



ISSN  
2671-3462 (print)  
2671-3470 (online)

Economy, Business & Development (2020) 1(1), 1-18  
DOI: 10.47063/ebd.00001

RESEARCH PAPER

Journal homepage: <https://journals.ukim.mk/index.php/ebd>

## COULD SHORT SELLING IMPROVE THE QUALITY OF EMERGING STOCK MARKETS? – REVIEW OF SOME THEORETICAL AND EMPIRICAL EVIDENCE PRESENTED IN LITERATURE

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### Abstract

*Short selling is a common practice in many developed markets. However, due to the lack of a suitable regulatory, institutional and market infrastructure, short selling cannot be practiced in many emerging market countries. Furthermore, the regulators who were concerned about potential adverse effects of short selling during various episodes of crises decided to place some constraints on short selling at different points in time and for different periods of time. Based on the experience with the short selling practices and the bans on short selling in different countries around the world and by respecting the assumption that there is at least a basic regulatory, institutional and market infrastructure, the author will try to answer the question: Could short selling improve the quality of emerging stock markets? According to the author's findings, short selling could improve the quality of emerging stock markets, under the determined condition. Additionally, as the regulatory, institutional and market infrastructure becomes more and more developed, the possibility of the market quality to be improved to a higher degree by short selling will increase.*

**Key words:** short selling, short sale bans, emerging stock markets, stock markets performance, stock market quality

**JEL classification:** G15 G19

### Introduction

Short selling is the sale of a security which is not owned by the seller at the time of the agreement. There are two forms of short sale transactions, i.e. two mechanisms to sell a security short. Within the first mechanism, the seller borrows a security from a security lender and sells it to a buyer in the open market, then he buys the security and returns it to the security lender at some point in the future. Therefore, the seller borrows the security before selling it. In this way, the seller guarantees availability of the security for its successful delivery on the settlement date. Such short selling is the covered short selling. The second form of short sale transactions is called naked or uncovered short selling. Opposite to the covered short selling, the naked short selling implies that the sellers do not borrow or even intend to borrow securities which they are due to deliver to the buyers on the settlement date of the transaction. In other words, the short sellers sell securities without previously securing the availability of the securities on the settlement date of the transaction. Thereby, the short sellers cannot guarantee that they will have an access to the securities at the time of settlement. If the naked short seller cannot borrow the security

for its successful delivery on the settlement date, there is a probability that the transaction will fail. (see: Yadav, Fotak and Raman, 2009; Bianchi and Drew, 2012)

There is an increased interest in short selling of a security if it is overvalued. In other words, the economic nature of different securities is the main motivator for short selling.

When the short sellers anticipate decline in the price of a security, they take a short sale position. They make a profit if the security price declines. Conversely, the short sellers incur losses if the price rises. As this trading strategy creates opportunities for making a profit, short selling is a common practice, primarily in developed financial markets. Furthermore, by shorting the securities, the short sellers depress securities prices. Economists and regulators generally agree that it is good for short selling to depress the prices of securities if the securities are overvalued and if the securities prices regress to their fundamental values in this way. The short sellers provide a valuable service to investors in some markets if they identify overvalued securities and correct mispricing. However, if the short selling pushes securities prices below their fundamental values, then it is counterproductive. Although the short selling can artificially depress securities prices below their fundamental values, it is not easy for the short sellers to make a profit in this trading strategy. Namely, the security price decrease caused by shorting the securities may be higher, equal to or lower than the security price increase caused by buying the securities to close the short sale position. The short sellers will make a profit only if they can buy securities at lower prices than they sold them for, in order to close the short sale position. The difference between the selling price and the buying price should be higher than trading costs. Otherwise, the short sellers will incur losses.

In short selling strategy, the short sellers can make a profit not only by shorting the overpriced securities, but also by shorting some securities that are priced correctly. Making a profit by shorting some securities that are not overvalued is incorrect but possible when the short seller weakens investors' confidence in the issuer whose securities were sold short. Another way in which the short seller may make a profit within short sale transaction implies that he somehow fools other investors into selling him the securities at a price that is lower than the one he charged to his buyers of securities. This possibility is present until investors catch the short seller in his game. If this happens before the short seller purchases the securities to cover his short position, he can suffer substantial losses as the investors drive up security prices. Moreover, the short seller may try to maintain security prices low by spreading false rumours about the issuer or by attempting to manipulate the prices of his securities in order to make a profit through short sale transactions of correctly priced securities. Since these activities are illegal, the security issuer may be expected to fight back. Following the above mentioned it appears that making a profit in this way may be risky, incorrect and very unprofitable. (see: Battalio, Mehran and Schultz, 2012)

Besides the economic features of securities, there are some other motivators for short selling. Some researchers discerned larger presence of the short sellers around particular corporate events such as analyst forecast revisions, analyst downgrades, disappointing earnings announcements and the discoveries of financial misconduct. However, there is no consensus among the researchers whether bad news events cause short selling or not.

Investors who believe the securities are overpriced and expect to make a profit by purchasing the securities at lower prices than they sold them for will maintain short positions for longer periods. Contrary to these investors, market makers and high-frequency traders generally sell securities short for short periods, typically for a few minutes or even for a few seconds. Market makers and high-frequency traders are the major short sale traders. Most short sales are conducted by them and especially by options market makers who sell short to hedge their option positions. (see: Battalio, Mehran and Schultz, 2012)

A short selling transaction can be a hedging or a speculative one. Hence, a trader can enter a short selling transaction to transfer a risk or to speculate on security price movement. Due to the possibility of achieving different trading objectives, the short selling transactions are commonly employed in many markets around the world, including stock markets, bond markets, global foreign exchange markets, gold bullion markets, futures and options markets, for both risk transfer (hedging) and speculation. In this article, we will focus on short selling in stock markets.

Each market has to meet the institutional, personnel information and regulatory requirements for the short selling to be effective. Specifically, an efficient stock-lending system, a short sale order execution system and short sale supervisory system need to be established, the reliable and occupational stock-lenders, stock-borrowers, short sale order executors and short sales regulators need to be qualified, the up-to-date accounting data and other information on the participants in the short selling process need to be provided, and the comprehensive regulation of short sales need to be established. Due to the lack of a suitable regulatory, institutional and market infrastructure, the short selling cannot be practiced in many emerging market countries. (see: Fantazzini and Maggi, 2012)

On a regular basis, the short selling has drawn the attention of scientists, regulators and general public in the periods of market collapses. This was the case during the global financial crisis, too. Every time the question whether the short sellers were responsible for panic selling and massive stock price declines was raised or for the correction of mispricing, liquidity increase and volatility decrease, i.e. for market quality improvement.

The author intends to provide the knowledge necessary for the policy makers, market regulators and participants to strengthen or make a decision about the short selling affirmation in emerging stock markets. More specifically, the results in this paper could motivate policy makers, market regulators and participants to find an appropriate approach for further affirmation of short selling in the emerging stock markets in which the short selling is allowed. They could also motivate market regulators in the emerging stock markets in which the short selling is banned to rethink the decision about the prohibition of short selling in their countries, and then make a decision about the short selling affirmation, collaborating with policy makers and participants. The results in this paper will be of use to the researchers as well. The researchers could be motivated to provide scientific support for the short selling affirmation in emerging stock markets to be effective. The researchers could, for example, investigate if there are market conditions under which the short selling activity in emerging stock markets could be detrimental to stock price efficiency, and measuring the effectiveness of bans on short selling in emerging stock markets, and other relevant issues.

Based on the experience with the short selling practices and the bans on short selling in different countries around the world and by respecting the assumption that there is at least a basic regulatory, institutional and market infrastructure, we will try to answer the question: Could short selling improve the quality of emerging stock markets? To answer this question, we need to understand the short selling process i.e. the activities and participants in this process. We also need to consider the theoretical knowledge and the experience associated with the implications of short selling on emerging stock markets performance and the consequences of imposing constraints on short selling. These issues will be addressed in the following four sections of the article. Finally, we will come to the conclusion.

### **Short Selling: Activities and Participants in the Process**

The covered short selling process starts with the short seller's borrowing the stocks from the stock owner, either directly or through an intermediary. To arrange a stock lending/borrowing transaction, the short seller seeks a counterparty which owns or holds the stocks and which is willing to lend those stocks. The demand for stocks intended to be borrowed and sold short by the short seller and the supply of stocks intended to be lent for a fee by its owner or holder are matched in the stock lending market.

Three key participants in a stock lending/borrowing transaction are a stock owner, a stock lender and a stock borrower. The stock owner is the entity whose shares are lent/borrowed in the stock lending/borrowing transaction. When the stock owner decides to lend his shares directly to borrowers, he simultaneously takes over the role of the stock lender as well. In this case, he has to establish and maintain his own internal lending department. By establishing this department and directly lending the shares to borrowers, the stock owner retains total control over the lending process and can obtain additional revenue. However, only the largest institutional investors, such as insurance companies and pension funds that have shares in their portfolios can lend the securities in this way, because the costs of setting up a lending department and other necessary infrastructure are high. Frequently, the stock owners lend their shares through an intermediary. In this type of stock lending, two different entities take over the role of the stock owner and the role of the stock lender. In other words, the intermediary acts

as the stock lender. The largest intermediaries between the stock owners and the stock borrowers have traditionally been custodian banks. The custodian banks lend shares on behalf of the stock owners and any revenue generated by stock lending is divided among them in accordance with a prearranged fee sharing agreement. Besides the custodian banks, some other agents, e.g. asset managers and dealers also lend shares on behalf of the stock owners, but they do not act as custodian institutions for these securities. The stock owners obtain more lending revenue by lending the shares through these intermediaries than by lending through custodian banks.

In the stock lending/borrowing transaction, the stock borrowers are the short sellers. They are usually “prime brokerage firms facilitating the short demand for their own proprietary trading desks, for their hedge fund clients and other leveraged investors” (Reed, 2013, 254). The short sellers were proven to be skilled investors and to earn more return per deal than unskilled traders. The evidence was provided by Chague and Giovannetti (2017) and Chague, De-Losso and Giovannetti (2019) in the research covering 4,575,324 stock loan contracts closed in the Brazil Stock Market from January 2012 to December 2014. The skilled short sellers “contribute to the price discovery process by accelerating the incorporation of negative information into stock prices, instead of by avoiding short-term price overshooting” (Chague, De-Losso and Giovannetti, 2019, 90). Additionally, these two groups of authors found that the short sellers have the stock-picking and market-timing skills. In their study, Chague, De-Losso and Giovannetti stated: “With respect to stock-picking, we find that skilled short-sellers are more likely to pick value, liquid, short- and long-term losers, and high-volatility stocks. With respect to timing, we find that skilled short-sellers are more likely to initiate a short position after price drops, prior to earning announcements and around sell recommendations.” (Chague, De-Losso and Giovannetti, 2019, 90) Besides these two skills, Chague and Giovannetti uncovered the cover-timing skill for the short sellers as well. This skill is based on the ability of the short sellers to choose the time point when to cover their short selling positions.

Most stock loans in the stock lending market are made in widely held stocks which are cheap to borrow. The rest of the stock loans is made in the stocks which are less popular among the stock holders and more expensive to borrow. “Finding the shares to borrow can sometimes be a problem. Brokers often borrow shares from the accounts of their customers, although this practice is restricted. Institutions can and do lend shares from their portfolios in the institutional stock lending market. In the typical stock loan agreement, the lender can demand the return of the shares at any time. This gives the lender the flexibility to sell the shares at any time. [...] Furthermore, the borrower can also return the shares at any time. Less frequently, the borrower and lender may agree to a term loan of the shares in which the shares may not be recalled for a fixed period of time.” (Angel and McCabe, 2009, 240)

The settlement of a stock lending transaction takes three trading days. In most equity markets, a stock sale is also settled in three trading days. As the transfer of stocks both from the lender to the borrower and from the seller to the buyer occurs in  $T + 3$ , i.e. three days after the transaction date, a short seller will borrow a stock on the same day when he sells the stock short in order to simultaneously ensure the delivery of stocks to the buyer by the deadline, and to minimise borrowing costs.

When the short seller receives the borrowed stocks from the lender, in return, he has to transfer the cash or other securities as collateral. The short seller places cash rather than other securities with the stock lender. Usually, the short seller places the proceeds from the short sale as a deposit with the stock lender. The amount of cash and the value of securities have to be equal to or slightly higher than the market value of the stocks. Based on the previously stated fact, it is clear that the covered short selling is a fully collateralised transaction. The value of the stock loan is adjusted to the market on a daily basis. If the stock price increases, the stock lender will require additional collateral for the loan. However, if the stock price decreases, the stock lender will return some of the collateral to the short seller. When the short seller returns the stock loan to the stock lender, the stock lender returns the collateral to the short seller. These two returning operations occur simultaneously. The short seller can provide stocks to sell them short not only by collateralised stock loans, but also by a repurchasing agreement. “The typical and economically equivalent operation for cash - rather than security-driven transaction - is a repurchasing agreement or a buy/sell back, whereby received security serves as collateral for a cash loan” (Geraci and Veredas, 2016, 5), as Geraci and Veredas stated.

A stock loan which is collateralised with cash can be a viable alternative for lender's financing. Additional benefit of the stock lending for the stock lender is the possibility to earn a stock lending fee. This fee refers to the price the short seller effectively pays for borrowing the stock, i.e. the price of the stock loan. It depends on the supply of and demand for the stock loan and varies over time. The stock lending fee is low for the vast majority of stocks that are easy to borrow. However, the short sellers pay much higher prices for stocks that are hard to borrow. Some stocks will be hard to borrow if they are less widely held and consequently, if they are in high borrowing demand and/or in low lending supply. These stocks are said to be trading special, or just special. Only few stocks are traded special each day. The specials are not exclusively small stocks. They are identified by increased stock lending fees and, thus, by their low so-called rebate rates. The special stocks are hard to borrow not only due to the higher borrowing costs, but also due to another problem. Namely, special stocks "present additional difficulties to borrowers. Only well-placed investors, e.g., large proprietary trading desks, can borrow specials and receive the reduced rebate. Brokers generally do not borrow special shares on behalf of small investors and instead deny short-sale orders. Loans in stock specials are therefore expensive for well-placed investors and impossible to obtain for retail investors." (Reed, 2013, 248) The short seller does not pay a stock lending fee by transferring cash to the stock lender. Instead, the stock lender receives the spread between the current market interest rate and the rebate rate paid to the short seller.

During the stock lending period, the stock lender invests received cash collateral and earns interests. The interest on the invested cash collateral is calculated at the current market interest rate. A part of the earned interest returns to the short seller. It is calculated at the rebate rate. The rebate rate is negotiated between the short seller and the stock lender on a case-by-case basis. It effectively determines the stock lending fee and vice versa. The higher (lower) the stock lending fee, the lower (higher) the rebate rate is. Hence, the rebate rate is higher if the stocks are easy to borrow. In this case, the rebate rate is slightly below the current market interest rate. Conversely, the rebate rate is lower if the stocks are hard to borrow. In such event, the rebate rate may be substantially below the current market interest rate. In rare and mostly extreme cases, the rebate rate can be negative. If the rebate rate is negative, the short seller will pay interest to the stock lender rather than the other way around.

Based on everything previously mentioned, we can conclude that the short seller earns the current market interest rate minus the stock lending fee. The short seller can expect to earn almost full rebate rate on the collateral or the general collateral rate of the stocks which are easy to borrow. Of the stocks which are not so easily available for borrowing, the short seller can expect to earn the rate which is below the general collateral rate or, extremely, to make a loss in the stock lending transaction.

After the short seller borrows stocks, he will sell them at the prevailing market price to a stock buyer. The stock buyer is usually unaware that he is participating in a short selling transaction. Between the short selling date and the maturity date of stock borrowing/lending contract, the short seller has to repurchase the equivalent stocks in the market. If the stock price falls during this time, the short seller will repurchase the stocks at a lower price and thereby make a profit from the price difference. However, if the stock price rises, the short seller will suffer a loss in the short selling transaction. Finally, the short seller has to repay the stock loan by delivering the stocks back to the stock lender at the maturity date of the stock borrowing/lending contract. The short selling transaction is closed and the covered short selling process is finished when the short seller returns the stocks to the lender.

The naked short selling process takes less time. This process takes place without stock borrowing/lending. Given that the availability of stock provides guarantee for successful settlement of the short selling transaction, in the case when the stock borrowing/lending is excluded from the process "the short sale may result in a delivery failure in which the buyer fails to receive shares and the lender may fail to deliver those shares. Despite regulatory scrutiny of the issue, the academic community has paid limited attention to the issue." (Reed, 2013, 249)

## **General Overview of the Short Selling Implications on Stock Markets' Performance**

Regulators, governments and media share the popular view that short sellers trigger market declines. Thereby, the short sellers were blamed for distorting business activities, panic selling and large declines in the market. Due to the belief in negative influence of the short sellers, regulators in many countries

introduced new regulations and imposed bans on the short sales in order to end the downturn in the markets during the global financial crisis and debt crisis. However, financial theory and financial economists take different views on the short sellers and the implications of their trading on stock market quality. On the one hand, most literature (e.g. Yadav, Fotak and Raman, 2009; Lecce, Lepone, McKenzie and Segara, 2012; Massa, Zhang and Zhang, 2015; Sobaci, Sensoy and Erturk, 2014; Chen and Rhee, 2010; Chague, De-Losso, De Genaro and Giovannetti, 2013; Feng and Chan, 2016; Jung, Kim and Lee, 2013; Wang, Lee and Woo, 2017) explains that short sellers improve the overall market quality by enhancing the price efficiency, the stock price predictability, the liquidity, the stability and the short sales profitability, as well as by detecting financial misconduct in the market. On the other hand, some theorists (e.g. Geraci and Veredas, 2016; Thornock, 2013; Ni and Yin, 2019; Luo, Ni, and Tian, 2019) argue that short sellers follow manipulative and predatory trading strategies, which cause less informative prices, i.e. pressures focused on the initiation of stock price increase and the formation of overpriced stocks, firm decisions distortion, firm value dampening and market destabilisation.

According to the widely accepted standpoints (e.g. Boehmer and Wu, 2012; Lee, 2016; Edwards and Hanley, 2010; Blau and Brough, 2012; Yadav, Fotak and Raman, 2009; Lecce, Lepone, McKenzie and Segara, 2012; Sobaci, Sensoy and Erturk, 2014; Lee and Wang, 2015; Jung, Kim and Lee, 2013), the short selling provides the efficient price discovery process. As most empirical studies suggest that the short sellers are informed and rational traders, the short selling may be used, and it is often used, as a mispricing correction tool. The short selling helps to incorporate negative information into stock prices and helps to align stock prices with their fundamental values. It increases the speed of the adjustment of security prices to the relevant information.

The possibility of selling stocks short enables traders to narrow the bid–ask spread, and consequently to reduce transaction costs for investors. If the transaction costs were lower, the investors might trade in larger quantities and thus enhance the liquidity of stock market. The investors might also execute their trades faster and additionally enhance the liquidity of the market, as they can enter and exit the stock market more easily at a time that is most convenient to them. In the market in which it is easier to buy and sell stocks, the investors are more likely to invest in productive businesses and the businesses are more likely to raise capital. Thereby, the market allocation is more likely to be efficient and the rate of economic growth is more likely to be higher. Stock market liquidity is also a key variable for efficient market risk pricing.

Although some theorists (e.g. Geraci and Veredas, 2016) argue that the short sellers destabilise the market, the vast majority of financial economists (e.g. Lee, 2016; Yadav, Fotak and Raman, 2009; Sobaci, Sensoy and Erturk, 2014; Lee and Wang, 2015; Feng and Chan, 2016; Jung, Kim and Lee, 2013) regard the short sellers as the stock market stability defenders. The short sellers are often considered to be positioned at the first line of defence against market instability. Namely, by maintaining the stock prices in line with their fundamental values and by reducing the overvaluation of shares, the short sellers prevent losses to the other less informed investors, who may otherwise purchase overpriced shares. In this way, they enhance corporate governance and prevent firm value dampening. Following above mentioned emerges that the short sellers do not trade against the market, but that they are the so-called contrarian traders.

Given that there are different views on the effects of the short selling among theorists, regulators, governments and media, as well as among theorists themselves, the impact of the short selling on the performance of the stock market is still highly controversial. The effects of the short selling have often been debated. It has been one of the most considered issues in finance literature, especially since the recent global financial crisis. As the short selling is a common practice in many developed markets, most existing empirical studies put focus on these markets. Empirical evidence from developed markets mainly points to positive roles of the short selling.

Boehmer and Wu (2012), among others, using four different approaches to measure how efficiently prices incorporate information (high- and low-frequency measures of the relative informational efficiency of prices, post-earnings-announcement drift and return reversals at the daily frequency), discovered that the short sellers improve the informational efficiency of prices in the US stock market. Their findings suggest that the short sellers help keep prices in line with fundamental values. In other words, the short sellers play a critical role in facilitating the efficient price discovery. As the authors of study stated: “The

short selling is associated with more efficient pricing in the sense that prices appear to be closer to efficient or fundamental values when the short sellers are more active. Our results suggest that the efficiency-enhancing effect of the short sales affects prices quickly.” (Boehmer and Wu, 2012, 318) Positive influence of the short selling in correcting the overpricing quickly and promoting the price discovery process in the US stock market is also argued by Lee (2016). Namely, in the study in which a Kalman Filter approach was applied to estimate deviations from a stock’s fundamental value, Lee (2016) revealed that the short sellers exploit a temporary mispricing in the market. Specifically, she found the higher (lower) levels of the short selling for temporarily overvalued (undervalued) stocks. “High (low) short-selling activity in temporarily overvalued (undervalued) stocks leads to the faster reduction of mispricing, while high (low) short-selling activity in undervalued (overvalued) stocks delays the correction of mispricing.” (Lee, 2016, 830) Through this analysis, Lee (2016) found no evidence that heavy shorting activity of the short sellers destabilises the stock market by amplifying the magnitude of underpricing. Edwards and Hanley (2010) found that the short selling contributes to the lower level of underpricing even of the IPOs in the US stock market. Contrary to popular belief of many academics that the short selling is constrained early in the IPO process, in the study, the authors mentioned that the “short selling is an integral part of the aftermarket trading of IPOs. Despite possible constraints on both the ability and cost of borrowing shares for delivery, we show that short selling occurs simultaneously with opening the trading and without a delay, as previously thought. Short selling occurs on the offer day in 99.5% of the IPOs in our sample and the majority of first-day short sales occur at the opening of trading.” (Edwards and Hanley, 2010, 21-22)

Blau and Brough (2012) examined whether the short sellers in the US market intend to push prices lower in the stocks that are already underpriced or if they are contrarian traders. In the research, the authors applied correlation and regression analysis. From a theoretical perspective, when the consecutive days of abnormally high shorting activity, which the authors in their study denote as concentrated shorting episodes, occur after periods of negative returns, the short sellers are said to trade against the market. “On the other hand, if the short sellers add the informational efficiency of individual stock prices by targeting stocks that become out-of-line with their fundamental value (Diether et al., 2009a), then we expect that concentrated shorting activity will occur in stocks that have experienced recent price run-ups.” (Blau and Brough, 2012, 188) According to the authors’ findings, the concentrated short selling activity reflects episodes of contrarian trading. It follows periods of positive returns rather than periods of negative returns, as well as periods of abnormally high volatility. The short sellers will target the stocks that are increasing in price during the periods of high price volatility in order to correct overvaluation. Additionally, the authors discovered that the returns become negative shortly after the last day of the concentrated shorting episodes. This finding shows that, during the episodes, the short sellers are informed about future price movements and can predict them.

While the association between short selling and price changes is weak in normal times, in the exceptional circumstances of a severe financial crisis, this relation can become very strong, as Geraci and Veredas (2016) proved. Using a measure of tail correlation, they found that the large changes in the short selling positions in the North American and European markets are strongly and negatively related to large changes in stock prices. Extreme negative price changes are more strongly associated with extreme positive rather than extreme negative changes in short selling. This relationship was found to be much stronger for small firms, in terms of market capitalisation. This stronger relationship for smaller firms can be explained by the fact that the small firms have a generally lower stock liquidity. The findings in this study only confirmed the earlier empirical finding that the stocks with lower liquidity are more price-sensitive to the short selling.

In financial theory, there is a significant body of literature (which we referred to in the previous paragraphs of this section) focusing on the impact of the short selling on stock market quality. However, this literature does not distinguish between the influences of covered and naked short selling. Theoretically, both covered and naked short selling activity should be beneficial for pricing efficiency, liquidity and stability in the market. To check if the naked short selling itself has a positive or negative impact on the US Stock Market quality, Yadav, Fotak and Raman (2009) applied a vector autoregressive model in order to empirically investigate its effects on, among other things, pricing errors, the volatility of stock price returns, bid-ask spreads and pricing error volatility. The authors found that “this impact is very positive overall. On average, naked short sellers function effectively as liquidity providers who reduce order imbalances, and as value arbitrageurs who stabilise markets and reduce the mispricing of

overvalued securities.” (Yadav, Fotak and Raman, 2009, 29) For the Australian Stock Market which allows naked short sales for certain securities on an approved short sale list that is revised over time by employing market-adjusted model, matching methodology and regression discontinuity design, Lecce, Lepone, McKenzie and Segara (2012) revealed that “allowing naked short selling impairs market quality (liquidity and volatility), but there appears to be some improvement in price efficiency, with the results predominantly limited to stocks with high short sale constraints” (Lecce et al., 2012, 83).

Thornock (2013) examined how dividend taxation affects two key participants in the short selling process, i.e. the stock lender and the short seller as the stock borrower, and consequently, how through the short selling it influences the US market quality. In the research, the author applied regression analysis. According to the author’s findings, the taxes have a negative impact not only on the short sales market activity, but also on the market quality. More precisely, the tax effect of holding a short selling position open over the dividend dates can lead to the declines in quality of both equity loan and stock market, manifesting in increased search frictions in obtaining a stock loan, loan fee inefficiencies, microstructure breakdowns and equity mispricing. In short, taxes affect short selling and this effect can have substantial negative implications for the US market quality.

Disciplining effect of the short selling on the corporate managers’ earnings management incentives was confirmed by Massa, Zhang and Zhang (2015) in the research which covered the short selling activity of 17,555 firms from thirty-three developed and developing countries all over the world (Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Indonesia, Ireland, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, United States), and in which a regression analysis was applied. As the authors argued, “the short selling affects the behaviour and incentives of managers because its presence can accelerate the pace at which information is incorporated into the market and thus allows the market to uncover potential earnings management with a higher probability and at a higher speed” (Massa, Zhang and Zhang, 2015, 1732-1733). The disciplining effect of the short selling applies to various types of earnings management.

Based on everything previously mentioned we can conclude that the short sellers do not destabilise the developed market in normal times. Likewise, they would not destabilise the market during a severe financial crisis if the stock price sensitivity to the short selling was reduced through the liquidity increase. Moreover, the stock market destabilisation would not occur if the short selling activity was not constrained. Also, the dividend taxation would not have such a detrimental role for the short selling and consequently for the market quality if an appropriate combination of the tax effects and the short selling effects on the market development and economy were chosen. The short sellers contribute to the improvement of the market quality by correcting the mispricing quickly over time, correctly predicting the price movements, increasing the liquidity, achieving the stability and enhancing the corporate governance.

### **Implications of the Short Selling on Emerging Stock Markets’ Performance: Empirical Evidence**

Short selling is a market practice that has mostly positive effects in emerging stock markets, too. The evidence for that was provided by, among others, Sobaci, Sensoy and Erturk (2014), Lee and Wang (2015 and 2016), Chen and Rhee (2010), Chague, De-Losso, De Genaro and Giovannetti (2013), Feng and Chan (2016), Jung, Kim and Lee (2013), Wang, Lee and Woo (2017), Aksoy and Dastan (2011), Deng and Gao (2018), Ni and Yin (2017) and Luo, Ni and Tian (2019).

Sobaci, Sensoy and Erturk (2014) employed a VAR(p)-cDCC-FIEGARCH(1,d,1) approach in their research and found that the increased short sales in Turkey over the period from January 3, 2005 to December 31, 2012 were associated with the improvement of market quality. Over the entire observed period, including the 2008 financial crisis, the short sellers acted as the contrarian traders and as such they had a stabilising role in the market. They also contributed to the more efficient markets by avoiding any overvaluation in stock prices, and to the greater liquidity. During the crisis, the relationship between the short selling and three market quality variables (market return, liquidity and volatility) weakened to a degree, but they remained sufficiently robust for the short sellers to be still considered to have no



adverse effect on the market quality. Same as the Turkish short sellers, foreign short sellers in the Korean Stock Market, in which the majority (about 88%) of the short selling activity was performed by this type of the short sellers during the observed period from January 1, 2006 to May 31, 2010, followed contrarian trading strategy, as Lee and Wang (2015) revealed in the research in which a regression analysis was applied. Trading in accordance with this strategy enables the short-term future return to be predictable based on the short selling activity of foreign investors. The future return predictability referred only to the stocks with high short selling activity and it was higher in the earlier observed period than in the subsequent sub-period. Furthermore, the short-selling role of foreign investors in providing liquidity was not found in the analysed market. "Short-selling provides liquidity to the market if it is performed to absorb excessive buying pressure. That is, foreign investors provide liquidity through short-selling when they bet on short-run price reversals, considering that the past days' positive returns are due to temporary buying pressure." (Lee and Wang, 2015, 6) Even though the foreign short sellers increased their short selling activity when the buying pressure was high, the level of the short selling activity was not sufficient to fully resolve the buying pressure. Therefore, they did not improve stock market liquidity. The authors also found that the short selling activity of foreign investors was not associated with the future return volatility increase. Following above-mentioned emerges that the short selling of foreign investors had no an adverse impact on stock prices, liquidity, and volatility in the Korean Stock Market.

Short sales significantly enhance overall market efficiency in Hong Kong Stock Market, too. As Chen and Rhee stated in the conclusion of their research study, "short sales speed up the price adjustment to not only firm-specific private/public but also market-wide information" (Chen and Rhee, 2010, 483). The predictive power of the level of short selling activity over stock prices in the Brazil Stock Market was empirically confirmed in the study of Chague, De-Losso, De Genaro and Giovannetti (2013), in which the panel regressions were applied in the research. It comes from two distinct channels. The first channel is related to the demand for short selling. The second one is related to the supply of stock lending. Hypothetically, a higher demand for the short selling should anticipate lower short-run future returns if the short sellers are well informed investors with superior analytical skills. A higher supply of the short selling should anticipate lower short-run future returns if the short sellers are not able to sell short the full amount they are willing to. In other words, overpricing would occur if there were short sale constraints. These two hypotheses were empirically proven. Based on the results, the authors finally made a conclusion according to which "the short-sellers are informed traders but, since they are usually able to sell short less than they are willing to, prices do not reflect all information present in the market". (Chague et al., 2013, 15)

The predictive power, as well as the stabilising role of the short selling over stock prices in the Chinese Stock Market during the three-year period from 2010 through 2012 was discovered by Feng and Chan (2016) using regression analysis. According to the authors' findings, during the analysed time interval, the short sellers in China possessed information advantage during the earnings announcement periods and they were able to increase (reduce) short selling positions before the firm experienced the negative (positive) earnings surprise. Simply put, the short sellers were informed traders and they were able to utilise the forthcoming earning announcement events to make a profit. Extreme short selling preceded future negative returns, i.e. it signalled the negative future return movements. Predicting the future returns in a three-day window after earnings announcement was possible on the basis of extreme short selling.

In their research, Jung, Kim and Lee (2013) and Wang, Lee and Woo (2017) put focus on the influence of the individual investors' participation in short sale on the market quality and profitability of the short selling in the Korean stock market, respectively. Jung, Kim and Lee (2013) executed difference-in-difference estimations, panel regression analysis and matching-firm analysis and found that the individual short sellers enhanced the efficiency of stock pricing, increased the stock liquidity and did not destabilise stock market during the period from January 2007 to August 2008. Specifically, the participation of individual investors in the short sales did not significantly change the volatility and skewness of stock return and caused the stocks to be traded within a narrower bid-ask spread. According to the findings of Wang, Lee and Woo (2017), which were obtained in regression analysis, the individual investors' participation in short sale contributed to the profitability of the short selling in the Korean Stock Market over a relatively long period from August 1, 2007 to May 31, 2010. Namely, in the observed period, the profitability of individual investors' short selling was empirically proven, that is, the

individual short sellers made a profit from their short selling activity. The short sellers had a predominantly short investment horizon. As the investment horizon lengthened, the profitability of short selling decreased. Furthermore, the short sellers who were selling multiple stocks short (i.e. stocks of a larger number of companies) made a higher profit than those who were selling only fewer stocks short (i.e. stocks of fewer companies). Finally, the profitability of individual investors' short selling was proven to be persistent in the Korean Stock Market over the analysed period. Lee and Wang (2016) also investigated the profitability of the individual investors' short selling in the Korean Stock Market, but they shed a light on this issue from another viewpoint. Namely, using profitability measures and regression analysis, they examined if the individual investors' short sales, which are initiated and closed on the same day, and which the authors briefly marked as "day trading short selling" were profitable during the period from August 1, 2007 to May 31, 2010, whereby the short selling ban period from October 1, 2008 to May 31, 2009 was excluded. As the authors discovered, in the short selling market in Korea, the day trading short selling is very prevalent and mostly profitable. "The profits are higher for the shorts that are initiated in the morning and are held longer in a given day or for those that are made when the intraday volatility is high." (Lee and Wang, 2016, 210)

Aksoy and Dastan (2011) tested whether the day of the week effect and the weekend effect were present and affected short selling activity and short sellers' returns in Istanbul Stock Exchange from 2005 to 2009 or not, applying correlation and regression analysis. Their results indicated the presence of a day of the week effect for the short selling activity. The short selling pattern across the days of the week was statistically different. The highest short selling was observed on Monday and after holidays. The lowest short selling was observed on Tuesday. Contrary to the expected result, the existence of the weekend effect was not empirically confirmed. A positive correlation between short selling and returns for all days of the week was found. "The correlation was the greatest on Monday (0.177), contradicting the notion that short selling pressure decreases returns on Monday, thus causing a weekend effect." (Aksoy and Dastan, 2011, 210) Based on the obtained results, the authors made a conclusion that the short sellers are sophisticated and well informed traders, who can exploit return anomalies and trade according to them, which is why they can be considered to be the contrarian traders focused on balancing returns.

The influence of the short selling activities on the behaviour and performance of the Chinese companies was examined by Deng and Gao (2018), Ni and Yin (2019) and Luo, Ni, and Tian (2019). Applying regression analysis, the first group of authors discovered that during the period from March 31, 2010 to November 9, 2012, the short sellers generated monitoring effects, i.e. they performed some kind of monitoring over the companies. There are two explanations for these effects. The first one was a positive relation between the short selling and the probability of corporate fraud detection. The short sellers were able to identify the potential corporate fraud earlier and respond to it. The second explanation was a negative relation between the short selling and the future stock price crash risk. As the authors stated, "the effects of increased short selling activities on reducing the crash risk are stronger for the firms of smaller size and lower state ownership." (Deng and Gao, 2018, 69) "The short selling monitoring effect is stronger for firms with higher degree of information asymmetry and higher stock market sensitive agency costs." (Deng and Gao, 2018, 77) The study of Ni and Yin (2019) is one of the first research which provided empirical evidence on the negative effect of the short selling. The authors used a difference in differences regression specification in their research and found that the companies will follow more conservative investment and financial policies if the short selling is allowed. The level and risk of corporate investments will bring about significant negative changes. The likelihood of the corporate debt and equity financing will also be reduced and the saved capital will be used to decrease financial leverage. The consequences of such corporate behaviour will be reduced risk-taking and decreased firm performance. According to the author's standpoint, the large institutional differences in the analysed market compared to the US and other developed markets can explain why their findings are fundamentally different from those in developed markets. Contrary to the developed markets, the concentrated ownership and weak investor protection exist in the analysed market. Therefore, the authors emphasised that under these conditions, it is important to consider the institutional differences in ownership structure and the strength of the investor protection when the economic impact of the short selling is being assessed. Although Ni and Yin examined the real effect of the short selling in China from 2008 to 2014, they stated in the conclusion of the study: "As China shares many common institutional features with other emerging markets, we can draw broader conclusions from the broader experiment in China and generalise them into other developing economies." (Ni and Yin, 2019, 29) A negative impact of the short selling on the behaviour of Chinese companies was also revealed by Luo, Ni, and

Tian (2019). Namely, using a difference in differences regression specification, the authors examined a causal relation between the short selling and the corporate tax avoidance in China during the period from 2007 to 2015, and discovered that the short selling incited corporate tax avoidance. The analysed relation was more pronounced, that is, significant tax avoidance increase was observed in financially constrained (i.e. smaller and younger) firms and in non-state-owned enterprises. The obtained results suggest that the tax avoidance helps Chinese companies generate additional internal funds for financing the future investment opportunities and growth (that is, tax avoidance acts as a financing mechanism which is an alternative to the costly external financing) and thus helps them mitigate the adverse effects of the short selling that they are experiencing under downward price pressure. Tax avoidance was possible in China because it was not expensive. Weak law enforcement, mild legal penalties and a lack of external monitoring mechanisms made tax avoidance cost efficient or even free. Finally, Luo, Ni, and Tian, similarly to Ni and Yin, made a conclusion “that the findings might be generalizable to many other developing economies, at least those with strong government intervention and lax law enforcement” (Luo, Ni and Tian, 2019, 4).

### Consequences of Imposing Constraints on Short Selling

Regulators in many developed and developing countries imposed constraints on short selling during the previous global financial crisis and debt crisis. For example, on July 9, 2008, the Securities and Exchange Commission (SEC) curbed the naked short selling for nineteen financial firms in the United States. In September 2008, the SEC placed a temporary ban on the covered short selling of selected financial stocks as well. At the same time, the Financial Services Authority (FSA) temporarily banned the short selling (both covered and naked) of leading financial stocks in the United Kingdom. Other countries soon followed them and imposed their own short selling constraints. Australia and Korea temporarily banned the short selling of all stocks and for all of its forms. Afterwards, Australia banned the naked short selling indefinitely. Canada, Denmark, Indonesia, Ireland, Germany, Greece, Norway, Pakistan and Russia placed a ban on the short selling of leading financial stocks. Japan and Switzerland banned the naked short selling of all stocks. The ban on the naked short selling of leading financial stocks was placed in Austria, Belgium, France, Italy, Luxembourg, Portugal and the Netherlands. In most markets, the naked short selling has remained largely outlawed, while the covered short selling was reinstated as a legitimate trading activity.

In order to respond to the debt crisis, on August 11, 2011, the European Securities and Markets Authority (ESMA) decided to impose a coordinated ban on the short selling of financial institutions stocks in four European equity markets, i.e. Belgium, France, Italy and Spain. “Although these measures were expected to be in place for 15 days only (with the exception of Belgium, which announced that the ban would remain in effect indefinitely), they remained active until February 2012.” Temporary banning the short selling of financial stocks “aimed to reduce volatility and to stop (or, at least, mitigate) financial panic and downward spiral in prices”. (Alves, Mendes and Silva, 2016, 252-253)

Contrary to the above-mentioned countries, China was continuously prohibiting the short selling until March 31, 2010. On this day, the China Securities Regulatory Commission (CSRC) launched a pilot program, intending to gradually remove the short selling ban. To achieve this, it designated and periodically revised the list of stocks eligible for short selling. The stock would be included in the list if it met the size, liquidity and volatility requirements. The list has been substantially expanded over time. In China, the naked short selling is not allowed.

Since January 1994, in Hong Kong, the short selling has been allowed only for the stocks which are listed on the so-called D-list. The stocks which satisfied certain requirements, i.e. which are qualified to be sold short are listed on this D-list. The Hong Kong Stock Exchange (HKEx) has revised and expanded the list every quarter. “Any stocks not on the D-list are prohibited from short sales. This restriction makes the HKEx unique, whereas almost all stocks can be sold short in the NYSE and the NASDAQ.”<sup>1</sup> (Chen and Rhee, 2010, 473)

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<sup>1</sup> Securities traded in the OTC markets including NASDAQ Small Cap, OTC Bulletin Board, and OTC Pink Sheets are not subject to short sale restrictions.

Placing the short selling ban was mostly motivated by the intention of regulators to mitigate the turmoil in financial markets, make sudden and excessive fluctuations of the stock prices impossible, prevent share prices plummeting sharply, stop illegal stock price manipulation, disable a regulatory arbitrage in cross-listed stocks, decrease the volatility and contagion risk of financial institutions and, consequently maintain fair and orderly markets. It was sometimes motivated simply by the lack of institutional framework for borrowing shares to be sold short. Was the short selling ban really effective? Financial theory and empirical evidence have been trying to provide answer to this question so far.

In financial theory, there has been an intense debate over the effects of short selling constraints. According to the widely accepted attitudes (e.g. Grullon, Michenaud and Weston, 2015; Helmes, Henker, Henker and Smith, 2017; Beber and Pagano, 2013; Frino, Lecce and Lepone, 2011; Marsh and Payne, 2012; Saffi and Sigurdsson, 2011; Jain, Jain, McInish and McKenzie, 2013; Dungey, McKenzie and Yalama, 2013; Chang, Luo and Ren, 2014; Ebrahimnejad and Hoseinzade, 2019; Sochi, 2018; Saastamoinen and Suhonen, 2013; Alves, Mendes and Silva, 2016; Grima and Sammut, 2017), the restriction or non-existence of the regulated short selling can reduce stock price efficiency, slow down stock price discovery process, amplify market fluctuations, which can induce the increase in the possibility of extreme events occurrence, make the stock market much more vulnerable to speculative bubbles, destabilise the stock market, seriously slow down stock market recovery and/or pose limitations in derivatives market development. The impact of the short selling restrictions on the stock market liquidity and stock pricing is ambiguous. Some authors (e.g. Helmes, Henker, Henker and Smith, 2017; Beber and Pagano, 2013; Chang, Luo and Ren, 2014) argue that placing the short selling ban causes bid-ask spread increase and stock overpricing, while others (e.g. Battalio, Mehran and Schultz, 2012; Grullon, Michenaud and Weston, 2015) suggest that the short selling constraints may have opposite effects. The theoretical knowledge was empirically tested and the predominantly negative influence of the short selling ban was proven.

In the US Stock Market, for example, in 2008, “the prices of financial stocks fell more than 12 percent over the fourteen days during which the ban was in effect. Shortly after the ban was lifted, however, the prices of financial stocks stabilised” (Battalio, Mehran and Schultz, 2012, 4), as Battalio, Mehran and Schultz stated in their study. Grullon, Michenaud and Weston (2015) also discovered negative influence of the short selling ban in the US Stock Market. Namely, applying regression analysis, the authors examined the effects of the regulatory change in 2005, which implied the removal of restrictions on the short selling for the firms from pilot group, on stock prices and corporate behaviour. They revealed that this regulatory change caused an increase in the short selling activity, generated stock prices decline and distorted investment and financing decisions (investment and equity issuances declined) for the randomly selected group of firms representing the pilot group. “Firms in the pilot group with a big increase in short-selling activity exhibit larger reductions in investment and equity issuance.” (Grullon, Michenaud and Weston, 2015, 1740) “The results are stronger for small firms and for firms that were more likely to be overvalued and/or more susceptible to bear raids prior to the regulatory change.” (Grullon, Michenaud and Weston, 2015, 1764) Following obtained findings emerges that the short selling constraints in the USA disrupted stock price efficiency and destabilised stock market.

In the Australian Stock Market, in the wake of the global financial crisis, the restrictions on short selling were imposed for all financial firms over a period of 8 months. These restrictions were aimed at calming the market, preserving the market confidence and supporting the prices. There was no evidence that the short selling ban contributed to achieving the goals of the regulators, as Helmes, Henker, Henker and Smith (2017) determined in the research implemented by employing a matching procedure in conjunction with a fixed-effect panel methodology. Due to restricting the short selling, market confidence eroded and market quality severely degraded, that is, the stocks subject to the short selling ban experienced an increase in volatility and bid–ask spreads and a decrease in trading activity. Contrary to the intention of Australian regulators, the short selling ban generated substantial negative effects in the targeted stock market.

According to the findings of Beber and Pagano (2013) obtained with panel data techniques, the short selling bans or regulatory constraints imposed during the global financial crisis were detrimental to three dimensions of market performance in 30 countries (most European markets and developed non-European markets such as Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Ireland, Israel, Italy, Japan, Luxemburg, Netherlands,

New Zealand, Norway, Poland, Portugal, Singapore, Slovenia, South Korea, Spain, Sweden, Switzerland, United Kingdom, United States). Specifically, in the analysed markets, the bid-ask spreads observed a statistically and economically significant increase, whereby the adverse liquidity effect was stronger for the stocks with small market capitalisation, higher volatility and no listed options. Beber and Pagano stated: "For the dually listed stocks in our sample, short-selling bans in the home market increased bid-ask spreads both on the home and on the foreign market, while bans in the foreign market only reduced liquidity locally, without spillover liquidity effects to the home market." (Beber and Pagano, 2013, 345) Furthermore, the short selling bans slowed down price discovery, especially in the event when the prices responded to bad news. Finally, the effects of the short selling bans on stock prices were at worst negative and at best neutral. Four dimensions of the market quality, i.e. abnormal returns, stock price volatility, bid-ask spreads and trading volume were adversely affected by the short selling bans, which were imposed in 2008, in eleven countries around the world (Belgium, Canada, France, Germany, Italy, Netherlands, Norway, Portugal, Switzerland, United Kingdom, United States), as Frino, Lecce and Lepone (2011) found as well. Deterioration in four dimensions of market quality, i.e. in trading activity, liquidity, efficiency and price discovery, for financial stocks in the UK Equity Market from the start of June 2008 to the end of February 2009 was also discovered by Marsh and Payne (2012) using a difference in differences regression specification and Hasbrouck VAR approach. Even for the sample consisting of 26 both developed and developing markets all over the world (Australia, Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, Hong Kong, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Portugal, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States) using regression analysis, Saffi and Sigurdsson (2011) proved that the short selling constraints were associated with less price efficiency. As the authors concluded in their study, the stocks with limited lending supply and high borrowing fees had a longer delay in responding to market-wide shocks. Relaxing the short selling restrictions was associated with an increase in speed by which the information was incorporated into prices. Large and more liquid firms also tended to have more efficient prices, while those with higher leverage or low book-to-market ratios tended to be less efficient.

By using a sample which also consisted of both developed and developing markets all over the world, Jain, Jain, McInish and McKenzie (2013) and Dungey, McKenzie and Yalama (2013) implemented a research in order to examine whether the home market short selling constraints affected home market only or other markets as well. Jain, Jain, McInish and McKenzie applied regression analysis and revealed that the short selling-related stock borrowing within home market decreased by 45%, and the short selling of home country's ADRs reduced by 68% in 82 countries (Argentina, Australia, Austria, Bahrain, Bangladesh, Barbados, Belgium, Bermuda, Brazil, Bulgaria, Canada, Cayman Islands, Chile, China, Colombia, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Finland, France, Georgia, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kuwait, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Malta, Mauritius, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Oman, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Qatar, Russia, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Tunisia, Turkey, Ukraine, UAE, United Kingdom, United States, Venezuela, Zambia, Zimbabwe), as a consequence of placing the 2008 short selling restrictions. With these results the authors provided evidence in support of the regulatory reach hypothesis according to which the "home country restrictions curtail short selling of cross-listed stocks in foreign markets. In the current context, this suggests that foreign country trading restrictions decrease short selling of a stock's ADR in the US market." (Jain et al., 2013, 178) In other words, they proved that national regulators were able to effectively enforce the short selling restrictions both within and outside their home markets. However, if the competing hypothesis of regulatory arbitrage had been proven, it would have required that the short selling move to foreign locations, after the home market introduced restrictions, i.e. that the volume of ADRs short selling increase, because traders opted to trade in unrestricted regimes. In this case, it would be concluded that the short selling restrictions influence home market only. Not only the volume of the short selling activity outside the home market, but also the direction of spillovers from shocks among countries with and without the restrictions can be affected by the home market short selling constraints. Namely, by using a sample consisting of 26 developed and the countries with emerging markets from Europe, North America, South America and Asia, whereby some of them imposed short selling bans (Australia, Denmark, Greece, Indonesia, Ireland, Korea, Norway, Pakistan, Russia, Switzerland, Taiwan, UK, USA) and some did not (Argentina, Brazil, China, France, Germany, Hong Kong, Japan, Malaysia, Mexico, Netherlands, Singapore, Italy,

Sweden), and estimating the spillover index, Dungey, McKenzie and Yalama investigated the impact of the home market short selling constraints on the market volatility dynamics during the crisis period in 2008. They found that the volatility was redirected towards the markets in which the short selling bans were not imposed. More specifically, during the periods when the short selling bans were in place, “the impact of shocks emanating from countries which imposed short sale bans was reduced, particularly on other markets that also imposed bans. However, the impact of shocks from markets that did not impose bans was increased.” (Dungey, McKenzie and Yalama, 2013, 69) Following the above-mentioned it appears that, during the periods when the short selling bans were in place, the bans did not provide protection from shocks emanating from countries where they were not in effect.

A research concerning the effectiveness of bans on short selling in emerging markets only is scarce. Continuous bans on the short selling in many emerging markets could explain the lack of this research. These bans have made it difficult for researchers to examine the effect of bans there. The researchers cannot examine the short selling effects in the common approach by comparing the effects before and after the changes in short selling regulations, as the investors in many emerging markets have never been able to sell stocks short. Similar to most research implemented in developed stock markets, and in the available studies which covered emerging markets, an adverse effect of the short selling bans on the market efficiency, price discovery, market stability and future return predictability was found. Thus, using regression analysis, Chang, Luo and Ren (2014) discovered that the intensified short selling activity in China, after the ban was lifted, generated negative event returns, improved price efficiency particularly during market downturns, decreased return volatility in both the up- and down-market, declined the frequency of extreme stock returns and made future returns prediction over up to five trading days feasible. Based on the obtained results, they made a conclusion that the short selling constraints in China contributed to stock overvaluation, hindered price discovery, destabilised the stock market and reduced predictive power of trades by the short sellers. Furthermore, using regression analysis, Ebrahimnejad and Hoseinzade (2019) revealed that, after the removal of constraints in the Hong Kong market, the short selling improved stock price informativeness and reduced the common movement of stock prices in the market. Their findings point to the negative impact of the short selling ban on the price efficiency in Hong Kong, too. The same effect of the short selling restrictions on the price efficiency was also found for the Dhaka Stock Exchange (DSE). Namely, using data covering the period from January 1999 through December 2014, and employing the runs test in conjunction with a Monte Carlo simulation, Sochi documented that “for both good and bad news, the DSE ban on short selling causes prices to adjust more slowly to a new equilibrium, resulting in a disproportionate number of lengthy return runs” (Sochi, 2018, 3).

An ineffectiveness of the European short selling ban, which was placed as a response to the debt crisis in 2011, was proven in Belgium, France, Greece, Italy and Spain. Namely, Saastamoinen and Suhonen (2013) applied differences-in-differences and differences-in-differences-in-differences methodologies in order to measure effectiveness of the ban by comparing the returns volatility of financial stocks from Belgium, France, Greece, Italy and Spain to their US cross-listings (so-called ADRs), as well as to the returns volatility of financial stocks from four European countries (Ireland, Germany, Portugal and the Netherlands) which, among others, did not join the ban, before and after the ban was issued. The authors revealed that the returns volatility of all the analysed financial stocks increased after the ban was placed compared to the volatility before the ban occurred. Such result indicates the ineffectiveness of the ban. If the ban had been effective, after imposing the ban, the returns of the banned stocks traded in Europe would have exhibited less volatility than those of their ADRs and of other European stocks not subjected to the ban.

Mostly adverse effect of the short selling ban on the liquidity, volatility, price discovery mechanisms and price dynamics of securities subjected to the August 2011 bans in Belgium, France, Italy and Spain was also found by Alves, Mendes and Silva (2016) and Grima and Sammut (2017). According to the findings of these two groups of authors, the bans had a negative impact on liquidity and volatility in the stock markets. The second group of authors additionally discovered that the negative impact of the bans on the market liquidity was short-term for all the analysed countries, while the bans had a negative impact on volatility over a short period as well, but with the exception of Spain. The results associated with the influence of bans on the price discovery mechanisms, which were obtained by the above-mentioned authors, are different. For all four countries, Alves, Mendes and Silva documented “a longer delay in the adjustment to negative market-wide news, particularly among stocks subjected to the bans. Conversely,

the delay in the adjustment to positive market-wide news falls.” (Alves, Mendes and Silva, 2016, 254) On the other hand, Grima and Sammut found that the bans slowed down price discovery in Belgium and France and did not affect price discovery mechanisms in Spain and Italy. After the bans were lifted, all countries experienced a better price discovery performance, indicating their short-term impact on the price discovery mechanisms. Finally, the above-mentioned two groups of authors agreed about the positive influence of the bans on the financial stock prices in all four analysed countries. However, they did not agree about the duration of influence. Alves, Mendes and Silva provided evidence that the impact on prices was only temporary. Contrary to this evidence, the short selling bans were found by Grima and Sammut to have a positive long-term impact on the prices of the banned financial stocks.

## Conclusion

Every time the short selling drew the attention of theorists, practitioners and regulators, the question whether the short sellers were responsible for panic selling and massive stock price declines or for the correction of mispricing, liquidity increase and volatility decrease, i.e. market quality improvement was raised once again. In many developed markets, the widely accepted theoretical attitude that the short sellers improve the overall market quality was empirically proven. There, the short sellers largely contribute to the market quality improvement by correcting the mispricing quickly over time, correctly predicting the price movements, increasing the liquidity, achieving the stability and enhancing the corporate governance. Therefore, the empirical evidence from developed stock markets mostly indicates positive roles of the short selling. The positive influence of the short selling would be complete if the stock price sensitivity to the short selling was additionally reduced through the liquidity increase, if the short selling activity was not constrained anywhere and if an appropriate combination of the tax effects and the short selling effects on the market development and economy was chosen. Although the short selling cannot be practiced in many emerging market countries due to the lack of a suitable regulatory, institutional and market infrastructure, positive effects were mostly found in many markets where it is allowed. Opposite findings related to the influence of the short selling activities on the behaviour and performance of companies only come from the countries where the concentrated ownership, weak investor protection, weak law enforcement, mild legal penalties and no external monitoring mechanisms exist. Based on everything previously mentioned, we can conclude that the short selling could improve the quality of emerging stock markets, under the condition that there is at least a basic regulatory, institutional and market infrastructure. Given that short selling mostly has a positive influence on the quality of stock markets under the stated conditions, the establishment and development of a suitable regulatory, institutional and market infrastructure is recommended for the markets where short selling cannot be practiced. As the regulatory, institutional and market infrastructure becomes more and more developed, the possibility of the market quality to be improved to a higher degree by the short selling will increase.

A large number of regulators from stock markets around the world, who were concerned about potential adverse effects of the short selling during various episodes of crises or who know that the regulatory, institutional and market infrastructure has not sufficiently or at all developed yet, decided to place some constraints on short selling at different points in time and for different periods of time, ignoring the existing scientific and empirical evidence about mostly positive short selling effects. However, these constraints were ineffective in many developed and emerging markets. The short selling bans or regulatory constraints largely caused disruption of stock price efficiency, a slowdown in stock price discovery process, a decline in stock market liquidity, the destabilisation of stock market, a decrease in trading activity and reduction of predictive power of trades by the short sellers. These findings further strengthen our conclusion.

Given that a research concerning the effectiveness of bans on short selling in emerging markets only is scarce, further investigation could be directed at finding an appropriate approach for this effectiveness to be measured. In this way, a more credible cost-benefit analysis of imposing the constraints on short selling could be done. Afterwards, the regulators might eventually want to rethink the prohibition of short selling in their countries. Moreover, future research could be aimed at discovering the level of market capitalisation and liquidity to which the stock price sensitivity to the short selling activity should be detrimental to stock price efficiency. Finally, choosing dividend taxation model beneficial for the short selling and consequently for the market quality, i.e. the model which will ensure achieving the optimal

combination of the tax effects and the short selling effects on the market development and economy could be the objective of further research as well.

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