

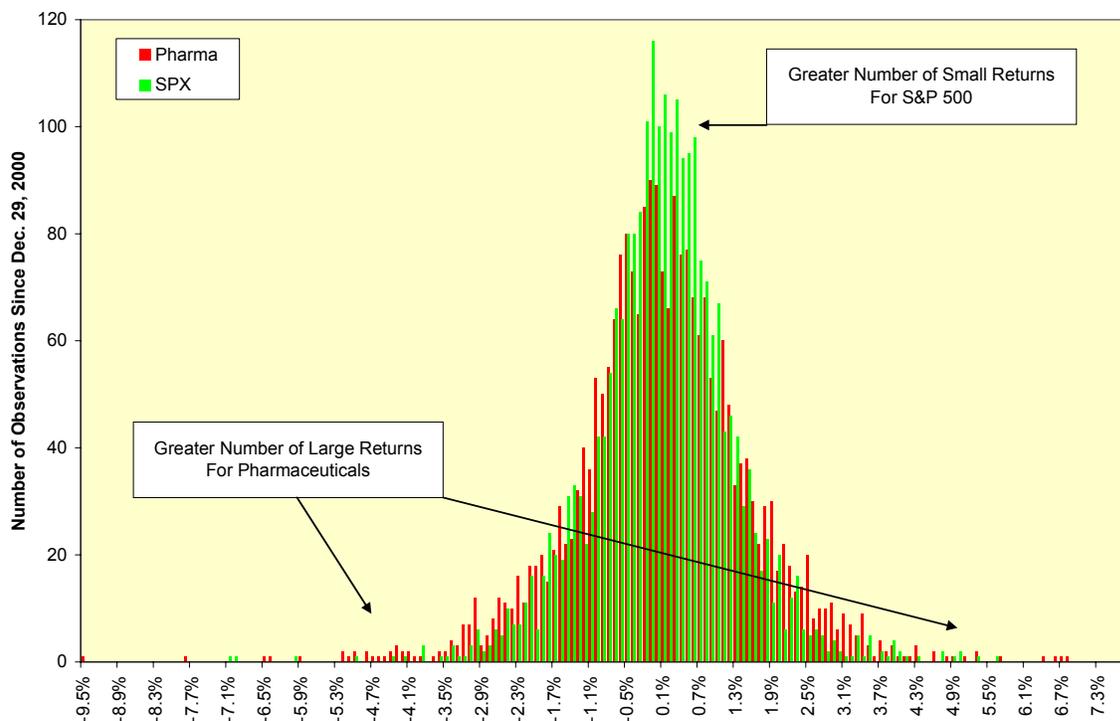
## Can Derivatives Cure Drugs?

Last week's Celebrex trapdoor opening beneath Pfizer, which came less than three months after a similar clobbering administered to Merck by Vioxx, highlights an industry with structural troubles. It would be too easy to cast stones at Big Pharma, to call them greedy or avaricious or simply careless in their testing and development. We could argue all day and into night whether the industry spends too much on advertising or is too focused on patent extension and the development of me-too drugs, so let's not. Instead let's engage in a few thought experiments about the nature and structure of this industry and those similarly situated.

First, let's remember this sector's importance to us as investors. The S&P Pharmaceutical index is the largest of the 132 index groups comprising the S&P 500. It accounts for 6.879% of the market's capitalization, so given the prevalence of indexation strategies, it is highly likely you own these firms in one form or another.

The pharmaceutical industry is a far riskier investment than the broad market as a whole as defined by its distribution of returns since the December 29, 2000 inception of the current S&P Pharmaceutical index. It has both a wider distribution of returns and a greater-than-expected incidence of extreme returns than does the broad market, and it is more skewed toward large negative values; its coefficient of skewness is (0.1257) as opposed to (0.10433) for the S&P 500. This distribution of returns defines the problem for investors: Risky assets are worth less to many. A solution is proposed later.

**Distribution of Returns: S&P Pharmaceutical Index Vs. S&P 500**



Second, the pharmaceutical industry is as much of an intellectual property business as are software and entertainment. Just as the first copy of a new operating system costs hundreds of millions of dollars to design and test and the second copy costs about 15¢ to stamp out on a CD, pharmaceutical firms have massive initial fixed costs and minuscule variable costs of production. While their products are not stolen and counterfeited as often as software or music, they face a myriad of global price controls, third-party payer policies and regulations. Finally, the profitability of pharmaceuticals is dependent on a set of legal monopolies in the form of patent protection. As the U.S. government showed when it threatened Bayer with loss of patent protection for Cipro in the anthrax episodes of 2001, those protections can be confiscated.

As an aside, has anyone ever been brought to justice for those anthrax murders?

### **A Bundle Of Options**

A third industrial parallel for the pharmaceutical industry can be found with natural resource exploration and production. Each winner has to pay for as many as twenty losers, a daunting proposition. It is a small wonder indeed why firms in this industry spend as much time as they do in wringing out the profits from their few winners and developing me-too drugs.

Viewed in option terms, an investor in a pharmaceutical firm owns two cash flow streams. The first is the existing revenues from current products, all of which have known patent expiration dates. The second is a prospective cash flow stream from a bundle of out-of-the-money call options. An out-of-the-money call option has a low probability of payoff, but a very high return when it does pay off; think of the rewards for buying put options on stock indices prior to a market meltdown.

The discounted cash flow stream from the ongoing business can be valued reasonably well, but as both the Vioxx and Celebrex cases have shown, even the revenues from existing products can disappear overnight and be replaced by mounting legal bills from the inevitable lawsuits.

The portfolio of call options is another matter altogether. Industry analysts, like the Kremlinologists of old and the Fed watchers of today, track the ongoing progress of clinical trials and try to navigate the labyrinth of the Food & Drug Administration's approval process. The end results of these efforts are mixed, as the wide distribution of returns for the S&P Pharmaceutical index demonstrates. Investors who dream of sugar plums on whether these out-of-the-money call options will reward them often wake up to find they have bought a pig in a poke instead.

### **Securitize**

The time has come for the pharmaceutical industry to securitize the options embedded in its product pipeline. Investors already own these options as a portfolio when they own the various stocks, so how much of a stretch is it to separate out each individual drug in the pipeline and sell it as a call warrant or option-embedded structured note to investors? The risk of each individual drug in the pipeline can then be confined to those seeking a portfolio of very high risk / very high return securities.

The movie business and for that matter the oil & gas drilling business long have sold participations in their wildcat projects. These investments have never been for the faint of heart, but they have allowed both industries to spin their risks off to the risk-seeking, provide a steadier and less variable stream of returns to more risk-averse investors and to concentrate on what they do best, conceive of new development projects.

The future economic well-being of the United States is going to lie increasingly in the intellectual property industries; let's face it, we have no competitive advantage with China on manufacturing costs. Our financial services industry has been a pioneer in the development of innovations such as mortgage securitizations (go Fannie, go) that redound to the benefit of society by distributing risks to, dare I say, a coalition of the willing.

It took a long time for various industries to start conceiving of themselves in financial engineering terms. We could argue that the U.S. automotive industry has transformed itself into a business that makes cars in order to make auto loans. The pharmaceutical industry can achieve the same sort of transformation by viewing itself as an innovation factory that finances itself by monetizing its future cash flows today. The alternative is what, to have a Vioxx or Celebrex blow-up three or four times a year?