



An ordered probit analysis of transaction stock prices



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Abstract

We estimate the conditional distribution of trade-to-trade price changes using *ordered probit*, a statistical model for discrete random variables. This approach recognizes that transaction price changes occur in discrete increments, typically eighths of a dollar, and occur at irregularly-spaced time intervals. Unlike existing models of discrete transactions prices, ordered probit can quantify the effects of other economic variables like volume, past price changes, and the time between trades on price changes. Using 1988 transactions data for over 100 randomly chosen U.S. stocks, we estimate the ordered probit model via maximum likelihood and use the parameter estimates to measure several transaction-related quantities, such as the price impact of trades of a given size, the tendency towards price reversals from one transaction to the next, and the empirical significance of price discreteness.

References (63)

Yakov Amihud *et al.*

[Dealership market: Market-making with inventory](#)

Journal of Financial Economics (1980)

Michael Barclay *et al.*

[Announcement effects of new equity issues and the use of intraday price data](#)

Journal of Financial Economics (1988)

David Easley *et al.*

[Price, trade size, and information in securities markets](#)

Journal of Financial Economics (1987)

Mark Garman

Market microstructure

Journal of Financial Economics (1976)

Lawrence Glosten *et al.*

Estimating the components of the bid/ask spread

Journal of Financial Economics (1988)

Lawrence Glosten *et al.*

Bid, ask and transaction prices in a specialist market with heterogeneously informed traders

Journal of Financial Economics (1985)

Joel Hasbrouck

Trades, quotes, inventories, and information

Journal of Financial Economics (1988)

Thomas Ho *et al.*

Optimal dealer pricing under transactions and return uncertainty

Journal of Financial Economics (1981)

Ananth Madhavan *et al.*

A Bayesian model of intraday specialist pricing

Journal of Financial Economics (1991)

Anat Admati *et al.*

A theory of intraday patterns: Volume and price variability

Review of Financial Studies (1988)



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...Similar approaches are applied for stock market predictions. Hausman, Lo and MacKinlay (1992) show that OP is superior in capturing the stock price changes compared to simple linear regression approaches, while Purda (2007) utilize OP to analyse stock market reactions originating from anticipated and surprising bond rating changes. Yang and Parwada (2012) also incorporate OP to predict the direction of price movements of nine Australian stocks....

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...Given the natural ordering of the index levels, the probabilities of transition can be computed according to an ordered qualitative dependent variable models, and then used to reconstruct the corresponding discrete-time transition matrix. Similar methodologies have been used in other contexts: for instance, Hausman et al. (1992) use ordered probit models to estimate the conditional distribution of transaction stock price changes; Nickell et al. (2000) and Hu et al. (2002) model the distribution of credit ratings changes by ordered qualitative models, proposing the derivation of ad-hoc transition matrices as an alternative to the rating matrices provided by credit rating agencies. In all previous cases the transition probabilities are constant over time, hypothesis that corresponds to a specification of an homogeneous Markov chain dynamics....

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