

FOCUS ON

THE STOCK MARKET

What's Average About the Dow?

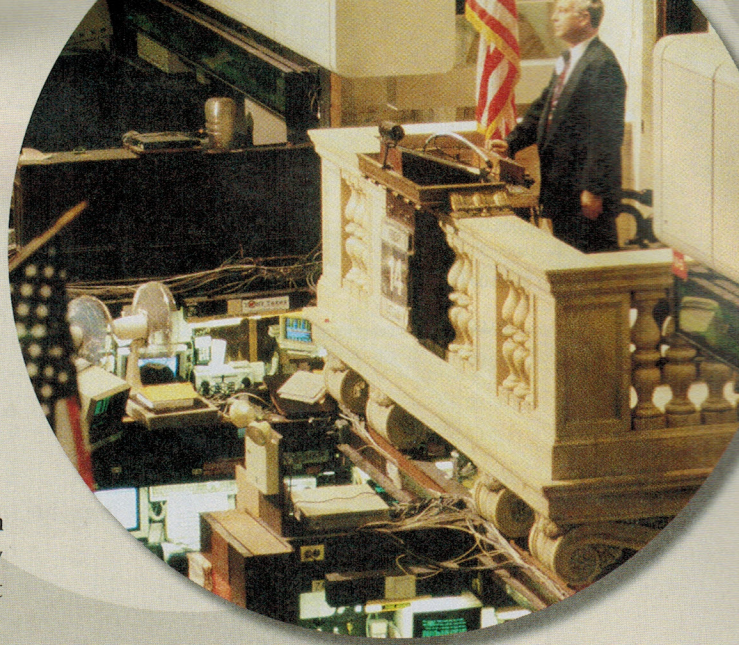
As “averages” go, this one is extraordinary. You can't watch the news without hearing what happened to it, and many people spend hours tracking it each day. It is by far the most famous indicator of stock market performance. We are talking, of course, about the Dow Jones Industrial Average, or DJIA for short. But what exactly is it?

The easiest way to understand the DJIA is by looking at its history. As the modern industrial era got under way in the late 19th century, most people considered stocks to be dangerous and highly speculative investments. One reason was a lack of regulation that made it easy for wealthy speculators, unscrupulous managers, and corporate raiders to manipulate stock prices. But another reason was that, given the complexities of daily stock trading, even Wall Street professionals had a hard time figuring out whether stocks in general were going up (a “bull market”) or down (a “bear market”). Charles H. Dow, the founder (along with Edward D. Jones) and first editor of the *Wall Street Journal*, believed he could rectify this problem by creating an “average” for the stock market as a whole. If the average was up, the market was up, and if the average was down, the market was down.

To keep the average simple, Dow chose 12 large corporations to include in his average. On May 26, 1896, he added the stock prices of these 12 companies and divided by 12, finding a mean stock price of \$40.94. This was the first value for the DJIA. As Dow had hoped, it suddenly became easy for the public to follow the market's direction just by comparing his average from day to day, month to month, or year to year.

The basic idea behind the DJIA is still the same, although the list now includes 30 stocks rather than 12; the list is selected by the editors of the *Wall Street Journal*, who occasionally change the stocks on the list. However, the DJIA is no longer the mean price of its 30 stocks. Instead, it is calculated by adding the prices of its 30 stocks and dividing by a special divisor. Because of this divisor, we now think of the DJIA as an index that helps us keep track of stock values, rather than as an actual average of stock prices.

The divisor is designed to preserve continuity in the underlying value represented by the DJIA, and it therefore must change whenever the list of 30 stocks changes or when a company on the list has a stock split. A simple example shows why the divisor must change when the list changes. Suppose the DJIA consisted of only 2 stocks (rather than 30): Stock



A with a price of \$100 and Stock B with a price of \$50. The mean price of these two stocks is $(\$100 + \$50)/2 = \$75$. Now, suppose that we change the list by replacing Stock B with Stock C and that Stock C's price is \$200. The new mean is $(\$100 + \$200)/2 = \$150$, so merely replacing one stock on the list would raise the mean price from \$75 to \$150. Therefore, to keep the “value” of the DJIA constant when we change this list, we must divide the new mean of \$150 by 2. In this way, the DJIA remains 75 both before and after the list change, but we can no longer think of this 75 as a mean price in dollars.

To see why a stock split changes the divisor, again suppose the index consists of just two stocks: Stock X at \$100 and Stock Y at \$50, for a mean price of \$75. Now, suppose Stock X undergoes a 2-for-1 stock split, so that its new price is \$50. With both stocks now priced at \$50, the mean price after the stock split would also be \$50. In other words, even though a stock split does not affect a company's total value (it only changes the number and prices of its shares), we'd find a drop in the mean price from \$75 to \$50. In this case, we can preserve continuity by dividing the new mean of 50 by $2/3$ (which is equivalent to multiplying by $3/2$) so that the DJIA holds at 75 both before and after the stock split.

Just as in these simple examples, the real divisor changes with every list change or stock split, so it has changed many times since Charles Dow first calculated the DJIA as an actual mean. The current value of the divisor is published daily in the *Wall Street Journal*.

Given that there are now well over 10,000 actively traded stocks, it might seem remarkable that a sample of only 30 could reflect overall market activity. But today, when computers make it easy to calculate stock market “averages” in many other ways, we can look at historical data and see that the DJIA has indeed been a reliable indicator of overall market performance. Figure 4.17 shows the historical performance of the DJIA.

If you study Figure 4.17 carefully, you may be tempted to think that you can see patterns that would allow you to forecast precise values of the market in the future. Unfortunately, no