MSCI Barra

RESEARCH BULLETIN

Hedging Inflation with Equities

July 2008

Summary

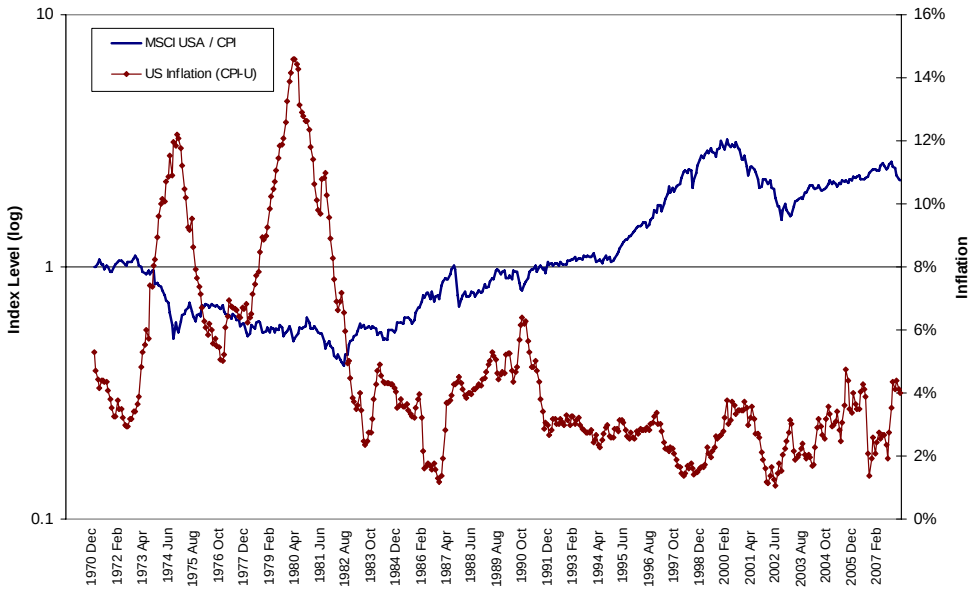
Investors have in the past addressed the threat of inflation via asset allocation. For example, investors might overweight asset classes such as commodities, real estate and TIPs and underweight bonds and cash. While equities have traditionally been associated with their inflation hedge characteristic, anecdotal evidence has shown that equity returns sometimes fail to provide protection against inflation over shorter horizons. Given the importance of equities in a typical multi-asset class portfolio, insulating an equity portfolio from inflation is therefore a key consideration for investors in the current environment.

The objective of this short study is to search for equity attributes that can be used to hedge against inflation by looking into the behavior of common factors during inflationary periods. Using the results, we analyze the properties of the recently launched MSCI Commodity Producers Indices to assess their potential application in addressing inflation.

Are Equities a Good Inflation Hedge?

Equities have traditionally been viewed as an inflation hedge asset class. The theory is simple: a company's revenues and earnings would also rise with inflation over the course of time. For example, US equities, as measured by the MSCI USA, have demonstrated an average annualized return of 7.6%, compared to the annualized inflation rate (CPI-U) of around 4% a year since 1970. From a long-term perspective, equities may therefore be considered an inflation hedge. However, the proposition does not always hold over shorter periods of time. Figure 1 shows the inflation-adjusted performance of the MSCI USA plotted on a log scale, it is clear that equities have failed to outperform inflation in certain periods.

Figure 1: Inflation and Equity Performance



Source: MSCI and Bureau of Labor Statistics Data.

However, we may be able to derive more insight if we look beneath the surface and try to understand the behavior of common factors that drive the market during inflationary periods. One way to accomplish this is to examine the industry and risk factor sensitivity through the use of the Barra factor model. The Barra fundamental factor model enables us to decompose

asset volatility into common factors and idiosyncratic risks and therefore provides more insight on the sources of risks during inflationary periods.

For the purpose of this paper, we will analyze the US equity markets, as the Barra US risk model (USE3) has the most comprehensive factor return history. We choose to focus only on the periods of rising inflation, as we are interested in understanding the behavior of equities when inflation is increasing. The two most severe rising inflationary periods documented in past 40 years of US equity history were registered between April 1973 to November 1974 and between December 1976 and April 1980, when the inflation rates ended in double-digits[1]. Table 1 shows the cumulative returns of select industry and style factors of the Barra USE3 model. For ease of analysis, the strength of each factor return is depicted in the forms of "+" and "–" signs with +++ representing factor returns exceeding 10 percentage points, ++ representing factor returns exceeding 5 percentage points and + representing factor returns exceeding 1 percentage points and vice versa.

Table 1: Cumulative Monthly Factor Returns of USE3S

	Cumulative Factor Returns		Strength of Cumulative Factor Returns	
	1973 Apr - 1974 Nov	1976 Dec - 1980 Apr	1973 Apr - 1974 Nov	1976 Dec - 1980 Apr
INDUSTRY FACTOR				
Gold	74.2%	124.7%	+++	+++
Oil Services	22.3%	70.5%	+++	+++
Energy Reserves	-23.2%	64.3%	- - -	+++
Oil Refining	-2.6%	49.2%	-	+++
Defense & Aerospace	-47.4%	39.6%	- - -	+++
Medical Products	0.0%	66.0%		+++
Drugs	-27.4%	28.1%	- - -	+++
Tobacco	-27.7%	7.3%	- - -	++
Hotels	-59.5%	33.6%	- - -	+++
Semiconductors	-21.3%	38.2%	- - -	+++
Electronic Equipment	-48.7%	32.3%	- - -	+++
Computer Hardware	-60.4%	27.6%	- - -	+++
Media	-58.0%	20.3%	- - -	+++
Information Services	-42.9%	11.1%	- - -	+++
Heavy Electrical Eqp	-46.4%	5.0%	- - -	+
STYLE FACTOR				
Earnings Yield	8.4%	19.5%	++	+++
Value	7.9%	2.9%	++	+
Leverage	-5.9%	-2.9%	- -	-
Size	0.7%	-16.3%		- - -

Notes: +++: Value > 10% pt , ++: Value > 5% pt , + : Value > 1% pt
- - -: Value < -10% pt , - -: Value < -5% pt , - : Value < -1% pt

Inflation Sensitive Industry and Style Factors

The results reveal that three categories of industry factor exposures seem to have reacted positively to the headline inflation. The first category is Gold and Oil related exposures. As shown by the factor returns, equities with exposures to these factors have been resilient during periods of rising inflation (although Energy Reserves and Oil Refining only reacted positively in the second period of inflation). Companies with exposure to these factors are typically precious metals producers and energy companies. Other categories that performed well during the second inflationary period in this analysis (December 1976 – April 1980) are Medical Services, Drugs, Defense and Aerospace, Hotels and Tobacco. A possible explanation for this is that demand for products and services in these industries are relatively inelastic and these companies could therefore provide an earnings hedge when inflation is

[1] It is important to note that each inflation period is different in nature. The early 1970s inflation was triggered primarily by the 1973 Oil Embargo. It ended less than a year later in March of 1974 but the effects stayed through. In 1979, the energy crisis in US triggered another round of inflation and peaked at around 15%.

high. Interestingly, technology related exposures such as Semiconductors, Electronic Equipment, Computer Hardware & Business Machines, and Media and Information Services also did well during the inflationary period from December 1976 to April 1980, suggesting that the stocks of companies that have exposures to these factors could also potentially provide inflation protection. Nonetheless, the linkage of inflation and technology exposure is weaker and could be potentially spurious in nature.

To complete the picture, we also performed a similar analysis on style factors. The results show that Earnings Yield[2] and Value have consistently registered positive returns during these two periods, although the signal on Value was weaker during the second period. On the other hand, the Leverage factor [3] consistently underperformed while the Size factor performed poorly during the second period of observation. The results indicate that an equity portfolio with higher than average earnings to price ratios and negative exposure to Leverage and Size factors would have potentially done well during the second inflationary period.

Characteristics of the MSCI Commodity Producers Indices

Given the above findings, we examine the MSCI Commodity Producers Indices to see whether they contain desirable features for providing a hedge against inflation. The MSCI Commodity Producers Indices are equity based indices that consist of stocks from select Global Industry Classification Standard (GICS®) sub-industries organized into Energy, Metals and Agricultural sectors[4]. As such, the indices have a natural bias towards Energy and Metals exposures (see Appendix), which historically have shown some potential inflation protection characteristics. Table 2 shows the style exposure breakdown of the MSCI USA Index versus the MSCI USA Commodity Producers Index. Compared to the MSCI USA Index, the MSCI USA Commodity Producers Index has a significantly higher exposure towards Earnings Yield (i.e. stocks with higher than average earnings to price) and a large negative exposure towards Leverage. This suggests that the MSCI Commodity Producers Indices possess some interesting attributes that may be useful to investors as an inflation hedge benchmark.

Table 2: Exposures of the MSCI USA and MSCI USA Commodity Producers Indices to Barra Style Factors, May 2008

Risk Index	MSCI USA	MSCI USA Commodity Producers
Size	0.29	0.86
Momentum	-0.02	0.79
Earnings Yield	0.05	0.49
Earnings Variation	-0.05	0.28
Trading Activity	0.03	0.2
Size Non-Linearity	0.11	0.15
Currency Sensitivity	0.01	0.12
Growth	-0.05	0.09
Non-Est Universe	0.01	0.02
Value	-0.03	-0.15
Yield	0.06	-0.16
Volatility	-0.08	-0.2
Leverage	-0.09	-0.62

[2] The USE3S Earnings Yield factor combines current and historical earnings-to-price ratios with a measure of analyst-predicted earnings-to-price ratio. A strong factor return suggests that stocks with similar earnings yields behave in a similar fashion with respect to their returns.

[3] The Barra USE3 Leverage factor is regressed by using long-term debts and preferred equities. For more details, please refer to the USE3 Handbook. As a side note, although inflation brings a de-leveraging effect and lowers the value of debts, the market did not appear to react positively to companies with high leverage during these two periods. Part of the reason could be attributed to the fact that the interest rate was highly correlated with the inflation rate. As such, the cost of funding could be higher during inflation.

[4] Commodity Producers sectors are not official GICS® sectors but aggregated subsets of GICS® sub-industries based on the MSCI Commodity Producers Indices Methodology.

Performance of MSCI ACWI Commodity Producers Index During Periods of Inflation

Using the inflation in G7 countries as a proxy for global inflation, we compare the performance of the MSCI All Country World Commodity Producers Index against the MSCI All Country World Index (ACWI) over the past three and half decades (Table 3). It is interesting to see that the MSCI ACWI Commodity Producers Index has documented consistent outperformance against the MSCI ACWI when inflation rose above its historical 36-month moving average while producing mixed results when inflation dipped below its historical average. The results seem to indicate that the MSCI ACWI Commodity Producers Index tends to work well when inflation is a high.

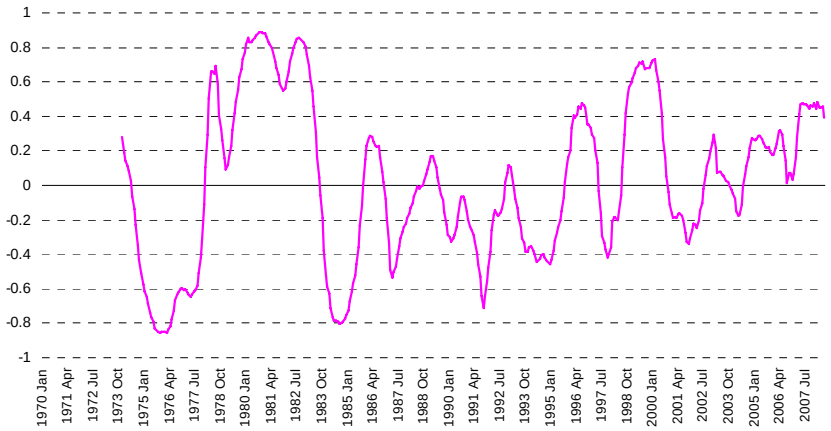
Table 3: Index Performances during Inflation

	G7 Inflation > 36m Avg G7 Inflation				G7 Inflation < 36m Avg G7 Inflation		
Period	ACWI Commodity Producers Index	ACWI	Outperform/ Underperform	Period	ACWI Commodity Producers Index	ACWI	Outperform/ Underperform
1973 Dec - 1975 Aug	-4%	-11%	+	1975 Sep - 1978 Dec	16%	32%	-
1979 Jan - 1981 Mar	85%	27%	+	1981 Apr - 1987 Jul	85%	194%	-
1987 Aug - 1991 Jul	7%	3%	+	1991 Aug - 1996 Sep	42%	56%	-
1999 Nov - 2001 Sep	-11%	-30%	+	1997 Mar - 1999 Aug	47%	46%	+
2002 Dec - 2003 Mar	-5%	-6%	+	2001 Oct - 2002 Nov	-5%	-11%	+
2004 Apr - 2005 May	27%	11%	+	2003 Apr - 2003 Aug	15%	12%	+
2005 Jul - 2006 Aug	26%	15%	+	2003 Oct - 2004 Mar	17%	10%	+
2007 Oct - 2008 Jun	9%	-12%	+	2006 Sep - 2007 Sep	46%	22%	+

Note:
+: ACWI Commodity Producers Index outperforms ACWI
- : ACWI Commodity Producers Index underperforms ACWI

However, it is also important to highlight that the correlation between the MSCI ACWI Commodity Producers Index and inflation is not constant over time (Figure 2). Importantly, the underlying drivers for each inflationary period can be very different. It is therefore useful to conduct further investigations to understand the behavior and exposures of the MSCI ACWI Commodity Producers Index under different macro economic conditions.

Figure 2: Correlation of G7 Inflation with MSCI ACWI Commodity Producers Index



Conclusion

This short piece represents a preliminary venture into the field of inflation protection using equity portfolios. Applying the long history and insight derived from the US Barra risk model, we embarked on a search of portfolio attributes that have helped to hedge against inflation in the past. We concluded that the MSCI Commodity Producers Indices possess some interesting properties that could potentially be used by investors as an inflation hedge index.

Appendix: Exposures of the MSCI USA and MSCI USA Commodity Producers Indices to Barra Industry Factors, May 2008

Industry	MSCI USA	MSCI USA Commodity Producers
Energy Reserves	6.6	51.7
Oil Refining	3.2	21.8
Mining & Metals	1.4	10.0
Chemicals	3.0	9.5
Food & Beverages	3.7	2.7
Forestry And Paper	0.5	2.0
Gold	0.2	1.9
Gas Utilities	0.4	0.2
Constructn & Real Prop	0.6	0.1
Industrial Parts	1.6	0.0
Truck/Sea/Air Freight	0.7	0.0
Oil Services	3.1	0.0
Airlines	0.0	-
Alcohol	0.4	-
Apparel & Textiles	0.4	-
Banks	6.6	-
Biotech	1.8	-
Clothing Stores	0.4	-
Computer Hardware	4.4	-
Computer Software	4.1	-
Consumer Durables	0.7	-
Defense & Aerospace	1.8	-
Department Stores	2.0	-
Drugs	4.4	-
Electric Utility	3.1	-
Electronic Equipment	2.1	-
Entertainment	0.8	-
Environmental Services	0.2	-
Equity Reit	1.6	-
Financial Services	3.2	-
Grocery Stores	0.4	-
Heavy Electrical Eqp	1.2	-
Heavy Machinery	0.6	-
Home Products	2.5	-
Hotels	0.4	-
Industrial Services	0.5	-
Information Services	2.4	-
Internet	2.0	-
Leisure	0.3	-
Life/Health Insurance	1.5	-
Media	2.2	-
Medical Products	4.0	-
Medical Services	1.7	-
Motor Vehicles & Parts	0.6	-
Property/Casualty Ins	1.8	-
Publishing	0.4	-
Railroads	1.0	-
Restaurants	0.9	-
Securities & Asst Mgmt	3.2	-
Semiconductors	2.7	-
Specialty Retail	2.2	-
Telephone	1.9	-
Thrifts	0.2	-
Tobacco	1.3	-
Wireless Telecom	1.5	-

Contact Information

clientservice@mscibarra.com

Americas	
Americas	1.888.588.4567 (toll free)
Atlanta	+ 1.404.949.4529
Boston	+ 1.617.856.8716
Chicago	+ 1.312.706.4999
Montreal	+ 1.514.847.7506
New York	+ 1.212.762.5790
San Francisco	+ 1.415.576.2323
Sao Paulo	+ 55.11.3048.6080
Toronto	+ 1.416.943.8390

Europe, Middle East & Africa	
Amsterdam	+ 31.20.462.1382
Cape Town	+ 27.21.683.3245
Frankfurt	+ 49.69.2166.5325
Geneva	+ 41.22.817.9800
London	+ 44.20.7618.2222
Madrid	+ 34.91.700.7275
Milan	+ 39.027.633.5429
Paris	0800.91.59.17 (toll free)
Zurich	+ 41.1.220.9300

Asia Pacific	
China Netcom	10800.852.1032 (toll free)
China Telecom	10800.152.1032 (toll free)
Hong Kong	+ 852.2848.7333
Singapore	+ 65.6834.6777
Sydney	+ 61.2.9220.9333
Tokyo	+ 813.5424.5470

www.mscibarra.com

Notice and Disclaimer

- This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of Morgan Stanley Capital International Inc. ("MSCI"), Barra, Inc. ("Barra"), or their affiliates (including without limitation Financial Engineering Associates, Inc.) (alone or with one or more of them, "MSCI Barra"), or their direct or indirect suppliers or any third party involved in the making or compiling of the Information (collectively, the "MSCI Barra Parties"), as applicable, and is provided for informational purposes only. The Information may not be reproduced or redisseminated in whole or in part without prior written permission from MSCI or Barra, as applicable.

- The Information may not be used to verify or correct other data, to create indices, risk models or analytics, or in connection with issuing, offering, sponsoring, managing or marketing any securities, portfolios, financial products or other investment vehicles based on, linked to, tracking or otherwise derived from any MSCI or Barra product or data.

- **Historical data and analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction.**

- **None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), or a promotion or recommendation of, any security, financial product or other investment vehicle or any trading strategy, and none of the MSCI Barra Parties endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies. None of the Information, MSCI Barra indices, models or other products or services is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such.**

- The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information.

- NONE OF THE MSCI BARRA PARTIES MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, MSCI AND BARRA, EACH ON THEIR BEHALF AND ON THE BEHALF OF EACH MSCI BARRA PARTY, HEREBY EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

- Without limiting any of the foregoing and to the maximum extent permitted by law, in no event shall any of the MSCI Barra Parties have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited.

- Any use of or access to products, services or information of MSCI or Barra or their subsidiaries requires a license from MSCI or Barra, or their subsidiaries, as applicable. MSCI, Barra, MSCI Barra, EAFE, Aegis, Cosmos, BarraOne, and all other MSCI and Barra product names are the trademarks, registered trademarks, or service marks of MSCI, Barra or their affiliates, in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor's. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and Standard & Poor's.

- The governing law applicable to these provisions is the substantive law of the State of New York without regard to its conflict or choice of law principles.

About MSCI Barra

MSCI Barra develops and maintains equity, hedge fund, and REIT indices that serve as benchmarks for an estimated USD 3 trillion on a worldwide basis. MSCI Barra's risk models and analytics products help the world's largest investors analyze, measure and manage portfolio and firm-wide investment risk. MSCI Barra is headquartered in New York, with research and commercial offices around the world. Morgan Stanley, a global financial services firm, is the majority shareholder of MSCI Barra, and Capital Group International, Inc. is the minority shareholder.