Upside/Downside Capture Ratios and S&P 500 Sector Returns in Volatile Markets

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Purpose:
The purpose of this study is to determine if Capture Ratios can predict the future returns of S&P 500 sectors.

Research Approach:
Data Requirements:

Period of Analysis:
- Calculation Period – 2007-2010
- Forecasting Period – 2011-2012

Model Specification:
- \( R_{st} = \frac{R_{st}}{R_{mt}} - 1 \) for \( R_{st} > 0 \), \( R_{mt} = 0 \)
- \( DCR_{st} = \sum_{t=1}^{n} \frac{DCR_{st}}{n} \)
- \( UCR_{st} = \sum_{t=1}^{n} \frac{UCR_{st}}{n} \)

Where:
- \( R_{st} = \) Return to sector at time \( t \)
- \( R_{mt} = \) Return to market at time \( t \)
- \( UCR = \) Upside capture ratio
- \( DCR = \) Downside capture ratio
- \( UCR = \) Average upside capture ratio
- \( DCR = \) Average downside capture ratio
- \( UCR/DCR = \) Ratio of Upside to Downside

Regression Results:

<table>
<thead>
<tr>
<th>Return Period</th>
<th>( R^2 )</th>
<th>( a )</th>
<th>( b )</th>
<th>T-stat</th>
<th>Independent Variable</th>
<th>Exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/31/10-4/30/11</td>
<td>0.0275</td>
<td>0.1062</td>
<td>-0.0229</td>
<td>-0.4753</td>
<td>UCR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0000</td>
<td>0.0752</td>
<td>0.0000</td>
<td>0.0007</td>
<td>UCR</td>
<td>HCX</td>
</tr>
<tr>
<td></td>
<td>0.1283</td>
<td>0.0237</td>
<td>0.0315</td>
<td>0.9399</td>
<td>UCR</td>
<td>HCX, SPENS</td>
</tr>
<tr>
<td></td>
<td>0.3995</td>
<td>0.0121</td>
<td>0.0455</td>
<td>1.8237</td>
<td>UCR</td>
<td>HCX, SPENS, SPFN</td>
</tr>
<tr>
<td>4/30/11-9/30/11</td>
<td>0.4673</td>
<td>0.0238</td>
<td>-0.1645</td>
<td>-2.6492</td>
<td>DCR</td>
<td></td>
</tr>
<tr>
<td>9/30/11-2/28/12</td>
<td>0.4150</td>
<td>-0.0384</td>
<td>0.1822</td>
<td>2.3822</td>
<td>UCR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.4383</td>
<td>-0.0943</td>
<td>0.2235</td>
<td>2.3372</td>
<td>UCR</td>
<td>HCX</td>
</tr>
<tr>
<td>1/1/11-2/28/12</td>
<td>0.2958</td>
<td>-0.1701</td>
<td>0.1520</td>
<td>1.8330</td>
<td>UCR/DCR</td>
<td></td>
</tr>
</tbody>
</table>

Estimating Equations:
- \( R_{st+1} = a + b*UCR_s \)
- \( R_{st+1} = a + b*DCR_s \)
- \( R_{st+1} = a + b*(UCR/DCR) \)

Where \( a, b = \) Regression Parameters
- \( t+1 = 12/30/11 - 4/30/11 \) (UCR)
- \( t+1 = 4/30/11 - 9/30/11 \) (DCR)
- \( t+1 = 9/30/11 - 2/28/12 \) (UCR)
- \( t+1 = 1/1/11 - 2/28/12 \) (UCR/DCR)

Sector List:
- SPCCS – Consumer Discretionary
- SPCNS – Consumer Staples
- SPENS – Energy
- SPFN – Financial
- HCX – Health Care
- SPIN – Industrials
- SPHTI – Information Technology
- SPBMS – Materials
- SPCSS – Telecommunications
- SPUT – Utilities

Conclusion:

12/31/10 – 4/30/11: Upswing Period
- \( R^2 \) is quite low and the \( b \) coefficient is statistically insignificant except for the model that excludes HCX, SPENS, and SPFN. This model is significant at the 90% confidence level and the \( b \) coefficient has the right sign.

4/30/11 – 9/30/11: Downswing Period
- \( R^2 \) is moderately low and the \( b \) coefficient is statistically significant at the 95% confidence level. The \( b \) coefficient has the right sign.

9/30/11 – 2/28/12: Upswing Period
- \( R^2 \) is moderately low and the \( b \) coefficient is statistically significant at the 95% confidence level. The \( b \) coefficient has the right sign.

1/1/11 – 2/28/12: Trading Range Period
- \( R^2 \) is low and the \( b \) coefficient is significant at the 90% confidence level. The \( b \) coefficient has the right sign.