

Prelipcean, Gabriela; Boscoianu, Mircea

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RISK ANALYSIS OF A HEDGE FUND ORIENTED ON SUSTAINABLE AND RESPONSIBLE INVESTMENTS FOR EMERGING MARKETS

Gabriela Prelipcean^{1*} and Mircea Boscoianu²

¹⁾ Ștefan cel Mare University of Suceava, Suceava, Romania

²⁾ Transilvania University of Brasov, Brasov, Romania

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Abstract

The aim of this paper is to analyse the development strategies of an innovative Special Purpose Vehicle (SPV) for sustainable and responsible investments (SRI). This contribution represents a premiere for the Romanian capital market, an emerging market with low liquidity and limited diversification possibilities through alternative investments, because it highlights both the integration of specific tools for sustainable development and the possibility of obtaining good performance (risk-return) through the link of alternative instruments and strategies.

Starting from the analysis of sustainable and responsible investment possibilities (SRI), it is justified the feasibility of integrating an active investment strategy, by using an innovative Hedge Fund architecture oriented towards sustainable and responsible investments (called HF-SRI). In this case, a natural and flexible integration of the sustainability principles in emerging capital markets can be achieved. In addition, the possibility of applying the satellite sub-portfolios method in the global analysis of the performance management combined with the risk analysis is justified.

The case study presents an intuitive, simple, but effective model based on applying the Analytical Hierarchy Process (AHP) to the eight risks identified by experts, grouped into three categories and associated with a HF-SRI architecture type with two basic sub-portfolios, oriented on innovative alternative instruments: venture capital funds (VCFs) and exchange traded funds (ETFs).

Keywords: economic-social-governance (ESG) factors; hedge fund for sustainable and responsible investments (HF-SRI); venture capital funds (VCF); exchange-traded funds (ETFs); Analytical Hierarchy Process (AHP).

JEL Classification: Q01, Q16, M14, G32, G24.

* Corresponding author, **Gabriela Prelipcean** – gprelipcean@yahoo.com

Introduction

Sustainable and socially responsible investments, from a social point of view, represent a major issue for emerging markets, and the paper aims to analyse the development strategy of a Special Purpose Vehicle (SPV) dedicated to them. The approach is a premiere for the Romanian capital market, an emerging market with low liquidity and extremely limited opportunities for diversification through alternative instruments.

It analyses for the first time the possibilities of sustainable and responsible investments in Romania, as an emerging market and the possible solutions for integrating the active management of portfolios within some innovative architectures. A Hedge Fund (HF) solution that allows a natural and flexible integration of sustainability principles in emerging capital markets (HF-SRI) is proposed.

It is also suggested to apply the method of satellite sub-portfolios in the performance and risk management of HF-SRI, detailing the situation of using two sub-portfolios, focused on innovative alternative instruments such as Venture Capital Funds (VCFs) and Exchange Traded Funds (ETFs).

The case study presents a hierarchy model of eight risks grouped into three categories and associated with a HF-SRI architecture with two basic sub-portfolios, VCFs and ETFs, adapted to emerging markets. The first sub-portfolio is oriented on obtaining superior returns, but is extremely volatile and illiquid, and the second, oriented on stock indices, is less volatile, but with superior liquidity.

In the first part of the paper there are presented the fundamentals of socially responsible investments (SRI) in emerging markets. Starting from the idea of social responsibility in business, the motivation of focusing on economic, social and governance factors (ESG) is argued and the principles of building the model for integrating the principles of sustainability (SRI type), modern and adapted to emerging markets are presented. Also, there are presented the implementation strategies of socially responsible investments (SRI), highlighting the priorities specific to emerging markets.

In the second part there are analysed the integration possibilities of active management of alternative investment funds (AIF) portfolios in Romania, and in the third section there are analysed the strategies for implementing the active management of AIF portfolios and risk control in emerging markets, and there is proposed a strategy for integrating sustainability principles within an alternative investment architecture of Hedge Fund type (HF-SRI). The exploitation of satellite sub-portfolios method in performance and risk management HF-SRI is presented in a general architecture and a simplified architecture, oriented on two sub-portfolios: VCFs and ETFs.

In the fourth section there is presented an analysis of the reputational risk management in case of HF-SRI. Starting from the identification of risks at the level of HF-SRI sub-portfolios (mixed top-down and bottom-up approach) and understanding the inter-correlations between resilience and reputational risk, the necessary elements in the case study were found.

The study case presented in the sixth section aims to hierarchize the HF-SRI risks with two basic sub-portfolios, SP3-VCF and SP4-ETF, functional in emerging markets. The eight risks obtained in the brainstorming sessions are grouped into three categories (risks associated with performance reduction, respectively risks associated with SP3 VCF and SP4 ETF sub-portfolios).

1. Socially responsible investments SRI in emerging markets – implementation strategies

Socially responsible investments (SRI), also known as sustainable and responsible investments represent long-term strategies focused on ESG (economic-social-governance) factors (Dobris, 2008; Godfrey, Merrill and Hansen, 2009; Juravle and Lewis, 2008, Krosinsky and Robins, 2008; Martin, 2009; Williams, 2007).

The SRI hypotheses are based on providing a suitable way of generating return simultaneously with the integration of the economic, social and environmental realities (balanced investment hypothesis), observation of a reconnection of investments with prudence and rationality and an increasing role of fairness, integrity, environmental health (reasonable investment hypothesis), and the natural adaptation of capital markets to social and environmental realities with impact on the construction of market resilience (hypothesis of market structural reform), profound impact of human emotions ("animal spirits") on the characteristics of transactions and therefore of market movements (Keynes-Schiller hypothesis), the compensation of instability periods from markets through involvement in the real economy, by reducing leverage (as an element of risk sensitivity), by the ability to reconsider social and environmental externalities, and by the realignment of executive responsibility (market resilience hypothesis) (Adler and Kritzman, 2008; Orlitzky, Schmidt and Rynes, 2008).

The reorientation of portfolio managers on responsible investments involves significant changes in the case of emerging markets, mainly related to long-term orientation and understanding of new tools and strategies for portfolio diversification (Anson, 2010; Geczy, Stambaugh and Levin, 2005; Haugh and Lo, 2001; Jensen, 2010; Pan, Sornette and Kortanek, 2006). Institutions could be more effective and efficient on their long term performances (a broader ESG impact beyond the direct one; alpha based increase extra-performance; lower portfolio risk; liquidity) by extending their basic instruments (equity and bonds) to alternative investments (real estate, venture capital/ private equity, infrastructures, commodities).

The configuration elements of strategies for sustainable investment in emerging markets result from the reconsideration of the link between entrepreneurial and financial education through a better understanding of risk, taking lessons learned from other sectors, and revising the rights of investors and how to reward managers not only by performance but by ethics, fairness and followed ecologic model (Siegel, 2008). Also, should consider the encouraging long-term investment approaches (modifying the taxation of capital gains from transactions) and considering within the selection of architectures for sustainable and responsible investments of some behavioural elements specific to emerging markets or national cultural framework. The integration of the impact elements from the Industry 4.0 revolution, operating institutional changes at the level of the capital markets structure in order to reflect environmental values and natural resources, encouraging saving and investments oriented towards the delivery of public goods are other pylons of sustainable investment in emerging markets. Other aspects are based on encouraging research – for the practice and the sustainability of investments (artificial intelligence, big data) and extending the collaboration between investors, issuers and regulators to improve sustainable investments; increasing the skills of the consultants - which will gradually have to become part of the solution and not part of the problem of sustainable investments (Siegel, 2008; Takahashi and Alexander, 2002).

Strategies for implementing responsible investments in emerging markets should be realized considering alternative investments with the ability to obtain high Sharpe rates (private equity funds, venture capital funds, real estate or hedge funds), considering active participation plans (active involvement in management and assistance capital strategies), increasing the construction precision and portfolios adjustment and a better consideration of active strategies.

The requirements imposed by investors refer usually to competitive return/ risk rates; tracking capital deficit or other opportunities resulted from market failures; anticipating change in industries; capabilities to obtain social and environmental benefits. There is the problem of finding some Special Purpose Vehicles (SPVs) dedicated for responsible investments in the real economy (SMEs, housing, public infrastructures) with capabilities to obtain better control, flexibility and extra-returns, comparing to the passive investments. Future research could be oriented on strategies capable to mix ideas around alternative investments (risk capital, real estate, infrastructures, commodities) adapted to the emerging markets.

2. Possibilities of integrating the active management of portfolios in the case of alternative investment funds in Romania

The new Alternative Investment Funds Law (AIF) provides specific investments in new fields such as real estate (RE), venture capital funds (VCFs) / private equity funds (PEF), as vehicles with possibilities for focusing on sustainability issues, SMEs and investments at local community level. In addition, it is noted the elimination of the holding threshold for financial investment companies (SIFs) by repealing Law 133/199, restrictive through the maximum holding limits and participation limits by issuers.

The reset of the investment objectives and policies of the AIF considers a better alignment of investment objectives and policies with the fund's mission and management vision; honest recognition of solutions to meet the fund's objectives (protection against inflation, targeting reasonable returns for risk levels, maximizing returns) under the conditions of correct specification of risk tolerance, investment horizon and compliance with current regulations; extension of the list of asset classes / instruments and appropriate integration within the possible sets of efficient management on the sub-portfolios; realization of synergies between strategic allocation (balancing long term risk-return) and tactical allocation (active management of dynamic hedging); reconfiguration of the organizational structures involved in the investment process and portfolio management; efficiency of reporting and monitoring activities.

3. Strategies for implementing the active management of AIF portfolios and risk control

3.1. Basic aspects of active portfolio management

The interest in active management inspired by hedge fund (HF) strategies results from finely controlled diversification by the nature of exposure to risks other than market risks and the non-linearity that accompany alternative investments. In the context of a limited range of investment opportunities, new opportunities for diversification and a relaxation of liquidity pressure are emerging for emerging markets, including for adverse periods such as turbulence and crisis.

In emerging markets, there are a number of specific problems in the measurement and control of risks: understanding the complexity of liquidity and credit risks; the difficulty of selecting a benchmark or of constructing a composite benchmark, understanding the dynamic and nonlinear effects of the risk associated with alternative instruments. In addition, there are problems of applying the value-at-risk (VaR) method by which potential losses are measured under normal conditions due to uncertainties at the level of unexpected events or with exceptional impact. The application of VaR under dynamic and nonlinear conditions is difficult due to the frequency of the data and the distance distribution of the returns of the classical Gaussian hypothesis. The practical answer in this case refers to the application of a set of methods such as stress test, scenario analysis and modelling using extreme value theory.

3.2 Integration of sustainability principles into an alternative investment architecture of hedge fund type (HF-SRI)

The idea of integrating the mechanisms specific to sustainable and responsible investments into an alternative investment fund architecture (AIF) is a new idea for emerging markets, which can be successfully adopted in the Romanian capital market. Due to the advantage offered by hedge funds (HF) in terms of performance, efficiency and evolution prospects, we have opted to integrate sustainable and responsible investments (SRI) in this innovative strategic solution, hereinafter referred to as HF-SRI (Aragon, 2007; Campbell and Viceira, 2002).

This investment vehicle offers the possibility of creating a flexible architecture of thematic sub-portfolios (equity, bonds, arbitrage, momentum, VCF/PEF, ETF, infrastructure, commodities). These constituent sub-portfolios can respond to the following strategies (Table no. 1):

Table no. 1. HF-SRI sub-portfolios and strategies

Sub-portfolio No.	Sub-portfolio Name	Significance of the strategy
SP1	Equity (variable income)	<ul style="list-style-type: none"> - strategy for selecting portfolio elements based on sustainability and responsibility requirements (SP1.1) - long/ short strategy (long stock+ short hedge) (SP1.2) - momentum strategies (macroeconomic vision of the probable direction of evolution) (SP1.3) - event-driven strategy (extreme or rare events; temporary supply disruptions; mergers and acquisitions) (SP1.4)
SP2	Bonds (fixed income)	<ul style="list-style-type: none"> - diversification strategies (SP2.1)
SP3	VCFs/PEFs (venture capital/ private equity funds)	<ul style="list-style-type: none"> - strategies aimed at long-term extra-returns (SP3.1)
SP4	ETF (exchange – traded funds)	<ul style="list-style-type: none"> - effective and efficient access for all types of investment projects in a flexible and adaptive way (modularity, scalability) (SP4.1) - liquidity buffer (SP4.2)
SP5	Money market instruments	<ul style="list-style-type: none"> - liquidity buffer (SP5.1= SP4.2)

Table no. 1 shows the harmonization between SPx sub-portfolios and SPx.y strategies. Because the investment in equity (SP1) and bonds (SP2) is classic and does not involve particular problems, and the SP5 strategy is simplistic, the focus will be on SP3 (VCF / PEF) and SP4 (ETF).

The HF-SRI evaluation starts from the following elements:

- performance elements: profitability/ relative profitability(return vs. benchmark) and the ability to generate alpha rate by using an active management;
- qualitative elements: short-term liquidity; total liquidity;
- specific elements - statistical arbitrage: identification and exploitation of situations in which the price of an asset deviates from the intrinsic value.

3.3. The sub-portfolio of venture capital funds (SP3/ HF-SRI)

Venture capital funds (VCF) represent financial intermediaries oriented on funding private firms (portfolio) that benefit from monitoring, active intervention and support possibilities, in order to maximize the return (Gompers and Lerner, 2006). The performance of VCFs is expressed by risk return, with a special focus on extra-return and on a global portfolio risk provided through diversification. The liquidity risk could be valued by using Pastor-Stambaugh model in which the liquidity factor reflects the returns associated to illiquid assets (Boscoianu, Prelipcean and Lupan, 2013; Prelipcean and Boscoianu, 2010).

Regarding the strategies for implementation, the main aspects are given by the specific elements for evaluation: the (expected) exit value, the risk return and the expected retention (in this case, quantitative and qualitative anticipations that determine the specific decision SP3 / HF-SRI are considered).

Creating an effective and efficient way to use VCFs is very complex in the actual Romanian capital market status because it is not well adapted to scalability, modularity and the real world behaviour of investors. A pure VCF is hard to believe that it could be developed and would work efficiently in the current context of the capital market.

3.4. The sub-portfolio of exchange-traded funds ETFs (SP4/ HF-SRI)

The exchange-traded funds (ETF) represent a disruptive technology, expressed by the triade fast- good- cheap, which provides easy access for all types of investment projects in a flexible and adaptive way. On the other side, ETFs offer modularity, scalability for all types of investors, and a unique access for retail investors at an extended set of alternative instruments like index funds, futures, options, swaps, commodities, real estate, infrastructures. Comparing to conventional investment funds, the ETFs offer a better efficiency via versatility, liquidity, and low transaction costs.

The main advantages of ETFs are: standardization of products, diversity (different ETF types anchored on equity, bonds, commodities), transparency of portfolio elements (with impact on diversification and liquidity), exchange listing, lower costs.

In the life cycle of ETF financing, there are two critical aspects: the mechanisms of creation and the exit strategies. Regarding the liquidity of ETFs, the most important aspect is related to the implied liquidity mechanism (ILM). Based on the ILM mechanism, it results a natural

flexibility that offers efficacy of rotation to thematic sub- portfolios, with direct impact on the integration of ETFs in a diversified HF-SRI portfolio.

The main benefits of including ETFs in the HF-SRI portfolios in emerging markets are the robustness as versatile measuring vehicle (ETFs are versatile instruments capable to adjust the equity ratios in order to align to a market or a thematic benchmark), respectively in the adjustment of an effective and efficient mechanism for the dynamic portfolio rebalancing. In addition, other benefits are related to an efficient instrument for flexible portfolio adaptation/ completion and an efficient instrument for the flexible adaptation/ completion of the portfolio. Likewise, it represents an efficient instrument for liquidity and for the control of risks in a low cost context, an effective and efficient instrument for hedging market risk in emerging markets, an instrument that could be used in short term moves in the portfolios and an instrument easy to use for retail portfolio allocations.

3.5. Exploitation of satellite sub-portfolios method for performance and risk management in the case of HF-SRI

An innovative method for managing satellite sub-portfolios within the HF-SRI is proposed to provide a fast, intuitive picture of global performance management. The method is useful for emerging markets, characterized by inefficiency and lack of liquidity, providing an image of the concrete possibilities of diversification.

A dynamic flexible management method is proposed for emerging markets where the following mechanisms are being used: the tendency to aggressively allocate new types of assets against the backdrop of an increasing role of tactical allocation, with aggressive restructuring (on reduced portfolios and low or medium liquidity issuers), interventions based on timing strategies; implementation of the results of academic research, expressed by new models, better adapted to the characteristics of emerging markets; accessing the advantage of the first move in the market, which refers to the benefits resulting from the initial movement resulting from the correct anticipation of a long-term trend (approaching based on real options could provide pleasant surprises in deciphering dynamic reshaping initiatives of the sub-portfolios); deep understanding and acceptance of liquidity risk - the tendency to over-evaluate liquid assets can create a certain superficiality in the analysis, understanding the impact of financial leverage constructions; existence of specialists for sophisticated alternative investments.

In portfolio design, administrators start from risk and return objectives, taking into account quite a few essential quality elements in the case of inefficient markets. In the case of HF-SRI, the performance management can benefit from the advantage offered by the scalability aspects and the new approach based on the sub-portfolios.

In the first version, the generalized approach of the satellite sub-portfolios around a semi-rigid central sub-portfolio is presented. The aim is to overcome the average market performance by combining passive management with active management. Sub-portfolios are built specifically to achieve higher market returns in the context of minimizing costs and volatility. In the foreground is the sub-portfolio with passive management oriented to strategic allocations, while the satellite sub-portfolios that are characterized by active management and higher investment costs, with tactical allocations oriented to the alpha growth / extra-return, have special flexibility possibilities.

The central sub-portfolio aims to exploit the relationships previously established (such as the flow of dividends from the higher quality issuers) and through the quality of the assets, obtaining higher returns under predictable conditions. Satellite sub-portfolios are smaller and are subject to dynamic, sometimes radical, changes oriented to the opportunities of the moment. The management of satellite sub-portfolios can be viewed beyond the setting of portfolios as a test-oriented method and pilot investment projects.

The weight of the satellite sub-portfolios depends on a set of factors which include the period of alternative investments (there is a significant diversity to be included in the overall analysis); the available liquidity (a larger buffer gives the possibility of a higher degree of exploitation); expected movements and surprise fluctuations at the level of alternative investment categories.

The use of the satellite sub-portfolios paradigm for the active management of the HF-SRI portfolios with two sub-portfolios SP3 (VCF/ PEF) and SP4 (ETF) represents a particularly simplified, but representative case because between these sub-portfolios there are complementarities and synergies of performance. Thus SP3 refers to long-term investments, illiquid, lacking in modularity and scalability, but with significant possibilities for extra returns, and SP4 includes flexible, liquid, versatile ETFs are particularly useful in the active management of portfolios in emerging markets such as the one from Romania.

This global type method is simple and intuitive, offering both the image of performance management and portfolio risk management. In addition, the method does not exclude the integration of other instruments specific to portfolio management decisions based on artificial intelligence techniques or Data Analytics. This paradigm actually arranges the way of strategies thinking, the links between strategic and tactical allocation, between short-term and long-term trade-off aspects, in the context of the inefficiencies inherent in the emerging markets and the obvious limits in managing the information specific to these markets.

4. Reputational risk management in the case of HF-SRI

HF-SRI type hedge funds are a complex combination of the use of alternative instruments at the same time with alternative strategies and cannot provide investors with sufficient information on how to manage, diversify and use strategies, all of which are discretionary. Building trust in HF-SRI in the context of the impossibility of reporting data related to managerial inspiration, however, involves having refined knowledge in the field of reputational risk management. This is all the more relevant in the case of emerging markets.

4.1. Identification of risks at the level of HF-SRI sub-portfolios

To identify the risks specific to HF-SRI it is considered a mix of top-down and bottom-up approaches (different, but complementary).

In the top-down approach (the image of the large exposures and the significant threats) the basic threats are pursued, which can negatively influence the strategic obvious of the HF-SRI (Table no. 2). Risk identification has been carried out in a workshop. The participants in the brainstorming session (four experts in portfolio management and six investors) followed simultaneously with the identification of the risks and the generation of scenarios, by using different techniques and tools (review exposures and vulnerabilities, risk wheel and the

causal analysis of the potential impact). The results are used as data entry in risk control exercises and self-assessment.

Table no. 2. Top-down risk assessment for SP3 and SP4 sub-portfolios

Risk type	Description
strategy level risks	- erroneous initial allocations of the HF-SRI portfolio
emerging risks	- insufficient understanding of ETFs as new tools for emerging capital markets
global trends	- wrong expectations about the business cycle of the companies in SP3
major threats	- turbulence and major crises

In the bottom-up approach (Table no. 3), we consider the tactical vulnerabilities at the level of local or specific sub-portfolios, respectively the inefficiencies of trading. The bottom-up analysis focused on the operational risks related to the VCF projects, respectively the processes of scanning the portfolio companies, the problems of efficiency in the interventions near the management of the portfolio companies. Under conditions of prudent diversification of the SP3/HF-SRI sub-portfolio, there are no significant exposures, so the impact risks have a very low probability.

The risk identification was based on the use of the individual brainstorming technique, specifically for the SP3 and SP4 sub-portfolios.

Table no. 3. Bottom- up risk assessment for SP3 and SP4 sub-portfolios

Risk type	Description
operational efficiency	- erroneous analysis of the management solutions proposed by the companies from SP3; - the existence of unmonitored operations or resistant to risk management; - modularity and scalability issues in SP4; - the liquidity buffer volatility provided within SP4.
organized processes	- incorrect assessment of key organizational risks (with implications in the management of sub-portfolios HF-SRI)
sub-portfolio inefficiencies	- inefficiency of the additional liquidity fruiting mechanism through implied liquidity mechanism (ILM)
staff competences	- lack of experience in trading large packages of ETFs

4.2. The dualism resilient - reputational risk in the management of HF-SRI portfolios

The reputation is not in itself a risk but an outcome (beliefs and opinions) that the HF-SRI portfolio manager manages and controls, being regarded as an operating license. The benefits of reputation include superior performance and resilient capabilities. Reputation should be built on a continuous basis, being essential the way of responding to the requirement of investors, dealing with operational incidents, quality of interaction with all stakeholders.

Reputation is essential in any type of alternative investment funds (AIFs) and the HF-SRI manager must take into account aspects like building the reputation of the HF management, a complex process that makes references including to behaviour during turbulent periods or exploration management incidents (errors of assessment of companies under SP3-VCF sub-portfolio, errors in the estimation of SP4-ETF sub-portfolio liquidity) and rationale for building resilience necessary in preserving reputation. Also, the reputation is a consequence of investor beliefs based on historical performance, behaviour and character, and reputational risk transposes the uncertain, random character, and comprises two aspects: reputation is a result of previous behaviour (results, performance, relationships) and the impact on the reputation of incidents and other turbulent events (investors appreciate the management behaviour of HF-SRI in previous risk events and how to deal with crises).

In the construction of the HF-SRI reputation, it is highlighted the reputation for whom (investors, regulators, managers of the component companies of SP3-VCF, competitors, government) and reputation about what (identifying the significant elements: stability and performance, evolutionary perspectives, transparency and honesty, innovation, resilience to shocks and turbulences).

During the Brainstorming session, the factors influencing the reputation of an HF-SRI were also mentioned the quality of the regulations, the level of transparency (HF typically benefits from more relaxed reporting requirements compared to other mutual funds), respectively solutions for maintaining the reputation (protecting reputation in the event of adverse events, proactive resilience building, interaction and communication with investors).

Resilience represents the ability of rapid recovery from market shocks and suggests the quality of rapid post-crisis recovery. In crisis management the focus is on three elements: speed (rapid, decisive response), competence (relevant skills), and transparency (in relation with the investors' confidence).

Reputational risk management consists of building values, strengthening investor relations, identifying scenarios and continuously updating investment strategies, communication strategies and contingency and mitigation plans - communication, rapid response, transparency (McAsian, 2010).

5. Risk hierarchy of an HF-SRI with two basic sub-portfolios, SP3-VCF and SP4-ETF functional in emerging markets - an AHP application

In order to understand the possibility of ranking these risks, the AHP-Saaty method will be applied. The criteria in this method will be represented precisely by the set of eight risks that will be hierarchically intuitive in a way that covers both aspects (subjective and objective) of the practical decisions. AHP is based on a three-step algorithm: vector calculation with risk weights; calculating

the score option matrix; presentation of the options' final hierarchy. Next, for simplicity, the notion of criteria will be used, because it better reflects the idea of hierarchy in AHP.

The use of the AHP technique implies the existence of m evaluation criteria and n evaluated options and there is the possibility of verifying the robustness of the results by verifying the consistency criterion. For the estimation of associated ratios, the AHP method starts from the design of an $m \times m$ pairs' comparison matrix (A), where m is the specified number of the evaluation criteria.

The relative importance of the j criterion in relationship with the k criterion is expressed by the a_{jk} elements of matrix A . Given that $a_{jk} > 1$, then j is more important than k , while if $a_{jk} < 1$, then j is of a less importance than k . If the criteria are of equal importance, then $a_{jk} = 1$. The elements on the diagonal of the matrix have unit values.

One needs to note the fact that the a_{jk} and a_{kj} inputs meet the condition:

$$a_{jk} = \frac{1}{a_{kj}} \quad (1)$$

The relative importance between the pairs of criteria is estimated on a 1 to 9 scale (in this particular case the j criterion is considered as being equal or more important than the k criterion). To each, a number is assigned on a scale and it is associated with conclusions such as: "extremely important", "much more important", "of an equal importance", etc.

The design of the 8×8 type of matrix corresponds to the pairwise comparisons (the C_i features are compared with the C_{i+p} features where i stands for the matrix's index of lines), it is filling the corresponding upper triangle matrix diagonal in compliance with a set of specific rules of AHP methodology:

- When the attributed value $a_{i,i+p} \in \overline{1,9}$ is placed on the left side of the value 1 (refer to table 2), this means that C_i has a higher value than C_{i+p} , thus this specific value is to be filled in the matrix.

- When the attributed value $a_{i,i+p} \in \overline{1,9}$ is placed on the left of the value 1 (refer to table 2), this means that C_{i+p} has a higher value than C_i , thus the $\frac{1}{a_{i,i+p}}$ value is to be filled in the

matrix. It is to be noted that A is a reciprocal matrix:

$$a_{ji} = \frac{1}{a_{ij}}; a_{ij} > 0 \quad (2)$$

AHP methodology has the advantage of verifying the coherence of decision-making and complex assessment of the testing possibility for various scenarios of interest highlighted on the map.

In this case study, the objective is to prioritize the risks associated with an HF-SRI hedge fund type equipped with two SP3-VCF and SP4-ETF sub-portfolios. Table no. 4 shows the initial AHP setting according to eight stated risks.

The research hypotheses were necessary in the hierarchy of risks at individual level:

H1: the experts are equipped with relevant experience and expertise in emerging markets and the knowledge related to alternative investments and strategies

H2: the use of a HF-SRI architecture with only two sub-portfolios is relevant for an emerging market because the proposed option is oriented towards the critical alternative liquidity instruments

H3: the analysis is provided for a reference situation, the case of normality (without shocks and turbulences).

The eight risks are grouped into three categories as follows:

- **Group A** – R1, R2, R3 – Risks associated with performance reduction and some qualitative aspects of SRI (for the case of an emerging market)

R1 – possible pressures of investors on reducing investments subject to ESG factors for portfolio diversification reasons, which may influence portfolio management decisions.

R2 – risks associated with insufficient understanding of the innovation of companies oriented on ESG factors (expressed through the competitiveness of new products and new organizational architectures).

R3 – risks associated to corporate social performance of the firms oriented on ESG.

- **Group B** –R4, R5 – Risks associated with the SP3 VCFs sub-portfolio

R4 – suboptimal sub-portfolios VCFs (the complexity of the screening process).

R5 – cost associated to agency conflicts (between the management of the firm and the management of SP3- VCF).

- **Group C** – R6, R7, R8 – Risks associated with the SP4 ETF sub-portfolio

R6 – performance of sub-portfolio managers (selectivity, diversification, market timing).

R7 – lack of understanding/knowledge of new products.

R8 – overestimation of the mechanism of amplification of liquidity.

Table no. 4. Initial setting (state of normality)

	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
R1								x										R2
						x												R3
						x												R4
						x												R5
				x														R6
				x														R7
				x														R8
	R2							x										
							x											R4
							x											R5
					x													R6
					x													R7
				x														R8

	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	
R3									x									R4
									x									R5
								x										R6
								x										R7
R4																		R8
								x										R5
								x										R6
								x										R7
R5																		R8
								x										R6
								x										R7
R6									x									R8
									x									R7
R7										x								R8

Comparisons matrix $C =$

$$\begin{pmatrix} 1 & 2 & 4 & 4 & 4 & 6 & 6 & 6 \\ \frac{1}{2} & 1 & 3 & 3 & 3 & 5 & 5 & 5 \\ \frac{1}{4} & \frac{1}{3} & 1 & 1 & 1 & 2 & 2 & 2 \\ \frac{1}{4} & \frac{1}{3} & 1 & 1 & 1 & 2 & 2 & 2 \\ \frac{1}{4} & \frac{1}{3} & 1 & 1 & 1 & 2 & 2 & 2 \\ \frac{1}{6} & \frac{1}{5} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & 1 & 1 & 1 \\ \frac{1}{6} & \frac{1}{5} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & 1 & 1 & 1 \\ \frac{1}{6} & \frac{1}{5} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & 1 & 1 & 1 \end{pmatrix} \tag{3}$$

Percentage resulted from the use of the AHP procedure (W_i^t matrix):

$$W_i^t = (0.3446; 0.2417; 0.09; 0.09; 0.09; 0.048; 0.048; 0.048) \tag{4}$$

Consistency indicator is $CR = 0.4\% < 10\%$. For the reference (normality) case, risks R1 (possible pressures of investors on reducing the investments) and R2 (lack of understanding of ESG innovation) are essential, followed by the R3 (CSR risks), R4 (complexity of the screening of VCF portfolio elements), and R5 (cost associated to agency conflicts), while R6 (performance of managers - selectivity, diversification, market timing), R7 (lack of understanding of new products because of the complexity and novelty) and R8 (overestimation of the mechanism of amplification of liquidity) which come last.

Regarding the confirmation of research hypotheses, H1 which refers to the relevance of expert knowledge, is essential in conducting the AHP study in the absence of a database (HF-SRI product is a construction proposed by the authors), while the use of hypothesis H2 in which HF-SRI is equipped with only two sub-portfolios is relevant for an emerging market (the effect of diversification being amplified by active strategies), and H3 allows the study of AHP in situations other than the reference case, providing flexibility and relevance.

Conclusions

In this article have been presented an analysis of the possibilities of developing a special purpose vehicle (SPV) dedicated to SRI investments and an approach of global analysis of the performances and the associated risk. The SRI problem is very topical in Romania in the context of a capital market with modest possibilities for prudent diversification of portfolios and the proposal of integration is also a national premiere.

Likewise, the real possibilities of sustainable and responsible investments (SRI) in Romania were presented and the possibilities of integrating the active portfolio management within innovative Hedge Fund-type architectures were analysed. The solution proposed for integration in this architecture of SRI considers the current context of development of alternative investments in Romania. For the HF-SRI architectural design there was applied the method of satellite sub-portfolios, a simple and efficient global method for understanding the way to obtain the performance and risk control. The effectiveness of using only two sub-portfolios, focused on innovative alternative VCFs and ETFs, was justified.

The case study presents a hierarchy model of eight risks grouped into three categories dedicated to the HF-SRI architecture with two proposed basic sub-portfolios, in a AHP adapted for emerging markets.

The main contributions of this paper are: premiere analysis of the real possibilities of integrating the active management of the portfolios of alternative investment funds in Romania, with the highlighting of some mechanisms that allow the development of these investment vehicles; creating a hedge fund type of architecture that responds to the strategy of integrating sustainability principles into emerging capital markets (HF-SRI); the proposal to exploit the satellite sub-portfolios method in the performance and risk management of HF-SRI in various architectures, detailing the particular case with two sub-portfolios, oriented on innovative alternative instruments VCFs and ETFs; carrying out a case study for the hierarchy of eight risks grouped into three categories and associated with a HF-SRI with two basic sub-portfolios, SP3-VCF and SP4 ETF functional in emerging markets.

Future work will be oriented on: deepening the construction method of the optimal HF-SRI portfolio in scenarios in which several sub-portfolios intervene; development of the HF-SRI model in terms of substantiating the sub-portfolio rotation decisions; finding solutions for the strategic alignment between HF-SRI and the interests of investors in an extended scenario in which to integrate value creation by increasing the attention paid to the relationship with all stakeholders; understanding the motivations of investors in emerging markets to follow strategies proposed by HF-SRI; in-depth understanding of how HF-SRI managers act in the interest of investors in case of active strategies in emerging markets.

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