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DIVERSIFICATION OF INVESTMENT PORTFOLIOS AS AN INSTRUMENT USED BY INSTITUTIONAL INVESTORS IN THE CAPITAL MANAGEMENT PROCESS

Paweł Trippner[1]

Abstract

The paper presents the essence and ways of limiting the level of investment risk through the processes of diversifying the composition of investment portfolios. The paper shows types of deposit portfolios. The author analyzed the profitability of deposit portfolios with various share of high-risk instruments in 2005-2010 as well as the influence of the recession in 2007-2008 on the profitability of particular investment portfolios.

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Introduction

Each investor, when taking a decision on how to invest disposable means in the financial market, should take into account a number of factors, the most essential of which seem the investment risk and return on investment (Socha, 1998, p. 240). These factors results from the essence of investment. At the foundation of investment decisions we have a desire to increase the value of invested capital, which is the desire to achieve profit. The investment process is also closely linked with resignation from current consumption to achieve future benefits. We should notice the presence of the time factor here. Due to unpredictability of future, investment is inseparably accompanied with the risk element, as the benefits expected by the investor may be achieved, but they are not certain (Jajuga, Kuziak, Markowski, 1998, p. 11).

Both factors, profit and risk, should be analyzed jointly as they are interdependent. The relation betweeninvestment risk and return on investment is growing, namely, we cannot expect a higher return on investment rate without the necessity of taking additional risk. This means that investment in high-risk instruments may eventually lead to experiencing investment losses.

Financial intermediaries, whose services of capital management are becoming increasingly popular in Poland, perform the process of diversifying the composition of their deposit portfolios in order to minimize the level of risk and to achieve satisfactory return on investment rates.

[1] Dr Paweł Trippner, Academy of Management in Łódź, ul. Sienkiewicza 9, 90 – 113 Łódź, ptrippner@swspiz.pl.

These processes are also the effect of possession of ever-increasing level of assets, which makes it impossible to invest them only in one type of financial instruments.
The relationship between both factors is usually described with the so-called risk-return map, which determines the influence of the market price fluctuations of the financial instrument on its profitability.
The map is most often used to analyze investment in a particular type of financial instruments, mainly to evaluate the profitability of investment in shares or bonds.

Table 1: The risk-return map

Expected profitability of the financial instrument	Risk (degree of the instrument market price fluctuation)	
	low	high
HIGH	The most profitable area for investors, but also the rarest. An example could be IPOs with high probability of large positive difference between the price of shares on stock exchange and the issued price.	Instruments with high risk and high expected profitability (shares of companies listed on stock exchange, participation units of investment funds)
LOW	Instruments with low risk and low profitability, such as treasury bonds, treasury certificates, bank deposits, participation units of funds investing in bonds and money markets.	The least profitable area for investors – there is no point in taking high risk while expecting low level of profits. An example could be investment in shares during the bear market.

Source: Tarczyński, W. (1996). Analiza portfelowa na giełdzie papierów wartościowych. Szczecin: PTE

The aim of the article is to carry out an analysis of profitability of creating investment portfolios. We evaluate various portfolios with different share of instruments of money and capital market available to investors, such as treasury certificates, treasury bonds, bank deposits and shares of companies listed on Warsaw Stock Exchange. We constructed theoretical portfolios with various shares of high-risk instruments. Thanks to this we could provide an answer to whether conservative capital management brings the same effects as high-risk investment. The analysis covers the period of 2005-2010.

The essence, aims and mechanisms of creation and diversification of investment portfolios

Each rationally behaving investor tries to select securities in a way that allows him, at steady acceptable investment risk, to obtain maximum benefits. It is impossible to combine maximization of profits with minimal level of risk, as securities which promise potentially high return rate are also burdened with high risk. It is possible, however, to act for limiting the risk level and maintaining the required return rate. This aim can be achieved through creation of securities portfolio. The people managing the portfolio strive at minimizing risk while

maintaining the assumed profitability or at maximizing profits at steady, acceptable risk level (Nowak, Pielichaty, Poszwa, 1999, p. 178 – 179).

Investment portfolio is a collection of securities owned by an investor. It contains as many elements as it has types of securities (Tarczyński, 1996, p. 72).

To classify portfolios we can use two criteria:

1) number of elements in a portfolio,
2) type of financial instruments included in it.

According to the first criterion, we can differentiate the following types of portfolios:

1) single element portfolios – they contain only one type of securities. For example this could be a portfolio containing the bonds from the same issue or shares of the same company. In this case, the process of differentiating the composition of the portfolio does not exist,
2) double element portfolios – such portfolios are made up of two types of financial instruments appearing in various configurations, that is two securities of high risk, or one high-risk security and safe security, or both securities with low risk level,
3) multi-element portfolios – these are the most popular types of portfolios, consisting of at least three types of securities. In practice, portfolios are built up of more than three elements, which allows their creators to use the principle of profit maximization while maintaining acceptable level of risk.

If we use the criterion of types of instruments used in a portfolio, we can differentiate the following types of investment portfolios (Jajuga, K., Jajuga, T., 1994, p. 133 – 134):

1) **aggressive** – their elements are shares of companies listed on stock exchange. Their typical feature is very high level of risk which is taken in hope of above-the-average future profits,
2) **mixed** – they are composed of both high-risk instruments (shares, derivative instruments) which are to increase the return rate of the portfolio and safe securities (bonds, treasury and commercial certificates, deposit certificates, bank deposits) which are to limit the losses of the portfolio in times of bear market,
3) **safe** – these portfolios do not contain any high-risk instruments. The dominant elements are such low-risk instruments as bonds and treasury certificates.

Portfolio managers have to perform two basic tasks (Reilly and Brown, 2001, vol. 2, p. 664 – 665):

1) to obtain above-the-average return rates at a given risk level through proper choice of portfolio elements,
2) to diversify the portfolio in order to eliminate non-systematic risk, that is the category of risk that is influenced by the manager and which the manager can eliminate.

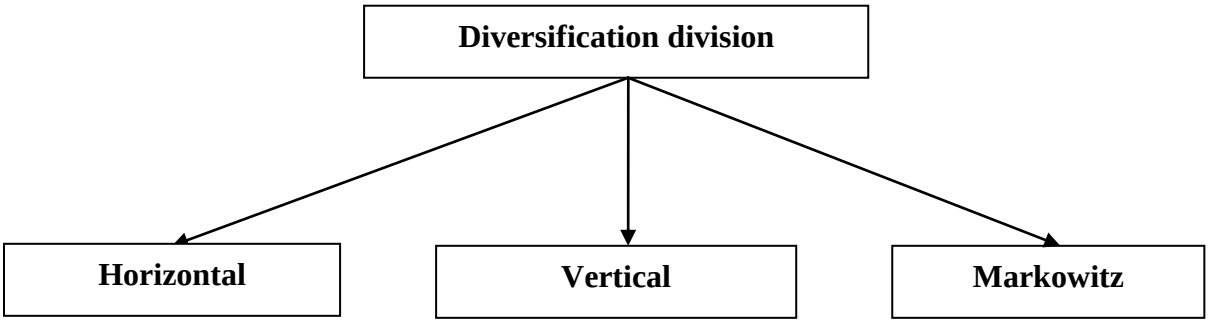
An important element taken into account by each investor is information on past data concerning return rates and risk of a particular security. However, it does not boil down to easy to use approach consisting in choosing the best securities. This is constrained by low flexibility of the portfolio and limited liquidity of the stock exchange. The construction of such a portfolio may take a lot of time. It is rational, therefore, to construct long-term portfolios. The security selection criterion may be the fundamental analysis, which determines the economic and financial situation of the company. Thanks to it, we can eliminate speculative shares, which offer only short-term benefits. This is risk diversification through the selection of a collection of potentially good companies for a long-term investment (Tarczyński, Łuniewska, 2004, p. 56 – 57). According to the above approach, the quality of

the portfolio does not depend only on the number of companies, but also on their situation which we learn from the fundamental analysis. Such activity is known as the **horizontal diversification of risk**.

On the other hand, the construction of the portfolio based on instruments with different investment risk (shares, bonds, currencies, real estate) is known as **vertical diversification of risk**.

The term investment diversification was first used in 1952 in a paper of portfolio theory written by Harry Markowitz. The main thesis put forward by the author contradicted the contemporary practices of making investment decisions based on maximization of profits. It introduced a new element to the decision process – namely security. Markowitz advocated seeking investments which will not only bring profit, but also minimize risk (Markowitz, 1952).

Figure 1: The most important types of investment portfolio diversifications



Source: Own elaboration

The evaluation of the effectiveness of investment policy using mechanisms of investment portfolio diversification

The analysis concerning evaluation of capital management through creating investment portfolios made use of mechanisms used by investment fund associations. They offer their clients differentiated composition of the portfolio, whose structure reflects the type of investment policy adopted by a particular fund. The most popular products in a wide product range are (Dawidowicz, 2008, p. 24):

1) debt securities funds – they construct their portfolios based on securities issued by the state treasury – bonds and treasury certificates as well as bank deposits,
2) stable growth funds – they divide their portfolios between secure instruments and high-risk ones, namely shares, which can constitute up to 50% of the portfolio,
3) balanced funds – they operate in the same way as stable growth funds, but the share part of the portfolio is bigger than 50%,
4) aggressive funds – as the name implies, the dominant instruments in their portfolios are shares of companies listed on stock exchange, which sometimes account for as much as 100% of the composition.

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Table 2: Investment portfolios structure

Portfolio type	Share (%)		
	High-risk instruments (shares)	**Debt instruments of capital market (Treasury bonds)**	**Debt instruments of money market and bank deposits**
Safe	0	70 – 100	0 – 30
Stable growth	20 – 50	40 – 80	0 – 10
Balanced	40 – 70	20 – 60	0 – 10
Aggressive	90 – 100	0 – 10	0

Source: Own elaboration

Thanks to calculations of constructed portfolios return rate for 2005-2010 we will be able to determine which investment strategies proved the most effective in the capital management process. In order to do so we will use the measure of weighted arithmetic mean, in which the weight are shares of particular instruments in the portfolio. For each of these instruments we calculated the return rate for years 2009-2009. The following information was used:

1) **shares** – symbolized by the WIG-20 index, grouping the biggest companies listed on stock exchange,
2) **bonds** – represented by 2-year treasury bonds, in which interests are capitalized annually,
3) **bank deposits**for 12 months with fixed interest rate. The interest rate is an arithmetic mean for 20 biggest banks in Poland.

After carrying out the analysis we obtained the following results:

1) shares (www.gpw.pl):
    a. value of the WIG-20 index: 31.12.2004. – 1 960,57 pts, 31.12.2010. – 2 744,17 pts.,
    b. return rate – 39.97 %,
2) 2-year treasury bonds (www.obligacjeskarbowe.pl):
    a. average interest in consecutive years: 4.68 %, 4.09 %, 4.48 %, 5.86 %, 5.19 %, 4.17 %,
    b. return rate after taking into account capitalization of interests – 32.05 %,
3) 12-month bank deposit (www.nbp.pl):
    a. average interest rate in consecutive years: 4.44 %, 3.03 %, 3.01 %, 4.33 %, 5.41 %, 5.15 %,
    b. return rate after taking into account annual capitalization of interests – 28.13 %.

We constructed the following investment portfolios:

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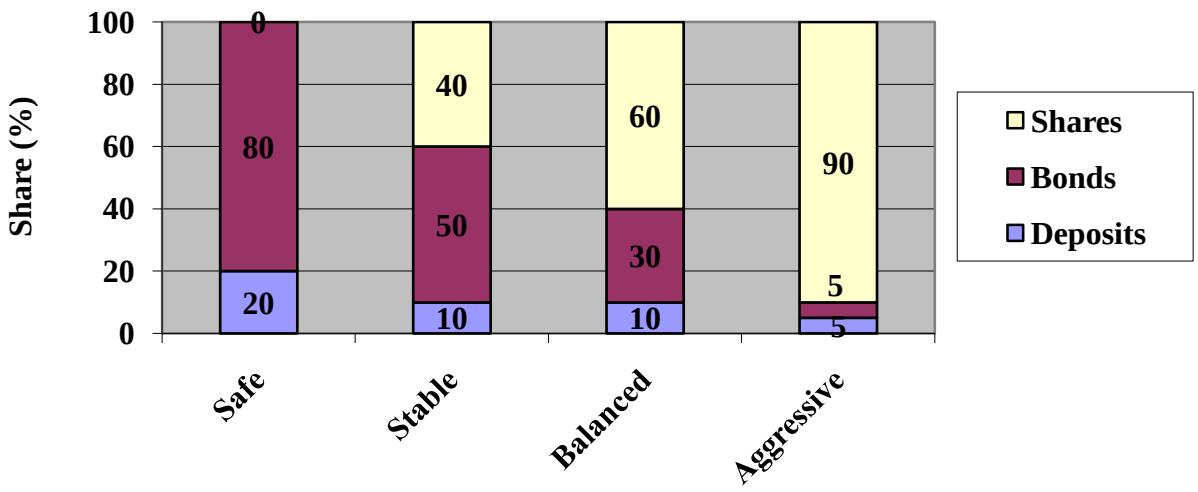
Figure 2: The structure of theoretical investment portfolio



Source: Own elaboration

Based on the previously calculated profitability of particular instruments and on assumptions presented in figure 1, we obtained the following results for particular portfolios.

Table 3: Return rates of the analyzed investment portfolios in 2004-2010

Type of portfolio	Shares		Bonds		Deposit		Weighted average return rate (%)
	Return rate	Share	Return rate	Share	Return rate	Share	
Safe	39.97	0.0	32.05	0.8	28.13	0.2	**31.27**
Stable	39.97	0.4	32.05	0.5	28.13	0.1	**34.83**
Balanced	39.97	0.6	32.05	0.3	28.13	0.1	**36.41**
Aggressive	39.97	0.9	32.05	0.05	28.13	0.05	**38.98**

Source: Own elaboration

The results of the analysis point at little differences between return rates of the portfolios which differ substantially in their structure of financial instruments. It should be emphasized that the highest profitability was achieved by the aggressive portfolio which had the highest share of stocks. One could also observe the fall in portfolio profitability together with the increasing share of safe instruments in it. The difference between the best and the worst portfolio in the analyzed 5-year period amounted to 7.71 percentage points, which does not seem a lot, taking into account the difference in the risk level of analyzed portfolios.
However, we should remember that the situation was the consequence of two events. High interest rate of debt treasury securities and bank deposits in 2007-2010 as well as the financial crisis of 2007-2008 which brought dramatic collapses of prices on stock exchange and significant fall of stock exchange indexes.

We are quite sure that such a successful period for investors allocating their means into safe instruments will not happen in the near future, as the inflation indicator, which has decisive influence on interest rates of debt instruments is at a relatively low level and nothing implies that it could grow significantly.

In order to demonstrate the significance of the processes of portfolio composition diversification in lowering the risk level and cutting the losses from investment in times of bear market, we made an identical analysis for the period of 2007-2008. These were the times of financial crisis which caused considerable fall of share prices on stock exchange and brought huge losses to many investors.

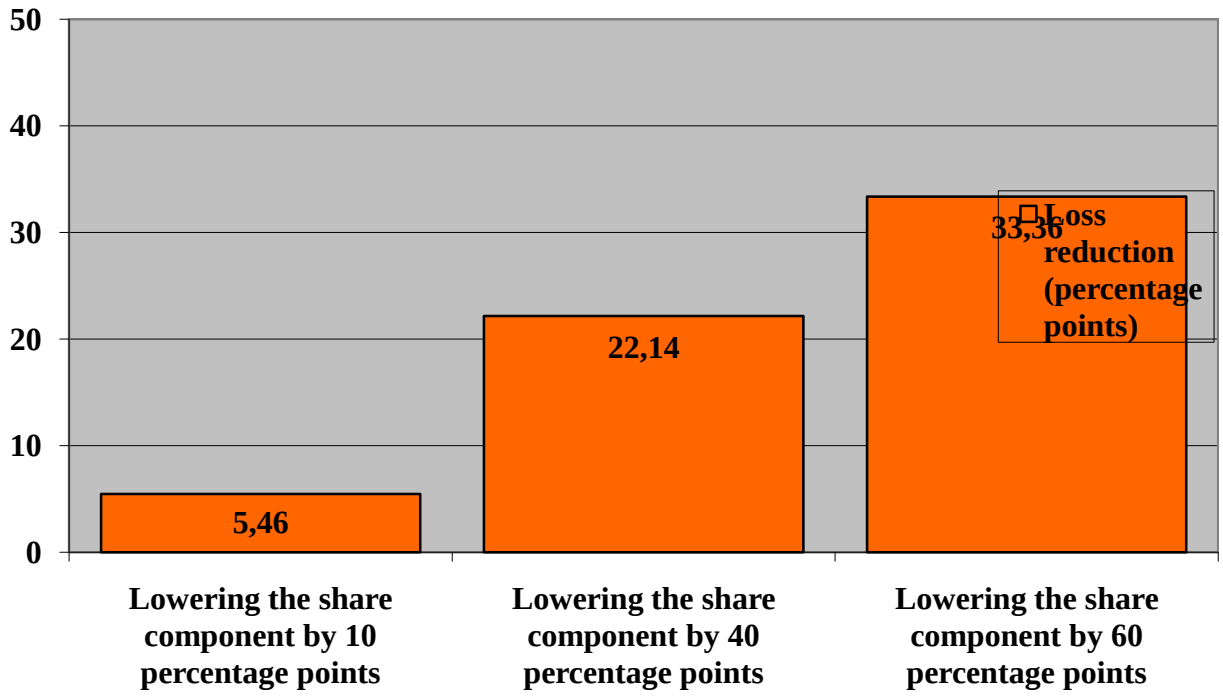
After the analysis we obtained the following results:

1) **shares** (www.gpw.pl**)**:
   - **a.** value of the WIG-20 index: 31.12.2006. – 3 285.49 pts, 31.12.2008. – 1 789.73 pts.,
   - **b.** return rate – (45,53) %,
2) **2-year treasury bonds** (www.obligacjeskarbowe.pl**)**:
   - **a.** average interest rate in consecutive years: 4.48 %, 5.86 %,
   - **b.** return rate after taking into account capitalization of interests – 10.60 %,
3) **12-month bank deposit** (www.nbp.pl):
   - **a.** average interest rate in consecutive years: 3.01 %, 4.33 %,
   - **b.** return rate after taking into account annual capitalization of interests – 7.47 %.

Table 4: Return rates of analyzed investment portfolios in 2007-2008

Type of portfolio	Shares		Bonds		Deposit		Weighted average return rate (%)
	Return rate	Share	Return rate	Share	Return rate	Share	
Safe	(45.53)	0.0	10.60	0.8	7.47	0.2	**9.97**
Stable	(45.53)	0.4	10.60	0.5	7.47	0.1	**(12.17)**
Balanced	(45.53)	0.6	10.60	0.3	7.47	0.1	**(23.39)**
Aggressive	(45.53)	0.9	10.60	0.05	7.47	0.05	**(40.07)**

Figure 3: Benefits of diversifying investment portfolios in 2007-2008



Source: Own elaboration on the basis of the data from table 4

The above-presented data shows clearly how important it is to diversify the composition of the investment portfolio properly, especially in times of bear market. Thanks to lowering the share component it was possible to limit investment losses resulting from negative effects of the financial crisis of 2007 - 2008.

Lowering the share component in the portfolio to 90% limited investment losses by nearly 6 percentage points. Assuming that the share component was on the level used by balanced investment funds (around 60%), it was possible to reduce the losses by over 22%. The strategy used by stable growth funds and the maximum acceptable limit of investment in shares that open investment funds have (share component at the level of 40%), decreased the losses from over 45% to only slightly over 12%.

This proves that it is necessary to diversify the composition of investment portfolios by financial investors who are institutions of public trust. Only due to such activities it is possible to limit the negative effects of the bear market on financial markets, especially on capital market.

We should also emphasize that in the period of 2007-2008 the only possibility of achieving profits was to use portfolios that did not have any shares. However, we should not consider this period as typical one, as the next years (2009-2010) saw the comeback of a good situation on stock exchange and again investment in shares offered the possibility of obtaining the highest return rates from investing in securities.

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Conclusions

The portfolio analysis, apart from the technical and fundamental analyses, constitutes one of the essential tools used when investing capital in financial instruments.Risk management is one of the most essential skills when investing financial surplus in securities. There are two approaches to the issue of investment risk.

The first one consists in maximizing profits while maintaining the fixed, acceptable level of risk. In the second one we minimize the risk level while maintaining the expected level of return on investment.

In both cases it is necessary to diversify the composition of the investment portfolio. Proper selection of securities for the portfolio allows us to achieve high return rates or limit losses during the periods of bear market.

The analyses we carried out fully confirmed the importance and benefits of the processes of diversifying investment portfolios. The obtained results confirmed that only introduction of safe instruments to portfolios allows us to cut investment losses in periods of bear market. As an example we could quote the financial crisis of 2007-2008, whose negative effects were also felt by investors on Polish capital market.

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