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The Impact of Portfolio Diversification in the Performance and the Risk of Investments of Kosovo Pension Savings Trust

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Abstract: Savings for people constitute the guaranty and the support for the uncertain future, consequently managing them comprises a gross interest. The investment of employee savings is exercised between necessity to wariness for the welfare of contributors and the investment possibilities, risks and returns related to them. Every entity engaged in investments is in permanent effort to find the best investment destination, which means the acquisition of assets with the highest return at the lowest risk. As if this in on contrast with the theoretical framework that teaches us that the relationship between risk and return or profit is positive, the higher the risk the higher the return. This constitutes exactly the greatest challenge for the investor. Investments have enabled people to put further the processes, whereas the people have elevated the investments into institutional level, giving life to innumerable investment funds and institutions. Pension funds invests in different classes of investments, always taking into consideration the need to find the alternative leading to high returns and low risk. One of the most comprehensive and most meaningful practices in this designation is diversification, otherwise said the investment in different assets to neutralize volatility in levels of return. Moreover, pension trusts, as the likes of Kosovo Pension Savings Trust, are obligated by law to diversify their investments. Financial literature recognizes as a publicly accepted fact the positive effect of diversification in the increase of investment effectiveness, this paper is tasked with incitement to try to testify that portfolio diversification has positive effect in reduction of risk and in increase in performance of Trust investments.

Key words: investment; risk; return; portfolio diversification; Kosovo Pension Savings (KPS)
JEL Code: G11

1. The Meaning of Investment

Investment constitutes a term related to business management, finances and economics, and also with savings and deferred consumption. Investment is redirecting the resources from actual consumption to raising of the profits in the future. Investment is the actual commitment of money for a period of time in order to gain future payments, which compensate the investor for: time and devoted funds, the expected rate of inflation and insecurity

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of future payments (Reilly and Brown, 2002; p. 5).

1.1 Investments in Portfolio

Most of financial assets are held as part of portfolio. Banks, pension trusts, insurance companies, joint funds and other financial institutions are determined by law to hold diversified portfolios (Brigham and Ehrhardt, 2008; p. 212). Parallel to institutional investors, as well as individual investors practice in mass the holding of investment portfolios instead of the acquisition of a single asset. In context of portfolio, risk and return of a specific asset is analyzed in the terms of their impact in risk and return of portfolio in which it is kept. It is no longer important for investor how the indicators move for a specific investment, but it is the manner how they reflect in the risk and the return of portfolio.

1.1.1 Portfolio risk

While the expected return of portfolio is the weighted average of returns of the individual assets, this is not valid for portfolio risk. The weighted average of standard deviation of individual assets does not constitute portfolio risk, usually it is smaller. The decision to invest in more assets is not prone only to acquire more financial means, but holding different assets creates the possibility to reduce the risk. As a rule, portfolio risk decreases by the increase of number of funds in portfolio, although deeper considerations shall be taken into consideration other than simply the quantitative plan of investments.

There is a multitude of factors that determine the level of portfolio risk, which are classified according to criterion of the level of impact in the investments in individual terms or in the market altogether. Portfolio risk includes the systematic risk and the non-systematic risk. Systematic risk is known as undiversifiable risk or market risk, whereas non-systematic risk is mentioned also as diversifiable risk or specific risk.

1.1.2 Risk diversification

> Diversification makes up a key topic of discussion when it comes to investments. Diversification comprises a practice that it is not unknown to people even before its acquisition from portfolio theory. If not deeper in history, there is a diversification principle outspread in The Bible. There is said: Divide your portion to seven, or even to eight, for you do not know what misfortune may occur on earth. (Ecclesiastes 11:2).

The moral behind this preaching is that the division of investments into many pieces to dodge the upcoming risks.

Diversification presents the investments practice which is performed by the construction of investment portfolio through buying assets which are not concentrated in a company, industry, state or an assets class. There's a rule on investment practices that testifies that by increasing the number of assets in portfolio, the portfolio risk decreases. The practice shows that there is a limit to the number of assets for portfolio diversification, an excess of which would only bring negative effects. The correlation between assets is more important than the number of them. The combination of assets in composure of portfolio has effect in reduction of risks, but there's no presumption of total risk elimination. Diversification results as effective in decreasing of non-systematic risk, which consequently is nominated as diversifiable risk. Diversification decreases the risk level under total weighted risk, hereupon it makes the portfolio risk to be lower that the simple sum of standard deviations of individual assets in portfolio composition. The dropping tendency of the total risk of portfolio due to the reduction of non-systematic risk as reflection of increase the assets number is shown in the following Figure 1:

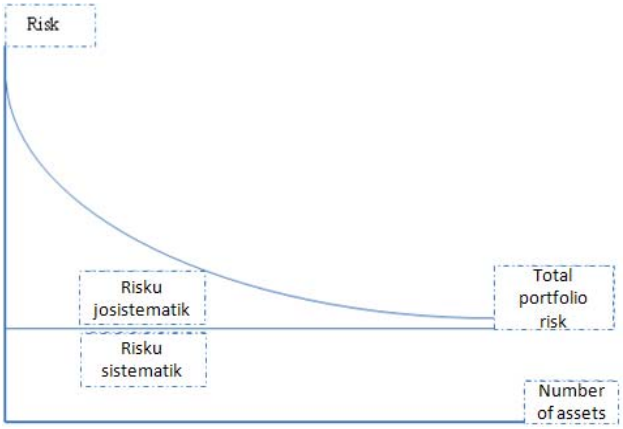

Figure 1 Diversification of Portfolio Risk

Source: Adapted from Brigham and Ehrhardt (2008, p. 217)

The simple determination for diversification and the investment in a number of assets does not have any effect in reduction of risk automatically. Pretending that by diversification the total risk of portfolio is decreased, that means the lower level of risk than the total risk of the individual assets risk, it is a necessary precondition to invest in assets, whose returns fluctuate in different directions. This criterion is known as asset correlation. Three situations exist in considerations for asset correlation within portfolio: assets correlated in the perfect positive manner, assets correlated in the perfect negative manner and uncorrelated assets. Positive correlation means the movements in the rates of asset return in approximate dimensions and intervals between assets, negative correlation means the totally different movements between assets, whereas miscorrelation means exactly that, the assets do not have any relation, they neither move equally nor opposite. The following Figure 2 presents two dimensions of portfolio asset correlation, positive correlation and negative correlation:

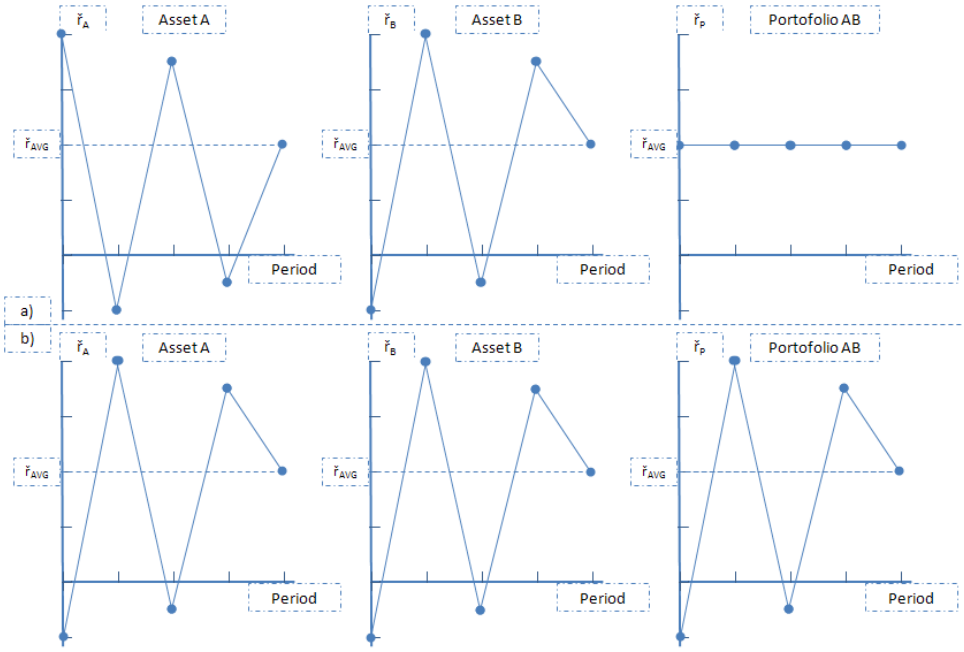

Figure 2 Correlation of Assets in Portfolio: (a) Perfect Negative Correlation (b) Perfect Positive Correlation

Source: Adapted from Brigham and Ehrhardt (2008, p. 214)

A negative intermediate correlation is needed for a successful diversification. In this way, decreases in actual return in proportion to the expected return of an asset are compensated with the over the expected rates of return of another asset, making the investment portfolio not to indicate significant decrease in performance. A diversified portfolio, consisting of investments in uncorrelated assets' classes, ensures the higher return with the lower variability. According to Modern Portfolio Theory, the suitable diversification is the investment in different asset classes that have independent decrease-increase alternations from each other.

Effectiveness of portfolio diversification depends on the coefficient correlation of assets comprising the portfolio. This coefficient makes up a statistic technique, which presents quantifiably the direction and the strength of interconnection between two assets. Correlation coefficient may be applied also for more assets, but the complexity of calculation and its reading increases. Correlation coefficient, expressed by letter of Greek alphabet rhi (ρ), may take the value between -1 and +1. Correlation sign shows the interconnection direction, positive sign (+) shows that a positive proportion exists between assets, whereas the negative sign (-) shows negative relationship. The correlation strength between assets is presented from absolute value of correlation coefficient; the closer to 1 the relation is stronger, whereas proximity to 0 indicates the weakness of the relation. Correlation strength is a burden on assets and portfolio in this way: positive correlation means the joint movement of assets and it has a minimal effect in decreasing the risk, negative correlation means opposite movements of assets and it has a great effect in decreasing the risk, whereas the zero correlation means independent movements of assets and moderated effect in decreasing the risk (McDonnell, 2008; p. 42).

1.2 Classes (Types) if Investments

When people have money available for consumption, they are not sufficient for them to spend on unlimited needs and alternatives. When people decide to save money, they only have to decide either to put them in a secret place at home or in a bank account. Whereas, when the decision is to invest, numerous alternatives are presented to potential investor, each of them different by the class, model, liquidity, return, risk or place. Nowadays, investors have wide choices to invest their money, whereas the greatest doubt is the determination of the best alternatives between many possibilities. It may happen that one only later finds out which alternative was the best.

Four assets categories are distinguishable from the wide investments alternatives: cash; fixed interest; shares; and property, real estate.

1.3 Investors Classification

In principle, investors are known as retail investors, which are persons with savings, or as institutional investors, which consist of: banks, pension trust or insurance companies (Brentani, 2004; p. 4). Investors can be classified in individual investors and institutional investors. Both individual investor and institutional ones can be presented as independent investors or they can trust the portfolio management of their assets to third parties or to engage financial advisers. This practice is accepted especially by some investment institutions to whom the investment does not represent the primary function, such as: pension trust, endowment funds etc. Financial intermediaries are key players in investments field. In parallel to institutions functioning formally as intermediaries, likewise some institutional investors such as hedge funds, joint funds or pension trusts, intermediate amidst individual investors and funds where they execute their investments.

1.3.1 Individual investors

Individual investors act in parallel to institutional investors in the investment field. Individual investors are

considerable in number, but their investment strength is comparably lower than the one of institutional investors. Individual investors are different in risk sustainability and in returns expectancy. Investors that fear from the risk are prone to safe investments, such as government securities and bank deposits, while the ones who are ready to take the risk invest directly in the securities market. In principle, individual investors do not invest openly to specific assets classes, respectively they do not buy directly shares or bonds of a company, but they do it through specialized funds, such as: bond funds, share funds etc.

1.3.2 Institutional investors

The definition of institutional investors does not give the review of a homogenous group of investors. A great number of profiles of the institutional investors exist, as well as a great number of fields of investment. Moreover, in the course of time specific funds for investments in specific classes of assets and in function of narrow social categories have been created. Institutional investors are organizations investing in different companies huge sums of money collected from individual investors. These companies act on behalf of people, who contribute with their money subject to desire for the higher benefits. Institutional investors can be considered as financial intermediaries because they act as instruments, enabling individuals to invest in a connotation that exceeds the retail investment. Their strength in market gives them a preferential treatment towards institutional investors, they pay lower commissions, they face less regulative obstacles, and as well they participate in private offer of securities from companies. Institutional investors sustain their decisions and actions in the investment field in comprehensive analyses and evaluations from professionals, hence they more probably will be able to maximize the returns and minimize the risk, as essential objectives of investment. Institutional investors are: joint funds, hedge funds, investment funds, insurance companies, endowment funds, banks and pension trusts.

2. Pension Funds

Pension funds are created for the purpose of managing the funds created by the contributions of employees during their work years. These funds are determined to provide benefits in shape of incomes for contributing employees after their retirement. Pension trusts enable individuals to accumulate savings from their work to finance their consumption needs in retirement. Pension funds collect, pool, and invest funds contributed by sponsors and beneficiaries to provide for the future pension entitlements of beneficiaries (Davis and Steil, 2001; p. 15). Entities that establish pension plans are private businesses, local or state entities on behalf of employees, syndicates on behalf of their members and individuals on their behalf. In principle, pension funds collect the contributions of employees during the period of their work and they manage them until the retirement age of contributors, who do not have a right to draw funds before time. This enables pension trusts to have long-term funds and keep investment instruments with high risk and high return.

2.1 Logical foundation of Pension Trusts

In the contemporary conditions of development, the economic–social welfare impacts the increase of lifespan, whereas the average age of population marks an increase in most of the countries. The world population is getting older and this phenomenon with global dimensions brings social and economic implications have to be dealt by the relevant institutions. The need to guarantee the personal and familiar welfare is imputed in every individual, which can be achieved by ensuring the financing of the lifelong needs. Unless individuals in employment relationship have continuous flows of money that they can use for fulfillment of their needs and family members'

needs, the achievement of retirement age puts them through the difficulties of keeping the welfare. One possibility is saving during the whole life for senility; the other is relying to family and relatives. Neither of them does make up a plan in which people may have assurance to guarantee senility. Here come in expression pension trusts. The creation of pension trusts makes up a vital way to enable the creation of conditions to the pensioners for a more qualitative life. Pension trusts collect small amounts from monthly incomes of employees and they invest them. The reason why the money is not saved to be distributed in same amounts (that wouldn't be nothing else than just the transformation of funds into savings repository) stands in the time value of money. The savings amount of employees for the time after retirement will not have the same value when they will be used. The value in time of money determines that one euro today is less valuable than one euro after a year, respectively after a year one euro is less valuable than today. This means that as long as the future pensioners do not achieve to ensure the higher incomes than simply the amount of their periodic contributions, it will result with losses of income and worsening of welfare.

Pension funds deserve the merit for providing funds for financing the needs for a good part of human life. If we affirm that the average lifespan in our time goes to late seventies and we know that the retirement age from work is 65 years, then we come to the fact that pension trusts provides finances for 17% of an individual's life.

2.2 Pension Trusts Investments

Pension trusts have long-term horizon regarding the investments, because they have relatively stable and certain money inflows (contributions) and outflow (benefits). Since these funds are engaged for individual savings for retirement, pension trusts are oriented in investments in shares and certain bonds, with low risk and possibly higher return. Pension trusts are long-term investors, because their liability lies along span of many years. Pension trusts, as banks, insurance companies, joint funds and other financial institutions are obliged by law to keep diversified portfolio (Brigham and Ehrhardt, 2008; p. 212).

Substantial distinctions exist in the investment policy of pension trusts, depending if they are open or closed funds and if they are funds with defined contributions (DC) or with defined benefits (DB). Closed pension funds with defined benefits have more aggressive portfolio than those with defined contributions. While in pension trusts with defined contribution employees carry the risk, otherwise, said the fund members, investments results to be more aggressive, whereas in the case of pension trusts with defined benefit, where the fund carries the risk, investments are more careful. Naturally, investment policy of pension trusts depends also from sponsors, government, trust, and other shareholders. Some pension trusts offer to members the individual packages of investments and the possibility to design personally the investment portfolio. The investments basket of pension trust does not differ much from that of other funds. Having social consideration in parallel with economic ones, the pension trusts investments are more careful and focused in those assets that are more conventional and more certain. The fields in which pension trusts mostly invest are: shares, bonds, real estates, alternative investments and cash investments. Although more than 700000 pension trusts of different types are counted today in the world, with different investments policies, a statement can be drawn to show which investments are more dense in investment portfolio of pension trust. Such a statement, showing in percentage the participation of different investments types in portfolios of pension funds in global term for the year 2008, is presented in the following Figure 3:

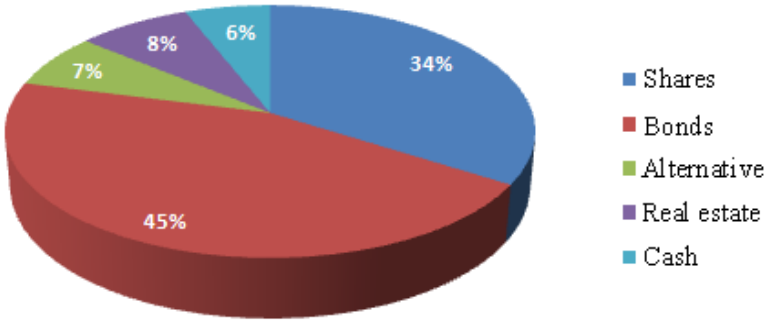

Figure 3 Relative Distribution of Pension Fund Investments

Source: Origin: www.bfinance.co.uk

Investment funds have expanded the universe of their investments in the last years, investing in the advanced international markets and in developing markets. The investment industry nowadays offers new alternatives of investments to investment funds. New assets classes, that are in considerations of the pension trusts investments in recent years are: hedge funds, commercial loans, investments in infrastructure, forestry, artworks, microfinance etc. The distribution of the investments' spectrum goes to function of efforts to increase the returns and for diversification of investments risk.

3. Pension System in Kosovo

Pension system of a country can only be understood in the context of political, economical and social system on which it is developed and in content of the reforms undertaken in the function of adjustments with new social circumstances. The pension system, as component part of social security, presents and institutional efforts of social welfare insurance by redistribution of the incomes to ensure means for financing consumption to incapable for work and pensioners, in conditions when the work market and health card qualifies them as unable to work and to ensure incomes for fulfillment of personal or familiar needs. Kosovo pension system shall be seen in three stages. In the period before 1990, the population employed in Kosovo was ensured according to Yugoslavia pension system. That was a typical Eastern European system, Pay-As-You-Go system, which had sharp defects, such as: high rates of contributions, delays in payments, evasion from contributors, financial instability, limited cover of old population, etc. (Snelbecker, 2005; p. 11). The Autonomous Office of Kosovo Pension Fund was an administrative agency, which collected contributions and paid benefits[1]. This office was closed in 1989, when Kosovo entered in the darkest decade of its history, with destruction of each value and existential threat. The swirl of destruction took away the pension system as well, while contributors were deprived from pension benefits. The end of war and emplacement of governmental and administrative international and local institutions have created the environment for building of a new reformed pension system of Kosovo.

Pension system in Kosovo is established based on the best international practices and coincides with high European standards. This system is established and regulated by UNMIK regulation no. 2001/35, that was has amended later by regulation no. 2005/20. Kosovo's pension system is the system consisting of three pillars.

The following Table 1 presents basic features of three-pillar pension system (Gubbels et al., 2007):

[1] Profile of the social security system in Kosovo (within the definition of UNSC Resolution 1244), 2010, International Labour Office, Sub-regional Office in Budapest, p. 21.

Table1 Overview of Kosovo Pension System Components

	Pillar I Basic pension	Pillar II Individual Savings Pension	Pillar III Voluntary Individual or Employer Pension
Eligibility	All citizens	Contributors	Contributors
Contribute rate		5% employer 5% employee	Varies
Funding Method	PAYG: General Revenue	Funded; Payroll Contributions	Funded by Employer or Individual contributions
Participation	Universal	Mandatory	Voluntary
Coverage	All habitual residents, either 65 years of age and over or 100% disabled	Phased implementation; All working habitual residents	Initially very limited
Provider	Kosovo Pension Administration	Kosovo Pension Savings Trust	Employers, Pension Funds, Insurance Companies, Banks
Regulatory and Oversight Bodies	Ministry of Labor and Social Welfare, Ministry of Economy and Finances	Central Bank of Kosovo (BQK)	Central Bank of Kosovo (BQK)
Investments	None	Professional Asset Managers	Licensed Asset Managers and Insurance Companies
Collection Agent	None	Tax Administration	Employers, Pension Funds, Insurance Companies, Banks

3.1 Kosovo Pension Savings Trust

The pension fund that forms the second pillar of Kosovo pension system is a pension fund with defined contributions. Legal form of this pension system is trust. The contributions are managed by Kosovo Pension Savings Trust, established under UNMIK regulation 2001/35, dated 22nd December 2001. This regulation was replaced with regulation 2005/10, whereas with independence of Kosovo, the legal framework of pension system law is composed by the law no. 03/L084, approved by the Assembly of the Republic of Kosovo, on 13th June 2008. Trust is determined according to chapter 11 of Constitutional Framework for Provisional Self-Government in Kosovo, as an independent legal entity under supervision of Banking and Payments Authority of Kosovo (now: Central Bank of Kosovo). Kosovo Pension Savings Trust (KPST) is an independent legal entity. Trust, as manager of obliged pension savings system is responsible for contributions and investments in order to ensure savings for contributors. Employee and employer pay 5% of gross salary for contributions, which are accumulated in the intact personal accounts. All contributions in individual accounts are the contributors' property, whereas Trust makes up the instrument to enable access in different markets to make investments, which are executed through the fund's managers.

3.2 Trust Investments

The lack of suitable investment assets in Kosovo has made the Trust focus its investments in international markets. Initial strategy was to invest mainly in money markets, gaining from efficiency of index funds and low costs of management. From the premise that all benefits are paid in euro, the Trust in its investments has been sensitive to the currency risk, respectively it has invested in euro denominations to avoid the risk of exchange rates. The first fund manger selected in 2003 was ABN AMRO, whereas funds have been invested in ABN AMRO Global Liquidity Fund, while these have been transferred in 2005 to IGF Euro Fund. A share manager has been contracted in 2004 and a part of shares have been invested in Vanguard Global Stock Index Fund. From 2005, Trust has gradually transferred investments from index funds to active funds, trusting 20% of funds to Schroder's and ECM. The year 2010 has marked the engagement of a new manager named Axa World Funds. The only way

for the Trust to engage funds in local market is the purchase of deposit certificates in commercial banks, not taking into consideration the fund left deposited in CBK. In 2009, the Trust has granted 6.4% of its funds in two commercial banks in Kosovo. The actual Trust allocations[2] are presented in the following Figure 4:

Institution	Asset class	Funds	Percentage
Vanguard	Equities	€ 194.231.941,21	39.73%
Fortis GLF	Money Market	€ 75.012.998,06	15.35%
Schroders	Bills	€ 60.517.219,44	12.38%
AXA GILB	Inflation related bills	€ 44.996.248,15	9.20%
ECM	Credit Market	€ 42.253.493,61	8.64%
BQK	Uninvested	€ 38.088.707,86	7.79%
Raiffeisen Bank	Bank CD	€ 18.429.485,56	3.77%
NLB Prishtina	Bank CD	€ 15.303.159,31	3.13%

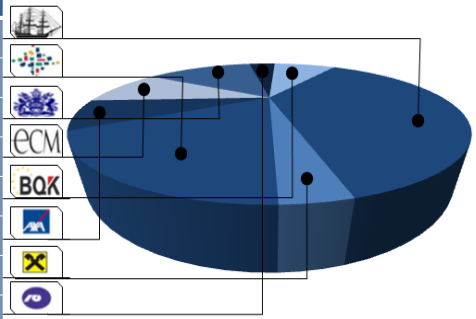

Figure 4 Trust Means Allocation, 31 December 2010

According to 31st of December 2010 bulletin, Kosovo Pension Savings Trust has €488,568,546 under management and it counts 350,960 contributors. The Trust has issued 473,065,186 shares until December 2010, with share price of €1.0327. The Trust has managed with €375,954,156 in 2009, which are equivalent with 9.6% of Kosovo's GDP (€3,912,400,000, Source: Statistical Office of Kosovo).

Trusts' investments as for the proportion of participation of investment classes are similar to those of pension trusts of OECD countries. Long-term investment strategy determined from the Governing Board of the Trust has determined three investments categories: 40% of funds are invested in index stock funds, 30% in instruments with absolute returns and 30% in money market, banks deposits etc.

3.3 Calculation of Trust Portfolio Return and Risk

Risk-return relationship makes up the axis to which are concluded all the investment decisions and analysis done in regards of investments and investments portfolio. While the portfolio return ($\sum_{i=1}^{n} w_i \bar{r}_i$) is calculated as the sum of multiplications of portfolio individual assets' returns ($\bar{r}_i$) with their proportion participation within that portfolio (w_i), finding the portfolio risk requires more analytic and mathematical actions. Portfolio risk consisting of two assets is calculated by the formula: $\sigma_P = \sqrt{w_A^2\sigma_A^2 + w_B^2\sigma_B^2 + 2\rho_{AB}w_A w_B \sigma_A \sigma_B}$, which shows that for finding portfolio risk for a year, the data for proportions of individual assets in portfolio(w_i), standard deviations of assets (σ^2_i), as well correlation coefficient between assets(ρ_{ij}) are required. If portfolio consists of more assets, then calculations become more complex. Under the square root are to be put the proportions productions and standard deviations of each asset with one another, as well as the rows of correlation coefficients of each assets combination. In order to find correlation coefficient it's necessary to know the covariance. Number of covariance terms is determined by the rule: n (n-1)/2. If portfolio holds 10 assets, then there's need for: 10(10-1)/2 = 45 covariance terms. In conditions where the putting terms into formula makes the calculation difficult and the reading of the result tiring, a correlation matrix is used, as in following Figure 5:

[2] www.trusti.org.

Asset	Asset	1	2	3	4	5	6	7	8	9	10
		$w_1\sigma_1$	$w_1\sigma_1$	$w_3\sigma_3$	$w_4\sigma_4$	$w_5\sigma_5$	$w_6\sigma_6$	$w_7\sigma_7$	$w_8\sigma_8$	$w_9\sigma_9$	$w_{10}\sigma_{10}$
1	$w_1\sigma_1$	$w_1\sigma_1w_1\sigma_1$ ρ_{11}	$w_1\sigma_1w_2\sigma_2$ ρ_{12}	$w_1\sigma_1w_3\sigma_3$ ρ_{13}	$w_1\sigma_1w_4\sigma_4$ ρ_{14}	$w_1\sigma_1w_5\sigma_5$ ρ_{15}	$w_1\sigma_1w_6\sigma_6$ ρ_{16}	$w_1\sigma_1w_7\sigma_7$ ρ_{17}	$w_1\sigma_1w_8\sigma_8$ ρ_{18}	$w_1\sigma_1w_9\sigma_9$ ρ_{19}	$w_1\sigma_1w_{10}\sigma_{10}$ ρ_{110}
2	$w_2\sigma_2$	$w_2\sigma_2w_1\sigma_1$ ρ_{21}	$w_2\sigma_2w_2\sigma_2$ ρ_{22}	$w_2\sigma_2w_3\sigma_3$ ρ_{23}	$w_2\sigma_2w_4\sigma_4$ ρ_{24}	$w_2\sigma_2w_5\sigma_5$ ρ_{25}	$w_2\sigma_2w_6\sigma_6$ ρ_{26}	$w_2\sigma_2w_7\sigma_7$ ρ_{27}	$w_2\sigma_2w_8\sigma_8$ ρ_{28}	$w_2\sigma_2w_9\sigma_9$ ρ_{29}	$w_2\sigma_2w_{10}\sigma_{10}$ ρ_{210}
3	$w_3\sigma_3$	$w_3\sigma_3w_1\sigma_1$ ρ_{31}	$w_3\sigma_3w_2\sigma_2$ ρ_{32}	$w_3\sigma_3w_3\sigma_3$ ρ_{33}	$w_3\sigma_3w_4\sigma_4$ ρ_{34}	$w_3\sigma_3w_5\sigma_5$ ρ_{35}	$w_3\sigma_3w_6\sigma_6$ ρ_{36}	$w_3\sigma_3w_7\sigma_7$ ρ_{37}	$w_3\sigma_3w_8\sigma_8$ ρ_{38}	$w_3\sigma_3w_9\sigma_9$ ρ_{39}	$w_3\sigma_3w_{10}\sigma_{10}$ ρ_{310}
4	$w_4\sigma_4$	$w_4\sigma_4w_1\sigma_1$ ρ_{41}	$w_4\sigma_4w_2\sigma_2$ ρ_{42}	$w_4\sigma_4w_3\sigma_3$ ρ_{43}	$w_4\sigma_4w_4\sigma_4$ ρ_{44}	$w_4\sigma_4w_5\sigma_5$ ρ_{45}	$w_4\sigma_4w_6\sigma_6$ ρ_{46}	$w_4\sigma_4w_7\sigma_7$ ρ_{47}	$w_4\sigma_4w_8\sigma_8$ ρ_{48}	$w_4\sigma_4w_9\sigma_9$ ρ_{49}	$w_4\sigma_4w_{10}\sigma_{10}$ ρ_{410}
5	$w_5\sigma_5$	$w_5\sigma_5w_1\sigma_1$ ρ_{51}	$w_5\sigma_5w_2\sigma_2$ ρ_{52}	$w_5\sigma_5w_3\sigma_3$ ρ_{53}	$w_5\sigma_5w_4\sigma_4$ ρ_{54}	$w_5\sigma_5w_5\sigma_5$ ρ_{55}	$w_5\sigma_5w_6\sigma_6$ ρ_{56}	$w_5\sigma_5w_7\sigma_7$ ρ_{57}	$w_5\sigma_5w_8\sigma_8$ ρ_{58}	$w_5\sigma_5w_9\sigma_9$ ρ_{59}	$w_5\sigma_5w_{10}\sigma_{10}$ ρ_{510}
6	$w_6\sigma_6$	$w_6\sigma_6w_1\sigma_1$ ρ_{61}	$w_6\sigma_6w_2\sigma_2$ ρ_{62}	$w_6\sigma_6w_3\sigma_3$ ρ_{63}	$w_6\sigma_6w_4\sigma_4$ ρ_{64}	$w_6\sigma_6w_5\sigma_5$ ρ_{65}	$w_6\sigma_6w_6\sigma_6$ ρ_{66}	$w_6\sigma_6w_7\sigma_7$ ρ_{67}	$w_6\sigma_6w_8\sigma_8$ ρ_{68}	$w_6\sigma_6w_9\sigma_9$ ρ_{69}	$w_6\sigma_6w_{10}\sigma_{10}$ ρ_{610}
7	$w_7\sigma_7$	$w_7\sigma_7w_1\sigma_1$ ρ_{71}	$w_7\sigma_7w_2\sigma_2$ ρ_{72}	$w_7\sigma_7w_3\sigma_3$ ρ_{73}	$w_7\sigma_7w_4\sigma_4$ ρ_{74}	$w_7\sigma_7w_5\sigma_5$ ρ_{75}	$w_7\sigma_7w_6\sigma_6$ ρ_{76}	$w_7\sigma_7w_7\sigma_7$ ρ_{77}	$w_7\sigma_7w_8\sigma_8$ ρ_{78}	$w_7\sigma_7w_9\sigma_9$ ρ_{79}	$w_7\sigma_7w_{10}\sigma_{10}$ ρ_{710}
8	$w_8\sigma_8$	$w_8\sigma_8w_1\sigma_1$ ρ_{81}	$w_8\sigma_8w_2\sigma_2$ ρ_{82}	$w_8\sigma_8w_3\sigma_3$ ρ_{83}	$w_8\sigma_8w_4\sigma_4$ ρ_{84}	$w_8\sigma_8w_5\sigma_5$ ρ_{85}	$w_8\sigma_8w_6\sigma_6$ ρ_{86}	$w_8\sigma_8w_7\sigma_7$ ρ_{87}	$w_8\sigma_8w_8\sigma_8$ ρ_{88}	$w_8\sigma_8w_9\sigma_9$ ρ_{89}	$w_8\sigma_8w_{10}\sigma_{10}$ ρ_{810}
9	$w_9\sigma_9$	$w_9\sigma_9w_1\sigma_1$ ρ_{91}	$w_9\sigma_9w_2\sigma_2$ ρ_{92}	$w_9\sigma_9w_3\sigma_3$ ρ_{93}	$w_9\sigma_9w_4\sigma_4$ ρ_{94}	$w_9\sigma_9w_5\sigma_5$ ρ_{95}	$w_9\sigma_9w_6\sigma_6$ ρ_{96}	$w_9\sigma_9w_7\sigma_7$ ρ_{97}	$w_9\sigma_9w_8\sigma_8$ ρ_{98}	$w_9\sigma_9w_9\sigma_9$ ρ_{99}	$w_9\sigma_9w_{10}\sigma_{10}$ ρ_{910}
10	$w_{10}\sigma_{10}$	$w_{10}\sigma_{10}w_1\sigma_1$ ρ_{101}	$w_{10}\sigma_{10}w_2\sigma_2$ ρ_{102}	$w_{10}\sigma_{10}w_3\sigma_3$ ρ_{103}	$w_{10}\sigma_{10}w_4\sigma_4$ ρ_{104}	$w_{10}\sigma_{10}w_5\sigma_5$ ρ_{105}	$w_{10}\sigma_{10}w_6\sigma_6$ ρ_{106}	$w_{10}\sigma_{10}w_7\sigma_7$ ρ_{107}	$w_{10}\sigma_{10}w_8\sigma_8$ ρ_{108}	$w_{10}\sigma_{10}w_9\sigma_9$ ρ_{109}	$w_{10}\sigma_{10}w_{10}\sigma_{10}$ ρ_{1010}

Figure 5 Correlation Matrix for Portfolio with 10 Assets

The sum of these cells put in square roots gives the portfolio standard deviation (σ_P).

The following table presents the numerical evidence for Trust portfolio risk and return as calculated by the above mentioned models.

Table 2 Kosovo Savings Pension Trust Portfolio Risk and Return

Year	Return ($\bar{r}_P$)	Risk (σ_P)
2005	8.68%	0.773571
2006	8.13%	1.822354
2007	2.46%	2.042392
2008	-34.36%	7.1496116
2009	12.89%	5.15972

4. Confrontation of Individual Investments' Indicators with Diversified Portfolio Returns

Taking the periodic returns of Trusts' investments and portfolio returns in a single analysis, fundamental assessments for diversification effect can be concluded. These are presented in the following Figure 6. The Trust portfolio return has had decrease-increase over the years, that didn't get out from market logic. The graphic presents the portfolio state, in which some assets realize increases in levels of return while the others mark decrease and vice verse. This is a reflection of negative correlation of assets, although in the period of economic decrease most of them have shown interconnected results. The negative correlation effect of assets makes the Trust portfolio returns show lower result than some of the individual investments and higher result than the rest of investments. Naturally, investments proportions shall be taken into consideration here. For illustration, Vanguard investments which in the years 2005 and 2009 had performed better than Trust and in 2008 felt deeply under Trust portfolio performance; have a very large proportion of investments in portfolio. Each asset contributes in return, but what's import is portfolio return, which with diversification ensures the sustainable increase in long-run and

moderated values in short-run.

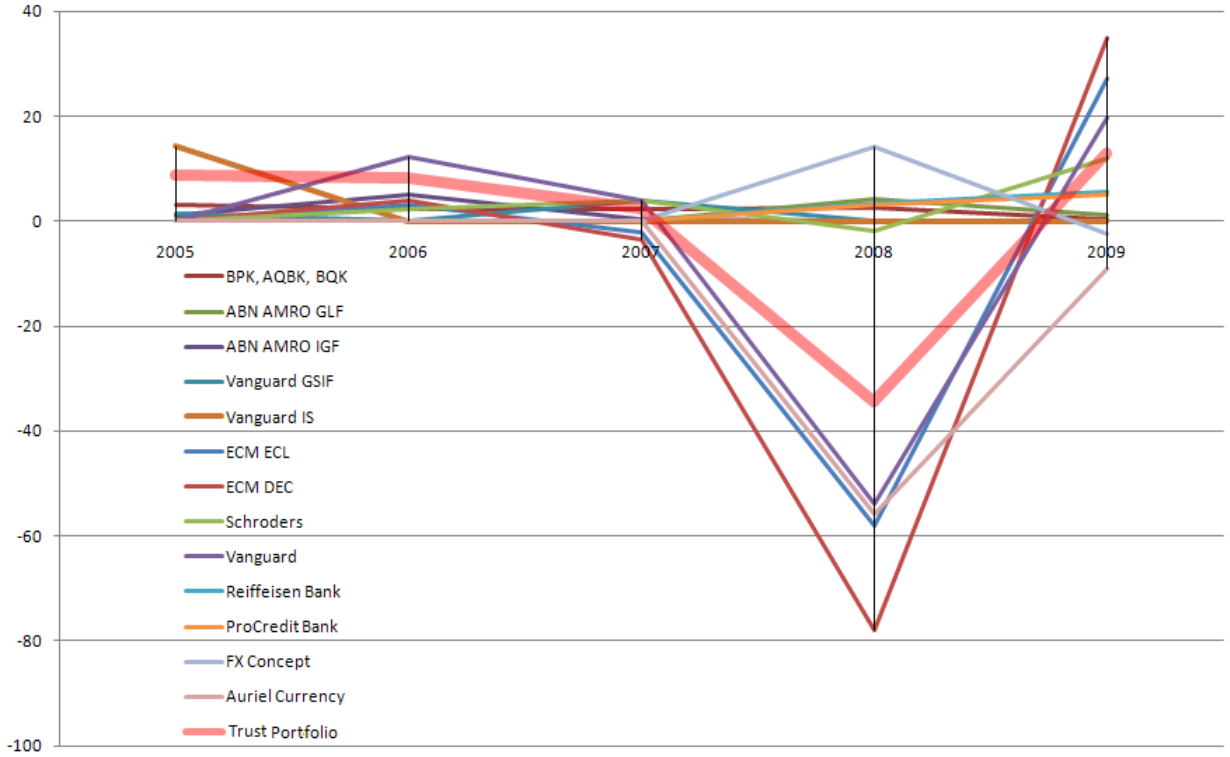

Figure 6 Individual Asset Returns Versus Trust's Portfolio Returns

Chiefly, diversification is practiced to reduce the risk. With addition of assets and keeping negatively correlated assets, the risk neutralization is enabled to some extent. For Trust portfolio, diversification effect in risk level is presented in the following graphic:

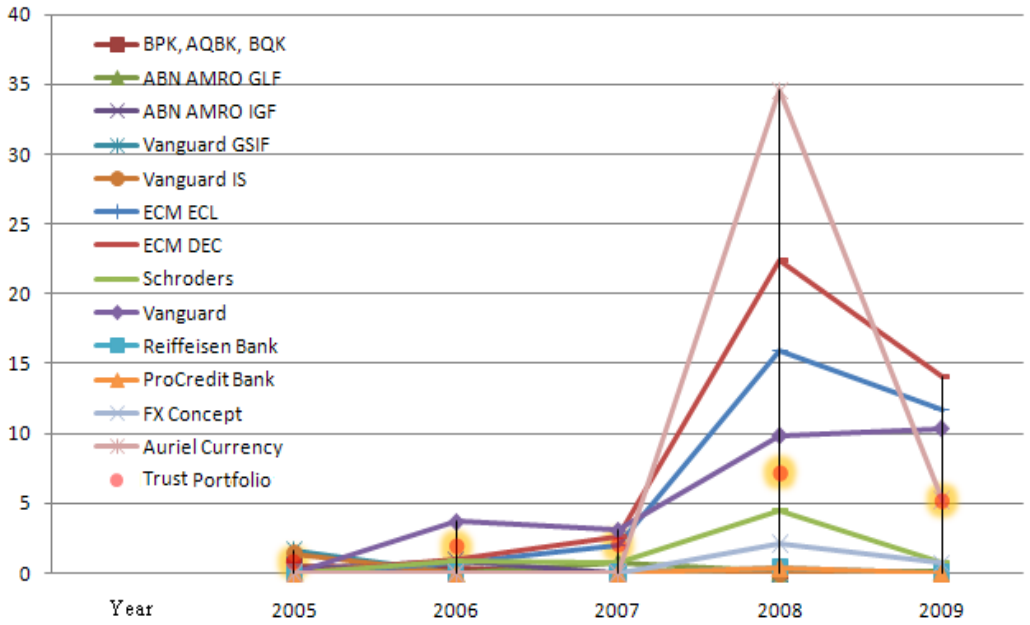

Figure 7 Assets Risk and Portfolio Risk of Trust

The Trust contains in its portfolio some investments with small proportions, which have also low risk, whereas investments with greater participation are investments with higher risk. Portfolio risk is in considerably lower than the risk of such investments such as Vanguard or ECM, which make up the greater part of portfolio. These investments give higher contribution in portfolio return and contain higher risk. By keeping them in a diversified portfolio, occurs that their risk is burdened in portfolio risk in lower proportion than their contribution in return.

In conditions when Trust is orientated for diversification, whereas it has not more that 10 assets in portfolio (one of them consists of funds kept in Central Bank of Kosovo-CBK) and it has gradually added funds in portfolio, it is impossible to present reduction of risk as a curved line with decreasing incline of diversifiable risk with assets as in every theoretical diversification argumentation. However, standard portfolio deviation for the year 2009 is under standard deviations of more assets than the standard portfolio deviation for the years 2005, 2006 or 2007 on other assets, and this is owing to the reduplication of number of assets in portfolio.

The following table presents Trusts' assets through years, their standard deviations and percentage of contribution in portfolio return:

Table 3 The standard deviation for the individual assets and the portfolio of KSPT

2005			2006			2007			2008			2009		
Assets	Standard deviation	% of contribution in r_p	Assets	Standard deviation	% of contribution in r_p	Assets	Standard deviation	% of contribution in r_p	Assets	Standard deviation	% of contribution in r_p	Assets	Standard deviation	% of contribution in r_p
									ECM DEC	14.009	13.595	Auriel Currency	34.555	2.037599
									ECM ECL	11.716	11.101	ECM DEC	22.364	12.46243
Vanguard GSIF	1.638	10.479				Vanguard	3.060	82.625	Vanguard	10.299	58.396	ECM ECL	15.920	10.40894
Vanguard IS	1.373	79.421	Vanguard	3.664	78.781	ECM DEC	2.638	-10.984	Auriel Currency	5.212	-1.137	Vanguard	9.800	76.81073
Trust Portfolio	0.773		Trust Portfolio	1.822		Trust Portfolio	2.042		Trust Portfolio	5.159		Trust Portfolio	7.149	
BPK, AQBK, BQK	0.518	0.297	ECM DEC	0.938	4.701	ECM ECL	2.002	-7.163	Schroders	0.735	15.863	Schroders	4.461	0.462727
ABN AMRO IGF	0.180	6.100	ABN AMRO IGF	0.897	7.790	ABN AMRO GLF	0.765	4.837	FX Concept	0.700	-0.533	FX Concept	2.119	-1.08406
ABN AMRO GLF	0.153	3.700	Schroders	0.897	4.711	Schroders	0.725	28.546	ABN AMRO GLF	0.135	0.122	Reiffeisen Bank	0.400	-0.38265
			ECM ECL	0.712	3.581	BPK, AQBK, BQK	0.020	1.510	BPK, AQBK, BQK	0.041	0.418	ProCredit Bank	0.376	-0.16909
			BPK, AQBK, BQK	0.303	0.433				ProCredit Bank	0.013	0.671	BPK, AQBK, BQK	0.170	-0.36143
									Reiffeisen Bank	0.0127	1.501	ABN AMRO GLF	0.059	-0.18521

These data incent the argument that portfolio diversification has created circumstances on which the portfolio risk is lower in comparison with investments that have high risk and contribute with greater percentage in portfolio return. The assets with higher risk than portfolio risk, give higher contributions in portfolio return. If Trust would invest all means in one of the funds with lower risk, would have ensured very low returns, whereas investment in assets with high risk would ensure higher returns, but risk would be extremely high for a pension trust. Diversification enables the actualization of significant returns, whereas risk is kept at low levels.

5. Sharpe Ratio

Sharpe ratio shows the additional return that investor fruits in confront to the un sustainability of keeping risky assets, differently said, it shows the compensation that investor takes for the risk endured by not investing in assets without risk. Sharpe ratio that is named after its developer William F. Sharpe, is expressed by formula:

$$S_P = \frac{\bar{r}_P - \bar{r}_f}{\sigma_P}$$

Instating as risk free return ($\bar{r}_f$) the return rate collected from funds in CBK, which is about 0.23 percentage and knowing the return and the risk of portfolio, Sharpe proportion is:

$$S_P = \frac{\bar{r}_P - \bar{r}_f}{\sigma_P} = \frac{12.89 - 0.23}{5.15972} = \frac{12.66}{5.15972} = 2.45$$

This means that for each percentage of endured risk, the Trust ensures 2.45% return. This makes up a very good ratio, which holds forth about the positive effect of diversification.

6. Conclusions

The more assets Trust has enfolded in its portfolio, the better the return and the lower the risk of the investment have been, abstracting the 2008 period of global financial crisis.

Investing in negatively correlated assets has inclined Trust portfolio returns to halt reaching the summit returns of some assets as well as to skip hitting the bottom like some other assets.

Portfolio diversification represents the virtue that has enabled less alterable returns in the long-run and moderate returns in the short-run.

Portfolio risk becomes considerably lower through diversification; individual investment's risk participates in portfolio risk with a lower proportion than their contribution in portfolio returns.

Trust's portfolio risk is lower compared to investments that provide for more that 80% of portfolio return. If Trust had invested its entire funds in those investments, returns would be higher, but the risk would overleap pension funds character.

7. Recommendations

Trust needs to increase the degree of reaction to adverse investment indicators, making changes in fund allocations (such a case would be the reaction to downgrades of European Credit Management, which have been observed even before the overall extension of the global financial crisis and have been extremely large in size).

Trust needs to increase investment alternation by interfering in the global market when returns are high and sustainable and turning investment means in domestic market when there's convulsions in global markets.

Every effort should be practiced to establish the capital market in Kosovo, which could increase Trusts' options allocation of funds, and would help the overall economic development of Kosovo.

Trust should explore the possibilities to increased allocations in commercial banks in Kosovo, increasing safety and giving cash infusion to the economy, in terms of banking capital increase, which would be used as loans to finance businesses.

Trust needs to redimension its investment policy by involving in the privatization process, by means of acquisition of shares, whose holders would be the Kosovo citizen's contributors to the Trust.

Trust needs to continue policy of diversification of investment portfolio as the only way to ensure the sustainability of returns versus continuous fluctuations in the performance of investment.

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