# What Factors *Really* Push Stock Prices?

Take the most insipid inspirational posters you can recall; no, not the ones they sell in the back of airline magazines, the ones found in places like non-profits' offices. Can you really visualize world peace? And if so, how; no one ever has seen it? Wouldn't we all be better off with a poster that reads, "Visualize market commentary based on facts and quantitative research, not on some quick-and-pat answer designed to fit into a seven-second soundbite?"

We all have different utopian visions, don't we?

As we all have heard crude oil, the dollar/euro exchange rate and bond yields get blamed for causing various stock market movements, both higher and lower, we should be able to assess whether these attributions are at all accurate or, as you may be suspecting by now, complete gibberish.

**Analytic Framework**
Standard & Poor's has divided the S&P 500 index (SPX) into ten different economic sectors based on GICS (Global Industry Classification Standard) codes. Each sector is divided in turn into industry groups; the total number varies according to changes in the index' composition; there are 130 at the time of this writing.

We can measure the performance of each industry group relative to the SPX. The performance indices can be regressed against a set of market factors to assess the statistical impact of each factor on the relative performance of each industry group at a 90% confidence interval. The beta, or degree to which the variance of relative performance can be explained by the variance in each market factor, will be displayed in the tables below. A positive beta means an increase in the selected factor leads to stronger performance by the industry group relative to the SPX; the opposite is true for a negative beta.

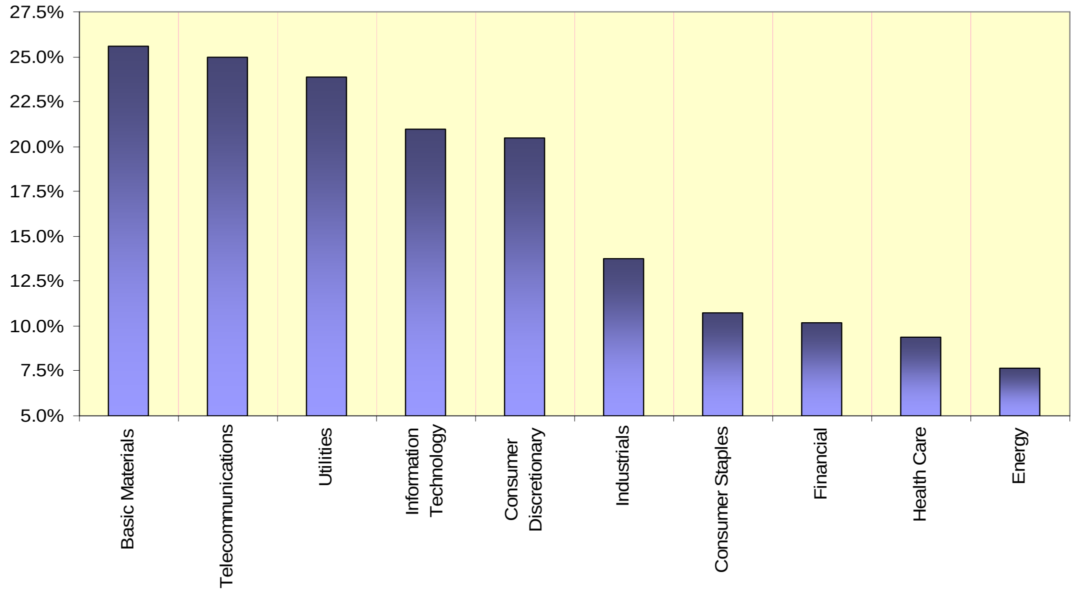
We can extract one additional measure, and that is the market capitalization of each industry group as a percentage of the SPX. If we multiply the industry group's beta by its weight in the SPX, we get a weighted beta. This is nothing more than the impact on the SPX as a whole exerted by an industry group as a function of a move in, say, crude oil prices.

Finally, if we sum all of the statistically significant positive impacts and all of the statistically significant negative impacts, we get a total impact on the SPX from the market factor. Then, and only then, can we say with full force and clear conscience the SPX rose or fell because a selected factor rose or fell.

In full disclosure, the author does not expect this to become standard practice in his lifetime.

**Crude Oil's Impact**
Higher crude oil prices are presumed to have a negative impact on stock prices. After all, more companies are net consumers of crude oil than are involved in its production and distribution, and most of us individuals consider higher prices for gasoline a negative. The stock market rally in 2006 began just before crude oil hit its all-time high in nominal dollars. As we can see in Chart 1, each of the ten economic sectors participated in that rally…with the energy sector bringing up the rear. The assertion that lower crude oil prices "caused" the stock market rally appears to be based in fact.

**Chart 1: Total Return On Select SPDRs Since Crude Oil's August 2006 Peak**




The net impact is something different. The seventeen groups with positive betas to crude oil prices account for 15.04% of the SPX by weight. Their weighted beta of 3.52% exceeds the weighted beta of -2.96% for the 60 groups accounting for a combined total of 70.1% of the SPX. While the breadth of crude oil's negative impact vastly exceeds that of its positive impact, the depth of crude oil's positive impact is such that its net weighted beta is a positive 0.56%. The partial contribution of crude oil prices - its impact with all other factors held equal - can be restated as every 1% rise in crude oil prices should push the SPX higher by 0.0056%.

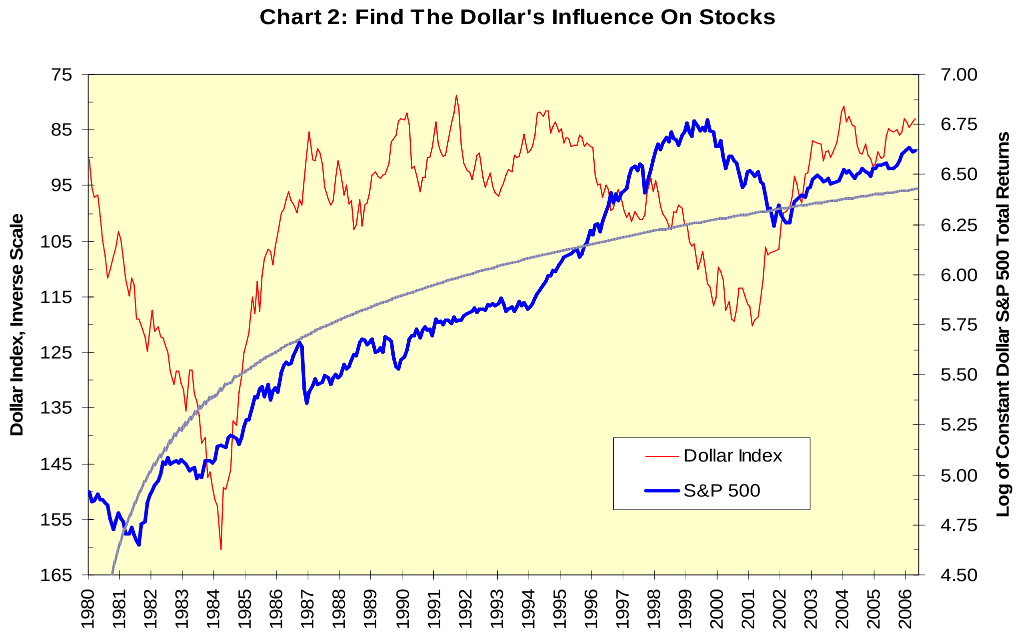
**Crude Oil Beta-Weighted Impact On S&P 500**

| | SPX Weight | CL Beta | Weighted Beta |
|---|---|---|---|
| Pharmaceuticals | 6.34% | 0.044 | -0.28% |
| Industrial Conglomerates | 3.83% | 0.044 | -0.17% |
| Other Diversified Financial Services | 5.03% | 0.031 | -0.16% |
| Computer Hardware | 3.25% | 0.044 | -0.14% |
| Systems Software | 2.76% | 0.051 | -0.14% |
| Communications Equipment | 2.63% | 0.053 | -0.14% |
| Integrated Telecommunications | 3.08% | 0.042 | -0.13% |
| Semiconductors | 2.02% | 0.048 | -0.10% |
| Multiline Insurers | 1.89% | 0.048 | -0.09% |
| Diversified Banks | 2.26% | 0.039 | -0.09% |
| Household Products | 2.13% | 0.039 | -0.08% |
| Hypercenters & Superstores | 1.11% | 0.071 | -0.08% |
| Investment Banking & Brokerage | 2.57% | 0.030 | -0.08% |
| Tobacco | 1.31% | 0.060 | -0.08% |
| Regional Banks | 1.76% | 0.040 | -0.07% |
| Home Improvement Retailers | 1.03% | 0.064 | -0.07% |
| Aerospace & Defense | 2.48% | 0.026 | -0.06% |
| Drug Retailers | 0.77% | 0.074 | -0.06% |
| Air Freight & Logistics | 0.90% | 0.062 | -0.06% |
| General Merchandise Retailers | 0.52% | 0.107 | -0.06% |
| Data Processing & Outsourcing | 1.01% | 0.051 | -0.05% |
| Movies & Entertainment | 1.81% | 0.028 | -0.05% |
| Healthcare Equipment | 1.67% | 0.030 | -0.05% |
| Biotech | 1.27% | 0.038 | -0.05% |
| Property & Casualty Insurers | 1.35% | 0.034 | -0.05% |
| Thrifts & Mortgages | 1.32% | 0.035 | -0.05% |
| Department Stores | 0.76% | 0.060 | -0.05% |
| Asset Management & Custodial Banks | 1.17% | 0.035 | -0.04% |
| Healthcare Distributors | 0.48% | 0.083 | -0.04% |
| Consumer Finance | 0.89% | 0.032 | -0.03% |
| Life & Health Insurers | 1.27% | 0.021 | -0.03% |
| Wireless Services | 0.62% | 0.042 | -0.03% |
| Diversified Chemicals | 0.87% | 0.028 | -0.02% |
| Packaged Foods | 1.30% | 0.018 | -0.02% |
| Restaurants | 0.80% | 0.028 | -0.02% |
| Application Software | 0.41% | 0.047 | -0.02% |
| Airlines | 0.09% | 0.207 | -0.02% |
| Semiconductor Equipment | 0.34% | 0.055 | -0.02% |
| Automobile Manufacturers | 0.26% | 0.073 | -0.02% |
| Food Retailers | 0.40% | 0.046 | -0.02% |
| Hotels | 0.58% | 0.032 | -0.02% |
| Computer Storage & Peripherals | 0.48% | 0.034 | -0.02% |
| Apparel Retailers | 0.29% | 0.053 | -0.02% |
| Computers & Electronics Retailers | 0.20% | 0.070 | -0.01% |
| Specialty Stores | 0.30% | 0.045 | -0.01% |
| Environmental Services | 0.17% | 0.065 | -0.01% |
| Apparel & Accessories | 0.31% | 0.030 | -0.01% |
| Casinos & Gaming | 0.23% | 0.040 | -0.01% |
| Auto Parts & Equipment | 0.15% | 0.058 | -0.01% |
| Electrical Components & Equipment | 0.41% | 0.020 | -0.01% |
| Personal Products | 0.18% | 0.042 | -0.01% |
| Leisure Products | 0.15% | 0.045 | -0.01% |
| Household Appliances | 0.15% | 0.039 | -0.01% |
| Office Electronics | 0.13% | 0.043 | -0.01% |
| Specialty Chemicals | 0.19% | 0.026 | 0.00% |
| Electrical Equipment Manufacturing | 0.13% | 0.038 | 0.00% |
| Distributors | 0.07% | 0.048 | 0.00% |
| Office Services & Supplies | 0.12% | 0.024 | 0.00% |
| Diversified Commercial Services | 0.07% | 0.039 | 0.00% |
| Photo Products | 0.05% | 0.049 | 0.00% |
| Subtotal: | 70.10% | | -2.96% |

| | SPX Weight | CL Beta | Weighted Beta |
|---|---|---|---|
| Integrated Oil & Gas | 6.32% | 0.283 | 1.79% |
| Oil & Gas Equipment | 1.42% | 0.430 | 0.61% |
| Oil & Gas Exploration | 0.99% | 0.430 | 0.43% |
| Oil & Gas Drilling | 0.43% | 0.469 | 0.20% |
| Oil & Gas Refining | 0.38% | 0.414 | 0.16% |
| Steel | 0.34% | 0.170 | 0.06% |
| Diversified Metals & Mining | 0.20% | 0.254 | 0.05% |
| Multiline Utilities | 1.25% | 0.039 | 0.05% |
| Electric Utilities | 1.93% | 0.024 | 0.05% |
| Gold | 0.15% | 0.243 | 0.04% |
| Construction & Farm Machinery | 0.79% | 0.037 | 0.03% |
| Aluminum | 0.23% | 0.093 | 0.02% |
| Agricultural Products | 0.19% | 0.090 | 0.02% |
| Homebuilding | 0.20% | 0.058 | 0.01% |
| Construction & Engineering | 0.06% | 0.093 | 0.01% |
| Gas Utilities | 0.08% | 0.068 | 0.01% |
| Construction Materials | 0.09% | 0.048 | 0.00% |
| Subtotal: | 15.04% | | 3.52% |
| **Total:** | **85.15%** | | **0.56%** |

## The Euro

No statement out of the blue (or anywhere else) should infuriate market analysts more than “stocks rose in spite of a weaker dollar…” In spite of? Some of the most exuberant stock market rallies of all time, including those of 1985-1987 and 1995 occurred in the midst of a declining dollar. The real message, as can be seen in Chart 2, is how the growth rate of the S&P 500’s total returns in constant dollars has grown at a pace independent of the dollar index for more than a quarter-century. The long-term observation is the dollar does not matter for stocks, never has and never will.




With the admonition above in mind for the dollar index, let's turn to a more specific set of relationships, those between the euro and SPX industry groups since April 2004. This period was chosen as it represented the starting point of the Federal Reserve's rate-hike campaign of 2004-2006 and therefore defined a new market regime.

The twenty-six groups with a statistically significant negative relationship to the euro account for 15.24% of the index' capitalization and have a combined weighted beta of -2.08%. On the other side of the ledger the 15 groups with a statistically significant relationship to the euro account for 16.35% of market capitalization and have a combined weighted beta of 4.43%. The net effect is a positive beta of 2.35%, which is a fairly high partial contribution for any one market factor. It would be far more accurate for market commentators to say the market declined despite a weaker dollar rather than the oft-mentioned opposite.

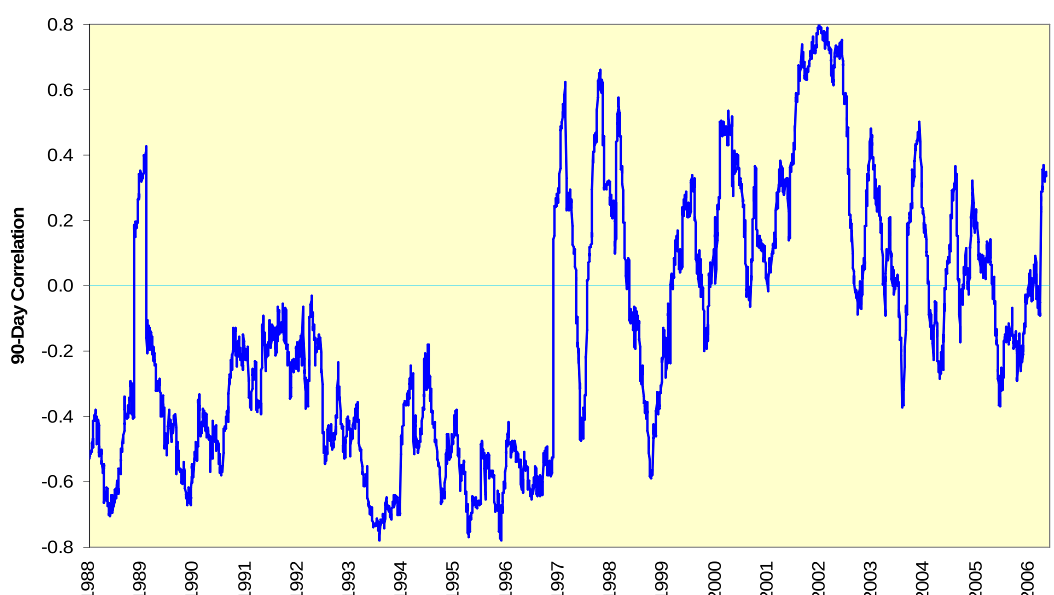
**Euro Beta-Weighted Impact On S&P 500**

| | SPX Weight | EUR Beta | Weighted Beta | | SPX Weight | EUR Beta | Weighted Beta |
|---|---|---|---|---|---|---|---|
| Computer Hardware | 3.25% | 0.099 | -0.32% | Integrated Oil & Gas | 6.32% | 0.303 | 1.92% |
| Household Products | 2.14% | 0.135 | -0.29% | Oil & Gas Equipment | 1.42% | 0.410 | 0.58% |
| Drug Retailers | 0.77% | 0.299 | -0.23% | Oil & Gas Exploration | 0.99% | 0.367 | 0.36% |
| Hypercenters & Superstores | 1.11% | 0.136 | -0.15% | Gold | 0.15% | 1.429 | 0.22% |
| Department Stores | 0.76% | 0.186 | -0.14% | Electric Utilities | 1.93% | 0.112 | 0.22% |
| Home Improvement Retailers | 1.03% | 0.115 | -0.12% | Oil & Gas Refining | 0.38% | 0.490 | 0.18% |
| Data Processing & Outsourcing | 1.01% | 0.118 | -0.12% | Oil & Gas Drilling | 0.43% | 0.394 | 0.17% |
| Packaged Foods | 1.30% | 0.086 | -0.11% | Diversified Metals & Mining | 0.20% | 0.833 | 0.16% |
| General Merchandise Retailers | 0.52% | 0.164 | -0.09% | Diversified Banks | 2.26% | 0.072 | 0.16% |
| Computer Storage & Peripherals | 0.49% | 0.141 | -0.07% | Steel | 0.34% | 0.313 | 0.11% |
| Specialty Stores | 0.30% | 0.186 | -0.06% | Asset Management & Custodial Banks | 1.17% | 0.088 | 0.10% |
| Apparel & Accessories | 0.31% | 0.165 | -0.05% | Homebuilding | 0.20% | 0.410 | 0.08% |
| Food Distributors | 0.16% | 0.280 | -0.05% | Aluminum | 0.23% | 0.307 | 0.07% |
| Food Retailers | 0.40% | 0.106 | -0.04% | Fertilizers & Agricultural Chemicals | 0.24% | 0.281 | 0.07% |
| Publishing & Printing | 0.38% | 0.107 | -0.04% | Construction Materials | 0.09% | 0.173 | 0.02% |
| Casinos & Gaming | 0.23% | 0.177 | -0.04% | | | | |
| Home Entertainment Software | 0.13% | 0.226 | -0.03% | Subtotal: | 16.35% | | 4.43% |
| Environmental Services | 0.17% | 0.159 | -0.03% | | | | |
| Leisure Products | 0.15% | 0.163 | -0.02% | | | | |
| Advertising | 0.18% | 0.132 | -0.02% | | | | |
| Motorcycle Manufacturers | 0.12% | 0.183 | -0.02% | | | | |
| Office Electronics | 0.13% | 0.165 | -0.02% | **Total:** | **31.59%** | | **2.35%** |
| Office Services & Supplies | 0.12% | 0.074 | -0.01% | | | | |
| Distributors | 0.07% | 0.107 | -0.01% | | | | |
| Healthcare Suppliers | 0.02% | 0.183 | 0.00% | | | | |
| Pharmaceuticals | 0.00% | 0.086 | 0.00% | | | | |
| Subtotal: | 15.24% | | -2.08% | | | | |

### Ten-Year Notes

If you want to stir the pot a little, start a discussion about the relationship between stocks and bonds. Everyone will have a learned opinion on whether stocks go up when yields rise or when yields fall. And everyone will be correct over large segments of history. If we look at the rolling 90-day correlation of returns between ten-year note prices and the SPX, we see how they were negatively correlated for much of the 1990s, but then switched to a long period of very positive correlation during the low-interest rate periods of 1997-1998 and again during the bear market of a few years ago. At best we can say the relationship is highly regime-dependent.

**Chart 3: Rolling Correlation of Returns: Ten-Year Notes And S&P 500**




The net weighted beta for ten-year note yields – not price – is close to neutral. A total of 16 groups with a statistically significant positive relationship to yields accounts for 11.34% of the SPX' capitalization and have a weighted beta of 0.83%. A total of 14 groups with a statistically significant negative relationship to yields accounts for 16.73% of the SPX' capitalization and have a weighted beta of -1.43%. The net effect is a beta of -0.6%; since April 2004, lower yields have, on balance, been a slight positive for stocks.

**Ten-Year Yield Beta-Weighted Impact On S&P 500**

| | SPX Weight | TY Beta | Weighted Beta | | SPX Weight | TY Beta | Weighted Beta |
|---|---|---|---|---|---|---|---|
| Electric Utilities | 1.93% | 0.163 | -0.31% | Systems Software | 2.76% | 0.058 | 0.16% |
| Other Diversified Financial Services | 5.03% | 0.038 | -0.19% | Aerospace & Defense | 2.48% | 0.049 | 0.12% |
| Diversified Banks | 2.26% | 0.080 | -0.18% | Department Stores | 0.76% | 0.104 | 0.08% |
| Multiline Utilities | 1.25% | 0.144 | -0.18% | Railroads | 0.74% | 0.103 | 0.08% |
| Regional Banks | 1.76% | 0.072 | -0.13% | Diversified Chemicals | 0.87% | 0.076 | 0.07% |
| Thrifts & Mortgages | 1.32% | 0.091 | -0.12% | Steel | 0.34% | 0.189 | 0.06% |
| Managed Health | 1.41% | 0.078 | -0.11% | Drug Retailers | 0.77% | 0.078 | 0.06% |
| Homebuilding | 0.20% | 0.341 | -0.07% | Data Processing & Outsourcing | 1.01% | 0.044 | 0.04% |
| Consumer Finance | 0.89% | 0.054 | -0.05% | Automobile Manufacturers | 0.26% | 0.171 | 0.04% |
| Specialized Finance | 0.34% | 0.108 | -0.04% | Application Software | 0.41% | 0.078 | 0.03% |
| Gold | 0.15% | 0.197 | -0.03% | Specialty Stores | 0.30% | 0.083 | 0.02% |
| Construction Materials | 0.09% | 0.093 | -0.01% | IT Consulting & Services | 0.12% | 0.124 | 0.02% |
| Gas Utilities | 0.08% | 0.097 | -0.01% | Employment Services | 0.09% | 0.166 | 0.01% |
| Home Furnishings | 0.03% | 0.086 | 0.00% | Motorcycle Manufacturers | 0.12% | 0.102 | 0.01% |
| | | | | Advertising | 0.18% | 0.060 | 0.01% |
| | | | | Office Services & Supplies | 0.12% | 0.042 | 0.01% |
| Subtotal: | 16.73% | | -1.43% | Subtotal: | 11.34% | | 0.83% |
| | | | | **Total:** | **28.07%** | | **-0.60%** |

## Conclusion

One of the toughest lessons for any trader is learning to distinguish between reasons and excuses. Every market move can be linked to an excuse; anyone who is asked to comment on the market with any frequency lapses into offering plausible excuses. This is inexcusable. Unless there are reasons, and reasons come with statistical reinforcements in this business, the best course of action is to say nothing or promise to get back to the reporter later or demand more than a seven-second soundbite.