Alternative Investment Analyst Review

Alternative Inflation Hedging Portfolio Strategies: Going Forward Under Immoderate Macroeconomics

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1. Introduction

Inflation hedgers worldwide can be divided between those that are compelled by law or contract to do so and those who choose to do so as an investment strategy. In the first category we find institutional investors such as British pension funds, that must offer pensioners a guaranteed real value for their retirements. In the second category we find their American peers who choose to offer real return targets to their investors. In practice, we find a collection of investors between these extremes who are partly driven by imperative and partly driven by strategy. This last category includes French retail banks hedging their inflation-linked retail savings products or insurers that offer policies that, by law, are guaranteeing real values. As both of these cases involve exposure to short-run inflation liabilities, the firms have the option not to fully hedge this inflation exposure and keep the risk on their books. This combination of imperative and strategic decisions has generated a massive influx of money into inflation hedging assets which could be defined as too many dollars chasing too few (securities). This steady increase in the demand for inflation hedging assets as inflation remains modest begs for an explanation.

2. Need for Inflation Hedging

As Volcker's monetary tightening drive in the late 1970s took its toll on the robust inflationary pressures in the U.S. economy, the Great Inflation era seemed to have come to a close (Meltzer, 2005). However, as investors were ushered into a new era of declining inflation and overall macroeconomic stabilization, the days of cheap oil were numbered; emerging economies were exhibiting signs of economic progress.

As those countries advanced toward becoming developed economies, so did their oil consumption. Depressed oil prices in the decades following the oil shocks (Mabro, 1987) as a result of both economic difficulties (Hamilton, 2011) and large offshore discoveries in the 1980s led to a dramatic underinvestment in oil production, the consequences of which would only be felt at the end of the 2000s - an ever-rising demand overwhelmed the growth in production. As the global financial crisis hit the world's most advanced economies, the level and volatility of crude oil prices rose significantly, driving inflation upward in most countries and threatening to overwhelm any minor signs of economic recovery. Throughout this period, the very nature of inflation drivers had changed as headline inflation indices faced a roller-coaster ride of a very different nature from the one experienced in the 1970s (Blanchard and Gali, 2007) - core inflation was now flat for every advanced economy (van den Noord and André, 2007 and Todd and Stephen, 2010).

The subprime crisis and the ensuing Great Recession (Farmer, 2011) have had a lasting impact in the form of depressed economic activity and limited wage increases concurrent with a gradual increase in inflation

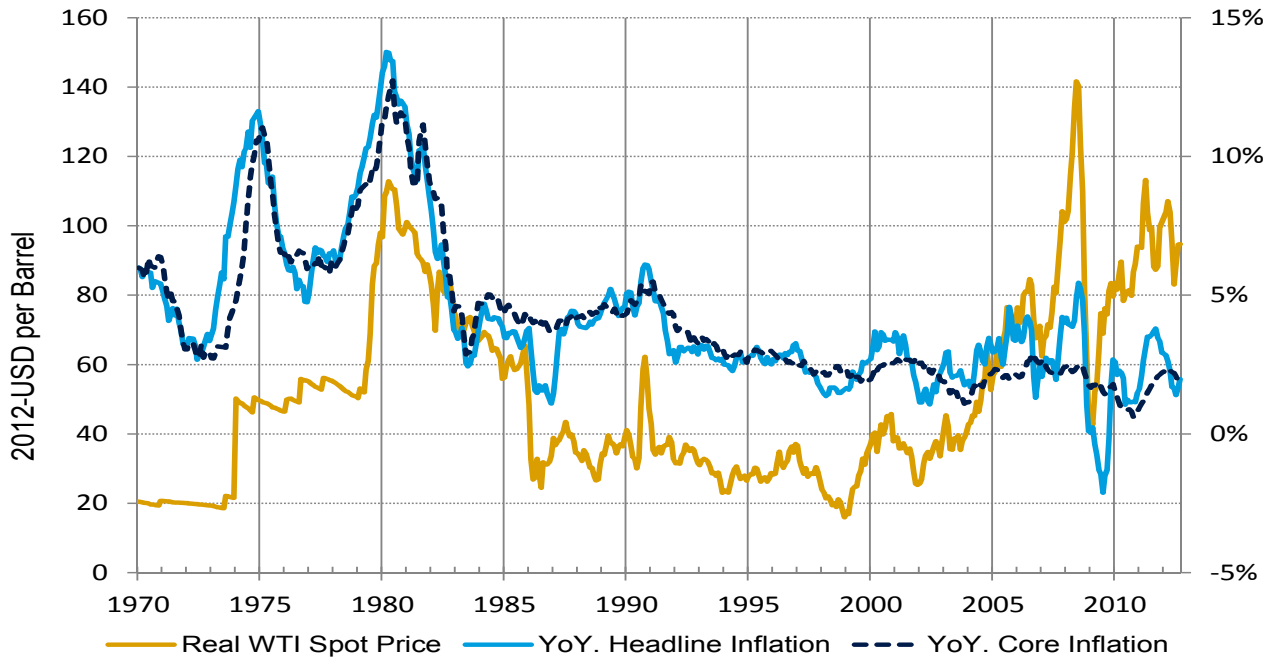

Exhibit 1 Crude Oil and Inflation Over Forty Years in the U.S.

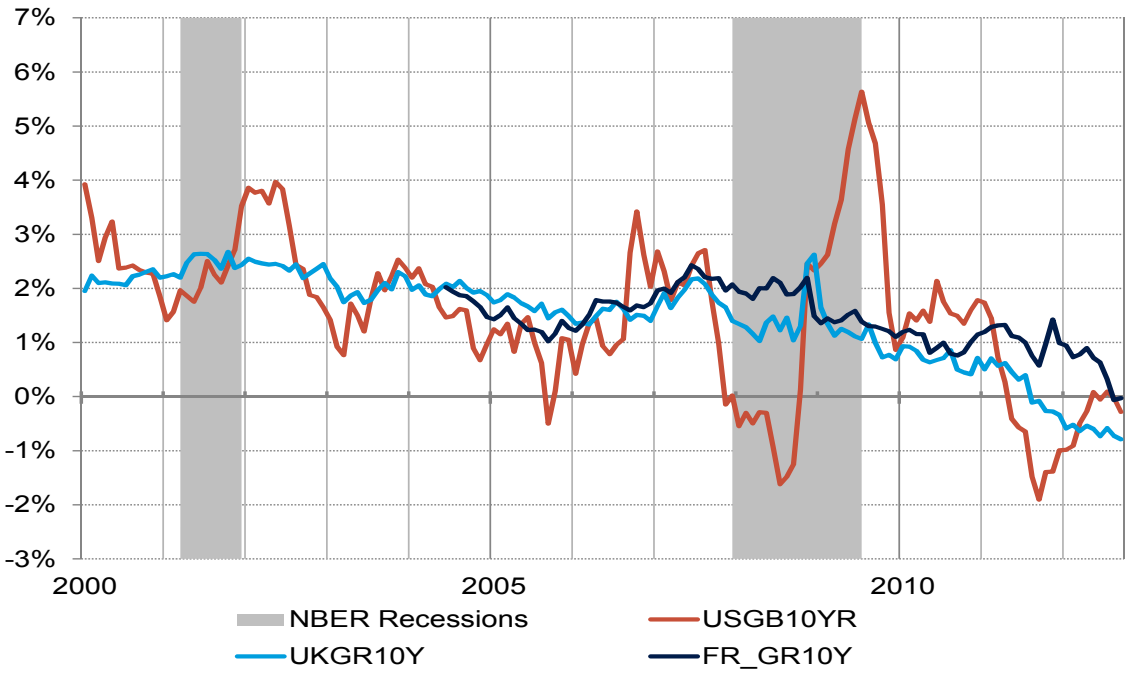

Exhibit 2 Real Sovereign 10-year Yields for France, the UK and the U.S.

(Levanon, Chen, and Cheng, 2012). While the effects of the unconventional monetary policies implemented in the wake of the financial crisis have not yet resulted in any clear signs of inflationary pressures, negative long-term real rates have become a pressing reality for asset liability managers. The dangers posed by ever-growing unhedged inflation liabilities seem all the more acute as constantly increasing flows of investors concerned with growth in inflation and the collapse of financial markets sought inflation protection. It is unlikely that this demand will abate. Populations in advanced economies are aging and they seem to be unable to reform their increasingly fragile redistributive pension systems. It is likely that the result will be an increase in the demand for private pension schemes that have embedded purchasing power guarantees, synonymous with inflation protection (Zhang, Korn, and Ewald, 2007). As the prospect of stable and moderate inflation fades, with it vanishes the underpinnings of inflation-linked bond issues by sovereign states. As the macroeconomic paradigm shifts and the future of the primary inflation-linked market is challenged, it is time to rethink inflation hedging.

3. The Conventional Portfolio Allocation to Hedge Inflation

Gold has been largely synonymous with inflation protection for centuries if not millennia. Wars, empires, industrial revolutions, the gold standard, stock market and real estate bubbles, and crashes have come and gone, but the magic of gold remains largely intact. Unsurprisingly, time passed without burnishing the real value of the yellow metal which to this day maintains its position as the grail of real value (Dempster and Artigas, 2010). But gold itself is not immune to boom and bust cycles. Even though gold's very long-term inflation hedging properties are undeniable, its propensity to attract feverish investor confidence, especially in time of economic turmoil, makes it a highly unsuitable asset to hedge inflation when a guarantee of purchasing power is required. While gold may have been the asset of choice for state reserves and central banks with infinite horizons, the same logic cannot apply to individual investors. As J.M. Keynes famously remarked, "In the long run we are all dead." Through one's lifetime, the value of gold will rise and fall and will take years, if not decades, before a correction occurs, which may be substantially longer than our desired investment horizon.

Hardly a week goes by without an article on a new inflation hedging asset class or a new allocation technique. But in truth, there is no silver bullet for inflation hedging allocation - inflation is linked only to explicitly inflation-linked securities such as linked bonds or swaps. All other asset classes have only time-varying hedging capabilities and offer limited protection (Attié and Roache, 2009). Linked bonds

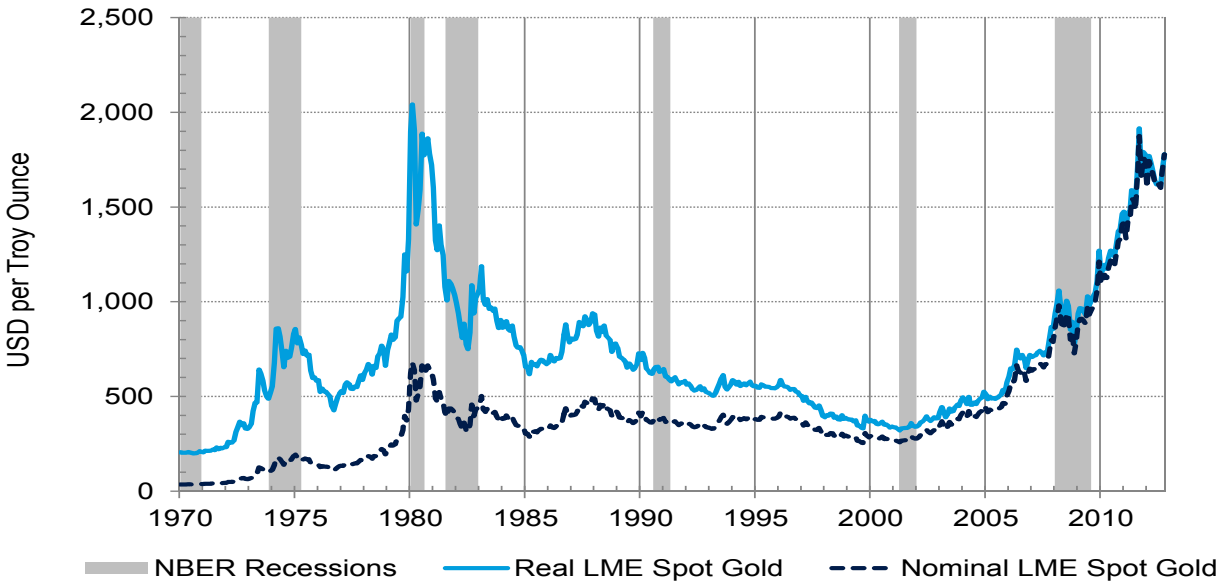

Exhibit 3 Real and Nominal Gold Prices Over Fifty Years

have accordingly become the core of inflation hedging literature and make up the bulk of inflation hedged portfolios today (Bodie, 1988). Yet, this one and only solution remains unsatisfactory for many investors. Linked bonds are available in limited supply and accordingly suffer from low returns and less than optimal liquidity and depth compared to their nominal equivalents (D'Amico, Kim, and Wei, 2008). This is partly due to the fact that more than 30 years after their introduction in the UK, the issuance of private linked bonds has remained largely marginal and confined to a few sovereign or quasi-sovereign issuers (Garcia and Van Rixtel, 2007). The problem has become all the more acute as the current sovereign crisis has raised credible questions as to whether sovereign issuers will continue their real rate issue policy in the face of rising costs as inflation gradually rises and long-term real rates have turned negative.

As good times bring on bad habits, the Great Moderation era (Stock and Watson, 2003) preceding the subprime crisis was no exception. This period witnessed a remarkable environment of low and stable inflation which progressively relaxed the inflationary fears of the 1970s, suppressing memories of the high and volatile inflation which had characterized the period. Rising inflation volatility at the turn of the last decade brought back those fears and resulted in a new wave of interest in inflation protection. But the most pronounced development was yet to come as nominal rates decreased contemporaneously with a sharp increase in inflation. Purely nominal un-hedged strategies suffered and required a profound rethink. As central banks across the OECD countries began using unconventional monetary tools and expanding their balance sheets, fears developed that the problem would only get worse as Quantitative Easing and Twists become household terms (Baumeister and Benati, 2010). This new investment climate motivated researchers to move into a new era of alternative hedging strategies that would neither be linker-based nor dependent on a macroeconomic moderation hypothesis that had shown its limits.

4. Moving Away From Linkers with Portfolio Inflation Insurance

One of the most enduring testimonials of the financial meltdown, resulting from the subprime mortgage crisis in the U.S., can be found in the elevated level of risk aversion worldwide (Caceres, Guzzo, and Segoviano Basurto, 2010). The ensuing European sovereign crisis only fueled an additional flight to quality which had already gripped investors fleeing the hazardous combination of an equity bear market of historic proportions and the first significant spikes in headline inflation for at least two decades. The combination of these factors resulted in increased demand for at least inflation protected investments, if not theoretically

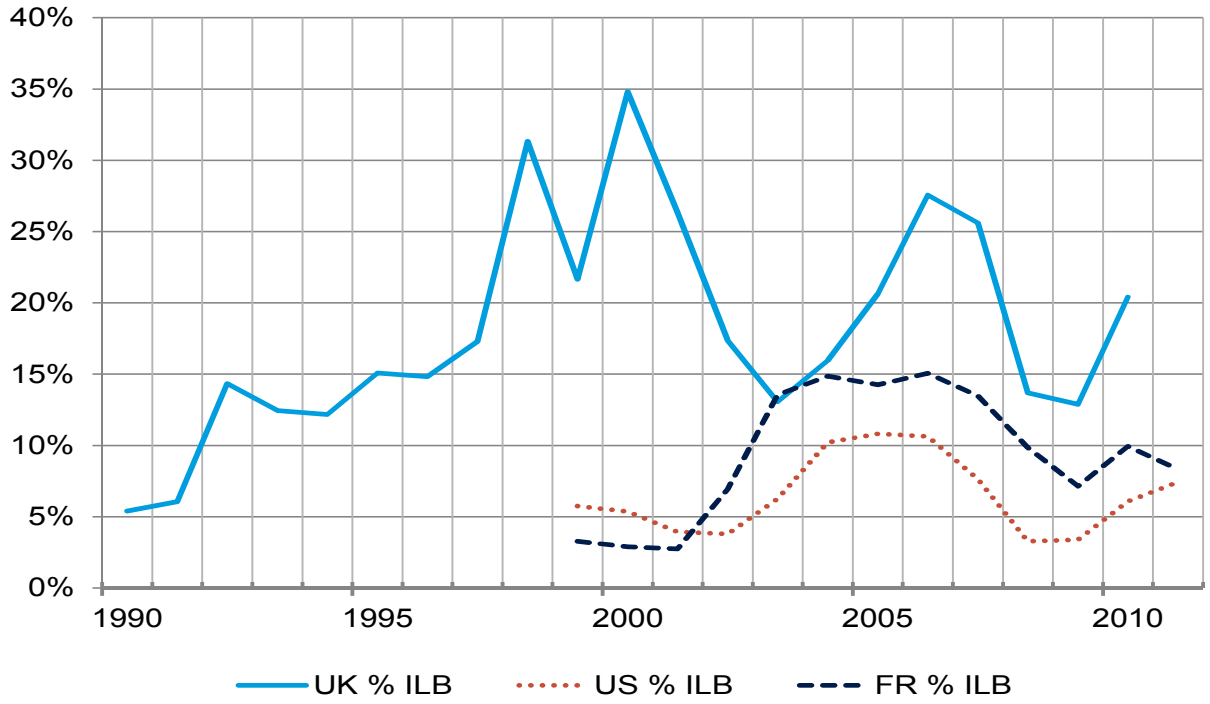

Exhibit 4 The Share of Linkers in Sovereign Issues for France, the UK, and the U.S.

nominal and real risk-free products, namely investment grade linkers. But the rise in the demand for these instruments was not to be matched by an equivalent rise in their issuance as sovereign treasuries were themselves battling with rising financing costs precisely as a result of this inflation linkage. The raison d'être of linkers had backfired badly as they turned out to be more expensive to issue than their nominal counterparts in times of rising inflation. This inevitably leads one to return to the question that had plagued inflation protection research in its nascent phase - the availability problem of linkers.

Considering the overwhelming debt overhang problem which looms over most sovereign issuers from industrialized countries, it is becoming increasingly clear that inflation will eventually be the last available weapon left in the state's arsenal to fight bulging balance sheets. Eroding debt through inflation will probably lead to a revision of sovereign issue policies, which could in turn lead to some reduction in the share of linkers in new issues if not an outright elimination. New issues in the last couple of years suggest that this policy shift may already be underway. Yet, the foreseeable scarcity of new inflation-linked bonds could be avoided or at least have little consequence if we were capable of replicating linkers with purely nominal assets that would also have inflation hedging capacities (Brennan and Xia, 2002). There is a large body of literature on natural inflation hedging assets (Amenc, Martellini, and Ziemann, 2009) such as commodities or listed real estate (REITs), which delves into their potential resilience to both expected and unexpected inflation shocks and their ex-ante optimal allocation in inflation hedging portfolios. But none of these alternative asset classes has a guaranteed value at maturity or even a real (and nominal) floor like linkers do. As most of the demand for inflation hedging assets comes from asset-liability-management desks, there is an added layer of complexity as these investors require not only a real floor, but also a certain level of real return to match part of their funding costs. Clearly, not all of these requirements can be met simultaneously, but a mitigation approach can be found in the application of portfolio insurance (Leland, 1980) to our problem.

The dynamic inflation hedging trading strategy (DIHTS), derived from constant proportion portfolio insurance (CPPI) provides real asset protection. This new framework developed in Fulli-Lemaire (2012a) envisages the inclusion of strong real return yielding assets with high volatility ones like equities, commodities, and REITs, to hedge a fundamentally low inflation volatility risk. It enables the real upside of these

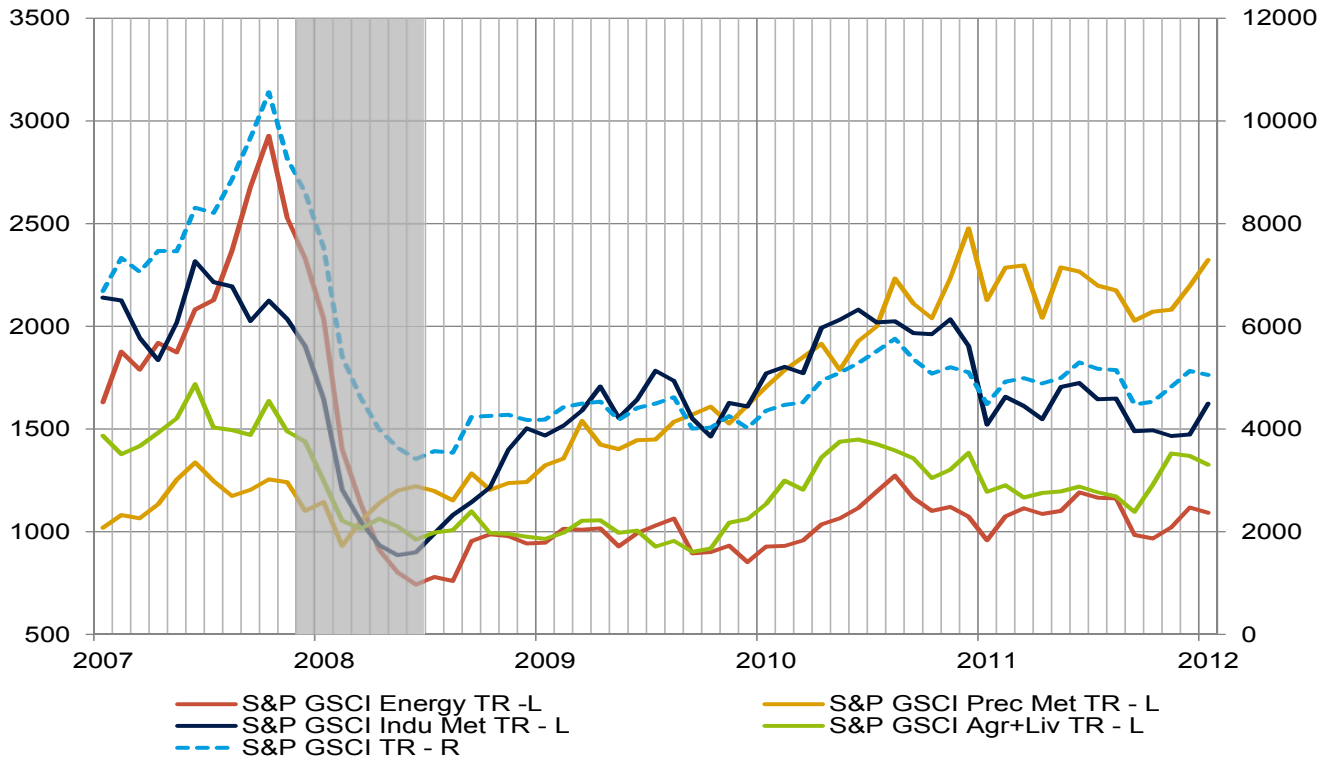

Exhibit 5 Commodities before and after the Great Recession

alternative assets to be captured, while significantly limiting the downside risk. The intrinsic limit of this strategy would be the persistence of negative long-term real rates at the inception of the strategy. This is unfortunately the case in the current investment environment, in which low nominal rates as a result of unconventional monetary policies, coupled with temporarily higher than officially targeted inflation, are yielding negative real rates for all but the longest maturities. This approach has been extended by Graf, Haertel, Kling, and Rub (2012) in their optimal product design under inflation risk for financial planning.

5. A Global Macro Approach to Allocate Commodities

The decade-long commodity bull-run, which came to a close in the summer of 2008, saw crude oil prices breach the psychological barrier of USD100 a barrel for the first time (in 2008 dollars) since the two oil shocks of the 1970s (Baffes and Haniotis, 2010). The ensuing Great Recession brought an abrupt end to a decade which witnessed the rise of emerging markets, whose growing commodity consumption had spurred their prices to reach unprecedented peace-time levels. Commodities had become known as the inflation hedging, crisis-resistant alternative investment class of choice. By 2012, more than USD400 billion of commodities had found their way into investors' portfolios, a more than tenfold increase in a decade according to a Barclays commodity survey (Barclays Capital, 2012). Their appeal only momentarily waned as losses on commodity investments mounted due to a recession-induced global reduction in demand. The contrarians' triumph was short lived as a combination of government intervention to support growth in emerging countries, persistent geopolitical tensions throughout the Middle East, and resurging concerns about the timing of peak oil rapidly hit back at the bear run and promptly sent the Brent benchmark crude index hovering back above USD 100 a barrel. As recession gripped Europe and slowing growth worldwide took their toll on industrial metals, demand for agricultural commodities climbed as droughts, floods, and conflicts damaged crops and stocks. As in all turbulent times, demand for precious metals soared.

The underlying motive behind commodities' pivotal role in inflation protected portfolio allocations, apart from their obvious high-risk, high-reward profile, begs for an answer which is to be found in the nature of the relationship between investable asset classes and inflation. Inflation linkages can be divided into two categories: inflation-driving and inflation-driven.

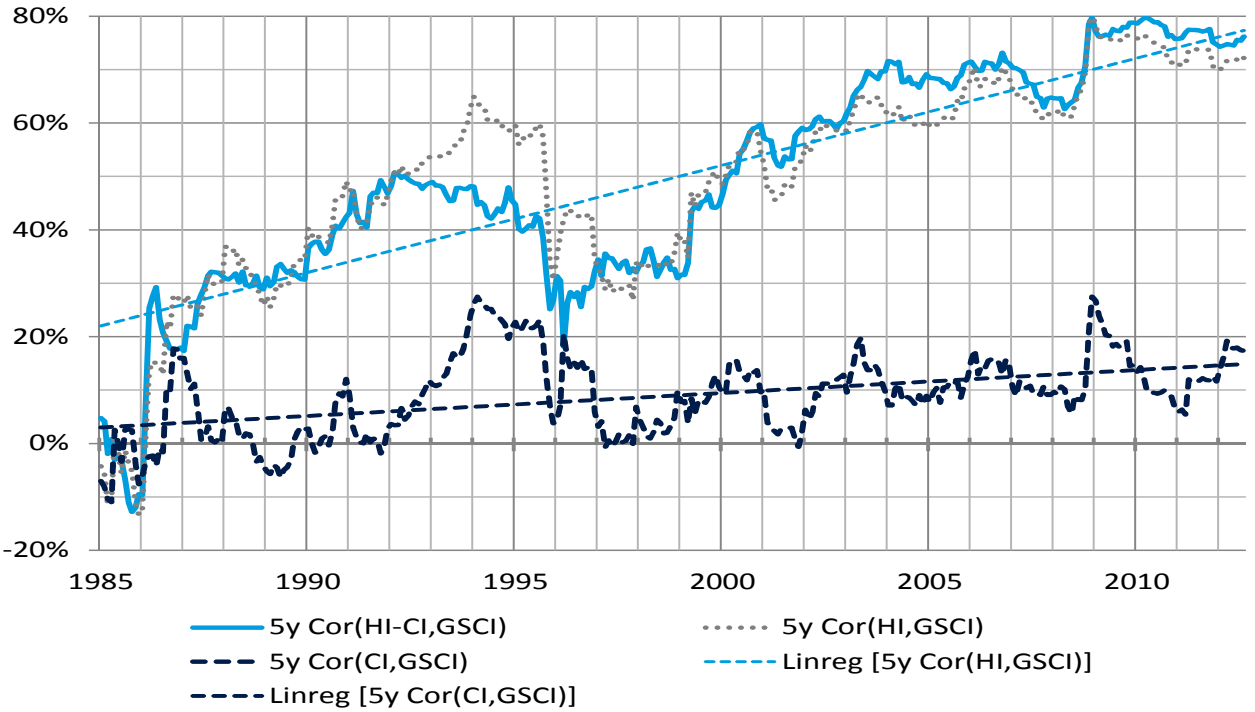

Exhibit 6 The Evolving Correlation Between Commodities and Inflation in the U.S.

Commodities and money market rates naturally qualify as inflation drivers: commodity price changes feed directly into inflation and cash rate hikes reduce inflation when they are used as monetary policy tools. In contrast, bonds and real estate are inflation-driven: bond investment dwindles under rising inflation and real estate investments should increase as rents adjust to inflation. It is worth noting that equities also behave as inflation-driven assets even if the impact seems particularly investment-horizon dependent. Since equities entitle their holders to a share of real assets' cash flows, they should be long horizon inflation neutral as nominal cash flows gradually adjust to inflation over time, but should be negatively impacted in the short run until the inflation adjustment takes place.

From a portfolio protection perspective, investing in inflation-driving assets seems the prudent choice as they should perform better at hedging inflation risk in both the short- and the long-term, therefore providing investors with an inflation-protected liquidity option on their investment at any time. Commodities thus arose as the potentially lucrative real-return yielding alternative asset class despite the fact that their volatility is significantly higher than that of the liability benchmark they are intended to outperform (Bodie, 1983). In this context, one might question whether current allocation techniques are performing satisfactorily or whether we should endeavor to find a radically new approach that would take into account the inflation driving factor? Fulli-Lemaire (2012b) goes down this path in applying advances in macroeconomics to achieve an efficient allocation.

As commodity prices rose, economic agents' perception of their impact on inflation seems to have amplified. Their increasing influence on the consumer price index (CPI), a proxy measure for headline inflation, has been extensively documented by econometricians and macroeconomists in the last two decades (Blanchard and Gali, 2007). It appears that around the mid-1990s a macroeconomic paradigm shift began to unfold as follows: while the pass-through of exogenous commodity price shocks into headline inflation increased by a half, the equivalent pass-through into core inflation seems to have ceased. While these results should have profound implications for liability-driven commodity investors, there is still a clear gap in the literature on this subject as no one seems to have outlined an appropriate allocation technique to address the paradigm shift. This is especially true of the link between investable commodities and inflation liabilities.

6. Swapping Headline for Core Inflation

Longer term investors exposed to inflation during the financial crisis were in a difficult situation as, in the short run, surging commodity prices pushed their inflation-linked liabilities higher while the mark-

to-market value of their assets declined with falling equity and alternative investment values. Meanwhile, persistently low nominal rates and negative real rates threatened the stability of their balance sheet in the longer run. To a certain degree, this asset-liability gap could be closed with the alternative inflation hedging techniques previously described. Yet, deviating from plain-vanilla assets to embark on a path of either structured solutions (Fulli-Lemaire, 2012a) or a refined use of alternative asset classes (Fulli-Lemaire, 2012b) is certainly not risk-free even though it offers a certain degree of risk mitigation. Both the portfolio insurance scheme and the pass-through partial hedging technique incorporate an increased reliance on risky asset classes such as commodities, that can at times experience extreme swings in value. The volatility that commodity investors have experienced over the last decade is evidence of the risks of such endeavors. The previously discussed macroeconomic paradigm shift, and in particular the muted response of core inflation to exogenous commodity price shocks and the mean reversal of headline inflation to core inflation, raises the question of whether we should invest in headline inflation-linked investments at all. Such an approach is obviously only appropriate if we can bear to hold our investment for a sufficiently long period of time for the pass-through cycle to operate to completion.

In other words, not all inflation hedgers should be treated as equal. Long-term players with investment horizons that extend beyond that of the expected duration of the mean-reverting process should choose to target core inflation despite their headline inflation liabilities. The pass-through cycle rarely exceeds five years and seems to have even been shortened in the last decade compared to the average duration of pension funds' investment horizons, which can extend to several decades. This liability duration criteria draws a wedge between long-term and short-term inflation hedgers as the former should seek core inflation protection while the latter should strive to obtain a headline inflation hedge. The obvious pitfall of this methodology is that, to this date, no core inflation-linked asset exists. Deutsche Bank (Li and Zeng, 2012) recently announced the launch of an investable proxy for core inflation which paves the way for an outright core-linked market which would be the equivalent of the headline-linked market that materialized at the turn of the last century in the U.S., a little over a decade after its British counterpart appeared.

To allow us to proceed in the absence of an appropriate investable asset, we envisage a core versus headline inflation swap that would see long-term players receive a fixed rate for the spread between headline and core

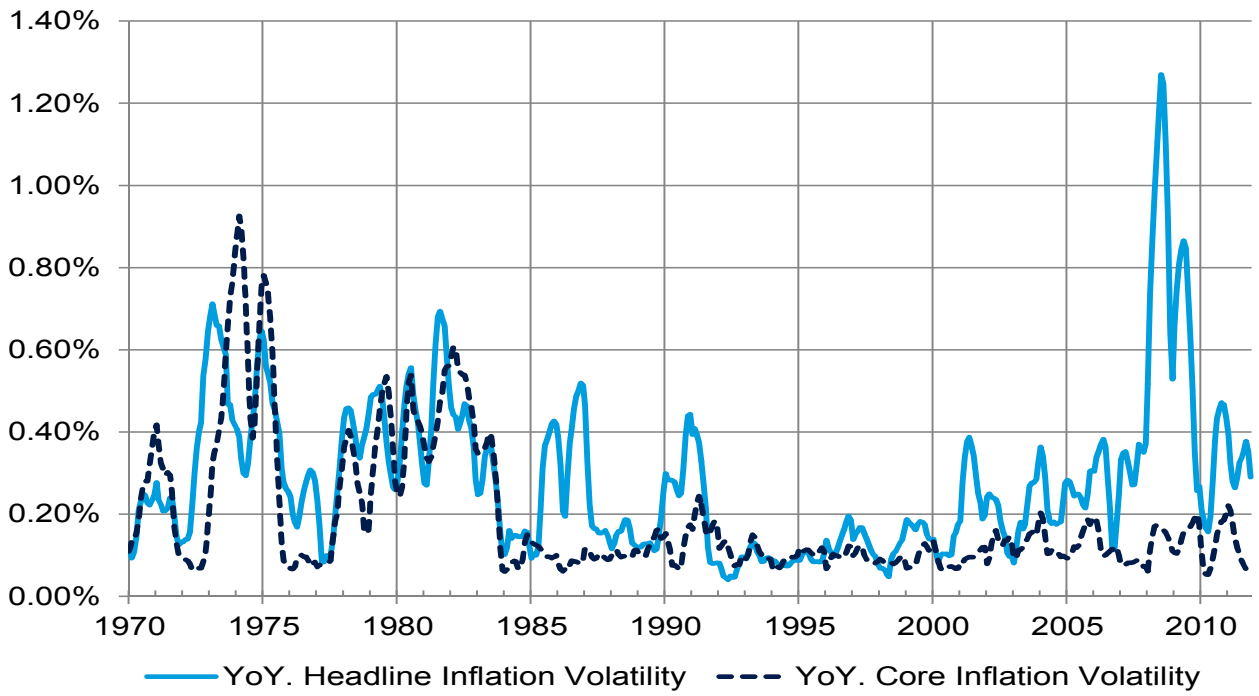

Exhibit 7 The Volatility Spread Between Headline and Core Inflation in the U.S.

inflation with short-term players on the other side of the trade (Fulli-Lemaire and Palidda, 2012). Long-term players would most obviously have to roll swaps in order to have continuous coverage since short-term players will only participate in shorter maturities. Since core inflation is particularly sluggish over short horizons, we focus on a strategy in which long-term players invest in linkers, while short-term players invest in nominal bonds, and both parties engage in the inflation spread fixed-for-float rate swap (on opposite sides). Long-term players would obtain a real rate and a core floor plus a fixed risk premium, while short-term players would achieve a nominal return minus a fixed rate and a hedge of the volatile component of inflation. Short-term players would still retain their core inflation risk, which should be a reasonable risk for short- to medium-maturities. However, they should benefit from much higher real returns for accepting this risk. This approach would offer both a synthetic core-linked asset for long-term hedgers and offer enhanced returns for short-term hedgers. The demand for short-term inflation hedges is currently severely curtailed by extremely low real rates at short maturities. In essence, the strategy yields an intermediated commodity investment for short-term players, which would boost their return on a risk-adjusted basis. The second additional benefit of this new derivative would be the onset of a market curve for core inflation that could be derived from the trading of these swaps and enable easy mark-to-market valuation of other core-linked securities in balance sheets, therefore easing the way for future issuances of truly core-linked assets in the primary market. The last hurdle these products would face is a likely mismatch between the potential demands from long-term and short-term players. The former would be expected to significantly outweigh the latter. Any supply and demand market disequilibrium between long-term sellers of headline inflation and short-term sellers of core inflation could be matched by the intermediation of market makers who could price the derivative based on the cross hedging potential of commodities since the inflation spread is highly co-integrated with commodity indices (Fulli-Lemaire, 2012b).

7. Conclusions

As the perfect financial storm (Blanchard, 2009) receded, its aftermath revealed a profoundly changed macroeconomic landscape to which investors have yet to adapt. The risk managers of institutional investors were not exempt from these changes as the nature of both their assets and their liabilities were profoundly altered. The liability side of their balance sheet suddenly appeared more risky as inflation risk surged, while their assets declined as a result of poor market performance and dangerously low real rates. These forces continue to jeopardize their long-term stability and thereby threaten their very existence. This year witnessed pension funds in the UK collapsing under the pressures of their asset-liability gap. It is imperative that we rethink inflation hedging. This paper provides three possible alternatives.

The first alternative proposed here consists of adapting portfolio insurance to provide additional protection from inflation risk. Fulli-Lemaire (2012a) offers a way to eliminate our dependency on linkers. Unfortunately, the extremely low, if not negative, real rates currently prevailing throughout industrialized countries make this an unattractive time to implement such a strategy. An alternative solution may be found in a partial reduction in the dependency on linkers by devising a CPPI strategy based on real bonds, thereby offering enhanced real returns with an inflation floor as in the iCPPI of (Graf, Haertel, Kling, and Ruß, 2012).

This hybrid class of structured products would not be constrained by the level of real rates and would reduce the demand for linkers relative to current fully hedged portfolio strategies. It would ideally complement the DIHTS when market conditions hinder its inception.

The second alternative aims to allocate commodities in inflation protected portfolios. The impact of commodities on headline inflation has increased while their linkage with core inflation seems to have dissipated in the early 1990s. This creates opportunities for strategically optimizing our commodity investments depending on the pass-through cycle of headline inflation mean reverting to its core anchor as espoused by (Fulli-Lemaire, 2012b).

The final alternative consists of distinguishing between long-term and short-term inflation hedgers in order to differentiate their optimal hedging choices between headline and core linked assets. Following the premises of a core-linked inflation market born out of the issuance of the first investable U.S. core inflation proxy by Deutsche-Bank (Li and Zeng, 2012), Fulli-Lemaire and Palidda, (2012) propose a swap to optimally transfer the

reference mismatch between our two classes of investors. This would provide a solution for the lack of core-linked assets for long-term investors while providing a way to enhance the real return of short-term investors. If such core-linked markets were to develop, we would have to rewrite the current asset liability management practices. We could envisage shifting long-term liabilities such as pension contracts towards a core benchmark since a regime change would at worst bring core inflation back more closely in line with its headline counterpart.

This document presents the ideas and the views of the author only and does not reflect Amundi AM's opinion in any way. It does not constitute investment advice and is for information purposes only.

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A graduate of both the Ecole Polytechnique in economic engineering and the HEC Paris business school in finance, he holds a Bachelor degree in mathematics from the University of Paris VI and a PhD in economics from Paris II. Nicolas Fulli-Lemaire joined the Crédit Agricole Group in 2010 as a quantitative analyst for the asset liability management modeling group and then joined the Investor Research Center of Amundi as a research analyst in 2012. His research focuses on inflation hedging for asset liability management purposes and extends to alternative investing and commodities.

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