

## Quantifying Uncertainty

**The Fog:** A structural rise in economic policy uncertainty is quantified using an indicator constructed from a Google News Search, expiring US federal tax provisions, and dispersion readings for federal spending and CPI from the Philadelphia Survey of Professional Forecasters. Furthermore, there is evidence of higher equity volatility once there is certainty around the eventual winner of the US presidential election, as attention shifts towards the likely policies enacted during the first term.

**Trade Recommendations:** Targeting 1338 and then 1287 on the SP500. Reload equity shorts via options.

### ECONOMIC UNCERTAINTY

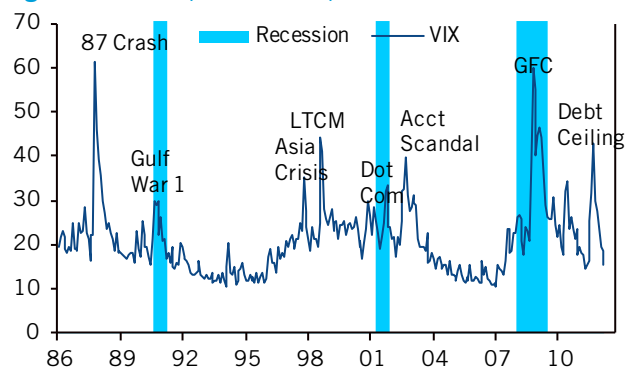
“Although our intellect always longs for clarity and certainty, our nature often finds uncertainty fascinating”

– Karl Von Clausewitz

Uncertainty is a word that is used a lot these days. What is it? Can it be quantified? Why is it bad? Is it likely to rise into the US presidential election? Although they overlap, uncertainties are broken down into three categories: economic, policy-related, and election-related.

Economic uncertainty depresses economic growth and financial markets. There is a cyclical element — it rises with recession and declines during recoveries. Uncertainty is also tied to major events like the Gulf Wars, 9-11, and most recently the Great Financial Crisis. Spikes in the VIX, a measure of fear, coincides with the cyclical and event-driven uncertainties.

**Figure 1 VIX, Recessions, and Events**



Source: Bloomberg

### ECONOMIC POLICY UNCERTAINTY

Spikes in financial market volatility are shocks that invite chaotic deleveraging, causing sharp re-pricing of risk premia. Economic Policy Uncertainty is something a little different as it relates specifically to:

- Monetary Policy – uncertainties about the path of interest rates, the zero-rate bound, effectiveness of extraordinary policy and their unintended consequences for growth and inflation.
- Fiscal Policy – uncertainties about future taxes, spending, regulations, health care reform, and more generally future policies to tackle the fiscal deficit.

An excellent paper, [Measuring Economic Policy Uncertainty](#), written by Scott R. Baker, Nicholas Bloom, and Steven J Davis offers an index for tracking economic policy uncertainty through time. The subcomponents of the index include the following:

1. Newspaper coverage of policy-related economic uncertainty;
2. Number of federal tax code provisions set to expire;
3. Disagreement among economic forecasters on future levels of CPI; and
4. Disagreement among economic forecasters on federal government purchases of goods and services.

The weights of the index are 50% on the broad newspaper index and 50% for the three other components.

The authors find three preliminary results:

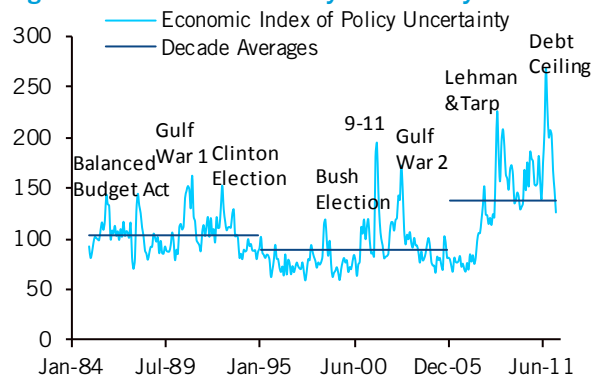
- Policy uncertainty fluctuates over time and since 2008 has reached all-time levels
- Policy uncertainty is now large (and probably the largest) driver of overall economic uncertainty

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- Policy uncertainty appears to lower economic growth and raise stock market volatility.

Figure 2 shows the path of the EPU Index through time and the decade averages. The 2006–12 average is 54% higher than in the previous decade. Indeed, for most of 2008–12 the index is above that average, refusing to normalize back to previous ranges.

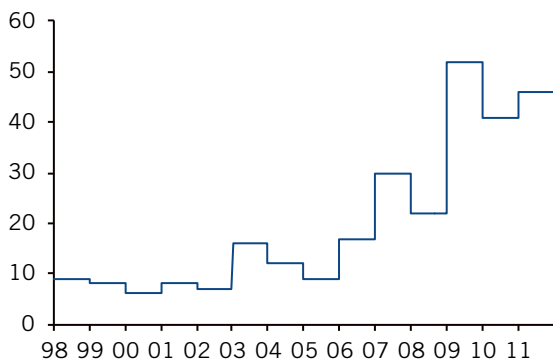
**Figure 2 Economic Policy Uncertainty Index**



Source: Baker, Bloom, Davis; Joint Committee on Taxation; Google News; Philadelphia Survey of Professional Forecasters

The tax expiration index subcomponent is derived from the tax expirations from the Joint Committee on Taxation. Each year's forecast is a 10-year horizon of expiring tax laws. Future expirations weighted by  $0.5^{((T+1)/12)}$  where T is the number of months until the tax expires.

**Figure 3 Tax Expiration Index**



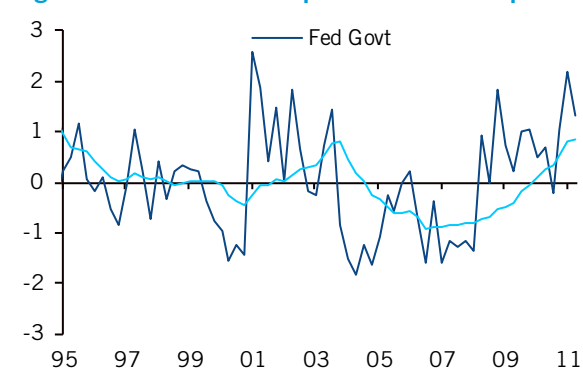
Source: Baker, Bloom, Davis; Joint Committee on Taxation

According to the authors, “Temporary tax code provisions are a source of uncertainty for businesses and households because Congress often extends them at the last minute, undermining stability in and certainty about the tax code.” An example is the Bush-era tax cuts that were scheduled to expire at the end of 2010. Democrats and Republicans debated on what to do, and then at the last minute extended them to 2012. It sounds as if uncertainty about future tax rates is not going away. On a medium-term basis, the temporary nature of tax codes makes for murkier outlooks for federal spending, borrowing, and tax revenue projections. The CBO produces both a “baseline” and an “alternative” scenario. Which is more likely? The baseline is based on

current law, projecting a massive fiscal drag of 3.5% of GDP in 2013. But might politicians extend the Bush-era tax cuts once again? If not extend, then modify?

The subcomponent for government purchases is constructed from the Philadelphia Fed Survey of Professional Forecasters. It is the interquartile range from the dispersion time series. The authors calculate it from levels rather than the changes shown below.

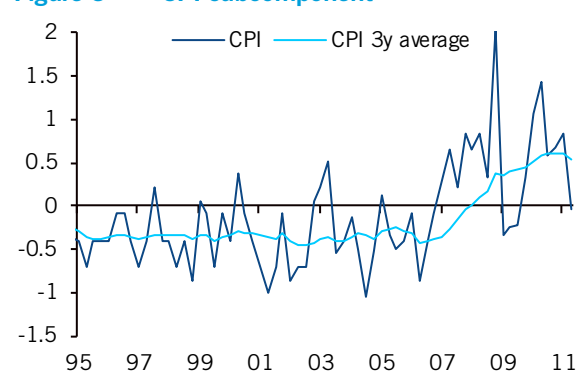
**Figure 4 Government purchases subcomponent**



Source: Philadelphia Survey of Professional Forecasters

The CPI subcomponent is the interquartile range. It is the most volatile of the components but is trending higher over time. That may reflect the volatility of energy and food prices. But uncertainty related to Fed policy, in particular the tail risks associated with the zero-rate bound and QE, are likely important factors. Uncertainty around commodities and monetary policy are likely to remain elevated for the foreseeable future. For the Fed there is little history in which to assess the risks of their strategy. Consequently, uncertainty is higher around monetary policy, growth and inflation outcomes are structurally higher.

**Figure 5 CPI subcomponent**



Source: Philadelphia Survey of Professional Forecasters

## UNCERTAINTY AND THE REAL ECONOMY

How does economic uncertainty impact the real economy? The authors note the economic literature is focused on three channels:

- “Real-options effects”: Uncertainty can make firms cautious about hiring and investing
- “Financing costs”: Uncertainty can increase risk premia
- “Precautionary savings”: Uncertainty can reduce consumption

In *Policy Uncertainty and Private Investment* (1991), Dani Rodrik says policy uncertainty is like a tax on investment and may cause firms to forego investment until that uncertainty is resolved.

Kevin A. Hassett and Gilbert E. Metcalf, *Investment with Uncertain Tax Policy*, (1999) examine how companies exploit the randomness of tax credits to time their investments. “Uncertainty about tax rates raises the value of waiting to invest” say Baker, Bloom and Davis. They “estimate the dynamic response to policy-related uncertainty shocks on economic activity in a simple vector autoregressive (VAR) models.” They estimate that “increase in policy uncertainty equivalent to the actual increase from 2006 to 2011 is followed by 2.2% decline in real GDP, a 13% drop in private sector investment and an employment drop of around 2.5 million persons.”

### PROPORTION OF TOTAL ECONOMIC UNCERTAINTY

The authors analyse what proportion of total economic uncertainty is explained by policy uncertainty. Using Google News, they search for articles to create two indices. The total economic uncertainty uses general terms of “uncertain” or “uncertainty” and “economic” or “economy.” Policy uncertainty also includes articles that contain one or more of the following terms: “policy”, “tax”, “spending”, “regulation”, “federal reserve”, “budget”, or “deficit.” Each index is scaled by a search for “today” to account for the growth in total articles through time.

Total economic uncertainty was much lower in the 1990s, before 9-11. During the 1990s, policy uncertainty accounted for a relatively small proportion of overall uncertainty. Since 2001, policymaker uncertainty accounted for a much larger 60% of total uncertainty. Incredibly the share increased to 77% in 2010–11.

**Figure 6 Ratio to total uncertainty**

Jan85-Jun90	Mid80s-Gulf War	64%
July90-Dec91	Gulf War 1	27%
Jan92-Aug01	1990's Boom to 9-11	42%
Sep01-June07	9-11 and 2000's boom	56%
July07-Aug08	Beginning of Credit Crunch	61%
Sep08-Dec09	Lehman to "recovery" start	56%
Jan10-Aug11	"recovery" onwards	77%
Jan85-Aug11	Overall Average	55%

Source: Baker, Bloom, Davis

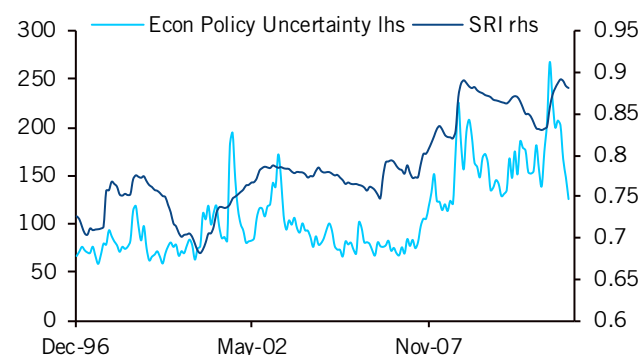
### THE LINK TO THE SYSTEMIC RISK INDEX

The Systemic Risk Index (SRI) measures the fragility of the global equity market. It is calculated by measuring the proportion of variation in industry returns that is explained by a fixed number of factors (PCA). This measure is called the absorption ratio. High levels of Systemic Risk indicate that unexpected shocks are likely to propagate quickly and broadly through the markets, potentially leading significant, soul-destroying market events. Low levels of Systemic Risk indicate that markets are loosely linked and may be more robust to shocks.

The Economic Policy Uncertainty Index (EPU) and SRI have very different constructions, but the 1996–2012 level-based correlation is 76%. The major difference is the volatility: EPU is 16.9 times more volatile. Both indices are structurally rising, but marginally eased in 2012.

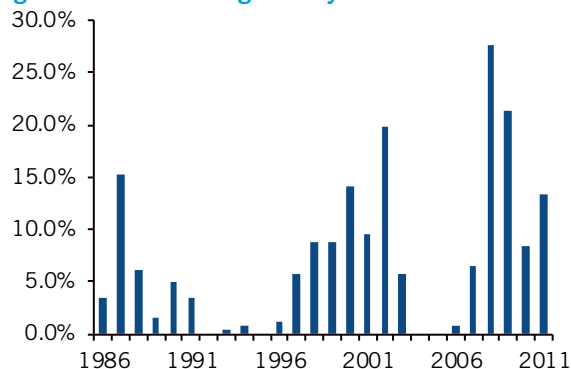
The attractiveness of the PCA-based approach is that it offers a warning of high Systemic Risk without precisely knowing the drivers. Nevertheless, the link is suggestive. Intuitively, markets that are more policy driven are more arbitrary than in the past. The uncertainty around tax, spending, regulation, and monetary policy is perhaps combining to increase Systemic Risk for financial markets.

**Figure 7 Correlation to Systemic Risk Index**



Source: State Street Global Markets; Baker, Bloom, Davis

An ex-post measure of market fragility is the percentage of days during a given year where the SP500 change exceeds 2%. It rises and falls with recessions as well as events like the 1987 crash. Then there are periods of relative calm during recoveries — 1992–96 and 2004–07 — where in some years there are no daily moves in excess of 2%. Those periods coincide with relative calm in the Economic Policy Uncertainty Index and the SRI. This recovery is very different. In 2011, 13.4% of days saw close to close moves in excess of 2.0%, very unusual for the US economy in the second year of recovery. Yet, it is consistent with high readings for systemic risk and economic policy uncertainty. 2012 has begun in a calm manner. So far there are no 2% days. Mr Risk believes it will not last. Think eye of the storm!

**Figure 8 Percentage of days with > 2.0% for SP500**

Source: Bloomberg

**POLITICS, EQUITIES, GDP, AND INFLATION**

Does it matter for markets which party wins the US presidential election? According to rational partisan theory, Democratic voters are more supportive of growth. Republican voters prefer anti-inflation policies. The data is supportive. Equity returns and GDP growth is higher under Democrats. Inflation is lower under the Republicans.

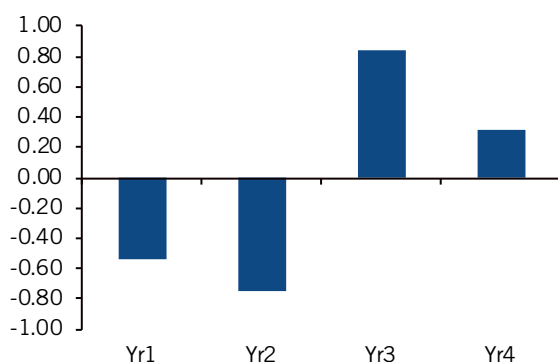
**Figure 9 Outcomes by political party (annualized)**

Party	SP500	GDP	CPI
GOP	4.67	2.71	3.90
DEM x-Obama	9.92	4.07	4.01

Source: Bloomberg

Note: Data shown is for 1952 through 2008

There is evidence supporting political business cycles. GDP growth rates increase relative to the previous years in the 3<sup>rd</sup> and 4<sup>th</sup> year of the presidential cycle but decline in years 1 and 2. The data is from 1952-2011.

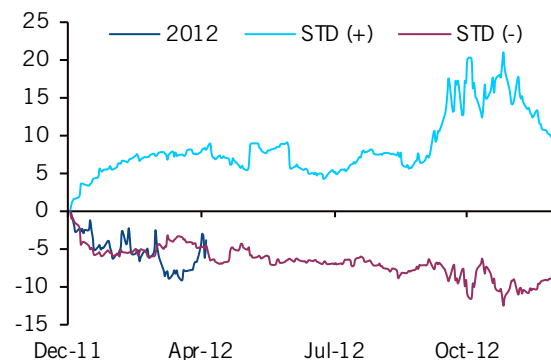
**Figure 10 GDP % change by presidential year**

Source: Bloomberg

Note: Data shown is for 1952 through 2011

**SP500 VOLATILITY IN AN ELECTION YEAR**

US equity volatility (1m realized until 1988 and then VIX thereafter) tends to trough toward midyear, rise into the November election and then fall in Q4 (1948-2008). The VIX in 2012 is tracking one standard deviation below the average.

**Figure 11 VIX versus 1 sigma bands (1948-2012)**

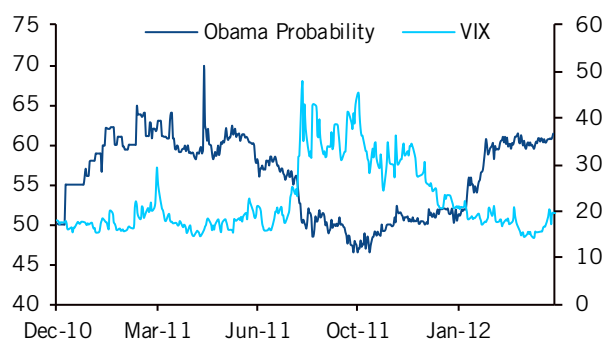
Source: Bloomberg

Li and Born (2006) in *Presidential Election Uncertainty and Common Stock Returns in the United States* show that stock prices and market volatility increase when neither candidate has a dominant lead in the polls. That is somewhat counterintuitive given the well-known negative correlation between volatility and stock prices. But apparently both can go up in an election year.

Goodell and Vahamaa (2012) in *U.S. Presidential Elections and Implied Volatility: The Role of Political Uncertainty* build a model to explain changes in stock market volatility. The Iowa Electronic Markets (IEM) is used to create a variable called PROBWIN. It is the one-month change in the probability of winning for the eventual successful candidate. Another variable is called ELECUN, which measures election uncertainty. It equals one unless one of the candidates is certain to win (PROBWIN=1). They add in other variables to strip out the impact of changing macro conditions, a key driver of volatility.

What is fascinating about the results is that as the probability increases for the eventual winner implied volatility goes higher. Although the uncertainty about the winner is resolved, the angst over what the new Administration might do begins.

The probability of Obama winning is 61%, according to Intrade.com. The probability is negatively correlated to the VIX. If the winner is positively correlated to the VIX, does this mean Romney wins? That is not the correct interpretation. The macro factors are dominant. The major risk to Obama is still the economy and financial markets. The probability of re-election is improving on the back of better data and a higher SP500. What does seem possible is that, as the election draws near, fears about 2013 policy could disrupt markets and drive volatility higher, in line with time-tested political business cycle. Yet, it is also possible that the spike in volatility and lower equity prices may offer a buying opportunity for the traditional Q4 rally.

**Figure 12 VIX versus Obama Probability of Win**

Source: Bloomberg, Intrade.com

What does the election mean for uncertainty and corporate investment? Two other papers look at this. Brandon Julio and Youngsung Yook, using data from 48 countries (1980-2005), show that corporate investment declines on average by 5% in years leading up to elections. See [Political Uncertainty and Corporate Investment Cycles](#) (2005). Art Durnev discovers that corporate investment sensitivity to their respective stock price is 40% lower in an election year relative to other years. See [The Real Effects of Political Uncertainty: Elections and Investment](#).

All of this rings a bell. Corporations are holding onto their cash, refusing to hire and invest. Uncertainty is why.

#### KEY TAKEAWAYS

- Economic uncertainty is trending higher
- Policy uncertainty share of total economic uncertainty is increasing
- Systemic risk remains high
- Equity volatility is determined not just by macro factors but also the election cycle.
- The political business cycle reminds us that the bad news is delivered in Y1 of the presidential cycle.
- Policy uncertainty is high. Following the election, there will be a debate about what to do with the expiring taxes as well as the largest issue of how the US addresses their longer-term fiscal problem.

#### PORTFOLIO

**Old Trades:** Selling Bunds was a nocturnal trade; it never saw daylight. To add insult to injury, it was stopped out on the high (140.56). Stand aside for now. If it reaches 142.80, Mr Risk will try again to sell this bad boy. On the brighter side, short USDJPY volatility is simply awesome. Another little piece of heaven is long ZARMXN. The VIX 25-30 call spread is set to expire tomorrow, worthless.

One of the frustrations is the failure of equity/FX volatility and skew to explode as European equity and credit risk premia increases. Based on the standardized shift in the

Systemic Risk Index (0.52) and the percentile rank of Turbulence (a measure of unusualness of volatility and correlation; 19%), the threat of a tail risk event is still low. Searching for an explanation, Mr Risk is latching onto the following:

- The economic data surprises are rolling over, but this was well flagged and an inevitable feature of the index construction.
- US/Global PMI and Global LEI diffusion indices are holding up.
- US banks are better capitalised and able to withstand the shock from Europe.
- China data — PMI, IP, loan growth are bottoming
- The low level of Turbulence says the correlation is moving in expected ways: in the down trade, there is movement toward defensives.
- The result is investor confidence is not shaken. Buying the dip rather than heading for the exit is the overwhelming sentiment.
- Low volatility and general decline in correlation means VaR metrics are not forcing deleveraging but allowing more liquidity to take advantage of the dip.

Nevertheless, Mr Risk continues to target 1338 and then 1287 on the SP500. The action plan is to cut short risk at the first target and build a long risk position on the way down to the second target, as long as our Tail Risk Indicator does not flash Alert, the highest warning sign. This occurs when the standardized shift of the Systemic Risk Index is greater than 1 and the 5y rolling window for Turbulence jumps above the 66 percentile.

**New Trades:** Shorts are rolling off this week. Therefore, Mr Risk reloads. Buy May SPY 135-130-125 ladder (0.61) to take advantage of skew. Also, Buy May VIX 25-30 call spread (0.63).

## Mr Risk's Portfolio

Strategy	Entry	Px	P&L	Target	Stop	RR Ratio	MAX Profit	MAX Loss
<b>RISK ON / Short Volatility</b>								
28/02/2012 Buy 3m USDJPY 80-82-84 call ladder	0.45	0.89	1,054,725	2.50	-3.80	-0.75	6,000,000	(10,200,000)
30/03/2012 Buy 1m USDJPY 82-80-77 put fly	0.46	1.67	2,914,348	2.50	-3.80	-0.75	6,000,000	(10,224,000)
12/04/2012 Buy 1m INRJPY 1.56-1.59 1x1.5 call	0.41	0.71	404,248	1.50	-0.25	9.38	2,000,000	(880,000)
12/04/2012 Sell 1m GBPSEK 10.85-11.10	0.6	0.30	996,439	0.00	1.80	0.00	2,000,000	(4,000,000)
<b>RISK OFF</b>								
28/02/2012 Buy 6m AUDJPY 75 Put / Sell 100 call	0.77	1.35	1,186,401	3.70	-0.21	3.00	6,000,000	(2,000,000)
10/04/2012 Buy 2wk AUDUSD 103-102-100.5 put fly	0.10	0.27	1,730,733	0.70	0.00	3.00	6,000,000	(1,000,000)
16/03/2012 Buy April SPY 135-130 Put Spread	0.61	0.42	(336,283)	4.00	0.00	3.00	6,000,000	(1,079,646)
10/04/2012 Buy April SPY 137-133-129 Put Spread	0.66	0.85	341,317	4.00	0.00	3.00	6,000,000	(1,185,629)
16/03/2012 Buy April VIX 25-30 Call Spread	0.75	0.00	(1,384,615)	4.00	0.00	3.00	6,000,000	(1,384,615)
16/03/2012 Buy 1y USDKRW 1200 Calls	3.95	3.67	(207,662)	12.00	1.27	3.00	6,000,000	(2,000,000)
<b>JGBs are not the new Subprime</b>								
09/03/2012 Sell JPY 5y5y 3.00 Payers	0.81	0.63	2,637,820	0.41	1.62	0.50	6,000,000	11,853,659
<b>Bonds in a range</b>								
27/01/2012 Buy 1y10y 2.50-2.25-1.75 Rec Ladder	0.43	0.65	705,930	1.90	-0.43	4.42	6,000,000	(2,715,789)
27/01/2012 Buy 2y10y - 1y10y 2.00 Rec Calendar	0.15	0.27	711,686	1.00	-0.15	6.67	6,000,000	(1,800,000)
12/04/2012 Buy TYM2 130-131-132-134	0.17	0.14	(187,500)	1.00	0.00	5.82	6,000,000	(1,031,250)
<b>Bonds Hammered</b>								
09/03/2012 USD 2-20y, 3y fwd	1.36	1.38	139,787	2.36	1.03	3.00	6,000,000	(2,000,000)
10/04/2012 Sell RXM2	139.56	140.56	(2,000,000)	136.56	140.56	3.00	6,000,000	(2,000,000)
12/04/2012 Buy RXM2 139-138.5-138 put ladder	0.04	0.01000	(187,500)	1.00	-0.25	3.00	6,000,000	(1,812,500)
<b>Correlation Trades</b>								
10/04/2012 Buy USDZAR 7.90-7.75 Put / Sell USDMXN 12.82 Put	0.12	0.53	1,110,160	2.36	-0.63	3.00	6,000,000	(2,000,000)

Closed Trades  
 Change to S/L or T/P

**Total at Risk** (35,459,771)  
**Closed Trades** 53,783,910  
**Open P&L** 9,630,034  
**Portfolio** 1,063,413,944  
**Portfolio Rtn** 6.34%

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