

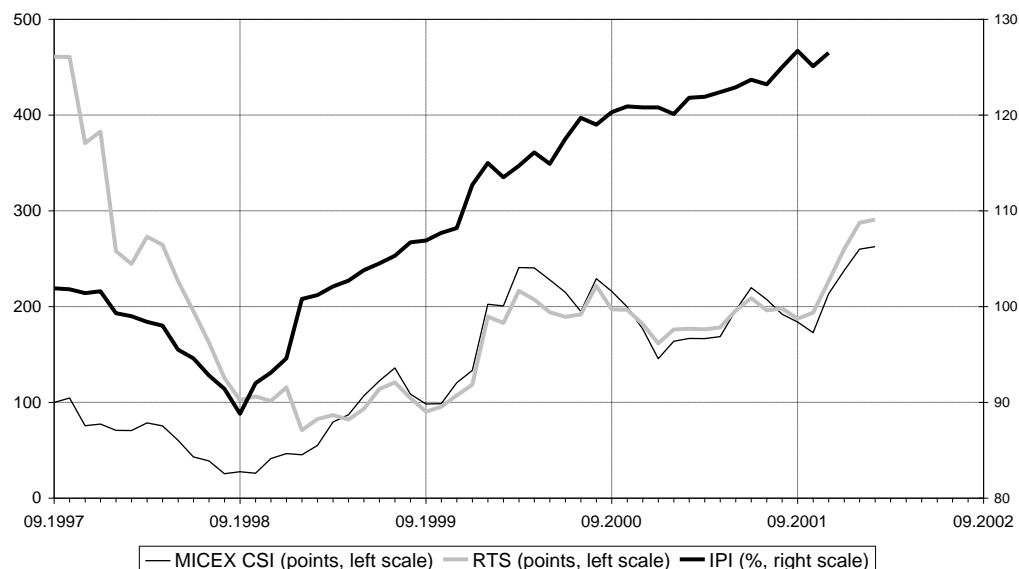
TWO RUSSIAN STOCK EXCHANGES: ANALYSIS OF RELATIONSHIPS

Leonid Grigoriev
Lilia Valitova

Development of Russian financial markets is gradually becoming a subject for standard economic analysis. Accumulated statistics make it possible to pose some questions about features of development and operation of financial markets in Russia. This paper analyses relationships between the two leading Moscow stock exchanges, as well as analysing performance of their indices and trading volumes, and factors determining index changes. The authors are far from thinking that their work is comprehensive or gives final answers to the questions posed. On the contrary, the authors hope that the paper will be a starting point for development of a fruitful scientific discussion of the issues concerned.

Russian stock exchanges, their trading volumes and share prices, offer material which makes it possible to search for clear and steady patterns of performance. Although the period of organised stock trading in Russia is quite short, the combined use of monthly, daily and hourly observations allows a variety of questions to be posed. For example, what is the relationship between the performance of the two exchanges as regards indices and trading volumes, and how are those related to international indices and important factors traditionally affecting levels of market activity, such as economic activity in Russia, commodity prices, etc.? One interesting aspect of stock index performance is the slow rate of index growth despite the relatively long-lasting economic recovery (Figure 1).

Figure 1. Stock indices and industrial production index (1997 = 100%)



A distinctive feature of Russian financial markets is the existence of several stock exchanges with different histories and types of organisation:

- RTS – the RTS Stock Exchange (formerly the RTS Trading System);
- MICEX – the Moscow Interbank Currency Exchange;
- MSE – the Moscow Stock Exchange.

The 1998 financial crash delayed access of many ‘second-tier’ companies to Russian and international stock exchanges. Some issuers, particularly oil companies and companies in par-

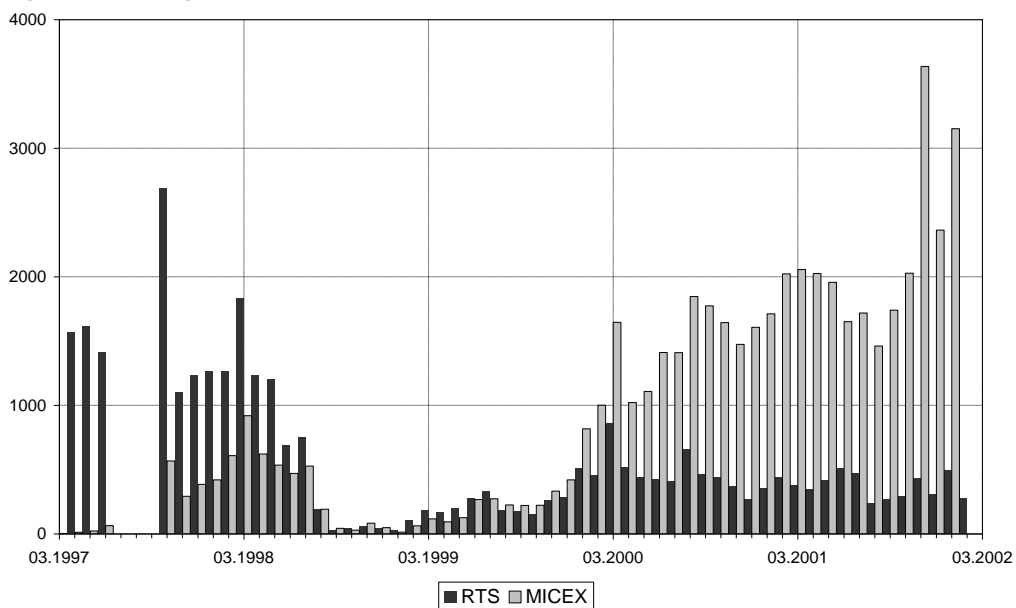
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Leonid Grigoriev, Leading Researcher, Institute for World Economy and International Relations, Russian Academy of Sciences (lgrigor@econweb.ru).

Lilia Valitova, graduate student, Moscow State University, Economics Department.

tial foreign ownership, succeeded in expanding their presence on stock exchanges and increasing their capitalisation. Outside Russia, Russian shares are still identified with Gazprom, UES, YUKOS, LUKoil and Rostelecom. Although stock indices used by the exchanges are usually composed of dozens of the most liquid shares, trading is heavily concentrated on corporate papers issued by a handful of key companies. These are shares of UES, LUKoil, Rostelecom, Norilsk Nickel and YUKOS on the RTS; the same shares plus corporate bonds on the MICEX; whereas the MSE is primarily a venue for trading in Gazprom shares. The history of stock indices is still very short. The RTS dates from the middle of 1995, the MICEX started securities trading as late as the end of 1997. Given the 1998 crash and devaluation, quantitative analysis can only cover the period beginning in 1999.

The analysis will mainly focus on the better known and more active exchanges: the RTS and the MICEX. One of the first and natural problems is to determine how close is the relationship between the two, which is in fact tantamount to asking whether the process of share pricing is uniform for both exchanges. The relationship between the performance of the same stocks on the two exchanges will be examined to see whether the market is uniform as regards pricing and volumes. Both exchanges are very active, both are expanding their range of shares and other instruments. However, 2001 saw a drastic rise in MICEX turnover, reflecting both general trends of stock trading and specific institutional features of the two exchanges (see Figure 2). RTS monthly trading volumes declined from \$509.7 mn to \$307.1 mn over 2000–2001, while on the MICEX they soared from \$817.8 mn to \$3636.0 mn (conversion into dollars at the average monthly exchange rate).

Figure 2. Trading volumes (\$ mn)



Difference between the two exchanges in trading volumes bears a complex relationship to the difference in customers and the nature of transactions. It is believed that big investors, including foreign investment banks, are operating on the RTS, where trading is in dollars. By contrast, the MICEX is dominated by Russian capital and Russian players. This probably explains why the MICEX uses two different indices: the standard Composite Stock Index CSI¹ and the MICEX10,² the latter intended for day-traders and tracking the slightest fluctuation in prices for the main financial instruments.

¹ The MICEX Composite Stock Index (CSI) is the market value-weighted index of capitalisation of shares included in the MICEX quotation lists. The index is calculated based on the traditional technique used for capitalisation-weighted indices, such as S&P, Emerging Market Indices, Dow Jones Global Indexes, DAX family.

² Price index calculated as the arithmetical average of price changes for 10 most liquid shares traded in the Stock Market Section (regardless of whether they are on the MICEX quotation lists). The composition of the index basket is determined quarterly based on four indicators of liquidity.

The aim of this paper is to show appropriateness of econometric techniques for analysis of the operation of Russian exchanges. It is important to answer the crucial question of why capitalisation of Russian companies in recent years has failed to match the rise in fundamental macroeconomic indicators. The paper also aims to find a relationship between the existing indices and prices for certain stocks, on the one hand, and a certain (primary) set of factors, including the impact of share price changes on foreign markets, on the other hand.

TRADING IN LEADING RUSSIAN SHARES³

Domination of stock indices by a limited number of shares will determine our analysis of the indices. Since MSE trading is primarily in shares of Gazprom,⁴ while trading in other stocks is mostly concentrated on the RTS and MICEX, the difference in trading volumes and the values of the RTS⁵ and CSI indices are mostly due to trading structures, i.e. which stocks dominate trading on each exchange.

Table 1. Trading in blue-chip stocks (monthly data, March 1997–December 2001)

	LUKoil		Rostelecom		UES		Gazprom
	MICEX	RTS	MICEX	RTS	MICEX	RTS	MSE
Average, R mn	1 669.92	1 535.93	418.23	344.64	1 7487.45	2 747.884	1 271.35
Standard deviation	2 218.96	938.08	563.04	270.21	2 0078.46	1 902.446	1 062.47
Ratio of standard deviation to the average	1.33	0.61	1.35	0.78	1.15	0.69	0.84
Number of observations	56	57	57	57	55	57	53

Thus, 99% of fluctuations in MICEX trading depend on fluctuations in trading volumes of LUKoil, UES, Surgutneftegaz and Rostelecom shares. On the RTS the leading role is played by LUKoil, UES, Norilsk Nickel and Rostelecom, whose overall contribution to volume variations in the system is 97%.⁶ Since Gazprom shares are mostly traded on the MSE, it is seen that just four Russian companies dominate the market, although in late 2001 YUKOS drew close to them. It is worth noting that the MICEX shows higher concentration of the three leading blue chip stocks in trading volumes (with much larger turnovers!) than the RTS (see Figure 3). The MICEX displays a very high concentration of trading in UES stock: 62.5% compared to 24.8% on the RTS (as of March 19, 2002).

A key feature of Russian exchanges is that the leading traded (liquid) stocks represent the natural monopolies sector, primarily energy. Unsurprisingly, the two huge energy companies UES and Gazprom, which were not split up in the 1990s, have the larger share on exchanges. At the same time, they are enormously undervalued. For example, UES is greatly undervalued compared to the sum of its constituent electricity companies which are to become independent through restructuring (provided that the newly established companies are managed efficiently). In a country like Russia, with its huge raw materials exports, it would be natural to expect domination by exporting companies in the metallurgy, oil and fertiliser industries. So far, however, only LUKoil and YUKOS are top-tier companies as regards capitalisation and level of trading activity. Some companies in the food-processing industry show promise, but they still have little effect on overall trading volumes on exchanges. An important feature and a weakness of natural monopolies is their dependence on administratively regulated prices. This makes them indirectly dependent on government policy in the fields of investment and inflation control, as was seen during the debate and decisions by the Government in January 2002

³ Unfortunately, hourly data on trading in individual stocks on Russian exchanges or relevant ADRs in the US (or Global Receipts for other foreign exchanges) are not available, making it impossible to analyse relationships between them.

⁴ The MSE will be considered below in analysing features of the markets for individual blue chips.

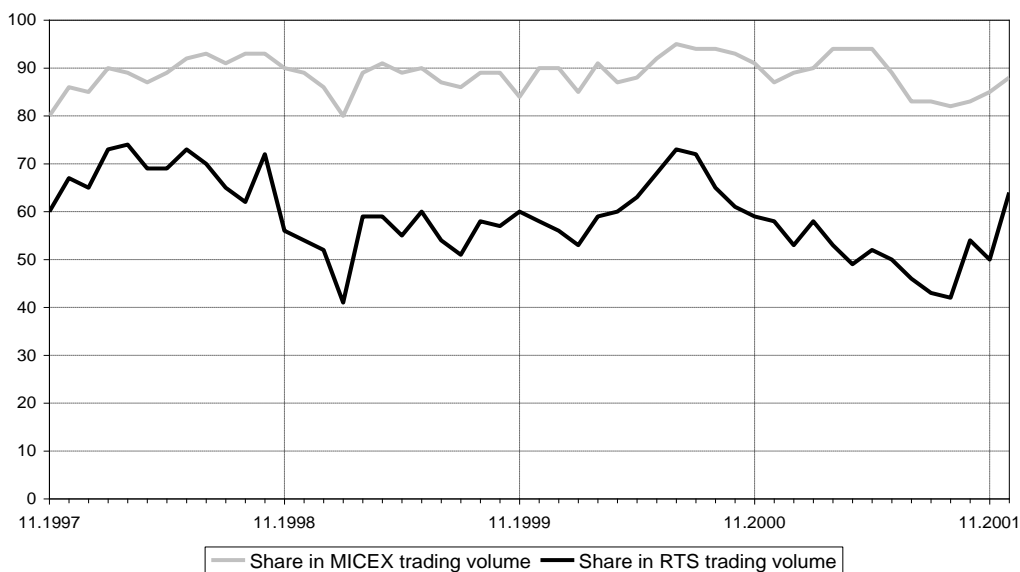
⁵ The RTS index is the only official indicator of the RTS Exchange, and is calculated as a market value-weighted index of capitalisation of shares on the RTS quoting lists. The list of shares used for measuring the index is revised once in three months. The index is calculated in terms of dollars and roubles (an auxiliary value).

⁶ Measured as the share of explained variance in the model, in which trading volumes for the relevant shares are assumed to be exogenous variables and trading volumes of the exchange are assumed to be endogenous variables.

to cap tariff increases by Gazprom and UES for the rest of the year at 20%, i.e. close to the expected inflation rate.

In this context, capitalisation growth of Russian companies (accordingly, of the exchanges) will depend on the situation of the key stocks listed above, on the rate of increase in the number of blue-chip companies, and on broader involvement of exporting and manufacturing companies in active trading. Capitalisation growth will be conditional on the quality of management, accounting and financial transparency (given the new ‘Arthur Andersen syndrome’), and improvement of corporate governance in general. It should be reiterated, however, that in the short term the situation on the exchanges mostly depends on four or five companies.

Figure 3. Share of volumes of trading in LUKoil, Rostelecom and UES in total trading volumes on the MICEX and the RTS (%)



The correlation between trading volumes for individual stocks (monthly data) points to fairly complex relationships. Specifically, pair correlations for the same stocks on the RTS and MICEX are 0.62 for UES, 0.41 for Rostelecom and only 0.29 for LUKoil. Estimation by detrended data produces roughly the same results. Getting back to the issue of measuring turnovers for individual shares (only the stock indices were considered above), it should be noted that growth in MICEX trading volumes probably points to institutional difference between the two leading exchanges, producing high correlation between the indices but accelerated growth in volumes on the MICEX. The inflow of Russian capital to the MICEX in 2000–2001 led to growth in overall trading volumes.

RELATIONSHIPS BETWEEN STOCK INDICES

All Russian national stock indices are, of course, well correlated with each other. Correlation coefficients for the monthly data showed that removal of linear trends is important. As expected, the correlation coefficients of Russian stock indices, the Emerging Markets Index (EMI)⁷ and the S&P500⁸ show a close relationship between the EMI and S&P500 (0.87) based on daily data (see Table 3). For comparison, the AKM index,⁹ independently tracking changes in the prices of Russian stocks, is also shown. A more unexpected result is high correlation in detrended data between the EMI and all Russian indices. Influence of foreign (including off-shore Russian) capital on the performance of the Russian exchanges is probably evidenced by

⁷ The Emerging Markets Index (MSCI Emerging Markets Free), the Morgan Stanley Capital International index family.

⁸ Part of the Standard&Poor's index family – a market value-weighted index of 500 corporations' stocks (400 industrials, 20 transportation, 40 utility and 40 financial companies), mostly NYSE- and AMEX-listed.

⁹ The AKM Composite Index published by the information agency AK&M is a market value-weighted index of capitalisation of stocks listed by the Agency.

the impact which investor perception of emerging markets as a whole, risks and business environment, has on Russian stocks. In other words, emerging market depressions affect share prices on Russian exchanges. Thus, the Russian equity market (reflecting mainly domestic pricing factors) has never been isolated from the rest of the world and it would now be fair to say that this relationship has become very clear.

Table 2. Correlation between Russian stock indices and the EMI (monthly data, January 1999–November 2001)¹

	AKM	RTS	MICEX10	CSI	EMI
AKM		0.99	0.83	0.97	0.03
RTS	0.96		0.95	0.96	0.01
MICEX10	0.61	0.85		0.84	-0.31
CSI	0.99	0.96	0.77		0.22
EMI	0.75	0.71	0.50	0.79	

¹ Below the central diagonal: correlation between residuals (detrended data).

Accordingly, the RTS and MICEX10 indices based on hourly data (from 11:00 on January 4, 2001, to 16:00 on June 13, 2001) show a predictably high correlation coefficient of 0.97. The Granger causality test conducted for hourly data, rejects the hypothesis that there is no relationship between the MICEX10 and RTS indices.¹⁰ The test suggests that changes in the MICEX10 index Granger-cause changes in the RTS index with a lag of at least two hours.¹¹ A similar result was obtained for the detrended time series.¹² This very interesting result may be at variance with a traditional notion of the role of exchanges, but it makes one wonder about the relationship between observations of experts and econometric analysis. The priority of the MICEX10 index probably reflects specific features of trading in UES shares. Individual shares are unlikely to reverse the causality direction, although final solution of the problem would require an additional step – calculation based on hourly prices of the same stocks on different exchanges.

Similarly, the Granger test performed for daily data rejects the hypothesis that there is no causality between the S&P500 index and the EMI.¹³ The Granger test does not show such a relationship for daily fluctuations of the MICEX10 and RTS indices.

Table 3. Correlation between Russian and foreign stock indices (daily data, January 4, 2001–June 13, 2001)¹

	MICEX10	RTS	EMI	S&P500
MICEX10		0.96	-0.31	-0.05
RTS	0.95		-0.13	0.09
EMI	0.82	0.81		0.87
S&P500	0.71	0.68	0.88	

¹ Below the central diagonal: correlation between residuals (detrended data).

It is noteworthy that removal of linear trends results in a positive correlation between RTS trading volumes and trading volumes on exchanges making up the Emerging Markets Index (Table 4). A tentative conclusion can thus be drawn that RTS trading seems to be closer to overall activity level of the emerging markets.

¹⁰ *F*-statistic is 71.6 (critical value at the 5% significance level is 3.0)

¹¹ It should be noted that more than 70% of MICEX trading is conducted on-line, while on the RTS there still are some procedures in which deal fixing takes at least half an hour. In addition, it should be borne in mind that the MICEX index is not a weighted one, whereas the RTS index is company capitalisation-weighted.

¹² *F*-statistic is 82.2 (critical value at the 5% significance level is 3.0).

¹³ *F*-statistic is 71.9 (critical value at the 5% significance level is 3.7)

Table 4. Correlation between trading volumes (\$ mn) and EMI (points) (monthly time series, January 1999–November 2001)¹

	EMI	MICEX	RTS
EMI		-0.33	0.39
MICEX	0.19		0.59
RTS	0.75	0.47	

¹ Below the central diagonal: correlation in residuals.

PERFORMANCE OF RUSSIAN STOCK INDICES

Development of the Russian private financial sector was interrupted by the 1998 crash, which changed trends of development of financial markets, especially of the banking sector. Losses were suffered by non-bank financial institutions, especially due to the GKO default. Dramatic devaluation, economic decline and a series of bank bankruptcies created a new development situation. Attempts to defend the rouble during the three steps towards the crash, from autumn 1997 to summer 1998, meant an indirect sacrifice of the equity market and a gradual slide of the GKO market to default, as shown in Table 5. The economic recovery of 2000–2002 changed the situation in Russia, creating conditions for recovery of financial markets.¹⁴

Table 5. Indicators of the 1997–1998 financial crisis

Indicator	RTS Index		Average weighted yield on GKO's		Exchange rate	
	Date	01.09.95 = 100	Date	%	Date	R/\$
1st step						
Beginning	22.10.97	550.4	24.10.97	18.2	22.10.97	5878
End	02.12.97	320.4	02.12.97	46.0	02.12.97	5921
Change		-41.8%		27.8		0.7%
2nd step						
Beginning	05.01.98	411.6	09.01.98	29.0	05.01.98	5.960
End	29.01.98	265.9	30.01.98	45.6	30.01.98	6.025
Change		-35.4%		16.6		1.1%
3rd step						
Beginning	05.05.98	315.2	05.05.98	31.2	05.05.98	6.134
End	01.06.98	171.7	28.05.98	68.6	28.05.98	6.162
Change		-45.5%		37.4		0.5%
The crash						
Beginning	20.07.98	193.0	31.07.98	58.7	22.07.98	6.226
End	30.09.98	44.0	14.08.98	162.5	09.09.98	20.825
Change		-77.2%		103.8		234.5%

Source: *Biuro ekonomicheskogo analiza (1999)*.

Recovery of Russian stock exchange indices was slow despite considerable (and, for many, unexpected) GDP and industrial production growth. This suggests that the stock market more accurately reflected the slow pace of reform, property rights enhancement and improvement of profitability. Thus, the post-crisis recovery of gross economic indicators failed to change the situation on the Russian market and secure inflow of capital. Of course, growth in macroeconomic indicators is only a part of the factors determining the situation with stocks – investors have learned the lesson of the 1994 and 1996–1997 booms (followed by crashes). There was a strong recovery of stock prices on the RTS in mid-March 2002 (320–340 points) and a forecast of growth to 400 points by the end of 2002 on condition of accelerated growth in Russia (about 4% GDP).¹⁵ The 400 point-barrier was actually passed as early as May. Stock price growth is helped by overall stability. Also, the market is affected by the large volume of corporate takeovers, even if they are occurring 'behind the scenes'.¹⁶

Data on trading structure show that the majority of Russian indices, data on which are available for four years, have similar coefficients of variation (about 0.5). It should also be noted that daily data show variation of Russian indices in the first half of 2001 (our chosen

¹⁴ See, for example *Radygin and Entov (1999)*.

¹⁵ *Epshtein (2002a)*.

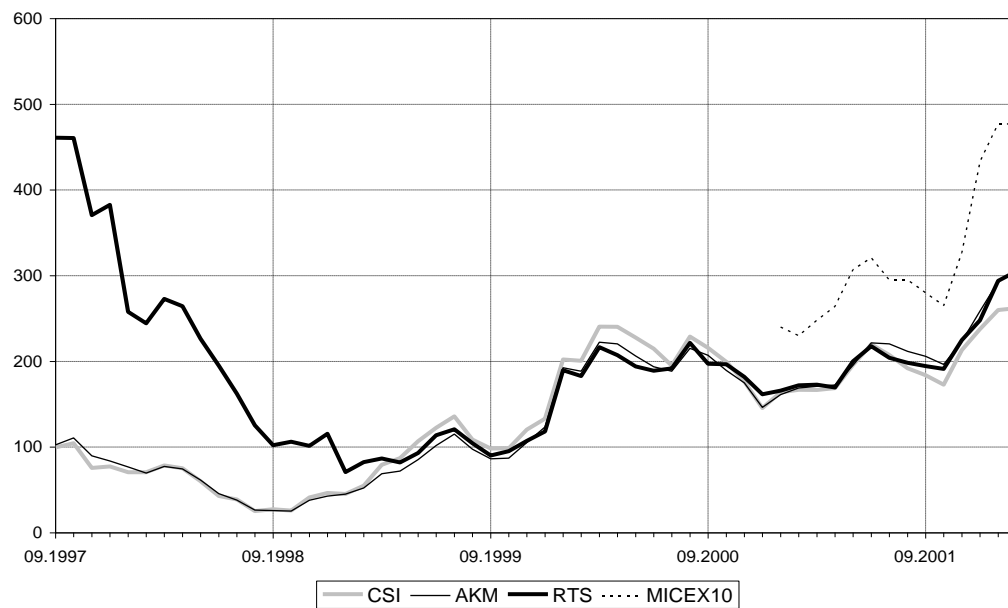
¹⁶ *Epshtein (2002b)*.

time period) to be twice as high as that shown by the S&P500 index or EMI (0.09–0.12 versus 0.06). Variance in hourly data of the MICEX index was higher than that of the RTS, probably reflecting a higher trend component of the former. Thus, from January 1, 1999, to the end of 2001 the RTS index rose from 70.8 to 260.0 points (267%), while the MICEX index (CSI) grew from 45.3 to 237.6 points (426%).

RELATIONSHIP BETWEEN STOCK INDICES AND MACROECONOMIC INDICATORS

Analysis of graphic representation of monthly data allowed one relatively homogenous period to be identified: that from the beginning of 1999. This choice is confirmed by the Chow breakpoint test, which showed breakpoints between August 1998 and March 1999 for some models. For some variables the breakpoint is March 2000. Further analysis of all data was performed for the homogeneity period of January 1999–December 2001. Thus analysis of the activity level of Russian exchanges covered the entire period of fast economic growth (see Figure 4).¹⁷

Figure 4. Indices of stock exchanges



We controlled for world oil prices and bond yields – standard factors, which should affect the performance of stock indices in a market economy.¹⁸ All the models were first constructed for the period March 1997–December 2001, tested for stability (the Chow test), and, after selection of the homogeneity period, estimated for a shorter period (January 1999–December 2001). All the time series in the period under study are stationary and auto-regressive. The Granger test, allowing the causality between the variables to be found, necessitated inclusion of lagged variables in the model. Our findings were as follows:

- Exchange rate performance Granger-causes changes in the CSI, AKM, RTS indices and trading volumes on the RTS and MICEX with a lag of 1–3 months.

¹⁷ The analysis used monthly stock index data: the MICEX10, CSI and RTS in dollar terms, the AKM, and data on trading volumes on the MICEX and RTS in R mn. In addition, a variety of macroeconomic indicators were considered: the average export price for crude oil, \$/tonne (OILe); average producer prices for oil, R thous./tonne (OIL); natural gas, R thous./m³ (GAS); electricity, R thous./thous. kWt-hour (ELECTRICITY); natural gas production, bn m³ in annualised seasonally adjusted terms (GAS PRODUCTION); oil production, bn tonnes in annualised seasonally adjusted terms (OIL PRODUCTION); exchange rate, \$/R (EX. RATE); industrial production, R mn at prices of December 1992 (IP); the Consumer Price Index (CPI); the S&P500; and the EMI. Sources: Vedi analytical laboratory, www.vedi.ru; Russian Economic Trends, January 2002; and RTS and MICEX, www.rts.ru, www.micex.ru.

¹⁸ In our case the GKO default and weakness of the private bond market did not allow us to control for crowding out effects, etc.

- Changes in domestic oil prices Granger-cause changes in MICEX trading volumes with a lag of 1–3 months.
- Changes in domestic gas prices Granger-cause changes in RTS trading volumes with a lag of 1–3 months.
- Changes in the EMI Granger-cause changes in the CSI, AKM and RTS indices and RTS trading volumes with a lag of 1–3 months.

Table 6. Correlation with main economic indicators (monthly data, January 1999–December 2001)

	OIL	OILe	GAS	ELECTRICITY	EX. RATE	CPI	IP	EMI
AKM	0.82	0.83	0.70	0.17	0.91	-0.25	0.66	0.25
RTS	0.84	0.82	0.69	0.31	0.90	-0.27	0.66	0.20
CSI	0.74	0.82	0.59	-0.04	0.87	-0.20	0.60	0.37
MICEX	0.94	0.74	0.82	0.87	0.88	-0.32	0.73	-0.15
RTS	0.65	0.71	0.53	-0.10	0.78	-0.19	0.59	0.42

Table 7. Correlation with fuel and energy sector production (monthly data, January 1999–July 2001)

	Electricity generation (bn kWt-hours)	Gas production (bn m ³)	Oil production (mn tonnes)	IP
AKM	0.78	-0.53	0.75	0.66
RTS	0.79	-0.50	0.74	0.66
CSI	0.69	-0.45	0.60	0.60
MICEX	0.83	-0.51	0.87	0.73
RTS	0.50	-0.32	0.37	0.59

The nature of correlation between the stock indices largely agrees with analysts' expectations. In a country with important oil and gas factors, stock indices are closely correlated with oil and gas prices. Influence of the rouble exchange rate is predictable, since the indices are prepared in dollar terms. In fact there is a masked dollar-denominated investor valuation of shares. The expected correlation is observed between stock indices and the consumer price and industrial production indices. Correlation with the EMI was negative for the MICEX and positive for other stock indices (particularly the RTS), which is easily explainable by the higher performance of this exchange.

Two best equations were left for each dependent variable:

CSI Index

$$CSI - 0.47 \cdot CSI(-1) = -247.75 + 10.49 \cdot EX.RATE(-1) + 0.14 \cdot EMI(-1)$$

$$\text{Adjusted } R^2 = 0.71$$

$$F\text{-statistic} = 44.7$$

$$\text{Durbin-Watson statistic} = 1.76$$

Period: February 1999–December 2001

$$CSI - 0.41 \cdot CSI(-1) = -595.63 + 0.40 \cdot EMI(-1) + 1.75 \cdot OIL PRODUCTION(-1)$$

$$\text{Adjusted } R^2 = 0.74$$

$$F\text{-statistic} = 49.3$$

$$\text{Durbin-Watson statistic} = 1.7$$

Period: February 1999–December 2001

RTS Index

$$RTS - 0.55 \cdot RTS(-1) = -252.75 + 10.97 \cdot EX.RATE + 0.07 \cdot EMI$$

$$\text{Adjusted } R^2 = 0.71$$

$$F\text{-statistic} = 44.1$$

$$\text{Durbin-Watson statistic} = 1.98$$

Period: February 1999–December 2001

$$RTS - 0.45 \cdot RTS(-1) = -535.86 + 0.28 \cdot EMI(-1) + 1.67 \cdot OIL PRODUCTION(-1)$$

$$\text{Adjusted } R^2 = 0.74$$

$$F\text{-statistic} = 50.45$$

$$\text{Durbin-Watson statistic} = 1.89$$

Period: February 1999–December 2001

All the above indicators were used as explanatory variables in regression estimations. The final equation specifications included only significant variables. All the three stock indices (including AKM) showed a lagged relationship with the EMI, which points to gradual convergence of the emerging market indices in the period under study.

Such macroeconomic indicators as the Consumer Price Index and industrial production, proved to be insignificant in equations despite their high correlation coefficients. This result is probably the most important. It is a paradoxical indication of underdevelopment of financial markets that key macroeconomic factors do not so far play an explicit role in determining the dynamics of stock indices. Despite the high correlation between oil export prices and indices and trading volumes, Granger-causation by world oil prices was not found. Like domestic oil prices, export oil prices were found to be insignificant factors. Moreover, unlike domestic prices, which significantly influence changes in MICEX trading volumes, world prices in a similar specification are insignificant.

When they discuss the impact of world oil prices on Russian stock indices, most financial analysts are referring mainly to a high correlation coefficient or specific events, such as OPEC decisions, etc.¹⁹ Our analysis covers a limited period and does not provide grounds for categorical conclusions. However, the finding that oil prices do not affect stock indices in an oil exporting country encourages us to formulate an ad hoc hypothesis. The conclusion that suggests itself is that investors and shareholders do not expect substantial stock price growth after oil price rises. At the present stage of market development, factors such as restructuring of companies and improvement of their transparency have a greater impact than general economic factors.

Russian and foreign analysts tend to think that current trends on stock markets are caused by the slowdown of growth in Russia in the winter of 2001–2002. ‘Fluctuations in oil prices are one of the key factors influencing Russian market performance (a decline in share prices in the second half of November was due to the differences between Russia and OPEC). However, medium term growth expectations are justified because of positive developments in Russia on both macroeconomic and corporate levels’.²⁰ ‘The RTS index showed growth of nearly 70% in the whole of 2001 with a real boom in December, when the RTS index gained 33 points thanks to international inflows, which drove up the Russian equity market. The overall re-rating of the Russian market was based on Russia’s recent steps towards the West and its relatively strong economic performance. Observers even speculate that there would have been a much more substantial re-rating of Russian equities last year if international events and international market dynamics had not prevented it’.²¹ Analysts usually also point to oil prices, impact of NASDAQ²² and S&P500 indices, dynamics of country rating by international agencies (Moody’s, S&P), and the situation on financial markets in Turkey, Argentina, etc, as factors affecting Russian stock markets.

Trading volumes on both leading exchanges were found to be statistically related to oil prices and natural gas production (the MICEX), and the rouble exchange rate and natural gas production (the RTS). The former relationship may reflect variations in capital inflow to exchanges, the latter may reflect gradual decline in production.

MICEX trading volumes

$$\text{MICEX} - 0.4 \text{ MICEX}(-1) = -242312.57 + 32.51 \cdot \text{OIL}(-1) + 385.61 \cdot \text{GAS PRODUCTION}(-1)$$

Adjusted R² = 0.86
 F-statistic = 89
 Durbin–Watson statistic = 2.0
 Period: February 1999–August 2001

RTS trading volumes

¹⁹ For example, ‘the likely decision by OPEC will not have a substantial negative effect on the Russian exchange market’, according to the director of Regent European Securities research department. ‘The current price correction on world oil markets will not seriously affect developments on the Russian stock market’ (Interview with AK&M, 10.03.2000).

²⁰ Russian Economic Trends Monthly, December 2001.

²¹ Russian Economic Trends Monthly, January 2002.

²² A market value-weighted index of over-the counter-stocks, including about 3500 stocks (except those traded on exchanges).

$$\text{RTS} = -187112.91 + 2283.57 \cdot \text{EX.RATE} (-1) + 231.16 \cdot \text{GAS PRODUCTION} (-1)$$

$$\text{Adjusted } R^2 = 0.69$$

$$\text{F-statistic} = 34$$

$$\text{Durbin-Watson statistic} = 2.0$$

Period: February 1999–August 2001

The limited estimation period and a host of other factors suggest that these findings should be regarded as preliminary and requiring further analysis, especially more detailed comparison across periods. Difference in correlation coefficients between the MICEX and the RTS was caused by a considerable growth in trading volumes on the former.

CONCLUSIONS

Calculations show a relatively close relationship between Russian stock indices, and, surprisingly, their close relationship with the Morgan Stanley Emerging Markets Index (EMI) over the period January 1999–December 2001. Analysis shows high correlation between the Russian stock indices for all time parameters, which suggests considerable unity of the stock market. However, volumes of trading in the same stocks do not necessarily vary synchronously. The two leading Russian exchanges, the MICEX and the RTS, probably play important but different roles in development of the stock market, complementing each other to a great extent. At any rate, a major boom on only one of them is hard to imagine in the future. Given the weakness of the market, and the long way it has to go in order to meet the demand of the economy for financial intermediation, the existence of several exchanges is probably justified by institutional reasons.

Accumulated statistical data and knowledge of stock pricing processes are still inadequate but correlation and regression analyses yield reasonable results as regards the impact of macroeconomic indicators on stock indices. Of course, domination of trading volumes on exchanges by the natural monopolies restricts capitalisation growth and makes stock index performance depend on administratively regulated prices, the exchange rate and oil prices. Further analysis is required in order to establish the robustness of relationships between the performance of the two leading exchanges, between share prices and trading volumes for individual stocks, and to determine conditions for shares to move towards the 'second tier'. It should also be noted that calculations on daily and hourly basis are for a particular limited period of time and the authors assume that the parameters thus obtained may vary from period to period.

The main point is that considerable structural changes in Russia's economy are required for establishment of normal relationships, allowing, for example, forecasting of future performance of stock indices in relation to fluctuations in oil export prices. One of the collateral conclusions of the analysis is relative independence of stock indices from current rates of economic growth. Specifically, industrial production decline by 0.5% in February 2002 did not have a serious effect on the level of market activity, which agrees with our calculations. A picture emerges in which future growth in capitalisation of Russian companies (and, accordingly, performance of exchanges) will depend on ever-changing combinations of domestic macroeconomic and institutional factors, the overall situation on stock exchanges of leading developed countries, and the world economic outlook in general.

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