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Webcast Presentation:

Investment & Portfolio Strategy - Looking at Hedge Funds

February 23, 2016

Presented by:

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Presentation Outline

I. Chris Piros - The Role of Alternatives: Focus on Hedge Fund Strategies
   • Each Hedge Fund is Different
   • Market Exposure is Variable
   • Metamorphosis: Traditional Manager into a Hedge Fund
   • Portfolio Construction at a Glance
   • Diversification

II. Mark Hoffman - Selecting the Managers
   • Our Resources
   • Philosophy
   • Due Diligence
   • Varied Investment Objectives Require Diversified Platform
   • Illustrations

III. Questions and Answers
Speakers

**Chris Piros, PhD, CFA**
Chris is Managing Director of Investment Strategy and Chairman of the Investment Policy Committee for PNC Institutional Asset Management and Hawthorn, PNC Family Wealth. As chief investment strategist, Chris guides investment decisions at all levels of the investment process. In addition, he is a member of various committees for PNC’s Asset Management Group.

**Mark Hoffman, PhD, CFA**
Mark is the Head of Alternative Investments within our Investment Advisor Research Group. Mark’s team focuses on alternative investment products, including hedge funds, private equity partnerships, funds of funds, and alternative mutual funds. He is actively involved in all aspects of investment manager due diligence in the alternative investment arena and led the build out of PNC’s single-strategy hedge fund and private equity platform.
The Role of Alternatives: Focus on Hedge Funds
The Role of Alternatives

Each major category of alternatives brings something valuable to a portfolio.

**Private Equity & Debt**
- Facilitate debt and equity investments for which control, flexibility and customization, active and intensive oversight, freedom from public scrutiny, and/or participatory management are critical contributors to return.

**Real Estate**
- Ownership of a large portion of the economy’s productive capacity, providing services that are vital to virtually every business.

**Commodities**
- Diversification and potential protection of purchasing power.
The Role of Alternatives

Hedge Fund Strategies

Well-managed funds typically allow investors to reduce portfolio volatility without sacrificing much, if any, potential return by relying more heavily on active management and less heavily on broad market movements as a driver of risk and return.
Each Hedge Fund is Different

Dispersion of Monthly Returns
Range Between 1st & 4th Quartile Each Month
January 2004 – December 2013

Correlation with S&P500
January 2004 – December 2013

Returns across large cap core mutual funds was consistently within a narrow range.

The range of returns for long/short US equity hedge funds was always much wider and sometimes extremely wide.

All the large cap core mutual funds were very highly correlated with the S&P500.

Correlations for the long/short hedge funds varied widely.

Source: Morningstar, PNC

Past performance is no guarantee of future results. An investment cannot be made directly in an index.
Variable Market Exposure

Most large cap core mutual funds exhibited a stable correlation with the market over various two-year periods*.

Almost all of the long/short US equity hedge funds exhibited very unstable correlation with the market over various periods.

* The timeframe included two year periods from Jan 2004 – Dec 2013.

Past performance is no guarantee of future results. An investment cannot be made directly in an index.

Source: Morningstar, PNC
Metamorphosis
Converting a Traditional Manager into a Hedge Fund

Hypothetical hedge fund has the potential for significantly higher return, but may still have lower volatility.

Source: PNC
The return on a hedge fund portfolio has two components:
- a market driven component ("beta")
- an active management component

All else the same we want more of the potential return to come from active management and less from market exposure.
- this increases the diversification benefit of combining hedge funds with traditional asset classes.
- we can obtain market exposure more cheaply and more reliably with long-only managers.

The chart depicts two aspects of portfolio construction:
- **Client Objectives**: A longer arrow indicates a higher risk/higher potential return profile.
- **Potential Diversification**: The steeper the arrow the smaller the market-related component of return and the greater the diversification benefit.

Source: PNC
Consider two hypothetical portfolios combining hedge funds with a market index fund. Each combination of hedge funds has the same mean return and volatility as the market index.

For each portfolio, the indicated region captures 95% of the potential outcomes.

Source: PNC
Selecting the Managers
How PNC Bank Selects Managers – PNC Bank Leverages a Broad Array of Resources to Select Investment Managers

PNC Bank’s Investment Advisor Research (IAR) Team has Wide Ranging Experience in Equities, Fixed Income, and Alternative Investments

- IAR analysts approach each search with an investor’s mindset due to the team’s unique experience set:
  - Fund of funds and family office investors
  - Institutional advisors
  - Direct trading experience as members of equity, fixed income, and alternative investment teams
- Team has broad experience in quantitative performance analysis, qualitative factor review, and detailed knowledge of the underlying trading strategies and the investment manager universe

IAR Utilizes Extensive Databases and Quantitative Tools to Source and Analyze Funds

- IAR has access to data on over 5,000 hedge funds and alternative mutual funds through third party and internally developed databases
- Our analysis incorporates the sophisticated analytics available through vendors such as Factset, Morningstar Direct, and proprietary systems developed in-house

PNC Bank has developed a differentiated sourcing and due diligence process

- Systematic, quantitative review of historical performance that helps us to identify consistent top performers
- Detailed understanding of trading strategies and risk controls to assess repeatability and potential loss
- Close collaboration with strategy team to identify funds that serve a specific purpose in client portfolios
PNC Bank’s Manager Selection Philosophy – Seek Proven Managers with Repeatable Track Records

Proven Top Performers
• We look for managers who have shown their abilities in multiple market environments
• Past performance does not guarantee future success, but it may provide evidence of skill
• We are skeptical that investing in turnaround stories or new managers may generate excess returns over the long term

Consistent Returns
• We are not excited by track records that are dominated by a small number of large, concentrated bets or one great year – impossible to differentiate between luck and skill
• We seek managers who outperform their peers year in and year out – thus we focus on managers with consistently high percentile rankings

Strong Investment Process
• Repeatable return streams should come from a sustainable idea generation methodology, research process, and trade structuring
• We strive to understand every part of the investment process and portfolio management to ascertain the likelihood of future outperformance and risk control

World-Class Team
• A quality investment team and strong culture are generally necessary for any investment process to work
• We look for knowledgeable, creative thinkers who have a deep understanding of their markets
• Culture, compensation structure, and team retention success typically increase the ability of a firm to make the most of its human capital
PNC Bank Executes a Systematic Sourcing and Due Diligence Process to Strategically Select Managers

**Investment Thesis**
- Each manager search is focused on a specific investment strategy objective identified by our Investment Strategy team

**Investable Universe**
- Our comprehensive database includes over 5,000 hedge funds and alternative mutual funds

**Quantitative Analysis**
- Managers are screened and ranked based on detailed, proprietary quantitative analysis of historical returns, risks, and exposures with a focus on consistent performance over time

**In-Depth Due Diligence**
- Top-ranked managers are then scrutinized by IAR analysts through careful review of offering documents, deep-dive portfolio analysis, and interviews with key investment professionals

**Final Approval**
- Each manager on our platform is recommended by an IAR analyst and approved by our Investment Advisor Research Committee, which includes IAR analysts and senior investment professionals from PNC

**Ongoing Monitoring**
IAR analysts remain in contact with each manager on the platform, monitoring performance, the investment team, and the investment process on at least a quarterly basis to confirm that each manager is continuing to invest in line with our expectations
Hedge Fund Allocations Should Be Based on Investment Objectives – Funds with the Same Trading Strategy Can Vary Dramatically

- Fund A and Fund B are both focused on trades that are best described as “Discretionary Global Macro”
- Fund A exhibits low volatility and may offer a fixed income substitute, while Fund B has an equity-like risk/return profile

Varying “Global Macro” funds meet different portfolio needs

Certain of the data used in constructing the above graphic was obtained by PNC from hedge fund managers which are on PNC’s approved alternative investment platform. Such data is selected by PNC analysts to illustrate the variation in returns that are possible for two managers investing via a similar trading strategy and may or may not be representative of all hedge funds on the PNC investment platform with a similar strategy or performance history. Past performance is no guarantee of future results. An investment cannot be made directly in an index.
Hedge Funds Vary on More than Just Trading Strategy: PNC Bank’s Platform Is Diversified Across Three Dimensions

Trading Strategy
- Global Macro
- Equity Long/Short
- Event Driven
- Relative Value
- Credit/Arbitrage

Manager Attributes
- Emerging vs. Established
- Length of track record
- Size of team
- Assets under management

Return Target
- High Return vs. Low Volatility

We consider managers in light of these three main drivers of risk and return to develop tailored hedge fund portfolios that meet specific investment objectives.

Hedge fund return profiles vary dramatically even within a trading strategy.
Two Sample Illustrations: (1) Fixed-Income-Like Return/Volatility and (2) Reducing Equity Market Risk While Maintaining Equity-Like Returns

<table>
<thead>
<tr>
<th>Absolute Return Portfolio</th>
<th>Growth Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment Objective</strong></td>
<td>• Generate returns consistent with long-term equity returns while reducing equity market risk in the overall portfolio</td>
</tr>
<tr>
<td><strong>Target Fund Characteristics</strong></td>
<td>• Generate returns in the current rising interest rate environment that are consistent with historical fixed income returns and volatility</td>
</tr>
<tr>
<td></td>
<td>• Volatility and losses comparable to a broad-based fixed income portfolio</td>
</tr>
<tr>
<td></td>
<td>• Returns do not depend on interest rates, i.e. funds should not be highly correlated to the broad bond market</td>
</tr>
<tr>
<td></td>
<td>• Historical returns should be at least as strong as those for a broad-based fixed income portfolio</td>
</tr>
<tr>
<td></td>
<td>• Lower volatility and losses than a broad-based equity portfolio</td>
</tr>
<tr>
<td></td>
<td>• Low correlation to the equity markets</td>
</tr>
<tr>
<td></td>
<td>• Historical returns that meet or exceed historical equity returns</td>
</tr>
</tbody>
</table>
Illustration 1: Selecting Hedge Fund Strategies as a Low Volatility Solution

Return and Risk Metrics - Trailing 5 Years

<table>
<thead>
<tr>
<th></th>
<th>Return</th>
<th>Std Dev</th>
<th>Sharpe Ratio</th>
<th>Max Drawdown</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Vol Global Macro MF</td>
<td>1.81</td>
<td>2.70</td>
<td>0.66</td>
<td>-2.71</td>
<td>0.02</td>
</tr>
<tr>
<td>Low Vol Alt Credit MF</td>
<td>0.83</td>
<td>4.61</td>
<td>0.19</td>
<td>-9.26</td>
<td>-0.10</td>
</tr>
<tr>
<td>Low Vol Multi-Strategy MF</td>
<td>1.60</td>
<td>4.82</td>
<td>0.34</td>
<td>-8.12</td>
<td>-0.11</td>
</tr>
<tr>
<td>Low Volatility Portfolio - Mutual Funds</td>
<td>1.45</td>
<td>3.49</td>
<td>0.41</td>
<td>-6.56</td>
<td>-0.09</td>
</tr>
<tr>
<td>Low Vol Global Macro HF</td>
<td>3.00</td>
<td>3.75</td>
<td>0.79</td>
<td>-6.61</td>
<td>-0.03</td>
</tr>
<tr>
<td>Low Vol Distressed Credit HF</td>
<td>4.47</td>
<td>2.74</td>
<td>1.59</td>
<td>-3.92</td>
<td>-0.12</td>
</tr>
<tr>
<td>Low Vol Long/Short Equity HF</td>
<td>11.52</td>
<td>4.82</td>
<td>2.28</td>
<td>-3.62</td>
<td>0.03</td>
</tr>
<tr>
<td>Low Volatility Portfolio - Hedge Funds</td>
<td>6.39</td>
<td>2.58</td>
<td>2.40</td>
<td>-1.48</td>
<td>-0.04</td>
</tr>
<tr>
<td>Barclays US Agg Bond TR USD</td>
<td>3.25</td>
<td>2.71</td>
<td>1.17</td>
<td>-3.67</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Trailing Returns by Year

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Vol Global Macro MF</td>
<td>2.63</td>
<td>3.03</td>
<td>-0.24</td>
<td>4.11</td>
<td>-0.39</td>
<td>4.75</td>
<td>11.18</td>
<td>1.80</td>
</tr>
<tr>
<td>Low Vol Alt Credit MF</td>
<td>-1.07</td>
<td>-0.87</td>
<td>2.99</td>
<td>9.34</td>
<td>-5.61</td>
<td>5.18</td>
<td>22.12</td>
<td>0.40</td>
</tr>
<tr>
<td>Low Vol Multi-Strategy MF</td>
<td>-2.18</td>
<td>3.09</td>
<td>8.33</td>
<td>2.73</td>
<td>-3.51</td>
<td>3.16</td>
<td>6.28</td>
<td></td>
</tr>
<tr>
<td>Low Volatility Portfolio - Mutual Funds</td>
<td>-0.21</td>
<td>1.75</td>
<td>3.69</td>
<td>5.39</td>
<td>-3.17</td>
<td>4.36</td>
<td>13.19</td>
<td>-3.39</td>
</tr>
<tr>
<td>Low Vol Global Macro HF</td>
<td>1.87</td>
<td>-3.35</td>
<td>2.50</td>
<td>6.00</td>
<td>8.37</td>
<td>6.65</td>
<td>12.40</td>
<td>18.85</td>
</tr>
<tr>
<td>Low Vol Distressed Credit HF</td>
<td>-2.25</td>
<td>4.63</td>
<td>10.98</td>
<td>9.43</td>
<td>0.21</td>
<td>5.72</td>
<td>20.16</td>
<td>2.56</td>
</tr>
<tr>
<td>Low Vol Long/Short Equity HF</td>
<td>11.61</td>
<td>7.63</td>
<td>22.02</td>
<td>7.69</td>
<td>9.26</td>
<td>7.81</td>
<td>31.79</td>
<td>-19.25</td>
</tr>
<tr>
<td>Low Volatility Portfolio - Hedge Funds</td>
<td>3.74</td>
<td>2.97</td>
<td>11.83</td>
<td>7.71</td>
<td>5.95</td>
<td>6.73</td>
<td>21.45</td>
<td>0.28</td>
</tr>
<tr>
<td>Barclays US Agg Bond TR USD</td>
<td>0.55</td>
<td>5.97</td>
<td>-2.02</td>
<td>4.21</td>
<td>7.84</td>
<td>6.54</td>
<td>5.93</td>
<td>5.24</td>
</tr>
</tbody>
</table>

Source: Morningstar, PNC

Certain of the data used in constructing the above graphic was obtained by PNC from hedge fund managers which are on PNC’s approved alternative investment platform. Such data is selected by PNC analysts specifically for this illustration. Funds were selected to match strategies across the four illustration portfolios as closely as possible, and certain managers were excluded because they would not generally be used as part of an equal-weight, three fund portfolio due to the PNC analysts’ assessment of specific risks associated with those funds. Further, only funds with inception dates prior to January 1, 2008 were used in order to show long-term historical results. Past performance is no guarantee of future results. An investment cannot be made directly in an index.
Low Volatility Hedge Fund Strategies Do Not Depend on Falling Interest Rates to Generate Returns

Returns During Rising Interest Rate Periods
Calculation Benchmark: Barclays US Agg Bond TR USD

Source: Morningstar, PNC

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Illustration 2: Reducing Equity Market Risk With Hedge Fund Strategies While Maintaining Equity-Like Returns

**Return and Risk Metrics - Trailing 5 Years**

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Return</th>
<th>Std Dev</th>
<th>Sharpe Ratio</th>
<th>Max Drawdown</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ret CTA MF</td>
<td>3.37</td>
<td>9.28</td>
<td>0.40</td>
<td>-9.85</td>
<td>-0.15</td>
</tr>
<tr>
<td>High Ret Alt Credit MF</td>
<td>9.19</td>
<td>4.81</td>
<td>1.85</td>
<td>-7.37</td>
<td>0.12</td>
</tr>
<tr>
<td>High Ret Long/Short Equity MF</td>
<td>7.98</td>
<td>9.07</td>
<td>0.89</td>
<td>-12.06</td>
<td>0.93</td>
</tr>
<tr>
<td>High Return Mutual Fund Portfolio</td>
<td>7.00</td>
<td>4.46</td>
<td>1.53</td>
<td>-4.93</td>
<td>0.55</td>
</tr>
<tr>
<td>High Ret Global Macro HF</td>
<td>6.12</td>
<td>11.68</td>
<td>0.56</td>
<td>-18.22</td>
<td>0.14</td>
</tr>
<tr>
<td>High Return Distressed Credit HF</td>
<td>5.45</td>
<td>8.06</td>
<td>0.69</td>
<td>-15.69</td>
<td>0.66</td>
</tr>
<tr>
<td>High Return Long/Short Equity HF</td>
<td>9.27</td>
<td>9.10</td>
<td>1.02</td>
<td>-9.24</td>
<td>0.68</td>
</tr>
<tr>
<td>High Return Hedge Fund Portfolio</td>
<td>7.03</td>
<td>7.13</td>
<td>0.98</td>
<td>-10.27</td>
<td>0.61</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>12.57</td>
<td>11.70</td>
<td>1.07</td>
<td>-16.26</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Investment Growth**

Time Period: 1/1/2008 to 12/31/2015

**Drawdown**

Time Period: 1/1/2008 to 12/31/2015

*Source: Morningstar, PNC*

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Hedge Fund Strategies Have Offered Some Protection in Equity Market Downturns

**Note:** Returns data not available for the High Return Mutual Fund Portfolio Prior to January 1, 2011

**Source:** Morningstar, PNC

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Summary

• The role of alternative investments in a portfolio serves to diversify portfolio risk and return.

• Hedge Fund strategies, in particular, allow investors an opportunity to reduce portfolio volatility, without a dramatic reduction in potential return.

• Each hedge fund is unique and performance is heavily dependent upon active manager experience versus broad market movement.

• PNC Bank seeks proven managers with repeatable track records using quantitative analysis and in depth due diligence.
Questions?
Disclosures

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