

Limit Moves and Price Resolution: The Case of the Treasury Bond Futures Market: A Comment

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In a recent article appearing in this journal, Ma, Rao and Sears (MRS) explore price resolution on days when price limit constraints are triggered in the Treasury bond futures market. The authors attempt to solve through empirical analysis whether traders overreact to information, thereby triggering price limits, or if price limits merely act as barriers to price movements motivated by fundamental market information. Based on their analysis, the authors conclude in favor of the overreaction hypothesis. The limits, they argue, thus function as a cooling off mechanism, allowing traders a period of time to evaluate market information in a rational manner and then to resume trading.

Their conclusion rests on the finding that prices have a tendency to reverse direction after striking limits. They argue that this tendency, as opposed to a tendency for prices to continue moving in the same direction after striking a limit as before, supports the hypothesis that traders overreact to information. The construction of a cumulative average return (CAR) series by MRS, however, is not adequate to distinguish between a price reversal resulting from an overreaction and that caused by new information. The result is that even if price reversals are caused by new information, the conclusion that price reversals are caused by overreactions will be supported.

The problem associated with the MRS analysis stems from the inclusion of intraday price limit moves in the dataset. The dataset used in MRS consists of limit move days during which one of two distinct types of moves occurs. In the first, an overnight move, prices move to a limit and remain there for the remainder of the trading day. The second type of move, an intraday move, occurs when prices hit one of the limits, but then rebound. Although MRS distinguish between the two types of moves, the methodology used to analyze them is the same, and therein lies the problem.

For a dataset which contains intraday limit moves, the methodology used by MRS is biased toward accepting the price reversal hypothesis. By definition, the

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CAR measure calculated by MRS over the interval $t = 1$ to $t = 360$ must show a reversal, or at least no change, from the CAR which existed at interval $t = 0$. This is so because the daily price limit prevents prices from moving beyond it, thus only allowing prices to remain at or reverse themselves from the limit price. For example, in interval $t = 1$ the CAR only can reverse itself or remain unchanged from the level observed at interval $t = 0$. This holds for every other interval between $t = 0$ and $t = 360$ as individual prices move to or away from the limit price. If the market on at least one of these intraday limit days closes at a price other than the limit price, the CAR at $t = 360$ will show a reversal from the limit. Extending into the next day, the CARs which are calculated from interval $t = 361$ and beyond, will be based on a level which is higher (lower) than the level of the CAR calculated at the time the down (up) limit was struck on the previous day. Thus, there will be a tendency to conclude that levels of the CAR in the vicinity of interval $t = 0$ are higher (lower) than intervals beyond $t = 1$ following an up (down) limit move. That is, there will be a bias toward acceptance of price reversal behavior when intraday limit moves are included in the data set.

In summary, the analysis of price behavior in the Treasury bond market offered by Ma, Rao and Sears suffers from the fact that prices are constrained by price limits. On intraday limit move days, price reversals are the only type of behavior which can be observed after a limit is reached. This behavior, however, can result because of new information entering the market or because traders had previously overreacted to information. Since the methodology used by the authors does not distinguish between these two types of behaviors, they simply beg the question when they conclude that price reversals imply overreaction behavior.

Bibliography

- Ma, C. K., Rao, R. P. and Sears, R. S. (1989): "Limit Moves and Price Resolution: The Case of the Treasury Bond Futures Market," *The Journal of Futures Markets*, 9:322-335.

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