

## Are Markets Efficient? -- No, Arbitrage Is Inherently Risky

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The extraordinary performance of the stock market until recent months has led many skeptics -- from Federal Reserve Chairman Alan Greenspan to bestselling economist Robert Shiller -- to complain about irrational exuberance. Market enthusiasts have responded by pointing to the efficient markets theory, which holds that the market is far better equipped to assess the prospects of American companies than any pundit.

The idea that "the market knows best" was developed at the University of Chicago in the 1960s. It has gained enormous intellectual dominance since then and is now drilled into the heads of tens of thousands of business students around the world. Yet a growing number of economists, myself included, are of the belief that because arbitrage is risky business, markets are necessarily inefficient.

The efficient markets theory holds that the trading by investors in a free and competitive market drives security prices to their true "fundamental" values. The market can better assess what a stock or a bond is worth than any individual trader. If the stock market is efficient, we don't need to worry about irrational exuberance or a crash, and we don't need to make up stories to explain the New Economy. But if the market isn't efficient, we are in for a meltdown, or at least a long period of mediocre returns.

Perhaps the most compelling evidence in favor of market efficiency is the inability of even the shrewdest investors to consistently beat the market. It isn't just that individual investors trail the passive benchmarks, such as the Standard & Poor's 500, by 2% to 3% a year. Nearly all mutual and pension funds also fail to beat the market on a consistent basis. Even the savviest investors -- George Soros, Warren Buffett, Julian Robertson -- occasionally stumble. If markets were irrational, the argument goes, then the very best investors would find strategies to make money consistently and without risk. The fact that they do stumble proves that the market truly knows best.

This last argument -- that even the best managers aren't able to outsmart the market -- is the most plausible, and has become the bedrock of the efficient market theory. Unfortunately, it is false, and for a very simple reason. In financial markets, bets against security mispricing, sometimes referred to as arbitrage, are bets that prices will converge to true values. With rare exceptions, such bets are inherently risky.

An overpriced stock today can become even more overpriced tomorrow, bringing losses to even the cleverest short-seller. A bargain today can become an even better bargain next month, bringing grief to a value investor. Even the shrewdest investors must bear these risks and so lose money on occasion. Some of the risks they face can be hedged, but many can't. Because rational arbitrage is always risky, it is inherently limited in its ability to bring prices to their true values. A free, competitive market is almost necessarily inefficient.

To illustrate this point, consider how efficient markets theory goes wrong. One very clear example is the pricing of the shares of Royal Dutch and Shell. Royal Dutch and Shell are independently incorporated in the Netherlands and England, respectively. In 1907, they formed an alliance agreeing to merge their interests on a 60-40 basis while remaining separate and distinct entities. All their profits, adjusting for corporate taxes and control rights, are effectively split into these proportions.

Information clarifying the linkages between the two companies is widely available. This makes for an easy prediction for the efficient markets theory: If prices are right, the market value of Royal Dutch should always equal 1.5 times the market value of Shell. In this case, the efficient markets theory reflects the law of one price: Identical securities must sell at the same price in different markets. If not, there would be clear and easy arbitrage opportunities from dumping the relatively expensive stock and buying the cheaper one.

The nearby chart shows the deviations of market values of Royal Dutch and Shell from the 60-40 parity from 1990 to 1999. In the early 1990s, Royal Dutch traded at a 5% to 7% discount from parity, while in the late 1990s it traded at up to a 20% premium. A closer look at the chart clarifies why the market doesn't bring the relative prices to efficiency.

A shrewd investor who noticed, for example, that in the summer of 1997, Royal Dutch traded at an 8% to 10% premium relative to Shell, would have sold short the expensive Royal Dutch shares and hedged his position with the cheaper Shell shares. Sadly for this investor, the deviation from the 60-40 parity only widened in 1998, reaching nearly 20% in the autumn crisis. This bet against market inefficiency lost money, and a lot of money if leveraged.

In this case, it is said that when Long Term Capital Management collapsed during the Russian crisis, it unwound a large position in the Royal Dutch and Shell trade. Smart investors can lose a lot of money at the times when an inefficient market becomes even less efficient. In fact, as the LTCM experience illustrates, their businesses might not survive long enough to see markets return to efficiency.

The inefficiency in the pricing of Royal Dutch and Shell is a fantastic embarrassment for the efficient markets hypothesis because the setting is the best case for that theory. The same cash flows should sell for the same price in different markets. It shows that deviations from efficiency can be large and persistent, especially with no catalysts to bring markets back to efficiency. It also shows that market forces need not be strong enough to get prices in line even when many risks can be hedged, and that rational and sophisticated investors can lose money along the way, as mispricing deepens.

But if markets fail to achieve efficiency in this near-textbook case, what should we expect in more complicated situations, when the risks of arbitrage are greater? Who would dare to sell short Internet stocks to bring their prices down to earth when a company trading at five times its fundamental value can easily rise to 10 times its value? Or who would bet against the overpriced S&P 500 as a whole? What would have happened to the sellers of the market who heeded Alan Greenspan's concerns in 1996?

If smart investors lose money whenever markets move away from efficiency, it is no puzzle that even the mightiest stumble. On average, they make money (the track records of Messrs. Soros, Buffett and Robertson are nothing to complain about) but the money they make is not without risk. The fact that arbitrage is risky in no ways implies that the market knows best. To the contrary, it shows that a misvalued market can become even more misvalued. As the great financial economist Fischer Black once wrote humorously, the market is "efficient" when security prices are within a factor of two from value.

In inefficient markets, active investment management pays off in the long run. Contrarian strategies -- betting against the mispricing -- do better over the longterm than indexation. Value stocks have in fact outperformed growth stocks over long periods in the U.S. and European markets. But these strategies are inherently risky precisely because markets can move further away from efficiency. The Internet bubble of 1998-99 killed the relative performance of value investors; Mr. Robertson was only one of the victims. The question for active investors is whether they can take the pain of volatility long enough before the bubble bursts.

The fact that markets aren't efficient doesn't imply that the government should regulate them. Far from it. There are many benefits of inefficient markets. The Internet boom would not have been possible -- at least not on the same scale -- without financing from irrationally exuberant investors. The millions of Americans now benefitting from stocks might have stuck with savings accounts without the boom. The proposals to reform Social Security -- both Democratic and Republican -- would not have even started if markets were moribund. Yet to keep the government away from markets, we do not need to proclaim that "markets know best." The weaker but more accurate proposition, that the market knows better than the government, is more than sufficient.