Getting real about risk and return

What failed, what worked, in crisis and beyond

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Executive Summary
Getting real about risk and return – Part 1

What failed, what worked, in crisis and beyond

- Faking alpha: how alternatives failed
  - “Alternative” assets generally failed to deliver “alpha” – returns that were uncorrelated with traditional risk assets
  - But rose and fell along with credit and equities, like beta in disguise
  - Zero alpha and positive beta have been evident since at least 2003

- Simple but not safe: how long-only failed
  - Credit, equities, commodities and even government bonds can underperform cash for decades
  - Over the last 20 years, standard risk classes have delivered near-zero risk-adjusted returns

Source: Nomura International, Bloomberg. Excess returns are total returns above cash rates. FX Carry is blend of G10 carry positions. Credit is blend of Lehman Brothers AA, A, and BBBI indexes. Equities is MSCI World TR. Commodities is S&P GSCI from launch date (May 1991). Government bonds is EFFAS US government bond index and Nomura estimates. Excess returns are total returns above cash rates, except for credit where excess returns are total returns above the returns of duration-adjusted US Treasuries.
Getting real about risk and return – Part 2

What failed, what worked, in crisis and beyond

- Uncommon success: adapt to fundamentals
  - What is special about fixed income is the links with macro fundamentals, which are quasi-predictable
  - Absolute returns should not require genius or luck.
  - Adapting to fundamentals is enough, in crisis or not
  - Our strategies perform well by ruthlessly positioning based on G10 economic and market data

- What next? Apply the fundamentals, not hope
  - Fundamentals are the best guide, but few apply
  - Obstacles: tradition, long-only, operational hassle
  - Add value by enforcing rational positions, especially when uncomfortable or inconvenient
  - Many products that are thought to provide this actually do not (CTAs, Macro hedge funds, global bonds funds, hedge fund replication)

Faking Alpha: How alternatives failed
Faking Alpha: How alternatives failed

Where were the absolute, uncorrelated returns?

Private equity suffered more than public equity

2008: the end of absolute returns?

Not alternative since at least 2003

Correlation, Beta were high in 2008, but also earlier

And these are alternatives? Persistent high correlation with equities

Alpha may be missing, but beta is stable, significant to equities\(^1\)


1. Beta measured from regression on MSCI World.
Where has the alpha gone?

How alpha has deteriorated over time and across formats

1. Alpha measured on regression of MSCI World excess returns.
Faking alpha was easy

Short volatility positioning created the illusion of alpha in stable markets

"Quadratic Decimation Partners" looked so hot for 16 years

Good economists avoid “peso problems”, but some seek them out

Simple but not safe:
How long-only failed
Simple but not safe: How long-only has failed

Traditional risk assets have delivered little in the last 20 years

Long-term risk-adjusted returns approximately zero

- Should government bonds and FX outperform equities, credit, and commodities?
- Can we have faith of government bonds?

Source: Nomura International, Bloomberg. Excess returns are total returns above cash rates. FX Carry is blend of G10 carry positions. Credit is blend of Lehman Brothers AA, A, and BBBI indexes. Equities is MSCI World TR. Commodities is S&P GSCI from launch date (May 1991). Government bonds is EFFAS US government bond index and Nomura estimates. Excess returns are total returns above cash rates, except for credit where excess returns are total returns above the returns of duration-adjusted US Treasuries.
Are government bonds good value going forward?

Why a long-term bear market is a possibility

Bond yields have fallen dramatically since 1981

When government bonds underperformed cash (1954-1986)

What will the next 20 years be like?

<table>
<thead>
<tr>
<th>Period</th>
<th>Excess Returns, p.a.</th>
<th>Sharpe Ratio</th>
<th>Calmar Ratio</th>
<th>UST Yield at Start</th>
<th>UST Yield at End</th>
<th>UST Yield Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948-1968</td>
<td>-0.82%</td>
<td>-0.23</td>
<td>-0.04</td>
<td>2.44%</td>
<td>6.03%</td>
<td>+3.59%</td>
</tr>
<tr>
<td>1968-1988</td>
<td>-0.21%</td>
<td>-0.03</td>
<td>-0.01</td>
<td>6.03%</td>
<td>9.10%</td>
<td>+3.07%</td>
</tr>
<tr>
<td>1988-2008</td>
<td>2.79%</td>
<td>0.60</td>
<td>0.30</td>
<td>9.10%</td>
<td>2.40%</td>
<td>?</td>
</tr>
</tbody>
</table>

Commodities and credit revert to zero excess return

No clear evidence of long-term positive drift

Long-only credit does not add value long-term, just occasionally\(^1\)

Long-only S&P GSCI generally fails to outperform cash\(^2\)

1. The Cumulative Excess Returns series are based on monthly excess returns – the monthly total return of credit index less the return of duration-equivalent US Treasuries.
2. The Cumulative Excess Returns series is derived from SPGCCIP Index on Bloomberg.
FX Carry has performed over the last 20 years

But often similar to other asset classes

AUDJPY carry only performed when commodities rallied

FX Carry baskets seem similar to writing puts on equities

1. The Cumulative Excess Returns series is derived from SPGCCIP Index on Bloomberg.
Equities have delivered little over the last 40 years

Perhaps expectations of 500 bp pa excess returns are unrealistic.

Japan: zero value-added since 1973

MSCI World added no value except 1985-1987

20th Century real returns: US 4.3%, Rest of World: 0.80%
MSCI World excess return over last 20 years: -0.57%
MSCI World excess return over last 40 years: 1.43%

1. The Cumulative Excess Returns series is derived from MSCI Total Return index less cash rates.
2. The Cumulative Excess Returns series is derived from MSCI World Total Return less cash rates.
What returns above cash should we expect over time?

Theory for long-only in equities is coherent, but not for fixed income

- **Equities:**
  - CAPM rationale still widely accepted
  - Positive beta to economy means positive expected excess returns
  - But how positive? Is the Mehra and Prescott (1985) estimate of 0.4% too low after all?

- **Government bonds:**
  - No CAPM rationale—negative beta to economy means negative expected excess returns?
  - Perhaps positive beta to price stability in similar way as equities
  - Not much consensus on theory, data mixed.

- **Credit:**
  - Like equities if buy-and-hold form
  - But common methods (e.g. long-only indexes) embed trading rules (rating-based, default-based)
  - Such trading rules generate negative returns relative to buy-and-hold

- **Commodities:**
  - Spot prices generally pro-cyclical, like equities
  - But indexes using futures also embed curve exposure—i.e. storage cost, convenience yield
  - Net result can be zero or negative long-term excess returns for a given commodity

- **Currencies:**
  - Long-only or “carry” formats often resemble equities or commodities
Uncommon sense: How some succeeded
Fundamentals change, even if long-only does not

Unemployment

Default Rates

Inflation

Copper Inventories

Future returns depend on current conditions

Long-only cannot be right in all circumstances

- Fixed income returns are semi-predictable, based on current fundamental information
- Predictability in fixed income is higher than in equities

Recent examples

Fundamental-based long/short generally added value

- IRIS had long bias over much of the year, so the potential for de-correlation was not as obvious
- Macro signals for credit turned negative in Summer, 2007

In the long term

Fundamental-based long / short generally add value

- De-correlation between long-only and Macro Duration becomes obvious over the longer sample
- Long-only commodities more volatile, more prone to drawdowns

Case study: commodities
Sharing bear markets—commodities and equities

10% “correlation”, but 70% overlap between MSCI and S&P GSCI bear markets

Source: Nomura (September 2009). Drawdown is percent change from historical to date peak. “Bear market” is defined as a drawdown of 20% or more.
The Bretton Woods bust—post 1975, zero value added

Commodity index returns are near zero post 1975

The collapse of the USD/Gold peg

Source: Bloomberg, BP, IMF, Nomura (September 2009)

Source: Bloomberg, Nomura (September 2009)
Key drawbacks: backtest bias and lack of rationale

Single strategies can show strong historical performance that may not repeat going forward

<table>
<thead>
<tr>
<th>Trend following</th>
<th>Carry</th>
<th>Curve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad-hoc parameter choices</td>
<td>Share weaknesses of carry trades in other markets, such as pro-cyclical behaviour</td>
<td>Worked well since the late 1990s when classic long-only indices became popular</td>
</tr>
<tr>
<td>Can experience severe drawdowns at turning points in the market</td>
<td>Vulnerable to rising inflation, interest rates and volatility</td>
<td>But prior to this, performance is mediocre</td>
</tr>
</tbody>
</table>

Back-test windows are usually short...

![Backtest windows](image)

...especially for curve strategy backtests

![Curve strategy backtest](image)

Source: Bloomberg, Nomura (September 2009).
Source: Fame, Nomura (September 2009)
MaCS: A macro approach to commodities

- Unlocking the potential, overcoming problems

- Problems: weak diversification and returns
  - Diversification fails in bear markets
  - Weak returns relative to inflation or cash

- A step forward: the macro link
  - Similarities to FX and government bonds
  - Macro tools can and should be applied

- MaCS: what a strategy should look like
  - Long / short individual commodities,
  - Liquid contracts across each curve
  - Multi-strat: momentum, carry, curve

- Key differences
  - Coherent economic framework
  - Tested on 40 years of data
  - Higher risk-adjusted returns
  - Low correlation to equities, even in bear markets

MaCS outperforms long-only

Bear market overlap: MSCI, S&P GSCI, and MaCS

* Proportion of time since 1970 that, while equities is in a bear market (>20% drawdown), index is also in a bear market. MaCS is scaled to match historical GSCI volatility.
Case study: credit
Why credit indices underperform cash

The cost of removing fallen angels: buying high and selling low

- Buying high: credits join indices close to par
- Selling low: fallen angels are removed from indices usually at much less than par
- Fallen angels are more frequent in a high-spread environment
- A relatively small number of fallen angels (about 3%) can wipe out the spread income generated by others

Fallen angels and market value loss

<table>
<thead>
<tr>
<th>Company</th>
<th>Average market value loss(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>iStar Financial Inc (2008)</td>
<td>37%</td>
</tr>
<tr>
<td>Ambac Financial Group (2008)</td>
<td>29%</td>
</tr>
<tr>
<td>Brunswick (2008)</td>
<td>29%</td>
</tr>
<tr>
<td>Heidelberg Cement AG (2008)</td>
<td>35%</td>
</tr>
<tr>
<td>MGIC Investment Corp (2009)</td>
<td>36%</td>
</tr>
<tr>
<td>The PMI Group (2009)</td>
<td>41%</td>
</tr>
<tr>
<td>Radian Group (2008)</td>
<td>52%</td>
</tr>
</tbody>
</table>

Fallen angels are more likely when spreads are high

Estimated credit spread carry, p.a. | 1.05%
Probability of downgrade from high grade, p.a. | 3.38%
Excess return breakeven market value loss | 31.1%

(1) Companies downgraded from investment to sub-investment grade.
(2) The illustrative calculation shows that with 3.38% fallen angels p.a. and a market value loss of 31.1% upon removal from the index the spread income earned on a typical investment grade portfolio will just be enough to cover the losses. the estimated spread carry is the average US investment grade spread from 1990 until 2007. Probability obtained from Moody’s rating migration matrix (2008). (3) Average market value loss of a 5 year bond included in the index 2 years prior to the downgrade to subinvestment grade based on CDS spreads.

Source: Moody’s Investor Service, Bloomberg, Nomura
Macro CPS Index: A better way

► Breaking away from long-only

- Macro CPS solves the long-only problem by positioning long or short based on macro fundamentals
- Benefit from both negative and positive trends in credit markets

### Cumulative excess returns: long-only credit vs Macro CPS

<table>
<thead>
<tr>
<th>Excess returns</th>
<th>Macro CPS</th>
<th>US credit Index(1)</th>
<th>Euro credit Index(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average p.a.</td>
<td>1.4%</td>
<td>-0.3%</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Volatility p.a.</td>
<td>1.7%</td>
<td>3.0%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>0.80</td>
<td>-0.10</td>
<td>-0.18</td>
</tr>
<tr>
<td>Calmar ratio(2)</td>
<td>0.56</td>
<td>-0.01</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

- Better risk and return
  - Sharpe ratio: 0.80 vs. -0.10
  - Calmar ratio: 0.56 vs. -0.01

Source: Bloomberg, Nomura; (1) Excess returns of US credit index 1990 – 2009 and European credit index 1999-2009; Benchmark excess returns indices are volatility scaled relative to the Macro CPS Strategy index based on 1990-2009 standard deviations. Historical Macro CPS returns are reconstructed purely using historical data and for illustrative purposes. Past performance provides no guarantee of future results. There is no assurance that projections (if any) are realised. (2) The Calmar ratio is defined as the ratio of the annualised return over the maximum drawdown. Maximum drawdown = absolute value of the largest peak-to-valley return of the index during the observed period.
Determining Macro CPS signals

► Trading signals are generated using macroeconomic and market data

<table>
<thead>
<tr>
<th>Classes and example indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macro Fundamentals</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Employment data</td>
</tr>
<tr>
<td>Economic sentiment</td>
</tr>
<tr>
<td>Consumer prices</td>
</tr>
</tbody>
</table>

Trading signals are calculated daily

- Each indicator is normalised relative to its long run moving average and standard deviation, range-bound from -1 to +1 (the equivalent of trading positions of 100% short to 100% long)
- Simple averages of the normalised indicators are calculated for each of the four indicator classes
- A simple average of the four classes is calculated to determine the country trading signal

Country returns are aggregated daily

- Country trading signals are applied to On-the-run 5-year CDX IG and iTraxx Main indices
- Country weights: 50% USA, 50% Europe

For a full description of the strategy and the risks investors should always review the presentation “Macro Credit Positioning System ("Macro CPS") - A macro-fundamental approach to long-short credit investing” and the Final Terms.
Performance in the long sample

► A Proxy of the Macro CPS performs well since 1973

- Sanity check: how reliable is the mechanism out of sample, i.e. before 1990?
- Through several credit cycles, the Proxy Macro CPS index would have performed robustly with:
  - An attractive risk-return profile reflected in a high Sharpe ratio over the whole period
  - A high positive skew avoiding the heavy draw-downs in credit markets

<table>
<thead>
<tr>
<th>Proxy Macro CPS index since 1973</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess returns 1973-1991</td>
</tr>
<tr>
<td>Avg returns (bps p.a.)</td>
</tr>
<tr>
<td>Sharpe ratio</td>
</tr>
<tr>
<td>Hit ratio</td>
</tr>
<tr>
<td>Skew</td>
</tr>
<tr>
<td>Excess returns 1991-2009</td>
</tr>
<tr>
<td>Avg returns (bps p.a.)</td>
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</tr>
<tr>
<td>Hit ratio</td>
</tr>
<tr>
<td>Skew</td>
</tr>
</tbody>
</table>

Source: Nomura, Bloomberg. Calculations are based on monthly data from 1973 to 2009. The proxy Macro CPS strategy has been implemented using the US BBB credit index. No transactions costs have been incorporated in the above performance numbers. Please see Appendix for list of assumptions in the back-testing of the proxy Macro CPS strategy.

Sharpe ratio = annualised return / annualised volatility. Historical Macro CPS returns are reconstructed purely using historical data and for illustrative purposes. Past performance provides no guarantee of future results. There is no assurance that projections (if any) are realised.
Final thoughts
Fundamental long / short makes sense

Theory is more coherent for long/short than for long-only

- Risk premia are not constant and perhaps not even positive
  - Long-only makes sense if expected excess returns are positive, constant, and dynamically similar to random-walk
  - Otherwise, long/short is more appropriate, as conditional expected returns are semi-predictable
  - Extensive academic literature on this subject
- Macro fundamental data displays strong trends
  - Central bank policy rates, default rates, unemployment rates, physical inventory changes are anything but a random walk
  - Many fixed income instruments inherit this trending to some extent
Fundamental long / short makes sense

Generating “cheap straddles”

- Macro-fundamental trend following creates long straddle exposure at relatively low cost
  - Trend following creates exposure similar to that of a long straddle
  - If underlying assets display trending, cost of carry may be zero or negative
- Long straddle exposure generates long gamma and positive skew
  - Typical alternative strategies are short gamma and negatively skewed (e.g. most HFRX indexes)
  - Many long-only benchmarks are similar (e.g. credit, equities)
  - The only other main method of generating positive skew (CTAs) suffers from poor long-term returns
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