CHAPTER 27.

LIQUIDITY MEASURING OF FINANCIAL MARKET IN WESTERN BALKAN REGION: THE CASE OF SERBIA[1]

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Abstract

This paper presents theoretical and empirical studies on liquidity measuring of financial market in the Western Balkan region (the Serbian market). Liquidity itself is not observable and therefore, has to be proxies by different liquidity measures. The liquidity measures covered in this paper are: Bid-Ask Spread, Amivest's measure, Amihud's measure, Amihud's based measure, zero-return proportion, and price pressure of non-trading. Market liquidity is a fundamental aspect of market development. In order integrate Serbian market into EU financial market, structural change is required. Serbian market belongs to frontier markets. One of the major requirements that this market transforms to emerging, and then to develop market is to improve its liquidity. For empirical analysis of Serbian market liquidity we use two measures: zero-return proportion and price pressure of non-trading as in Bekaert, Harvey, and Lundblad (2007), for the period: 2005-2009. Results of this paper showed that the Serbian market is extremely illiquid. It is just one of the key barriers that foreign investors face while investing in the Western Balkan region. Additionally, for whole the Serbian market, the most illiquid year was 2008, while the least illiquid year was 2007, according to the value of zero-return proportion. Particularly, in the post-crises period level of illiquidity increased for both BELEX indices.

Key words: *liquidity, zero-return proportion, price pressure measure, BELEX indices, Western Balkan.*

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[1] This paper is a part of research projects numbers 47009 (European integrations and social and economic changes in Serbian economy on the way to the EU) and 179015 (Challenges and prospects of structural changes in Serbia: Strategic directions for economic development and harmonization with EU requirements), financed by the Ministry of Science and Technological Development of the Republic of Serbia.

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INTRODUCTION

The Western Balkans region, along with some of the other Central and East European Countries (CEEs), lags in many ways behind the Central European transition economies. The private sector is not as well developed in the Western Balkans; the public sector is only partially reformed, and the informal economy is more evident than in the CEECs (Redžepagić and Richet, 2008). Emerging markets (markets in the Western Balkan region) often feature low liquidity and infrequent trading. Investors in emerging markets are attracted by the high return potential but, at the same time, are scared by the liquidity risk in the market (Zhang, 2010). Emerging markets are converging on developed markets they still constitute an important distinct asset class (Eun and Lee, 2010). However, the characteristics of emerging markets could lead to liquidity being measured with more noise, if the existing liquidity proxies proposed based on the US market are used. Compared to the US market, emerging markets have more insider trading and weaker corporate governance. Investors, especially retail investors, have the expectation that they can be expropriated by the management or more informed investors. They also have relatively low disposable income to invest in the stock market and limited resource to obtain information. All these factors result in the on average low trading activity in the emerging markets. In other words, trading frequency becomes particularly important in emerging markets but the existing liquidity proxies rarely consider it. On the other hand, trading activeness vary across individual markets (Zhang, 2010). Šoškić and Živković (2007) pointed out that in transition economy, such as the Serbian economy, needed financial structure is not achieved in order to enable accelerated economic development. Some of the missing elements are: the lack of state regulation, corporate control, private financial analysis, financial intermediation, the lack of transparency reports, long history of trading, removed information asymmetry, and reliability of information.

Liquidity generally denotes the ability to trade large quantities quickly, at a low cost, and without moving the price. Liquidity has several aspects and cannot be described by one indicator only (Amihud, 2002). Market liquidity is a fundamental aspect of market development. The presence of illiquidity is one of the key barriers that foreign investors face while investing in some market. It represents main barrier to further stock market development due to lower inflows of capital. Redžepagić and Richet (2008) pointed out that the transformation of the Western Balkan countries economies into market economies could not have taken place without the assistance of the foreign capital. These authors told that the Western Balkan region has been transformed into a marketplace with dynamic growth, attracting a significant amount of Foreign Direct Investments (FDI). FDI in the Western Balkans are mostly concentrated in the service sector (banks,

telecommunications, insurance) in non-tradable inward oriented sectors (constructions, real-estate) (Redžepagić and Richet, 2008).

Rouwenhorst (1999) analyzed returns and liquidity in 20 emerging markets. Clark (2008) studied history and measurement of liquidity risk in frontier markets. Bekaert, Harvey, and Lundblad (2007) analyzed measuring of liquidity for 19 emerging equity markets. Zhang (2010) studied measuring liquidity in 20 emerging markets, and he introduced new measure for these types of markets. Cajueiroa i Tabak (2004) analyzed emerging markets, too. They showed that these markets tend to become more efficient in time. Yeyati, Schmukler, and Van Horen (2008) described behavior of emerging market liquidity in crises period. Hearn, Piesse, and Strange (2009) analyzed liquidity in African emerging markets. Živković and Minović (2010) explored causes illiquidity of the Serbian financial market. Benić and Franić (2008) determined the level of liquidity on the Croatian stock market, and on the developing markets that are part of Central and Eastern Europe. They compared the Croatian market liquidity with other markets in the region, and then compared those results with the German market in order to perceive differences between developing and developed markets. Lesmond (2005) studied and tested different liquidity measures for emerging markets. He concludes that any measuring of liquidity has its advantages and disadvantages when used for estimation of liquidity among countries or within some country.

The many available research papers on liquidity and its measuring are mainly focused on developed markets. There are no major research ventures on stock market liquidity and its measuring in the Western Balkan countries. This paper contributes to this field of research. However, the important issue for empirical analysis in this paper is the choice of appropriate measures of liquidity for the Serbian capital market. Market liquidity is very important factor for development and integration of Serbia in financial system of EU. The financial market in Serbia is, by its type, a frontier market. Many of the more sophisticated measures of liquidity (bid-ask spread, Amivest's measure, Amihud's measure, etc.) could not be used for estimation of liquidity of the Serbian financial market, and other the Western Balkan countries, because of the lack of data and specific features of these markets. The main problem of the frontier markets (the Western Balkan countries) impacting market liquidity are: small number of stocks with significant capitalization, small number of shares outstanding, infrequent and irregular trading, expressed information asymmetry, etc. To measure illiquidity for the Serbian market we use zero-return (ZR) proportion (by Lesmond, Ogden, and Trzcinka, 1999), and "price pressure" (PP) measure as in Bekaert, Harvey, and Lundblad (2007). We used daily data for stocks from BELEX*line* and BELEX15 indices (http://www.belex.rs), as well as data for all stocks listed at the Belgrade Stock Exchange in the period: October, 2005 – December, 2009. In order to

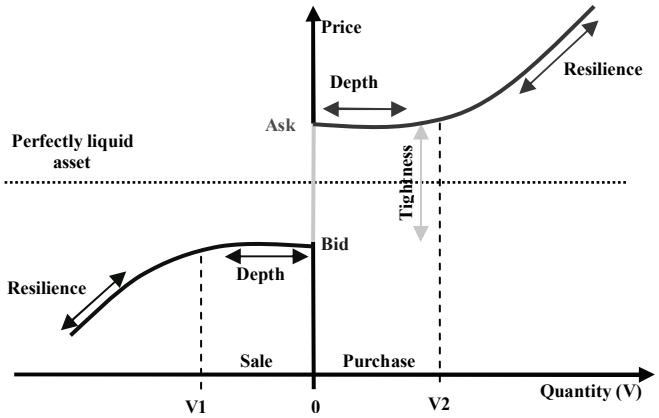
obtain and apply the corresponding illiquidity measures, we have written a program within Microsoft Access package. After calculating return and illiquidity series on daily level, we have been averaged by months in order to obtain series on a monthly level. We analyzed level of liquidity for whole the Serbian market, and for both Serbia's indices, in the pre-crises and post-crises period. Particularly, we found which year is the most illiquid, and the least illiquid year in observed sample period.

The rest of the paper is organized as follows. The Section 2 presents dimensions of liquidity, different liquidity measures, their advantages and disadvantages. The Section 3 shows changes in the level of illiquidity for each year in observed sample period, as well as the level of illiquidity in the pre- and post-crises eras, for both indices from the Belgrade Stock Exchange. The Section 4 concludes.

DIMENSIONS OF LIQUIDITY AND AN OVERVIEW OF LIQUIDITY MEASURES

Liquidity is not easy to define and there is no common definition of liquidity anyway (Wyss, 2004). Liquidity is easier to recognize than to define (Crockett, 2008). Liquidity can be well described as a function of a number of variables, where each variable is an approximation for incomprehensible concept of liquidity (Amihud, 2002). So far evolution of ideas in this field shows that measuring market liquidity is not a trivial issue. Liquidity on stock exchange is generated by the so called market makers (Campbell, Lo, and MacKinlay, 1997).

Graph 1. Dimensions of market liquidity



Source: Hibbert, Kirchner, Kretzschmar, Li, and McNeil (2009), page 7.

Speculative investors and market makers are the key players that bring about market or assets liquidity (Huberman and Halka, 2001). Liquidity is one the favorable characteristics required by the investors. Indeed, liquidity is the condition for investors (regardless of the investors being individuals or institutions) to get returns from the expected changes in prices. They, however, generate demand which enables liquidity. The dimensions of market liquidity include: market *depth*, or the ability to execute large transactions without influencing prices unduly; *tightness*, or the gap between bid and offer prices; *immediacy* or the speed with which transactions can be executed; and *resilience*, or the speed with which underlying prices are restored after a disturbance (Crockett, 2008). Dimensions of market liquidity you can see on Graph 1.

Absolute Spread (S^{aps})

Glosten and Milgrom (1985) consider a market structure in which competitive market makers must quote binding bid and ask prices and investors arrive sequentially and can decide whether to buy one share at the ask (P_t^a), sell one share at the bid (P_t^b), or refrain from trading. In this case, the bid is the expected value of the fundamental given that the next trade is a sell order, and similarly for the ask leading to the following "regret free" prices (Amihud, Mendelson, and Pedersen, 2005):

$$P_t^b = E\left(f \middle| \Im_t, sell\right), \tag{1}$$

$$P_t^a = E\left(f \middle| \Im_t, buy\right), \tag{2}$$

where f is the fundamental value of orders, and $\Im_t$ is the public information. The quoted bid price (eq. 2.1) reflects the risk that a seller is informed of bad news, and the ask (eq. 2.2) reflects the risk that a buyer is informed of good news. If the market maker were sure that the counterparty is informed, she would not trade at all since as long as the informed trader wishes to sell, the price is too high. What makes the market maker willing to trade is the possibility that the counterparty is uninformed, and it may gain by selling to him at a "high"-ask-price or buying from him at a "low"-bid-price. Thus, the market maker gains from trading with uninformed traders and looses with informed ones. Since in a competitive market the market maker ends up with zero profit, the gains of the informed traders are at the expense of the uninformed trade. Clearly, the model implies a bid–ask spread (bid<ask) which is greater if the probability of trading with informed traders is larger (Amihud, Mendelson, and Pedersen, 2005).

The absolute bid-ask spread is the difference between the lowest ask price, and the highest bid price:

$$S_t^{aps} = P_t^a - P_t^b . \quad (3)$$

This measure is always positive and its lower limit is the minimum tick size.

Amivest's Measure

Amivest's ratio of liquidity, measures the trading volume associated with a unit change in the stock price. The liquidity ratio is defined as

$$\mathrm{AR}_j = \frac{\sum_t V_{jt}}{\sum_t \left| R_{jt} \right|}, \quad (4)$$

where are V_{jt}, and R_{jt}, respectively, the volume and return on stock *j* on day *t*, and the summation is over the days in the estimation period (Amihud et al., 1997). However, Amivest's ratio of liquidity is measure of price impact, and this ratio is undefined for zero return days (Goyenko et al., 2008). A larger value of the ratio implies larger liquidity or depth (Amihud et al., 1997).

Amihud's Measure

Amihud (2002) attempts to generalize the liquidity measure to make it more adaptable to markets around the world. Amihud's definition is the ratio of the daily absolute return to the dollar trading volume. This ratio more closely follows the Kyle (1985) price impact definition of liquidity, or the response of price to order flow (Lesmond, 2005).

However, stock illiquidity is defined here as the average ratio of the daily absolute return to the (dollar) trading volume on that day. R_{iyt} is the return on stock *i* on day *t* of year *y* and V_{iyt} is the respective daily volume in dollars. This ratio gives the absolute (percentage) price change per dollar of daily trading volume, or the daily price impact of the order flow. For every year *y*, illiquidity measure of stock *i* calculates as annual average

$$ILLIQ_{iy} = \frac{1}{d_{iy}} \sum_{t=1}^{d_{iy}} \frac{\left| R_{iyt} \right|}{V_{iyt}}, \quad (5)$$

where d_{iy} is the number of days for which data are available for stock *i* in year *y*. The illiquidity measure employed here, called *ILLIQ*; is the daily ratio of absolute stock return to its dollar volume, averaged over some period. It can be interpreted

as the daily price response associated with one dollar of trading volume, thus serving as a rough measure of price impact (Amihud, 2002). Therefore, the high value of illiquidity measure *ILLIQ* for some stock, indicates that this stock is illiquid - if the stock's price moves a lot in response to little volume (Acharya and Pedersen, 2005).

Amihud's based measure

Zhang (2010) introduced a new illiquidity measure for emerging markets. This measure is calculated by formula:

$$\mathrm{ILLIQ}^{Zhang} = \left[\ln(ILLIQ)\right] \cdot \left(1 + NT\%\right), \tag{6}$$

where *NT%* is the percentage of no-trading days within a month, and *ILLIQ* is calculated by formula (2.5).

The Zero-Return Measure (The LOT's measure)

A relatively new and popular measure of illiquidity is the zero-return proportion measure proposed by Lesmond, Ogden, and Trzcinka (1999). They proposed such an illiquidity measure based on the portion of zero return days out of possible trading days. The zero-return measure is the ratio of the number of zero-return days to the total number of trading days in a given month (Lee, 2006). LOT's measure is as follows:

$$ZR_{i,t} \equiv \frac{N_{i,t}}{T_t}, \tag{7}$$

where T_t is a number of trading days in month t and $N_{i,t}$ is the number of zero-return days of stock i in month t.

The economic intuition for the zero return measure is derived from simple trade-offs of the cost and benefit of trading for informed investors: when the trading cost is too high to cover the benefit from informed trading, informed investors would choose not to trade and this non-trading would lead to an observed zero return for that day. Importantly, the zero-return measure is defined over zero-volume days as well as positive volume days since this measure assumes that a zero-return day with positive volume is a day when noise trading induces trading volume (Lee, 2006).

The Price Pressure Measure

Daily price pressure (PP) measure is defined as follows:

$$\mathrm{PP}_{i,t} = \frac{\sum_{j=1}^{N} \omega_j \delta_{j,t} \left| R_{j,t,\tau} \right|}{\sum_{j=1}^{N} \omega_j \left| R_{j,t,\tau} \right|}, \tag{8}$$

where ω_j represents the weighting of the stocks in the market index (Bekaert et al., 2007). In our case, the market index is BELEX*line* index. *N* is number of stocks, each indexed by *j*. Coefficient $\delta_{j,t}$ indicates no trade days (as proxy by zero return days) and the first day after a no trade interval when the price impact is felt.

$$\delta_{j,t} = \begin{cases} 1, & \text{if} \quad R_{j,t} \text{ or } R_{j,t-1} = 0 \\ 0, & \text{otherwise} \end{cases}. \tag{9}$$

Also,

$$R_{j,t,\tau} = \begin{cases} R_{j,t} & \text{if} \quad R_{j,t-1} \neq 0 \\ \prod_{k=0}^{\tau-1} \left(1 + R_{m,t-k}\right) - 1, & \text{if} \quad R_{j,t-1} = 0 \end{cases}. \tag{10}$$

Here τ represents the number of days the stock has not been trading and $R_{j,t,\tau}$ is an estimate of the return that would have occurred if the stock had traded. Because in frontier and emerging markets market-wide factors may dominate return behavior with respect to idiosyncratic factors, we use the value-weighted market return, $R_{m,t}$, as our proxy for the unobserved return. Note that when a stock does not trade for a lengthy interval, $R_{j,t,\tau}$ may become quite large and the price impact illiquidity measure (PP_t) may move to 1 (Bekaert et al., 2007).

Advantages and disadvantages of liquidity measures

Although the bid-ask spread is the most used measure, spread is not always available for all asset or for all time periods. This is especially true for thinly traded asset. The bid-ask spread based on market microstructure data is not accessed for longer time series. The quotes are rough indicators of the underlying liquidity. The bid–ask quote is by far the most demonstrable indicator of overall liquidity, but closing prices often deviate from the quotes as trades are consummated at different prices from, or even outside, the quotes. In addition, quotes are not always available in all markets and for all time periods (Lesmond, 2005), specially in emerging markets of Western Balkan region.

Amivest's measure, Amihud's measure, Amihud's based measure (by Zhang, 2010), zero-return proportion, and price pressure measure are the multidimensional liquidity measures, while bid-ask spread is one-dimensional measure. The multidimensional measures combine the several liquidity aspects.

Disadvantage of Amivest's estimator of liquidity is that it is undefined for zero return days. However, zero return days often occur in the emerging and frontier market of the Western Balkan region. It is reason why Amivest's estimator is not good proxy for measuring liquidity of emerging and frontier markets.

Lesmond (2005) found that the volume-based model of Amihud is downward biased for low liquidity markets. This downward bias is practically manifested by reduced trading volume that specifically affects Amihud's measure. The results by Lesmond (2005), Bekaert et al. (2007) showed that Amihud's measure, was significant, and it is robust estimator of liquidity when it is used within each individual country (Lesmond, 2005). Disadvantage of Amihud's estimator of liquidity is that it cannot be calculated for days without price change. However, zero volume days also occur, leaving this estimator undefined. For that reason this measure is not usable as liquidity measure in frontier and emerging markets of Western Balkan region. Relating the estimator to the spread, this estimator should be positively related to the bid–ask spread because smaller spreads are associated with lower price impact (Lesmond, 2005). Additionally, Amihud's measure given by equation (2.5) is not stationary (i.e. inflation is ignored). Another problem with this measure is that *ILLIQ* is instrument for the cost of sales, which means that it does not measure directly the cost of trade (Acharya and Pedersen, 2005).

Bekaert, Harvey, and Lundblad (2007) used Price Pressure measure given by equation (8) as illiquidity measure, averaged across all days in a particular month for each country. They showed that this measure is reliable for examination of liquidity on emerging capital markets.

Lesmond (2005) found that the zero-return measure or LOT's measure outperform volume-based liquidity measures (Amihud's measure or turnover) at representing cross-sectional ranking differences in the bid–ask spread. Then, within each country liquidity is the best to measure by LOT's model. So, Lesmond (2005), Bekaert et al. (2007) showed that LOT's measure is robust estimator of liquidity within each individual country. Practical drawback of LOT's measure that it requires enough long time period (i.e. longer than one month) in order to estimate parameters. Moreover a lot of zero-returns (i.e. if there are more than 80% for estimation period) make this measure invaluable. Bekaert et al. (2007) employed LOT's measure and they indicated that only this

measure is applicable as illiquidity measure for emerging markets. Finally, in emerging markets, Lesmond (2005) compared the liquidity measures of Roll (1984), Amihud (2002) and turnover and argued the superiority of the zero-return based measure (Lee, 2006).

EMPIRICAL ANALYSIS OF LIQUIDITY

Many of the more sophisticated liquidity measures which are applicable for developed markets require the use of high-frequency transactions and quotes data, which may not be available for some markets, especially emerging and frontier markets (Zhang, 2010). These sophisticated measures of liquidity could not be used for estimation of liquidity of the Serbian financial market, because of the lack of the data and specific features of this market. In case of the Serbian frontier market, illiquidity is measured using two measures, Zero Rates (ZR), and Price Pressure of non-trading (PP). Both of these measures are used in Bekaert et al. (2007) for analyzing illiquidity of 19 emerging markets. The reason to use the trading frequency (measured by ZR) and price impact (measured by PP), rather than transaction cost, is that the Serbian market has relatively high information asymmetry. For the construction of these measures only data on stock prices and indices at closing were sufficient. Selected measures of illiquidity, ZR and PP, have values in the range between 0 and 1. If the value of these measures is closer to 1, this means that illiquidity is extremely high. For calculating ZR measure we used equation (7). This measure can be obtained for every stock on a monthly basis. Then, its value is averaged for all the stocks and the whole of the period.

Bekaert, Harvey, and Lundblad (2007) found that the least liquid country is Colombia according to the value of ZR measure (average value of ZR = 0.773). The country with average value of ZR = 0.109 is Taiwan (Bekaert et al., 2007), interpreting that Taiwan is the most liquid country of all 19 analyzed emerging markets. In order to find level of markets' liquidity in Serbia, we have established some critical value. An average value of ZR for all 19 analyzed emerging markets in Bekaert et al. (2007) was 0.495.

We decided to denote all average values of ZR measure above 0.495 as state of low liquidity. For the whole Serbian market, value of ZR measure in the case when excluded stocks have more than 80% of zero returns, is 0.506 (Table 1), indicating that Serbian market is low liquid. From table 1 we can see that mean value of ZR measure in the case when excluded stocks having more than 99% of zero returns, is 0.763. This would be the most realistic representative of the level of illiquidity. As the number of 0.763 is much higher than the critical value of 0.495, we can say that the Serbian market is extremely illiquid.

Table 1. The mean of ZR measure for the whole Serbian market and for the whole observed period: 2005-2009, in case when excluded stocks have more than 80%, 90%, and 99% of zero returns, respectively.

ZR measure	to 80%	to 90%	to 99%	All stocks
whole market	0.506	0.629	0.763	0.972

Note: The average value of ZR measure is given with the consideration of all stocks that have ever existed in the market.
Source: Author's calculation

According to the values of ZR measure (Table 2), for every year value of ZR measure was above the critical value of 0.495, indicating that in the Serbian frontier market, illiquidity is persistent. Indeed, persistence of liquidity are empirically proved by the following authors: Amihud (2002), Chordia, Roll, Subrahmanyam (2000, 2001), Hasbrouck and Seppi (2001), Huberman and Halka (2001), Pástor and Stambaugh (2003), Acharya and Pedersen (2005), and others. The Serbian market was the most illiquid in 2008 (year of the crisis), while it was the least illiquid in 2007. This is interesting result, because in the pre-crises period, market has reached "the peak" in the sense that it was the least illiquid. Then the market suffered a fall almost by Gaussian law, in the sense that it has reached maximum illiquidity. The mean value of ZR measure for every year and for whole observed period, for both BELEX indices is presented in Table 3.

Table 2. An average value of ZR measure of every year in observed period for whole market, in two cases: when excluded stocks having more than 99% of zero returns, and when are taken into account all shares.

ZR measure-whole market	2005	2006	2007	2008	2009
to 99%	0.775	0.778	0.726	0.786	0.771
All stocks	0.978	0.979	0.958	0.971	0.980

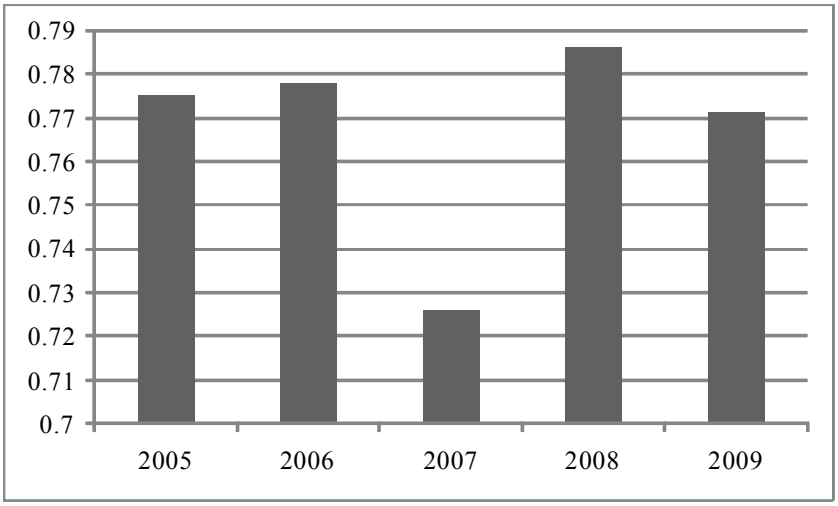
Source: Author's calculation

Table 3. The mean value of ZR measure for every year and for whole observed period, for both BELEX indices. The average value is calculated with monthly data.

ZR measure	2005	2006	2007	2008	2009	Average
BELEX*line*	0.699	0.718	0.529	0.649	0.664	0.644
BELEX15	0.266	0.251	0.101	0.190	0.166	0.182

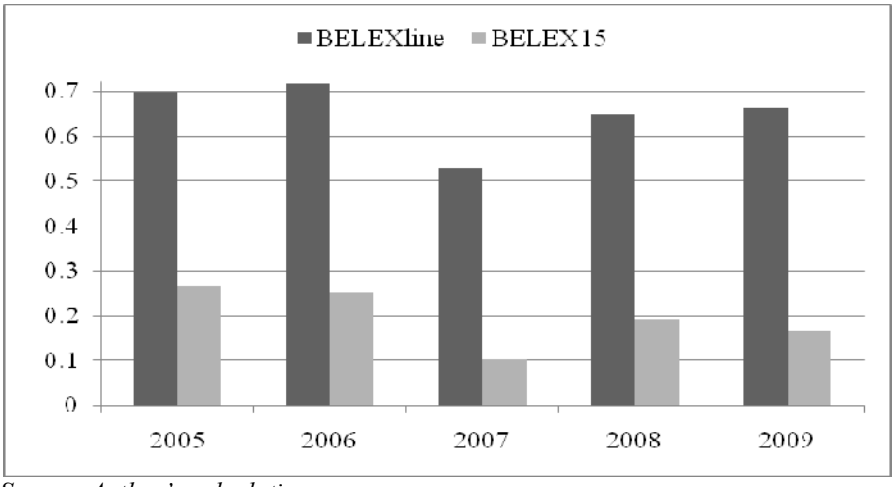
Source: Author's calculation

Graph 2. An average values of ZR measures for whole the Serbian market, for every year in observed period, in case when excluded stocks having more than 99% of zero returns.



Source: Author's calculation

Graph 3. An average values of ZR measures for BELEX indices, for every year in observed period (2005-2009).

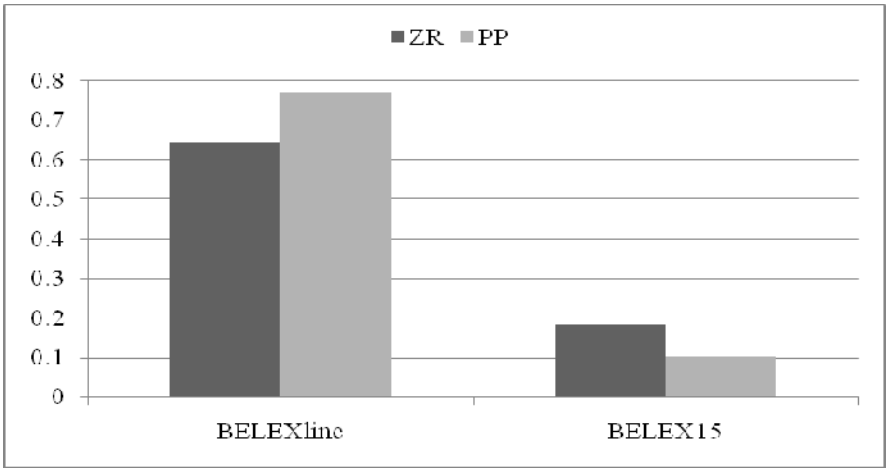


Source: Author's calculation

For calculating PP measure we used equations from (8) to (10). In order to get and apply corresponding Price Pressure of non-trading (PP) illiquidity measure, we wrote the program within Microsoft Access package. To validate results, we

computed two capitalization-weighted[3] illiquidity measures of BELEX*line* and BELEX15 indices, respectively. Hence, we get two illiquidity measures on daily basis. Then, daily illiquidity measures have been averaged across all days in a particular month.

Graph 4. An average values of ZR and PP measures for BELEX indices, for whole observed period (2005-2009).



Source: Author's calculation

In order to compare illiquidity for each year we calculated an average value of PP measure of both BELEX indices (see Table 4). For whole market, the most illiquid year was 2009 (mean of PP for BELEX*line* index = 0.874), while the least illiquid year was 2007 (mean of PP for BELEX*line* index = 0.588). For the most liquid stocks (BELEX15 index), the least liquid year was 2008 (mean of PP for BELEX15 index= 0.120), while the most liquid year was 2007 (mean of PP for BELEX15 index = 0.051). Bekaert, Harvey and Lundblad (2007) found that the least liquid country is Indonesia according to the value of PP measure (mean of PP = 0.776). The country with mean of PP measure = 0.158 is Taiwan (Bekaert et al., 2007), interpreting that Taiwan is the most liquid country of all 19 analyzed emerging markets. In order to find level of markets' liquidity in Serbia, we have established some critical value. An average value of PP for all 19 analyzed emerging markets in Bekaert et al. (2007) was 0.552. Then we decided to denote all values of PP measure above 0.552 as state of low liquidity.

From Table 4 we see that mean of PP measure for BELEX*line* is 0.771, indicating that Serbian market is low liquid. On the other hand, mean of PP measure for

[3] Bekaert et al. (2007) computed value-weighted PP measure, too.

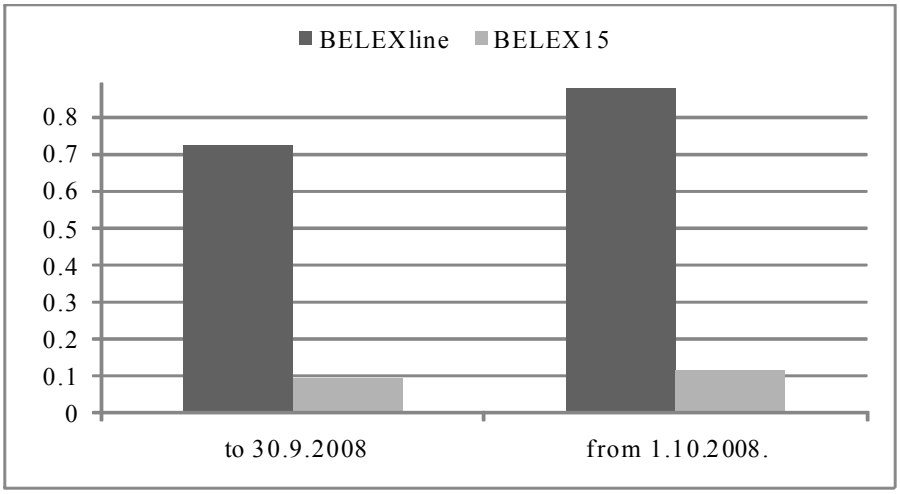
BELEX15 is 0.101, indicating that this index (portfolio consisting of the 15 most liquid stocks) is highly liquid.

Table 4. An average value of monthly illiquidity measure of BELEXline and BELEX15 indices for every year in observed period.

PP measure	2005	2006	2007	2008	2009	Average
BELEX*line*	0.881	0.808	0.588	0.786	0.874	0.771
BELEX15	0.108	0.115	0.051	0.120	0.116	0.101

Source: Author's calculation

Graph 5. An average values of PP measures for BELEX indices, before and after crises.



Source: Author's calculation

Table 5. An average value of monthly illiquidity measure PP, for two BELEX indices in the pre-crises and post-crises period.

PP measure	Average	to 30.9.2008	from 1.10.2008.
BELEX*line*	0.771	0.724	0.878
BELEX15	0.101	0.094	0.117

Source: Author's calculation

Results from Table 5 suggest that level of illiquidity in the post-crises period increased. Hence, level of market illiquidity (BELEX*line*) increased in the post

crises period in Serbia, as well as level of illiquidity of the most liquid stocks (BELEX15 index) increased in this period, too.

Erić (2010) told that revenues from privatization, grants and foreign direct investments have declined, some even dried up with the increase of crisis. Therefore, there is a slowdown in Serbian economic growth. This author pointed out that the development of the Serbian capital market is an extremely important issue and involves a very serious and responsible approach. There are no new legal regulations, the development of institutions is slow, there are no new instruments and the turnover of the existing instruments has been reduced. All these facts must be understood as an important warning (Erić, 2010). Šoškić and Živković (2007) stated that in the Serbian market, there are no exact rules regarding available information about company, and consequently insider information has a huge influence on investor's decisions. Better regulation in this area, with increased amount of publicly available information, can reduce the information asymmetry risk. On the other side, this will lead to decreasing transactional costs and also to reduced illiquidity risk, which could bring up the level of foreign investments.

CONCLUSION

This paper presents research on liquidity measuring of financial market in the Western Balkan region (the case of Serbia). The paper presents an overview of different types of multidimensional liquidity measures. These liquidity measures covered in this paper are: Amivest's measure, Amihud's measure, zero-return proportion, price pressure of non-trading. The advantages and disadvantages of these measures are given. For empirical analysis of the Serbian market liquidity we used two measures: zero-return proportion and price pressure of non-trading as in Bekaert, Harvey, and Lundblad (2007). We used daily data for stocks from BELEX*line* and BELEX15 indices, as well as data for all stocks listed at the Belgrade Stock Exchange in the period: October, 2005 – December, 2009. In order to obtain and apply the corresponding illiquidity measures, we have written a program within Microsoft Access package. Results of analysis suggest that, for whole the Serbian market, the most illiquid year was 2008, while the least illiquid year was 2007. Particularly, in the post-crises period level of illiquidity increased for both BELEX indices. Results of this paper showed that the Serbian market is extremely illiquid. The presence of illiquidity is one of the key barriers that foreign investors face while investing in the Serbian market, and whole Western Balkan region. It represents main barrier to further stock market development due to lower inflows of capital. In order integrate the Serbian market into EU financial market, structural change is required. One of the major requirements that the Serbian market transformed to emerging markets in order to develop market is to

improve market liquidity and its measuring. In order to enable accelerated economic development Serbia has to improve state regulation, corporate control, private financial analysis, financial intermediation, transparency reports, and remove information asymmetry.

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