

Use of fixed income products within a company's portfolio

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Abstract. *Financial instruments have been developed over time from bonds, with a simple structure of cash flows, to yielding instruments that have a complex structure, attracting a much broader range of investors and permitting issuers of bonds to allow reduce the costs of fund raising. To construct investment strategies to control interest rate risk and grow revenues, investors must understand the forces that controls the bond market but also the tendencies.*

The main objective of this paper is to show how they apply to an investment strategy and asset allocation tools available. Fixed income products occupy a large share in total assets, so we want to highlight how to use fixed income products in order to optimize the portfolio of companies. Working hypothesis we chose looks at how the value of financial assets is influenced by macroeconomic factors and market price developments. Investment banks, in particular, put great emphasis on fixed income products and their use by customers. Thus traditional banking and financial products together with fixed income products enables companies to finance current needs, to finance development and to diversify the asset allocation tools.

Keywords: fixed income products; bonds; yield; monetary policy; investment strategy.

JEL Codes: E52.

REL Codes: 8J, 8K.

1. Fixed income products

1.1. Money market

For profits, the risks assumed by an investor, whether individual or company, are directly proportional. For many investors, a volatile market is more than willing to take, so the money market is an alternative not as appealing, but much safer.

But money market is only part of the market fixed income. The latter is often misunderstood as the bond market, but they represent only one type of fixed income instrument. The money market trades instruments with maturity less than one year.

Money market securities are highly liquid and are considered highly reliable by investors. Because of their simplicity as financial instruments, they earn revenue much smaller than other instruments. Money market is used by those entities (companies, institutions, etc.) which need short term financing to cover the gap between operating costs and revenues from sales of products. There are various products that are traded in the money market, offering revenue and a different risk level.

1.2. Bonds

Bonds are financial instruments by which the issuer undertakes to pay the buyer the amount borrowed, called principal, plus regular interest, calculated on the amount borrowed for a period of time. A bond may be standard or not. The standard has a fixed coupon, payable by the issuer periodically and the principal is paid at maturity.

The purpose for an issuer of bonds (whether by the Ministry of Finance of a State, by a bank or a corporation) is to finance its budget projects that invested at a rate expected to be less than the return on investment (this is true at least in the private sector). By issuing bonds, the issuer has direct access to the market and avoids borrowing through banking institutions at a higher interest. The bond holding has creditor status, unlike a shareholder, which has the status of the owner of that corporation. For this reason, bonds are less risky than shares.

1.2.1. Floater bonds reversed (reverse floater)

Are those bonds that have a coupon that positive change if the reference rate decreases, and vice versa.

Some bonds have included coupon formula based on future rates of inflation. Martellini and Priaulet P. and Priaulet S., in "Fixed Income Securities Valuation, Risk Management and Portfolio Strategies", explains that investors who buy such bonds are to protect themselves from future increases in inflation and thus increase its power purchase.

These types of bonds, with coupons linked to inflation, can be used to cover the risk of a portfolio (en., hedge) fluctuations in inflation, to diversify (coupon bonds is correlated with other assets such as shares, bonds with fixed coupons or cash, so helping to diversify the portfolio of assets by spreading the risk) or to improve the management of assets and liabilities (e.g. insurance companies can use these bonds to cover the risk of inflation when damage occurs until they have to pay to the customers).

For coupon bonds floater, there are certain thresholds that can be specified by the issuer, called caps (upper threshold) and floors (lower thresholds). These thresholds helps limit exposure to high fluctuations in the rates of reference, with upper and lower limits for the coupon rate. When both limits are present, the combination of the two is called the collar. Kaplan Schweser, in "Fixed Income", exemplifies this. Thus, consider a coupon bond floater, which has a coupon rate at issuance of 5%, a cap of 7% and 3% floor. If the coupon rate (reference rate plus the margin) rises above 7%, then the issuer will pay only 7% over the period in which the coupon rate is at or above 7%. If the coupon rate is below 3%, the issuer pays 3% coupon long as the coupon rate is at or below 3%.

1.2.2 Price, yield and duration

Next we will show how to calculate bond price, yield and duration. Bond prices represent a percentage of their nominal value (face value). For example, if the price of a bond is EUR 101.5 for bonds denominated in EUR, then it corresponds to the value of 101.5% of the nominal value of 100%.

Bond price

Fixed coupon bond price corresponds to the price at which market actors are ready to buy or sell. The market price (market price) is influenced by several factors:

- time to maturity of the bond (time to maturity);
- return (yield) bonds with the same maturity;
- coupon;
- attached credit risk (credit risk of issuer - established by rating);
- secondary market liquidity for that bond (whether sold or not).

Next we will consider the first three influential factors: time to maturity, yield and coupon. Government securities have credit risk and liquidity risk and therefore less will use them to illustrate how the influence of the first three factors.

To calculate the price of a bond it must be taken into account that for these bonds it will be received a fixed income throughout the bond and face value at maturity. So when you buy a bond one that pays virtually acquired the present value of future cash flows it brings the bond (Choudhry, 2005, p. 15).

Yield (the yield)

When the price of a bond is known, we can calculate the *yield*, it is equivalent to calculating the internal rate of return, IRR noted below, also called *yield to maturity* (YTM). IRR method is used to calculate the yield of a bond (Choudhry, 2005, p. 20). Usually investors want to see return on a bond when requesting quotations in the secondary market.

Yield of any investment is the discount rate that makes the present value of cash flows equal to the cost/price initially. From mathematical point of view, yield of an investment represents the interest in the price equation.

The most common way of measuring efficiency is uniform yield curve (flat yield curve or current yield).

It has the formula:

$$rc = \frac{c}{p} \times 100,$$

where

rc is the *yield* - the current yield, the *bond price* is P and C is the *coupon*.

This calculation assumes that all future cash flows have the same interest discount factor for the entire period until the bond maturity. In fact, for different maturities are paid different rates. Therefore, to use the classical formula for calculating the price of a bond it is assumed a *uniform yield curves (flat yield curve)*. This formula is used to calculate the cost or short-term profit. To measure a bond yield, the most common method is YTM (*yield to maturity*). This method takes into account the coupon payment structure, time to maturity of the bond and profit or loss for the period remaining until maturity.

Duration

To calculate the price sensitivity to changes in market interest there are some concepts. Of these we shall refer in the following to the duration. It measures the price sensitivity to interest rates, that is how price changes in

response to changes in interest rates. This concept is called *Macaulay duration*, after which introduced this concept, Frederick R. Macaulay, in 1938. He made the following statement: *if changes in market interest rates, will be two changes on the bond*. First change *the price* and secondly *coupons* can be reinvested with another performance. These two effects are always opposite. For example, when rates rise, the bond price drops and future coupons can be reinvested at a higher yield and vice versa. Macaulay duration describes the time that the two variables are compensated each other. In other words, a temporal dimension is measured in years, indicating the time needed to fix bonds to compensate for price changes due to changes in interest rates.

The model assumes, however, one change in the yield curve, in accordance with the formula:

$$D_{\text{Macaulay}} = \frac{\sum_{n=1}^N \frac{n \times CF_n}{(1+r)^n}}{\sum_{n=1}^N \frac{CF_n}{(1+r)^n}},$$

where

D_{Macaulay} = Macaulay duration;

n = year;

N = total number of years;

CF_n = *cash flow at time n*;

r = yield.

When it comes to duration, we do not refer to Macaulay duration, but to modified duration (en., modified duration), namely:

$$MD = D_{\text{Macaulay}} \times \frac{1}{1+r}$$

Modified duration can be used to demonstrate that small changes of the *yield* determines inverse changes of the price (Choudhry, 2005, p. 34).

The main reason for use of the *modified duration* is to measure price volatility or interest rate risk.

Factors influencing the modified duration are:

- Period (in years) that was issued the bond (term of the bond) - since it is higher, the greater the impact of changing rates on bond prices;
- Coupon; a coupon meant that a large part of the bond amount is paid back early to the buyer by the payment of the coupon; so the modified

duration is less, therefore the price sensitivity of higher coupon bonds is less;

- Efficiency of the market (market yield); cash flows are subject to the discount factor using the market yield, the higher the efficiency of the market, the lower the price and modified duration, so the impact of a change of 1% of market efficiency is lower compared to a high level of interest rates than at low levels

1.3. Coverage of interest rate risk

Risks of a portfolio consisting of deposits, government securities and corporate bonds are those relating to interest rate movement.

Due to the close connection between the interest rate and bond price, we have the following situation: a decrease (increase) in interest rates will increase (decrease) the bond prices and volatility levels occur in longer term bonds and those with lower coupons. Therefore, an investor, in order to get the best impact, should buy longer term bonds with smaller coupons.

2. Investment strategies

What influences investment decisions is that markets are considered efficient.

This implies that prices will not remove the economic values that investors determine.

These economic values are actually related to investor's expectations on revenue and risk. If the market price deviates from the expected economic value, then investors act so as to align the two values. Thus, as new information in an efficient market, prices adjust to this information quickly and accurately. In an efficient market economy, assets would remove from their economic values, but enough so that investors want to take advantage of these differences.

Therefore, an effective economic market (*lack of opportunities for arbitrage*) is a passive investment strategy, i.e. expected results are to be in the market, not over it (for example, if the market yield is 5%, then the investor who adopts a passive strategy would yield 5% on the portfolio, no more) (Martellini et al., 2003, p. 211).

On the other hand there are investors who do not accept the *efficient market hypothesis*, and have an *active* investment strategy, taking advantage on their side information, their skills. These investors generate higher costs but marginal gains are higher than marginal costs.

We present below the main aspects that base an investment strategy and how they can use *fixed income products* within the portfolio of a company.

2.1. Investment strategy of a company

To illustrate, we consider the investment strategy of an insurance company present in Romania for the period 2011-2012.

The strategy aims to cover credit risk. According to Order CSA nr.18/2009, credit risk is the possibility of loss or failure, record of not reaching the estimated profits, resulting from fluctuations in rating the issuers of securities or any debtors to which insurance companies are exposed or contractual failure by intermediaries, policyholders, reinsurers or other debtors.

Period of investment/risk horizon:

- all insurance services are usually on long term and therefore typically have an horizon also as long-term investment. Annually it is performed the re-evaluation for the need for enlarging/reducing the investment horizon, according to business line.

Company's investment risks are measured and reported monthly, using quantitative and statistical methods, but also the history of market data.

Economic capacity is the total planned sum for the annual profit, unrealized investment income, reserves for liabilities. This is the basis to evaluate the ability to support a negative event.

Portfolio assets are divided into different classes, closely related to each other. They are: bonds (including funds that invest in bonds), money market instruments (money market instruments with maturity of up to 12 months, i.e. deposits), equity (shares, funds action) and alternative investments.

Risk management is structured so that the potential risk that arises due to fluctuations in prices, interest rates and currency rates to be clear and limited. This risk is reduced by establishing clear boundaries for each class of assets the company can invest in; limits are implemented both for each asset class and for the total portfolio.

Risk affecting the performance makes the distinction between securities valued at market prices (*bond sensitive at prices*) and those valued at *carrying value* (those that have a stable market value or unidentifiable or relevant or should be valued at *carrying value*/or to the value which is in accordance with the accounting rules – "bonds with stable prices-stable-priced-bonds"). To identify the economic risk, all securities will be valued at market value, face value or any other evaluation otherwise decided by the company and potential fluctuations will be reported.

The investment process depends on the approval for strategic asset allocation (Strategic Asset Allocation) and leads to asset management by classes. The second goal of the process is to create a database to allow a quantitative analysis of the portfolio.

2.2. Application of the investment strategy

The insurance company considered as for example seeks lines of investment strategy and adapts them to the economic situation in Romania. Given the need to minimize risk on the asset side, the company can chose to invest mainly in government securities with coupon, to limit setting of its total assets up to 70%. Thus, at the year end the main exposure would be in Lei, due to the percentage of bonds in total assets.

The asset allocation decisions takes account, in addition to strategy, of the macro-economic indicators in Romania.

Central bank interest rate policy has been reformulated since August 2005 with the introduction of inflation targeting mechanism, implemented by exercising a firm control over money market liquidity via open market operations, combined with periods of partial sterilization.

During 2005-2012, National Bank of Romania took these target rate of inflation, as shown in the table below:

Year	Target rate of inflation (%)	Inflation (%)
2005	7.5 ±1	8.7
2006	5.0 ±1	4.9
2007	4.0 ±1	6.7
2008	3.8 ±1	6.4
2009	3.5 ±1	4.7
2010	3.5 ±1	7.9
2011	3.0 ±1	3.1
2012	3.0 ±1	2.4

Source: National Bank of Romania, www.bnro.ro.

National Bank of Romania also changed over time the reference rate, such that from 10.25% in January 2009 it reached 5.25%, last changed in March 2012.

Policies practiced by the central bank before the crisis of 2007-2008, such as the integration of the measures to reduce inflation (exchange rate flexibility, inflation targeting, capital account liberalization) with concerns regarding financial stability (high levels of minimum reserves on 40% for foreign currency and 20% for lei at the end of 2007 – and limiting excessive currency appreciation via massive purchases by the central bank on the market, in 2004-2007), allowed efficient management of monetary policy after the beginning of

the crisis. Therefore the impact of global crisis on Romania manifested indirectly through the economic downturn, the need to adjust the current account deficit and the financial sector, unexposed to toxic assets balance was maintained, with no cases of insolvency where central bank intervention was necessary (Isărescu, 2012, pp. 22-24).

In response to central bank policy rates in the interbank market, yields have fluctuated depending on inflationary expectations, as can be seen in the table below:

interest rate and yields	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NBR key rate	6,25%	6,25%	6,25%	6,25%	6,25%	6,25%	6,25%	6,25%	6,25%	6,25%	6,00%	5,75%
ROBOR 1M	5,50%	5,50%	4,40%	4,40%	4,40%	4,40%	4,40%	5,40%	6,10%	6,10%	6,10%	5,34%
ROBOR 3M	5,60%	5,60%	5,70%	5,70%	5,70%	5,40%	5,40%	5,80%	6,20%	6,20%	6,30%	5,56%
T-bonds 3y ask	6,90%	6,90%	7,10%	7,10%	7,10%	7,00%	7,00%	7,20%	7,30%	7,30%	6,90%	6,60%
T-bonds 5y ask	7,00%	7,00%	7,10%	7,10%	7,10%	7,10%	7,10%	7,30%	7,40%	7,40%	7,00%	6,80%
T-bonds 10y ask	6,90%	6,90%	7,10%	7,10%	7,10%	7,20%	7,20%	7,40%	7,40%	7,40%	1,10%	6,90%

Source: Economic overview Romania Jan-Dec 2011, Raiffeisen RESEARCH.

According to these data but also with the forecasts made by commercial banks active in the Romanian market, the insurance company considered as for example could have made a forecast for the rate of reinvestment of the assets which were calculated based on income and asset portfolio yields in 2011.

For asset allocation, the insurance company limits followed investment strategy, plans made for the total value of assets and incomes macro and micro-economic indicators.

Thus, investments were directed in governmental securities issued by the Ministry of Finance, purchased on the secondary market via partner banks.

In order to perform the reevaluation of the assets, the insurance company can use two methods: IRR for treasury bills and bonds held to maturity (Helt to maturity) and market valuation of assets available for sale (for those using target price offered by the partner bank on the last day of each month).

3. Conclusions

The asset allocation requires a well structured investment strategy, with limits on every asset classes in order to calculate the risks of financial instruments within the portfolio.

Also, an investor must be well informed about economic development, both at the macroeconomic and microeconomic level.

On the other hand, many companies that have several lines of business, other than investments, prefer a simple strategy, limiting risk as much as possible. In this sense, the insurance company present on the Romanian market invests in fixed income assets, enabling the calculation of income and future cash flows and covers liabilities without any risk. Companies can have stable investment policies, involving portfolios composed mostly of governmental securities in Romania, bought in the secondary market.

In order to meet investment objective is very important the proactiviy, the choice of the opportunity and of timing for entering into a transaction of sale or purchase. This implies a constant and a correlation analysis of various sources of forecast, close monitoring of economic indicators and the socio-political situation in Romania, EU and globally, and efficient use of fixed income products.

The maturity degree of the financial and banking markets, the development of banking and investments products, the sophistication of corporate customers as well as retail customers, financial and banking culture, are determinant for hedging and for portfolio diversification.

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