

Investment Perspectives

What are the inflation beating asset classes?



Schroders

OVERVIEW

In this second paper in our inflation series, we look at the ability of each asset class to hedge inflation and to provide returns above inflation.

We find that:

- » Some asset classes, such as equities, which many believe to be good at hedging inflation, actually provide poor inflation hedging characteristics but strong returns above inflation over the longer term
- » Sub-sectors of commodities and equities, particularly those that are energy and metals related, provide good inflation hedging characteristics and have historically provided strong returns above inflation
- » Some interesting areas worth considering for their inflation hedging properties such as leveraged loans, infrastructure and timberland have limited data and therefore we have evaluated these from a theoretical perspective.

INTRODUCTION

OUR ANALYSIS LOOKS AT THE ABILITY OF EACH ASSET CLASS TO MITIGATE RISING INFLATION AND PROVIDE RETURNS IN EXCESS OF CPI

As we discussed in our first inflation paper, 'Rising unexpected inflation – a risk worth taking', there is currently a high level of uncertainty about inflation and this, coupled with concerns about possible rising inflation in the US, led to us to question which assets could help to mitigate rising inflation. We also consider the return expectations of these assets. Many investors have objectives of achieving returns in excess of CPI and we wanted to assess how realistic these objectives are.

Most investors have a view about the most suitable assets for keeping pace with inflation, such as equities, commodities or property, but our objective was to carry out rigorous analysis of the asset classes, considering both long term and short term hedging properties to assess whether investors' beliefs are well-founded.

An IMF working paper published in April 2009¹ considered the ability of a variety of assets to hedge inflation. We planned to build on this work by evaluating each asset class from an investor's perspective and examining periods in history when assets demonstrated evidence of strong inflation hedging properties.

In order to evaluate the effectiveness of an asset class' ability to hedge inflation, we have used inflation beta as the key statistical measure². This measures the change in inflation from one period to the next against the return from the asset class over the same period. We believe this measure to more relevant than using correlation between the inflation rate and the asset return. Regression analysis shows us whether higher inflation leads to higher asset class returns but does not show when asset returns and inflation move together. Remember that investors are looking for returns above inflation and so an asset class that hedges well but generates weak returns would not meet this objective.

Some of the analysis produced unexpected results – for example, in order for an equity investor to ensure a return above inflation over the past one hundred and forty years, he would have to have held equities for at least 20 years. Over the same time period, holding equities for fifty years would not have ensured a CPI plus 5% target. This is substantially longer than the horizons for most long term investors!

We now examine each asset class in turn from a first principles or theoretical basis and from a historical experience perspective. In this paper we have not examined different inflation regimes or the drivers of inflation. In our third paper we consider these and how they can impact portfolio construction.

We have considered other research into inflation and asset classes and provided comment on these. Where relevant, we have highlighted a particular period in history that displays how the asset class has been affected by inflation.

SOME ASSET CLASSES PRODUCED UNEXPECTED RESULTS AND HAVE TO BE HELD FOR VERY LONG PERIODS TO PROVIDE RETURNS IN EXCESS OF INFLATION

¹ Attie, A. Roach, S. 'Inflation hedging for long term investors', IMF working paper, April 2009.

² When we use the term 'inflation beta' we are discussing the relationship between an asset classes return and the change in the level of inflation. This 'beta' is derived through regression analysis, and the 'beta' ultimately represents the slope coefficient of the line between the change in the level of inflation and the asset class return. Using our previous example in regard to inflation, a beta of 1.15 would suggest that a 1% increase in inflation would lead to a 1.15% increase in the return of the relevant asset.

The data we have used to calculate this 'inflation beta' is annual data every month over a five year rolling period in order to capture the change in the relationship between an asset and inflation over time.

EQUITIES

THEORY

Conventional theory suggests that if prices rise across the economy equally for different goods, an equity stake in a company should rise proportionally. This is because firms should be able to maintain real cash flows by passing on higher costs to consumers.

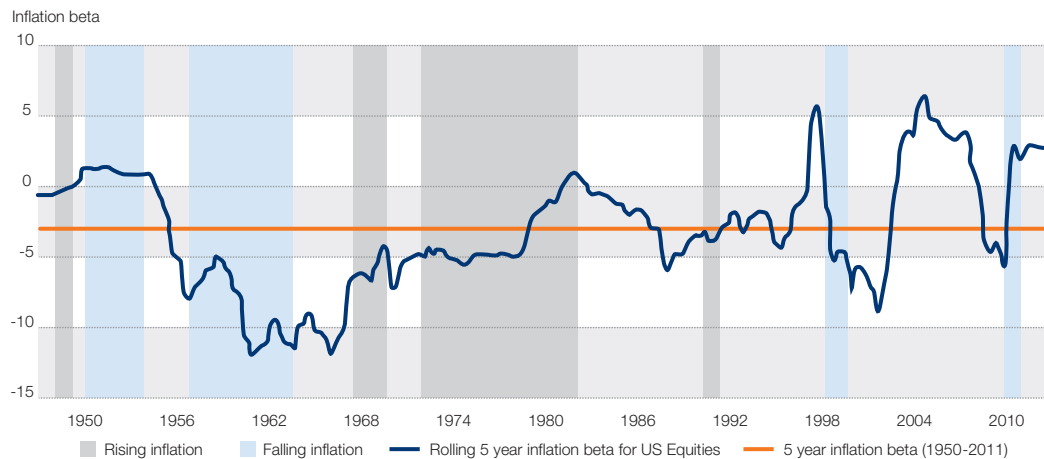
Of course, when goods prices change, they do so in an uneven fashion. This means that some sectors revenues and costs are likely to rise by different amounts, and in turn, higher profitability will be skewed towards companies that benefit from constant (or lower) input prices, while being able to demand higher prices for their final goods.

Should this theory hold, by looking at a diversified index, we should be able to capture the change in price level across the market as winning and losing sectors will be netted-off against each other. We use the S&P index as a proxy for a fully diversified index, however in reality there are areas of an economy an investor simply is unable to capture, predominantly due to private ownership.

MEDIUM TERM RETURN PATTERN

In Chart 1 we measure the effectiveness of US equities as a short/medium term inflation hedge. Looking at the change in rolling annual CPI against the rolling annual returns of the S&P Index, we can see that US equities tend to have a highly volatile negative relationship with inflation. The orange line shows a negative beta over the whole period. This effect also holds for a five year rolling beta and is exacerbated when looking at US equity returns in a rising inflation environment.

Chart 1 – US Equities are a poor inflation hedge in most environments



Decade	Annual inflation (% p.a.)	Change in inflation (% p.a.)	Volatility (% p.a.)	US Equity Returns 1950-2010 (% p.a.)
Overall (1950-2010)	3.7	2.8	2.5	11.1
1950s	2.0	3.4	3.8	14.3
1960s	2.3	4.3	1.3	8.8
1970s	6.9	6.1	2.9	4.7
1980s	5.6	-8.1	3.0	17.2
1990s	3.0	-2.1	1.2	18.1
2000s	2.6	-2.8	2.5	-1.7

Source: Datastream. Period: January 1950 – December 2011, monthly data.

Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. Change in inflation represents the level of the CPI index at the end of the period against its level at the beginning of the period. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

EQUITIES ARE OFTEN THOUGHT TO HAVE INFLATION HEDGING CHARACTERISTICS BECAUSE COMPANIES ARE ASSUMED TO BE ABLE TO PASS ON PRICE RISES TO CONSUMERS

OUR ANALYSIS SHOWS THAT U.S. EQUITIES ARE A POOR INFLATION HEDGE IN MOST ENVIRONMENTS

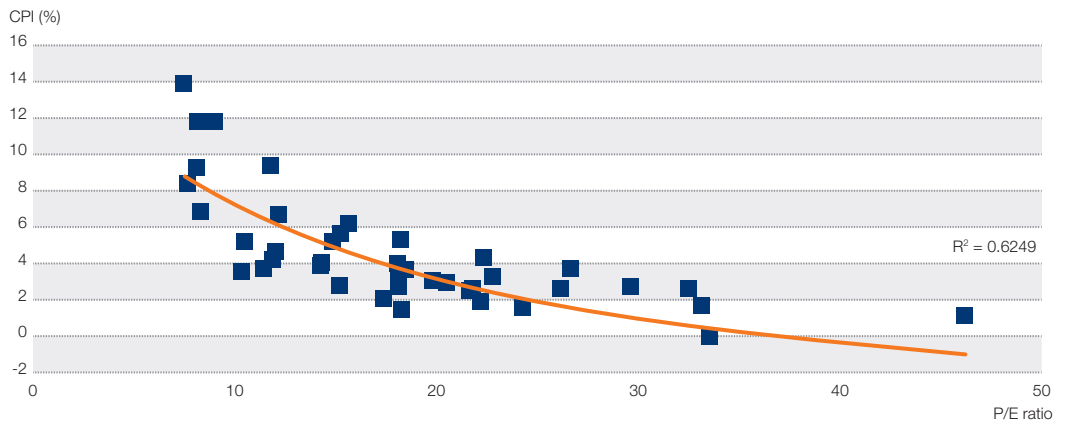
Looking at the change in this relationship over a slightly longer time horizon, we see a strong disconnect between US equities and changes in US inflation over most of the past sixty years.

However, periods where deflationary scares were present seem to lead to a positive inflation beta as seen particularly in the early 2000s. This sustained period of positive inflation beta for equities was attributable to the bursting of the dot-com bubble in 2000. Inflation had been falling through the end of the 1990s and the rapid decline in the S&P following 10 March 2000 meant that for the coming few years, the five year beta between equities and inflation was positive (i.e. a positive beta when inflation is falling means negative returns for the asset class).

THE RELATIONSHIP BETWEEN INFLATION AND EQUITY VALUATION

Fundamental to the short term relationship between inflation and equity returns is the company's ability to respond to higher input prices with increased earnings as well as investors' reaction to higher inflation. Chart 2 shows that investors have historically reacted negatively to higher inflation.

Chart 2 – In rising inflation, rising earnings can act as an inflationary hedge



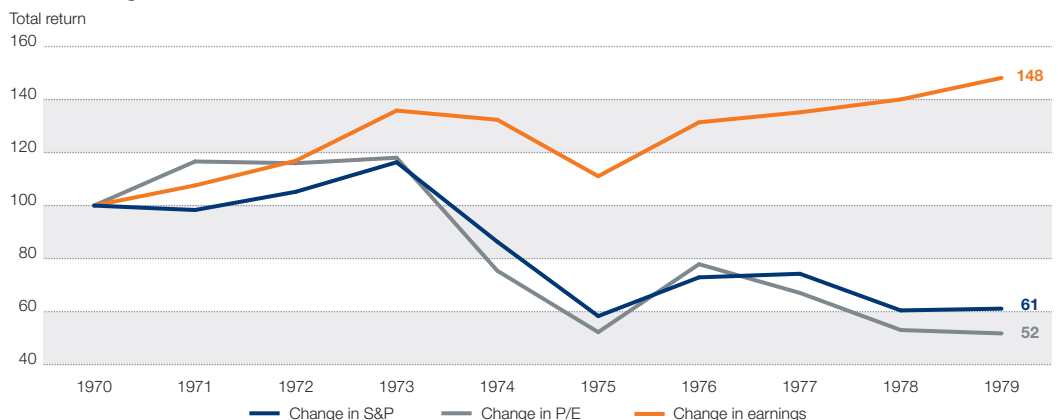
Source: Shiller, 1970-2011.

The P/E ratio falls in response to rising inflation. This is because, although companies can pass through price increases in, say, wages and oil-based production costs, this is not sufficient compared to the rate at which the market discounts future expected cashflows from the company.

When we refer to the market discounting expected future cashflows, this relates to the increase in the discount rate used to calculate the present value of future cashflows, due to the increased uncertainty of this future income.

A prime example of this can be seen during the high inflation period of the 1970s. Real earnings over the period fell 1.3% on average per year, reflecting moderate nominal growth but a high inflation rate. However, over the same period the S&P Index fell 7.4% annually.

Chart 3 – Changes in real corporate profits were lagged by changes in the price to earnings ratio during the 1970s



Source: Shiller. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

THE RELATIONSHIP BETWEEN EQUITIES AND INVESTORS' NEGATIVE REACTION TO RISING INFLATION RESULTS IN POOR INFLATION HEDGING CHARACTERISTICS FOR EQUITIES

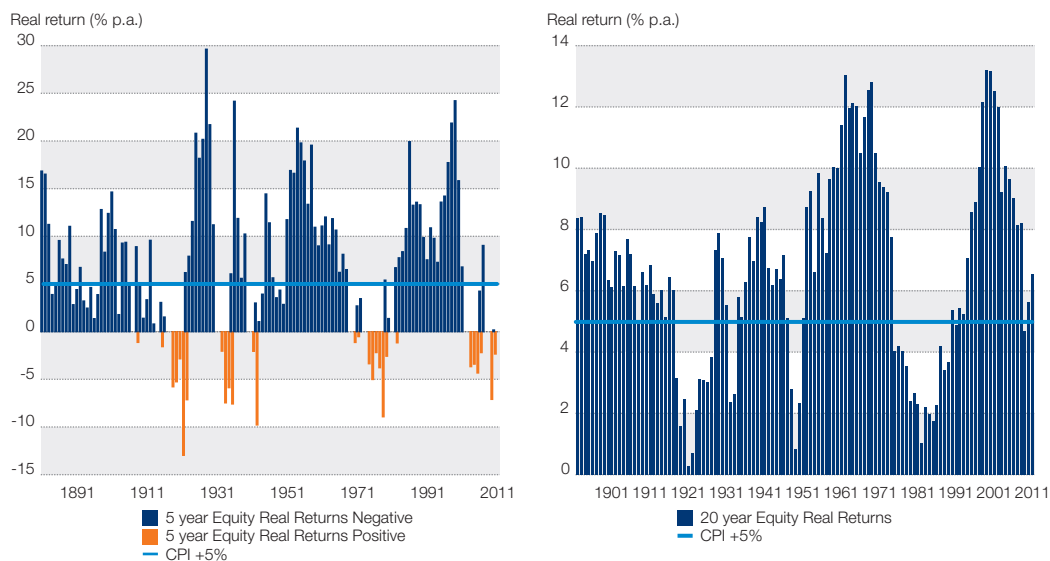
As Chart 3 shows us, despite nominal earnings gains, the S&P index fell considerably through the decade. The reason equity returns were so much worse than corporate earnings declines was due to investors reacting badly to rising inflation. Using a ratio that takes into account normalized earnings over a ten year period (the P/10 ratio)³, we saw an average annual derating of over 5% as a consequence of the negative sentiment attached to rising inflation, which combined with the falling earnings led to poor investment returns for equity investors.

LONG TERM RETURN PATTERN

The theory that equities provide a good inflation hedge has held since 1872, provided that investors have a long time horizon. As shown by Chart 5, if an investor has held US equities for at least twenty years then in all instances, they have accumulated positive real returns.

Looking at an example target of CPI plus 5% in Charts 4 and 5, we can see that since 1892 in 73% of twenty year rolling annual periods, US equities outperformed this target. It is these long term return-generating qualities that make equities such an important asset class in an investor's growth portfolio.

Chart 4 and 5 – Equities produce consistently positive real returns over a 20 year horizon



Source: Shiller, Schroders. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

CONCLUSION

As an investor, long term exposure to equities is sensible as they have provided good real returns. However it is important to tactically reduce exposure to equities during structural inflation or deflationary scares.

Some specific equities, where the financial strength is more closely tied to resources, provide a better hedge to CPI than broad US equities. This may enable investors to capture equity-like returns while keeping a commodity-like inflation hedge in place. From an inflation hedging perspective, the most interesting of these sectors of the equity markets are probably the materials and energy, which we investigate in further detail below.

EQUITIES HAVE PROVIDED GOOD LONG TERM REAL RETURNS BUT DO NOT EXHIBIT STRONG INFLATION HEDGING CHARACTERISTICS

³ P/10 Ratio – This is a measure of the market value of a company divided by the companies average annual earning per share over the previous ten years.

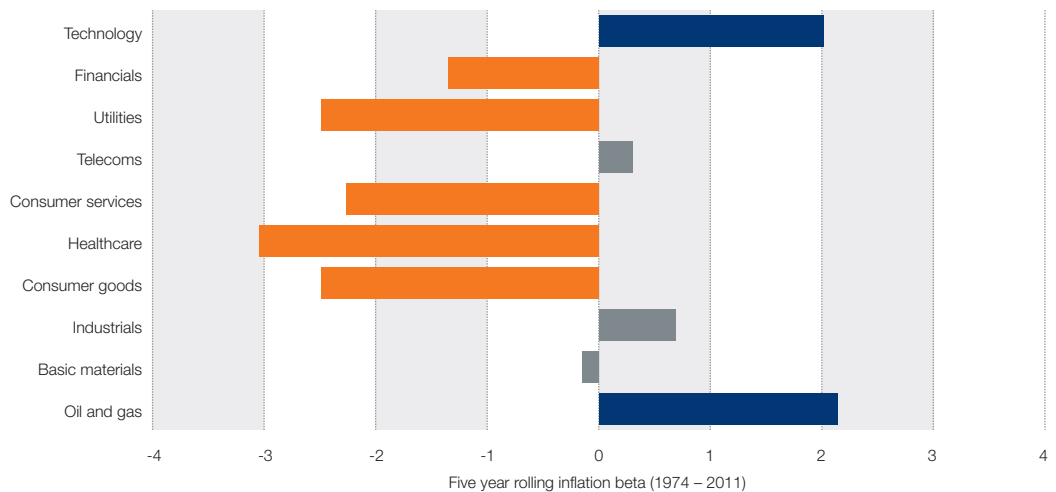
SOME SUB-SECTORS OF THE EQUITY MARKET, SUCH AS MATERIALS AND ENERGY, HAVE BETTER INFLATIONARY HEDGING CHARACTERISTICS THAN THE BROAD EQUITY MARKET

SECTORS OF THE EQUITY MARKET

As we mentioned earlier, broad indices such as the S&P500 do not necessarily react to changes in the price level in a similar fashion.

Looking below at Chart 6, we can see that, as expected, the energy sector has a strong relationship with inflation. Technology stocks have also performed strongly, however this seems most likely to be attributable to the rise and subsequent fall in inflation in the late 1990s and early 2000s matching the build-up and bursting of the technology bubble, and is not indicative of an intrinsic relationship between the sector and inflation.

Chart 6 – Sectors of the equity market react differently to rising inflation



Source: Datastream. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed. Sectors are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

THE THEORY

From a forward looking perspective, we would expect materials and energy stocks to be the best inflation hedging sectors. Materials stocks (for example Rio Tinto and BHP Billiton) and energy stocks (including oil majors Exxon and Royal Dutch Shell) are essentially an equity play on the commodity market. Agricultural producing companies (such as seed and agricultural chemicals companies) are another equity investment that provide commodity-like characteristics.

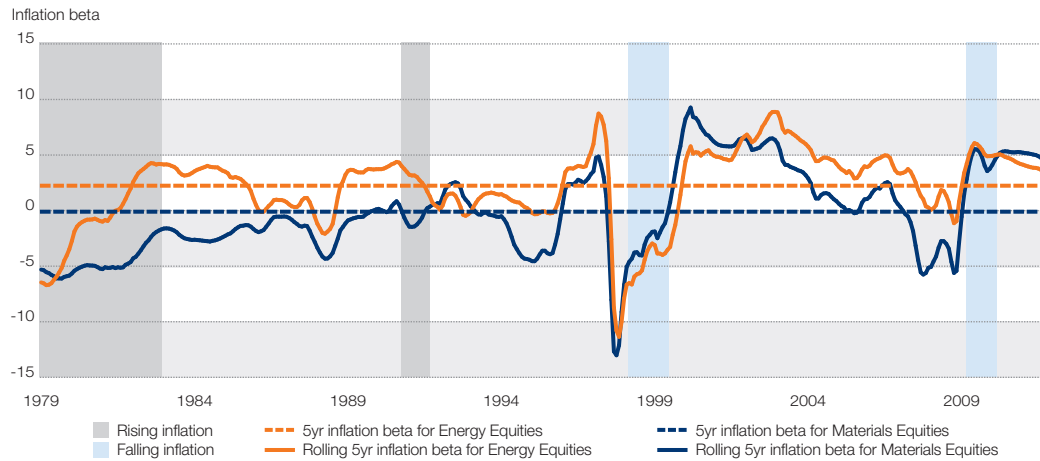
The high inflation hedging characteristics of energy equities are likely due to the intrinsic relationship between energy prices and inflation (as discussed in 'Rising unexpected inflation – a risk worth taking' and later in the commodities section of this paper). As a core input in the industrial production process, a rise in energy prices would have a direct effect on core inflation as goods prices would have to rise to take account of higher input prices.

In the past, both materials and energy stocks have been pro-cyclical (i.e. their profitability is positively correlated with the overall state of the economy). However, materials companies have tended to use increased leverage, while energy companies have been more defensive in nature, holding high levels of cash on their balance sheets. For this reason, the two different equity sectors may react differently to inflation at different stages of the cycle.

MEDIUM TERM PERFORMANCE

Applying the same analysis completed on US equities to energy and material equities to determine the asset's short term inflation sensitivity, we are able to see how much more responsive energy equities are to changes in inflation, in particular when prices are rising.

Chart 7 – Energy and materials equities provide a reasonable hedge against rising inflation, in particular when volatility is high



Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	Energy Equity Returns 1974-2010 (% p.a.)	Material Equity Returns 1974-2010 (% p.a.)
Overall (1970-2010)	4.5	-4.8	2.5	12.7	10.7
1970s	6.9	6.1	2.9	11.6	6.9
1980s	2.3	-8.1	3.0	15.0	21.4
1990s	6.9	-2.1	1.2	11.4	2.1
2000s	5.6	-2.8	2.5	11.5	9.1

Source: Datastream. Period: February 1974 – December 2011.

Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

Whereas the S&P index as a whole displayed a negative relationship with inflation, the energy equity index has an overall positive relationship over the period 1974 to 2011. While materials equities have not performed as well as the energy equity index as an inflation hedge, they would have mitigated increases in inflation better than the S&P index as a whole. Anomalously, we see a rapid dip in the five year inflation beta for both energy and materials equities in 1997. This is due to a rally in the energy and materials markets, which followed the overall market trend during the late 1990s, while inflation continued to steadily trend downwards.

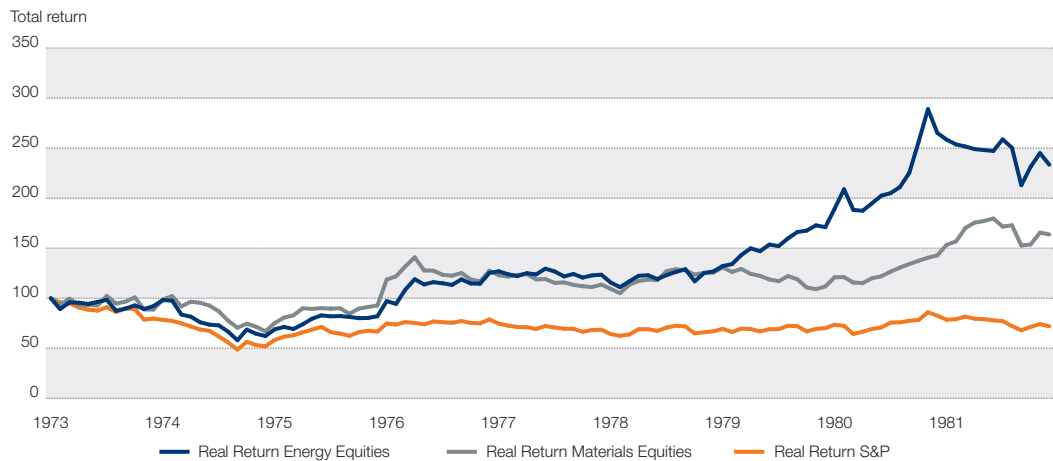
Unfortunately we do not have enough data to show a five year inflation beta for the entirety of the 1970s in Chart 7, however as we mentioned before, this was a particularly high inflation decade and therefore is very interesting to analyze.

OUR ANALYSIS SHOWS THAT ENERGY AND MATERIAL STOCKS HAVE A POSITIVE RELATIONSHIP WITH INFLATION OVER LONGER TIME PERIODS

THE EXAMPLE OF THE 1970s

When we considered the 1970s earlier, we saw the de-rating of the price to earnings ratio negatively affecting US equity returns. However, looking specifically at the energy equity sector, we can see that the inflation that followed the breakdown of the Bretton-Woods system⁴ in 1973 led to a decade of negative equity returns for the S&P index as a whole, while materials equities returns remained fairly constant, and energy equities specifically thrived.

Chart 8 – Energy equities maintained strong returns through the high inflation 1970s



Source: Federal Reserve Bank of St Louis, Datastream. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed. Sectors are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

CONCLUSION

When discussing the general equity market we suggested that reducing equity exposure in the presence of structural inflation may be beneficial to portfolio returns. However, as we can see in Chart 8, certain sectors of the equity market (predominantly those linked to commodity prices) tend to outperform a diversified equity index when the economy is suffering from structural inflation.

It should also be noted that commodity-related equities are more significantly exposed to equity market movements than to commodities. This means that these equities provide less diversification benefits than commodities. We discuss this in our third paper when we examine portfolio construction of an inflation hedging portfolio.

However, as mentioned before, unlike commodities, equities are cashflow generating assets and despite having slightly lower short-term inflation beta, they are more likely to provide higher returns over the longer term as seen in Chart 5.

COMMODITY-RELATED
EQUITIES PROVIDE
HIGHER REAL RETURNS
COMPARED TO
COMMODITIES BUT
WITH SLIGHTLY LOWER
INFLATION BETA

⁴ Bretton-Woods breakdown: Following the Second World War, it was decided that currencies would be tied to the dollar, which would be convertible to gold at \$35 an ounce. However, by 1971 the pressures of a sustained budget deficit and high inflation meant that the US dollar was substantially overvalued in the currency markets. Germany and Japan were unwilling to sacrifice export competitiveness and allow their currencies to appreciate to help out America. Thus, by 1973 the US and other nations allowed their currencies to float. The US dollar promptly depreciated, making imports more expensive and allowing foreign capital flows to raise already accelerating prices in the US domestic economy.

REITS (i.e. REAL ESTATE INVESTMENT)

The final equity sector we consider are REITs as they offer a liquid way to gain property exposure within a portfolio.

REITs came about as a result of Congress legislation in the 1960s, in order to enable small investors to make investments in large scale, significant income-producing real estate.⁵ In this arrangement, the REIT company distributes all income to shareholders in the form of dividends.

A number of studies⁶ have been carried out into the relationship between property and inflation in recent years (as well as a number in the 1970s-1990s). These studies are somewhat contradictory in their results as some support the idea that real estate is a relatively good asset to use as an inflation hedge, particularly over the long term, while others refute its ability to hedge increases in the CPI index.

THEORY

Investors generally believe property will provide a good hedge against rising inflation. The key seems to be that investors expect a return above long dated government bonds due to the liquidity risk of investing in property.

Higher inflation tends to lead to higher long dated government bond yields and property yields as investors demand a higher income to offset the increase in inflation.

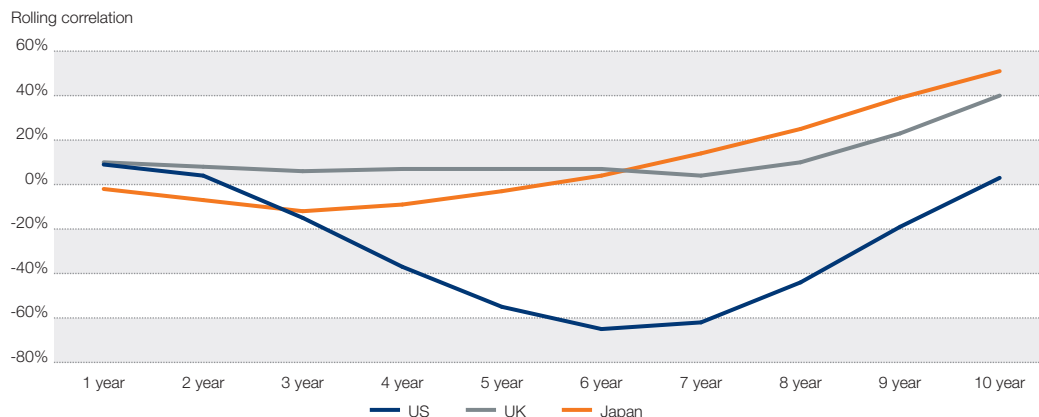
This rise in inflation leading to the increase in property yields will be due to one of two key effects. If rent negotiation by the lender is successful in raising revenues to combat the increased price level, we are likely to see property investment returns keeping pace with inflation. However, if rents are unable to rise in line with inflation, the increased return requirement as a result of higher prices is likely to feed through in the form of a reduction in real property prices.

REALITY

A lag period in property should theoretically exist to allow for rents and overall property prices to adjust to the change in the price level.

This has not necessarily come to fruition, as can be seen in the following chart, which shows the correlation between property total returns and inflation over different rolling periods ranging between one and ten years. The UK, US and Japan have experienced a closer relationship between property returns and inflation over a ten year period than over a one year period. However, perhaps more interestingly, the US seems to lag both the UK and Japan. In Chart 9 we can see that the adjustment period tends to last for between five and ten years. Therefore, in order to compare property returns against a nominal or inflation-linked target we should use at least a five year property cycle.

Chart 9 – The US lags behind its international counterparts in terms of property price adjustment to inflation



Source: IPD Annual Index, Mitsubishi, NCREIF, EuroStat.

Note: UK results 1970-2010. Japan and USA results 1977 – 2010.

EXISTING RESEARCH
ON THE RELATIONSHIP
BETWEEN REITS AND
INFLATION IS POLARISED

THERE IS A CLEAR
LAG BETWEEN
PROPERTY RETURNS
AND INFLATION AND
THIS DIFFERS FROM
COUNTRY TO COUNTRY

5 www.reit.de/english/reit.htm

Legislation in the late 1980s reduced the tax advantages of shelter-orientated real estate investments, while allowing REIT companies to actively manage properties.

6 Lu and So (2001); Glascock, Lu and So (2002); Adrangi, Chatrath and Raffiee (2004); Goetzmann and Valaitis (2006); Westerheide (2006); Simpson, Ramchander and Webb (2007); Hoesli, Lizieri and MacGregor (2008).

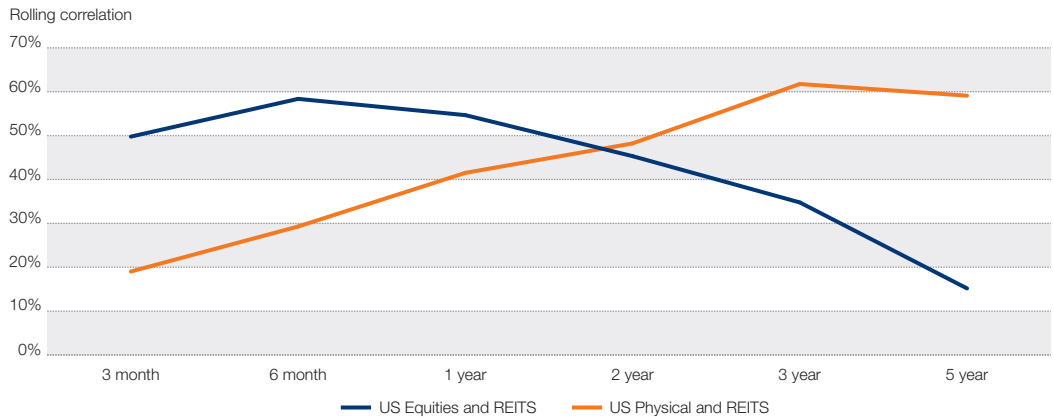
ACCESSING THE PROPERTY RELATIONSHIP WITH INFLATION

In order to access this inflation hedging quality of property, believed by many investors to exist, we have two options. Direct property can form part of a portfolio as long as investors are willing to accept the illiquidity of the asset class. However, for a liquidity constrained investor, REITs rather than physical property, offer a liquid alternative. For this reason we will use REITs as a proxy for direct property investment.

DO THEY BEHAVE JUST THE SAME AS EQUITIES?

As we can see in Chart 10, REITs tend to be more correlated with US equities in the short term than physical property, which may explain the poor one year inflation beta as seen in Chart 11. However, over the longer term, REITs tend to be more correlated with the actual returns of the physical property market, corroborating the view that they are a good liquid proxy for property.

Chart 10 – In the short term REITs are strongly correlated with equities, but over the long term they become more correlated with property returns

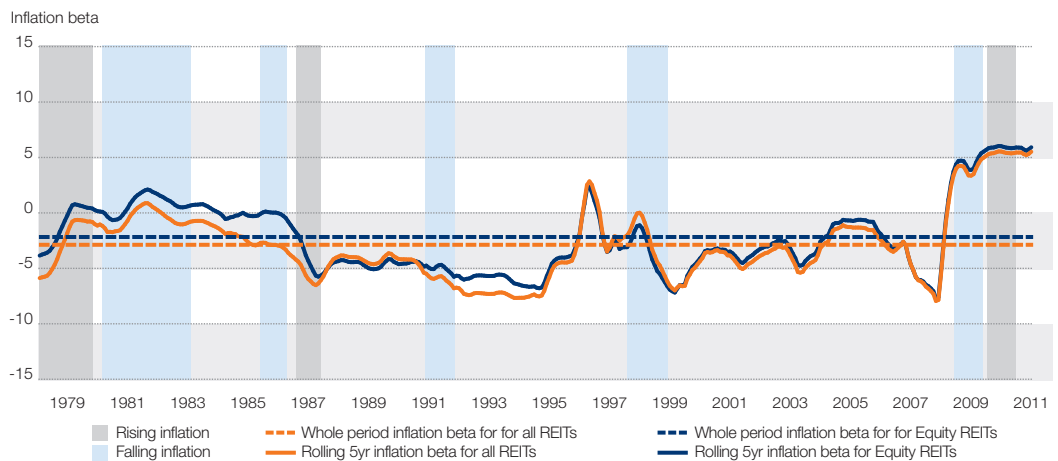


Source: Datastream, Case-Shiller, Federal Reserve Bank of St Louis.

MEDIUM TERM INFLATION HEDGING CHARACTERISTICS

The strong short term relationship between equities and REITs suggests that our previous equity analysis will hold for REITs as well. Unsurprisingly, sensitivity analysis shows REITs to not be a strong inflation hedge in the short run.

Chart 11 – REITs provide a poor inflation hedge



OUR ANALYSIS SHOWS THAT REITs DO NOT PROVIDE STRONG INFLATIONARY HEDGING CHARACTERISTICS OVER THE SHORT AND MEDIUM TERM

Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	REIT Composite Returns 1974-2010 (% p.a.)	Equity REIT Returns 1974-2010 (% p.a.)
Overall (1970-2010)	4.5	-4.8	2.5	9.7	12.3
1970s	6.9	6.9	2.9	5.7	13.0
1980s	2.3	2.3	3.0	13.4	16.5
1990s	6.9	6.9	1.2	8.2	9.6
2000s	5.6	5.6	2.5	6.7	7.1

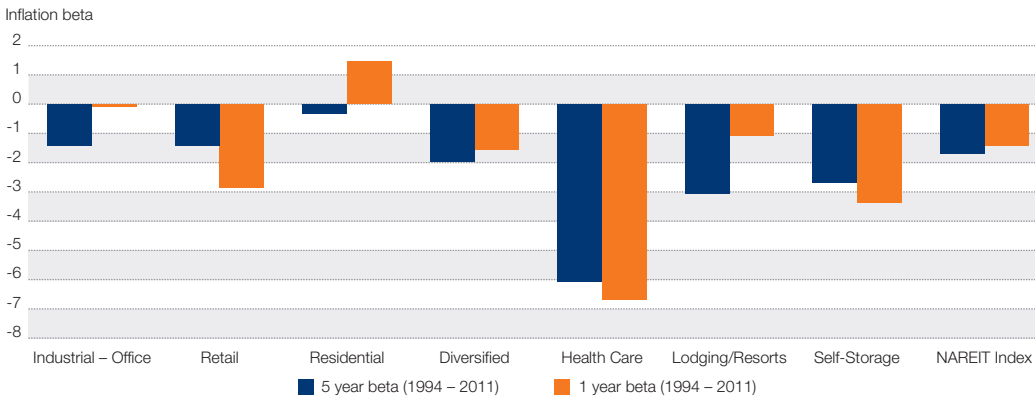
Source: Datastream. Period: February 1972 – December 2011. Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge.

REITs Equity – Invest in and own properties. Their revenues come principally from properties rents. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

The five year inflation beta for All REITs⁷ of -2.8 between 1974 and 2011, and the five year beta from 1994 and 2011 of -1.8, both clearly display a consistent negative relationship between the overall REIT index and changes in the level of inflation. However, as we can see in Chart 12, different sectors of the REIT market behave uniquely in response to changes in the level of the CPI.

Most notably, the residential REIT sector actually responds favorably to rising inflation over a five year period. This is likely due to the short term nature of residential leases allowing price increases to be incorporated into contracts with tenants.

Chart 12 – The majority of REIT sectors respond negatively to increases in inflation



Source: NAREIT Indices. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed, Sectors are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

GLOBAL EX-US REITS

Global REIT indices that exclude the US may be interesting to an inflation hedging investor both for their diversification qualities, and in the case of the UK and Japan as seen in Chart 9, their ability to hedge domestic inflation (assuming a correlation between developed countries' inflation rates). The relationship between Global ex-US REITs and US CPI is currently hard to quantitatively analyze due to a lack of long term local currency data, however this will be an asset class to watch.

CONCLUSION

As we have seen throughout this analysis of equities and REITs, despite theory suggesting that a relationship should exist between property prices and inflation, we are unable to prove this in reality, most notably in the case of the US market.

This is due predominantly to two factors. Firstly, if property prices adjust to changes in the price level, this tends to incorporate a lag period. Secondly, the liquid alternative of property, REITs, act more like equities than property in the short term, which we earlier showed to have a poor relationship with changes in inflation.

However, there are subsectors of the REIT market that provide better inflation hedging characteristics than the broad REIT index. This is analogous to there being subsectors of the equity market that provide improved inflation hedges than the broad equity market.

SUB-SECTORS OF THE REIT MARKET HAVE A POSITIVE RELATIONSHIP WITH INFLATION

GLOBAL REITS (AND SUB-SECTORS OF THESE) COULD BE INTERESTING DIVERSIFYING ASSETS TO CONSIDER IN A PORTFOLIO TARGETING RETURNS ABOVE INFLATION

⁷ All REITs – All REITs index from the FTSE NAREIT US Real Estate Index.

CASH AND CASH EQUIVALENTS

CASH

THEORETICALLY, WITH PERFECT FORESIGHT, THE FEDERAL RESERVE SHOULD BE ABLE TO CHANGE INTEREST RATES TO MAINTAIN REAL RETURNS ON CASH

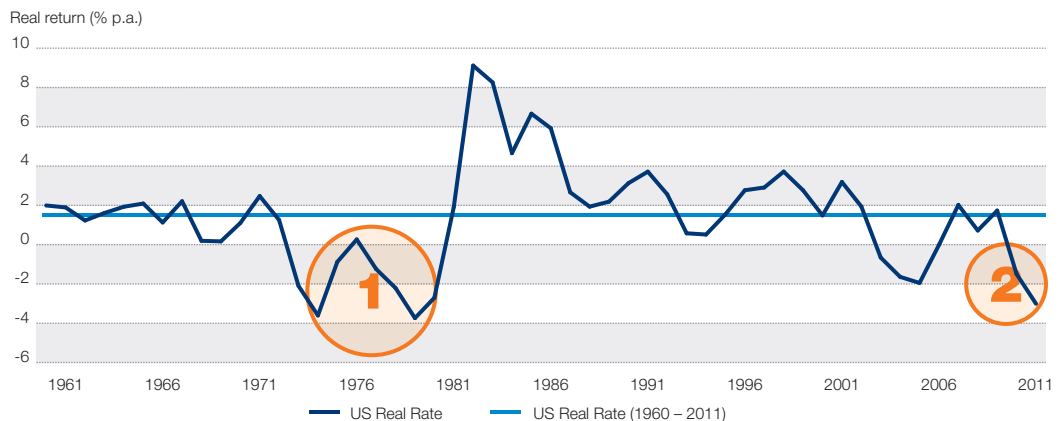
When we refer to cash we are discussing the return on three month Treasury Bills (T-Bills). We use T-Bills as a proxy for the cash return due to their close relationship with the Fed Funds rate and their liquid nature.

The Federal Reserve has the dual objective of price stability and maximum employment, as discussed in 'Rising unexpected inflation – a risk worth taking'. Through open market operations it is able to influence interest rates in the economy. Therefore, with perfect foresight the Federal Reserve would be able to change interest rates to maintain the real return on cash in any positive inflationary environment. In this sense, cash should provide a strong inflationary hedge.

However, as shown in Chart 1 of 'Rising unexpected inflation – a risk worth taking', inflation forecasters do not have perfect foresight. Therefore a lag generally exists between the increase in inflation and the resulting rise in interest rates, meaning lower real returns for investors holding cash. Furthermore, as the mandate of the Federal Reserve also includes maximum employment, situations may occur whereby interest rates are held low to stimulate growth at the expense of high inflation.

Work by the IMF suggests that cash has an inflation beta of 0.8, which corroborates our view.⁸

Chart 13 – During sustained periods of time, the Federal Reserve has deviated from its mandate of price stability



Period 1

Following the breakdown of the Bretton Woods mechanism, a continued focus on growth measures to reduce unemployment to an unattainably low level, combined with two oil price shocks, led to rapid price increases. The prioritization of economic growth at the expense of rising inflation meant that interest rates were not raised by the Federal Reserve, leading to significantly negative real rates in the US in the 1970s.

Period 2

A deflationary scare in the early 2000s (bursting of the technology bubble) and another in the later part of the decade (global financial crisis) led to the Federal Reserve aggressively cutting base rates. The ensuing inflation was driven by cheap credit in the first instance and spiking commodity prices in the second case and as can be seen, resulted in negative real rates.

Source: Datastream. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

CONCLUSION

In Chart 13, we show the US real rate as the return on a three month T-Bills minus inflation. The short term nature of these T-Bills suggests that bill yields should take into account expectations of future inflation. If we look at 'pure' cash as one day bills, we would expect yields to accurately hedge inflation, likely showing an inflation beta of very near to one. However for an investor looking to meet a long term target of CPI plus 5%, allocating their portfolio cash is unlikely to meet their investment target (real return of under 2% since 1960).

SHORT TERM CASH DOES PROVIDE GOOD INFLATION HEDGING CHARACTERISTICS BUT REAL RETURNS OVER THE LONGER TERM HAVE BEEN VERY LOW

⁸ Attie, A and Roache, S. 'Inflation hedging for long term investors,' IMF Working paper, 2009.

LEVERAGED LOANS

As cash is unlikely to meet most investor's target return, we look into the relationship between leveraged loans and inflation. Leveraged loans should provide a similar hedge to cash with the opportunity to enhance return through additional credit risk.

WHAT ARE LEVERAGED LOANS?

Leveraged loans are loans made to a company that already has a significant level of debt and therefore these companies have a below investment grade rating. As the company is already leveraged, investors require a return that is commensurate with this additional risk of default or insolvency (a credit risk premium). As a result, a leveraged loan can have an attractive interest rate to compensate the increased risk. Frequently, the interest rate is floating and is linked to the interbank lending rate.

Leveraged loans have coupon payments that are floating i.e. are reset from time to time based on changes in short term interest rates. This means that the price of the loans will not decline even if interest rates rise (i.e. the increases are broadly correlated with the Fed funds rate).

It is important to remember that although leveraged loans tend to be granted to non-investment grade borrowers, they are not the same thing as high yield debt. Whereas high yield debt sits below bank loans in the credit structure of a company, leveraged loan debtors are at the top of the repayment schedule. This is reiterated by the recovery rate differential between leveraged loans and unsecured debt. According to Moodys, the recovery rate for leveraged loans between 2000 and 2010 was 68%, whereas unsecured debt had a recovery rate of 42% over the same period.

Similar to cash, investment in leveraged loans is in part taking a stance on the likelihood that the Federal Reserve will raise interest rates to deal with future inflation. If holding cash was a perfect inflation hedge, leveraged loans would be a very good investment strategy as it effectively offers investors a credit premium over cash with associated risks.

LEVERAGED
LOANS SHOULD
THEORETICALLY
HAVE SIMILAR
INFLATION HEDGING
CHARACTERISTICS
AS CASH, DUE TO
THEIR STRUCTURE

As discussed earlier in the 'cash' section, during certain periods, interest rates have either lagged rising inflation or have been held artificially low in order to stimulate growth at the expense of increasing inflationary pressures. During these time periods they are unlikely to provide strong inflation hedging characteristics.

If we assume a long run real rate on cash (as shown in Chart 13) of approximately 2%, by accessing a credit premium of approximately 3% (it was 2.7% for the period 1997-2011), leveraged loans are able to generate returns compatible with our target of CPI plus 5%. This makes leveraged loans a potentially well suited candidate for addition to an inflation hedging portfolio.⁹

When allocating to leveraged loans, an investor must be aware that as well as the short term duration component, the credit component of the return also has a relationship with inflation which is discussed in greater detail in the corporate bond section.

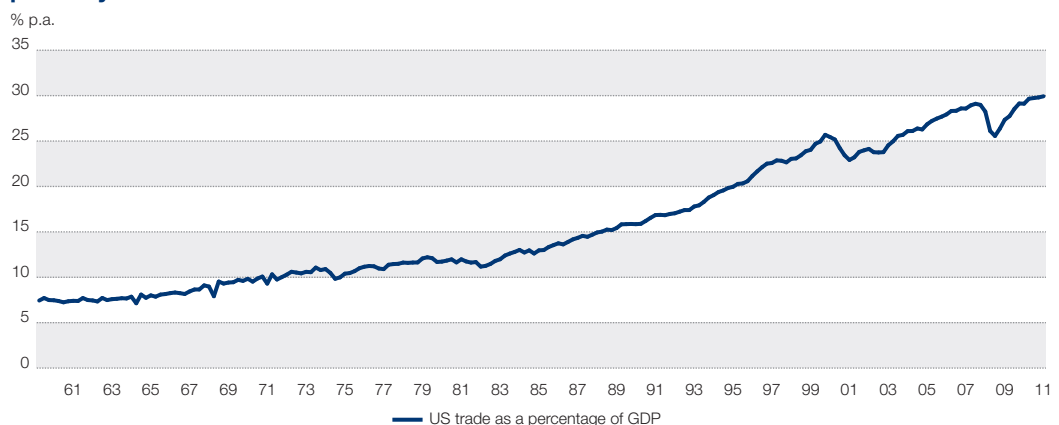
NON-US CURRENCY – OVERSEAS CURRENCIES

THEORY

When looking at domestic cash returns we focus on the ability of the monetary authority to anticipate and react to changes in inflation. However, it is also important to realize that monetary authorities are not always able to achieve consistency with their inflation objectives. This has implications for the domestic currency in the foreign exchange markets and for this reason is well worth investigating.

The world is becoming increasingly inter-dependent with globalization being a buzz word for the past two decades. The importance of trade even in the traditionally self-reliant US economy has increased with total trade as a percentage of GDP consistently rising since 1960 as seen in Chart 14.

Chart 14 – The importance of trade to the US economy has consistently risen over the past 50 years



Source: Federal Reserve Bank of St Louis.

The value of the dollar plays a formidable role in the direction of international trade flows. The economic theory of purchasing power parity states that goods with similar inputs in different countries should cost the same when converted into a common currency. If they were not, there would be an arbitrage opportunity. Of course, in practice, there are real world frictions such as transport costs that would make it prohibitively expensive to arbitrage bulk goods such as cement or non-tradable service such as hair dressing. None the less, a country with a consistently lower inflation rate should experience rising purchasing power relative to a higher inflation country. In order for this to occur, the low inflation currency would appreciate in order to maintain equilibrium.¹⁰ Although in the short-term, purchasing power parity has been shown to not hold in all cases, evidence suggests that it should be a good long-term anchor for real exchange rates.¹¹

Therefore a short dollar position could offer a good hedge against higher domestic inflation compared to overseas countries if the Federal Reserve is running a looser monetary regime than its trading partners.

EXPERIENCE

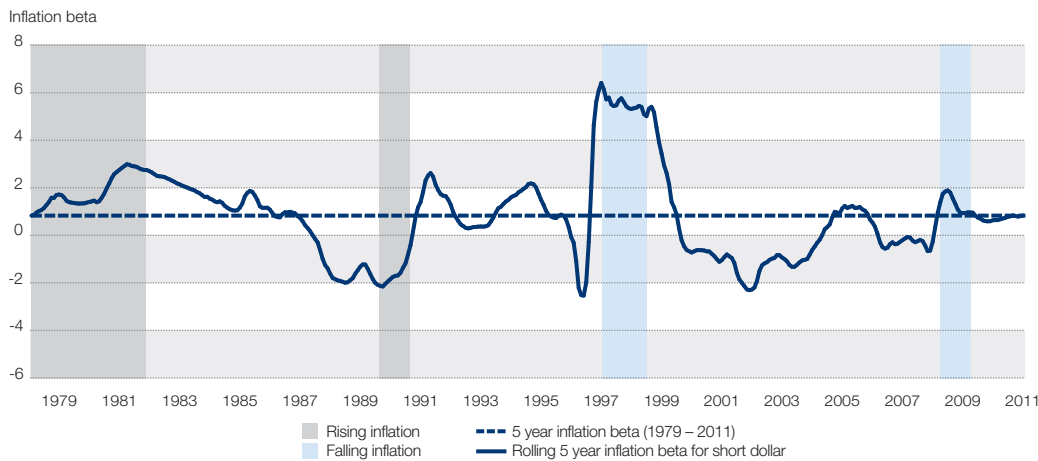
In the analysis shown in Chart 15 we have used the German Mark which has then been combined with the Euro at its creation in January 2002. We chose the Mark for our analysis because the German central bank, the Bundesbank, has focused on inflation above all other considerations because the German's experience of hyper inflation during the 1930s has made them extremely averse to an inflationary outcome. Some of this character has been transferred to the ECB, demonstrated by its decision to raise rates in mid 2008.

¹⁰ Relative PPP predicts that inflation differentials are matched by changes in the exchange rate.

¹¹ Taylor, A. Taylor, M. 'The Purchasing Power Parity Debate', The Journal of Economic Perspectives, Vol. 18, No. 4. (Autumn, 2004), pp. 135-158.

THEORETICALLY,
A SHORT DOLLAR
POSITION COULD
OFFER A GOOD HEDGE
AGAINST HIGHER
DOMESTIC INFLATION
COMPARED TO
OVERSEAS COUNTRIES
IF THE FEDERAL
RESERVE IS RUNNING
A LOOSER MONETARY
REGIME THAN ITS
TRADING PARTNERS

Chart 15 – A short dollar position does well in hedging short term inflation fluctuations



OUR ANALYSIS SHOWS THAT A SHORT DOLLAR POSITION CAN HEDGE SHORT-TERM INFLATION FLUCTUATIONS IN ENVIRONMENTS WHERE CENTRAL BANKS FOCUS ON INFLATION RATHER THAN UNEMPLOYMENT

Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	Short US Dollar Returns 1974-2010 (% p.a.)
Overall (1970-2010)	4.5	-4.8	2.5	-0.4
1970s	6.9	6.1	2.9	1.4
1980s	2.3	-8.1	3.0	-2.8
1990s	6.9	-2.1	1.2	-0.8
2000s	5.6	-2.8	2.5	1.3

Source: Bloomberg. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed. Period: February 1974 – December 2011, monthly data. Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge.

The chart above shows that most of the time a short dollar/long Mark position has delivered a small positive inflation beta.

Focusing on the period of the 1970s an ECB paper contrasts the US, German and Swiss monetary policy.¹² It argues that the policy perused by the US was too expansionary as it continued to target higher employment rather than focus on the inflationary environment. This contrasted with the Swiss and German approach that followed a ‘hard money’ approach focusing on inflation. This difference in philosophy led to a considerable difference in inflationary outcome and is one explanation for the poor relative price performance of the dollar during the 1970s.

STRUCTURAL CHANGE IN THE EMERGING MARKETS

While the developed world remains the largest trading partner of the US, the centre of marginal growth has shifted towards the emerging markets. The considerable intervention which they engage in to maintain currency pegs, or manage movements in their currency has come under much scrutiny.

We believe that investing in emerging market currencies could be an effective way of mitigating inflationary pressures generated through emerging market growth. It is widely noted that a favourable combination of economic growth and a current account surplus are supportive of a free market appreciation in a range of emerging market currencies.

Recently, emerging market economies have been more accepting of countercyclical monetary policy, whereby interest rates are increased in response to rising inflationary pressures. On the other hand, their developed counterparts have been unable to enact these policies in the face of rising headline and core inflation figures due to the policy’s negative implications for economic growth.

¹² ‘The “Great Inflation”: Lessons For Monetary Policy’, ECB Monthly Bulletin, May 2010.

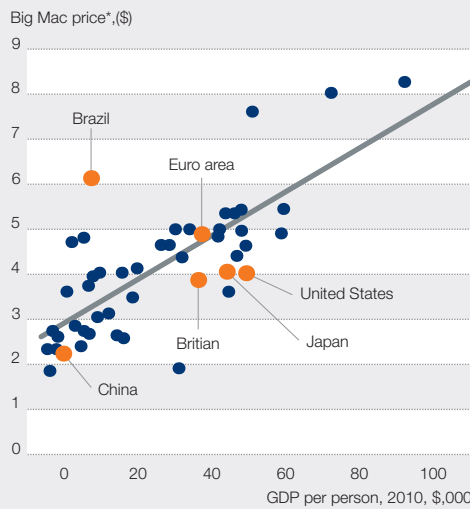
SOME ANALYSIS SUPPORTS THE THEORY THAT EMERGING MARKET CURRENCIES ARE UNDER VALUED BUT ADJUSTMENTS USING GDP MAKE THE PICTURE LESS EXTREME

DEBATE

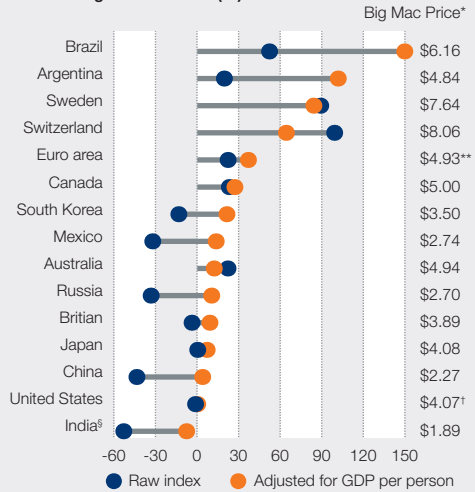
It is generally accepted that several emerging market currencies are undervalued based on the purchasing power method. A well known approach to measuring the purchasing power of countries is the Economist's Big Mac index. It states as the input of Big Mac's around the world is identical, then this is a good which if valued in a common currency should be worth a similar amount no matter where it is produced in the world. If this were not the case it may indicate the currency is over or undervalued. This simple measure indicates that many emerging market currencies are under valued. However the recent version below shows that once adjusted for GDP per person, in attempt to take into account difference in labour costs, the picture becomes less extreme. It is likely that the reality lies between the over simplistic, but amusing, Big Mac index and the GDP adjusted one which may put too much emphasis on wages over the cost of raw materials.

Chart 16 – Big Mac Index, July 2011¹³

Big Mac prices versus GDP per person



Big Mac index, local currency under/over valuation against the dollar(%)



Source: McDonald's, IMF, The Economist.

*At market exchange rate (25 July). **Average of member countries. [†]Average of four cities. [§]Maharaja Mac.

CONCLUSION

A short position in the dollar may offer a reliable domestic inflation hedge when the Federal Reserve is following a more expansionary monetary policy compared to other countries. Globalization has resulted in trade forming a more important part of the US economy. The inflation rate may therefore become more sensitive to fluctuations in the value of the dollar increasing the validity of overseas currencies as an inflation hedge.

Emerging market currencies, which are viewed as being under valued using simple purchasing power parity, offer an interesting asymmetric inflation hedge. However, as the above discussion highlights, investing blindly on a purchasing power basis alone is unlikely to be a sensible strategy. However combining this indicator with the state of the world economy and the knowledge there is explicit market manipulation (which drives an asset's price away from its fundamental value) offers an interesting long run real investment opportunity.

Foreign currencies return generating capabilities are driven by the level of carry available in the trade. However, over the long term we would expect this would be unlikely with very few exceptions to meet a CPI plus 5% target.

OUR ANALYSIS SHOWS THAT OVERSEAS CURRENCIES CAN PROVIDE AN INFLATION HEDGE IN SOME ENVIRONMENTS BUT THAT LONG-TERM RETURNS ARE GENERALLY UNLIKELY TO EXCEED A CPI +5% TARGET

GOLD

Gold is a currently a very hot topic, both in regard to its strong recent performance but mainly in relation to its purported ability to hedge inflation. Many investors see gold as not only a commodity but also a currency in its own right, due to its reputation as a store of value.

However, a report by Oxford Economics states that the gold price does not move in line with the general price level but rather exhibits long periods where it moves without any apparent link to inflation trends, partly due to structural changes in the gold market¹⁴. This may be due to its relationship with sovereign uncertainty which we look at in the following sidebar.

THE THEORY

As gold is a non-yielding asset, the opportunity cost of holding it rises with an increase in interest rates. Conversely, when real yields are negative as they are now, it should provide a stimulus for buying gold. This phenomenon was seen in the 1970s when real yields fell into negative territory leading to high gold prices, which only fell following the extreme increase in interest rates to mitigate the inflationary pressures in 1980. The inverse relationship between the real interest rate and the price of gold can clearly be seen in Chart 17 below:

Chart 17 – As real rates decline, gold prices tend to rise



Source: Bloomberg. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

This relationship has become important to an investor wishing to hedge against inflation. As most Western central banks have committed to keeping interest rates low for a sustained period of time, real rates are now driven by changes in inflation. Therefore, gold may currently be more driven by changes in inflation than when interest rates were higher.

SOME INVESTORS
BELIEVE GOLD IS AN
INFLATION HEDGE
WHILE OTHER ANALYSIS
DEMONSTRATES NO
LINK BETWEEN GOLD
AND INFLATION

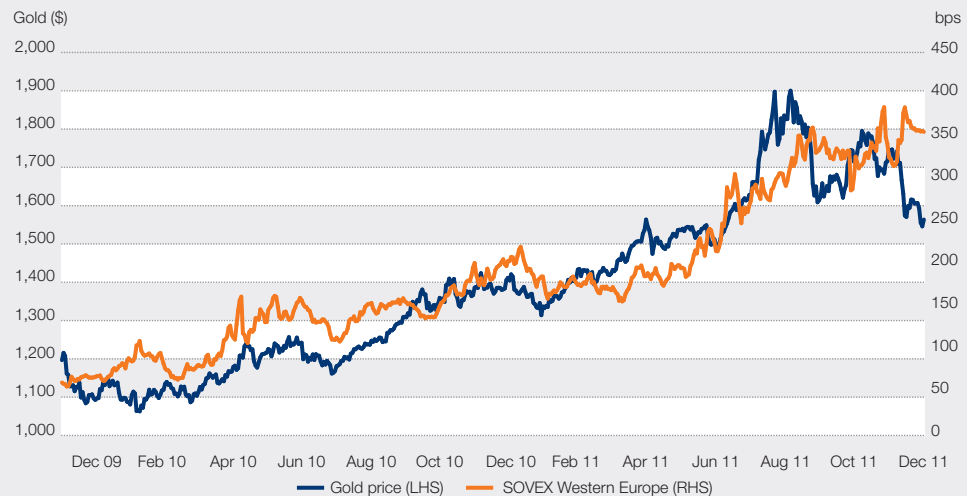
ANALYSIS SHOWS THAT GOLD PRICES ARE STRONGLY CORRELATED TO THE COST OF BUYING INSURANCE AGAINST SOVEREIGN DEFAULT

SOVEREIGN UNCERTAINTY

A further factor that has a strong impact on gold prices is sovereign uncertainty. Gold is permitted a safe haven status by investors, as unlike a fiat currency¹⁵, its purchasing power is not directly related to its monetary authorities objective, be it inflation mitigation or the stimulation of growth.

The cost of buying insurance against sovereign default, as seen by the generic five year SOVEX Index in Chart 18, signals the level of insecurity over the repayment of government debt in Western Europe.

Chart 18 – Gold prices have a strong positive correlation with International CDS spreads

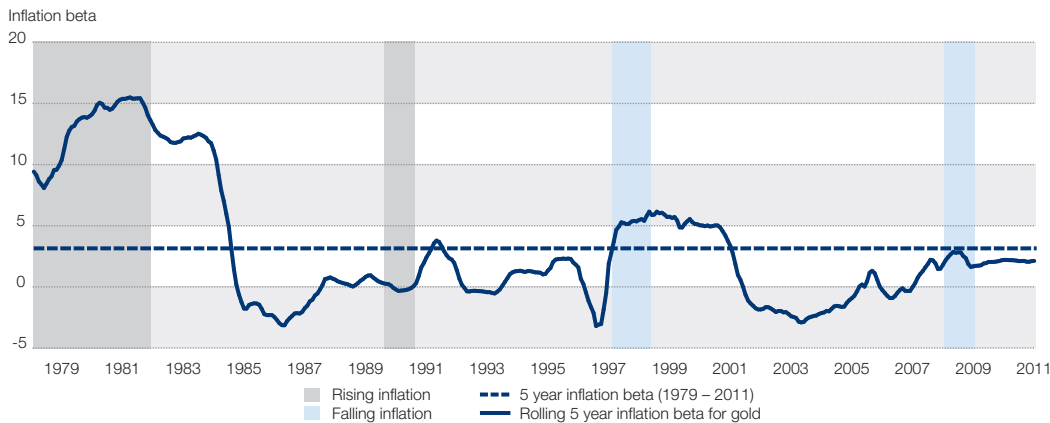


Source: Bloomberg.

Conducting the same sensitivity analysis we have performed on other asset classes, we can see from past periods how gold spot prices have reacted to different inflationary environments. The high inflation 1970s, where average CPI annual increases were over 7%, supported an annual gain on the gold spot price by 21.5%. However, the 1990s saw a much lower average annual increase in the Consumer Price Index of 2.8%, which consequentially led to an average annual loss for gold bullion investors of 3%. This clear relationship between the changes in the price level and gold returns can be seen in Chart 19, which shows a whole period inflation beta of 3.2 for gold.¹⁵

¹⁵ Fiat Currency – This refers to currency that a government has declared to be legal tender. It is not physically backed by gold or reserves.

Chart 19 – The gold price tends to respond positively to rising inflation



OUR ANALYSIS SHOWS THAT GOLD TENDS TO HOLD ITS VALUE IN REAL TERMS BUT IS UNABLE TO ACHIEVE EQUITY-LIKE RETURNS

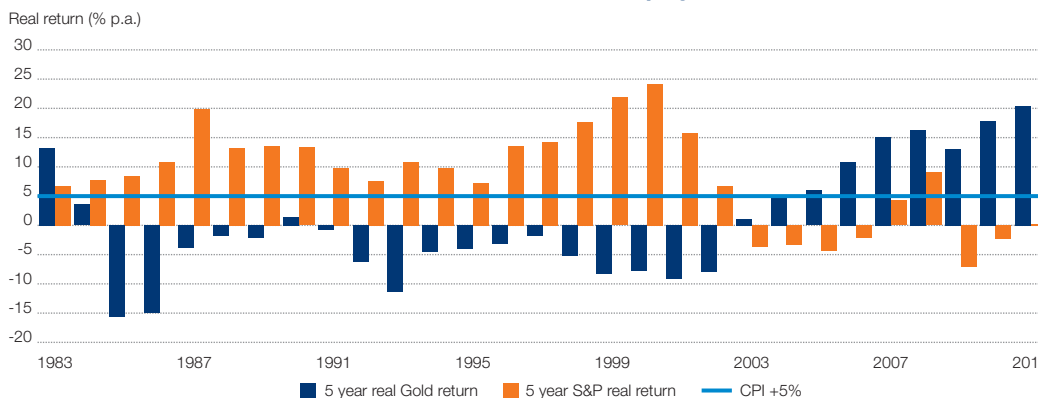
Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	Gold Returns 1974-2010 (% p.a.)
Overall (1970-2010)	4.5	-4.8	2.5	6.9
1970s	6.9	6.1	2.9	20.0
1980s	2.3	-8.1	3.0	1.1
1990s	6.9	-2.1	1.2	-3.0
2000s	5.6	-2.8	2.5	13.3

Source: Datastream. Period: February 1974 – December 2011, monthly data.
 Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge.

RETURNS

Although the gold price may be driven by a variety of factors in the short term, over the very long term it tends to hold its value in real terms. However, despite this, gold is unable to provide equity-like returns. Looking at the period between 1983 and 2011 in Chart 20, 72% of the time equities outperformed a target of CPI plus 5%, while in the case of gold, it only outperformed in 31% of observations. This chart also shows the lack of a strong relationship between gold and US equities (the two assets have a correlation of 0.08), making gold a good diversifying asset class for equity investors.

Chart 20 – Gold returns are far less consistent than US equity returns



Source: Bloomberg. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed. Indices are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

CONCLUSION

Due to the lack of a consistent return pattern and the extreme influence of short term factors in determining the gold price, it is important to be able to tactically alter portfolio positions to gold, rather than holding it as a constant element of an inflation resistant portfolio.

COMMODITIES AND COMMODITY FUTURES

THEORY

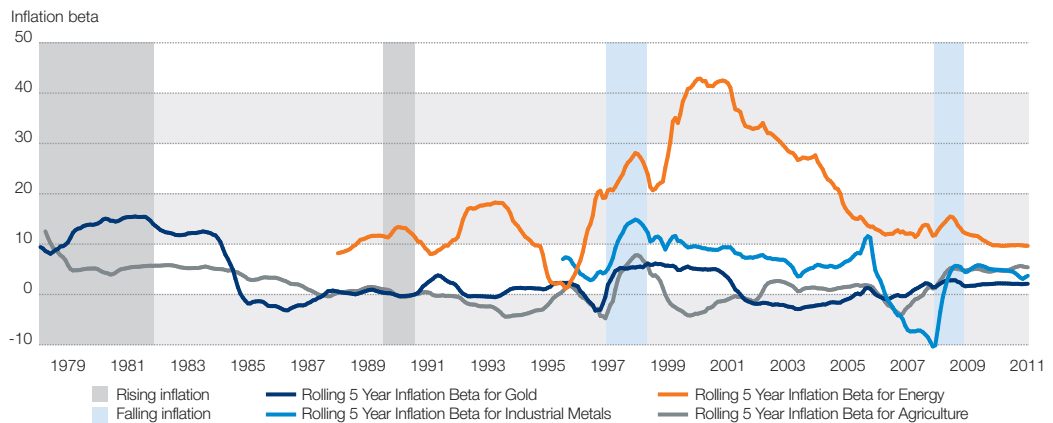
OTHER COMMODITIES PROVIDE GOOD INFLATION HEDGES BUT FOR DIFFERENT REASONS TO GOLD

As we have just seen, gold is a good hedge for rising inflation. However, many other commodities are generally believed to be a good hedge against rising inflation as well, but in many instances, it is for an entirely different set of reasons. Many commodities are an important part of the CPI basket or are direct inputs into the production of many goods we consume. As a result of this, there should be a good relationship between inflation and commodities over the short term, with commodity prices often leading broad inflation trends.

However, this group of assets do not provide homogenous hedging (or risk/return) characteristics and therefore analysis at a sub-category level is likely to provide more insight into this asset class than analyzing the broad basket of commodities.

As can be seen from Chart 21, some sub-categories of commodities provide better inflation hedges than others.

Chart 21 – Commodities tend to perform well during inflationary periods



MANY COMMODITIES ARE AN IMPORTANT PART OF THE CPI BASKET OR ARE DIRECT INPUTS INTO THE PRODUCTION OF GOODS

Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	Agriculture Returns 1974-2010 (% p.a.)	Industrial Metal Returns 1991-2010 (% p.a.)	Gold Returns 1974-2010 (% p.a.)	Energy Returns 1984-2010 (% p.a.)
Overall (1970-2010)	4.5	-4.8	2.5	-2.0	7.6	6.9	8.5
1970s	6.9	6.1	2.9	10.9	0.0	20.0	0.0
1980s	2.3	-8.1	3.0	-7.6	0.0	1.1	15.6
1990s	6.9	-2.1	1.2	-5.0	-0.2	-3.0	4.5
2000s	5.6	-2.8	2.5	-2.1	11.8	13.3	8.4

Source: Datastream. Period: February 1974 – December 2011, monthly data.

Energy Total Returns from 1984-2011, Industrial Metal Total Returns from 1991-2011.

Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed. Sectors are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

Energy has the strongest link to inflation of all the sub sectors, giving a consistently high and positive inflation beta. The broad GSCI index mainly consists of Oil and its products. Oil is a commodity fundamental to modern economies as it is the fuel on which the transport infrastructure is built. Transport makes up a meaningful direct portion of the CPI basket and the cost embedded indirectly in many goods and services where it is an important input cost.

Agriculture has the lowest average beta to inflation of all the sub indices. This is likely because it has historically had the lowest beta to growth and therefore only offers a hedge against specific agriculture risk rather than broad inflationary pressure brought about by an overheating economy. Agriculture offers a good hedge against shocks, such as the Russian fires in the summer of 2010, which can cause a jump in agriculture inflation. We believe the focus should therefore be on minimizing the cost of carry (rolling over futures contracts when the futures curve is in contango as discussed in the following panel) of this hedge rather than trying to predict the unpredictable weather events.

However, the policy of blending ethanol derived from corn with gasoline in the US has increased the link with crude oil prices and therefore agriculture is likely to have an increased growth beta and inflation beta, this can be seen in the rolling inflation beta since 2008.

Industrial metals index have a strong positive inflation beta. We feel that this is driven primarily by its link to growth, as the economy begins to overheat, shortages develop in industrial metals increasing prices along with all other goods in the economy. It offers little in the way of idiosyncratic inflation hedges. There may be opportunities in specific metals where there are supply and demand imbalances. Like equities and REITS, there are subsections of the commodities market that provide better inflation hedging characteristics at certain times in the economic cycle.

COMMODITIES ARE NOT A HOMOGENOUS ASSET CLASS; ENERGY AND INDUSTRIAL METALS HAVE A POSITIVE RELATIONSHIP WITH INFLATION, WHEREAS AGRICULTURE DOES NOT. IN ADDITION LONG-TERM RETURNS OF COMMODITIES MAY NOT CONSISTENTLY GENERATE INFLATION PLUS RETURNS

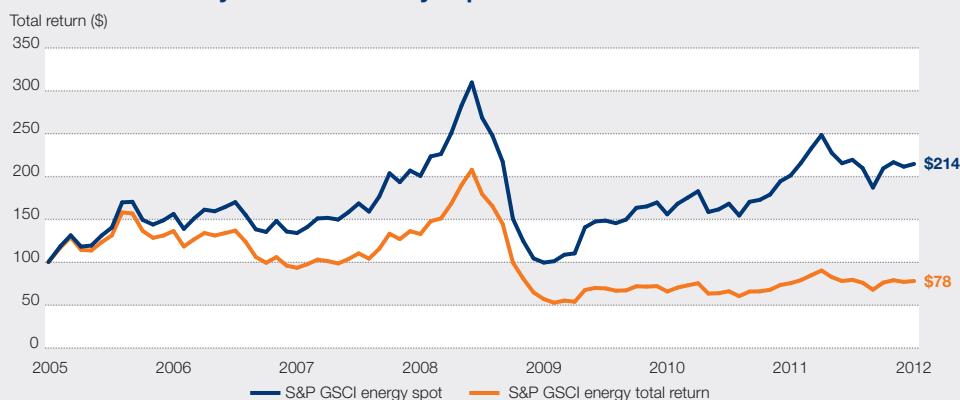
ACTIVE VERSUS PASSIVE MANAGEMENT OF A COMMODITY STRATEGY

In commodity investment the total return is generated from three primary sources:

1. The spot return of the physical commodity.
2. The collateral yield (the interest obtained on the cash backing the futures).
3. The roll yield. The roll yield comes from continually 'rolling' over futures contracts in order to avoid physical delivery of the commodity.

If the forward curve is in a state of backwardation (downward sloping), an investor can earn returns by buying futures contracts that will 'roll up' into the spot price. This is known as a positive roll yield. However, when the opposite occurs and the market is in 'contango' (futures price higher than the current spot price), an investor would receive a negative yield. As can be seen in the chart, despite spot prices rising throughout the period, a negative roll yield would have led to a negative total return.

Chart 22 – The roll yield can adversely impact returns



Source: Bloomberg. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed. Indices are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

Therefore, long-only passive strategies have been a victim of negative roll yields over the past six years. Looking to the future, active commodity management doesn't just take directional views or asset selection decisions, it also must take into account the shape of the forward curve and how this can be used to generate superior returns.

CONCLUSION

Commodities offer a strong inflation hedge demonstrated by the consistent and high inflation beta. The precious metal, energy and agriculture sub-sectors offer good diversification properties offering a hedge against several idiosyncratic inflation shocks that could derail tradition bond and equity investments. While industrial metals have a strong inflation beta, we are cautious about the additional benefits they add to a portfolio over and above equities. The long run returns of commodities can be questioned and therefore we are cautious about their role as an asset which will consistently deliver inflation plus returns. The cause for this concern is primarily centred around the lack of cash generating properties.

INFRASTRUCTURE SHOULD THEORETICALLY PROVIDE A REASONABLE HEDGE AGAINST INFLATION BUT DATA IS TOO LIMITED TO VALIDATE THIS THEORY

INFRASTRUCTURE

Infrastructure should theoretically provide a reasonable hedge against inflation as infrastructure operators have some scope to raise user fees. However, some forms of infrastructure may offer more certain inflation protection than others. Public infrastructure contracts are fixed at the time of purchase or lease, and usually include limits on permissible increases in user fees (which are typically linked to CPI, but in reality the increases are usually less than CPI). However, private infrastructure contracts are generally either annual or are negotiated regularly. This regular negotiation allows operators to ensure increases are more in line with, or in excess of, CPI. In fact, the most relevant measure of inflation for US infrastructure is actually from the Bureau of Reclamation which measures the costs of labour, equipment and materials used in heavy construction – pipelines, roads, bridges, earthworks, pumping plants, transmission lines, etc. Since 2003, the Bureau of Reclamation series has risen at twice the rate of the CPI¹⁶ so measuring inflation beta against CPI is not a perfect measure of infrastructure's ability to hedge inflation.

Data is extremely limited in this area i.e. it does not cover different inflationary environments and therefore is not particularly helpful in assessing the effectiveness of the asset class to hedge inflation in a rising inflationary environment.

It should also be noted that this is an illiquid asset class and therefore utilizing this type of investment in a dynamic fund is not possible unless it forms a long-term strategic position in the portfolio.

FORESTRY/TIMBERLAND

A similar theory about broad agricultural commodities is also applicable to timberland. Timberland was previously seen as an uninvestable asset for institutions due to the inherent lack of liquidity. However, with the increasing ability of financial instruments to give investors access to alternative asset classes, timberland has gained attraction as an inflation hedging asset class.

THEORY

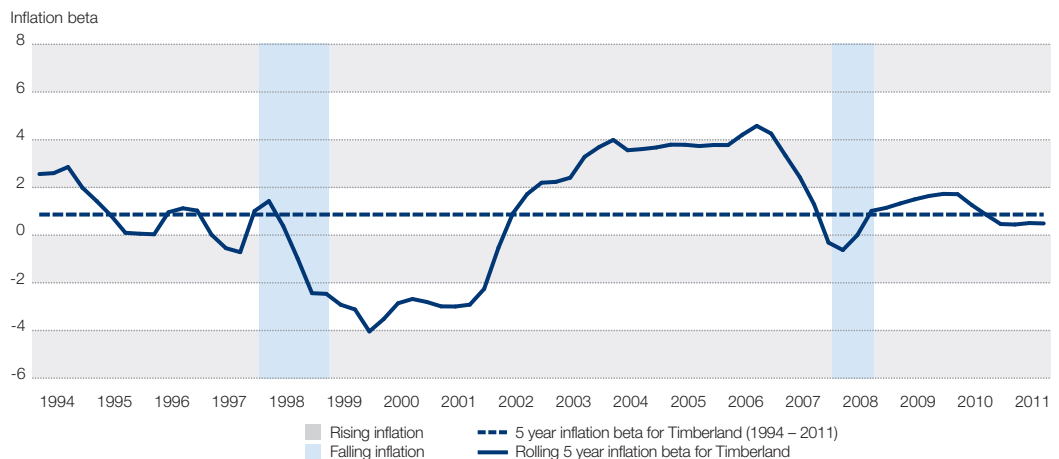
Two key factors have historically influenced the relationship between timberland and inflation. Firstly, in the case of most structural softwoods, supply is unable to change (upwards) rapidly. Secondly, timberland has primarily been owned by large industrial owners who are able to exert significant pricing power.

However, it is worth noting that a trend over the past decade by large forest industries to divest land in favour of long term strategic supply-contracts is likely to diminish pricing power in the industry.

MEDIUM TERM INFLATION HEDGING CHARACTERISTICS

As we can see in Chart 23, timberland returns have on average held a positive relationship with changes in the level of inflation over the past three decades, corroborating the earlier suggestion that landowners have previously had power over timber prices.

Chart 23 – Over the past 18 years timberland has tended to hedge inflation fairly well



¹⁶ <http://www.usbr.gov/pmts/estimate/cct00-03.pdf>

TIMBERLAND SHOULD ALSO THEORETICALLY HAVE INFLATION HEDGING CHARACTERISTICS AND OUR ANALYSIS CORROBORATES THIS THEORY

Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	Timberland Returns 1987-2010 (% p.a.)
Overall (1987-2010)	2.9	0.1	2.0	13.9
1980s	2.3	-8.1	3.0	0.0
1990s	6.9	-2.1	1.2	17.8
2000s	5.6	-2.8	2.5	8.8

Source: NCREIF Timberland Index. Period: January 1987 – September 2011, quarterly data.

Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. It is important to understand that the NCREIF Timberland index has key limitations for data analysis. The index suffers from limited contributors, a short period of data (since 1987) and the use of quarterly returns. About half of properties in the NCREIF index are appraised annually while the others are appraised semi-annually. If a property is not appraised in a specific quarter, its earnings are reported as zero, causing artificial volatility in the index.¹⁷ Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

Further, timberland does also offer diversifying characteristics from equities. (The NCREIF had a correlation of 0.08 with the S&P500 since 1988).

CONCLUSION

The issue remains that timberland is an illiquid asset class and therefore difficult to implement in a dynamic inflation strategy.

It is possible to invest in more liquid forms of timberland through ETFs and Timber REITs. ETFs are generally invested in forestry and paper stocks, resulting in an investment that is not timber-like. Timber REITs tend to consist of a mixture of timber and real estate, and like property REITs covered earlier, tend to exhibit characteristics that are more correlated with equities than timber. Again data on these type of more liquid investments is short and analysis is therefore limited.

FIXED INCOME AND TIPS

THEORY

The expected nominal yield on a fixed income instrument takes into account expectations of future inflation. This is through the bond pricing mechanism, as the value of a bond is a reflection of the present value of its future cashflows. In order to determine the present value of future cashflows, the discount rate must incorporate expectations of future inflation.

An increase in inflation should lead to an increase in the discount rate, in turn reducing the price of a bond. As longer duration bonds are more sensitive to changes in the discount rate, the magnitude of the relationship between bond returns and inflation is directly related to the bond's duration.

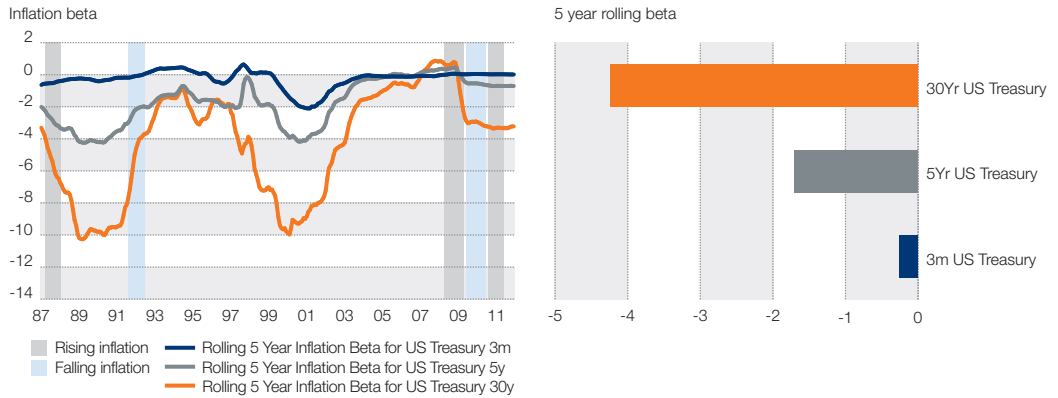
EXPERIENCE

Theoretical assumptions about bond returns and inflation have tended to hold true. As can be seen in the following chart, shorter duration fixed income instruments tend to have less of a negative relationship with inflation. In particular we can see that the bond rally of the 1980s coincided with steady reduction in inflation following Paul Volker taking over chairmanship of the Federal Reserve. Between January 1980 and December 1987, ten year and thirty year Treasuries had an annual return of 15.8% and 16.6% respectively, while the level of inflation fell from 12.6% to 4.5%.

TIMBERLAND IS AN ILLIQUID ASSET CLASS AND MORE LIQUID FORMS COULD BE CONSIDERED BUT THESE ARE LIKELY TO HAVE LOWER INFLATION HEDGING CHARACTERISTICS

OUR ANALYSIS DEMONSTRATES THAT FIXED INCOME HAS A NEGATIVE RELATIONSHIP WITH INFLATION AND THAT THIS NEGATIVE RELATIONSHIP INCREASES WITH DURATION

Chart 24 and 25 – longer duration Treasuries have an increasingly negative relationship with changes in inflation



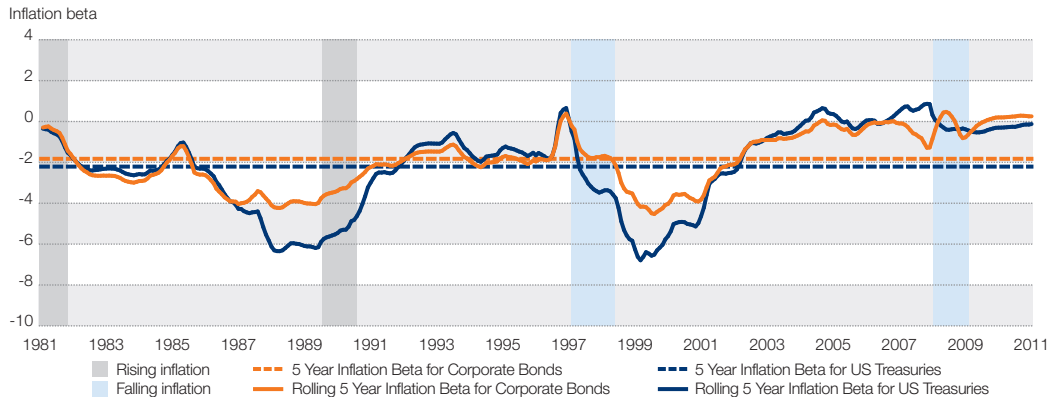
Source: Datastream. Period: January 1987 – December 2011, monthly data. Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed, Sectors are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

CORPORATE BONDS

CORPORATE BONDS ALSO HAVE A NEGATIVE RELATIONSHIP WITH INFLATION

The same theoretical assumptions may also be applied the corporate bond market as changes in bond prices will also tend to reflect changes to the discount rate. We would expect to see a picture similar to Charts 24 and 25 for the respective duration corporate indices. If we compare corporate bonds against US Treasury bonds since 1975 (data limitations prevent us using corporates pre-1975), we find a very similar relationship between the two types of fixed income and inflation, once adjusted for slightly different durations of the two indices¹⁸, as can be seen in Chart 26.

Chart 26 – Corporate bonds and US Treasuries tend to have a similar relationship with inflation



Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	Corporate Bond Returns 1977-2010 (% p.a.)	US Treasury Returns 1977-2010 (% p.a.)
Overall (1970-2010)	4.5	-4.8	2.5	8.6	7.8
1970s	6.9	6.1	2.9	5.6	4.0
1980s	2.3	-8.1	3.0	11.5	11.0
1990s	6.9	-2.1	1.2	9.0	8.0
2000s	5.6	-2.8	2.5	5.6	6.1

Source: Datastream. Period: January 1976 – December 2011, monthly data. Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed, Sectors are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

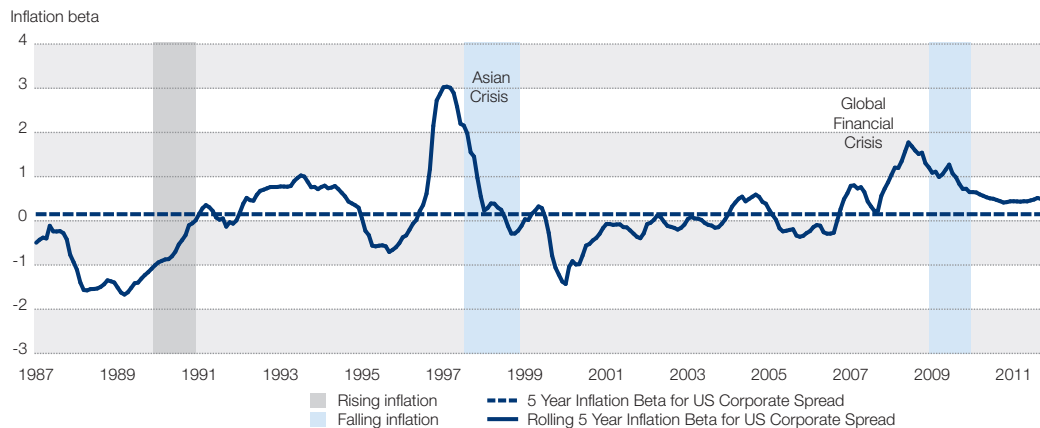
¹⁸ Duration of Corporate Bond index is on average 5.9, while duration of US Treasury index is 4.7 on average.

Looking at the corporate bond index against a US Treasury index, we can clearly see that the duration component of corporate bonds has the greatest effect on their ability to hedge inflation. By hedging the duration of the corporate bond index, we are able to ascertain the relationship between inflation and the yield spread over Treasuries.

The yield spread primarily reflects the perceived ability of a company to repay its debt to investors. Theoretically, rising inflation should mean that the corporate borrower pays less in real terms to the bondholders (coupons stay the same while the real value of the payments falls), which would suggest a positive relationship between the yield spread and changes in inflation (increased inflation means less likelihood of default). On the other hand, rising inflation may imply issues with the overall state of the economy, as seen in the equity section. Therefore, in the absence of crises (Asian crisis and Global financial crisis), we would expect an inflation beta of near zero.

As we can see in Chart 27, in general the duration-adjusted yield spread of corporate bonds has a positive relationship with inflation over the period 1988 to 2011 but this is largely attributable to the impact of crises; overall, changes in the returns of corporate bonds in inflationary environments are more driven by the relationship between inflation and the duration of the corporate bond.

Chart 27 – The yield spread of corporate bonds over Treasuries has a slightly positive relationship with inflation



Source: Datastream. Schroders. Period: November 1982 – December 2011, monthly data. Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. Change in inflation represents the level of the CPI index at the end of the period against its level at the beginning of the period. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

Nominal bonds are susceptible to rising inflation and this is clearly an issue for investors with a CPI plus target. However, looking at the ability of nominal bonds to generate inflation beating returns over the past 140 years, we have seen that they are able to generate real annual positive returns on 65% of occasions. The creation of inflation-linked bonds (TIPS in the US), which were created to behave differently to nominal bonds during rising inflation periods has been an extremely important development in the pensions industry.

TIPS SHOULD
THEORETICALLY
PROVIDE STRONG
INFLATION HEDGING
CHARACTERISTICS

TIPS

THEORY

Treasury inflation protected securities (TIPS) are bonds issued by the US treasury that have existed since 1997. The principal amount repaid at maturity of the bond changes in line with the CPI index. The coupons of the TIPS are a fixed percentage of the principal amount, meaning that the semi-annual coupon payments to investors should reflect changes in the price index.

Consequently, if the market correctly prices inflation, TIPS should offer investors similar returns to nominal Treasuries, with the added bonus of inflation protection.

It is standard practice to break TIPS into two components; the real yield, which is shown by the TIPS yield, and the break-even rate, which is the computed rate that inflation would have to be in order for an investor to be ambivalent between Treasuries and TIPS.

EXPERIENCE

Due to the importance of real return bonds as an inflation hedging instrument, we have created a proxy of TIPS index returns back to 1962 in order to analyze their effectiveness as an inflation hedge.

Our proxy TIPS index is based on an estimation of the change of a modelled real yield combined with changes in the nominal government bond index.

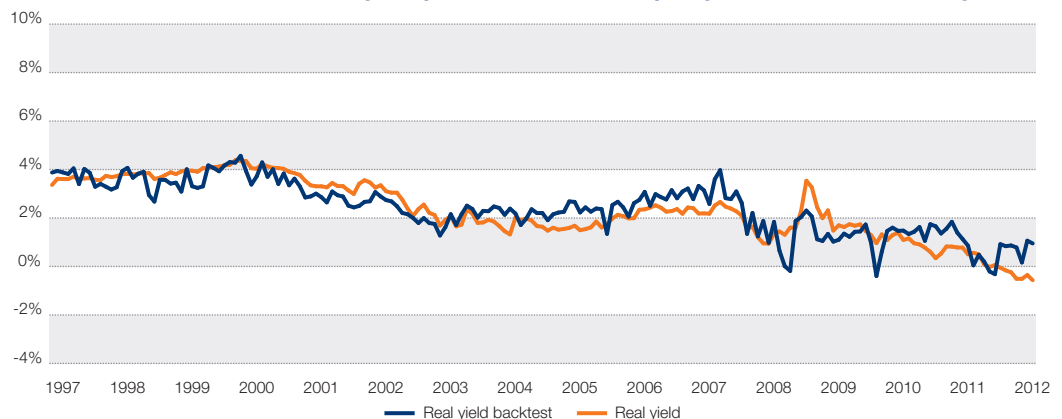
METHODOLOGY

We regressed six key variables on real yields, and using a regime based scenario (rising and falling CPI (month on month)) derived statistically significant sensitivities. These sensitivities have been used to create a proxy real yield back to 1962. The following variables were included in its creation:

- » Nominal 10 year yield on Government Bonds
- » The year on year change in the ISM Manufacturing Index
- » Expectations of Inflation
- » Monthly change in annual CPI
- » Annual Inflation volatility
- » The Real Federal Funds rate.

A correlation of 0.86 between the proxy real yield and the actual real yield between 1997 and 2011 suggests that the proxy real yield successfully mimics changes in the observed real yield. Further, regression analysis suggests that the proxy yield significantly reflects changes in the observed real yield. The two indices can be seen below in Chart 28.

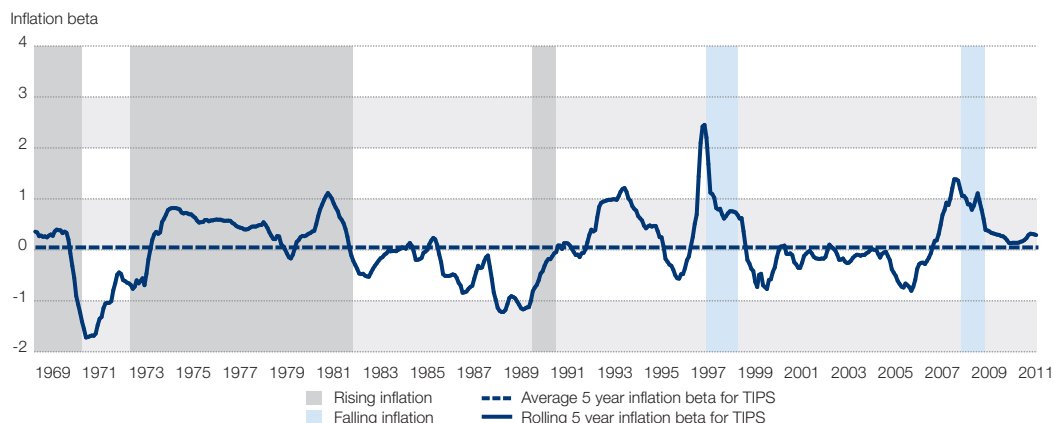
Chart 28 – The back tested real yield proved a successful proxy for the observed real yield



Source: Datastream, Schroders.

Using this recreated TIPS index, we tested the inflation hedging abilities of TIPS using a five year inflation beta. Looking at Chart 29, it transpires that TIPS are unable to perfectly hedge inflation in all periods.

Chart 29 – TIPS are unable to exactly hedge inflation



Decade	Annual Inflation (% p.a.)	Change in Inflation (% p.a.)	Volatility (% p.a.)	TIPS Returns 1964-2010 (% p.a.)
Overall (1960-2010)	4.0	-0.2	2.2	4.0
1960s	2.3	4.3	1.3	1.1
1970s	6.9	6.1	2.9	3.5
1980s	2.3	-8.1	3.0	6.8
1990s	6.9	-2.1	1.2	4.5
2000s	5.6	-2.8	2.5	3.4

Source: Datastream, Schroders. Period: March 1964 – December 2011, monthly data.

Note: A positive beta when inflation is falling suggests negative returns i.e. a poor hedge. Past performance is no guarantee of future results. The value of an investment may go down as well as up and is not guaranteed.

Economic theory suggests that TIPS have an inflation beta of one; however this is clearly inconsistent with the data.

The discrepancy between the expected hedging potential of TIPS and the quantitative reality revolves around the relationship between inflation expectations and yields. For example, looking at the 1970s where inflation consistently surprised on the upside, we saw that yield increases were less than the increase in inflation. The inconsistency between yield increases and inflation increases meant that TIPS did not fully hedge the increase in inflation, resulting in an inflation beta of less than one.

CONCLUSION

For an investor looking solely for inflation protection, in most instances TIPS provide a good hedging asset. Moreover, Kothari and Shanken (2004)¹⁹ reconstructed an index of inflation-linked bonds back to the 1950s, which suggests that the inflation-linked instruments provide better diversification benefits against equities than nominal bonds. However, as noted before, TIPS are backward looking and as such tend not to perfectly hedge multiple surprises. As well as this, in most cases, an investor must suffer a return drag for holding TIPS as opposed to nominal bonds due to premium paid for inflation protection.

THE THEORY DOES NOT HOLD PERFECTLY TRUE; WHERE INFLATION SURPRISES ON THE UPSIDE, YIELDS OFTEN DO NOT KEEP PACE. IN ADDITION RETURNS ON TIPS ARE UNLIKELY TO PROVIDE CPI +5%

¹⁹ Kothari, S. Shanken, J. 'Asset Allocation with Inflation-Protected Bonds', Financial Analysts Journal, February 2004.

OUR ANALYSIS HAS DEMONSTRATED THAT SOME COMMONLY HELD INVESTOR BELIEFS ABOUT INFLATION HEDGING CHARACTERISTICS OF ASSET CLASSES WERE CORRECT BUT THAT THERE IS OFTEN A TRADE-OFF BETWEEN GOOD HEDGING AND GOOD LONG TERM RETURNS

SUMMARY

Our intention with this analysis was to better understand each asset class' ability to hedge inflation and deliver strong returns. Investors' beliefs about the best asset classes in which to invest in times of rising inflation turned out to be partly correct. Some commodities do provide a good hedge but not all. This is non-homogenous asset class and energy is far better at hedging and delivering returns above inflation than agriculture. Gold, which has been seen by some as a real asset, does hold its value in real terms over the very long term but returns over this longer term period would not meet investors' objectives of CPI plus 5%.

Equities provide a poor inflation hedge but good long term returns so this can be a challenge for an investor thinking about how best to achieve an objective of return above inflation. Like commodities, portions of the equity market, namely those that are more energy or materials related, provide stronger inflation hedging properties.

REITs in general provide a poor inflation hedge, although residential REITs do seem to provide better hedging characteristics than the broad REIT index.

Cash and leveraged loans should provide reasonable inflation hedging characteristics, although the former would not provide sufficient return for most long term investors. Non-US currencies provide diversification and potentially better returns than cash.

Commodities are a non-homogenous asset class and sub-sectors such as energy and industrial metals provide good inflation betas. Implementation of a commodities position within a portfolio is key to ensuring that these do not result in a drag on the portfolio due to their lack of cash generating properties.

Fixed income, particularly longer duration, is a poor inflation hedge but more surprisingly, TIPS theoretically should provide a good inflation hedge but there are circumstances when this does not hold true. In particular, inflation expectations may rise but the change in the real yield component is uncertain. If, for example, the real yield rises when inflation expectations rise, the value of TIPS will fall. Additionally, the return on TIPS is low over the longer term and therefore the significant use of TIPS in a portfolio should be carefully considered.

In addition to conducting theoretical and historical analysis from an investor's perspective, we also wanted to go further than some other studies to evaluate infrastructure and timberland. While infrastructure (and to some extent, timberland) provides inflation hedging characteristics, a lack of robust historical data means we cannot substantiate this view. Lack of liquidity means that these asset classes are also difficult to implement in a dynamic inflation hedging portfolio unless they form a strategic element of the portfolio.

Historical analysis provides some indication of the tool set which could be used to counter future structural inflation. However, it is important to remember that history provides only a guide, and we must be cognizant of the fact that future experience may differ from the past.

The table below summarizes how each asset class hedges inflation on a scale from red, through amber to green (red being poor, amber being average and green being good) over the short term and the longer term. In addition, as we are considering how each asset class fits in a portfolio, we show how each asset class diversifies from equities.

	Hedge against inflation (short-term)	Hedge against inflation (long-term)	Diversification from equities
Equity	●	●	N/A
Materials Equity	●	●	●
Energy Equity	●	●	●
Property	●	●	●
REITs	●	●	●
Cash	●	●	●
Leveraged loans	●	●	●
Gold	●	●	●
Overseas FX	●	●	●
Nominal Bonds	●	●	●
TIPS	●	●	●
Industrial Metals	●	●	●
Energy	●	●	●
Commodities	●	●	●

Source: Schroders. Sectors are mentioned for illustrative purposes only and should not be viewed as a recommendation to buy/sell.

When we consider the short term hedge against inflation, unsurprisingly energy and commodities are graded highly given their role in the calculation of inflation. Equities at the other end of the scale have very poor short inflation hedging characteristics due to the higher discount rate in rising inflationary environments not being offset by increases in profits.

Over the longer term, in contrast, energy and commodities may not provide inflation hedging/inflation plus returns that are as good as equities (hence the amber and green colors respectively). This is mainly due to the lack of cash generating properties of commodities.

Finally, when constructing a portfolio with multiple asset classes, we need to consider diversification benefits of each asset class. We have compared each asset class to equities as equities provide good long term inflation plus returns and are likely to be used as part of a long term portfolio. As can be seen, most of the asset classes provide average or good diversifying benefits, with the exception of REITs (which have equity-like characteristics).

Constructing an inflation hedging portfolio that provides inflation plus returns in a variety of inflation environments clearly requires understanding of the drivers of inflation and dynamic management.

EACH ASSET CLASS HAS DIFFERING CHARACTERISTICS IN TERMS OF ITS ABILITY TO HEDGE INFLATION OVER THE LONG AND SHORT TERM AND TO PROVIDE INFLATION PLUS RETURNS. DIVERSIFICATION BENEFITS ALSO NEED TO BE CONSIDERED WHEN CONSTRUCTING PORTFOLIOS

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