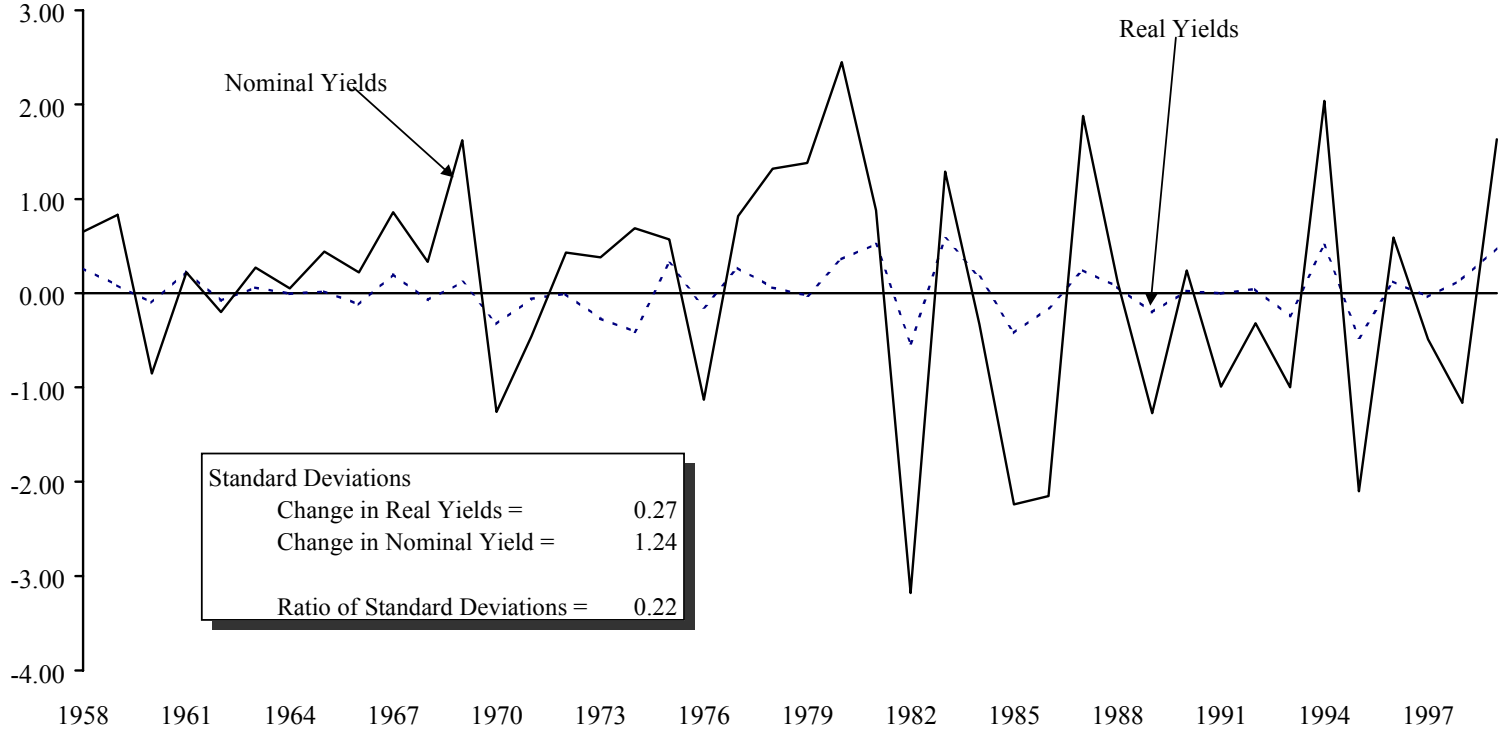
*Global Index returns are shown in U.S. Dollars.

Exhibit 16

VOLATILITY OF SIMULATED REAL YIELDS RELATIVE TO NOMINAL YIELDS

United States

January 1, 1958 - December 31, 1999



Source: Bridgewater Associates.

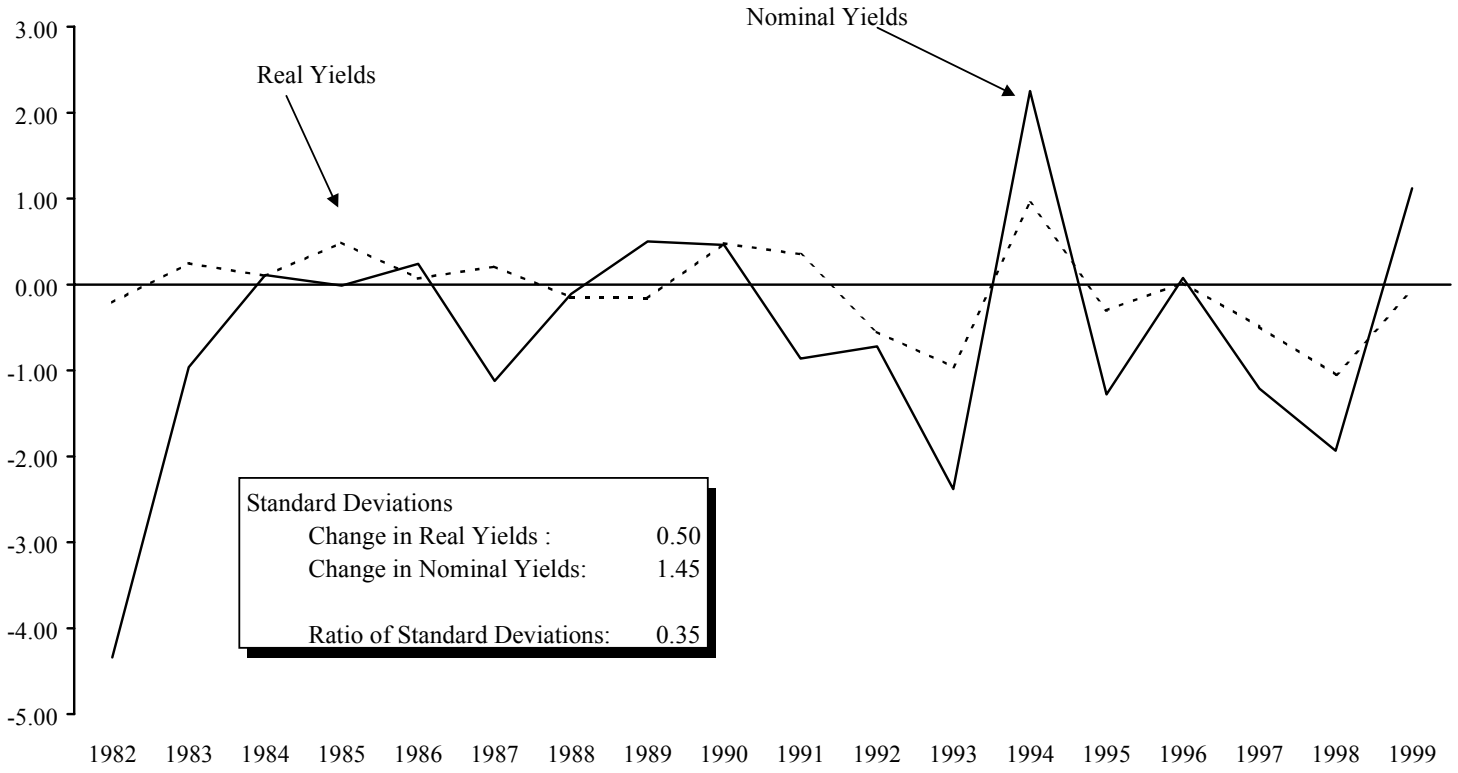
Note: The real yield series is simulated through December 1996, beginning in January 1997, actual real yield data are used.

Exhibit 17

VOLATILITY OF CHANGES IN REAL YIELDS RELATIVE TO NOMINAL YIELDS

United Kingdom

January 1, 1982 - December 31, 1999



Source: Bridgewater Associates.

Exhibit 18

CORRELATIONS OF REAL RETURNS OF TIPS WITH EQUITIES, BONDS AND CASH OVER VARYING TIME HORIZONS

Correlation of TIPS with

	Quarterly Returns (%)			Annual Returns (%)			3-Year Returns (%)		
	S&P 500	Ibbotson Intermediate Gov't Bonds	91-Day T-Bills	S&P 500	Ibbotson Intermediate Gov't Bonds	91-Day T-Bills	S&P 500	Ibbotson Intermediate Gov't Bonds	91-Day T-Bills
Full Period 1958-99	0.15	0.79	0.07	-0.08	0.61	0.06	-0.21	0.48	0.03
Low Inflation 1958-72	-0.01	0.59	-0.01	-0.61	0.76	0.22	---	---	---
High Inflation 1973-81	0.18	0.85	-0.19	-0.52	0.00	-0.60	---	---	---
Low Inflation 1982-99	0.16	0.84	0.24	0.25	0.79	0.24	---	---	---

Sources: Bridgewater Associates, Bureau of Labor Statistics, Datastream International, Lehman Brothers Inc., and Standard & Poor's.
Also used: Stocks, Bonds, Bills, and Inflation 1998 Yearbook. Ibbotson Associates, Chicago (annually updates work by Roger G. Ibbotson and Rex A. Sinquefield). Used with permission. All rights reserved.

Note: The Bridgewater series is simulated from 1958-96 and is live from 1997-99.

Exhibit 19

SIMPLIFIED SCENARIO USING TIPS TO HEDGE ENDOWMENT SPENDING

	Year One		Year Two	
	$ million	Percent	$ million	Percent
Initial Assumptions				
Total Beginning Market Value	$ 100.00		$ 80.93	
Asset Allocation				
Stocks	$ 70.00	70.0%	$ 56.65	70.0%
Bonds	$ 20.00	20.0%	$ 16.19	20.0%
Inflation-Linked Bonds	$ 10.00	10.0%	$ 8.09	10.0%
Spending	$ 5.00	5.0%	$ 5.00	6.2%
Current Yield:				
Bonds		6.7%		8.8%
Inflation-Linked Bonds		4.1%		4.1%
Real Estate		6.1%		7.2%
Inflationary Period				
Expected Inflation		4.1%		8.2%
Actual Inflation		6.5%		10.5%
Total Returns:				
Stocks		-18.9%		-28.8%
Bonds		-10.3%		-4.4%
Inflation-Linked Bonds		10.8%		14.9%
Additions/(Withdrawals)				
Stocks	($0.35)		$1.66	
Bonds	($1.77)		($3.56)	
Inflation-Linked Bonds	($2.88)		($3.10)	
Ending Market Value	**$ 80.93**		**$ 60.05**	
Stocks	$ 56.65	70.0%	$ 42.04	70.0%
Bonds	$ 16.19	20.0%	$ 12.01	20.0%
Inflation-Linked Bonds	$ 8.09	10.0%	$ 6.01	10.0%
Real Ending Market Value	**$ 75.99**		**$ 51.03**	

Exhibit 19 (continued)

NOTES ON SIMPLIFIED SCENARIO USING TIPS TO HEDGE ENDOWMENT SPENDING

The exhibit on the facing page provides a simple example of how an allocation to TIPS can hedge spending.

Assumptions

- An endowment of $100 million is invested 70% in equities, 20% in nominal bonds, and 10% in TIPS.
- The endowment spends the greater of 5% of its beginning market value or last year's spending.
- Inflation reaches 6.5% in year one and 10.5% in year two.
- Equities return approximately -20% in year one and -30% in year two, and nominal bonds return approximately -10% and -4%, respectively.
- The annual return on the TIPS in a flat interest rate environment would be equal to the real yield of 4% plus the inflation of 6.5% and 10.5%.

Results

- At the end of year one, the income plus appreciation of TIPS totals only $1,076,000 in year one, falling far short of the $5 million required for spending. However, since the total value of the endowment has declined to $81 million after spending, a 10% allocation to TIPS would total approximately $8 million. After selling TIPS to rebalance, nearly $3 million is available for spending without selling any stocks or bonds at depressed prices. Add to this the proceeds from rebalancing nominal bonds, and one is only $350,000 short of the required $5 million.
- During year two, the sale of appreciated TIPS, combined with the sale of nominal bonds to rebalance, would be sufficient to support spending. Additionally, over $1.5 million would be rebalanced into equities in order to restore their allocation to 70% of the portfolio.
- Although TIPS hedge only approximately 60% of spending needs under these extreme conditions, the outcome is far better for the endowment than would have been the case if no inflation-hedging assets were available.

Exhibit 20

LIQUIDITY OF TIPS RELATIVE TO TREASURIES AND CORPORATE BONDS

1999 Average Bid/Ask Spreads

	1999 Average Bid/Ask Yield Spread	12/31/1999 Bid/Ask Yield Spread
TIP Maturing		
July 15, 2002	0.0228	0.0270
January 15, 2007	0.0093	0.0100
January 15, 2008	0.0092	0.0090
January 15, 2009	0.0078	0.0080
April 15, 2028	0.0067	0.0067
April 15, 2029	0.0123	0.0123

Bid/Ask Yield Spreads of Representative Treasuries and Corporate Bonds

On-the-Run Treasuries:	0.0013
Off-the-Run Treasuries:	0.0052
10-Year High Quality Corporate:	1.0000
30-Year High Quality Corporate:	3.0000

Sources: The Bloomberg and Morgan Stanley Dean Witter.

APPENDIX A

FUNDAMENTALS OF TIPS INVESTING

THE MECHANICS OF TIPS PRICING

TIPS in the United States are indexed to the non-seasonally adjusted U.S. City Average All Items Consumer Price Index for All Urban Consumers (CPI-U) with a lag of three months. The coupon percentage stays fixed and the principal is adjusted by the change in CPI-U. The lag in the CPI-U is necessary in order to allow for daily pricing of TIPS through linear interpolation (described below), given that the CPI is released on a monthly basis. Therefore, a TIPS issued on December 1, 1999 would be indexed to inflation occurring after September 1, 1999. The three-month lagging date is referred to as the reference date, and the CPI-U level on that date is the reference CPI. The Treasury announces reference CPI dates and reference CPI values to prevent confusion and to simplify the process of calculating TIPS prices.

Pricing information on the 3-5/8% ten-year TIPS issued on January 15, 1998 is provided in Exhibit A-1. On December 1, 1999, the principal value of the inflation-linked bond issued on January 15, 1998, was adjusted by increasing its principal value by the rate of inflation that occurred between October 15, 1997 and October 1, 1999. The indexed principal value is calculated by multiplying the face value of the TIPS of $100 by the index ratio, which was 1.039 on December 1, 1999, resulting in a principal value of $103.93. The index ratio is equal to the ratio of the reference CPI at the date of valuation, 168.200 (CPI-U level October 1, 1999) to the reference CPI at issuance, 161.555 (interpolated CPI-U level on October 15, 1997).

As noted above, daily pricing of TIPS is achieved through linear interpolation of monthly CPI levels. In the example above, the reference CPI at issuance of the TIPS issued on January 15, 1998 represents a linear interpolation between the reference CPI on January 1, 1998 (CPI-U level on October 1, 1997) and February 1, 1998 (CPI-U on November 1, 1997). This is calculated by taking the reference CPI on January 1, 1998 of 161.6 and adding approximately one-half (the fraction of full days elapsed during the month, or 14/31, on January 15) of the difference between the reference CPI-U level 161.5 on February 1, 1998 and 161.6 on January 1, 1998. This results in a reference CPI of 161.555 [161.6+14/31*(161.5-161.6)].

The Treasury guarantees that maturing TIPS will be redeemed at least at face value. However, the Treasury does not guarantee a minimum coupon payment. Coupon payments are calculated as the fixed coupon rate multiplied by the indexed principal. If inflation is negative, the indexed principal value declines, and the coupon payments decline, including the final coupon payment that is distributed at the same time as the repayment of principal.

TIPS FOR TAXABLE INVESTORS

In general, TIPS are not attractive in taxable accounts because the inflation accruals to principal are taxed in the period in which they accrued, even though no income is distributed-as is also the case with zero-coupon bonds. Consequently, there is a threshold rate of inflation above which coupon payments will fail to cover the tax liability, leaving the investor out-of-pocket. This threshold inflation rate decreases as tax rates rise and as coupon payments decline. Investors paying the highest marginal Federal tax rates therefore incur a significant risk that their tax liability will exceed the cash flow from their TIPS' coupons.

Exhibit A-1

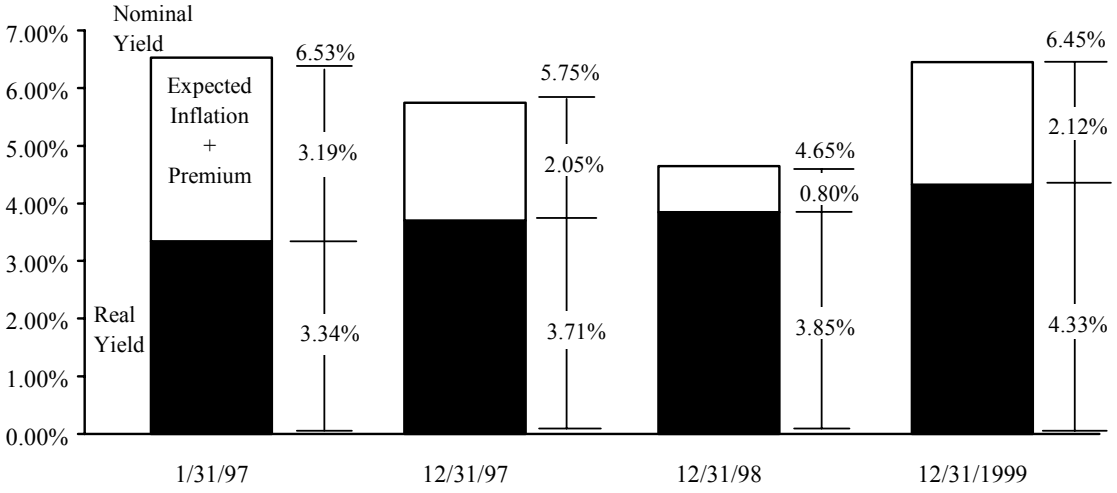
PRICING OF THE 3-5/8% TEN-YEAR TIPS; ISSUED 01/15/1998, PAR $100

Date	Three-month Lagging CPI-U Date	Ref CPI	Index Ratio	Principal Value	Semi-annual Coupon Payment
01/01/1998	Oct-97	161.600	---	---	---
01/15/1998	---	161.555	1.000	$100.00	---
02/01/1998	Nov-97	161.500	1.000	$99.97	---
03/01/1998	Dec-97	161.300	0.998	$99.84	---
04/01/1998	Jan-98	161.600	1.000	$100.03	---
05/01/1998	Feb-98	161.900	1.002	$100.21	---
06/01/1998	Mar-98	162.200	1.004	$100.40	---
07/01/1998	Apr-98	162.500	1.006	$100.59	---
07/15/1998	---	162.635	1.007	$100.67	$1.82
08/01/1998	May-98	162.800	1.008	$100.77	---
09/01/1998	Jun-98	163.000	1.009	$100.89	---
10/01/1998	Jul-98	163.200	1.010	$101.02	---
11/01/1998	Aug-98	163.400	1.011	$101.14	---
12/01/1998	Sep-98	163.600	1.013	$101.27	---
01/01/1999	Oct-98	164.000	1.015	$101.51	---
01/15/1999	---	164.000	1.015	$101.51	$1.84
02/01/1999	Nov-98	164.000	1.015	$101.51	---
03/01/1999	Dec-98	163.900	1.015	$101.45	---
04/01/1999	Jan-99	164.300	1.017	$101.70	---
05/01/1999	Feb-99	164.500	1.018	$101.82	---
06/01/1999	Mar-99	165.000	1.021	$102.13	---
07/01/1999	Apr-99	166.200	1.029	$102.88	---
07/15/1999	---	166.200	1.029	$102.88	$1.86
08/01/1999	May-99	166.200	1.029	$102.88	---
09/01/1999	Jun-99	166.200	1.029	$102.88	---
10/01/1999	Jul-99	166.700	1.032	$103.18	---
11/01/1999	Aug-99	167.100	1.034	$103.43	---
12/01/1999	Sep-99	167.900	1.039	$103.93	---
01/01/2000	Oct-99	168.200	1.041	$104.11	---
01/15/2000	---	168.245	1.041	$104.14	$1.89
02/01/2000	Nov-99	168.300	1.042	$104.18	---

Ref CPI on the first day of the month = The non-seasonally adjusted CPI-U lagged three months
Index Ratio = Reference CPI on date of pricing/Reference CPI at issuance
Intra-Month Ref CPI = Ref CPI on first day of current month + (percent of full days elapsed in month) * (Ref CPI on first day of following month - Ref CPI on first day of current month)
Pricipal Value = Index Ratio * 100
Semi-annual Coupon Payment = Principle Value * Real Yield/2

Exhibit A-2

COMPONENTS OF INFLATION-LINKED BOND YIELDS AND NOMINAL BONDS



Nominal Bond Yields = Expected Real Yield + Expected Inflation + Risk Premium

* Higher inflation expectations lead to a greater differential between nominal bond and inflation-linked bond yields.

* Lower inflation expectations lead to a smaller differential between nominal bond and inflation-indexed bond yields.

* The high correlation between nominal and inflation-linked bonds in the United Kingdom can be explained by the predominance of disinflationary periods over the period inflation-linked bonds have been available.

Exhibit A-3

EXPECTED BEHAVIOR OF INFLATION-LINKED BONDS COMPARED WITH CONVENTIONAL TREASURIES DURING VARYING ECONOMIC ENVIRONMENTS

	Effect on Bonds if Inflation:	
	Rises	Falls
Nominal Bonds	Negative	Positive
Inflation-Linked Bonds	Positive	Negative

	Effect on Bonds if Real Yields:	
	Rise	Fall
Nominal Bonds	Negative	Positive
Inflation-Linked Bonds	Negative	Positive

* If real yields rise when inflation increases, the effect on inflation-linked bonds may be negative, depending on the relative size of the increase in inflation and real yields.

* If the Federal Reserve Board preemptively raises rates, real yields may increase and inflation may be controlled. Both these factors would be negative for inflation-linked bonds.

EXHIBIT A-4
INVESTING IN TIPS

Advantages

- At 4.3%, yields on ten-year TIPS are at their highest point since they were first issued in January 1997, and are high relative to a longer history of real yields.
- The current investment environment is favorable for TIPS. Over the next ten years, TIPS will outperform nominal bonds if consumer price inflation is greater than 2.38%. While the spread between TIPS yields and yields of ten-year nominal Treasury bonds has increased from its low of 0.80% at year-end 1998, a 2.38% rate of inflation is still low by historical standards. In fact, the average annual inflation rate for every ten-year period this century is 3.2%, and has exceeded 2.38% in every ten-year period but 12 (periods ending in 1957-68) since the decade ending in 1941.
- TIPS are indexed to CPI-U and therefore provide direct long-term protection against unexpected inflation.
- TIPS are partially protected against the risk of falling prices by the Treasury's guarantee that the principal returned upon maturity will be at least equal to the face value of the bond.
- These securities should provide diversification benefits to a portfolio because they have low correlations to stocks and conventional bonds, particularly during periods when inflation expectations change. On average, we would expect the correlation of inflation-linked bonds to nominal bonds to be fairly high (i.e., about 60%). However, during periods of high inflation or disinflation, we would expect TIPS to have low or negative correlations to nominal bonds.
- TIPS may offer some advantages over other means for hedging against inflation: - Real estate and oil and gas partnership investments are somewhat illiquid. - REITs and energy stocks are often more correlated with stocks than inflation.
- Because TIPS may have superior risk-adjusted returns, their inclusion in a portfolio should enable investors to add other, higher-risk investments without increasing total portfolio risk.

Disadvantages

- It is premature to claim that we know how TIPS will behave under different market conditions. Their expected behavior has been modeled on that of inflation-linked bonds in other countries, which may not accurately reflect how they will behave in the United States.
- Inflation-linked bonds may not provide strong protection against unexpected inflation in the short-term if real yields rise more quickly than inflation. However, demand for TIPS should also increase under these conditions, driving prices higher.
- The real returns of these bonds may be less than that of other inflation hedging instruments. Investors will be paying for the inflation insurance by receiving a lower rate of return. However, leveraging inflation-linked bonds could allow for enhanced returns, albeit with higher risk.

EXHIBIT A-5
INVESTING IN LEVERAGED TIPS

Opportunities

- Leveraged TIPS may provide a means for hedging against inflation without experiencing an opportunity cost relative to alternative investments. While risks increase with the use of leverage, the estimated risk-adjusted returns of TIPS leveraged 2:1, between 1958 and 1999 were still greater than those of unleveraged investments in stocks and nominal bonds. However, it is important to note that additional risks are introduced by leverage that are not necessarily reflected in the volatility of returns.
- The nominal value of TIPS will tend to rise as borrowing costs rise because nominal LIBOR and TIPS returns are both positively correlated with inflation over the long-term. However, during shorter-term periods (e.g., quarterly or monthly), LIBOR and TIPS' correlations with inflation diminishes. Therefore, investors are still at risk of having to pay out cash for an extended period in the short-term if real yields were to increase during an inflationary period. Over the long-term, borrowing costs and TIPS might be positively correlated, but leverage always compresses an investor's time horizon such that the long term becomes irrelevant when the cash flow from the leveraged investment proves insufficient to finance margin payments, forcing the liquidation of the position at a loss.

Risks

- The expected behavior of inflation-linked bonds is based on historical behavior in other countries that offer similar instruments. This may not accurately reflect the behavior of the product in the United States.
- The return on leveraged inflation-linked bonds is comprised of the carry, or the spread between the yield on the bonds and the borrowing costs, and the return on the unleveraged bond.
  - When real short-term interest rates, or borrowing costs, rise above inflation-linked bond yields, the carry component of the return becomes negative. This would occur during periods where the yield curve is inverted.
  - For inflation-linked bonds leveraged 2:1, in order for the carry component of the return to entirely offset the return on the unleveraged portion of the investment, real short-term interest rates would have to be twice that of the real yield on the bond (assuming no change in real yields). For example, with a real yield on ten-year U.S. TIPS of 4.0%, in order for the return on bonds leveraged 2:1 to be negative, short term rates would have to be 8.0%: the carry return of -4.0% (4.0% to 8.0%) would completely offset the real value of the coupon payment on the unleveraged portion of the investment.
- The price impact of a change in real yields will be magnified by a leveraged investment in inflation-linked bonds. For example, an increase in the ten-year U.S. TIPS real yield of 100 bps

would result in a price decrease of approximately 8%. A 2:1 leveraged investment in the same bond would result in a loss of 16%.

- As with any leveraged investment, as noted above, leveraged inflation-linked bond investments are subject to cash flow risk when losses result in margin calls (in the case of derivatives) or when cash flows must be exchanged (in the case of a swaps).
- Leveraged investments are also generally subject to counterparty credit risk.

APPENDIX B
INFLATION-LINKED BOND INDEXES

The inflation-linked bond indexes in this Appendix are referred to by the following abbreviations:

Barclays Capital Global Inflation-Linked Bond Index - U.S. Sector: BCG-US
Barclays Capital Global Inflation-Linked Bond Index: BCG
Lehman Brothers U.S. TIPS Index: LB-US
Lehman Brothers Global Real Index: LBG
Merrill Lynch Inflation-Linked U.S. Treasuries Index: ML-US
Merrill Lynch Inflation-Linked Global Government Index: MLG
Salomon Smith Barney Inflation-Linked Securities Index: SSB

Exhibit B-1

COMPARATIVE PERFORMANCE OF INFLATION-LINKED INDEXES

Quarterly Return Performance

	US TIPS				Global Inflation-Linked Bonds		
	LB-US	SSB	BCG-US	ML-US	LBG	BCG	MLG
03/31/1997	---	---	---	---	---	-4.6	---
06/30/1997	---	0.9	0.9	1.0	---	2.6	---
09/30/1997	---	1.4	1.5	1.3	---	2.5	---
12/31/1997	1.0	1.2	1.2	1.1	5.2	4.7	---
03/31/1998	0.4	0.4	0.3	0.4	3.3	3.2	3.4
06/30/1998	1.3	1.3	1.3	1.3	3.1	2.9	3.0
09/30/1998	2.7	2.8	2.8	2.8	3.5	3.2	3.3
12/31/1998	-0.5	-0.5	-0.4	-0.6	2.6	2.6	2.5
03/31/1999	0.4	0.5	0.4	0.6	-0.7	-0.7	-0.7
06/30/1999	1.4	1.3	1.3	1.3	-1.0	-0.6	-0.7
09/30/1999	0.5	0.5	0.6	0.6	1.3	1.6	1.5
12/31/1999	0.0	0.0	-0.1	0.0	1.7	1.0	0.6
Standard Deviation	2.1	2.2	2.2	2.2	5.3	6.1	4.1

Correlations

	LB-US	SSB	BCG-US	ML-US	LBG	BCG	MLG
LB-US	1.000						
SSB	0.997	1.000					
BCG-US	0.995	0.995	1.000				
ML-US	0.995	0.994	0.993	1.000			
LBG	0.039	0.043	0.067	0.035	1.000		
BCG	0.110	0.110	0.139	0.105	0.985	1.000	
MLG	0.068	0.071	0.097	0.066	0.989	0.985	1.000

Sources: Barclays Capital, The Bloomberg, Lehman Brothers, Inc., and Salomon Smith Barney.

Exhibit B-2

INFLATION-LINKED BOND INDEX COVERAGE

U.S. Indexes

	Minimum Issue Size	Sectors Included	Countries Covered
BCG-US	$100 million	Government Only	United States
LB-US	$100 million	Government Only	United States
ML-US	$1 billion	Government Only	United States
SSB	$1 billion	U.S. Inflation-Linked Bonds (currently includes only TIPS based on liquidity constraints)	United States

Global Indexes

	Minimum Issue Size	Sectors Included	Countries Covered
BCG	$100 million (Aggregate market value of country must be greater than or or equal to $1 billion)	Government only National debt rating of AA or higher	Australia Canada France Sweden United Kingdom
LBG	$100 million	Government Only	Canada Sweden United Kingdom United States
MLG	varies by country The U.S. limit is $1 billion	Government Only	Australia Canada France New Zealand Sweden United Kingdom United States

Sources: Barclays Capital, The Bloomberg, Lehman Brothers, Inc., Merrill Lynch, and Salomon Smith Barney.

Note: All of the above indexes reconstitute monthly and require that individual issues have a minimum term to maturity of one year.

APPENDIX C

REPRESENTATIVE TIPS MANAGERS

REPRESENTATIVE TIPS MANAGERS

	Product Focus	Total Product Assets	Total Firm Assets	Minimum Annual Investment	Management Fee Schedule	Vehicle	Benchmarks
Bridgewater Associates							
Global Inflation-Linked Bonds	Active Global	$2,480 mm	$25,092 mm	$40 mm	Endowment & ERISA 0.500% on first $20 mm 0.400% on next $20 mm 0.300% on next $60 mm 0.200% on next $50 mm 0.150% over $150 mm Negotiable over $100 mm Fee excludes custody Performance-based fees available	Separate Account	Client customized benchmark
Leveraged Indexed Bonds	Active Global	$529 mm	$25,092 mm	$40 mm	Endowment & ERISA 0.350% an all assets Fee excludes custody Performance-based fees available	Separate Account	Client customized benchmark
Passive U.S. Inflation-Indexed Bonds	Passive U.S.	$323 mm	$25,092 mm	$40 mm	Endowment & ERISA 0.100% on all assets Fee excludes custody Performance-based fees available	Separate Account	Client customized benchmark
Brown Brothers Harriman and Company							
Treasury Inflation-Linked Index Securities (TIPS)	Active U.S.	$12 mm	$36,605 mm	Endowment & ERISA $ 10 MM Mutual Fund $5,000	Endowment & ERISA 0.300 % of first $10 mm 0.250% on next $15 mm 0.200% on next $25 mm 0.150% over $50 mm Fee includes custody Performance Based fees not available Mutual Fund Expense Ratio: 0.650% of assets** "Off the Street" 1st time client: $100,000 Client from other financial institution: $2,500 Existing Client: $5,000 This is a no-load fund Fee includes custody	Separate Account Mutual Fund	Salomon Smith Barney Inflation-Linked Securities Index

REPRESENTATIVE TIPS MANAGERS

	Product Focus	Total Product Assets	Total Firm Assets	Minimum Annual Investment	Management Fee Schedule	Vehicle	Benchmarks
Dresdner RCM Global Investors Real Return Fixed Income	Active U.S.	$29 mm	$68,303 mm*	$30 mm	Endowment & ERISA Fees are determined on a case by case basis Fee excludes custody Performance-based fees available	Separate Account	Salomon Smith Barney Inflation-Linked Securities Index
Grantham, Mayo, Van Otterloo & Company GMO Inflation-Linked Bond Fund	Active U.S.	$51 mm	$25,465 mm*	Endowment & ERISA $100 mm Mutual Fund $1 mm	Endowment & ERISA 0.250% on all assets Fee excludes custody Performance-based fees available Mutual Fund expense ratio: 0.250% of assets* Fee includes custody	Separate Account Mutual Fund	Lehman Brothers U.S. TIPS Index
Pacific Investment Management Company Real Return	Active U.S.	$290 mm	$ 171,845 mm*	Separate Account Endowment & ERISA $50 mm Mutual Fund $5 mm	Separate Account Endowment & ERISA 0.210% on first $500 mm 0.180% over $500 mm Fee excludes custody Performance based fees available Mutual Fund expense ratio: 0.500% of assets*** This is a no-load fund Fee includes custody	Separate Account Mutual Fund	Lehman Brothers U.S. TIPS Index
Western Asset Management Company Enhanced TIPS	Active U.S.	$4,001 mm	$57,418 mm*	$25 mm	Separate Account Endowment & ERISA 1.000% on first $100 mm 0.500% over $100 mm Fee excludes custody Performance-based fees available Fees negotiable for large investments	Separate Account	Lehman Brothers U.S. TIPS Index

Note: All data are as of 12/31/99 unless otherwise noted.
* Data are as of 6/30/99.
** Data are as of 9/30/99
***Data are as of 11/1/99.

REPRESENTATIVE MANAGER FACTSHEETS

BRIDGEWATER ASSOCIATES
Global Inflation-Indexed Bonds
One Glendinning Place
Westport, CT 06880
(203)226-3030
www.bridgewaterassociates.com

Philosophy: Global Bonds
Tax-Exempt Product Accounts (12/31/99): 5
Tax-Exempt Product Assets (12/31/99): $2,480 mm
Total Product Assets (12/31/99): $2,480 mm
Total Firm Assets (12/31/99): $25,092 mm

New Business Contact: Robert Zink (203)226-3030
Organization: Independent Investment Counsel

Year Founded: 1975
SEC Registered: Yes
AIMR Compliant: No

Investment Approach: A fundamental, systematic approach is utilized to add value to an inflation-indexed (I/I) bond portfolio. Several sources of alpha are included in the investment philosophy: 1) tactical shifts into I/I bonds of Non-U.S. countries, thus taking advantage of shifts in real yields across countries and increasing the liquidity of the portfolio; 2) opportunistic moves into conventional nominal bonds based upon an assessment of inflation as a potential source of value added due to the relative mispricings between I/I bonds and nominal bonds; 3) assessments of the fundamental factors affecting real yields and a comparison of the shape of the real yield curve to that of the nominal yield curve help to exploit pricing inefficiencies; 4) finally, portfolios may be structured to take advantage of the direction of real yields through active duration management. Currency hedging (in the form of currency forwards) is employed when permitted by the client. Further, currency-hedged tactical moves into foreign inflation-indexed bonds are used to exploit shifts in real yields across countries while maintaining an underlying sensitivity to domestic inflation. Portfolios are tailored to suit the needs of each client. Typically, portfolios contain 5 to 11 issues and are diversified among five countries.

Research: The firm relies on in-house research (100%).

Investment Results:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Bridgewater Associates	---	---	---	---	---	---	9.8	7.0	8.2	3.7
Barclays Capital Global Inflation-Linked Bond Index	---	---	---	---	---	---	---	5.1	12.5	1.3

Average Annual Compound Returns (%) Through Calendar Year 12/31/99

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Bridgewater Associates	---	---	---	---	---	---	7.2	6.3	5.9
Barclays Capital Global Inflation-Linked Bond Index	---	---	---	---	---	---	---	6.2	6.7

Performance Notes: Performance is for a representative Global Inflation-Indexed Bond account. Returns include return on cash reserves. Performance is gross of management fees. Returns have not been audited by an independent third party.

BRIDGEWATER ASSOCIATES
Leveraged Indexed Bonds
One Glendinning Place
Westport, CT 06880
(203)226-3030
www.bridgewaterassociates.com

Philosophy: Intermediate/Long-Term
Tax-Exempt Product Accounts (12/31/99): 1
Tax-Exempt Product Assets (12/31/99): $529 mm
Total Product Assets (12/31/99): $529 mm
Total Firm Assets (12/31/99): $25,092 mm

New Business Contact: William Mahoney (203)226-3030
Organization: Independent Investment Counsel

Year Founded: 1975
SEC Registered: Yes
AIMR Compliant: No

Investment Approach: A two step process is implemented in establishing a portfolio for a client's mandate. The firm begins the investment process by replicating the leveraged inflation-indexed benchmark portfolio, with the dual objectives of maintaining low tracking error and preserving enough flexibility to implement active decisions. The firm then deviates from the benchmark portfolio based on an assessment of market opportunities to add value. A fundamental, systematic approach is utilized to add value to an inflation-indexed (I/I) bond portfolio. Several sources of alpha are included in the investment philosophy: 1) tactical shifts into I/I bonds of Non-U.S. countries, thus taking advantage of shifts in real yields across countries and increasing the liquidity of the portfolio; 2) opportunistic moves into conventional nominal bonds based upon an assessment of inflation is a potential source of value added due to the relative mispricings between I/I bonds and nominal bonds; 3) assessments of the fundamental factors affecting real yields and a comparison of the shape of the real yield curve to that of the nominal yield curve help to exploit pricing inefficiencies; and 4) portfolios may be structured to take advantage of the direction of real yields through active duration management. Currency hedging (in the form of currency forwards) is employed when permitted by the client. Further, currency-hedged tactical moves into foreign inflation-indexed bonds are used to exploit shifts in real yields across countries while maintaining an underlying sensitivity to domestic inflation. Portfolios are tailored to suit the needs of each client. Typically, portfolios contain 5 to 11 issues and are diversified among five countries. The average security quality of portfolio holdings is AAA, and turnover ranges 50-300% annually. Cash reserves typically average 10%.

Research: The firm relies on in-house research (100%).

Investment Results:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Bridgewater Associates	---	---	---	---	---	23.1	14.9	12.1	14.3	3.9
Barclays Capital Global Inflation-Linked Bond Index	---	---	---	---	---	---	---	5.1	12.5	1.3

Average Annual Compound Returns (%) Through Calendar Year 12/31/99

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Bridgewater Associates	---	---	---	---	---	13.5	11.2	10.0	9.0
Barclays Capital Global Inflation-Linked Bond Index	---	---	---	---	---	---	---	6.2	6.7

Performance Notes: Performance represents a fully discretionary, tax-exempt Leveraged Indexed Bond account. Returns include return on cash reserves. Performance is gross of management fees. Returns have not been audited by an independent third party.

BRIDGEWATER ASSOCIATES
Passive U.S. Inflation-Indexed Bonds
One Glendinning Place
Westport, CT 06880
(203)226-3030
www.bridgewaterassociates.com

Philosophy: Intermediate/Long-Term
Tax-Exempt Product Accounts (12/31/99): 3
Tax-Exempt Product Assets (12/31/99): $323 mm
Total Product Assets (12/31/99): $323 mm
Total Firm Assets (12/31/99): $25,092 mm

New Business Contact: Bill Mahoney (203)226-3030
Organization: Independent Investment Counsel

Year Founded: 1975
SEC Registered: Yes
AIMR Compliant: No

Investment Approach: The firm employs a passive approach to investing in U.S. inflation-indexed bonds. The objective is to replicate the performance of the client's customized benchmark with as little tracking error as possible. Direct purchase or repurchase agreements are the two main avenues available to obtain the chosen benchmark exposure. Although a direct cash purchase of a security is used in most cases, bonds may be bought and then lent out allowing exposure to the security while earning an interest rate spread to cash. The firm seeks at all times to minimize transaction costs. A record of all trades executed with each dealer and record of the price at the time of the trade is maintained. Transaction costs with each dealer are reviewed regularly by comparing their execution prices with the price of comparable bonds. Dealers receive a report allowing them to see their relative performance. Poor performing dealers are initially warned and then removed from the active list. Derivatives are not used unless requested by the client. Portfolios have an average credit quality of AAA.

Research: The firm relies on in-house research (100%).

Investment Results:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Bridgewater Associates	---	---	---	---	---	---	---	---	4.1	1.6
Barclays Capital U.S. Inflation-Linked Bond Index	---	---	---	---	---	---	---	---	4.0	2.2

Average Annual Compound Returns (%) Through Calendar Year 12/31/99

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Bridgewater Associates	---	---	---	---	---	---	---	---	2.8
Barclays Capital U.S. Inflation-Linked Bond Index	---	---	---	---	---	---	---	---	3.1

Performance Notes: Performance represents a composite of all fully discretionary, tax-exempt Passive U.S. Inflation-Indexed Bonds accounts. Returns include return on cash reserves. Performance is gross of management fees. Returns have not been audited by an independent third party.

BROWN BROTHERS HARRIMAN & COMPANY
Treasury Inflation-Linked Index Securities (TIPS)
59 Wall Street
New York, NY 10005
(212)493-1818
www.bbhco.com

Philosophy: Intermediate/Long-Term
Tax-Exempt Product Accounts (12/31/99): N/A
Tax-Exempt Product Assets (12/31/99): N/A
Total Product Assets (12/31/99): $12 mm
Total Firm Assets (12/31/99): $36,605 mm

New Business Contact: Geoffrey Deasey (212)493-7229
Organization: New York Bank

Year Founded: 1818
SEC Registered: No
AIMR Compliant: Yes

Investment Approach: The objective of the firm's quantitative analysis is to uncover value between Treasury Inflation Protected Securities (TIPS) and conventional Treasuries. The first active strategy is security selection, whereby the firm trades among securities within the same sector when opportunities exist to add incremental value to client portfolios. The security selection process starts with identifying the prices and yields available in the Inflation-Linked (IL) bond universe. Securities are ranked in terms of absolute yield, expected volatility, and break-even inflation rates. International IL bonds may be used depending on individual client guidelines. The next step is gauging the upcoming supply calendar. An important method for adding value has been to avoid the part of the yield curve where the next auction will be. Break-even inflation rates are analyzed in conjunction with current year-over-year CPI, short and long run inflation expectations, as well as changes in expectations. The last step is to balance the fundamental picture versus the technical or supply picture. The firm's second strategy is to manage sector exposure within a portfolio. Sector allocations are a function of historical yield spreads, supply and demand variables, and market volatility levels. The firm's third active strategy attempts to enhance portfolio return, without changing interest rate risk, by varying the maturity distribution of securities in the portfolio. The fourth active management strategy is to manage the duration exposure of a portfolio. In accordance with client guidelines, the firm takes the duration of the portfolio benchmark as the "neutral" point for the portfolio. The firm then applies its duration policy, varying portfolio duration above or below the neutral point in order to capitalize on the outlook for interest rates. The average security quality of portfolio holdings is AAA, and turnover ranges 100-350% annually.

Research: The firm relies primarily on external sources (i.e., BARRA) (60%) supplemented by in-house research (20%) and "Street" research (20%).

Investment Results:

Annual Total Returns (%)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Brown Brothers Harriman & Company	---	---	---	---	---	---	---	---	5.4	4.1
Salomon Smith Barney Inflation-Linked Securities Index	---	---	---	---	---	---	---	---	3.9	2.4

Average Annual Compound Returns (%) Through Calendar Year 12/31/99

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Brown Brothers Harriman & Company	---	---	---	---	---	---	---	---	4.7
Salomon Smith Barney Inflation-Linked Securities Index	---	---	---	---	---	---	---	---	3.2

Performance Notes: Performance represents the 59 Wall Street Inflation - Indexed Securities Fund. Returns include return on cash reserves. Performance is gross of management fees. Returns have not been audited by an independent third party.

DRESDNER RCM GLOBAL INVESTORS
Real Return Fixed Income
Four Embarcadero Center, Suite 2900
San Francisco, CA 94111
(415)954-5400
www.dresdnerrcm.com

Philosophy: Intermediate
Tax-Exempt Product Accounts (12/31/99): 1
Tax-Exempt Product Assets (12/31/99): $29 mm
Total Product Assets (12/31/99): $29 mm
Total Firm Assets (6/30/99): $68,303 mm

New Business Contact: John Plowright (415)954-5491
Organization: Holding Company Subsidiary
Parent/Affiliate: Dresdner Bank AG

Year Founded: 1970
SEC Registered: Yes
AIMR Compliant: Yes, Level II

Investment Approach: The firm utilizes a top-down investment strategy to identify high quality investment opportunities. The product's core is invested primarily in U.S. TIPS to ensure a real rate of return consistent with client objectives and constraints, but allows for investments in riskier asset classes when appropriate. The firm actively manages its allocation to TIPS based on the relative attractiveness of real versus nominal Treasury yields. Value is specifically added by actively managing exposures in four areas: duration, yield-curve positioning, issue selection and non-TIPS allocations such as high-yield, international and emerging market securities. Special emphasis is placed on out-of-index overweighs and underweights. The firm avoids asset classes that show inefficient risk/reward characteristics in favor of those with superior features, taking into consideration the potential risk factors involved. Sector specialists are responsible for identifying individual securities for purchase or sale in client portfolios. The Investment Policy Team reviews the recommendations of sector specialists, which ensures buying and selling consistency across portfolios.

Research: The firm relies primarily on in-house research (80%) supplemented by "Street" sources (20%).

Investment Results:

Annual Total Returns (%)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	9 mos 1999
Dresdner RCM Global Investors	---	---	---	---	---	---	---	---	---	---	----
Salomon Smith Barney Inflation-Linked Securities Index	---	---	---	---	---	---	---	---	---	3.9	2.4

Average Annual Compound Returns (%) Through Calendar Year 12/31/98

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Dresdner RCM Global Investors	---	---	---	---	---	---	---	---	---
Salomon Smith Barney Inflation-Linked Securities Index	---	---	---	---	---	---	---	---	---

Performance Notes: Performance represents a composite of all fully discretionary, tax-exempt Real Return Fixed Income accounts. Returns include return on cash reserves. Performance is gross of management fees. Returns have not been audited by an independent third party. Product inception date is 7/31/99. Performance is not yet available.

GRANTHAM, MAYO, VAN OTTERLOO & COMPANY
GMO Inflation Indexed Bond Fund
40 Rowes Wharf
Boston, MA 02110
(617)330-7500
www.gmo.com

Philosophy: U.S. Bonds
Tax-Exempt Product Accounts (12/31/99): N/A
Tax-Exempt Product Assets (12/31/99): N/A
Total Product Assets (12/31/99): $51 mm
Total Firm Assets (6/30/99): $25,465 mm

New Business Contact: John Balder (617)346-7689
Organization: Independent Investment Counsel

Year Founded: 1977
SEC Registered: Yes
AIMR Compliant: No

Investment Approach: The investment methodology involves selecting issues to track the Lehman Brothers US TIPS Index using an investment process that matches duration with that of the benchmark. The portfolio concentrates on inflation-indexed securities issued by the U.S. Government and U.S. Government agencies, but can also invest in corporate inflation indexed bonds as well as inflation indexed bonds issued by foreign governments (e.g. U.K., Australia and New Zealand). While the 10-year sector represents about half of the fund, holdings of 30-year inflation indexed securities represent more than 20% of the fund. The bottom-up investment process does not rely on political or economic forecasting. Additionally, the fund does not forecast absolute levels of interest or foreign exchange rates, although analysts' models are designed to integrate these factors in determining relative valuations of currencies and bond markets. Risk is mitigated by matching the fund's duration with that of the index. The fixed income team does not employ sector swaps or maturity laddering. A minimum amount of credit research is performed due to the fund's emphasis on government securities. Annual turnover ranges from 9% to 95% and cash reserves range from 0% to 10%.

Research: The firm relies primarily on in-house research (90%) supplemented by "Street" sources (10%).

Investment Results:

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Grantham, Mayo, Van Otterloo & Co	---	---	---	---	---	---	---	---	4.4	3.0
Lehman Bros US TIPS Index	---	---	---	---	---	---	---	---	4.0	2.4

Average Annual Compound Returns (%) Through Calendar Year 12/31/99

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Grantham, Mayo, Van Otterloo & Co	---	---	---	---	---	---	---	---	3.7
Lehman Bros US TIPS Index	---	---	---	---	---	---	---	---	3.2

Performance Notes: Performance represents the GMO Inflation Indexed Bond Fund, a mutual fund. Returns include return on cash reserves. Performance is gross of management fees. Returns have been audited by an independent third party.

PACIFIC INVESTMENT MANAGEMENT COMPANY
Real Return
840 Newport Center Drive
P.O. Box 6430
Newport Beach, CA 92658-6430
(949)720-6000
www.pimco.com

Philosophy: Intermediate-Term
Tax-Exempt Product Accounts (12/31/99): 3
Tax-Exempt Product Assets (12/31/99): $135 mm
Total Product Assets (12/31/99): $290 mm
Total Firm Assets (6/30/99): $171,845 mm

New Business Contact: Margaret Isberg (949)720-6013
Organization: Holding Company Subsidiary
Parent/Affiliate: PIMCO Advisors, L.P.

Year Founded: 1971
SEC Registered: Yes
AIMR Compliant: Yes, Level II

Investment Approach: The investment process begins with a top-down perspective to determine an overall risk exposure. Subsequent to the annual Investment Strategy Group meetings and its determination of the appropriate risk posture based upon a forecasted economic scenario, the Portfolio Management Group constructs a generic model portfolio. In turn, the real return portfolio management team constructs model real return portfolios, guided by the risk parameter ranges established in the generic model portfolio. Duration for real return assignments will typically be maintained in the range of the benchmark plus or minus 20%, although guidelines will allow for up to 30% discretion. Active management of portfolios also includes curve positioning, sector and security selection, cash management, and quantitative analysis. The top-down outlook, the limitation of portfolio tracking risk and quantitative evaluation of relative value (as compared to market price) are the primary drivers of any purchase or sale decision. Portfolios typically include 20 or more inflation-indexed, floating rate or conventional securities.

Research: The firm relies primarily on in-house research (80%) supplemented by "Street" research (20%).

Investment Results:

Annual Total Returns (%)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	9 mos 1999
Pacific Investment Management Company	---	---	---	---	---	---	---	---	---	5.7	5.7
Lehman Brothers U.S. TIPS Index	---	---	---	---	---	---	---	---	---	4.0	2.4

Average Annual Compound Returns (%) Through Calendar Year 12/31/98

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Pacific Investment Management Company	---	---	---	---	---	---	---	---	---
Lehman Brothers U.S. TIPS Index	---	---	---	---	---	---	---	---	---

Performance Notes: Performance represents a composite of all fully discretionary Real Return accounts with the Lehman Inflation Linked Index as their benchmark. Returns include return on cash reserves. Performance is gross of management fees. Returns have been audited by an independent third party.

WESTERN ASSET MANAGEMENT COMPANY
Enhanced TIPS
117 East Colorado Boulevard, Suite 600
Pasadena, CA 91105
(626)844-9400

Philosophy: Intermediate/Long-Term
Tax-Exempt Product Accounts (12/31/99): N/A
Tax-Exempt Product Assets (12/31/99): N/A
Total Product Assets (12/31/99): $4,001 mm
Total Firm Assets (6/30/99): $57,418 mm

New Business Contact: Tim O'Grady (626)844-9510
Organization: Broker Affiliate
Parent/Affiliate: Legg Mason, Inc.

Year Founded: 1971
SEC Registered: Yes
AIMR Compliant: Yes

Investment Approach: The foundation behind the management of the TIPS portfolios is a thorough examination of the real interest rate curve, the level of real interest rates, the expected inflation rate priced into nominal Treasury yields, and the relative volatility of real yields to nominal yields. The firm seeks to exploit the trading opportunity available between 10-year and 30-year TIPS during their auction cycles, to capture 10-15 basis point per year. The firm makes use of leverage when real rates rise above a predetermined threshold. Leverage is increased as real rates rise. Conversely, leverage is reduced if real rates decline, therefore the strategy provides liquidity when rates rise and takes advantage of liquidity when rates decline. Selection is dependent on the slope of the yield curve and short-term repurchase rates. Shifts in the yield curve are closely monitored. The Investment Strategy Group determines the implications of the yield curve's shape, along with projections of Fed policy and market expectations, and formulates a yield curve strategy to be implemented by the Portfolio Managers. The firm will use U.S.-issued TIPS exclusively until it has determined that non-U.S. inflation-linked bonds are liquid enough, can be financed, and have a better risk/return pattern hedged back into U.S. dollars than U.S. TIPS. Additionally, as the corporate and agency inflation indexed market grows, the firm sees potential value in switching between those issuing sectors and that of the U.S. Treasury. The average security quality of portfolio holdings is AAA, and turnover ranges 50-300% annually.

Research: The firm relies on in-house research (50%) supplemented by "Street" research (50%).

Investment Results:

Annual Total Returns (%)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	9 mos 1999
Western Asset Management Company	---	---	---	---	---	---	---	---	---	---	---
Lehman Brothers U.S. TIPS Index	---	---	---	---	---	---	---	---	---	4.0	2.4

Average Annual Compound Returns (%) Through Calendar Year 12/31/98

	10YR	9YR	8YR	7YR	6YR	5YR	4YR	3YR	2YR
Western Asset Management Company	---	---	---	---	---	---	---	---	---
Lehman Brothers U.S. TIPS Index	---	---	---	---	---	---	---	---	---

Performance Notes: Performance represents a composite of all fully discretionary Enhanced TIPS accounts. Returns include return on cash reserves. Performance is gross of management fees. Returns have not been audited by an independent third party. Product inception date is 10/1/99. Performance is not yet available.