

EFFICIENCY OF DIFFERENT PENSION FUND INVESTMENT REGULATION MODELS

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ABSTRACT

The Article presents a comparison of performances achieved by different funds applying different investment regulation systems with the aim of determining which system produces better results. The regulation system, which prescribes numerous strict quantitative investment limits as well as types of investments that the funds are allowed and not allowed to make, is applied by the Croatian mandatory pension funds. On the other hand, Croatian open-ended balanced mutual funds apply a system which ensures less strict investment limits and, in fact, indicates a tendency towards the application of the prudent person approach. By comparing performances achieved by the above-mentioned types of funds, which are actually very similar in terms of the asset classes they invest in but differ with regards to their investment policies defined by the regulator, we will try to establish which investment regulation system was more efficient, i.e. which system ensured the investors a more favorable risk-return profile during the observed period.

1. Introduction

In 2002, Croatia introduced mandatory pension funds, established within the framework of the pension system reform. Participation is mandatory for all workers under 40 years of age who pay a portion of their pension contribution into these funds. The pension fund management companies then invest the paid-in contributions in financial markets for the purpose of achieving returns, while assuming moderate investment risks. The system was designed by the World Bank in accordance with the Chilean model. The World Bank proposed that such a system be implemented in the developing countries, whose previous, mainly 'pay-as-you-go' systems started facing difficulties due to the aging society. (1) A system similar to the one implemented in Croatia was also implemented at the end of the 1990s and the beginning of the new millennium by Poland, Hungary, Slovakia, Latvia, Lithuania, Estonia, Romania, Bulgaria, Macedonia, and the system had previously been implemented in many South America countries as well. (2)

Just like in the above-mentioned countries, the investment policies of the newly established pension funds envisaged a system of quantitative investment limitations. The regulation prescribe the following investment limitations for Croatian mandatory pension funds: in the case of government bonds, a minimum limit of 50%; in the case of shares of domestic stock companies or domestic corporate bonds, a maximum limit of 30%; and in the case of securities issued by foreign entities, a maximum limit of 20%. Furthermore, investments in derivatives (other than FX forwards), alternative asset classes, small-cap shares and similar

are not allowed. (3) There is a whole series of other limitations concerning the minimum stock company capital requirements, the minimum size of bond issue, the minimum credit rating of the issuer, and the maximum share in a particular issue, and similar.

Many provisions envisaged under this kind of approach, which imposes strict investment limitations, significantly differ from the generally accepted practice in developed countries. It is stated in the OECD Guidelines on Pension Fund Asset Management, Recommendations of the Council adopted by the OECD Council in 2006, which recommendations are intended for entities responsible for regulating pension fund asset management, that the legal framework must, in the first place, take care about each pension fund's target revenue. The other two essential recommendations prescribed for such regulating entities are the application of the prudent person standard and adherence to the statement of investment policy. It is also stated that the regulating entities may prescribe quantitative limitations, so long as they are consistent with and promote the principles of safety, profitability and liquidity. In this regard, the guidelines consider that limitations prescribing the minimum amount of investment in a particular asset class are not consistent with the mentioned principles. (4)

However, in Central and Eastern European countries where mandatory pension funds are established, the relatively high minimum investment limit (50%) for investments in government bonds and limitations concerning the investments in securities issued by foreign entities, were interpreted as a result of insufficiently developed local financial markets and usual difficulties concerning the financing of public expenses, as well as significant transitional costs incurred in the process of establishing pension funds. In simpler terms, it was unrealistic to expect that the countries would allow outflow of significant domestic savings into foreign countries, while the only way to ensure financing of transitional costs incurred by transferring a portion of pension contributions to the new Pillar II was to ensure that the newly established pension funds get back the greatest part of the paid-in contributions by purchasing government bonds.

However, legislators also considered risk as one of the essential reasons for imposing a minimum limit for investments in government bonds, as this asset class was considered low-risk. To justify prescribing the above-mentioned limit, the regulating entities use the argument that it is not right to obligate the people to register with mandatory pension funds by the force of law, and then to expose their savings to the risks of capital markets and volatile asset classes (shares, alternative asset classes, and similar).

After a few years of operation, pension fund managers and the wider professional public started questioning whether the regulations which include extensive limitations are truly ensuring risk reduction in the portfolios of mandatory pension funds or they just stand in the way of achieving optimal asset allocation. This was particularly discussed during the period in which strong stock market growth was recorded (2005-2007). The crash in the financial markets which occurred in the 2007-2008 period attenuated the above-mentioned dilemma to a certain degree. It, however, remained one of the current and important discussion topics. A large amount of national savings held by mandatory pension funds is an important aspect of the overall national economy, and therefore efficient investment regulation is considered an issue of utmost importance.

So, the question remains whether to give more freedom to pension fund managers in making their asset management decisions in order to ensure optimal asset allocation or continue to impose limitations on them by pursuing the regulations with the aim of reducing portfolio risks. This dilemma rests on the desire to ensure the best risk-return profile for the members of mandatory pension funds. In order to offer meaningful, quantitatively measurable solutions

to this problem, the performances of the funds applying different investment regulation systems must be compared, including the funds regulated under the principles of the prudent person approach and the funds regulated by the approach imposing extensive quantitative investment limits.

2. Problem Analysis Method

Since the topic of this article is the comparison of two different approaches to regulating pension funds and an attempt to provide a quantitatively measurable account of the results of both approaches, we must first identify the funds which will be compared and which indicators will be used to measure the performance of the funds applying different regulation systems.

It should be quite easy to compare the performance of the funds applying different regulation systems. The pension funds whose investment policy is regulated by the application of the prudent person approach originate mainly from Anglo-Saxon regions, whereas the pension funds whose investments are restricted on the basis of strong statutory limitations originate from developing countries that have only recently carried out pension reforms, such as Chile, Argentina, Poland, Croatia, Bulgaria, etc. However, it is questionable whether a comparison of performances achieved by an American pension fund and a Croatian pension fund would be useful in establishing which pension fund regulating approach is better. It is also questionable whether a comparison of the performances achieved by an American pension fund and a Chilean pension fund would be useful in establishing which investment regulations would be appropriate for Croatian pension funds.

It is, however, not easy to compare the performance of Croatian pension funds or any other pension funds from the system of individual capitalized savings with investment funds from the Anglo-Saxon region. The funds originating from the Anglo-Saxon region usually have a series of sub-portfolios with different levels of risk that the insured people choose according to their own risk preferences, age, time until retirement, and similar. In such circumstances, it is questionable whether it is appropriate to compare the performance of a single portfolio of Croatian pension funds with some of the above-mentioned sub-portfolios. In addition, western pension funds, as opposed to Croatian funds, have been operating much longer than the Croatian pension funds and, in their case, there is already a significant number of former insured persons claiming pension benefits and a significant number of presently insured persons who will soon meet the pension requirements. Therefore, their investment policy is, in general, primarily guided by the aspect of liabilities (asset-liability management), i.e. the investment policy depends, to a great extent, on the amount of funds payable. Croatian pension funds, like most Central and Eastern European pension funds, are not as yet faced with such difficulties since the insured persons are mainly young people, so that the investment policy does not yet need to take into account significant asset outflow due to pension payments. Besides, western pension funds operate in completely developed capital markets characterized by higher levels of transparency, significant liquidity, a wide range of instruments in which investment is possible. It is not rare that such pension funds invest parts of their portfolios into the so-called alternative asset classes such as hedge funds, private equity funds, real estate funds, commodities, which are less correlated with traditional asset classes. In contrast, all the funds from emerging markets are characterized by insufficiently developed financial markets, low liquidity, lack of quality instruments, impossibility of diversification, and often lack of alternative asset classes in which investments are possible. We believe that an approach which would include comparison of performances and manners of operation of more similar systems could result in better conclusions.

In the attempt to avoid all the above-described problems in comparing performances of funds from different legislative environments, we established the possibility of comparing performances of two different types of Croatian portfolio managers, who manage assets under different terms. If we wish to determine whether better performance in terms of the return-risk profile is achieved applying the regulations which impose more limitations on portfolio managers and prescribe the allowed level of risk by defining investment limits or the regulations that ensure more freedom to portfolio managers in the selection of instruments in which the funds will be invested, while avoiding all the problems associated with specific characteristics of particular markets and all other specific characteristics of data that could lead to wrong conclusions, it is possible to compare performances of domestic mandatory pension funds and domestic mixed investment funds.

Domestic mandatory pension funds and open-ended balanced investment funds are in fact in many ways similar, which makes them comparable. Some of the key similarities include the following: a) they invest in very similar instruments and apply very similar portfolio structuring approaches, i.e. they try to ensure returns by investing in bonds and shares and, to a lesser extent, in money market instruments; b) they have a very similar history of operation; two of the largest Croatian open-ended balanced investment funds started operating in 2001, and pension funds started operating in 2002; c) they are comparable in terms of the size of assets under management, thus meeting the requirement to avoid a comparison between significantly different funds with respect to the size of assets; d) they are run by managers of similar mentality, work experience and level of education, and rely on very similar IT support, as well as organizational, workforce and other resources; e) they reach decisions in the same country, in the same environment which provides them with similar knowledge, information, sentiment and all other relevant variables for making concrete investment decision. In this manner, all the above-mentioned particularities which make comparison difficult are eliminated.

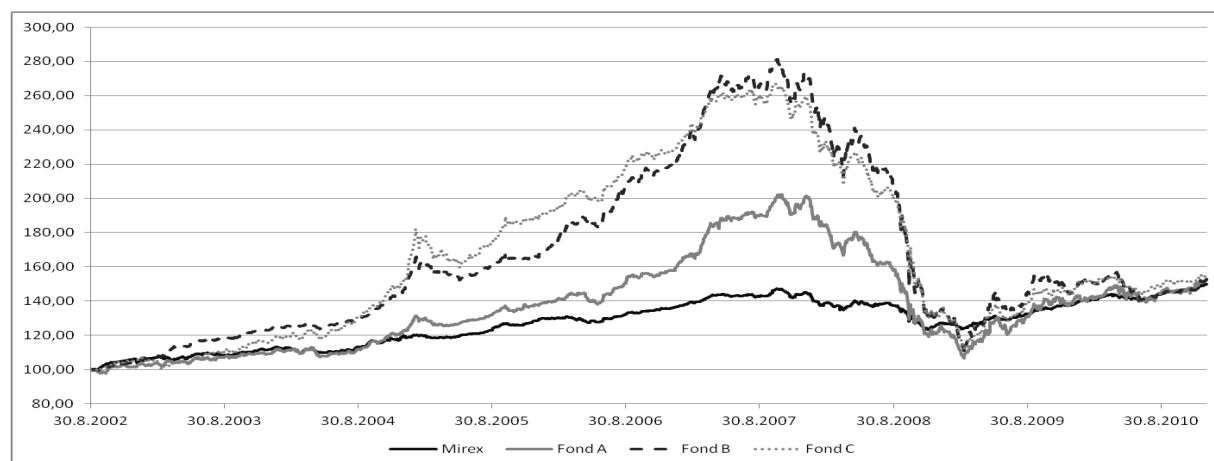
We will compare the performances of all four mandatory pension funds represented by MIREX, a weighted average of values of their units, with the values of units of the three largest Croatian open mixed investment funds. The values of the units recorded in the period from August 30, 2002 until December 31, 2010 will be used. (5)

For purposes of analyzing the performances of the funds, i.e. analyzing and comparing the achieved investment returns and risks of mandatory pension funds and three investment funds, we will calculate the Sharp ratio, modified Sharp ratio and Sortino ratio. The Sharp ratio is the most frequently used measure for comparing performances of different funds. The Sortino ratio is also a very frequently used measure which places emphasis on the risk of a decrease in the value of investment. We will also calculate the VaR of the compared funds, as well as the conditional VaR as a coherent risk measure taking into consideration the shape and thickness of the distribution tail, and the STARR ratio as a method for analyzing investment performance in which a coherent risk measure is applied (cVaR). (6) On the basis of the proposed calculations, the achieved returns and risks of the portfolios of the mentioned funds can be analyzed and it can be established whether more statutory limitations actually result in lower levels of risks and better risk-return ratio, as well as whether the lack of such limitations results in higher returns on a long term basis, while including an acceptable level of risk.

3. Data Analysis Results

Using a series of data for MIREX and three investment funds recorded in the period from August 30, 2002 until December 31, 2010, we produced the following chart presenting the trends in the value of units.

Chart 1: Trends in the Value of Units for MIREX and 3 funds in the period of August 30, 2002 until December 31, 2010



Source: Authors

The chart clearly shows that, in the observed period, the investment funds achieved greater average annual returns, albeit with a significantly greater level of volatility. Table 1 presents the return and risk analysis.

Table 1: Statistical Data on Returns and Risk Measures for MIREX and Funds A, B and C in the period from August 30, 2002 until December 31, 2010

	Average Annual Return	Annual Standard Deviation	Percentage of Negative Months	Greatest Monthly Decrease	Percentage of Negative Days	Greatest Daily Decrease
MIREX	6.311%	8.323%	30	- 4.3%	43.62	- 2.04%
Fund A	6.886%	18.067%	32	- 11.22%	45.20	- 4.14%
Fund B	9.197%	24.000%	30	- 16.74%	42.24	- 5.30%
Fund C	9.256%	22.913%	34	-16.43%	44.43	- 5.25%

	Maximum Annual Return	Minimum Annual Return	Cumulative Return for the Period	Maximum Continuous Decrease
MIREX	19.93%	- 12.50%	49.824%	- 16.38%
Fund A	26.50%	- 38.39%	52.388%	- 47.43%
Fund B	32.05%	- 50.88%	52.994%	- 60.54%
Fund C	29.69%	- 48.57%	55.536%	- 57.94%

Source: Authors

Table 2 shows the selected investment performance measures.

Table 2: *Quantile Risk Measures and Return Measures per Unit of Risk Assumed for the funds in the period 2002 – 2010 period*

	VaR (95%)	CVaR (95%)	Sharp Ratio	Modified Sharp Ratio	Sortino Ratio	STARR
MIREX	0.002954	0.004961	0.258	0.245	0.305	3.7889
Fond A	0.007688	0.011929	0.131	0.128	0.144	1.6417
Fond B	0.008231	0.015404	0.098	0.096	0.100	1.2834
Fond C	0.007822	0.014104	0.118	0.116	0.127	1.4559

Source: Authors

If we look at the overall results, MIREX achieved the lowest average returns but also the lowest level of risk measured on the basis of the standard deviation in the observed period. MIREX also achieved the lowest VaR and CVaR. MIREX recorded the lowest daily, monthly and annual decrease in the value of assets in the periods when decrease in the value of instruments was being recorded, and by far the lowest continuous decrease in value. MIREX also recorded the greatest Sharp, Sortino and STARR ratio values. On the other hand, all three investment funds achieved somewhat higher cumulative returns in the analyzed period, higher average returns and significantly higher returns in the best year of operation. However, the achieved difference in their cumulative returns compared to the cumulative returns achieved by MIREX is insignificant considering the substantially greater risks they were exposed to during the analyzed period.

4. Conclusion

We can conclude that, in the analyzed period, which is quite short but marked by significant volatility in financial markets and a lot of extreme events, the funds with strong statutory limitations in place achieved better results than the funds that enjoyed more freedom in asset allocation. Investment funds achieved higher average annual returns, which required assuming greater risks, so that the achieved return by the unit of risk assumed was actually greater in the case of pension funds. This was clearly confirmed on the basis of all investment performance measures applied. We may still wonder what results would have been obtained, if a longer period of time had been analyzed. Nevertheless, on the basis of these results alone we can conclude that certain limitations may really reduce the risks of the portfolios of pension funds.

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