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Advisors: Dr. Robert Dean, Dr. Tony Caporale

Study Purpose:
- The purpose of this study is to determine (1) if stock prices covary with Gross Domestic Income (GDI) and (2) if GDI can be used as a portfolio weighting factor with cross section of returns

Research Design:
- Develop linear regression models for 10 stocks within each of the following SPDR sectors; XLV, XLY, XLK, and XLI
- The Regression Equation
  \[ \text{Pit}(S_i) = A + B(GDi_t) \]
  where \( S_i = \) ithSPDR sector
  \( P_i = \) ithstock
  \( t = \) time in quarters (1999-2017)
  \( A = \) intercept
  \( B = \) regression coefficient
  \( GDI = \) Gross Domestic Income
- Portfolio Weighting Model by Sector
  \[ W_i = \frac{B_i}{\sum B_i} \]
  \( D_i = W_i x 1,000,000 \)
  \( \text{SHR}_i(t) = D_i / P_i(t) \)
  \( \text{MVi}(t+1) = \text{SHR}_i x P_i(t+i) \)
  \( \text{PV} = \sum \text{MVi}(t+i) \)

Conclusions:
- Cumulative Returns:
  - All sector models outperformed SPY
- Annual Returns:
  - XLV outperformed SPY 6/9yrs
  - XLY outperformed SPY 8/9yrs
  - XLK outperformed SPY 7/9yrs
  - XLI outperformed SPY 4/9yrs
  - Highest alpha: XLY
  - All 4 sectors outperformed SPY in 2011
  - 3/4 sectors outperformed SPY in 2015
  - On return-risk basis, SPY outperforms models

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Cumulative Returns</th>
</tr>
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<tbody>
<tr>
<td>Year</td>
<td>XLV %</td>
</tr>
<tr>
<td>2009</td>
<td>16%</td>
</tr>
<tr>
<td>2010</td>
<td>4%</td>
</tr>
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<td>2011</td>
<td>16%</td>
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<tr>
<td>2016</td>
<td>12%</td>
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<tr>
<td>2017</td>
<td>34%</td>
</tr>
</tbody>
</table>

| 1 / cov. | 1.48 | 1.12 | 1.64 | 1.33 | 1.73 |