
A NOTE ON THE CRASH AND PARTICIPATION IN STOCK INDEX FUTURES

JAMES T. MOSER

This communication documents a substantial change in the relationship between volume and open interest for the S&P 500 futures contract. Not unexpectedly, it affirms a positive association between volume and open interest. However, comparison of the relationship for the pre- and post-Crash periods implies that the elasticity of volume with respect to open interest increased from 0.16 before the Crash to 0.98 afterwards. This suggests a substantial change in trading strategies. Further evidence suggests that the decrease in contract volume following the Crash was not a direct result of the Crash, but to subsequent events.

Data employed in the specification are the levels of volume and open interest for S&P 500 futures trading at the Chicago Mercantile Exchange in the period April 23, 1982, through January 10, 1990. The data are contract volume and open interest across all active contracts. Inclusion of all actively traded contracts obviates the need for ad hoc procedures to accommodate rollovers as contracts expire.

The underlying question addressed by the specification is whether the Crash affected the level of contract participation or if it affected

The analysis and conclusion of this article are those of the author and do not indicate concurrence by the members of the research staff, the Board of Governors, or the Federal Reserve Banks.

■ *James T. Moser is a Senior Economist at the Federal Reserve Bank of Chicago.*

how the contract is used. The regression is

$$\begin{aligned} \text{Vol}_t = & 16835 + 11488D_t + 40.30T_t - 56.82D_tT_t + 0.14OI_t \\ & (20.9) \quad (1.4) \quad (3.8) \quad (-11.9) \quad (13.8) \\ & + 0.20OI_tD_t + e_t \\ & (5.1) \end{aligned}$$

where Vol_t is the level of volume on trading day t ; D_t is zero prior to October 19, 1987 (the date of the Crash) and 1 thereafter; T_t is the time since contract inception (measured in calendar days); OI_t is open interest on trading day t . Products of these variables are used in tests for interactions and e_t is an error term. Quantities in parentheses under the coefficients are t statistics.

The coefficient on D_t does not differ reliably from zero.¹ This suggests that controls for other factors adequately explain the decline in volume. Given the nature of these other factors, in particular the time-from-inception variable, this coefficient suggests that the post-Crash reduction in volume was not abrupt. An abrupt shift might be expected if the Crash is perceived as proving the contract less useful. The positive coefficient on time since inception indicates that the evolution of strategies involving the S&P contract generally increases volume. The negative coefficient on the interaction of the Crash and time since inception indicates reversal of this trend. An F test rejects the null that these coefficients sum to zero, indicating that the decrease in volume following the Crash has more than offset any additions to volume which can be attributed to the evolution of strategies. Comparison of the significance levels of the coefficient on D_t and the coefficient on this interaction variable implies that the Crash preceded a steady decline in contract volume as opposed to precipitating an immediate shift in participation. This pattern of coefficients is consistent with the Crash leading to subsequent events which affected participation. No doubt some will construe these events as stemming from regulatory interference. This researcher feels direct evidence linking regulatory events to rates of contract participation is needed to warrant such a conclusion.

The coefficients on open interest and its Crash-interaction variable are indicative of changes in the type of strategies conducted before

¹ Indeed, the sign of this coefficient is inconsistent with the decline in volume which occurred after the Crash. Pre-Crash contract volume was 53,604 contracts per day. After the Crash average daily volume fell to 43,630 contracts.

and after the Crash. The coefficients on open interest and the Crash-interaction variable confirm the expected positive association between volume and open interest. These are usefully stated as elasticities of volume for open interest. In the pre-Crash era, this elasticity (evaluated at mean activity levels) was 0.16, indicating a 0.16% change in volume for each one percent change in open interest. Following the Crash the elasticity rose to 0.98, a substantial rise, indicating that each one percent rise in open interest increased volume by 0.98%. This shift in elasticities is indicative of a substantial decline in the proportion of strategies involving intraday positions. The evidence suggests that following the Crash the proportion of trades involving overnight positions increased substantially. This suggests an important change in the economic role of the S&P contract.

Interesting work remains to be done on participation in futures contracting. This communication suggests that exploration of the relationship between open interest and volume can be exploited to obtain insight on how futures contracts are used. Specifically, one can discriminate between long- and short-term strategies based on the elasticity of volume for open interest. These changes may be fundamental; that is, they may reflect changes in the underlying economic structure.

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