This article examines the returns and correlations of 20 asset classes in bull and bear markets as well as market corrections from 1970 or the start of an asset class index through 2010. The following definitions were used:

- Bull markets: when the S&P 500 gained 20 percent or more
- Bear markets: when the S&P 500 declined 20 percent or more
- Corrections: when the S&P 500 declined 10–19 percent

The 20 asset classes in this study include the following:

- Nine U.S. equity asset classes
- Two international equity categories: developed and emerging markets
- Four bond categories: high-grade bonds, high-yield bonds, global bonds, and Treasury Inflation-Protected Securities (TIPS)
- Cash, represented by 90-day Treasuries

Four alternative asset classes: real estate, hedge funds, natural resources, and gold

Table 1 shows the returns for 20 asset classes in the 10 bull markets that took place from 1970 or the start of an asset class index through 2010. Table 1 shows how asset class returns have been consistent or inconsistent in their relationship to each other in bull markets.

Table 2 shows the returns for 20 asset classes in the four bear markets and six corrections that took place from 1970 or the start of an asset class index through 2010. Table 2 shows how asset class returns have been consistent or inconsistent in bear markets and corrections.

Table 3 shows the correlation of each asset to the S&P 500 in bull markets as well as bear markets and corrections. Table 3 also shows the standard deviation of correlations to the index in up and down markets. A low standard deviation

### Table 1: Returns in Bull Markets

<table>
<thead>
<tr>
<th>Bull Markets (S&amp;P 500 Advances &gt; 20%)</th>
<th>S&amp;P 500</th>
<th>Large Growth</th>
<th>Large Value</th>
<th>Mid Growth</th>
<th>Mid Blend</th>
<th>Mid Value</th>
<th>Small Growth</th>
<th>Small Blend</th>
<th>Small Value</th>
<th>International</th>
<th>Emerging Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1970–Dec 1972</td>
<td>65.6%</td>
<td>81.3%</td>
<td>68.3%</td>
<td>51.5%</td>
<td>81.1%</td>
<td>34.6%</td>
<td>16.2%</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct 1974–June 1975</td>
<td>55.1%</td>
<td>61.6%</td>
<td>55.9%</td>
<td>64.0%</td>
<td>34.6%</td>
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</tr>
<tr>
<td>Oct 1975–Dec 1976</td>
<td>34.7%</td>
<td>26.9%</td>
<td>62.6%</td>
<td>58.4%</td>
<td>16.2%</td>
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</tr>
<tr>
<td>Mar 1976–Nov 1980</td>
<td>87.0%</td>
<td>113.0%</td>
<td>67.6%</td>
<td>149.8%</td>
<td>65.8%</td>
<td>336.0%</td>
<td>651.2%</td>
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</tr>
<tr>
<td>Aug 1982–Aug 1987</td>
<td>350.7%</td>
<td>319.4%</td>
<td>353.4%</td>
<td>254.2%</td>
<td>293.4%</td>
<td>336.0%</td>
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<tr>
<td>Dec 1987–May 1990</td>
<td>71.5%</td>
<td>73.2%</td>
<td>64.6%</td>
<td>73.6%</td>
<td>58.6%</td>
<td>58.9%</td>
<td>53.5%</td>
<td>30.3%</td>
<td>149.5%</td>
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<td></td>
</tr>
<tr>
<td>Nov 1990–Apr 1996</td>
<td>396.9%</td>
<td>390.1%</td>
<td>403.4%</td>
<td>307.8%</td>
<td>415.6%</td>
<td>427.6%</td>
<td>411.8%</td>
<td>445.1%</td>
<td>273.5%</td>
<td>371.3%</td>
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</tr>
<tr>
<td>Sept 1998–Dec 1999</td>
<td>56.2%</td>
<td>81.7%</td>
<td>32.4%</td>
<td>105.8%</td>
<td>49.1%</td>
<td>22.8%</td>
<td>94.9%</td>
<td>52.1%</td>
<td>49.9%</td>
<td>106.8%</td>
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<tr>
<td>Mar 2003–Oct 2007</td>
<td>98.2%</td>
<td>88.0%</td>
<td>119.0%</td>
<td>137.4%</td>
<td>149.4%</td>
<td>152.5%</td>
<td>135.7%</td>
<td>139.0%</td>
<td>215.8%</td>
<td>447.3%</td>
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<tr>
<td>Mar 2009–Dec 2009</td>
<td>60.4%</td>
<td>55.9%</td>
<td>56.1%</td>
<td>65.8%</td>
<td>67.7%</td>
<td>71.8%</td>
<td>62.4%</td>
<td>62.2%</td>
<td>64.1%</td>
<td>63.6%</td>
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</table>

### Table 2: Returns in Bear Markets and Corrections

<table>
<thead>
<tr>
<th>Bull Markets (S&amp;P 500 Declines &gt; 20%)</th>
<th>S&amp;P 500</th>
<th>High-Yield Bonds</th>
<th>Core Bonds</th>
<th>Global Bonds</th>
<th>TIPS</th>
<th>Cash</th>
<th>Real Estate</th>
<th>Natural Resources</th>
<th>Hedge Funds</th>
<th>Gold</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1970–Dec 1972</td>
<td>65.6%</td>
<td>30.3%</td>
<td>12.5%</td>
<td>37.4%</td>
<td>63.8%</td>
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<td></td>
</tr>
<tr>
<td>Oct 1974–June 1975</td>
<td>55.1%</td>
<td>8.3%</td>
<td>5.0%</td>
<td>25.7%</td>
<td>–27.0%</td>
<td>9.9%</td>
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</tr>
<tr>
<td>Oct 1975–Dec 1976</td>
<td>34.7%</td>
<td>17.2%</td>
<td>7.4%</td>
<td>49.8%</td>
<td>–25.1%</td>
<td>–4.8%</td>
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<tr>
<td>Mar 1987–Nov 1980</td>
<td>87.0%</td>
<td>12.7%</td>
<td>29.2%</td>
<td>91.2%</td>
<td>61.2%</td>
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</tr>
<tr>
<td>Aug 1982–Aug 1987</td>
<td>350.7%</td>
<td>185.5%</td>
<td>149.6%</td>
<td>299.9%</td>
<td>83.9%</td>
<td>100.2%</td>
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<tr>
<td>Dec 1987–May 1990</td>
<td>71.5%</td>
<td>16.3%</td>
<td>23.1%</td>
<td>3.2%</td>
<td>20.7%</td>
<td>21.2%</td>
<td>10.6%</td>
<td></td>
<td>–26.9%</td>
<td></td>
</tr>
<tr>
<td>Nov 1990–Apr 1996</td>
<td>396.9%</td>
<td>351.5%</td>
<td>264.5%</td>
<td>272.0%</td>
<td>214.2%</td>
<td>240.9%</td>
<td>254.5%</td>
<td>4.6%</td>
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</tr>
<tr>
<td>Sept 1998–Dec 1999</td>
<td>56.2%</td>
<td>5.0%</td>
<td>6.5%</td>
<td>6.1%</td>
<td>–2.2%</td>
<td>42.0%</td>
<td>25.4%</td>
<td>4.6%</td>
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</tr>
<tr>
<td>Mar 2003–Oct 2007</td>
<td>98.2%</td>
<td>68.0%</td>
<td>19.2%</td>
<td>45.4%</td>
<td>20.1%</td>
<td>13.6%</td>
<td>180.0%</td>
<td>48.5%</td>
<td>57.7%</td>
<td>133.8%</td>
</tr>
<tr>
<td>Mar 2009–Dec 2009</td>
<td>60.4%</td>
<td>54.1%</td>
<td>7.1%</td>
<td>12.6%</td>
<td>11.8%</td>
<td>0.4%</td>
<td>95.5%</td>
<td>32.7%</td>
<td>10.9%</td>
<td>15.7%</td>
</tr>
</tbody>
</table>

**Color Key**: **Green**: Gained more than the S&P 500 in bull markets; **Gray**: Gained less than the S&P 500 in bull markets, but did record positive returns; **Yellow**: Recorded negative returns in bull markets.
## TABLE 2: RETURNS IN BEAR MARKETS AND CORRECTIONS

<table>
<thead>
<tr>
<th>S&amp;P 500</th>
<th>Large Growth</th>
<th>Large Value</th>
<th>Mid Growth</th>
<th>Mid Blend</th>
<th>Mid Value</th>
<th>Small Growth</th>
<th>Small Blend</th>
<th>Small Value</th>
<th>International</th>
<th>Emerging Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear Markets (S&amp;P 500 Declines of &gt; 20%)</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Jan 1973–Sept 1974</td>
<td>-42.6%</td>
<td>-50.8%</td>
<td>-26.7%</td>
<td>-24.8%</td>
<td>-34.8%</td>
<td>-28.3%</td>
<td>-9.6%</td>
<td>-36.4%</td>
<td></td>
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</tr>
<tr>
<td>Sept 1987–Nov 1987</td>
<td>-29.6%</td>
<td>-31.7%</td>
<td>-27.0%</td>
<td>-40.4%</td>
<td>-30.2%</td>
<td>-20.3%</td>
<td>-20.7%</td>
<td>-36.6%</td>
<td>-32.5%</td>
<td>-14.5%</td>
</tr>
<tr>
<td>Jan 2000–Feb 2003</td>
<td>-40.2%</td>
<td>-58.8%</td>
<td>-18.9%</td>
<td>-49.6%</td>
<td>-17.2%</td>
<td>5.4%</td>
<td>-63.5%</td>
<td>-25.5%</td>
<td>16.5%</td>
<td>-48.7%</td>
</tr>
<tr>
<td>Nov 2007–Feb 2009</td>
<td>-51.0%</td>
<td>-84.0%</td>
<td>-64.4%</td>
<td>-52.9%</td>
<td>-53.7%</td>
<td>-49.7%</td>
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<td>-56.4%</td>
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<tr>
<td>Corrections (S&amp;P 500 Declines of –10% to –19%)</td>
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<tr>
<td>Jan 1970–June 1970</td>
<td>-19.5%</td>
<td>-26.4%</td>
<td>-14.7%</td>
<td>-36.2%</td>
<td>-13.0%</td>
<td>-9.8%</td>
<td>-23.0%</td>
<td>-22.9%</td>
<td>-22.7%</td>
<td>-9.8%</td>
</tr>
<tr>
<td>July 1975–Sept 1975</td>
<td>-11.0%</td>
<td>-26.4%</td>
<td>-14.7%</td>
<td>-36.2%</td>
<td>-13.0%</td>
<td>-9.8%</td>
<td>-23.0%</td>
<td>-22.9%</td>
<td>-22.7%</td>
<td>-9.8%</td>
</tr>
<tr>
<td>Jan 1977–Feb 1978</td>
<td>-14.3%</td>
<td>-17.7%</td>
<td>-3.8%</td>
<td>-27.3%</td>
<td>20.8%</td>
<td>27.3%</td>
<td>100.0%</td>
<td>-33.5%</td>
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<td>-33.5%</td>
</tr>
<tr>
<td>Dec 1980–July 1982</td>
<td>-16.5%</td>
<td>-26.2%</td>
<td>-10.9%</td>
<td>-26.7%</td>
<td>-13.2%</td>
<td>5.8%</td>
<td>-53.5%</td>
<td>-25.5%</td>
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<td>-46.7%</td>
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<tr>
<td>June 1990–Oct 1990</td>
<td>-14.7%</td>
<td>-14.0%</td>
<td>-17.1%</td>
<td>-20.8%</td>
<td>-22.9%</td>
<td>-29.0%</td>
<td>-28.1%</td>
<td>-9.6%</td>
<td>-15.9%</td>
<td>-61.4%</td>
</tr>
<tr>
<td>May 1998–Aug 1998</td>
<td>-13.5%</td>
<td>-12.9%</td>
<td>-16.6%</td>
<td>-23.6%</td>
<td>-21.4%</td>
<td>-24.5%</td>
<td>-29.8%</td>
<td>-29.0%</td>
<td>-28.1%</td>
<td>-9.6%</td>
</tr>
</tbody>
</table>

## TABLE 3: SUMMARY OF CORRELATIONS TO THE S&P 500

<table>
<thead>
<tr>
<th>S&amp;P 500</th>
<th>High-Yield Bonds</th>
<th>Core Bonds</th>
<th>Global Bonds</th>
<th>TIPS</th>
<th>Cash</th>
<th>Real Estate</th>
<th>Natural Resources</th>
<th>Hedge Funds</th>
<th>Gold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear Markets (S&amp;P 500 Declines of &gt; 20%)</td>
<td></td>
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</tr>
<tr>
<td>Jan 1973–Sept 1974</td>
<td>-42.6%</td>
<td>5.6%</td>
<td>13.8%</td>
<td>-31.6%</td>
<td>74.9%</td>
<td>133.1%</td>
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<tr>
<td>Sept 1987–Nov 1987</td>
<td>-29.6%</td>
<td>0.6%</td>
<td>3.9%</td>
<td>5.6%</td>
<td>0.8%</td>
<td>0.6%</td>
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<td></td>
</tr>
<tr>
<td>Jan 2000–Feb 2003</td>
<td>-40.2%</td>
<td>2.2%</td>
<td>32.0%</td>
<td>18.2%</td>
<td>48.8%</td>
<td>10.5%</td>
<td>47.5%</td>
<td>43.2%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Nov 2007–Feb 2009</td>
<td>-51.0%</td>
<td>-25.6%</td>
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<td>1.1%</td>
<td>2.0%</td>
<td>-64.9%</td>
<td>-53.4%</td>
<td>-22.0%</td>
</tr>
<tr>
<td>Corrections (S&amp;P 500 Declines of –10% to –19%)</td>
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<tr>
<td>Jan 1970–June 1970</td>
<td>-19.5%</td>
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<td>3.9%</td>
<td>-31.6%</td>
<td>74.9%</td>
<td>133.1%</td>
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<tr>
<td>July 1975–Sept 1975</td>
<td>-11.0%</td>
<td>8.3%</td>
<td>5.0%</td>
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<td>12.4%</td>
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<td>Jan 1977–Feb 1978</td>
<td>-14.3%</td>
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<tr>
<td>Dec 1980–July 1982</td>
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<td>-29.5%</td>
<td>-44.7%</td>
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<tr>
<td>June 1990–Oct 1990</td>
<td>-14.7%</td>
<td>6.7%</td>
<td>16.0%</td>
<td>-10.0%</td>
<td>31.4%</td>
<td>11.9%</td>
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<tr>
<td>May 1998–Aug 1998</td>
<td>-13.5%</td>
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<td>1.6%</td>
<td>-16.5%</td>
<td>-9.0%</td>
<td>-11.4%</td>
</tr>
</tbody>
</table>

COLOR KEY: Yellow: Declined more than the S&P 500 in bear markets or corrections; Gray: Recorded negative returns, but declined less than the S&P 500; Green: Recorded positive returns in bear markets or corrections.
The only equity-related asset class that escaped this horrific decline was gold, which gained 22 percent.

indicates the relationship has been consistent, and a high standard deviation of correlation indicates the connection has been inconsistent.

For space purposes, this article focuses on how equity-like assets, U.S. equities, international and emerging market stocks, real estate, hedge funds, natural resources, and gold performed relative to the S&P 500. Bond assets are discussed later in the paper.

Bear Markets
In this section the first paragraph focuses on equity assets that did not help diversify a portfolio because they declined in line with or more than the S&P 500. The second paragraph highlights equity assets that helped diversify a portfolio because they declined materially less than the index or earned positive returns.

January 1973–September 1974
The S&P 500 fell 43 percent from January 1973 to September 1974. Large growth performed even worse, plunging 51 percent, and small stocks fell 43 percent. Large value, international stocks, and real estate helped somewhat, falling 27 percent, 36 percent, and 31 percent, respectively. But natural resources and gold helped a ton, soaring 75 percent and 133 percent.

Overall, diversifying into different equity-like assets would have cushioned the blow in this severe bear market, particularly if investors had a meaningful allocation to natural resources and gold.

September–November 1987
On October 16, 1987, the S&P 500 plunged 23 percent in one day, and the index fell 30 percent over this three-month period. Diversifying into the eight other U.S. equity styles did not help; they lost 26–34 percent, with an average decline of 32 percent. However, international stocks and real estate both declined just 14 percent, natural resources fell just 1 percent, and gold edged up 9 percent.

Overall, diversification into other equities in this bear market helped a lot if investors had a significant allocation to international stocks, real estate, natural resources, and gold. But investing into different U.S. equity styles did not help at all in this decline.

January 2000–February 2003
The S&P 500 fell 40 percent during this three-year period. Growth-style investing performed much worse; large-, mid-, and small-growth stocks each fell 50–57 percent. Investing in international stocks, which plunged 47 percent, made portfolio returns worse. Emerging markets lost 38 percent.

Large value fell just 19 percent, and mid value and small value actually recorded positive returns, up 5 percent and 17 percent, respectively. Real estate, natural resources, and gold did even better, up 48 percent, 43 percent, and 25 percent, respectively.

In the other three bear markets and most of the market corrections highlighted in this study, investing in a variety of other U.S. equity styles did not help much at all, but in this bear market it would have helped a lot if investors had a value tilt. On the other hand, a growth tilt would have made returns even worse.

November 2007–February 2009
As the S&P 500 nose-dived 51 percent during the financial crisis, the other eight U.S. equity asset classes plunged an average of 52 percent, and all eight fell at least 48 percent. International and emerging market stocks fell 56 percent and 61 percent, respectively. Natural resources declined 53 percent, and real estate was the worst performer of all, losing 65 percent. Even hedge funds declined 22 percent, shocking many investors who had invested in hedge funds believing they would provide positive returns regardless of market direction.

The only equity-related asset class that escaped this horrific decline was gold, which gained 22 percent. In short, diversification into a mix of other equity asset classes did not help in this bear market. It actually made the results worse; most equity assets lost more than the S&P 500.

Market Corrections

January–June 1970
While the S&P 500 fell 19 percent, large growth and small blend did much worse, declining 26 percent and 36 percent, respectively.

International stocks helped a bit, losing 13 percent. Natural resources and gold edged up 6 percent and 1 percent, respectively. A considerable allocation to natural resources and gold would have helped in this correction, but a blend of other U.S. styles would not have helped.

July–September 1975
The S&P 500 fell 11 percent, and most equity assets performed similarly. Large growth fell 13 percent, large value and small stocks lost 10 percent, and international stocks and real estate lost 9 percent. Even gold—which outperformed the S&P 500 in eight of the 10 bear markets and corrections in this study—lagged this time, falling 15 percent.
Natural resources was the one winner, gaining 12 percent. A sizeable allocation to natural resources would have helped limit portfolio losses in this decline, but other equity-like assets would not have helped.

January 1977–February 1978
As the S&P 500 fell 14 percent, only large growth declined more, losing 18 percent.
Large value fell just 4 percent, while small value, international stocks, and real estate actually recorded strong positive returns, gaining 21–27 percent. Gold shot up 36 percent, while natural resources edged up 3 percent. In this correction, diversifying into other equity assets helped substantially.

December 1980–July 1982
As the S&P 500 fell 17 percent, large and small growth did much worse, losing 26 percent and 29 percent, respectively. Natural resources and gold also did much worse, losing 30 percent and 45 percent, respectively. International stocks fell 15 percent.
Large value helped a bit, losing 11 percent. Real estate broke even, and small value edged up 6 percent.
In declines before 1980, natural resources and gold usually had provided good resistance or even strong positive returns, but in this correction they did much worse.

June–September 1990
While the S&P 500 fell 14 percent on concerns about oil prices after Iraq invaded Kuwait, the other eight U.S. equity styles performed worse, falling an average of 21 percent. Small stocks did particularly badly, falling 24 percent. International stocks also did worse than the index, losing 22 percent, and real estate declined 13 percent.
Natural resources soared, gaining 42 percent on rising oil prices, while gold edged up 4 percent.

May–August 1998
The S&P 500 declined 14 percent during the Asian currency and debt crisis, the default on Russian sovereign debt, and the blow-up of Long Term Capital Management, a highly leveraged hedge fund. The other eight U.S. equity styles did much worse, with small stocks plunging 30 percent. International stocks and gold fell 11 percent, while real estate and natural resources both declined 16 percent. Emerging markets, the epicenter of this market decline, nose-dived 44 percent.
In the other nine bear markets and corrections in this study, at least one equity asset class performed considerably better than the S&P 500, but that was not the case in this decline.

Bull Markets
This section presents the performance of equity-related asset classes in bull markets. The first paragraph focuses on equities that outperformed or were in-line with the S&P 500, and the second paragraph highlights those that lagged the index.

July 1970–December 1972
As the S&P 500 rose 66 percent, international stocks outpaced the index with a return of 81 percent, while gold gained 64 percent.
Small stocks and natural resources trailed with returns of 52 percent and 37 percent, respectively. Overall, diversification into other equities probably would have slightly reduced portfolio gains in this advance.

October 1974–June 1975
After a painful bear market ended in September 1974, the S&P 500 rose 55 percent in just nine months. Large growth, large value, and small stocks all slightly outperformed the index.
International stocks and real estate trailed, returning 35 percent and 26 percent, respectively. Natural resources performed poorly, declining 27 percent, and gold lagged significantly, up 9 percent. Overall, diversification would have significantly reduced returns during this rising market.

October 1975–December 1976
The S&P 500 rose 35 percent during this 15-month period. Large value, small stocks, and real estate all significantly outperformed, returning between 50 percent and 63 percent.
Large growth lagged a bit, returning 27 percent. International stocks trailed more meaningfully, gaining 16 percent. Gold edged up 10 percent, but natural resources plunged 25 percent. Overall, diversifying into a mix of other equity-like assets probably would have lowered returns in this market advance.

March 1978–November 1980
Overcoming high inflation and high unemployment during this period, the S&P 500 gained 87 percent, and most other equity asset classes did even better. Small stocks soared 150 percent, large growth gained 113 percent, and real estate returned 91 percent. Natural resources gained 81 percent. The big winner was gold, which rocketed 240 percent on high inflation.
Large value and international stocks trailed, returning 68 percent and 66 percent, respectively. In this bull market, most other equity assets outperformed the S&P 500, so a diversified mix of different equities would have boosted returns.

August 1982–August 1987
The S&P 500 soared 351 percent in this five-year stretch, but the big winner was international stocks, which returned a whopping 591 percent, though a huge bubble was forming in Japanese stocks.
All other equity-like assets lagged the index. The average return of the other U.S. equity styles was 312 percent, with small growth the greatest equity-like laggard, returning 254 percent. Real estate returned 300 percent. Natural resources and gold were the lowest performers among equity assets, returning 84 percent and 130 percent, respectively. Overall, the effect of investing in other equities would have depended on the allocation; international stocks would have boosted returns while other assets would have brought returns down.

**December 1987–May 1990**
As the S&P 500 gained 72 percent, emerging markets surged 150 percent.

Other U.S. equity styles generally trailed, with small stocks returning 59 percent. International stocks gained just 30 percent as the Japanese stock market began to burst in late December 1989. Real estate and natural resources also lagged considerably, gaining just 21 percent and 11 percent, respectively. Gold declined 26 percent. Overall, diversification into different equity styles would have held down returns significantly during this market advance.

**October 1990–April 1998**
The S&P 500 gained 396 percent during this 7⅓-year stretch. The other eight U.S. equity asset classes all had returns similar to the index. Real estate and emerging market stocks surged 371 percent and 366 percent, respectively. International stocks lagged considerably, but still gained 295 percent. High-yield bonds acted more like stocks, returning 341 percent, and hedge funds did very well, gaining 311 percent.

The big laggards were natural resources and gold, which rose 162 percent and 182 percent, respectively. While diversification would have held down returns, overall portfolio returns were extraordinary as stocks, bonds, and alternatives in every category earned high returns.

**September 1998–December 1999**
While the S&P 500 gained 56 percent, growth stocks and emerging markets surged 94 percent and 109 percent, respectively, in just 16 months.

Value stocks trailed significantly, gaining just 23 percent. International stocks and natural resources lagged slightly, gaining 49 percent and 42 percent, respectively. But real estate actually lost 2 percent, and gold gained just 5 percent.

**March 2003–October 2007**
Even though the S&P 500 gained 88 percent, almost all equity-like assets outperformed the index. Value investing and small stocks gained on average 137 percent. International stocks surged 216 percent, backed by dollar weakness. Emerging market stocks rocketed 447 percent in just 4½ years. Real estate more than doubled the S&P 500, gaining 180 percent. Gold also outpaced the index, gaining 133 percent.

The only laggard among equity assets was natural resources, which gained 49 percent. But overall, diversification in other equity styles would have substantially boosted returns during this market advance.

**March 2009–December 2010**
The S&P 500 gained 85 percent in just 20 months, while mid-cap and small stocks soared 111 percent and 107 percent, respectively. Real estate and emerging markets significantly outperformed, surging 151 percent and 142 percent, respectively.

Large value, large growth, and international stocks all trailed the index, but only slightly. Natural resources and gold lagged, gaining 45 percent and 49 percent.

### Assessment by Asset Class

#### Large Growth

Large growth outperformed the S&P 500 in six of the 10 bull markets in this study and lagged in four. In the four bear markets in this study, large growth lost more than the index four times. In six market corrections, large growth lost more than the index five times. Large growth has had a high correlation to the S&P 500 in both up and down markets. The standard deviation of those correlations also has been very low, indicating large growth has had a high degree of consistency in its relationship to the index in both up and down markets.

#### Mid-Growth

Mid-growth outperformed the S&P 500 in four of the past five bull markets and slightly lagged once. It lost more than the index in all five bear markets and corrections.

#### Small Growth

Small growth gained more than the S&P 500 in three of the past six bull markets and gained less on three occasions. It lost more than the index in all six bear markets and corrections, declining significantly more on four of those occasions.

#### Large Value

Large value gained more than the S&P 500 in six out of the past 10 bull markets and gained less on three occasions. It lost less than the index in seven of the past 10 bear markets and corrections, including outperforming by at least 10 percent on three occasions.

#### Mid-Value

Mid-value outperformed the S&P 500 in three of the past five bull markets. It lost less than the index in three of the past five declining markets, including earning positive returns once.
Small Value

Small value outperformed the S&P 500 in three of the past six bull markets. It lost more than the index in four out of six declines but actually recorded positive returns in the other two.

U.S. Equity Overall

- All nine U.S. equity styles are usually highly correlated (high correlations with low standard deviation of the correlations) to each other during both rising and falling markets, and their correlations tend to rise further in declining markets. Hence, investing in different U.S. equity styles usually has not improved resistance in down markets; the few exceptions are discussed below.
- Large, mid-, and small growth have offered very few diversification benefits when combined with the index.
- Value investing, particularly small value, has offered somewhat greater diversification benefits than growth stocks. But overall the correlations of all U.S. equity styles to the index tend to be high.

International Stocks

- Companies doing significantly more business overseas, and the popularity of exchange-traded funds and hedge funds (which often have more-flexible mandates than traditional stock and bond managers) have significantly increased the correlations between U.S. and international stocks in recent years, in both bull and bear markets.
- In bull markets through the 1990s, international stocks and the S&P 500 had correlations of 0.3–0.7, but correlations have jumped to 0.8 and 0.9 in the past two bull markets.
- In bear markets and corrections before 1987, international stocks had correlations to the S&P 500 of 0.12–0.66. But in the five bear markets and corrections since 1987, the correlation has been at least 0.84 and averaged 0.92.
- International stocks lost more than the S&P 500 in just one of the eight bear markets and corrections before 2000. But in the two severe bear markets of the 2000s, they lost more both times.

Emerging Market Stocks

- Emerging markets used to have low correlations to U.S. markets during bull markets, but that has changed. Emerging markets now are much more integrated into the global economy, causing correlations to rise significantly. The correlation between emerging and U.S. markets was just 0.13 in the 1987–1990 advance, but rose to 0.49 in the 1990–1998 advance, 0.61 and 0.64 in the next two advances, and soared to 0.93 in the 2009–2010 bull market.
- Emerging markets never have provided good resistance in down markets; they have performed particularly worse in periods of significant de-risking (2008) and when they've been the epicenter of trouble (1998).

- Could emerging markets decouple from developed markets and considerably outperform in future declines? Their superior fundamentals and the growth of their economies in 2008 (when the economies of developed markets plunged) suggest a potential for decoupling. On the other hand, emerging markets remain risky and volatile assets, and decoupling may prove difficult in a global economy.

Real Estate

- Real estate outperformed the S&P 500 in four of the past nine bull markets and lost money once. Real estate outperformed or underperformed the index by at least 15 percent in eight of nine bull markets, reflecting a modest correlation in up markets.
- In nine bear markets and corrections, real estate lost more than the index just twice and earned positive returns of more than 20 percent on two occasions, reflecting a modest overall correlation in down markets as well. But when real estate has been the center of trouble, as it has been in the recent financial crisis, it is likely to decline much more than the index.
- In falling markets, real estate's correlation to the S&P 500 has had a high standard deviation of 0.38, indicating that real estate has not provided consistent diversification benefits.

Natural Resources

- Natural resources earned positive returns in six of the 10 bear markets and corrections in this study. In one period natural resources declined less than the index but on three occasions lost more.
- When conflict in the Middle East has been the key reason for a decline in the broad market (e.g., the 1973–1974 bear market; the 1990 correction), natural resources tend to provide good returns.
- In the November 2007–February 2009 bear market, natural resources initially did very well. During November 2007–June 2008, it surged 45 percent while the S&P 500 fell 16 percent. But the multi-year run-up eventually led to a speculative frenzy, and during July 2008–February 2009 natural resources fell off a cliff, plunging 68 percent in just eight months, far worse than the S&P 500's decline of 42 percent over the same period.
- In declining markets, the correlation of natural resources to the S&P 500 has had a high standard deviation of 0.42, indicating that natural resources have not provided reliable diversification benefits.
- In the 10 bull markets since 1970, natural resources lagged the S&P 500 every time, despite earning positive returns eight times. In two bull markets, however, natural resources fell hard. In the mid-1970s when the S&P 500 rose 55 percent, natural resources fell 27 percent. Just a year later
when the index gained 35 percent, natural resources fell another 25 percent. Such repeated disappointments and large underperformance in a short period of time can test investor patience in an investment strategy.

Gold
- Gold has earned positive returns in all four bear markets since 1970, including a 133-percent gain in the 1973–1974 bear market when the S&P 500 tanked 43 percent. But gold has earned positive returns in only three out of six corrections, and during December 1980–July 1982 when the S&P 500 fell 14 percent, gold sank a whopping 45 percent.
- In declining markets, gold’s correlation to the S&P 500 has had a high standard deviation of 0.34, indicating that gold has not provided dependable diversification benefits.
- In the 10 bull markets since 1970, gold has earned positive returns nine times and declined just once. It also outperformed the S&P 500 in two bull markets, both by significant amounts. But gold also has underperformed by very large amounts in several bull markets.

Hedge Funds
- Hedge funds have lagged the S&P 500 in all four bull markets since the inception of the Hedge Fund Research Index in 1990. In the four bear markets and corrections since then, hedge funds lost less than the S&P 500 all four times, including earning positive returns on two occasions.
- But as hedge funds have become more popular—total assets are now roughly $2 trillion—returns have become more pedestrian. In the three straight years 2008–2010, hedge funds have underperformed a 50–50 mix of the S&P 500 and core U.S. bonds.

High-Yield Bonds
- High-yield bonds act more like stocks than core bonds, in both up and down markets. In the past five bull markets, high-yield bonds earned positive returns all five times, and earned 70 percent or more of the S&P 500’s return on three occasions. In the past five bear markets and corrections, high-yield bonds declined all five times, while core bonds earned positive returns each time.

Core Bonds, Global Bonds, and TIPS
Core bonds, global bonds, TIPS, and cash all earned positive returns in all 10 bull markets in this study. Historically, the diversification benefits of bonds and cash have been compelling. But the following factors should be considered regarding how bonds and cash may behave relative to stocks.

High government debt and deficits. Governments in many developed countries have massive deficits and debt, which are on a path to become much worse as healthcare and pension costs grow faster than their economies.

Potential for serious trouble in the bond market. An explosion of credit over more than 30 years resulted in a housing bubble, bad debt, and a global financial crisis. Consumer debt has edged down recently, but leverage overall actually has risen because governments have taken on mountains of new debt to rescue the financial system. The world still is highly leveraged, and debt levels still are rising. Investors in government bonds are being repaid with issuance of new bonds to other investors. In other words, government bonds are a Ponzi scheme. Ponzi schemes last as long as there are more new investors than redeeming investors, and they end badly when redeeming investors outnumber new investors. In short, bonds always have had a low correlation to stocks, even in bear markets and corrections. But that may not always be the case, particularly in a highly indebted world.

“Ponzi schemes last as long as there are more new investors than redeeming investors, and they end badly when redeeming investors outnumber new investors.”

What Causes Correlations to Change?
This section presents factors that cause temporary or structural change in how an asset class interacts with other assets.

Relative Valuation
Significant variances in relative valuation increase the probability that an asset class will de-link from its long-term correlation to another asset. Here are a few examples:

Value versus growth. During 1995–1999, growth stocks significantly outperformed value. During September 1998–December 1999 alone, a 16-month period, large growth stocks soared 82 percent while large value returned a relatively paltry 32 percent. Small growth returned 95 percent, while small value gained just 14 percent. Growth stocks have had an average premium price-earnings ratio of around 60 percent to value, but by the end of 1999 the premium had soared to 200 percent. In the March 2000–February 2003 bear market, relative values compressed toward longer-term norms as value on average broke even while growth plunged more than 50 percent.

Real estate versus growth. During September 1998–December 1999, real estate actually declined 2 percent while growth stocks soared 82 percent. By the end of 1999 the
Subsequent results. All the asset classes noted above incurred disappointing returns after becoming popular. During 1984–1990, U.S. small stocks trailed the S&P 500 by about 10 percent per year, and in 1994–2002 emerging markets trailed the index by nearly 14 percent per year. In 2008 hedge funds lost 19 percent, their first-ever annual decline. The popularity of international small stocks did not last as long so their subsequent underperformance was not as severe; they lost 43 percent in 2008 when the S&P 500 fell 37 percent.

In short, the initial and subsequent effects of an asset class becoming popular can be very powerful and should not be overlooked.

Globalization

Among S&P 500 constituents that report foreign sales, 47 percent of 2009 revenues were earned outside the United States. Companies doing more business overseas has caused the correlation of U.S., international, and emerging market stocks to rise significantly, as shown in table 4.

Speed of Communications

Investors are now much more aware of what others are doing, resulting in faster, widespread copying of investment strategies. Recently, investors piled into private equity, hedge funds, emerging markets, and natural resources within a few years of each other. When asset levels for an asset class surge, uniqueness dissipates, causing correlations to the broader market to rise and alpha returns to deflate.

The Current Environment

Risk. The global financial system is dependent on the buyers of government bonds continuing to finance a Ponzi scheme. Government debts and deficits represent extraordinary risks to the global financial system.

Hope. While there are serious investment risks, there is also tangible reason for hope. Never before has as large a percentage of the world’s population been on a fast track toward economic development. If hundreds of millions or a billion or more new middle-class consumers develop in emerging markets over the next several decades, the United States could become a leading exporter, and a virtuous cycle

| TABLE 4: CHANGE IN CERTAIN CORRELATIONS AND EMERGENCE OF THE GLOBAL ECONOMY |
|-----------------------------------------------|----------------|----------------|----------------|
| | International Equity to the S&P 500 | Emerging Markets to the S&P 500 | International Equity to Emerging Markets |
| Prior to 1990 | 0.49 | 0.18 | 0.17 |
| 1990 to 1999 | 0.54 | 0.57 | 0.53 |
| 2000 to 2004 | 0.85 | 0.77 | 0.81 |
| 2005 to 2010 | 0.90 | 0.82 | 0.92 |
Hedge funds used to provide very good resistance in down markets, but as they’ve gained in popularity their strategies are becoming less differentiated from the overall market.

of rising wages and living standards could emerge both at home and abroad.

Conclusion

This research shows that investing in a variety of U.S. equity styles usually has not done much to improve resistance in down markets.

International stocks used to have low correlations to U.S. markets in both bull and bear markets, but their correlations are now very high in both rising and falling markets, particularly the latter.

Emerging markets used to have low correlations to U.S. stocks in bull markets, but as emerging markets have become much more integrated into the global economy, their correlations are now very high in both bull and bear markets.

Real estate usually has declined less than the S&P 500 in falling markets, but much depends on the relative valuation of real estate to stocks, unemployment, credit conditions, and whether real estate is the center of trouble in falling markets.

Natural resources and gold frequently have made money in bear markets and corrections, but not always, and sometimes they’ve fallen much harder.

Hedge funds used to provide very good resistance in down markets, but as they’ve gained in popularity their strategies are becoming less differentiated from the overall market. As a result, hedge funds now are more apt to lose money in falling markets, and their alpha has declined.

High-yield bonds tend to act more like stocks than core bonds, in both rising and falling markets.

Bonds always have earned positive returns in both bull and bear markets, providing excellent diversification benefits in falling markets. However, bonds may not always earn positive returns in down markets because of the poor financial condition of the biggest issuers of bonds—the governments of developed countries.

The perpetual evolution of markets and economies means that correlations between assets are subject to one-time or structural change. Serious risks, primarily related to government deficits and debts, still exist. On the other hand, never before has as large a percentage of the world’s population been on a fast track toward economic development, which offers hope for increasing wealth creation and rising living standards both at home and abroad.

In short, in making asset allocation decisions, the author recommends putting less emphasis on historical returns, risks, and correlations between asset classes, and putting extra emphasis on a portfolio’s risk and liquidity profile, relative valuation, being aware of crowded strategies, and understanding the evolution of markets and the common factor risks among seemingly different asset classes.

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