SHOULD UNIVERSITIES AND PENSION FUNDS DIVEST FROM FOSSIL FUEL STOCKS?
Monday, November 24, 2014

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Risks and Returns of Fossil Fuel Free Investing
Presentation to the Sabin Center for Climate Change

November 24th, 2014
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Bruce Kahn, Ph.D.

- Portfolio manager at SICM
- Former Director of Deutsche Asset Management conducting analytical research on sustainable investing (2008 – 2012)
- Managed sustainable investment portfolio at Citi Smith Barney across a broad mix of sectors including sustainability leaders, agribusiness, clean tech and renewable energy companies (2004 – 2008)
- Lecturer at Columbia University’s Earth Institute in the Sustainability Management program (2012 – present)
- PhD in Land Resources from University of Wisconsin, Madison
Key questions that every Asset Owner and Asset Manager need to consider...

1. How is fossil fuel free defined?
2. What is the most suitable benchmark?
3. What are the sources of returns?
4. What are the unintentional risks?
1. How is Fossil Fuel Free Defined?

GICS Sub-Industry Exclusions in the S&P 500 Index

- **CORE (Oil & Gas)** (~8% of the S&P 500 index)
- **EXTENDED** (~16% of the S&P 500 index)
- **Go Fossil Free (GFF)** (~6% of the S&P 500 index)

Source: S&P 500, The Carbon Tracker Initiative, SICM (as of June 30th 2014)
The weighting may change over time.
1. How is Fossil Fuel Free Defined?

S&P 500 Index sector weightings over time. Only calendar year-end are shown.

Source: S&P Dow Jones Indices, SICM.
2. What is the Most Suitable Benchmark?

Morningstar Agriculture Equity Sector (Europe) Benchmarks (by AUM)

Source: Morningstar
2. What is the Most Suitable Benchmark?

Morningstar Agriculture Equity Fund Performance (Europe)
BASED ON 12 MONTH RETURN

Source: Morningstar, SICM, DAX Indices, MSCI
3. What are the Sources of Return?

Five Largest Positive Contributors to Cumulative Active Return in the ‘Core’ Portfolio

<table>
<thead>
<tr>
<th>Best Five Policies</th>
<th>Average Active Exposure (%)</th>
<th>Risk (% Std Dev)</th>
<th>Contribution (% Return)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Sector</td>
<td>-11.31</td>
<td>1.01</td>
<td>9.57</td>
<td>10.34</td>
</tr>
<tr>
<td>Information Technology Sector</td>
<td>3.16</td>
<td>0.14</td>
<td>2.07</td>
<td>1.87</td>
</tr>
<tr>
<td>Momentum</td>
<td>1.16</td>
<td>0.14</td>
<td>0.48</td>
<td>1.22</td>
</tr>
<tr>
<td>Health Care Sector</td>
<td>1.29</td>
<td>0.07</td>
<td>1.14</td>
<td>1.04</td>
</tr>
<tr>
<td>Consumer Staples Sector</td>
<td>2.26</td>
<td>0.10</td>
<td>1.04</td>
<td>1.01</td>
</tr>
</tbody>
</table>

Source: MSCI Barra, SICM (analyzed five-year results, as of June 30th, 2014)
*Terms defined on slide 12
4. What are the Unintentional Risks?

Five Largest Negative Contributors to Cumulative Active Return in the ‘Core’ Portfolio*

<table>
<thead>
<tr>
<th>Worst Five Policies</th>
<th>Average Active Exposure</th>
<th>Risk (% Std Dev)</th>
<th>Contribution (% Return)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta</td>
<td>-0.06</td>
<td>0.41</td>
<td>-3.74</td>
</tr>
<tr>
<td>Asset Selection</td>
<td>N/A</td>
<td>0.73</td>
<td>N/A</td>
</tr>
<tr>
<td>Asset Selection - Americas Region</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Earnings Yield</td>
<td>-0.04</td>
<td>0.06</td>
<td>-1.58</td>
</tr>
<tr>
<td>Asset Selection - Health Care Sector</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-4.88</td>
</tr>
</tbody>
</table>

Source: MSCI Barra, SICM (analyzed five-year results, as of June 30th, 2014)

*Terms defined on slide 12
3. What are the Sources of Return?

Five Largest Positive Contributors to Cumulative Active Return in the ‘GFF’ Portfolio*

<table>
<thead>
<tr>
<th>Best Five Policies</th>
<th>Average Active Exposure</th>
<th>Risk (% Std Dev)</th>
<th>Contribution (% Return)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average</td>
</tr>
<tr>
<td><strong>Energy Sector</strong></td>
<td>-8.61</td>
<td>0.73</td>
<td>8.09</td>
</tr>
<tr>
<td><strong>Information Technology Sector</strong></td>
<td>2.56</td>
<td>0.11</td>
<td>1.70</td>
</tr>
<tr>
<td>Momentum</td>
<td>0.01</td>
<td>0.11</td>
<td>0.44</td>
</tr>
<tr>
<td>Consumer Staples Sector</td>
<td>1.90</td>
<td>0.08</td>
<td>0.86</td>
</tr>
<tr>
<td>Asset Selection - Energy Sector</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Source: MSCI Barra, SICM (analyzed five-year results, as of June 30th, 2014)

*Terms defined on slide 12
4. What are the Unintentional Risks?

Five Largest Negative Contributors to Cumulative Active Return in the ‘GFF’ Portfolio*

<table>
<thead>
<tr>
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<th>Risk (% Std Dev)</th>
<th>Contribution (% Return)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Average</td>
</tr>
<tr>
<td>Beta</td>
<td>-0.03</td>
<td>0.22</td>
<td>-1.83</td>
</tr>
<tr>
<td>Earnings Yield</td>
<td>-0.04</td>
<td>0.06</td>
<td>-1.51</td>
</tr>
<tr>
<td>Residual Volatility</td>
<td>0.03</td>
<td>0.14</td>
<td>-1.39</td>
</tr>
<tr>
<td>Asset Selection - Health Care Sector</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Asset Selection</td>
<td>N/A</td>
<td>0.65</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: MSCI Barra, SICM (analyzed five-year results, as of June 30th, 2014)
*Terms defined on slide 12
Summary

1. Define your terms – what is fossil fuel free?
2. Measure the asset manager – a suitable benchmark is crucial
3. Identify the sources of return – keep an eye on the asset manager
4. Understand the unintended risks – did the asset manager control the unintended risks?
Definitions

‘Core’ Portfolio – Core Portfolio excludes eight CIGS sub-industries: Coal & Consumable Fuels, Diversified Metals & Mining, Integrated Oil & Gas, Oil & Gas Drilling, Oil & Gas Equipment & Services, Oil & Gas Exploration, Oil & Gas Refining & Marketing, Oil & Gas Storage & Transportation. See page 10 of SICM, Fossil Fuel Free Investing for more information.

‘GFF’ Portfolio – GFF Portfolio excludes 181 actively traded companies that were listed on the Go Fossil Fuel campaign’s top companies by estimated carbon reserves. See page 13 of SICM, Fossil Fuel Free Investing for more information.

Asset Selection is risk that is specific to a company and is uncorrelated (or negligibly correlated) with the asset selection risk of other companies.

Beta captures market risk that cannot be explained using the Country factor.

Earnings Yield describes return differences based on a company’s earnings relative to its price.

Momentum explains the return differences of stocks based on their relative performance over the trailing 6-12 months.

Residual Volatility explains returns associated with high volatility stocks that are not captured by the Beta factor.
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