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stock exchanges boom and bust:
Macedonian stock exchange case**

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TOWARDS SMALL STOCK EXCHANGES BOOM AND BUST:
MACEDONIAN STOCK EXCHANGE CASE**

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Abstract. This paper aims to answer the question if and how much the foreign investors influence the boom and bust of small stock exchanges. It examines the impact of the foreign investors' turnover towards small stock exchange turnover, particularly the Macedonian Stock Exchange. Based on the Macedonian Stock Exchange data for the period of January 2006 to July 2009, I find strong evidence that for a small and open stock exchange such as the Macedonian Stock Exchange, foreign investors substantially contributes to the Stock Exchange boom and bust.

Keywords: Stock Exchange, Foreign Investors, Turnover, Linear Regression

JEL classification: C35, G01, G12, N24, O16

1 Introduction

Global Financial Crisis has big impact on capital markets, especially stock exchanges. For those young and underdeveloped stock exchanges, such as the Macedonian Stock Exchange, which exists from 1995, the period from the beginning of 2005 until the middle of 2009 has been the most remarkable period that will be remembered for generations. The value of the basic Macedonian Stock Exchange index MBI10 in January 2005 was 1.000. At its peak, at the end of August 2007 the value rose to 10.057 or 905% growth for only 2 years and 8 months, and now, in April 2011 decreased to only 2.500, or 75% less than the highest value. This phenomenon evokes many questions, but maybe the most important one is "if and to what extent foreign investors were the reason for the Macedonian Stock Exchange boom and bust.

The impact of foreign investors towards the big Stock Exchange was immense. For example, their withdrawal of US\$35bn from the Russian stock market through early September 2007, forced the Russian Central Bank to defend the ruble, sending reserves down 4.2%. Russian Stock Exchange Index for the following 12 months lost almost 80% of its value. Foreign Investors withdrawals decreased more than 50% from Dow Jones Industrial Average.

Underdevelopment of the Macedonian Stock Exchange did not challenge the scientific and professional public to analyze the reasons for its fast boom and bust. Therefore, this study addresses these issue by: (1) analyzing Macedonian Stock Exchange development since its beginnings in 1995, in order to determine the level of its development and exposure to influences from abroad, (2) investigating Macedonian Stock Exchange index MBI 10 since its beginning at the end of 2004 in order to establish the reasons for the fast growth and reduction (3) measuring Foreign Investors impact on Macedonian Stock Exchange using linear regression on the percentage change in Foreign Investors and Macedonian Stock Exchange turnover (Risteski and Tevdovski, 2008 and Field, 2005).

2 Data and Model

2.1 Macedonian Stock Exchange development

The story of the Macedonian Stock Exchange began on September 13, 1995. This is the official date of the establishment of the first organized securities exchange in the history of the Macedonia. The conclusion of transactions was carried out on the "stock exchange floor" in the trading hall through the method of continuous auction and the model of "order-driven market" until 2001.

In December 1999 the Securities Law was amended, which set the basis for dematerialization of securities and introduced the centralized record keeping of shares ownership in Macedonia. In 2001, the trading on the stock exchange floor stopped and the electronic trading of securities started using the new "Bourse Electronic System of Trading" (BEST).

The first official stock exchange index - the Macedonian Bourse Index (MBI) was promoted. The long-awaited process of complete dematerialization of shares in more than 670 companies in the country and the operation of the Central Securities Depository had begun. In 2002, price limitations were introduced for the listed securities on the Official Market from +/-10% of their last official average price, which contributed to the high volatility of the Macedonian Stock Exchange shares in the following years.

In 2004 the listing criteria on the Official Market were raised to a higher level, the Unofficial Market was split into two parts - Market for Publicly Held Companies and a Free Market. The criteria for shares listing were toughened, and new continuous obligations for reporting were introduced (submitting of a three-month cumulative unaudited Income Statements, publication of a dividend calendar and notification of large owners). Publication of the new Exchange index was announced (MBI-10).

A software application called SEI-NET was introduced in 2005, as the official and only way of delivering information from the listed companies to the Exchange. The new Securities Law was passed, with which a further harmonization of the regulation in the securities industry with the EU Directives and the principles of IOSCO (International Organization of Securities Commissions) was made.

The main characteristic of the year 2006 was entrance of capital inflow from regional institutional investors into Macedonian capital market. Two private pension funds appear at the domestic market as new institutional investors. In 2006, state owned company for electricity supply and distribution "ESM" was privatized by selling certain percentage of their capital to foreign investor. During the year, the state presence on the securities market was considerable, due to the selling state owned capital in many joint stock companies among which the most significant was Makedonski Telekom AD Skopje and few more listed companies.

Year 2007 was the most successful since the foundation of MSE back in 1995. The MSE realized record turnover of 41.7 billion € and MBI 10 index achieved its biggest value breaking the barrier of 10.000 index points, or 905% growth for 2 years and 8 months. As a comparison, Dow Jones Industrial Average for the same

period (January 2005 – August 2007) rose only 23,87% (from 10.783,01 to 13.357.74), and Standard & Poor's rose only 21,62% (from 1.211,92 to 1473,99).

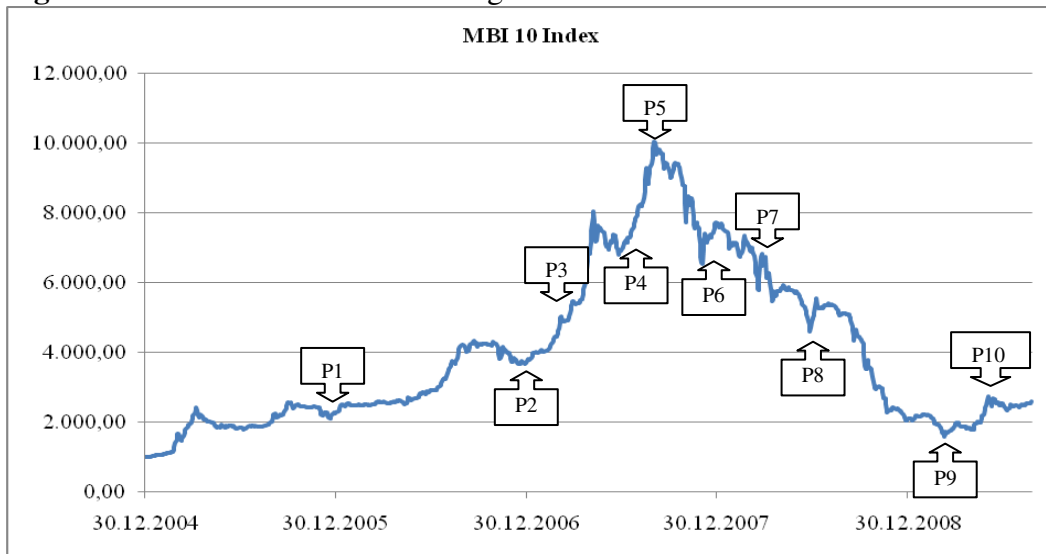
The global financial crisis from the middle of 2007 has its impact on the Macedonian Stock Exchange as well, having in mind its openness and the immense exposure to foreign investors. Foreign institutional investors in order to cover their liquidity needs, raised from investor's requests for stepping out of their investment funds, were forced to sell their stock positions especially those in Macedonia where highest returns were made.

2.2 MBI 10 Index and Foreign Investors' turnover

The initial value of MBI 10 index was established at 1.000 on December 30, 2004. For only one year (2005), it grew to 2.292,04 or 129,2% (Figure 1, peak 1). Additional 61,54% the MBI 10 Index grew in 2006 to value of 3.702,54 (peak 2). Only for the first quarter in 2007, the index grew for additional 48,06% to value of 5.481,92 (peak 3). On the end of June 2007, the index reaches the value of 6.917,51 or continuing the growth with additional 26,29% just for the second quarter (peak 4). Macedonian Stock Exchange and its MBI 10 Index reaches its peak on August 31, 2007 when the value of the index stop at 10.057,77 (peak 5), which was 45,4% growth for only 2 months, 171,65% growth for those eight months in 2007 or 905,78% growth for only 2 years and 8 months when the index was first introduced and measured.

On the end of 2007, MBI 10 starts declining for the first time for 16,61% for the fourth quarter and 23,04% from its peak in the end of August (peak 6). Decline of 13,35% was evidenced for the first quarter of 2008 and additional 27,16% for the second quarter of 2008, or 51,42% for only 10 months – from the peak (peak 7 and 8). Third quarter of 2008 finished with decline of 8,95% and the fourth quarter with additional 52,88% or 79,16% decline from the peak 16 months ago. MBI 10 index reach its bottom on March 10, 2009 when the value of the index was only 1.598,5 or 84,11% decline from the highest peak in August 2007 (peak 9). Second quarter of 2009 finished with growth of 32,89% compared to the first quarter value or value of 2.532,43 (peak 10). This value has not change until today (April 29, 2011) with only small fluctuations.

Figure 1. Macedonian Stock Exchange Index MBI 10

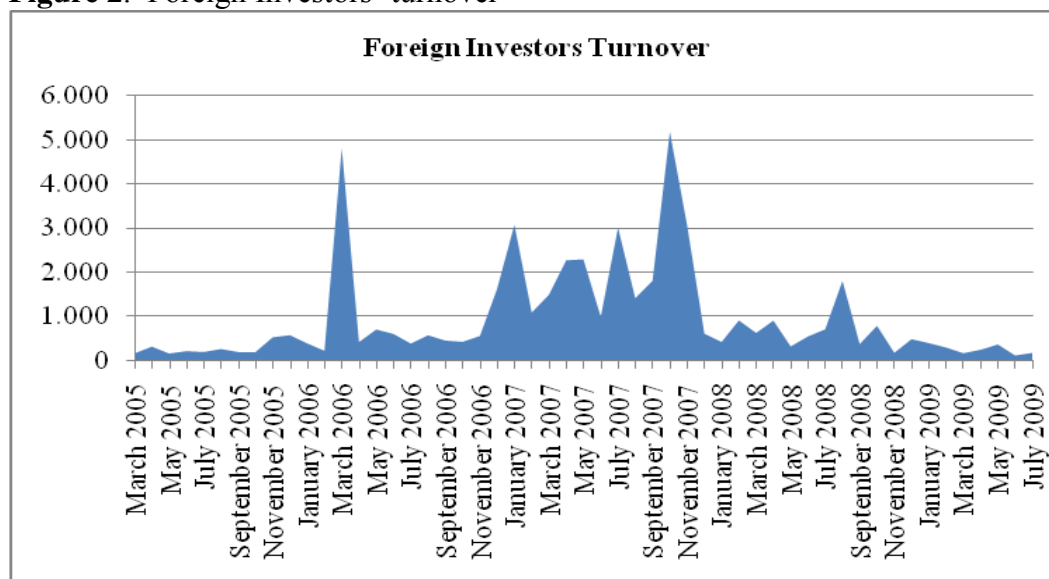


Source: Macedonian Stock Exchange data, authors' own creation

Foreign Investors appear on the Macedonian Stock Exchange at the beginning of 2005. From Figure 2, we can see that first more significant turnover they realized at the beginning of 2006 when they had 4,8 billion MKD turnover¹ - period when the first more significant growth in MBI 10 can be noticed from Figure 1. Year 2006 was finished with 11 billion MKD turnover or 282% growth from the previous year, which result with the additional growth in MBI 10 Index of 61,54% on annual basis. In 2007 we can find the most significant activity of foreign investors since the total turnover in this year was 26,2 billion MKD or increase of 137,34% from the previous year (from peak 2 to peak 6 in Figure 1). In this year MBI 10 reach its peak on August 31, with growth of 171,65% only for those 8 months from that year.

¹ Foreign exchange rate for 1 € = 61,3 MKD

Figure 2. Foreign Investors' turnover



Source: Macedonian Stock Exchange Data, Authors' own creation

After the first decline in the fourth quarter of 2007, foreign investors' turnover starts declining significantly, thus sending stocks into a tailspin. This can be explained partially with the decline in share prices but mainly with the worries over a possible recession in the US. Since then, foreign investors decrease their turnover to minimum historical levels, investing their money in more developed stock exchanges where the first signs that the global financial crisis has finished were noticed through the positive rise in the value of their indexes. For example from the bottom at the value of 6.626,94 on March 6, 2009 the index Dow Jones Industrial Average rose to 12.810,54 on April 30, 2009 or 93,31%²; S&P 500 Index from the minimum value of 683,38 on March 6, 2009 rose to 1.363,61 on April 30, 2009 or 99,54%.

According to (Sumanjeet and Paliwal, 2010), the increase in the volume of foreign institutional investment inflows in recent time has led to concerns regarding the volatility of these flows, threat of capital flight, its impact on the stock markets and influence of changes in regulatory regimes. They revealed that any problem related to foreign institutional investors is the problem of management and that India should develop new tools to manage foreign institutional investors effectively and efficiently. This can be good direction towards which the Macedonian Stock Exchange and the security market regulators should be acting in the next period if immense volatility wants to be eliminated and more stable

² <http://www.google.com/finance?client=ob&q=INDEXDJI:DJI>

security market established. This can be crucial for the future preservation of domestic investors, their investments and participation in the security market.

2.3 Linear regression

In determining the influence of foreign investors on the Macedonian Stock Exchange, quantitative analysis has been used. In the analysis, applied is simple linear regression to assess the impact of the percent change in the foreign investors' turnover (independent variable) on the percent change in Macedonian Stock Exchange turnover (dependent variable). The elaborated period includes monthly data from January 2006 to July 2009 and covers 42 observations. For the analysis, data from the Macedonian Stock Exchange have been used (Appendix 1).

The theoretically substantiated result, for a small and open economy such as Macedonia, is that the higher Foreign Investors' turnover, substantially contributes to higher turnover on the Macedonian Stock Exchange. The obtained results indicate high positive linear correlation of 95.9% between the observed variables.

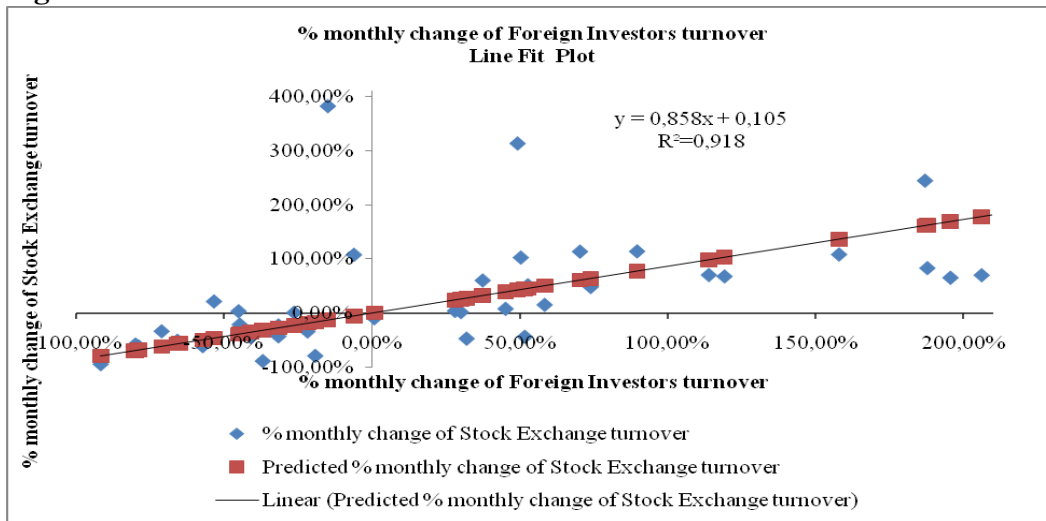
Table 1: Regression Statistics

Multiple R	0,959
R Square	0,919
Adjusted R Square	0,917
Standard Error	0,893
Observations	42

Source: Authors' own calculations

Adjusted coefficient of determination that is also high, shows that the share of the explained variability in the total variability was 91.7%, or it can be interpreted that variations or changes that cause the change of the Macedonian Stock Exchange turnover is 91.7% explained with the changes caused in the Foreign Investors' turnover, while the rest 8.3% is caused by variations of domestic investors' turnover.

Figure 3. Line Fit Plot

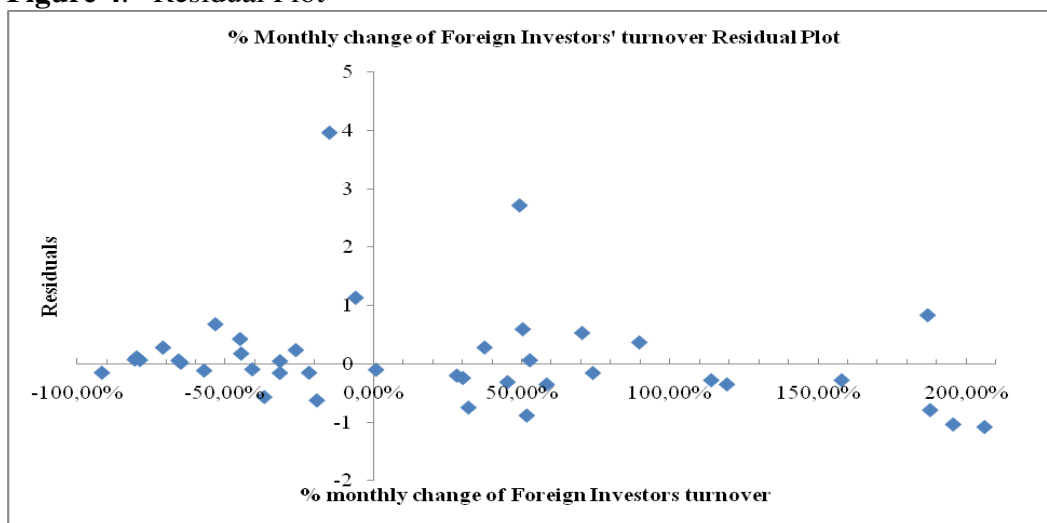


Source: Authors' own calculations

The standard error of regression is small, amounting to 0.893, and shows us the absolute deviation of the empirical data from the regression analysis of the sample. The regression equation of the sample is as follows:
 $y' = b_0 + b_1x_i = 0,105 + 0,858x_i$

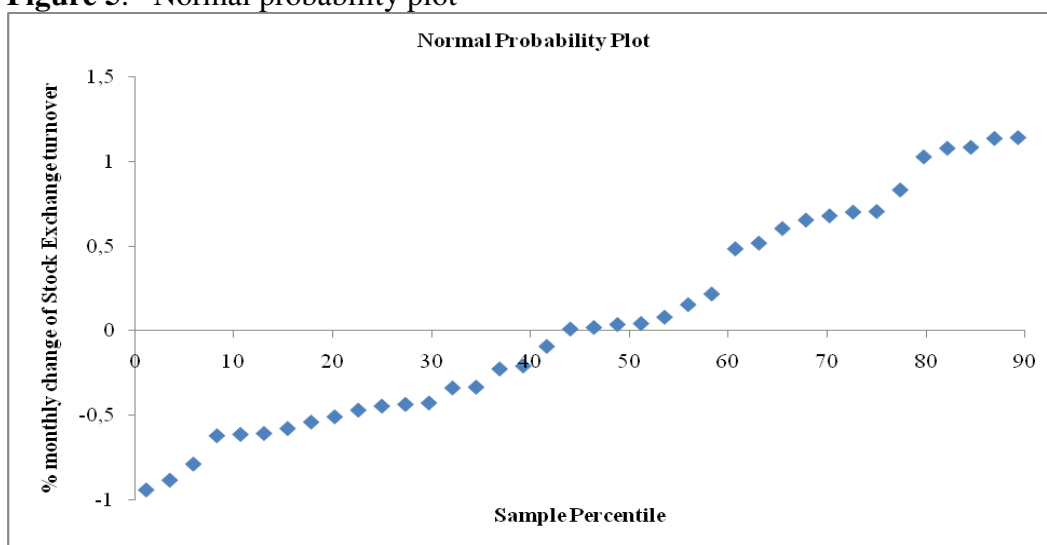
Stretch of the Y-axis or value of the dependent variable when the independent variable $X = 0$ is the value of regression parameter $b_0 = 0,105$. Regression parameter $b_1 = 0,858$ indicates the change in the dependent variable Y when the independent variable X will increase by one of its unit. In this case, it suggests that if the Foreign Investors' turnover were increased by 1%, then the Stock Exchange turnover on average would increase by 0.858%. Estimated value of this ratio with the risk of error of 5% will range from 0.777% to 0.940%. Testing the regression coefficient $b_1 = 0,858$ gives p value of 0.000. This value indicates the smallest level of significance for which the zero hypothesis $H_0 : \beta_1 = 0$ can be dismissed and the alternative hypothesis $H_1 : \beta_1 \neq 0$ accepted. In our case, the alternative hypothesis is accepted, i.e. the regression coefficient $b_1 = 0,858$ also statistically is confirmed that is different from 0, or that the independent variable truly affects the dependent variable. Residual Plot Figure shows the standardized residuals of the regression on Y-axis and the predicted standardized values of the regression on X-axis.

Figure 4. Residual Plot



Source: Authors' own calculations

Figure 5. Normal probability plot



Source: Authors' own calculations

From the previously elaborated, it can be concluded that the assumption of full linearity is fulfilled, but the same it cannot be entirely declared for the assumption of homoscedasticity or equality of residuals.

All this statistically confirms the theoretical expectation that Macedonian Stock Exchange turnover positively depends on the Foreign Investors' turnover.

3 Summary

From the analysis of the Macedonian Stock Exchange development since its beginnings in 1995, having in mind the small history of existence, it can be concluded that the Stock Exchange is still underdeveloped and too much opened and exposed to influences from abroad. Macedonian Stock Exchange Index MBI 10 for only 2 years and 8 months grew 905%, and for the following 18 months was reduced for 84%, which is an evidence for very high volatility.

Investigating the reasons, we can conclude that despite the global financial crises, direct reason for the fast growth and reduction of the MBI 10 Index was the foreign investors' turnover.

The theoretically substantiated result, for a small and open economy such as Macedonia, is that the higher Foreign Investors' turnover, substantially contributes to higher turnover on the Macedonian Stock Exchange. The obtained results from the regression indicate high positive linear correlation of 95.9% between the observed variables.

Both theoretically and empirically, this study proved that foreign investors substantially contribute to the Macedonian Stock Exchange boom and bust. In order to be protected from future immense volatility, Macedonian security market regulators need to establish more sound rolls that will enable effective and efficient management of the stock exchange. This should provide stability and eliminate the negative influence coming from the openness and exposure of the Macedonian Stock Exchange to foreign investors.

4 Acknowledgements

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Appendix 1

Table 2: Macedonian Stock Exchange Data

	Macedonian Stock Exchange Turnover³	% change of Macedonian Stock Exchange Turnover	Foreign investors' turnover⁴	% change of Foreign investors' turnover
January 2006	729.821.735	n/a	378.193.623	n/a
February 2006	577.553.739	-20,86%	209.652.007	-44,56%
March 2006	11.686.914.615	1923,52%	4.816.177.513	2197,22%
April 2006	675.779.595	-94,22%	408.103.297	-91,53%
May 2006	1.444.799.993	113,80%	695.526.717	70,43%
June 2006	6.973.598.598	382,67%	592.755.881	-14,78%
July 2006	805.369.545	-88,45%	374.738.449	-36,78%
August 2006	1.633.634.810	102,84%	563.604.009	50,40%
September 2006	1.080.810.050	-33,84%	441.510.905	-21,66%
October 2006	2.247.645.453	107,96%	415.140.115	-5,97%
November 2006	1.191.008.537	-47,01%	548.340.330	32,09%
December 2006	1.970.997.263	65,49%	1.620.751.049	195,57%
January 2007	4.223.183.976	114,27%	3.074.477.935	89,69%
February 2007	1.939.990.193	-54,06%	1.079.798.541	-64,88%
March 2007	3.113.169.854	60,47%	1.484.982.020	37,52%
April 2007	4.726.054.924	51,81%	2.268.978.969	52,80%
May 2007	4.288.787.998	-9,25%	2.289.783.912	0,92%
June 2007	1.682.118.805	-60,78%	982.862.018	-57,08%
July 2007	2.862.587.167	70,18%	3.008.865.371	206,13%
August 2007	3.484.656.539	21,73%	1.406.755.845	-53,25%
September 2007	3.633.652.176	4,28%	1.803.018.210	28,17%
October 2007	6.660.933.629	83,31%	5.188.867.297	187,79%
November 2007	3.690.422.068	-44,60%	3.071.538.287	-40,81%
December 2007	1.396.763.119	-62,15%	600.049.436	-80,46%
January 2008	799.744.209	-42,74%	410.988.549	-31,51%
February 2008	1.343.493.855	67,99%	901.081.329	119,25%
March 2008	1.039.593.255	-22,62%	617.414.434	-31,48%
April 2008	1.122.998.859	8,02%	896.826.889	45,26%
May 2008	550.902.297	-50,94%	308.009.474	-65,66%
June 2008	817.860.186	48,46%	536.025.566	74,03%
July 2008	833.487.050	1,91%	697.878.707	30,20%
August 2008	1.738.052.930	108,53%	1.800.101.420	157,94%
September 2008	732.285.137	-57,87%	363.799.256	-79,79%
October 2008	1.248.960.065	70,56%	778.351.913	113,95%
November 2008	482.533.487	-61,37%	165.605.493	-78,72%
December 2008	1.664.049.515	244,86%	475.252.541	186,98%
January 2009	350.616.520	-78,93%	384.731.507	-19,05%
February 2009	354.127.668	1,00%	284.187.454	-26,13%
March 2009	367.193.897	3,69%	156.461.320	-44,94%
April 2009	1.519.038.214	313,69%	233.628.077	49,32%
May 2009	856.912.383	-43,59%	354.504.653	51,74%
June 2009	570.652.166	-33,41%	103.002.716	-70,94%
July 2009	658.728.115	15,43%	163.232.827	58,47%

Source: Macedonian Stock Exchange Data, Authors' own creation

³ Macedonian Stock Exchange Turnover represent the total value of bought or sold securities for that month

⁴ Foreign Investors' turnover represent the total value of both bought and sold securities for that month by the foreign investors