A Covariance Analysis of Consumer Healthcare Expenditures and Healthcare Sector Price Movements

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A Covariance Analysis of Consumer Expenditures on Health Care and Health Care Sector Price Movement

Courtney Cady and David Christian
Advisor: Dr. Bob Dean and Dr. Trevor Collier

Study Objective:
Determine if Health Care (HC) sector stock prices covary directly with consumer expenditures on health care

Research:
• Univariate Regression Analysis
• Time Period 2004-2013
• Data Sets
  • HC Consumer Expenditures
  • HC Sector ETF (XLV)
  • HC Equipment (XHE)
  • Biotech (XBH)
  • Pharmaceuticals (XHD)
  • HC Services (XHS)
• Data Frequency: Quarterly Data

Model Specifications
XLV=A+B(HCCE)
XHE=A+B(HCCE)
XBI=A+B(HCCE)
XHD=A+B(HCCE)
XHP=A+B(HCCE)
XHS=A+B(HCCE)

Hypothesis:
There is a direct relationship between HCCE and HC sector Prices: B>0 ;Tstat > 2

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Dependent Variable</th>
<th>B</th>
<th>Tstat</th>
<th>Rsquared</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-2014</td>
<td>XLV</td>
<td>0.027</td>
<td>6.339</td>
<td>0.489</td>
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<tr>
<td>2011-2014</td>
<td>XHE</td>
<td>0.105</td>
<td>7.327</td>
<td>0.891</td>
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<tr>
<td>2006-2014</td>
<td>XBI</td>
<td>0.140</td>
<td>9.355</td>
<td>0.849</td>
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<tr>
<td>2006-2014</td>
<td>XPH</td>
<td>0.100</td>
<td>10.115</td>
<td>0.86955</td>
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<tr>
<td>2011-2014</td>
<td>XHS</td>
<td>0.222</td>
<td>17.870</td>
<td>0.982</td>
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</tbody>
</table>

Table 2 Logarithmic Regressions Results

<table>
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<th>Time Period</th>
<th>Dependent Variable</th>
<th>B</th>
<th>Tstat</th>
<th>Rsquared</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-2014</td>
<td>XLV</td>
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<td>2011-2014</td>
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<td>7.113735</td>
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<td>2006-2014</td>
<td>XBI</td>
<td>0.002973</td>
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<td>2006-2014</td>
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<td>0.004356</td>
<td>9.111437</td>
<td>0.715562</td>
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<tr>
<td>2011-2014</td>
<td>XHS</td>
<td>0.002282</td>
<td>16.92373</td>
<td>0.959787</td>
</tr>
</tbody>
</table>

Conclusions:
• Linear Models B>0 and Tstat>2
• Log Linear Models B>0 and Tstat>2
• XHS Best Linear and Log Linear Relationship, Rsquared>.95