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Special Report

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Factors That Influence 10-Year Treasury Inflation Protected Securities' (TIPS) Breakeven Inflation Rate

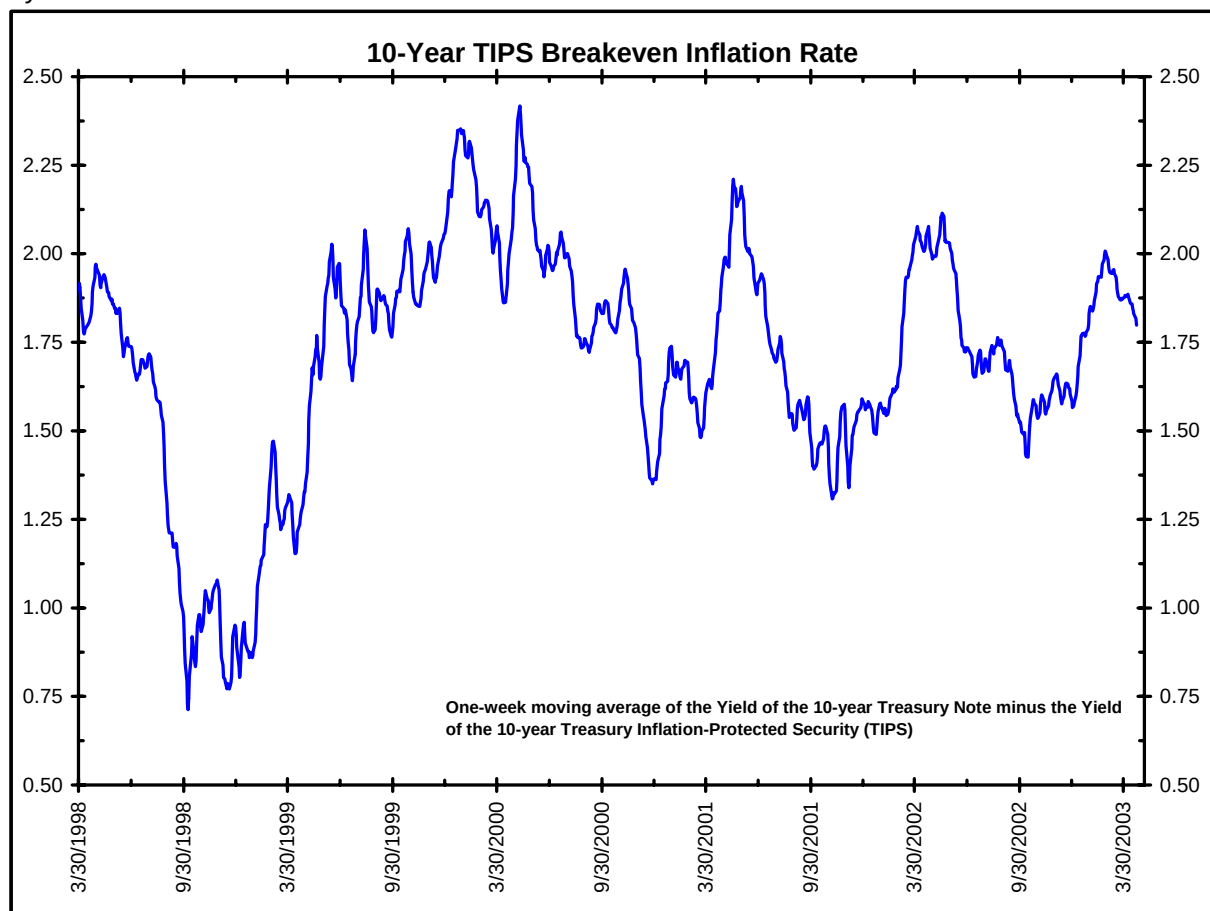
In this *Special Report* we detail our model to determine the trend in the 10-year TIPS breakeven inflation rate.

A TIPS security pays a yield **and** the inflation rate to its holder. The inflation rate is measured using the non-seasonally adjusted Consumer Price Index – All Urban Consumers (CPI-nsa) and is paid on a two-month lag due to reporting/timing delays. By subtracting the yield of the 10-year TIPS security from the yield of the 10-year Treasury Note (the “nominal”), one can derive a “breakeven inflation rate.” That is, the inflation rate the holder of a TIPS security must receive in order to collect the same

income as the holder of a 10-year “nominal” Treasury note. (Note: this breakeven inflation rate is the market's assessment of the **10-year** annualized inflation rate, not the upcoming year-over-year rate as is commonly mistaken).

We use the breakeven inflation rate because we felt it would have the additional benefit of being useful to non-TIPS investors since it is also a gauge for changing inflation expectations.

The chart below shows the 10-year breakeven inflation rate back to the first 10-year TIPS auction in 1998.



A Four-Part Model

How can we objectively determine the trend of this rate? More importantly, how can we determine when the trend changes? In order to answer these questions, we've built a model that incorporates the following components:

- The **level** of the breakeven rate itself
- The price of **crude oil**
- The Leuthold Inflation Beneficiaries **Stock Index**
- The **yield curve**

The Level Of The Spread

First we "smoothed out" some of the erratic day-to-day price fluctuations to improve the reliability of any signals produced by our model. We accomplished this by using a 1-week moving average of the breakeven inflation rate rather than the "raw" rate itself.

Next, we added a 3-month moving average of the breakeven inflation rate as a way to measure the significance of movement in the 1-week moving average. Three months was chosen as our longer-term time frame because most managers are focused on quarterly performance.

A widening bias is signaled when the 1-week moving average moves **above** the 3-month moving average. A tightening bias is signaled when the 1-week moves **below** the 3-month.

Crude Oil

We used cash crude oil prices (Cushing) rather than nearby futures to avoid any artificial price movement due to contract rollover.

Again, we used a 1-week moving average of price in an attempt to smooth out any erratic day-to-day movements in the price of crude oil. We then added a 2-month moving average of the price of crude oil for comparison with the 1-week average. We chose a 2-month moving average (rather than a 3-month as used for the price of the spread) to align this inflation measure with the payout of TIPS securities as explained above. We wanted to measure the movement in this inflation measure since the last "CPI payout" (or *accretion*, as its called).

A widening (inflationary) bias is signaled when the 1-week moving average moves **above** the 2-month moving average. A tightening bias is signaled when the 1-week moves **below** the 2-month.

The Leuthold Inflation Beneficiaries Stock Index

This index is a "modified market-cap weighted" index of twenty-four stocks that, according to The Leuthold Group, "benefit from rising inflation". Details about its construction, and a chart comparing it to the S&P 500, can be found in the appendix at the end of this report.

Once again we used a 1-week average to smooth out the day-to-day fluctuations in price, and a 2-month average for a benchmark to measure the movements in the shorter moving average against. We selected the 2-month time frame for the longer moving average for the same reason we did in crude oil: to align our benchmark with the 2-month lag in the TIPS payout of CPI-nsa.

A widening (inflationary) bias is signaled when the 1-week moving average moves **above** the 2-month moving average. A tightening bias is signaled when the 1-week moves **below** the 2-month.

The Yield Curve

We used the 10-year/3-month yield curve for our model because it's the same one used by the index of Leading Economic Indicators (LEI). This is the yield curve that is supposed to lead economic activity. To remain consistent with the other "inflation measures", first we smoothed the smoothed the data with a 1-week moving average, and then measured it against a 2-month moving average.

A widening (inflationary) bias is signaled when the 1-week moving average moves **above** the 2-month moving average. A tightening bias is signaled when the 1-week moves **below** the 2-month.

Putting The Model Together

Regular readers of our research will notice that the methodology used for generating signals for this model is nearly identical to that used in the [Corporate Spread Model](#).

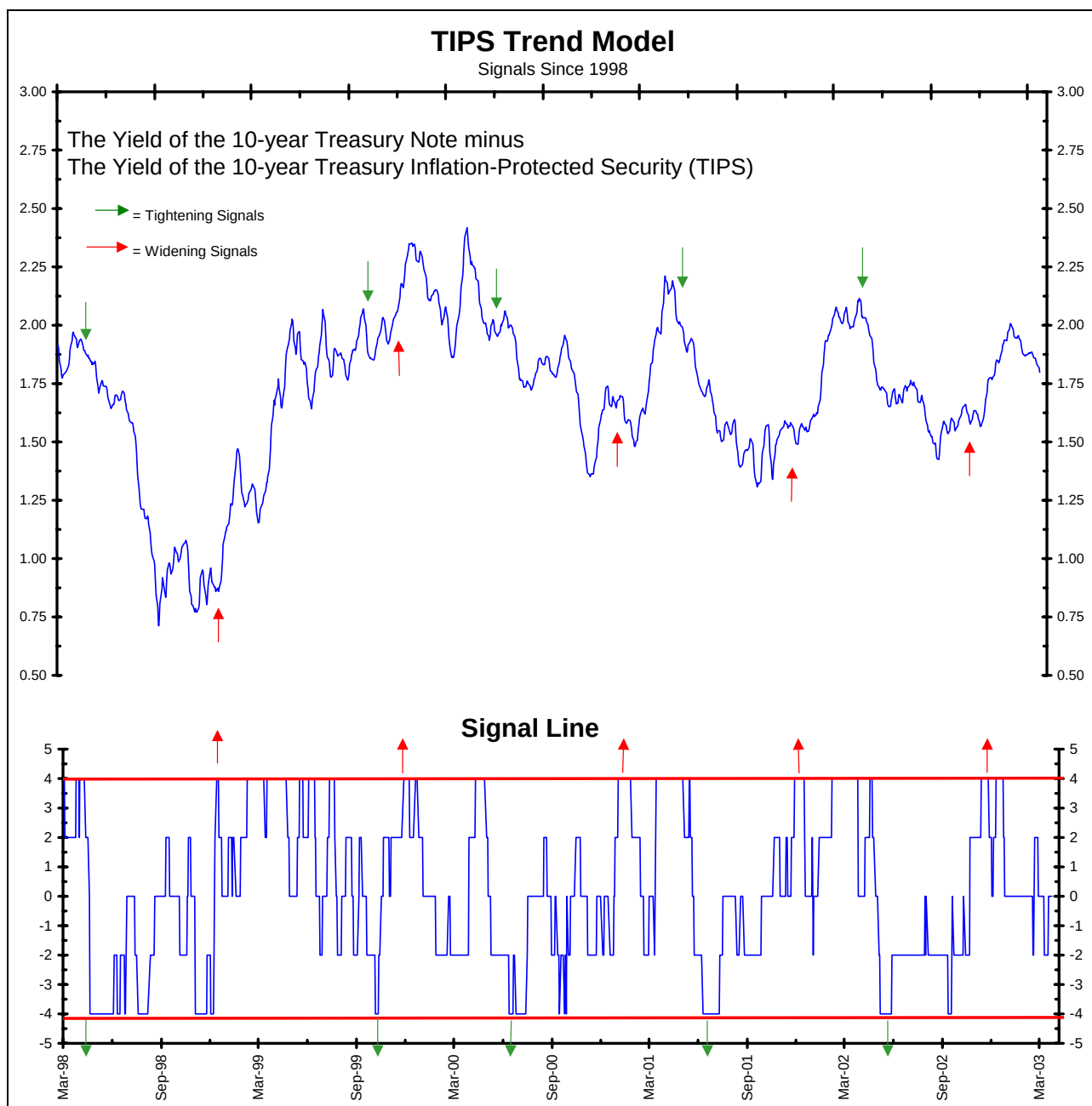
For each of the four components we assign a "+1" when the indicator is signaling a widening trend and a "-1" if it's signaling a tightening trend. There is no neutral signal — it is either one or the other, depending on the 1-week moving average of that particular component's position relative to its longer moving average.

The chart on the next page shows the results of this model. The top panel shows the breakeven inflation rate. The bottom panel shows the model's signals. The widening signals are highlighted with red arrows pointing up when the bottom panel hits +4 (meaning all four of the components discussed above are signaling a widening). The tightening signals are highlighted with green arrows pointing down when

the bottom panel hits -4 (meaning all four components are signaling a tightening).

Like the individual components themselves, this model is always "in the market" as it moves from

signaling a widening trend (when it reaches $+4$) to signaling a tightening trend (when it reaches -4).



We show the last five plus years in the chart above – the entire history of the 10-year TIPS. Close inspection of the chart shows signals have been successful at defining the trend during both widening and tightening periods.

The table on the next page shows the results of following this model back to January 2, 1998. The highlights of the table are as follows:

- 73% of all signals were profitable.
- The model yielded +314 bps since 1998 versus -9 bps using a buy and hold strategy.
- The tightening and widening signals have been equally successful: +152 bps during

widening trend, +163 during tightening trends.

- Profitable signals were in the market almost twice as long as unprofitable signals.

All Signals Back To March 30, 1998

Through April 21, 2003

Summary Statistics	Widening	Tightening	Combined
Number of Signals	6	6	12
Number of Winning Signals	3	5	8
Percentage of Winning Signals	60%	83%	73%
Number of Losing Signals	2	1	3
Percentage of Losing Signals	40%	17%	27%
Average Profitable Signal Length (days)	135	128	131
Average Unprofitable Signal Length (days)	90	38	72
Biggest Win (bps)	79	81	81
Biggest Loss (bps)	6	20	20
Cumulative Gains (bps)	145	163	308

Conclusion

When we put this model together we asked ourselves the question, "What factors do managers look at when investing in TIPS?" We initially considered a dozen factors including:

- 10-year Treasury yields
- the yield curve
- the level of the spread itself
- the CRB Index, (an index of 17 commodity futures prices)
- the price of crude oil
- the S&P 500
- the Volatility Index (VIX)
- inflation-sensitive stocks
- the MOVE Index (a volatility index of the bond market)
- CPI-nsa momentum
- ECRI (Economic Cycle Research Index) Leading Inflation Index
- Non-Seasonally Adjusted CPI – All Urban Consumers

After testing these indicators individually and in combination with each other, we found that most did not work as trend indicators of the breakeven spread.

However, four of these indicators did work:

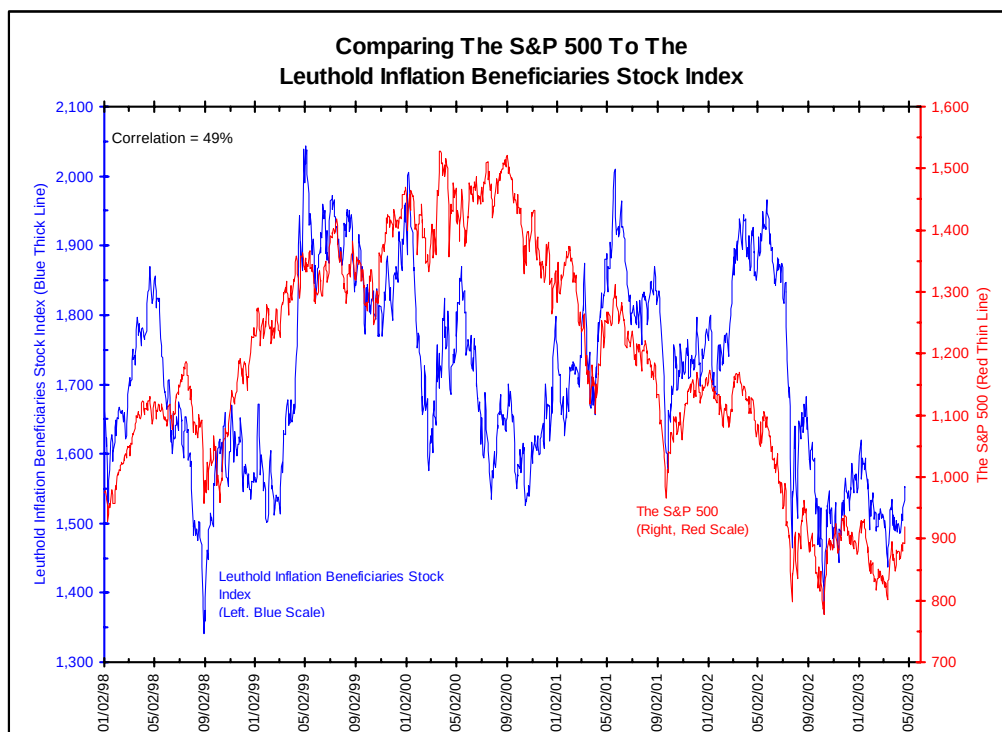
- the level of the spread itself
- crude oil
- inflation-sensitive stocks
- the yield curve

And interestingly, these four worked better in concert with one another than they did individually. For example, the yield curve component avoided some unprofitable signals by not allowing the model to go into a widening signal during the February to December 2000 period when the curve was inverted.

Once we settled on this group of factors that worked well, we then tried to put them together in such a way that would produce an objective conclusion regarding the spread's direction that was free from emotion and other extraneous factors. We chose time frames that are consistent with either a money manager's focus on quarterly performance or the time lag (two months) associated with the reporting of Leading Economic Indicators.

The result is an objective methodology to determine the major trend in the 10-year TIPS Inflation Breakeven Rate.

Appendix



Inflation Beneficiaries				Beta: 0.54		ROE: 2.2				
	3/31	Mcap	Mar	YTD	RS	Est LT	Est		Leut	
	Ticker	Price	(Bil)	Perf	Perf	Rank	Grow	P/E	P/S	Wgt
Large Cap										
ALCOA	AA	19	\$ 16.4	-5%	-15%	17	10%	11	0.8	3.0
BARRICK GLD	ABX	16	\$ 8.4	-3%	1%	48	10%	47	4.3	3.0
CHEVRONTEX	CVX	65	\$ 69.1	1%	-3%	31	6%	14	0.8	5.0
DOW CHEMICAL	DOW	28	\$ 25.2	1%	-7%	40	9%	11	0.9	4.0
EXXON MOBIL	XOM	35	\$ 234.2	3%	0%	52	9%	18	1.4	5.0
NEWMONT MNG	NEM	26	\$ 9.2	-4%	-10%	48	20%	28	4.0	3.0
SUNCOR ENERGY	SU	17	\$ 7.8	-4%	11%	72	19%	14	2.5	3.0
WEYERHRSR	WY	48	\$ 10.5	-4%	-3%	42	7%	12	0.6	3.0
Averages				-2%	-3%	44	11%	19	1.9	
Mid Cap										
FREEPRT MCM	FCX	17	\$ 2.5	0%	2%	74	20%	10	1.3	1.5
GRG-PAC GRP	GP	14	\$ 3.5	-7%	-14%	17	6%	6	0.1	2.0
INCO LTD	N	19	\$ 3.4	-13%	-12%	50	22%	11	1.6	2.0
MURPHY OIL	MUR	44	\$ 4.0	3%	3%	70	18%	14	1.0	2.0
NOBLE AFFIL	NBL	34	\$ 2.0	-3%	-9%	48	11%	34	1.4	1.5
PHELPS DODG	PD	32	\$ 2.9	-10%	3%	59	NA	14	0.8	2.0
PLACER DOME	PDG	10	\$ 3.9	0%	-15%	38	6%	20	3.2	2.0
PLUM CREEK	PCL	22	\$ 4.0	-1%	-9%	28	5%	16	3.5	2.0
UNOCAL CORP	UCL	26	\$ 6.8	0%	-14%	19	6%	17	1.3	2.0
Averages				-3%	-7%	45	12%	16	1.6	
Small Cap										
AGNICO EAGL	AEM	13	\$ 1.1	-5%	-12%	36	13%	31	10.1	1.0
BOISE CASCD	BCC	22	\$ 1.3	-9%	-13%	19	7%	12	0.2	1.0
CLEV-CLIFFS	CLF	19	\$ 0.2	-12%	-6%	25	NA	6	0.3	0.2
GRT NO IRON	GNI	70	\$ 0.1	2%	11%	82	NA	NA	10.9	0.1
HECLA MIN	HL	3	\$ 0.4	-13%	-35%	45	0%	9	3.4	0.2
RAYONIER	RYN	44	\$ 1.2	4%	-3%	51	11%	16	1.1	1.0
TERRA IND	TRA	1	\$ 0.1	16%	-11%	NA	0%	19	0.1	0.1
Averages				-3%	-10%	43	6%	16	3.7	
Inflation Beneficiaries Averages						44	10%	17	2.3	
Leuthold Weighted Performance										
Inflation Beneficiaries				Mar	YTD	2002	2001	2000	1999	
				-2%	-5%	0%	-5%	-5%	33%	
Comparator Performance										
				Mar	YTD	2002	2001	2000	1999	
S&P 500 Index				1%	-4%	-23%	-13%	-10%	20%	
S&P Mid Cap				1%	-5%	-15%	-2%	16%	13%	
S&P Small Cap				1%	-6%	-15%	6%	11%	12%	

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