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Price limits on a call auction market: Evidence from the Warsaw Stock Exchange

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Abstract

We empirically investigate the impact of price limits on volatility and autocorrelation in the call auction segment of the Warsaw Stock Exchange (WSE). Because call auctions offer time-out periods to investors, we do not expect price limits to counter overreaction and panic in this market structure. Indeed, our empirical findings show that price limits result in excess volatility on the next trading day and strong continuation of price movements, which indicates that price limits only delay the adjustment of prices to equilibrium levels. Our results question the necessity of price limits in the call auction system of the WSE.

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1. Introduction

A number of security markets worldwide impose limits on daily asset price movements. Among these markets are very liquid and important exchanges, such as Paris Bourse/Euronext and the

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Tokyo Stock Exchange. A price limit rule restricts daily changes in asset prices by a defined percentage of a previous price. Depending on the regulatory framework in a particular market, trading is either suspended after a limit hit or continues, with subsequent prices fixed either at the limit or within the price limit bounds.

Because price limits directly interfere with asset price resolution, their influence is actively discussed by both practitioners and academic researchers. Price limit advocates consider them beneficial due to the following reasons. First, price limits prevent markets from overreacting by bounding the maximum price change during the trading day. Thus, until trading is resumed, investors may reassess new information and adjust their beliefs about the asset's fundamental value accordingly. Second, price limits constitute an upper bound for daily volatility and thus reduce the risk that investors bear during turbulent trading days. Therefore, price limit mechanisms are supposed to ensure orderly markets and smooth prices.

However, the implementation of price limits is associated with tangible costs for market participants, which may outweigh their potential benefits. First, prices cannot adjust immediately to their equilibrium in case of large changes in the fundamental asset value because they are restricted by the allowed variation band. A second cost of price limits lies in their interference with liquidity. Because price limits restrict trading beyond certain price ranges and may cause trading halts, some investors are excluded from trading which may cause temporal inefficiency of portfolios and suboptimal risk sharing.

Whether the gains from price limit application exceed its costs is scrutinized in a number of studies of equity and futures markets. Evidence on the beneficial influence of price limits is provided by Huang, Fu, and Ke (2001), Ma, Dare, and Donaldson (1990), and Ma, Rao, and Sears (1989a). Other studies (Chen, 1998; Gay, Kale, Kolb, & Noe, 1994) find no support for systematic overreaction by market participants, thus challenging the expected advantage of price limits. Another strand of the literature, analyzing the impact of price limits under different price limit regimes on particular markets, casts further doubt on the view that price bounds yield beneficial effects. These investigations document that tighter price limits do not necessarily result in lower volatility levels on the stock markets of Korea (Chung, 1991), Taiwan (Chen, 1993; Kim, 2001), and Greece (Phylaktis, Kavussanos, & Manalis, 1999). A possible reason behind this finding is that price limits, bounding volatility on the limit-hit day, merely transfer it to the subsequent day. Abnormally high volatility on the days following a limit move is reported by Kim and Rhee (1997) for the Tokyo Stock Exchange.¹ This volatility spillover is accompanied by strong price continuation after limit hits, indicating that price limits retard price discovery (Kim & Rhee, 1997; Shen & Wang, 1998). The available evidence thus indicates the lack of conformity between proposed and actual effects of price limits.

There are, however, marked differences in market architecture across exchanges and, therefore, price limits do not necessarily have the same effects across markets. The trading process, for example, as one of the key characteristics of market organization, can be organized as periodic call auctions, continuous auctions, or as continuous dealer markets. The studies cited above all focus on markets where trading takes place continuously or the market clears frequently during operating hours.² To the

¹ Similar effects are reported for circuit breakers (Kuhn, Kurserk, & Locke, 1991) and trading halts on the NYSE (Lee, Ready, & Seguin, 1994). Ma, Rao, and Sears (1989b) find lower volatility after limit-hitting days; their methodology was, however, subject to heavy criticism (Lehmann, 1989; Miller, 1989).

² In Taiwan, for example, the market is organized as a periodic call auction with the time between market clearings varying between 60 and 90 s (see Kim & Limpaphayom, 2000).

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