

## Introduction

The US Federal Reserve lived up to market expectations when it recently divulged its widely anticipated second round of Quantitative Easing (QE2 plan). At the November 3, 2010 meeting, the Federal Open Market Committee formally announced it would purchase an additional USD600bln in US Treasuries by the end of the second quarter 2011, for a total of USD850-900bln, including the reinvestment of principal payments from their mortgage portfolio. For the first time, the Fed explicitly indicated its focus will be on the intermediate portion of the curve, meaning the 7- to 10-year sector. The Fed notably commented that it would remain open to adjusting the size of the program as economic conditions evolve.

In the aftermath of the announcement, the yield curve steepened as long-end Treasuries sold off, particularly the spread between 10-year and 30-year bonds. (Planned purchases will actually be lower in the long-end compared to what the Fed has done in the past.)

With the Fed continuing to keep its foot firmly placed on the stimulus pedal, stocks have performed well along with other risk assets like inflation-linked bonds (ILBs), commodities, and emerging currencies. But have stocks always performed well in such an environment? Which sectors and industries have benefitted? In this paper we identify a handful of past periods where there was a similar steepening of the long-end of the yield curve, and examine how various equity segments performed.

## Steep Curve Regimes

The slope of the yield curve is analyzed by looking at the difference between two US Treasury yields at any point on the curve. In a steep curve environment, this difference will be more pronounced as yields increase in the back end of the curve (relative to shorter maturities).

The interest rate on a long-term bond will equal the average of the short-term interest rates expected to prevail over the life of the bond, plus a term premium. In periods of uncertainty, this premium tends to be larger as investors demand additional compensation for risk-taking. (Capital losses are possible because a given change in interest rates would provoke a bigger change in the price of longer-term bonds compared to short-term bonds.) In the past, yields have generally steepened in the periods following recessions as uncertainty lingers.

Exhibit 1 compares intermediate (10-year) sector yields to long-end (30-year) sector yields. The data we use are monthly yields available from January 1980 to November 2010<sup>1</sup> in the Federal Reserve Statistics database.<sup>2</sup> The three most extreme periods of curve steepness historically are highlighted in Exhibit 1. These periods are: (1) Jul-92 to Jul-93; (2) Jun-02 to Nov-04, and (3) Feb-09 to Nov-10<sup>3</sup>. For the remainder of this Research Bulletin, we label them Regimes 1, 2, and 3, correspondingly.

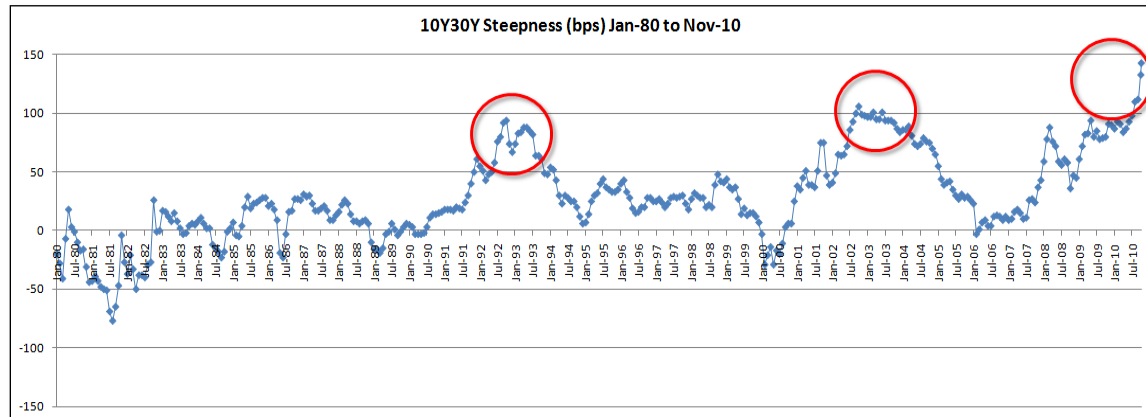
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<sup>1</sup> Plus weekly data through November 5, 2010.

<sup>2</sup> During the period spanning Mar02-Jan06, no monthly 30-year yield data were available. As such, 20-year monthly yield data were substituted from the same Federal Reserve Statistics database.

<sup>3</sup> Thresholds for the regimes are defined by taking the average spread between yields over the period of study and calculating the standard deviation. Positive divergences in excess of the standard deviation when added to the average are highlighted in red in Exhibit 1, indicating periods where the difference between 2Y10Y, 2Y30Y, 7Y30Y and 10Y30Y spreads exceeded this sum.

**Exhibit 1: Changes in 10-year versus 30-year Spread (January 1980 to November 2010)**



The Regime 1 steep curve environment (July 1992 to July 1993) followed what was then the slowest post-recession recovery since WWII. The level of GDP did not revert to its pre-recession level until the third quarter of 1992 (rising from 1.5% during the second quarter of 1992 to 3.4%) as industrial production, employment, retail sales, M1 and M2<sup>4</sup> were all tilting lower in the second half of 1992. Hence, an easy monetary policy was extended to July 1993 when the FOMC explicitly stated that the next policy step would be in the direction of firming rather than easing. At that time, the curve began to flatten.

The Regime 2 steep curve environment was the longest in duration (June 2002 to November 2004). At the start of the period, the uncertainty following the 9/11 attacks exacerbated existing weak spots. Risks to near-term profit and investment, restraints on household spending given a backup in rates, and the wide-spread price deflation that had occurred over the previous two years followed the bursting of the dot-com bubble. During this recession the Fed cut benchmark rates eight times to 2% (discount rate to 1.5%) hoping to boost consumer confidence and the economy<sup>5</sup>.

The present Regime 3 steep curve environment differs from Regimes 1 and 2. Typically, when the FOMC targets Fed Funds (and if the market expects this target to stay low), longer-term rates should decline accordingly. However, with the Fed Funds rate presently trading near 0%, it is essentially impossible to lower rates without purchasing assets. The present regime's Quantitative Easing methodology is designed to keep rates low to stimulate the economy when risk premia tend to keep these levels high. The Fed first purchased Agency Mortgage-Backed Securities to smooth the housing crisis (QE1)<sup>6</sup> in 2009 and is presently targeting intermediate (less than 10-year) Treasury securities (QE2). The Fed's announced purchase of the intermediate portion of the curve ran contrary to the market's initial expectation of longer-dated purchases, resulting in a rally in intermediates and a sell-off in the long end.

In periods of steep yield curves, yields of shorter maturity securities are significantly lower than those yields further out on the curve as the Fed attempts to induce economic activity. This leads

<sup>4</sup> The early 90s recession period spanned Jul-90 to Mar-91. The de-emphasis of M2 and monetary targets to be used as operational objectives (the relationship between money growth and inflation was determined to be more important in the long-term versus the short-term) defined this recovery period.

<sup>5</sup> The first recession of the new millennium spanned Mar-01 to Nov-01. The notable addition of forward-looking language was used by then chairman Greenspan on August 12, 2003 indicating easy policy would be maintained for a "considerable period".

<sup>6</sup> The most recent recession began in Dec-07 and officially ended in Jun-09. The Treasury bought approximately USD220bln in Agency Mortgage-Backed Securities during 2009 in an effort to keep longer-term rates low in the wake of the housing crisis.

to a higher inflation expectation, which in turn causes longer-dated yields to rise. Inflation-sensitive instruments (i.e., Treasury Inflation-Protected Securities) and industries (i.e., Gold and Commodities) increase in value, as shown below in Exhibit 2.

### Equity Sector Performance During Steep Curve Regimes

Turning to the performance of equity sectors, we look next at the industry factor returns of the Barra US Equity Model (USE3).<sup>7</sup> Note: The industry returns are mapped to thirteen Barra sectors; the sector returns are formed by equally weighting the industries within each sector. Exhibit 2 compares the returns of the thirteen sectors across the three regimes to the average return of the entire period under study (January 1980 to November 2010). Three sectors highlighted below (Basic Materials, Energy, and Telecommunications) exhibited the strongest performance, averaged across all three regimes compared to the entire period's average return.

**Exhibit 2: Average Sector Returns Comparison (Annualized Return)**

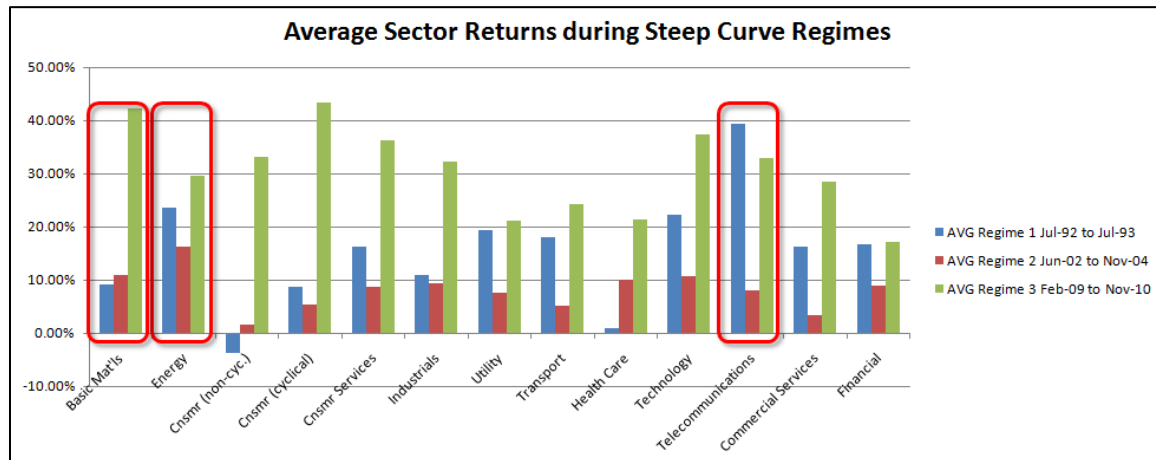
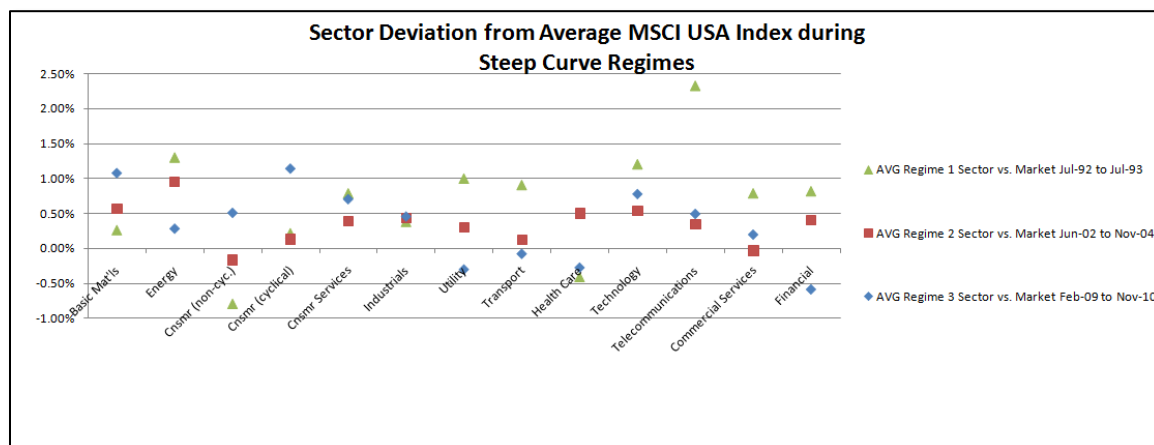


Exhibit 3 plots the differences between the sector returns (averaged across each regime) and the average market return, represented by the MSCI USA Index.<sup>8</sup> Here we see a limited number of sectors underperformed the market: Consumer (non-cyclical), Utility, Transport, Health Care, Commercial Services, and Financial.

<sup>7</sup> Barra industry factor returns are used rather than MSCI industry returns as their history extends back to 1972. For sector returns, equally weighted industry factors are applied in each group.

<sup>8</sup> Again, we note that these sector returns are constructed from industry returns (as opposed to market-cap weighted sector returns). We use this methodology because of the longer history associated with industry returns.

**Exhibit 3: Sector Return Outperformance/Underperformance versus the MSCI USA Index**



**Equity Industry Performance During Steep Curve Regimes**

Next we drill down to the industry level. There are fifty-five industry factors in the Barra USE3 model. Exhibit 4 shows the top performing industries within the top sectors. To identify the top performers, we break the sector returns into quartiles for each period. The top sectors are those that rank in the 3<sup>rd</sup> or 4<sup>th</sup> quartile in at least two regimes. The top industries are those that rank in the 3<sup>rd</sup> or 4<sup>th</sup> quartile in all three regimes.<sup>9</sup> As highlighted in Exhibit 4 below, Technology and Gold appear in the 4<sup>th</sup> quartiles during all three of the steep curve regimes.

**Exhibit 4: Top Performing Sectors and Industries across Steep Curve Regimes**

TOP PERFORMING SECTORS IN MULTIPLE REGIMES	TOP PERFORMING INDUSTRIES IN MULTIPLE REGIMES	QUARTILE	REGIME	QUARTILE	REGIME	QUARTILE	REGIME
Basic Mat'ls		QUARTILE 4	R3	QUARTILE 4	R2	QUARTILE 2	R1
	Gold	QUARTILE 4	R3	QUARTILE 4	R2	QUARTILE 4	R1
Energy		QUARTILE 2	R3	QUARTILE 4	R2	QUARTILE 4	R1
	Oil Refining	QUARTILE 4	R3	QUARTILE 4	R2	QUARTILE 3	R1
Cnsmr Services		QUARTILE 4	R3	QUARTILE 3	R2	QUARTILE 2	R1
	Entertainment	QUARTILE 4	R3	QUARTILE 4	R2	QUARTILE 3	R1
	Hotels	QUARTILE 3	R3	QUARTILE 4	R2	QUARTILE 4	R1
Industrials		QUARTILE 3	R3	QUARTILE 3	R2	QUARTILE 2	R1
	Heavy Electrical Equip	QUARTILE 3	R3	QUARTILE 3	R2	QUARTILE 3	R1
	Heavy Machinery	QUARTILE 3	R3	QUARTILE 4	R2	QUARTILE 4	R1
Technology		QUARTILE 4	R3	QUARTILE 4	R2	QUARTILE 4	R1
	Electronic Equipment	QUARTILE 3	R3	QUARTILE 3	R2	QUARTILE 4	R1

\*No data available for Internet, Equity Real Estate Trust and Biotechnology sectors during Regime 1 (Jul-92 to Jul-93).

<sup>9</sup> Railroads were the only top-performing industry omitted because the respective sector, Transport, did not outperform according to this criteria.

In Exhibit 5, we summarize all the relative performance rankings by showing how many sectors/industries outperformed or underperformed in the three regimes. The column to the right specifies which sectors/industries were included in the study.

**Exhibit 5: Summary of Relative Sector/Industry Performance During Steep Curve Regimes**

RELATIVE SECTOR/INDUSTRY PERFORMANCE DURING STEEP CURVE REGIMES	COUNT	PCT	OUTPERFORMING/UNDERPERFORMING SECTORS/INDUSTRIES
<b>SECTOR LEVEL</b>			
SECTOR OUTPERFORMING IN ALL 3 REGIMES	1	7.69%	Technology
SECTOR OUTPERFORMING IN 2 REGIMES	6	46.15%	Consumer Services, Industrials, Telecommunications, Financial
SECTOR UNDERPERFORMING IN ALL 3 REGIMES	0	0.00%	
SECTOR UNDERPERFORMING IN 2 REGIMES	6	46.15%	Consumer (Non-Cyc), Consumer (cyclical), Utility, Transport, Health Care, Commercial Services
<b>INDUSTRY LEVEL</b>			
INDUSTRY OUTPERFORMING IN ALL 3 REGIMES	8	14.29%	Electronic Equipment, Entertainment, Gold, Heavy Electrical Equipment, Heavy Machinery, Hotels, Oil Refining, Railroads
INDUSTRY OUTPERFORMING IN 2 REGIMES	15	26.79%	Apparel & Textiles, Chemicals, Computer Hardware & Business Machines, Computer Software, Consumer Durables, Energy Reserves, Gas & Water Utilities, Industrial Parts, Internet, Media, Oil Services, Securities & Asset Management, Semiconductors, Telephone, Wireless Telecommunications
INDUSTRY UNDERPERFORMING IN ALL 3 REGIMES	5	8.93%	Alcohol, Electrical Utility, Environmental Services, Grocery Stores, Publishing
INDUSTRY UNDERPERFORMING IN 2 REGIMES	28	50.00%	Airlines, Banks, Biotechnology, Clothing Stores, Construction & Real Property, Defense & Aerospace, Department Stores, Drugs, Equity REITs, Financial Services, Food & Beverages, Forestry & Paper, Home Products, Industrial Services, Information Services, Leisure, Life & Health Services, Medical Products & Supplies, Medical Services, Mining & Metals, Motor Vehicles & Parts, Property & Casualty Insurance, Restaurants, Specialty Retail, Thrifts, Tobacco, Trucking, Sea & Air Freight, Wireless Telecommunications

Which industries underperformed in historical periods of curve steepening? There were five industries that fell in the 1<sup>st</sup> and 2<sup>nd</sup> (median) quartiles during all three steep curve environments. This list includes Alcohol, Electrical Utilities, Environmental Services, Grocery Stores, and Publishing.

**Conclusion**

The Fed announced on November 3, 2010 that it would be implementing asset purchases (QE2) by buying (intermediate) US Treasury bonds in the 7- to10-year portion of the curve. Immediately following the announcement, there was a sell-off in longer-dated (10-years+) Treasuries. Given this recent episode of curve-steepening, we looked at similar periods to see which equity segments have historically done well. We identified three steep curve environments since January 1980 and found that the Technology sector and Gold industry have historically performed the strongest on a relative basis during these periods, while Alcohol, Electric Utilities, Environmental Services, Grocery Stores, and Publishing have historically performed the weakest.

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