

RISK MANAGEMENT STRATEGIES FOR A BONDS PORTFOLIO

Turcaş Daniela Liliana

*West Univerisity Timișoara, Economy and Business Administration Faculty Sc Smart Consult Srl
Arad, str. D. Bolintineanu, nr.5 Email: daniela.turcas@yahoo.com Phone: 072267752,
0257281611*

On the international capital markets there have been stated numerous strategies which have as main objective, in the process of selection and management of financial instruments such as bonds, to minimize the impact of the interest rate fluctuation risk on the performance of this type of portfolio. The performance level of the managers of investment funds, with a portfolio structured primarily on fixed-income instruments (treasury bonds, corporate bonds, possibly preferred shares), is a direct consequence of the ability to use proper strategies.

In this paper I intend to present some of the techniques of risk management for a bond portfolio and to illustrate a model of risk protection through immunization technique, applied to the bond portfolio of SIF Banat-Crișana.

Keywords: credit risk, immunization, dedication, financial derivatives.

JEL Clasification: G11: Portfolio Choice, Investment decisions

I. Introduction

The exposure to credit risk arises from the acquisition of corporate, bank and municipal bonds.

The credit risk is associated with the treasury certificates and bonds issuers' ability to pay the interest and principal and can be controlled by selecting those companies with high financial performances, which provide security of interest and principal payments.

The implementation of evaluation techniques and of risk analysis in the portfolio manager's selection and management process is of great importance. The specific risk of investments in fixed-income financial instruments is given by the interest rate variability.

The mostly used components of the risk management on the developed bond markets are: **immunization, dedication** and the use of **financial derivatives**.

II. Bond portfolio immunization

The immunization strategy is based on the selection process of financial instruments having the same sensitivity to changing interest rates as the investment fund's payment obligations. This criterion allows the same method of adjustment to be used on assets and liabilities. The updated flow of assets is sized so to cover at any moment the flow of liabilities, given the amounts and maturities.

The immunization strategy is riskier than the dedication strategy because is influenced by the precision in estimating the assets' sensitivity to interest rate shifts. If we take into account that it is a predictions and estimates based technique, immunization can be considered an active portfolio management strategy. By implementing the market tracking strategy, the structure of an immunized bond portfolio will undergo periodic adjustments through replacements determined by the higher periodic rentability of certain financial instruments. It is known that active strategy portfolio managers have low risk aversion and will accept the risk of not covering the liability flows.

Aiming to better yields from the managed portfolios, they can also select variable income financial instruments, such as shares and their derivatives, instruments that are not recommended in immunization as they imply a higher risk than bonds and bank deposits.

The determinant factor in taking this decision is the balance between assets and liabilities. In the case of an active strategy, with frequent asset structure adjustments by including variable income,

high volatility financial instruments, the increased level of liabilities will generate a higher exposure to the risk of debt nonpayment.

A strategy similar to the immunization strategy is dedication, by connecting inputs to outputs, without sensitivity correlation.

III. Bond portfolio dedication

The structure of a fixed-income, zero-risk financial instruments portfolio, such as treasury notes and treasury bonds, is an example of a dedicated portfolio, with minimal risk and yield. The dedication strategy is based on the adjustment of inputs to the outputs of financial flows (exact matching).

The starting point of this strategy implementation consist in selecting the eligible bonds for this purpose. The bonds with high bankruptcy risk or those with advance repayments option will be rejected because the real cash flow can differ considerably from the forecasted cash flow. The intial portfolio acquisition cost can be minimized using the linear programming technique.

While immunization is an active portfolio management strategy, dedication is a passive strategy. As long as the asset flow matches the liabilities flow, there will be no additional interventions (bonds *shall* not be sold in order to meet the nedd of funds), even if financial instruments' yields change. Interest rate shifts do not affect the balance, even if the market could provide rewarding alternatives for secutiries selection.

Assuming that managers seek am additional increase of the portfolio performance, they can still take decisions regarding the active management, disconsidering the original premises of balancing the two categories of flows. For example, they can include predictable flows assets in the portfolio, with higher yields than treasury bonds, such as corporate bonds or preffered stocks of certain issuers. The risk associated with this portfolio is higher because of the coupon or dividend nonpayment risk implied by the corporations compared to the state.

IV. Using financial derivatives

The derivatives are frequently used on international bond markets, where the main actors are the governments, the major companies treasurers, corporations, pension funds and individuals. The main types of derivatives are futures, forwards, options and swaps. They are also called *random receivables* because of their random regulation at settlement, depending on the underlying asset price.

The goals of the users of financial derivatives consist of:

- financing diversification;
- decrease of the international financing cost;
- reduce the price risk;
- availability of favourable exchange rates on international markets;
- diversification of risk management techniques.

By implementing the hedging strategy for a loan, the exposure to interest rate shifts is offset by an opposite exposure to the existing one. The hedging limits not only the risk, but also the opportunity of additional profit in favourable market circumstances. Speculators are willing to undertake the risk (the opposite of hedgers) expecting to gain some profit from price differences. Individuals and companies may also look for arbitrage opportunities, looking for profits deriving from price differences between markets.

Returning to the protection of a bond portfolio of an investment fund, the futures on bonds can be used as means of interest rate risk management, without altering the portfolio structure. If the interest rate decreases, the bond price increases. The risk analysis for bonds is based on the following indicators: maturity, length, adjusted length, base point value and convexity. The process of interest rate risk management implies the calculation of these indicators.

High liquidity in international financial markets³⁷¹ has provided the conditions for a professional management of bond portfolios and stimulated the innovative ability for new financial products. On these market there are often used both types of strategies (active and passive). The approach depends on the performance level requested and on investors' risk tolerance. The changes occurred in financial instruments prices are reduced as amplitude, considering the high rate of price predicability. The technical analysis of prices provides reliable and feasible data for identifying the entry-exit points for the financial instrument.

The Romanian capital market is an emergent market, with a reduced informational efficiency and highly volatile. The options of the portfolio manager are constrained by the reduced number of available financial products and the market liquidity³⁷². The price variations are more extensive and the technical and financial analysis tools are unefficient.

Obviously, compared to developed financial market, the Romanian capital market provides higher opportunities for profit or loss.

V. Case study: Immunization model applied to SIF Banat-Crișana's bond portfolio

Analysis date: 3rd quarter, 2008

We considered the immunization model of SIF Banat-Crișana's bond portfolio.

Problem data:

A portfolio manager intends to regroup in a portfolio six (6) bonds issued by: BCR, EIB, EFG Hellas, EBS, Procredit, Primăria Timișoara, having different features.

The main goal is to minimize the loss of portfolio value risk as a result of interest rate shifts and to ensure the necessary funds for certain future payments in the conditions of fluctuating interest rates.

The portfolio is considered immunized for a given period of time if its value at the end of this period in fluctuating interest rate conditions is equal to the portfolio value in constant interest rate scenario.

The problem consists in identifying an optimal portfolio structure, indicating each bond weight, in order to achieve the goal.

The necessary condition is that **the average length of the bond portfolio to be equal to the investment horizon**, expressed in years.

The other constraints of the model concern positive values for weights, and the sum of the weights must be 100%.

Premises:

- I assumed a liquid bond market;

Note:

In practice, this premise is met for only 3 of the 6 bonds: Erste Bank (EBS – listed on Wien Stock Exchange), EFG Hellas (EFG – listed on Luxembourg Stock Exchange) and European Investment Bank (EIB – listed on Luxembourg Stock Exchange). BCR bonds, Timișoara municipal bonds and Procredit Bank corporate bonds, are also listed on the Bucharest Stock Exchange, but their liquidity is extremely low. The BSE recorder 49 trades with BCR bonds in the last 52 weeks, 12 trades with Timișoara and 16 trades with Procredit Bank bonds. The treasury bonds, existing in SIF Banat-Crișana's portfolio and listed on BSE, have not been included in this model as there are no trading quotes for these instruments. Even if 24 treasury bonds were listed on BSE in august 2008, by the time of this analysis there were only 2 trades.

371 We consider the evolutions prior to subprime crisis (august 2008)

372 We cannot talk of a liquid bond market on BSE, and the treasury bond market was initiated in the second half of 2008. Sibiu Monetary-Financial and Commodities exchange does not allow a proper protection for all listed instruments on BSE, not even the first tier ones.

- I assumed that all bonds issued have the reference interest rate related to the market interest rate;

- I assumed an investment horizon of 3 years for the bond portfolio.

I maintained the data regarding the maturity of each bond, the nominal value and coupon payment dates according to the issuance prospectus.

On the basis of this information I calculated the lengths expressed in years for each bond:

Table 1 Bond portfolio immunization model

	BCR	EIB	EFG	EBS	PRO	TIM	Total
Optimal portfolio structure [%]	0%	11%	89%	0%	0%	0%	100%
Maturity yield	7.25%	7.00%	13.50%	12.14%	8.50%	8.25%	
Coupon [RON]	7.25	7.00	27,000	1,214.00	42.5	8.25	
Nominal value [RON]	100	100	200,000	10,000	500	100	
Maturity [years]	3.0	7.0	3.0	2.0	3.0	5.0	
Length [years]	2.80	5.77	2.66	1.89	2.77	4.29	

Investment horizon: 3 years

Portfolio length: 3 years

Portfolio yield: 12.78%

The constraint of investment horizon (3 years) revealed an investment solution consisting in keeping in the optimal portfolio only EIB bonds, having a weight of 11% and EFG bonds with a weight of 89%. In these conditions, the maximum yield for the immunized portfolio would be of 12.78%. The solutions differ in accordance with constraint changes.

VI. Conclusions

Considering the realities of the Romanian financial market and the evolution of international financial markets as a result of subprime crisis, it is difficult to estimate which is the best investment strategy today for increasing the portfolio performance.

The financial crisis effects will be felt for a hard to estimate time horizon. Even the firm intervention of governments for stopping the crisis cannot help changing the investors sentiment toward the economy. This will continue to generate a high vulnerability degree for long-term financing, increasing the cost of financing and the risk premium on financial markets.

The assets value corrections on the residential mortgage market influenced the prices of other financial assets, such as corporate and municipal bonds. It is considered that the mortgage market shock generated an overreaction (overshooting) on financial markets, translated into uncertainty and higher investment risks for financial instruments.

The financial environment is responsible for today's effects regarding the innovative ability to develop complex financial products and the methodology for risk assessment implemented by rating agencies.

The strong financial turmoil highlighted the complexity and vulnerability of proper identification and evaluation mechanisms for investment risk and represents an additional argument for the importance of risk management strategies.

Bibliography

- 1 .L. Badea, – The management of primary securities portfolio, Editura Economică, 2005
2. E.Cazan, I.Cuzman, B.Dima, L.Eros-Stark, P. Fărcaș, - The management of financial instruments portfolio, Ed. Universității de Vest Timișoara, 2004
3. Carmen Corduneanu, - Instruments, tools and strategies for interest rate risk management, Editura Mirton, Timișoara, 2005
4. Carmen Corduneanu, - The capital markets, theories and practices, Editura Mirton , Timișoara, 2006
5. R. Deal, - Trading de plan, Build Wealth, Manage Money, Control Risk, John Wiley&Sons, Inc, 1997
6. Pascal François – Financial derivatives, Ed. Dunod, Paris, 2005
- 7.Collections: Bursa and Piața Financiară, 2007-2008
8. REUTERS collection – Introduction to the study of securities, John Wiley&Sons (Asia) Pte Ltd, Editura Economică, 2000
9. Reuters collection – Introduction to the study of bond markets, John Wiley&Sons (Asia) Pte Ltd, Editura Economică, 2002
- 10 .www.rhoworks.com/software/index.htm
11. www.riskglossary.com/link/volatility.htm