Economic SYNOPSES
short essays and reports on the economic issues of the day

2003 ■ Number 3

Does Stock Market Volatility Forecast Returns?

Hui Guo

When stock market risk, or volatility, increases, risk-averse investors tend to reduce their holding of equities relative to safe assets such as Treasury bills. Thus, to induce investors to hold a broadly measured stock market index, the expected excess stock market return—the difference between the return on the stock market index and a risk-free rate—has to rise. Such a positive relation between stock market volatility and returns is an important prediction of the widely accepted capital asset pricing model.

The level of volatility tends to persist over time, and, hence, we expect that past volatility should provide some indication of future stock market returns. Several studies, however, have found that volatility, by itself, explains little of the variation of stock market returns. We replicate this result in the accompanying table. Quarterly realized volatility is measured by the sum of the squared daily stock market returns in a quarter. We regress quarterly excess returns, measured by the difference between the return on the Standard & Poor's 500 index and the yield on three-month Treasury bills, on this measure of volatility. Row 1 shows that the adjusted R^2 from this regression is 0.01, indicating that volatility accounts for only about 1 percent of the variation of the one-quarter-ahead excess stock market return.

The weak estimated relationship between stock market volatility and returns may reflect the fact that other factors also affect stock prices. For example, Guo (2000) shows that, in addition to the risk premium, a liquidity premium is also an important component of excess stock market returns.[1] Intuitively, if investors have excess liquidity, they might be willing to hold stocks when expected return is low, even though expected volatility is high. However, the theory still stipulates a positive relation between stock market volatility and returns after taking into account the liquidity premium.

Although the liquidity premium is not directly observable in data, the consumption-to-wealth ratio is a suitable proxy for it. Row 2 shows that the one-quarter-lagged consumption-to-wealth ratio has predictive power for excess stock market returns.[2] Moreover, when this proxy for liquidity is included in the regression, we find that past volatility explains a significant portion of excess stock returns (row 3). Thus, theory and empirical evidence both indicate that stock market returns increase when volatility rises. ■

[1] Guo, Hui. "Limited Stock Market Participation and Asset Prices in a Dynamic Economy." Working Paper 2000-031B, Federal Reserve Bank of St. Louis, January 2002.

[2] This corroborates the finding in Lettau and Ludvigson: "Consumption, Aggregate Wealth, and Expected Stock Returns." *Journal of Finance*, June 2001, *56*(3), pp. 815-49.

Forecasting Excess Stock Market Returns: Regression Coefficient Estimates

	Intercept	Volatility	Consumption-to-wealth ratio	Adjusted R^2
1	–0.009	2.763		0.01
2	–0.806		1.898	0.09
3	–1.081	5.721	2.481	0.15

NOTE: The sample spans 1952:Q2 to 2002:Q3. The *p* value for volatility is 8.2 percent in row 1 and is less than 1.0 percent in row 3.

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