Managing the Investment Portfolio Structure in Response to a Lower CBR Key Rate

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Abstract. This paper discusses the methods for managing the investment portfolio structure in response to lower inflation and CBR key rate. The reduced attractiveness of fixed-yield instruments primarily results in a gradual increase in investments in the shares of companies offering high dividends and stable growth prospects. The goal hereof is to evaluate the correlation of the key rate dynamics and medium-term changes in the return on shares and bonds, which will enable structuring an optimal investment portfolio. To that end and to accurately substantiate the findings, the research relies on the comparative, correlation-regression, and variance analyses of the MoEx stock indices. The paper presents a structural analysis of sectoral indices as well as a correlation analysis of the key rate and major-issuer shares. We additionally evaluate the effect of the large specific weight of some companies in the structure of Russian stock indices. The analysis presented herein has produced accurate data on the correlation of low inflation, low CBR rate, and increases in most Russian stock indices. The findings enable accurate prediction of the further increase in the value of securities with a high dividend or coupon yield provided the country's basic macroeconomic parameters are maintained or improved.

Keywords: key rate, Central Bank of the Russian Federation, securities, stock market, bonds, investment portfolio.

1 Introduction

As of today, the Russian Federation's financial system features a high availability of credit, which entails a lower investment attractiveness of fixed-yield financial assets. The CBR key rate reduction cycle began in 2015 and has not yet come to an end, which enables us to predict an increase in investments in the Russian securities as well as their subsequent value growth. [1] This is due to the traditionally low price of such securities as well as to the favorable macroeconomic situation, i.e., the increasing oil prices on top of the weak ruble, low inflation and key rate.

The dividend yield of securities issued by Russian issuers has reached its historical high, now being one of the world's highest. [2] All of this causes a revision of the traditional approaches to investment portfolio management. Thus, balanced investment portfolios tend to reduce their share of assets with low but guaranteed yield.

2 Relevance, Scientific Significance, and State-of-the-Art

Research Relevance. Recent political and macroeconomic developments brought the Russian stock-market instruments to top ranks of investment attractiveness in terms of dividend and coupon yield, which is why it is as never relevant to predict the value of major security classes.

Scientific Significance. As of today, accurate assessment of the prospects of specific investment instruments in the light of the falling key rate remains an unresolved issue. An important advantage of this research is that it substantiates the correlation of the key rate dynamics and the price of financial assets, for which we use correlation-regression analysis as well as analysis of variance.

State of the Art. In the light of the CBR key rate volatility, rising oil prices, and the tightening of the US monetary policy, appropriate management of the investment portfolio structure is a problem yet to be solved. Some scholars believe that inflation and the exchange rate of the national currency will remain the basic indicators defining the development of Russian stock-market instruments; both indicators are hard to predict in the long term. [3; 4]

The problem of investment portfolio optimization is drawn upon in detail by Yu. Vorobyov, K. Kim, and T. Teplova. [5; 6; 7] These papers present a positive opinion on the prospects of the Russian stock market, which is based on a detailed analysis of the basic macroeconomic parameters. However, these researchers do not use precise mathematical models and correlation analysis.

The matters of portfolio investment efficiency as affected by regulatory action are detailed in papers by V. Pakhmutov, A. Glushchenko, and T. Goncharenko. [8; 9; 10] A brief comparative analysis of the correlations of individual shares, bonds, and deposits is presented in papers by K. Galenskaya, T. Teplova, and V. Lashina. [11; 12]

3 Statement of Problem

The purpose hereof is to find the optimal investment portfolio structure as a function of the CBR key rate trends. The subject matter hereof is the combination of financial relations arising from the managing the investment portfolio structure. The study examines a risk-balanced portfolio consisting of shares and bonds. It is therefore necessary to assess the correlation of key rate dynamics and medium-term changes in share/bond yield.

Substantiating the optimal ratio of investment portfolio elements requires the correlation-regression analysis, the analysis of variance, as well as the structural analysis of the MoEx indices. The analysis output will be used to formulate findings on structuring an appropriate-risk, sufficient-yield portfolio.

One of the key problems to solve consists in studying the dynamics of demand for financial assets, finding the causes of its growth by analyzing the macroeconomic indicators and new tax incentives, as well as researching the global financial trends.

4 Theory

Correlation of Inflation, CBR Key Rate, and Economic Growth In 2017, inflation in Russia amounted to about 2%, which on top of the gradual economic revival and reductions in the expected inflation indicates an economic stabilization. Currently, the regulator's actions are based on analyzing the economic development trends coupled with the specifics of the current economic cycle. Changes in the key rate have comprehensive effects on the economy. [13] The key rate has been instrumental to the stabilization and revival of the potential economic growth, being gradually reduced since December 2014, when it peaked at 17%. No doubt, it will be difficult to stimulate economic growth and lower the key rate in the long term. [14]

Any change to the key rate has an immediate impact on the one-day interbank lending rates, thus on the rest of the money market spectrum. Banks respond to a lower key rate by lowering their interest rates on credits and deposits. This process is intensified by the withdrawal of licenses once issued to the volatile market participants, with their clientele being redistributed among more reliable competitors.

Increasing Investments in the Stock-Market Instruments In the light of declining interest rights, deposits are becoming ever less interesting as investments despite being highly reliable. Crisis is the best time to purchase high-quality financial assets, as they tend to be cheaper compared to the times of stability. [15] A number of foreign investors whom sanctions might have forced to exclude Russian securities from portfolios have already done so.

In the current situation, economically active and financially knowledgeable people will prefer stock-market instruments, as their potential yield is much higher. The higher return on portfolio investments is attributable to the low price of financial assets in Russia, tax incentives on individual and investment accounts, and tax exemptions for the coupons of Russian companies' bonds issued in 2017–2020. [16]

Investment Portfolio Structure Management Theory. When forming a medium- or long-term investment portfolio, one has to consider diversifying it to minimize the risks of losses. Diversification implies adding assets of varying nature to the portfolio, particularly shares and bonds of different maturity, reliability, coupon yield, and dividend expectancy. [17] Proportions in the portfolio structure depend on the strategy of choice, the risk tolerance, and the potential yield. With capital preservation in mind, one must invest in high-quality liquid assets that offer highest ratings and minimum risks. [18] The potential yield might be increased by making such a portfolio, whose guaranteed returns will always compensate for the potential loss on high-risk assets. Higher yields can be attained by actively purchasing and selling securities in the short term; in this case, diversification is not as important, as the yield of such aggressive strategy depends more on the transaction value as well as on the analysis quality.

5 Practical Significance, Proposals and Implementation Results, Experimental Results

The relation of the key rate and stock instruments might be described by the correlation-regression analysis and analysis of variance with respect to how the dynamics of individual papers and aggregate indices correlates with the key rate. For such generalized analysis, we selected the IMoEx index, the blue-chip index, and the composite bond index, see Table 1. IMoEx is based on more than 50 securities of highest-capitalization companies. The Blue-Chip index is not as broad as IMoEx, as it describes the changes in about 15 most liquid shares of Russia's major companies. [19] The composite bond index reflects changes in the yields for the entire bond market of the country.

Table 1. Results of the correlation-regression analysis and analysis of variance of the MoEx aggregate indices and the CBR key rate, data from January 30, 2015 to March 30, 2018

	IMOEX	**RTSSTD (the Blue-Chip Index)**	**RUABITR (the composite bond index)**
Observations		796	
Dependency equation, where Y is the index value, X is the key rate	Y= 2,854.602 - 90.3912X	Y= 18,051.03 - 527.239X	Y= 238.4092 – 8.814X
Pearson Correlation Coefficient	- 0.76598	- 0.73095	- 0.95347
Coefficient of determination	0.58672	0.53429	0.90910
Normalized coefficient of determination	0.58620	0.53370	0.90899
Standard error	125.79540	816.22743	4.62131
Fisher test significance	< 0.001	< 0.001	0
Student test significance	< 0.001	< 0.001	0
Range of the model's deviation from the index	From 0.01 to 20.01%	From 0.004 to 17.65%	From 0.02 to 21.03%
Arithmetic mean deviation of the excess	5.27%	5.15%	2.51%

According to the calculations, the Pearson correlation coefficient indicates a high index to key rate correlation for all indices. The coefficient of determination indicates that the constructed regression will be sufficient to explain 50% to 60% of all deviations from the mean dependent variable for share indices and 91% of all deviations for bond indices. However, such analysis cannot explain the remaining deviations by statistical methods alone; those have to be explained by reference to the structural peculiarities of stock-exchange indices, where a company may be an outlier in terms of its specific weight. [20]

Investments in Bonds. Bonds are fundamental to the stable portfolio yield. Our findings indicate that bonds respond better to a lower key rate. For the composite bond index, the Pearson correlation coefficient is -0.95, which indicates a strong correlation with the key rate. As the value of bonds demonstrates a steady upward trend, the bond yields might become lower in the future.

Nevertheless, buying fixed- and floating-coupon government bonds is a by-default investment decision as of today. Fixed-coupon securities are particularly profitable when the key rate is declining, as their yield is fixed on purchase and will not change until they mature. Floating-coupon securities are advantageous due to the key-rate uncertainty in the long term, including post-2019 years. The highest-risk investments are investments in corporate bonds, as their efficiency in the portfolio requires continuous monitoring.

Investments in Major Companies' Shares Blue-chip investments are the safest investment option. First, these companies lead in their respective industries, and their shares are more prone to the effects of fundamental factors, which enables the investor to draw conclusions on the trends and prospects of the entire securities market. [22] On the other hand, such shares are very liquid and can be sold at any moment at the market price. Despite sanctions, major companies are likely to develop further, as they are of systemic importance for the economy, and the state will do its best to save them.

In fact, a lower key rate causes shares and bonds to increase in value, although the degree of such increase will vary considerably. [21] Note that researchers could use more accurate models to analyze the indices or individual securities. This would be important for technical analysis. However, such models are only efficient in the short term, as the market is distinguished by the large scale of speculative transactions based on the high variability of external environments.

When structuring the investment portfolio, it is important to consider the basic characteristics of issuers, including their market significance and sectoral specifics. A company's significance is defined by its capitalization and market share.

Structural Analysis of MoEx Sectoral Indices; Correlation Analysis of Their Components The Russian securities market began to emerge and take shape rather recently; its capitalization is rather low compared to many other countries, which is why the securities of some issuers make for too large a proportion in this market. [23] Accordingly, indices are strongly affected by the trends in individual shares. Table 2 presents the structural analysis of sectoral indices and the correlation analysis of large-proportion shares and key rate dynamics.

Table 2. Structural analysis of MoEx sectoral indices and correlation analysis of their components, indices, and key rate values; data sampled from January 30, 2015 to March 30, 2018

Sectoral index	Companies' shares	Proportion in the index as at March 30, 2018	Pearson correlation coefficient by index value	Pearson correlation coefficient by CBR key rate
Banks and finance	Sberbank SBER	21.73	0.78431	-0.88032

MICEXFNL	VTB VTBR	24.69	-0.25179	0.56837
	Moscow Exchange MOEX	26.38	0.97439	-0.7151
Metals and mining MICEXM&M	Alrosa ALRS	16.45	0.81081	0.44328
	Severstal CHMF	14.19	0.90329	-0.7014
	Polymetal POLY	9.14	0.40928	-0.40129
	Nornikel GMKN	14.88	0.30662	-0.04283
Oil and gas MICEXO&G	Gazprom GAZP	14.82	0.17433	0.46671
	Novatek NVTK	15.48	0.85616	-0.72938
	Rosneft ROSN	14.16	0.80434	0.51413
	Lukoil LKOH	15.63	0.85709	-0.60319
Consumer goods and trade MICEXCGS	Magnit MGNT	14.91	0.05696	0.72234
	M.video MVID	11.04	0.43201	-0.87898
Telecommunications MICEXTLC	MTS MTSS	66.39	0.67973	-0.51955
	Megafon MFON	16.55	-0.0567	0.35425
	Rostelecom RTKM	13.14	0.11239	0.62919
Transport MICEXTRN	Aeroflot AFLT	72.66	0.99447	-0.77176
	NMTP NMTP	20.96	0.94816	0.90604
Chemical production MICEXC	PhosAgro PHOR	75.27	0.50528	-0.14571
	Akron AKRN	20.29	0.86935	-0.7374
Electric power MICEXPWR	FGC UES FEES	15.42	0.96883	-0.69575
	RusHydro HYDR	14.75	0.89205	-0.6026
	Inter RAO IRAO	15.37	0.98437	-0.79877

Fundamental to choosing a share is the sector that to which the company belongs. The respective sectoral indices serve as good indicators of the market state-of-the-art and expectations.

According to our calculations, the Pearson correlation coefficient demonstrates a high correlation of the key rate with bank and finance indices, metals and mining indices, transportation indices, chemical production and electricity indices; the correlation is considerable for oil and gas, but weak for consumer goods and trade as well as for telecommunications. The coefficient of determination shows that for most indices, half of deviations is attributable to the presented regression; this does not apply to oil and gas, consumer goods and trade, as well as telecommunications indices.

Analysis Results. Therefore, there is a correlation linking the index value dynamics and the key rate, which serves as the mathematical proof of this paper's hypotheses. In fact, a declining or stably low key rate does increase the market value of most shares and sectoral indices. The most important exception is the telecommunications index, which is logically attributable to the extremely negative dynamics of Megafon shares coupled with their relatively high proportion in this sectoral index.

Calculation-based findings hold that the stock-quote and key-rate trends are directly opposite. The analysis also reflects an important finding that high dividend yield shares have a much stronger correlation with the key rate. In this case, it would be only logical to argue that in current macroeconomic situation, it is advisable to increase the proportion of high dividend yield shares issued by major Russian companies in your investment portfolio.

6 Conclusions

Correlation-regression analysis and analysis of variance suggest there is a strong correlation between a lower key rate and a higher bond price. This correlation is not as significant for share indices and for individual securities presented in such indices. Nevertheless, the key-rate reduction cycle is likely to end in 2019. This in turn indicates a limited growth potential with respect to fixed-yield instruments; however, tax incentives applicable to coupons and the development of individual investment accounts might make this factor considerably less important. Besides, in the light of a low key rate, the amount of reliable high-coupon bonds will be gradually falling due to the partial redemption of individual issues.

The share to CBR KR Pearson correlation coefficient indicates a high correlation for high-yield (or potentially high-yield) issuers. A low key rate makes dividend securities of major Russian companies attractive even in the context of financial sanctions. Investment expectations for this class of securities are more positive, as they are associated with longer planning and projections of increase in the future profits of domestic companies.

Therefore, over the next three to five years balanced investment portfolios must gradually increase the proportion of high-yield shares with a minimum possible Pearson correlation with the CBR key rate. Increasing the proportion of bonds will be acceptable no earlier than in 2019, as the CBR completes its key rate reduction cycle and is going to switch to a neutral monetary policy.

References

1. Utuchenkova, M.: The influence of monetary regulation on the stock market and business activity: a theoretical aspect. Theory and practice of modern science 4 (4), 321-324 (2015).
2. Gurov, I.: Financial instruments with the protection of profitability from inflation in the Russian capital market: first experience and prospects. Finance: Theory and Practice 5 (21), 140-149 (2017).
3. Boldareva, Yu.: Monetary and credit apparatus of Russia and its influence on the stock market of the country. Economics and management: problems, solutions 3, 126-129 (2015).
4. Gilmundinov, V.: Estimation of the impact of monetary policy on the Russian economy in the all-equilibrium inter-branch model with blocks of aggregated markets. Bulletin of NSUEF 3, 43-59 (2014).
5. Vorobiev, Yu.: The stock market of the Russian Federation: status and prospects. Scientific Herald: Finance, Banks, Investments 1 (38), 111-126 (2017).
6. 6. Kim, K.: The Russian corporate bond market: key indicators and development trends. Journal of Scientific and Applied Research 6, 36-38 (2016).
7. Teplova, T.: Debt burden: realities and trends in the public debt market of the United States, Europe, developing countries and Russia. Corporate Finance Management 2, 74-93 (2015).
8. Pakhmutov, V.: Individual investment account as a tool for attracting individuals to the government bond market. High school 13, 15-17 (2016).

9. 9. Glushchenko, A.: Investment attractiveness of bonds for individuals after the introduction of preferential taxation on the corporate bond market. Economy and Entrepreneurship 9-3 (86-3), 1037-1039 (2017).
10. Goncharenko, T.: Modern practice of operations of commercial banks with securities. Economy and Entrepreneurship 2 (55), 998-1002 (2015).
11. Galenskaya, K., Teplova, T.: Bonds or bank loans: the choice of companies and the reaction of investors in the Russian stock market. Management Accounting and Finance 3, 172-197 (2016).
12. Lashin, V.: Central banks and their role in the life of the global stock market. PRO-Economy 2 (4), 2 (2018).
13. Kartaev, F., Kozlova, N.: Econometric evaluation of the impact of monetary policy on the dynamics of the Russian stock market. Bulletin of Moscow University 1, 22-43 (2016).
14. Ivanchenko, I.: The Impact of Monetary Impulses on the Market Prices of Stock Assets. Banking 3, 50-54 (2010).
15. Ivlev, S.: Development of ETF investment funds in Russia as a way to attract investments. Economy and Entrepreneurship 8-3 (85-3), 1158-1161 (2017).
16. Root, A., Goloyad, A., Ivashinnikova, E.: Analysis of new opportunities for effective investment based on the use of an individual investment account. International Journal of Applied and Basic Research 12-9, 1696-1699 (2016).
17. Shamkina, E., Kozyrenko, A.: Formation and development of the corporate bond market. Fundamental and applied research in the modern world 14-2, 113-116 (2016).
18. Zadorozhnaya, A.: The influence of covenants on the yield of corporate bonds. Finance and Credit 7 (631), 34-44 (2015).
19. Gorbatikov, E., Khudko, E.: Financial markets. Economic development of Russia 7 (22), 62-67 (2015).
20. Mikhailov, A.: Forecasting the yield of Russian government bonds. Banking 9, 62-65 (2015).
21. Karaush, D.: Use of debt instruments in financial engineering: Financial studies 2 (47), 36-44 (2015).
22. Sokolova, T.: Analysis of factors affecting the development of the market for corporate and government ruble bonds. Corporate Finance Management 5, 294-307 (2015).
23. Shaker, I.: Financial instruments as an alternative to bank deposits. Finance, money, investment 3 (63), 24-29 (2017).