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Short-selling constraints as cause for price distortions: An experimental study

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In this paper we explore the influence of the possibility to short stocks and/or borrow money in laboratory markets. A key innovation of our study is that subjects can simultaneously trade two risky assets on two double-auction markets, allowing us to differentiate between assets with relatively high versus low capitalization. Divergence of opinions is created by providing each trader with noisy information on the intrinsic values of both assets. We find that when borrowing money or shorting stocks is restricted prices are systematically distorted. Specifically, stocks with high (low) capitalization are traded at lower (higher) prices than their fundamental value. Lifting the restrictions leads to more efficient prices and more liquidity, thereby also lowering volatility and bid-ask spreads.

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1. Introduction

After the sudden demise of Lehman Brothers in September 2008 several stock exchanges, including London and New York restricted the short selling of stocks of finance companies. This move – argued to be necessary to stop speculators from driving stocks prices to artificially low levels – was not uncommon in the history of finance. Nobody likes a “spoiler”, and short-sellers are bearish, while most “common” people bet on rising stock prices. The bears who, during a boom (or bubble) argue that prices are too high are ridiculed, and if they dare to make money on their opinion by selling short, they are called economic vandals when a bubble pops. Thus, bans on short selling are neither uncommon nor unpopular – the public is usually easily convinced that “speculators” need to be tamed.

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However, the story is probably not so easy – bears serve an invaluable function in markets, as they may keep prices from rising too far. Markets are supposed to aggregate all information available and incorporate it in prices. When this is possible without constraints, markets should properly reflect all available information, in the vein of Fama's efficient market hypothesis (Fama, 1970, 1991). The key question is thus how good markets are at aggregating and disseminating information (Hayek, 1945). The question whether and how short-selling constraints and limits of arbitrage influence price aggregation is central to this issue and is therefore hotly debated. This is particularly relevant since, on a global scale, constraints on short-selling vary between and within markets. Bris et al. (2007) give a comprehensive overview on the differences of short-selling restrictions across markets before the financial crisis of 2008. Subsequently, additional (temporary and/or sector-specific) bans on short-selling were imposed in numerous countries (e.g. in the US in 2008 and Germany in 2010). Since it is still not clear whether isolated bans on short-selling are an appropriate measure to "protect" markets against speculators, further insights in the effects of short-selling constraints on price aggregation are of high importance from a regulatory point of view.

In a seminal paper Miller (1977) argues that when investors disagree about the value of a stock, the optimistic buy while the pessimistic sell. When no constraints exist, prices reflect the average opinion. However, in the presence of short-selling constraints, divergence of opinions leads to higher-than-justified prices, as pessimists are unable to sell a stock once they no longer hold it, while optimists can buy without any limitations other than the money they have. As a consequence prices will be set by the optimists and thus too high. This is called the "overvaluation hypothesis" (see Duffie et al., 2002; Jiang, 2005; Scheinkman and Xiong, 2003; Shleifer and Vishny, 1997; for more literature supporting this view). In contrast, Diamond and Verrecchia (1987) claim that prices will not be biased because of short-selling constraints if traders have rational expectations. According to their analytical model, short-selling constraints only decrease the speed of price adjustment to private information.

The empirical evidence on the issue is mixed.¹ We attribute this to the difficulties in measuring relevant variables. Specifically, to explore the effect of short-selling constraints on market efficiency researchers have to (i) measure the degree to which shorting is constrained, (ii) estimate the intrinsic value of the stock, and (iii) measure the degree of divergence of opinions. None of the three is easy, but especially the last two are extremely tricky. Calculating the correct intrinsic value of a stock (if it exists at all) is the goal of a whole profession and so far no generally accepted model has been found. Similarly, collecting the different opinions on the market is virtually impossible. Thus, for both questions empirical research has to rely on proxies, which are noisy at best, biased at worst.

Given the methodological challenges to empirical studies, we think this issue lends itself naturally to experimental exploration. In laboratory markets we can control the institutional rules, intrinsic values of the contracts traded, and the fundamental information available to participants, thus solving all three of the tricky estimation problems that hamper empirical studies in this field.

We are aware of four studies that have explored the effects of short-selling restrictions in an experimental setting: Ackert et al. (2002), Haruvy and Noussair (2006), and King et al. (1993) are all based on the classical Smith et al. (1988) setting and find (weak) support for Miller's overvaluation hypothesis. However, in all three studies participants receive symmetric information, while asymmetry is an important feature of real markets. Fellner and Theissen (2011) set up a model with asymmetric information with results corroborating the overvaluation hypothesis, but they restrict the number of tradable assets to only one (as do Haruvy and Noussair, 2006; King et al., 1993). Only Ackert et al. (2002) implement trading in two assets. However, while one asset is intended to replicate a stock, the other is likened to a lottery ticket, as it has only a 4-percent-chance of generating a positive payoff. Thus, also in this study the important issue of investment decisions between different stocks, which is central to real financial markets, is not addressed.

A static equilibrium model proposed by Jacobsen et al. (2000) indicates that short-selling constraints on stocks will lead to a systematic bias, notably the overvaluation of low-capitalized

¹ See Asquitha et al. (2005); Boehme et al. (2006); Bris et al. (2007); Chen et al. (2002); Cohen et al. (2007); Daouk and Charoenrook (2005); Desai et al. (2002); Doukas et al. (2006); Figlewski and Webb (1993); Jones and Lamont (2002); Nagel (2005); Saffi and Sigurdsson (2011) for various approaches delivering inconclusive results on this issue.

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