

# **Risk factors in the Russian stock market**

ALEXEI GORIAEV<sup>1</sup>  
New Economic School

March 2004

*Draft version*

---

<sup>1</sup> New Economic School, Nakhimovsky pr. 47, Moscow 117418, Russia. Phone: +7095 129 3911, fax: +7095 129 3722, e-mail: [agoriaev@nes.ru](mailto:agoriaev@nes.ru). I would like to thank Denis Sokolov for excellent research assistance.

# Risk factors in the Russian stock market

## Abstract

The short history, high concentration, and low liquidity of the market have hindered formal analysis of multiple-factor models of Russian stocks. This paper is the first comprehensive formal study of the risk factors driving cross-sectional differences in expected returns of Russian stocks. Using the last five years of data, we investigate two sets of factors: fundamental (size, value, liquidity, momentum, etc.) and macroeconomic (oil, currency, bond spreads, etc.). The factor-mimicking portfolios are constructed as zero investment strategies with long (short) positions in stocks with high (low) values of an attribute. We find that the most important factor both from statistical and economical point of view is Russia's country risk, with a premium of 59% p.a. The corporate governance factor has a 25% premium paid by the poorly governed companies. Probably, due to political and macroeconomic stabilization in Russia the premiums for both risks have become much lower during the last two years. The more traditional size and dollar factors also offer a significant premium in a range from 33% to 39% p.a., respectively. The premiums on all four factors remain significant even in the presence of the short-selling constraints.

*Keywords:* risk factors, emerging markets.

## 1. Introduction

Emerging markets provide an excellent ground to test standard models of the developed markets or explore the specifics of their financial environment, e.g., the degree of integration and liberalization (see Bekaert and Harvey, 2003, for an excellent survey). An important part of this research concerns modelling risk factors driving cross-sectional differences in stock returns. Several studies have investigated whether size, value, and other factor premiums found in the U.S. and other developed markets (see, e.g., Fama and French, 1998) help to explain stock returns in emerging markets as well. So far, the findings have been ambiguous. For example, Rouwenhorst (1999) and Barry et al. (2002) find results on size and value premiums that are similar to those for developed markets, whereas Claessens et al. (1998) document in contrast a premium for large companies and growth stocks. In addition, the latter study finds the evidence for beta and turnover premiums, which also contrasts the findings of Rouwenhorst (1999). Van der Hart et al. (2003) report significant premiums for value, momentum, and earnings revisions effects, but find no significant evidence for size and liquidity effects.

The objective of the current paper is to investigate the risk factors at the Russian stock market. This is one of the largest emerging markets, with the total market capitalization around \$230 billion, as of March 2004. During the five years after the August 1998 crisis, the market has been growing at an average rate of 60% per year (see Table 1). However, the short history, high concentration, and low liquidity of the market have hindered formal analysis of multi-factor models of Russian stocks. Most existing studies have limited their attention to the tests of the domestic version of CAPM, which is strongly rejected (see, e.g. Barinov, 2003). Using a two-factor model with local market and global market factors, Fedorov and Sarkissian (2000) show that during 1995-1997 period portfolios of large companies, companies with stocks traded in the foreign exchanges, and exporting companies exhibit a higher degree of integration with the world markets. The anecdotal evidence points out a strong impact of non-market factors (e.g., affiliation with foreign partners and participation in shady privatization schemes in the past) on the returns of Russian stocks. Gorjaev and Sonin (2004) find substantial effects of political risks on the stock of YUKOS, the largest Russian oil company.

This paper, to the best of our knowledge, is the first comprehensive formal study of the risk factors capturing cross-sectional differences in returns of Russian stocks.<sup>2</sup> It provides another robustness check of the existing evidence on return premiums based on other countries. The resulting multi-factor model can be effectively used in portfolio management as well as performance evaluation and attribution in the Russian stock market.

Our sample includes 47 most liquid stocks traded on the major Russian stock exchanges during the post-crisis period from 1999 to 2003. We investigate two sets of factors: fundamental (size, value, liquidity, momentum, etc.) and macroeconomic (oil, currency, bond spreads, etc.). Following Fama and French (1993), we construct factor-mimicking portfolios as “High-Minus-Low” zero investment strategies with long (short) positions in stocks with high (low) values of an attribute. For macroeconomic factors, the strategy goes long in “pro-cyclical” stocks relative to a given factor and short in “counter-cyclical” stocks. We evaluate and interpret the factors by examining the mean strategy returns, their dynamics over time, their cross-correlation and relation to market and industry indices.

We find that the most important factor both from statistical and economical point of view is Russia’s country risk, with a premium of 59% p.a. The corporate governance factor has a 25% premium paid by the poorly governed companies. A positive moment is that due to political and

---

<sup>2</sup> To the best of our knowledge, van der Hart et al. (2003) is the only study studying Russian stocks in this context. However, they concentrate on average risk premiums across different emerging markets. In Table 3, they report results on value, momentum, and earnings revisions effects based on monthly data for 22 Russian stocks from 1997 to 2001; however, they are insignificant at the conventional levels.

macroeconomic stabilization in Russia the premiums for both risks have become much lower during the last two years. The more traditional size and dollar factors also offer a significant premium in a range from 33% to 39% p.a., respectively. The premiums on all four factors remain significant even in the presence of the short-selling constraints.

The structure of the remainder of the paper is as follows. Section 3 describes data and methodology. In Section 3, we discuss the results. Section 4 concludes.

## **2. Data and methodology**

### ***Sample***

In our analysis, we use daily data on 47 most liquid stocks traded on three major Russian stock exchanges, RTS (“Russian Trading System”) Stock Exchange, MICEX (“Moscow Interbank Currency Exchange”), and MSE (“Moscow Stock Exchange”). The data on stocks include close prices and trading volumes at daily frequency, dividends, the number of shares outstanding, and corporate governance ratings.<sup>3</sup> The sample period cover five full years of data, from January 1999 to December 2003. We did not include the year of the August 1998 crisis and preceding years, since the market environment as well as composition of stocks appear to have changed substantially after the crisis. Since the first year of the sample is used to derive the past values of the factors, the effective sample period includes four full years, from 2000 to 2003.

During the sample period, most Russian stocks were traded both in the RTS and in the MICEX. However, the trade intensity for a given stock differed across the two exchanges. Typically, the stock trades were concentrated in the RTS during the first years and then trading of most stocks gradually moved to the MICEX. However, the RTS has kept its role as a place for large transactions, which are realized in a much less frequent basis than in the MICEX. Therefore, we combined data on RTS and MICEX prices, selecting the exchange by the number of trading days with positive trading volume in a given year. Due to the relatively low number of liquid stocks, we decided to keep both common and preferred shares in the sample. The two types of shares differ in several respects (e.g. in dividends and control rights) and exhibit quite similar, but still distinctive dynamics. Since most trading is concentrated in the blue chips, we base our analysis on dividend-adjusted returns at weekly frequency, which helps us to partly mitigate the problem of low liquidity of the second-tier stocks.

Table 1 reports quarterly dynamics of the main indicators of the Russian stock market in 1999-2003. During the sample period, the Russian stock market realized very fast growth. The dollar value of the S&P/RUX market index increased by 11 times during the five-year sample period. As a result, the market capitalization rose by 9 times from \$15.8 billion in January 1999 to \$175.2 billion in December 2003. These developments were accompanied by more than 20 times decline in the spread between yields on Russian Eurobonds and US Treasury bonds (the EMBI Russia spread) and more than twofold rise in oil prices.

### ***Description of the factors***

The literature offers a long list of potential candidates for the role of risk factors (see, e.g., Fama and French, 1993, Chan et al., 1998). From this list, we select two sets of local factors: fundamental (based on observed company characteristics) and macroeconomic (based on the estimated exposure to a given proxy for the state of the economy).

---

<sup>3</sup> The data on Russian stocks were downloaded from RBC data archive (<http://export.rbc.ru/>).

The set of fundamental factors includes the indicators of size, value, corporate governance, liquidity (proxied by the turnover ratio and trade volume), and momentum. Note that past returns are measured with a lag of one week in order to attenuate the possible effects of the bid-ask spread bounce (see, e.g., Rouwenhorst, 1999).

SIZE – the market value of a given type of equity of the firm.

DP – the dividend-price ratio defined as the total dividends over the past year (with a lag of 40 trading days) divided by the current share price.

CG – the value of the latest company's corporate governance rating (in percentages).<sup>4</sup>

TURN – turnover ratio defined as the number of shares traded during the four weeks preceding the test period divided by the number of shares of the company.

VOL – the ruble trade volume for a given stock during the four weeks preceding the test period.

RET1M – the natural logarithm of the stock return over a one-month period finishing one week before the test period (weeks -5 to -1).

RET6M – the natural logarithm of the stock return over a six-month period finishing one week before the test period (weeks -27 to -1).

RET12M – the natural logarithm of the stock return over a twelve-month period finishing one week before the test period (weeks -53 to -1).

The set of macroeconomic factors is based on the variables reflecting the state of the economy, including the market factor motivated by the CAPM, default and term spreads suggested by Chen et al. (1986), the money market spread indicating the demand for short-term interbank loans, the EMBI Russia spread measuring country risk, as well as currency and oil factors.

RM – the natural logarithm of the return of the market index, S&P/RUX, over the last week before the start of the test period.<sup>5</sup>

DEF – the default spread measured as the difference between the return on CBONDS corporate bond index and the return on one-month Russian Treasury bills.<sup>6</sup>

TERM – the term spread measured as the difference between the returns on two-year Russian Treasury notes and on one-month Russian Treasury bills.

MONEY – the money market spread measured as the difference between the overnight Moscow interbank actual credit rate (MIACR) and the return on one-day Russian Treasury bills.

EMBI – the country spread measured as the difference between the return on the Russian Eurobonds (the Emerging Market Bond Index, EMBI) and the US Treasury notes.

USD – the natural logarithm of the change in the ruble-dollar exchange rate over the last week before the start of the test period.

---

<sup>4</sup> The corporate governance ratings were provided by the Institute of Corporate and Law Governance (ICLG) that publishes them once a quarter starting from March 2001. We assigned zero rating to 17 stocks whose companies did not receive the ICLG corporate governance rating.

<sup>5</sup> The S&P/RUX index is computed by the Index Agency RTS-Interfax in cooperation with Standard&Poors. It is a market-capitalization-weighted index of the Russian companies traded in the RTS ("Russian Trading System") Stock Exchange and Moscow Stock Exchange. Currently, the S&P/RUX index comprises 57 stocks. The index data were taken from the RTS website (<http://www.rts.ru/>).

<sup>6</sup> The CBONDS index is based on the close prices of Russian corporate bonds traded in the MICEX. The history of the CBONDS index starts in January 2002. Hereinafter, the Treasury N-day return is computed as a yield to maturity of a Russian state bill or bond with the shortest maturity equal to or larger than N days.

EURO – the natural logarithm of the change in the ruble-euro exchange rate over the last week before the start of the test period.

OIL – the natural logarithm of the change in the price of oil (Urals) over the last week before the start of the test period.

### ***Construction and evaluation of the factor-mimicking portfolios***

The factor-mimicking portfolios are constructed in the predictive fashion. At the beginning of each week, we rank all eligible stocks on each of the attributes in the descending order. The selection criterion is that the stock must have been traded during at least one of the preceding two weeks.<sup>7</sup> In case of fundamental factors, the attributes are directly observable. For the macroeconomic factors, the corresponding attribute is the stock's loading on the factor. The factor loading is estimated in a regression of stock weekly returns in excess of the risk-free rate (the one-month Treasury bill return) on the factor and (in case of non-market factors) the excess market return, using 52 preceding weeks. In order to control for the nonsynchronous trading effect, we include both current and lagged values of the regressors and compute factor loading as the sum of the factor coefficients.

For each factor, the “High” and “Low” portfolio are constructed as equally-weighted portfolios of top and bottom 30% of the stocks based on a value of a given attribute, respectively. The portfolios are rebalanced once a week and held during one week. The results do not materially change when we rebalance the portfolios at lower frequency or hold them for a longer period. The primary indicator of factor performance is the return on the HML (High-Minus-Low) zero-investment factor-mimicking portfolio, involving a long position in the high portfolio and short position in the low portfolio. One may argue that the returns on this long-short portfolio cannot be realized in practice due to the short-selling restrictions (see, e.g., van der Hart et al., 2003). Therefore, we also report returns of the HMI (High-Minus-Index) and LMI (Low-Minus-Index) portfolios measured as the High or, respectively, Low portfolio's return in excess of the return on an equally-weighted index portfolio of the stocks passing the selection criterion.

## **3. Results**

### ***Mean returns of the factor-mimicking portfolios***

Panel A of Table 2 reports the mean return of High, Low, HML, HMI, and LMI portfolios for each factor during the overall sample period and during two-year subperiods along with the corresponding t-statistics. As a benchmark for comparison, we use the equally-weighted index portfolio that had an average annual return of 47.3% p.a. during the sample period. The value-weighted S&P/RUX index and one-month Treasury bill had lower average annual returns: 34.1% and 12.4%, respectively.

In line with several other studies on developed and emerging markets (see Rouwenhorst, 1999, and Barry et al., 2002), we find a significant size premium at the Russian stock market. During the sample period, small stocks on average outperformed larger ones by 33% p.a. The size premium was especially large and significant during the first two years of the sample period (2000 and 2001); however, it became smaller during the last two years. Even in presence in of the short-selling restrictions, one could exploit the size effect, as the LMI strategy brought the average annual rate of return of 24.4%, which is significant at 1% level.

---

<sup>7</sup> The number of stocks selected by this selection criterion varies from 29 to 45. The results do not qualitatively change when we apply another, softer or harder, selection criterion.

The dividend-based HML portfolio does not yield a significant premium. However, both High dividend and Low dividend portfolios significantly outperform the equally-weighted index, at a rate of 22% and 17% p.a. In 90s, it had been a standard practice not to pay any dividends. Probably, high dividends that several companies started to pay in the beginning of 2000s signal that managers are willing to improve the standards of corporate governance and serve in the future the interests of all shareholders, including the minority ones. On the other hand, low dividends may imply that the company has high growth potential or saves on taxes.

The HML portfolio based on companies' corporate governance ratings has an average return of -26% p.a., which is significant at 5% level. This is the premium necessary to compensate for the poor protection of the company shareholders' rights. The premium for the corporate governance factor was especially large during the first half of the sample period, around 51% p.a. (significant at 10% level), which decreased later to 14% p.a. This evidence is consistent with the view that Russian companies have been improving their corporate governance during the last several years. One could also earn a premium by investing in poorly governed companies and shorting the equally-weighted market index, as the LMI portfolio brought an average annual return of 13 % p.a., significant at 5% level.

It appears that investors did not demand a premium for the lack of liquidity proxied by turnover ratio and trade volume, as the return on the corresponding HML portfolios was negative, but insignificantly different from 0. Moreover, we do not find any significant momentum or mean reversion effects during the sample period. If there is any past return effect, it seems to be rather negative than positive in a horizon up to one year.

Contrary to the predictions of the CAPM, we find a negative premium for high-beta stocks, which is significant at 10% level. Similar findings of a negative, though insignificant premium for the value-weighted market index were reported for a number of emerging markets by Rouwenhorst (1999). Probably, this puzzling result may be explained by poor estimation of the betas, especially for less liquid stocks.

The three spreads based on instruments from the Russian bond and money markets do not help to explain the cross-section of stock returns. Probably, this is due to the segmentation of the Russian stock and bond markets. Another explanation is the measurement problem, as the default spread was computed only during the second half of the sample, the term spread needs a longer difference in maturities of the underlying instruments, and the (one-day) money market spread is simply too noisy.

In contrast, the EMBI Russia spread has a highly significant (at 1% level) 59% annual premium. Stocks sensitive to Russia's country risk have to compensate for it by offering higher returns. This effect was especially strong in 2000-2001, when the country risk premium was around 91% p.a. As the economic and political environment in Russia stabilized, the country risk premium dropped to 28%, significant only at 10% level. Even investors with short-selling restrictions could profitably explore this effect; the HMI portfolio's return was on average about 28.6% p.a., significant at 1% level.

From the two currency factors, the dollar appears to be much more important than the Euro, which is fully consistent with our prior expectations. The dollar HML portfolio had an average return of about 39% p.a., significantly different from zero at 5% level. Companies with high sensitivity to the dollar exchange rate compensated this by higher returns. This effect remains significant (at 5% level) even when one uses only the long position in the dollar HML portfolio. However, during the last two years, Euro appears to have gained some ground against the dollar. As a consequence, the dollar risk premium dropped between the first and the second halves of the sample period from 60% to insignificant 17% p.a.

The oil factor does not offer a significant premium. Probably, this is due to the schemes used by oil companies to minimize the taxes by moving the profit to the affiliated companies. Such schemes are beneficial for the controlling shareholders, but not for portfolio investors.

### ***Cross-correlations between the factor-mimicking portfolios***

Portfolios formed to mimick the factors are not, in general, very highly correlated (see Panel B of Table 2). The size portfolio seems to be associated with the corporate governance and trade volume portfolios, with correlations of 0.68 and 0.64, respectively. Apparently, small companies typically have poor corporate governance as well as lower absolute trading volume. The corporate governance factor seems to be also related to the dividend and market factors; the corresponding correlation coefficients are 0.34 and 0.59. The successfully governed companies pay higher dividends and have higher betas (although the latter can be due to a larger size). The EMBI country spread portfolio seems to be negatively related to the term and money spread portfolios (correlations of -0.39 and -0.58, respectively); the correlation with the dollar portfolio is 0.38. It seems that companies with higher exposure to the local bond and money market yields are actually less sensitive to the country risk.

## **4. Conclusion**

This paper provides starting evidence on the risk factors driving cross-sectional differences in stock returns in the post-crisis Russia. We find that the factor most important both from statistical and economical point of view is Russia's country risk. The return difference between the companies sensitive to the country risk and those whose profits are stable in any macroeconomic environment is about 59% p.a. Another striking result is a 25% premium for the corporate governance factor, which is apparently highly priced in the Russian stock market. These risks, however, are more characteristic for the first part of the sample period and become much lower in 2002-2003. This is consistent with political and macroeconomic stabilization in Russia during the last years. The more traditional size and dollar factors also offer a significant premium in a range from 33% to 39% p.a., respectively. Moreover, the factor premiums remain significant even in the presence of the short-selling constraints, when we exclude from the zero-investment portfolio short positions on the stocks with lower returns.

In the further research we are planning to carry out multivariate analysis of the factors and study their relation to the industry indices. In addition, we are going to apply the resulting multi-factor to evaluate performance of Russian mutual funds.



## References

- Barinov, Alexander, 2003, Measuring performance of Russian mutual funds, Master's thesis, New Economic School.
- Barry, Christopher B., Golgreyer, Elizabeth, Lockwood, Larry, and Mauricio Rodriguez, 2002, Robustness of size and value effects in emerging equity markets, 1985-2000, *Emerging Markets Review* 3, 1-30.
- Bekaert, Geert, and Campbell R. Harvey, 2003, Emerging markets finance, *Journal of Empirical Finance* 10, 3-55.
- Brennan, Michael J., Chordia, Tarun, and Avanidhar Subrahmanyam, 1998, Alternative factor specifications, security characteristics, and the cross-section of expected stock returns, *Journal of Financial Economics* 49, 345-373.
- Chen, Nai-Fu, Roll, Richard, and Stephen A. Ross, 1986, Economic forces and the stock market, *Journal of Business* 59, 383-403.
- Chan, Louis K., Karceski, Jason, and Josef Lakonishok, 1998, The risk and return from factors, *Journal of Financial and Quantitative Analysis* 33(2), 159-188.
- Claessens, Stijn, Dasgupta, Susmita, and Jack Glen, 1998, The Cross-Section of Stock Returns: Evidence from Emerging Markets, *Emerging Markets Quarterly* 2, 4-13.
- Fama, Eugene, and Kenneth French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56.
- Fama, Eugene, and Kenneth French, 1998, Value versus growth: The international evidence, *Journal of Finance* 53(6), 1975-1999.
- Fedorov, Pavel, and Sergei Sarkissian, 2000, Cross-sectional variations in the degree of global integration: The case of Russian equities, *Journal of International Financial Markets, Institutions and Money* 10, 131-150.
- Goriaev, Alexei, and Konstantin Sonin, 2004, Prosecutors and financial markets: An event study of the YUKOS affair, working paper, New Economic School.
- Hart, Jaap van der, Slagter, Erica, and Dick van Dijk, 2003, Stock selection strategies in emerging markets, *Journal of Empirical Finance* 10, 105-132.
- Kargin, Vladislav, 2002, Value investing in emerging markets: risks and benefits, *Emerging Markets Review* 3, 233-244.
- Rouwenhorst, K. Geert, 1999, Local return factors and turnover in emerging stock markets, *Journal of Finance* 54(4), 1439-1464.
- Serra, Anna Paula, 2000, Country and industry factors in returns: Evidence from emerging markets' stocks, *Emerging Markets Review* 1, 127-151.

**Table 1. Summary statistics**

This table presents the quarterly dynamics of main economic indicators of the Russian stock market between January 1999 and December 2003.

	<b>Market index (S&amp;P/RUX), dollar values</b>	<b>Market (S&amp;P/RUX) capitalization, in \$bln</b>	<b>EMBI Russia Spread, in %</b>	<b>US dollar exchange rate, in rubles</b>	<b>Euro exchange rate, in rubles</b>	<b>Price of oil (Urals), in dollars</b>
04/01/1999	14.58	15.76	55.20	20.65	24.09	10.59
30/03/1999	18.01	19.67	52.09	24.18	25.94	14.17
30/06/1999	26.81	29.04	29.63	24.22	25.07	16.12
30/09/1999	18.16	19.68	39.05	25.08	26.46	22.03
30/12/1999	32.26	35.75	26.93	27.00	27.23	24.68
30/03/2000	46.30	53.30	17.76	28.27	27.08	22.24
30/06/2000	37.55	49.96	9.99	28.07	26.48	27.48
30/09/2000	43.25	51.78	10.09	27.75	24.50	24.32
30/12/2000	33.05	39.60	11.72	28.16	26.15	21.61
30/03/2001	38.37	44.57	10.88	28.76	25.50	21.00
30/06/2001	51.78	60.58	8.35	29.11	25.03	23.81
30/09/2001	42.84	50.27	9.45	29.40	27.02	21.22
30/12/2001	59.37	71.19	6.76	30.14	26.49	19.62
30/03/2002	80.89	97.52	4.96	31.11	27.27	23.59
30/06/2002	86.99	104.92	5.10	31.44	30.94	24.43
30/09/2002	77.49	92.72	6.15	31.64	30.91	27.63
30/12/2002	83.67	102.15	4.72	31.78	32.97	31.11
30/03/2003	84.99	104.86	3.65	31.38	33.59	25.90
30/06/2003	118.09	146.50	2.84	30.35	34.71	26.68
30/09/2003	133.38	165.48	2.85	30.61	35.08	26.97
30/12/2003	133.59	172.50	2.59	29.45	36.69	28.65

**Table 2. Returns of factor-mimicking portfolios**

At the beginning of each week between January 2000 and December 2003, all eligible stocks were sorted in descending order on each of the factors from column 1. SIZE is the market value of equity; DP is the dividend-price ratio; CG is the corporate governance rating; TURN1 and TURN2-13 denote the turnover ratio over the last week and weeks -2 to -13; RET1, RET2-4, RET5-26, and RET27-52 denote the return over the last week, weeks -2 to -4, weeks -5 to -26, and weeks -27 to -52, respectively. For the macroeconomic factors, the sorting variable is the stock's loading on the factor. RM is the market factor; DEF is the default spread; TERM is the term spread; MONEY is the money market spread; EMBI is the country spread; USD is the dollar factor; EURO is the euro factor; OIL is the oil factor. For each factor, the "high" and "low" portfolio are constructed as equally-weighted portfolios of top and bottom 30% of the stocks based on a value of a given attribute, respectively. The portfolios are rebalanced once a week and held during one week. The HML (high minus low) portfolio involves a long position in the high portfolio and short position in the low portfolio. The return of the HMI (high minus index) portfolio measured as the high portfolio's return in excess of the return on equally-weighted index portfolio of the stocks passing the selection criterion. Panel A presents mean returns of the portfolios (in percent, p.a.) along with the corresponding t-statistics, while Panel B reports correlations between returns on different factor-mimicking portfolios.

**Panel A. Mean returns**

	2000-2003				2000-2001		2002-2003		2000-2003		2000-2003	
	High	Low	HML	t(HML)	HML	t(HML)	HML	t(HML)	HMI	t(HMI)	LMI	t(LMI)
<b>SIZE</b>	38.43	71.78	-33.35	2.30	-44.80	2.04	-23.14	1.23	-8.88	1.13	24.47	2.61
<b>DP</b>	69.19	64.35	4.83	0.34	-2.31	0.10	13.26	0.88	21.88	2.72	17.05	1.94
<b>CG</b>	43.55	69.38	-25.84	1.97	-51.18	1.77	-14.88	1.06	-12.80	1.61	13.04	2.04
<b>TURN</b>	42.37	46.78	-4.42	0.20	-19.79	0.48	9.83	0.61	-4.94	0.48	-0.52	0.04
<b>VOL</b>	35.95	61.48	-25.52	1.21	-32.51	0.85	-19.03	1.05	-11.35	1.29	14.17	1.04
<b>RET1M</b>	37.81	59.03	-21.22	1.15	-38.48	1.15	-4.40	0.29	-9.50	0.91	11.72	1.23
<b>RET6M</b>	44.75	49.64	-4.89	0.24	-11.98	0.32	2.03	0.12	-2.56	0.22	2.33	0.22
<b>RET12M</b>	41.18	45.43	-4.25	0.26	5.07	0.18	-14.14	0.92	-6.13	0.55	-1.88	0.19
<b>RM</b>	25.16	62.13	-36.97	1.85	-66.11	1.88	-9.06	0.49	-22.14	2.06	14.82	1.28
<b>DEF</b>	52.55	40.73	11.82	0.72			11.82	0.72	8.79	0.88	-3.03	0.33
<b>TERM</b>	54.64	46.16	8.48	0.38	17.90	0.43	0.37	0.02	7.34	0.51	-1.15	0.11
<b>MONEY</b>	37.83	57.66	-19.83	0.96	-46.10	1.26	5.77	0.32	-9.47	0.77	10.36	0.99
<b>EMBI</b>	75.90	16.89	59.01	3.02	91.32	2.59	28.23	1.72	28.60	3.18	-30.42	2.32
<b>USD</b>	68.26	29.33	38.93	2.16	60.16	1.84	17.08	1.15	20.95	2.27	-17.98	1.67
<b>EURO</b>	59.10	39.43	19.67	0.98	27.89	0.77	10.61	0.60	11.79	1.22	-7.88	0.63
<b>OIL</b>	44.19	35.31	8.87	0.44	19.12	0.51	0.89	0.06	-3.12	0.32	-11.99	0.95

**Panel B. Cross-correlations**

	SIZE	DP	CG	TURN	VOL	RET1M	RET6M	RET12M	RM	DEF	TERM	MONEY	EMBI	USD	EURO	OIL
SIZE	100%	15%	68%	16%	64%	3%	7%	10%	38%	9%	-4%	-16%	2%	-4%	8%	18%
DP	15%	100%	34%	15%	24%	-8%	-21%	-19%	16%	7%	-11%	-3%	10%	-2%	3%	9%
CG	68%	34%	100%	23%	63%	-9%	-2%	-16%	59%	-2%	3%	1%	12%	-14%	12%	20%
TURN	16%	15%	23%	100%	78%	-19%	-39%	-25%	29%	26%	-29%	-26%	16%	23%	17%	17%
VOL	64%	24%	63%	78%	100%	-16%	-28%	-14%	44%	23%	-26%	-28%	15%	12%	19%	24%
RET1M	3%	-8%	-9%	-19%	-16%	100%	56%	21%	20%	-5%	24%	24%	-44%	-30%	-38%	-21%
RET6M	7%	-21%	-2%	-39%	-28%	56%	100%	54%	11%	13%	29%	22%	-44%	-32%	-35%	-37%
RET12M	10%	-19%	-16%	-25%	-14%	21%	54%	100%	-24%	4%	-11%	-21%	8%	6%	4%	8%
RM	38%	16%	59%	29%	44%	20%	11%	-24%	100%	15%	25%	21%	-39%	-38%	-36%	-23%
DEF	9%	7%	-2%	26%	23%	-5%	13%	4%	15%	100%	32%	-46%	-3%	-15%	-35%	-21%
TERM	-4%	-11%	3%	-29%	-26%	24%	29%	-11%	25%	32%	100%	44%	-39%	-38%	-34%	-58%
MONEY	-16%	-3%	1%	-26%	-28%	24%	22%	-21%	21%	-46%	44%	100%	-58%	-39%	-28%	-45%
EMBI	2%	10%	12%	16%	15%	-44%	-44%	8%	-39%	-3%	-39%	-58%	100%	38%	27%	45%
USD	-4%	-2%	-14%	23%	12%	-30%	-32%	6%	-38%	-15%	-38%	-39%	38%	100%	63%	44%
EURO	8%	3%	12%	17%	19%	-38%	-35%	4%	-36%	-35%	-34%	-28%	27%	63%	100%	36%
OIL	18%	9%	20%	17%	24%	-21%	-37%	8%	-23%	-21%	-58%	-45%	45%	44%	36%	100%