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Hedging Inflation Risk With CPI Futures

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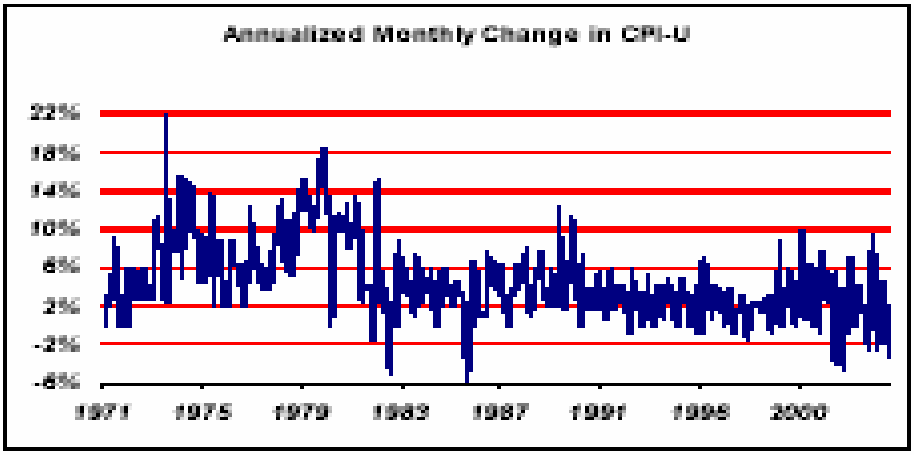
Through most of the 1990s, inflation was considered dead. During this period, inflation no longer seemed a factor that could adversely impact investment returns. This belief was reinforced by the long-term decline in the growth rate of prices as reflected by monthly CPI-U numbers displayed in Exhibit 6. (Consumer Price Index, U.S. city average for all urban consumers, all items, not seasonally adjusted published monthly by the Bureau of Labor Statistics. Historical CPI-U data was obtained from www.bls.gov/cpi.)

Going by recent reports in the popular press, it seems to be the case that inflation was never dead, maybe just dormant. Instead, with the US economy showing signs of recovering from the recent economic slump, it appears as if traders in the fixed income markets are concerned about the possibility of higher inflation in the coming months and years.

No matter one's view on the direction of price levels, until recently there was very little asset/liability (A/L) managers could do to actively manage inflation risk. Even before taking this step, a bank A/L manager had to develop a sense for market expectation of future inflation. Unfortunately, there were no traded securities signaling changes in expected inflation.

EXHIBIT 6.



Inflation-Indexed Bonds. One can never accuse the U.S. financial markets of not being innovative. Thanks to some much-needed help from the U.S. Treasury, a market in inflation-indexed instruments has evolved over the past six years. The first baby steps were taken with the launch in 1997 of Treasury Inflation-Indexed Securities, popularly known as TIPS by the U.S. Treasury.

Unlike conventional Treasury bonds that have fixed nominal coupon rates, coupon payments of TIPS are fixed in real terms at the time of issuance. Nominal payments track changes in the price level as reflected by the CPI-U. On coupon dates and at maturity, the par value of TIPS is adjusted for inflation. Coupon payments are calculated by applying the coupon interest rate to the inflation-adjusted principal. By means of this adjustment, investors are assured that the purchasing power of their interest and principal is protected from inflation.

An investor seeking to protect his or her retirement savings from inflation can invest in TIPS. Various investment institutions seeking inflation hedges now have recourse both to cash TIPS as well as inflation-indexed funds managed by large fund companies. There is also a relatively new but active inflation swaps market where A/L managers can obtain customized inflation hedges.

But care should be exercised in using TIPS-based products to hedge inflation risk. Any weaknesses in TIPS as an inflation hedge arise from the fact that a long position in TIPS is equivalent to a long position in a nominal bond and a short position in inflation. The instrument promises to deliver the real yield at the coupon rate, though with a 3-month lag. But, in doing so, it exposes the A/L manager to interest rate risk. For instance, holding everything else constant, a rise in the real interest rate will cause TIPS prices to fall, increasing the effective cost of the hedge, and vice versa.

CPI Futures. The gradual broadening and deepening of the inflation-linked bonds and inflation swaps markets has created the right set of conditions for an actively traded futures contract linked to the most popular benchmark of US inflation, the CPI-U.

Beginning in February of this year, bank A/L management committees (ALCOs) seeking a straightforward inflation hedge are now able to trade CPI futures at Chicago Mercantile Exchange (CME). This contract will be cash settled and will trade on CME's GLOBEX® electronic trading platform.

The CPI futures contract represents the inflation on a notional value of $1,000,000 for a period of three calendar months implied by the CPI-U. It is noteworthy that TIPS employ the same price index to adjust the nominal coupon and principal payments. This futures contract is designed to resemble the Eurodollar futures, the most actively traded futures contract in the U.S.. The contract has the familiar pricing style of 100 minus the contracted inflation rate. The final settlement value of the June 2004 contract, for instance, will be computed using the annualized percentage change from the CPI-U for February 2004, to be released on March 17, 2004, to CPI-U for May 2004, to be released on June 15, 2004.

It is important to note that while U.S. interest rates have historically stayed in positive territory, quarterly changes in inflation rate could become negative and hence result in CPI futures trading at prices greater than 100. This would happen if the market expects a decline in the CPI-U for the months upon which the CPI future's settlement price is based. Returning to Exhibit 6 on page 6, since 1971 there have been close to 23 instances of month-to-month drops in the CPI-U.

Trading CPI Futures. Bank A/L managers can indeed trade the CPI futures seeking protection from both rising and falling prices, as well as the rate of any such change. Let us look at a hypothetical example of how a bank A/L manager might take advantage of his or her view on the direction of inflation. Suppose that, on June 14, 2004, the consensus expectations for the May CPI release

scheduled for release on June 15, 2004, call for a decline in the CPI (CPURNSA <INDEX> on Bloomberg) of one-tenth from the April index level of 185.5. The soon-to-expire nearby CPI contract, June 2004, will settle to the change between the February and May CPI. Let us assume the February CPI index, released in March, came out at 184.4. (See Exhibit 7.)

EXHIBIT 7.

Feb CPURNSA (released in Mar)	184.4
Mar CPURNSA (released in Apr)	185.5
Apr CPURNSA (released in May)	185.5
Expected May CPURNSA	185.4

Based on the expected May CPURNSA, the June 2004 CPI should trade around 97.83:

$$100 - \left\{4 \times 100.00 \times \frac{185.4 - 184.4}{184.4} = 2.17\right\} = 97.83$$

But one A/L manager thinks the CPURNSA will print at 185.2. If she is correct, the CPI will actually settle at 98.26:

$$100 - \left\{4 \times 100.00 \times \frac{185.2 - 184.4}{184.4} = 1.73\right\} = 98.26$$

Therefore, she recommends that the ALCO buy the contract, expecting a lower measured inflation rate than the contract implies. If the bank ALCO buys 100 contracts, they would expect to make $107,500 (43 basis points (bps) x 100 contracts x $25) if their expectations are met. Each basis point of the CPI futures contract is worth $25. On the other hand, if the May 2004 CPI-U turns out to be higher at 185.6, the June 2004 contract will settle at 97.40:

$$100 - \left\{4 \times 100.00 \times \frac{185.7 - 184.4}{184.4} = 2.60\right\} = 97.40$$

The higher-than-expected CPI-U will result in a loss of $107,500.

Hedging with CPI Futures. With a listing of consecutive quarterly contract months, various applications are possible:

- With a single contract month, A/L managers can hedge short-term inflation risk. An example may include the inflation risk in the accretion of TIPS principal. Inflation accretion is basically the adjustment of the par value of TIPS for changes in the CPI-U. This risk arises from the fact that accretion takes place with a three-month delay. It also enables term repurchase (repo) transactions based on real interest rates.
- With a strip of consecutive contract months, A/L managers can hedge longer-term inflation risk. In particular, OTC swap dealers can price inflation swaps based on strips of CPI futures and hedge their risks with it.
- Issuers of inflation-linked securities may reengineer their exposure to inflation by trading a series of CPI futures. Alternatively, issuers and buyers of nominal rate debts can synthetically create an inflation-linked security with CPI futures.
- Portfolio managers and pension funds with substantial positions in regular dollar-denominated nominal corporate debt issues or conventional U.S. Treasury notes could create synthetic inflation-indexed securities by initiating a short position in the CPI futures coupled with a portion of their long cash position.

• Arbitrageurs could trade strips of consecutive quarterly CPI Futures expirations against strips of 3-month Eurodollar futures in order to trade forward real rates.

To demonstrate, a strip of CPI futures reflects expectations of CPI changes over the period covered by the strip. For example, the June 2004–March 2005 CPI futures strip should trade at a level which reflects expectations for the change in not seasonally-adjusted CPI-U during 2004 (actually from February 2004 to February 2005).

A strip of Eurodollar expirations reflects expectations of the nominal LIBOR rate over the period covered by the strip. For example, the March 2004–December 2004 Eurodollar strip should trade at a level which reflects expectations for the level and path of the 3-month LIBOR between March 2004 and March 2005, that is, approximately the same period covered by the aforementioned strip of CPI futures.

Thus, with a strip of consecutive contract months, A/L managers can hedge longer-term inflation risk. In particular, OTC swap dealers can price inflation swaps based on strips of CPI futures and hedge their risks with it.

For example, traders in the expanding over-the-counter US dollar inflation-indexed swap market could buy CPI futures as a hedge if they are receiving inflation in a swap or, conversely, sell CPI futures if they are paying inflation in an OTC swap—similar to the way participants in the interest rate swap market hedge their transactions using strips of consecutive Eurodollar futures.

Conclusion. Commercial banks, pension funds, fund managers, and the growing number of A/L managers at numerous banks can use the new CPI futures contract to manage their inflation risk. The contract is structured similarly to the highly liquid Eurodollar futures contract also traded on the mercantile exchanges. CPI futures can be combined with Treasury bond or Eurodollar futures contracts to create synthetic inflation-indexed instruments without incurring any tax burden on the inflation accrual to the TIPS principal.

The futures contract is a pure hedge. Hedge deals structured using TIPS for instance will contain interest rate exposures, unless the A/L manager is willing to strip out the interest rate component at an additional cost. Moreover, A/L managers can trade a series of CPI futures terminating at consecutive contract months to hedge their banks' exposures over specific portions of the term structure. As an exchange-traded instrument, CPI futures should have lower credit and operational risks.

The contract is based on quarterly changes in the CPI-U. Accordingly, A/L managers seeking to hedge against changes in price levels in specific market or geographic sectors can trade CPI futures to hedge the macro risk, and cover the basis risk by trading the sector specific securities. The availability of CPI futures will thereby reduce the effective cost of sector-specific hedges.

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