

National Economic Trends



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Volatile Firms, Stable Economy

Idiosyncratic stock volatility refers to the variation in returns to an individual company's stock that is not explained by the overall market return. Given returns in a quarter, for example, we can run a regression of one company's daily returns on daily market returns and use the standard deviation of the residuals as a measure of the idiosyncratic volatility of that company's stock in that quarter. To obtain an aggregate measure, we calculate the idiosyncratic volatility for each of 500 stocks with the largest market capitalization using the CRSP (Center for Research of Security Prices) daily returns data and then calculate an average weighted by market value.

In the accompanying chart, we plot this aggregate measure of idiosyncratic volatility for the period 1963:Q3 to 2002:Q4, with the shaded areas indicating business recessions dated by the National Bureau of Economic Research. We observe some interesting patterns. First, idiosyncratic volatility exhibits some persistence: If it is high, it is likely to remain at a relatively high level for a while. Second, idiosyncratic volatility fluctuates widely across time and it tends to rise especially during business recessions. It also has a dramatic upward spike during the stock market bubble in the late 1990s. Third, and most interestingly, as noted by many financial market observers, idiosyncratic volatility has increased on average in the past four decades: A linear time trend accounts for about 24 percent of its total variation.

According to standard finance theory, a firm's stock price is equal to its discounted expected future cash flows. Therefore, rising idiosyncratic volatility might reflect the fact that the firm-level economic performance has become more volatile. To investigate this hypothesis, some researchers have looked at firm-level variability in sales and earnings growth and have found upward trends in these measures as well. The increase in firm-level variability is in sharp contrast with the well-documented decline in the variability of the aggregate U.S. economy. Some tentative explanations have been put forward to reconcile

the diverging trends in macroeconomic and firm-level volatilities. For example, Philippon (2003) suggests that the two phenomena can be explained simultaneously by the fact that goods markets have become more competitive.¹ Competition between firms magnifies the effects of idiosyncratic productivity shocks, which helps explain the rise in firm volatility. At the same time, competitive pressures could induce firms to increase the frequency of their price adjustment, making the overall economy more resilient to aggregate demand shocks.

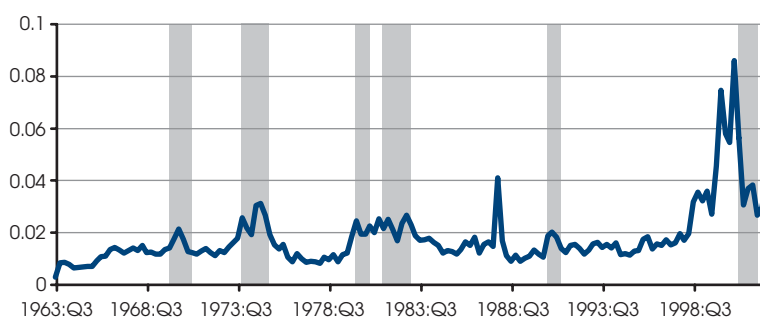
The increased firm-level volatility has important implications for the U.S. economy. For example, with a higher degree of idiosyncratic volatility, a typical firm is presumably more vulnerable to bankruptcy risk and thus needs to pay a higher default premium to raise capital in the bond market. Indeed, Campbell and Taksler (2003) find that spreads between corporate and Treasury bond yields tend to widen during periods of higher idiosyncratic risk in the period between 1963 and 1999.² This explanation is particularly relevant for the bond market in the late 1990s, when yield spreads widened substantially, despite the fact that investors were quite optimistic about the overall performance of the U.S. economy. This episode is less puzzling, however, if we take into account the dramatic increase in idiosyncratic volatility during this period.

—Hui Guo

¹ Philippon, Thomas. "An Explanation for the Joint Evolution of Firm and Aggregate Volatility." Working paper, New York University, 2003.

² Campbell, John and Taksler, Glen. "Equity Volatility and Corporate Bond Yield." *Journal of Finance*, December 2003, 58(6), pp. 2321-50.

**Value-Weighted Idiosyncratic Stock Volatility:
1963:Q3 to 2002:Q4**



Views expressed do not necessarily reflect official positions of the Federal Reserve System.