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# Addressing Socially Responsible Investments through Alternative Risk Transfer Solutions at International Level

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*The aim of the present paper is to connect sustainability with financial solutions designed to improve development in poor regions or developing countries. First part of the paper presents the concept of socially responsible investments (SRI) and their evolution in the last decades, emphasizing the social, environmental and governance objectives addressed by SRI. In order to find a possible solution for re-directing private financial capital and resources towards sustainability benefits, the second part of the paper introduces the concept of alternative risk transfer (ART) solutions, by presenting their appearance, evolution and classification. Third part of the paper reveals the social and environmental role that ART solutions could play by exposing three very recent representative examples of innovative financial products that have also achieved social and environmental goals in developing countries. Finally, fourth and fifth parts of the paper focus on current state in Romania, potential further research and conclusions.*

*Key-words: corporate social responsibility (CSR), socially responsible investments (SRI), alternative risk transfer (ART) solutions, index-based instruments, catastrophe bonds*

*JEL Classification: M14, G1, G11, G15, G19, G22*

## Argument

In the international financial markets of nowadays economies, the environmental, social and governance (ESG) role of different financial instruments is specifically approached in order to re-direct funds and resources from micro-level to macro-economic problems, such as alleviating climate change and reducing poverty. Socially responsible investments (SRI) are confirming their potential of increasing financial returns by incorporating ESG issues into the decision-making process. Alternative risk transfer (ART) solutions (e.g.: weather derivatives, catastrophe bonds) proved their potential of dealing with risks usually not covered by traditional re-insurance products. This is why the present paper intends to address the problem of sustainable investing by using ART solutions and recommends the key-findings from developed countries to be also applied at the level of developing or emerging economies. At the end of the paper the case of Romania is analyzed.

### 1. Socially Responsible Investments: Concept and Evolution

One of the most severe debates of nowadays economies is how much social concern should business practices take into account in order to best serve the interests of all the implied stakeholders and without losing the main purpose of a business activity. In this sense, the concept of *corporate social responsibility (CSR)* seems to reconcile the economic, social and environmental criteria. More important, according to Business for Social Responsibility (BSR), the world leader in CSR research and consulting, there has been a lot of talk in the last years about Environmental, Social, and Governance (ESG) integration criteria into investment analysis based on the belief that ESG issues are a driver of financial returns.

The European Commission – through the European Multistakeholder Forum (2004) – defines CSR as “a concept whereby companies

integrate social and environmental concerns in their business operations and in their interactions with their stakeholders on a voluntary basis”, meanwhile Kotler & Lee (2005) consider that “CSR is a commitment to improve community well-being through discretionary business practices and contributions of corporate resources”. Both definitions include the discretionary nature of CSR, undertaken by companies “in a manner that meets or exceeds the ethical, legal, commercial, and public expectations that society has of business” (BSR, 2006).

The main *instruments of CSR* used by companies in order to comply with social and environmental criteria are: *codes of conduct, management standards, sustainability reporting, social and eco-labels, socially responsible investments (SRI), surveys on sustainability performance, award schemes, benchmarking* etc.

For encompassing the full meaning of SRI, the European Investment Sustainable Forum – Eurosif (2008) frequently uses terms such as “*social*”, “*ethical*”, “*responsible*”, “*socially responsible*” and “*sustainable*” investments, the constant within this area being that sustainable and responsible investors are concerned with long-term investment, and environmental, social and governance (ESG) issues are important criteria in determining long-term investment performance. Eurosif (2008) considers that the vast domain of sustainable and socially responsible investments could be divided into three areas: *responsible investment (RI)*, *socially responsible investment (SRI)* and *sustainable investment (SI)*.

**a) Responsible Investment (RI)** is an area developing particularly among the institutional investors and remains most connected to the mainstream financial community. Responsible investors take into account the long-term influence of extra-financial factors such as environmental, social and governance (ESG) issues in their investment decision-making. They integrate ESG factors into their stock portfolio

analysis and management, bringing together social and sustainability indicators with traditional financial analysis.

**b) *Socially Responsible Investment (SRI)*** is an important area for the retail financial sector and may incorporate ESG issues as well as criteria more closely linked to a values-based approach. It can involve the application of pre-determined social or environmental values to investment selection. Investors choose to exclude or select particular companies or sectors to invest in because of their impact on the environment or stakeholders.

**c) *Sustainable Investment (SI)*** is a growing area where investors align their investments with emerging environmental and social realities, because of their financial and sustainable returns prospects. This area brings together those in the financial sector committed to the sustainability imperative along with those interested by the investment opportunities that the ongoing shift in regulations and market practices are creating.

Therefore, it is very important to emphasize that Eurosif continues to use the term “**SRI**” as the comprehensive acronym for the three above mentioned areas of this field, but having the direct meaning of “**Sustainable and Responsible Investment**”. In this sense, Eurosif (2008) considers that *SRI* is “*a generic term covering ethical investments, responsible investments, sustainable investments, and any other investment process that combines investors’ financial objectives with their concerns about environmental, social and governance (ESG) issues*”. *SRI* describes an investment strategy which seeks to maximize financial return and social good.

In general, socially responsible investors favour [corporate](#) practices that promote environmental stewardship, consumer protection, human rights, and diversity, but avoid businesses involved in alcohol, tobacco, gambling, weapons, nuclear industry and/or abortion. Because many investors consider that the effects of climate change represent a significant business and investment risk, *SRI* has become

lately increasingly defined as a way to promote environmentally sustainable development.

Usually, analysts consider that socially responsible investments can be made in distinctive companies or by appealing to a socially conscious mutual fund or exchange-traded fund (ETF). Mutual funds and ETFs offer an extra-advantage, because investors can gain exposure to more companies in many sectors with a single investment.

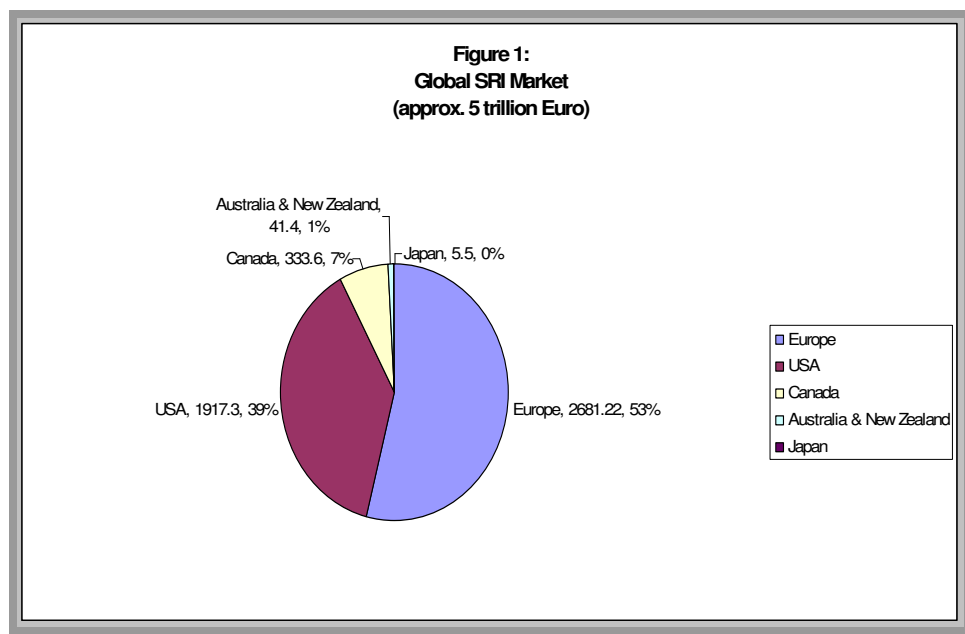
The most relevant aspect at corporate level is *analyzing institutional SRI* by different investment and pension funds, foundations, banks, insurance and reinsurance companies, financial investors and analysts, as well as other financial institutions (Iamandi and Filip, 2008). Székely and Knirsch (2005) state that institutional investors rank companies according to four main criteria: **negative screening** (the exclusion of certain companies or industrial sectors from investment portfolios on the basis of their inability to meet various social, ethical and environmental criteria; e.g.: the armaments, nuclear power and tobacco industries); **positive screening** (actively including companies in investment portfolios on the basis of their strong performance on social, environmental or ethical issues; e.g.: environmental policy, corporate codes, management systems and respect for human rights and working conditions); **engagement** (the use by investors of solid dialogue with boards or other management representatives with the aim of altering corporate behaviour in relation to social, environmental and ethical issues; e.g.: a lack of policy on climate change, pricing of medicines in developing countries); **shareholder activism** (the exercise of shareholder powers through general protest voting at annual meetings and through the support of SRI-related shareholder resolutions; e.g.: voting against resolutions to approve a company's report and accounts if it does not report on its environmental performance).

There are a large number of *specific SRI products and instruments* and the most important of them are the following: **ethical, social and green**

**funds** – mutual funds that select portfolios using ethical, social and environmental criteria; **pensions funds** – that invest part of their funds according to corporate social responsibility criteria; **sustainability indices** – Dow Jones Sustainability Index (DJSI), Financial Times Stock Exchange for Good (FTSE4Good), Domini Social Index 400, Ethibel etc., that have an important role in the relationship between funds allotted to SRI and their corresponding financial performance; **listing processes** – that should offer complete and relevant information to investors in order to evaluate companies.

The General Directorate for Employment and Social Affairs of the European Commission (2004) considers that there are *three main types of relevant initiatives* in the field of SRI: **retail and pension fund investment decision and disclosure** (e.g.: Transparency guidelines for sustainable investment funds – Eurosif transparency guidelines); **rating agencies and screening research** (e.g.: CSRR-QS 1.0 – Quality Standard for Corporate Social Responsibility Research); **dialogue between companies and financial analysts/investors** (Association of British Insurers (ABI) Disclosure Guidelines).

SRI is a global phenomenon and it became a booming market in both Europe and USA, especially in the last years. In order to have clear evidence about SRI at global level, in general, and at European level, in particular, Eurosif recently conducted a study (2008) emphasizing that the global SRI market value was about 5 trillion Euro at the end of 2007, with 53% corresponding to the European region (see *Figure 1: Global SRI Market*; for national evidence at European level, see also *Table 1: Global and National SRI Market*). In what concerns SRI assets under management in Europe, it has reached 2.681 trillion Euro as of December 31, 2007, meaning that SRI assets represent about 17.6% of the asset management industry in Europe.



Source: Adapted by the authors from Eurosif, *European SRI Study 2008*, 2008, p. 52.

**Table 1: Global and National SRI Market**

No.	Region/Country	Regional/National SRI Market Value (Billion Euro, 2007)
1.	<b>Europe (Total)</b>	<b>2681.22</b>
	Austria	1.17
	Belgium	283.80
	Denmark	114.50
	Finland	83.00
	France	98.60
	Germany	11.10
	Italy	243.40
	Norway	208.80
	Netherlands	435.00
	Spain	30.75

	Sweden	191.00
	Switzerland	21.10
	United Kingdom	959.00
<b>2.</b>	<b>United States</b>	<b>1917.30</b>
<b>3.</b>	<b>Canada</b>	<b>333.60</b>
<b>4.</b>	<b>Australia and New Zealand</b>	<b>41.4</b>
<b>5.</b>	<b>Japan</b>	<b>5.5</b>
<b>Total SRI in World (2007)</b>		<b>4979.02</b>

Source: Adapted by the authors from Eurosif, *European SRI Study 2008*, 2008, pp. 20-52.

Social investors frequently invest in companies with international operations and the ranks of social investors are growing in developed and developing countries. Trade organizations keeping track of some of this growth include the *Social Investment Forum* in the U.S., the *Social Investment Organization* in Canada, *Eurosif* in the E.U., the *Association for Sustainable and Responsible Investment in Asia*, and the *Responsible Investment Association of Australasia*. In 2006, the United Nations Environment Programme launched its Principles for Responsible Investment, which are providing a framework to help investors incorporate environmental, social, and governance (ESG) factors into the investment process.

Considering the potential of sustainable companies to outperform their less socially responsible competitors over the long term, SRI becomes a profitable business strategy. In a critical discussion of SRI as a driver of business sustainability, Jacob Park (2006) – one of the most famous specialists in the field – made the point that currently the success of SRI in OECD countries depends on the buy-in of institutional investors, such as pension funds, as well as a mass customization of the concept, which would make SRI more accessible to broader audiences. Addressing the role of SRI in emerging economies and the developing world, he posed the question *whether and how it could be possible to re-direct private financial capital and resources in*



*the industrialized countries towards public sustainability benefits in those countries.* Park (2006) considered that the two most important steps in this direction were represented by *the micro-loan market*, as well as *the weather derivative initiative* of the UN World Food program.

## **2. Alternative Risk Transfer Solutions: Concept and Evolution**

There is widely accepted nowadays that there are several factors that should be taken into account when discussing aspects related to the state and development of economic and social systems as a whole. One of them is represented by *climate change*.

*The Climate Change 2007: Synthesis Report*, a Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change – IPCC (2007)<sup>1</sup>, states that though societies have a long record of managing the impacts of weather and climate-related events, additional adaptation measures will be required to reduce the adverse impacts of projected climate change and variability, regardless of the scale of mitigation undertaken over the next two to three decades.

According to a Deutsche Bank Research report (2007), the economic repercussions of climate change can be grouped as follows: a) increasing property losses, earnings fluctuation and higher financing costs for corporations and governments; b) higher costs for corporations and, consequently, for consumers, induced by growing abatement and adjustment efforts (e.g. the introduction of costly emission rights for energy utilities and large industrial enterprises in the EU that is intended to move the affected industries towards the use of low carbon technologies, that could be translated into higher

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<sup>1</sup> The Intergovernmental Panel of Climate Change is the leading body for the assessment of climate change, established by the United Nations Environment Program (UNEP) and the [World Meteorological Organization](#) (WMO) to provide the world with a clear scientific view on the current state of climate change and its potential environmental and socio-economic consequences, according to their official website.

prices for energy and “low or carbon” products); c) customers and investors will be increasingly sensitive to and aware of climate aspects (e.g. regarding the investment decisions while taking into account the risks and chances related to climate change); therefore, companies will be challenged to respond. With reference to the financial markets’ efforts to confront with climate change, the report insulates both abatement strategies, intended to act preventively and subside climate change as best possible, and adjustment strategies, that are meant to react intelligently and effectively to unavoidable consequences of climate change.

The Deutsche Bank Research report (2007) states that the *abatement and adjustment solutions* identified within the financial system regard ***the emission trading*** (tradable emission certificates, derivative instruments on emission certificates, funds and other investment vehicles which invest in emission certificates – aiming the minimization of costs associated with greenhouse gas emission reduction), ***the climate-related investments*** (investment funds, certificates or private equity funds which invest in assets that could profit from climate change, environmental loans) and ***the market for catastrophe and weather risks*** (catastrophe risk transfer instruments, e.g. catastrophe bonds, derivative instruments for hedging weather risks). The financial instruments associated to the management of catastrophe and weather risks are an important part of the **Alternative Risk Transfer (ART) solutions**.

Though the literature regarding the discussed concept is abundant, there is broad consensus of opinion that there are two segments in the ART market: risk transfer through alternative carriers and risk transfer through alternative products. According to Hartwig and Wilkinson (2007), the market for ***alternative carriers*** (i.e., risk-bearers) includes the self-insurance, captives, risk retentions groups and pools; the ***alternative products*** include finite risk (re)insurance, runoff solutions, multi-line, multi-year products, multi-trigger programs, structured finance and new asset solutions and capital market

solutions for weather risk. One characteristic of ART for large scale exposures consists in their reliance on non-traditional sources of capital: if traditional insurance contracts involve the transfer of risk from policyholder/insurer to the re-insurance company, ART often aims at transferring the risk to the capital markets, rather than using only the claims-paying capital of the insurer.

Therefore, *ART solutions*, as an emergence of the process of convergence of the capital and insurance markets, *stand for an attractive financial answer that allows companies, governments or groups of private individuals to transfer or finance a part of the risks they are exposed to through non-traditional channels.*

Cummins and Weiss (2008) consider that among the *key determinants* of the integration of the insurance and capital markets, in general, and the convergence between the property-casualty risk transfer market and financial markets, in particular, one can recognize: **a) *the growth in property values in geographical areas prone to catastrophic risk***, which resulted in an unprecedented increase in insured property and insured losses from property catastrophes; therefore, losses from catastrophes like Hurricanes Andrew (1992), Katrina, Rita, and Wilma – KRW (2005) proved to be considerably higher than the total equity capital of global professional (re)insurers and there was a shift of orientation towards the capital markets for the financing of these risks, through catastrophe bonds and options; **b) *the reinsurance underwriting cycle***, represented by the alternating periods of relatively low prices and readily available coverage (soft market) and of high prices and restricted coverage supply (hard market); **c) *advances in computing and communications technologies***, that facilitated the collection and analysis of exposure, loss, and other underwriting data, which allowed the development of powerful and sophisticated models of insurer exposures and events that can cause insured losses, facilitating risk management and enhancing market transparency; **d) *the development of “holistic” or enterprise-wide risk management***, which increased the familiarity of corporate managers

with financial instruments and enhanced their receptiveness to innovative solutions; **e) market imperfections** (the various regulatory, accounting, tax, and rating agency factors) and **f) modern financial theory**, that resulted in a much deeper understanding of risk management transactions and eased the development of innovative solutions.

With respect to the *categorization of ART solutions*, one cannot speak of an idiosyncratic classification regarding these products, but of several taxonomies. We present here two of them, while focusing the presentation on those solutions considered most important for the purpose of our study.

One overview (Cummins and Weiss, 2008) segregates the market of ART approaches into three distinctive classes:

**a) Risk Pools and Insurers** (*Self-insurance plan, Captive insurance companies, and Risk-retention groups*).

As a result of the various inefficiencies encountered within the (re)insurance markets, like the high transactions costs, the non-insurance corporations developed *self-insurance programs*.

Furthermore, the corporations continued the cost reductions by formalizing their self-insurance programs in subsidiary corporations, that became known as *captive insurance companies or captives*, which have direct access to re-insurance markets.

*The risk-retention groups (RRG)*, available in the USA, stand for mutual organizations authorized by Congress in response to the liability insurance crisis of the 1980s to provide additional liability insurance capacity to businesses.

**b) Hybrid Products** (*Finite re-insurance, Multi-Year/Multi-Line Products (MMP), Industry loss warranties, Sidecars*).

These products combine features of financial instruments and traditional (re)insurance, but do not necessarily access capital markets directly.

*Finite re-insurance* combines a multi-year banking transaction with limited reinsurance coverage and it is often used to provide income smoothing for primary insurers with limited assumption of risk by the re-insurer.

*Multi-Year/Multi-Line Products (MMP)* incorporate multiple lines of insurance in the same policy, provide coverage at a predetermined premium for multiple years, include hedges for financial risks as well as underwriting risks, and cover risks not traditionally considered insurable.

*Industry loss warranties (ILW)* are dual trigger contracts designed to pay off on the occurrence of a joint event where a specified industry-wide loss index exceeds a particular threshold at the same time that the issuing insurer's losses from the event equal or exceed a specified amount.

*Sidecars* are *special purpose vehicles* sponsored by re-insurers to provide additional capacity to write re-insurance.

**c) Financial Instruments** (*Contingent capital, Swaps, Futures and Options, CAT bonds*).

These instruments closely resemble traded securities, but go beyond (re)insurance industry capacity to directly access capital markets. Therefore, they could absorb the risk associated to severe catastrophes and, at the same time, they have the potential to make the risk transfer market more liquid and transparent. The process through which the risks are transferred is called *securitization* and basically consists in the repackaging and trading of cash flows that traditionally would have been held on-balance-sheet.

A *contingent capital* resembles a put option and allows an insurer to issue capital at a predetermined strike price following the occurrence of a defined catastrophic event.

*Catastrophe swaps* are insurance-linked derivatives characterized by the fact that the insurer agrees to pay a series of fixed premium payments

to counterparty in exchange for floating or variable payments triggered by the occurrence of a specified insured event.

*Catastrophe Futures and Options* – As a consequence of the large losses induced by the severe catastrophes in 1992, new channels of the financial markets were tapped in order to manage the risk associated to these extreme events. The first catastrophe futures and options contracts were introduced at the Chicago Board of Trade (CBOT) in 1992 and were designed to pay on a catastrophe loss index basis. In 1995, due to the low interest from hedgers and speculators, the options were replaced with options contracts on nine catastrophe indices based on the estimates of catastrophic property losses in specified geographical areas of the U.S., during quarterly or annual exposure periods. The estimates were performed by the Property Claims Services (PCS), an internationally recognized authority on insured property losses from catastrophes. As a consequence of the lack of investor interest, they were de-listed in 2000. In 2007, New York Mercantile Exchange (NYMEX) and the Chicago Mercantile Exchange (CME) introduced futures and options contracts on loss indices (PCS/Gallagher Re regarding US insured property losses excluding earthquake and terrorism losses for the NYMEX contracts and the parametric Carville Hurricane Index (CHI) for the CME contracts). In September 2007, Insurance Futures Exchange (IFEX), in collaboration with Deutsche Bank, introduced Event Linked Futures (ELFs) – modelled on Industry Loss Warranty re-insurance policies, for US Tropical Wind – that are traded on a platform provided by the Chicago Climate Futures Exchange (CCFE), a subsidiary of the Chicago Climate Exchange (CCX). In April 2009, the CME Group acquired the Carville Hurricane Index from Carville America Inc. and renamed it the CME Hurricane Index, EQECAT, an authority on extreme-risk modelling, being the new calculation company for the index. In July 2009, IFEX expanded the variety of event linked futures by listing two new contracts: US Eastern Seaboard and US North East Wind Event Linked Futures.

*Catastrophe bonds (CAT bonds)* are considered risk-linked securities that transfer catastrophe risks from sponsors to investors. Usually, they are floating rate bonds, whose principal is paid to the sponsor if certain trigger conditions occur. The trigger mechanisms are connected to natural catastrophes. CAT bonds are typically used by insurers as an alternative to traditional catastrophe reinsurance.

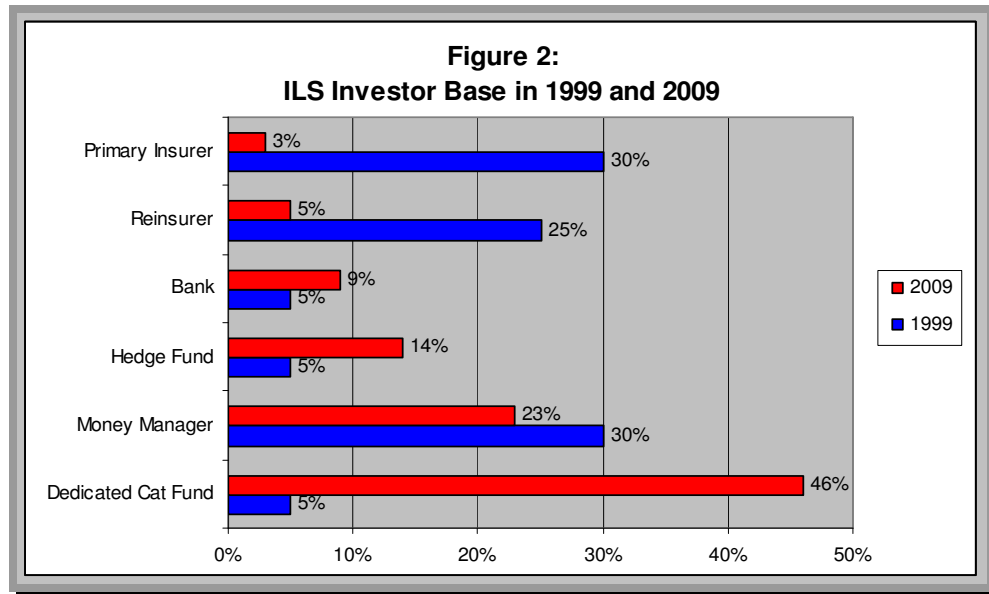
According to Härdle and Cabrera (2007), the basic structure of a catastrophe bond involves that the sponsor creates a special purpose vehicle (SPV), as an issuer of the bond and a source of re-insurance protection. The SPV issues bonds to capital market investors and the proceeds are deposited in a collateral account, in which earnings from assets are collected and from which a floating rate is paid to the SPV. The sponsor enters into a reinsurance or derivative contract with the issuer and pays him a premium. If the catastrophe event occurs, the proceeds from the SPV are used for the payment of the claims. One of the most important features of a catastrophe bond structure is represented by the triggering mechanism. In this regard, Swiss Re (2006) identifies six main types of triggers used to establish the amount of the losses covered by the catastrophe bond: *i) indemnity trigger mechanism* implies that the catastrophe bond is triggered by the actual losses of the ceding entity; *ii) industry index trigger mechanism* is founded on a loss industry index; *iii) pure parametric trigger* is based on the reported values of the parameters of the event; *iv) parametric index trigger* stands for a more sophisticated adaptation of the pure parametric trigger; *v) modelled loss trigger* implies that the parameters of the catastrophe event are introduced into a model in order to forecast the expected losses of the sponsor; *vi) MITT (modelled industry trigger transaction)* is the Swiss Re Capital Market's patented trigger mechanism and consists in the setting of the industry index weights after the occurrence of the event through modelled loss methods. There is known that the choice of a trigger over another translates into a trade-off between the maximization of the transparency desired by investors and minimization of basis risk desired by the ceding company.

Another comprehensive classification is presented in the “Insurance Linked Securities Report” of the Committee of European Insurance and Occupational Pensions Supervisors – CEIOPS (2009). One important aspect that worth mentioning is represented by the fact that the insurance-linked securities, part of the ART solutions, are viewed as a distinct asset class. Therefore, in accordance with CEIOPS, the ART solutions comprise: **a) *the derivatives*** include both the over-the-counter and the exchange traded derivatives. The contracts could take the form of swaps or futures and options. The underlying of the contract, in this case, is represented by a catastrophic event measured through an index (e.g.: in the case of weather derivatives, temperature, rainfall etc.); **b) *the equity-like instruments*** include: sidecars, industry loss warranties and contingent capital; **c) within *the insurance linked securities (ILS)*** class one distinguishes between life and non-life insurance risk transfers. The former ones refer to the securitization of mortality (e.g.: increasing mortality rates due to a pandemic) or longevity risks (the possibility of future life expectancies being higher than originally calculated by actuaries) through mortality or longevity bonds. The latter ones stand for the catastrophe bonds. For the past decade, the catastrophe bonds have dominated the ILS market. It is considered that the following juncture for the development of the market is represented by the structuring of the ILS products through CAT bonds, ILWs and derivatives written on both (Guy Carpenter, 2008).

A pivotal aspect in relation with the development of the studied products is represented by the significance of the indices. Within the ART solutions, we distinguish the following index-based instruments for transferring insurance risks: *ILWs, derivatives (over-the-counter P&C CAT derivatives, mortality/longevity swaps, exchange-traded CAT contracts, weather derivatives)* and *securitizations (P&C catastrophe bonds, extreme mortality bonds)*. In this sense, within a recent report, Swiss Re (2009) emphasizes *the importance of the indices* for the risk transfer solutions by mentioning the following benefits: *widening of the risk transfer markets*



(index-based instruments have provided tools to governments and previously un-insured individuals and businesses to protect against losses from natural catastrophes and weather-related events at lower costs than traditional insurance, while in developing countries these solutions permit to transfer some of the risks to the capital markets; consequently, the indices help (re)insurance companies with additional capacity and new capital and risk management tools, as well as investors with a supplementary class of assets characterized by returns typically uncorrelated with those of other investments); *contract standardization* (objective and transparent indices lead to standardization which, in turn, makes the contracts to be easily traded in secondary markets; as a consequence, the progress of risk transfer and portfolio diversification is smoothed); *new product offerings, reducing moral hazard* (as payouts are determined through independent metric); *diminishing adverse selection* (as payments are based on widely available information); *providing information for pricing of insurance risks* (by leading to the development of liquid risk trading markets, indices could be important for setting efficient insurance risk prices). Furthermore, with respect to the investor base of the ILS market (see *Figure 2*), on a 1999 to 2009 comparison basis, this one has broadened. The remarkable aspect is that though initially the insurers and re-insurance invested in more than half of the ILS issued capacity, these one have a minor role nowadays in comparison to the capital markets investors, such as dedicated CAT funds and money managers, which dominate the market.



Source: Adapted by the authors from Swiss Re Capital Markets

In light of the above considerations, one can assert that the market of the ART solutions evolved and expanded, encompassing now well defined contractual structures that are legitimized as a new innovative asset class. From a financial perspective, one can notice, within these contracts, the solving of the issue regarding the incomplete market through accessing the capital market resources (Constantin and Cernat-Gruici, 2008). Furthermore, the dynamics of the market, even with re-insurance prices softening and capacity widely available, indicates that catastrophe bonds have become important tools for cedents revealing the triumph of substance over form and a shift from tactical purchases to strategic ones (Guy Carpenter, 2008).

### **3. Revealing the Socially Responsible Character of Alternative Risk Transfer Solutions**

Socially responsible investments that support social, environmental and corporate responsibility show a growing interest, and, in recent years, new investment instruments have emerged, allowing investors to support the poor in low income countries while still making a good return (Skees, Barnett and Murphy, 2007). In this respect, some *examples of ART solutions* emphasize the social and environmental role that investment instruments could also assume:

#### ***3.1. World Bank dealing with food crisis in Malawi through index-based weather derivatives***

According to World Economic Forum (2009), 90% of all natural catastrophes are related to weather and severe weather incidents have been on the rise over the past decade. Many of the catastrophes, flash floods, droughts and tropical storms affect developing countries far more than developed countries. The losses, both of life and earnings that these populations experience due to natural catastrophes, are compounded by the fact that insurance penetration is low in emerging markets. Thus their recovery is more difficult.

In May 2008, in response to the acuteness of the food crisis and the requisite for prompt action, the World Bank Group instituted the Global Food Crisis Response Program (GFRP) in order to provide immediate relief to those countries severely affected by food high prices. The Bank response, which sustains the implementation of the joint Comprehensive Framework for Action (CFA), has been articulated in coordination with the United Nations' High-Level Task Force on food security. One of the World Bank initiatives meant to ensure increased capacity to respond to this challenge is represented by the efforts directed towards helping countries like Malawi, Thailand, Bangladesh, Senegal, Burkina Faso, Kenya, Jamaica, Indonesia and potentially Fiji develop financial market insurance

products and risk management strategies, such as weather derivatives, weather index insurance and crop insurance (World Bank, 2009). Therefore, the use of weather derivatives is part of a comprehensive strategy to reduce the impact of drought in developing countries. Within this context, in September 2008, Malawi became one of the first countries to use the Bank's new index-based weather derivative to transfer risks to the financial markets, while the International Development Association – a division of the World Bank that helps the world's poorest countries – assisted its first weather derivative contract with the Government of Malawi.

Structured as a put option, this ART solution is designed to manage the risk of low probability but high severity events, like severe droughts, using as underlying a rainfall index. The index connects the amount and distribution of the precipitation during the growing season to the maize production and determines the projected loss in maize production. The contract is triggered if the index value is lower than 10% of the historical average and, in this case, Malawi will receive the funds much faster than with standard crop insurance due to the loss assessment and monitoring. The weather data will be monitored by an independent third-party and will be then entered into a crop-rainfall model that determines whether Malawi receives a payout (adapted after World Bank, 2008). Under the terms of the contract, Swiss Re will pay out up to USD 5 million in the event that Malawi's farmers suffer from a drought-related shortfall in maize production.

### ***3.2. GlobalAgRisk<sup>1</sup> struggling against catastrophic flooding in Peru through index-based weather insurance products***

Natural disasters, such as drought and flooding, can affect large numbers of people simultaneously, and can have a major impact on the rural poor. For example, extreme *El Niño* events in 1982-83 and 1997-98 created catastrophic flooding in the northern regions of Peru.

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<sup>1</sup> GlobalAgRisk specializes in developing innovative financial instruments for agricultural and weather risk management.

Natural disasters create a constraint for lenders since a large number of loans are often not paid when natural disasters occur. Being able to transfer these risks into global re-insurance markets should improve financial services by lowering interest rates and increasing access to credit for small-holder farmers and other operators of small and medium enterprises.

Micro-insurance and other forms of micro-finance are becoming increasingly important as traditional insurance products fail to be affordable or provide cover at the right level for farmers in developing countries. Index insurance is just the first product to be derived from the wider alternative risk and weather risk markets.

On the July 1, 2009, GlobalAgRisk, Inc., of Lexington, working with an arrangement with the University of Kentucky put the basis of a new program to support the development and pilot testing of effective and affordable index-based weather insurance products for markets that serve small farmers. The program involves two major activities: in-country work in Peru to develop index insurance against extreme *El Niño*, which creates catastrophic flooding in the northern regions of Peru; and a global research and outreach program to provide essential information about the potential and the limitations of index-based weather insurance.

In the last year, GlobalAgRisk and local partners significantly advanced the development of index-based insurance against extreme *El Niño* risk. The insurance will be sold directly to financial institutions, firms in the value chain, and farmer associations operating in Peru. Index-based insurance reduces the cost of insuring against some weather-related losses because no claim adjustment is required. Instead, payments are based simply on realized values of specified weather variables that are highly correlated with losses. These weather variables are measured by independent third parties such as government meteorological services. Jerry Skees, president of GlobalAgRisk and Professor of Agricultural Policy and Risk in the

Department of Agricultural Economics in the UK College of Agriculture, considers that the most unique aspect of this program focused on index-based weather insurance products is the fact that the payments will actually occur before the catastrophic flooding begins. This is an aspect that has never happened before and it is potentially revolutionary for these efforts, because it gives people cash early enough that they can make the adjustments they need and organize themselves to get ready for the coming catastrophe. The program aims to emphasize the efficacy of index-based weather insurance for reducing poverty and improving development in lower income countries.

A grant to GlobalAgRisk from the Bill and Melinda Gates Foundation supports this program as part of the Foundation's efforts to create financial markets to serve the rural poor. Progress in transferring natural disaster risks to global markets could have a major impact on economic development and poverty reduction in lower income countries. GlobalAgRisk has conducted feasibility assessments, product design, and pilot implementation activities in numerous countries around the world, most recently with projects in Mali, Mongolia, Peru, and Vietnam.

### ***3.3. National Government attending earthquake risks in Mexico through catastrophe bonds***

Within a recent report prepared by the Global Risk Network of the World Economic Forum (2009), there is stated that countries are subject to a myriad of risks including natural catastrophes, food safety, pandemics and terrorism. Their governments are charged with the responsibility of maintaining critical infrastructure consisting of water, energy, transportation and communication, while preserving lives and economic livelihoods under increasing budgetary pressure.

Considering the geographical position of Mexico, there is a variety of natural phenomena, such as earthquakes, eruptions, hurricanes,

burning forests, floods and aridity (dryness) that could affect the natural and societal systems of the country. Amidst the risks associated to these natural extreme events, the first one to transfer is the seismic risk, as it has the largest impact at social, natural and economic level. For example, an earthquake of magnitude 8.1 Mw Richter scales that occurred in 1985 caused thousand of deaths and the Mexican insurance industry officials estimated payouts of four billion dollars (Härdle and Cabrera, 2007).

Taking into account that the requirement of funds in the event of a catastrophic disaster is enormous and unpredictable, the Mexican Government created in 1996 a “self-insurance” solution through a The Natural Disaster Fund (FONDEN). This natural disaster emergency expenses addressing instrument represented a pioneer approach in Latin America. Nevertheless, due to political economy problems and low fiscal revenues, the contributions to the fund have been reduced since 2001 and even stopped, as stated by Cárdenas (2006). In 2006, faced with the shortage of the FONDEN’s resources and the high probability of earthquake occurrence, the Mexican government decided to issue a parametric CAT bond against earthquake risk, considering that the design of this ART solution would protect and expand, with a degree of transparency, the resources of the trust. The CAT bond was meant to help the government with emergency services and rebuilding after a big earthquake. Moreover, the discussed financial contract had the potential of eluding the credit risk from the re-insurance, since the capital raised by issuing the bonds was invested in safe securities, which were held by a special purpose vehicle (SPV) The trigger mechanism was a parametric one as was based on the physical parameters of the underlying event (e.g.: the magnitude Mw) (Cabrera, 2006).

In support of the innovative catastrophe bond, for the assessment of the Mexican earthquake risk, the Government hired the AIR Worldwide Corporation (AIR) to perform the risk modeling and

analysis. It is worth mentioning that this was the first catastrophe bond risk analysis performed by AIR for a sovereign government and represented the first time a Latin American government accessed the capital markets to cover potential catastrophe losses. Therefore, AIR quantified the value of the entire inventory of structures in the country, including residential, commercial, public buildings, hospitals, and schools and, through its earthquake model for Mexico, estimated both potential costs resulting from future earthquake scenarios and costs the government could incur from emergency response. S. Ming Lee, executive vice president at AIR, considered that the modeling analysis for Mexico was different from the typical analysis the company conducted for the insurance industry, considering that the bond helped the government respond with emergency services and rebuilding, being triggered, due to its parametric structure, immediately after a devastating earthquake occurred and met the defined parameters.

For the structuring of the catastrophe bond transaction, FONDEN hired Swiss Re Capital Markets (SRCM), Swiss Reinsurance Company (SRC) and Deutsche Bank Securities through an international public bid. Swiss Re designed a financial structure where FONDEN transferred the risk to European Finance Reinsurance (EFR) – an indirect, wholly-owned subsidiary of SRC. Therefore, FONDEN entered into an insurance agreement with EFR and, EFR, at its turn, transferred the risk to SRC. For the securitization of the catastrophe risk, there was created a Cayman Island special purpose company, named CAT-Mex Ltd., which issued floating rate notes (CAT bonds) to capital markets investors to hedge the obligation towards SRC under the financial contract they entered. Inaugurating a new risk zone in the worldwide capital market, the Mexican transaction had an outstanding reception in the capital markets (Cárdenas, 2006).

The social and environmental component of the above mentioned ART solutions – *index-based weather derivatives, index-based weather insurance products and catastrophe bonds* – is clearly emphasized in



designing financial products that have the potential to generate high returns but also to help the poor in developing countries to “cover” against natural disasters and adverse weather (e.g.: droughts, floods, earthquakes) by reducing poverty and improving development. In this way, the ART solutions could also play the role of SRI by ensuring sustainability in low income countries. The financial protection that ART solutions provide against weather risks in emerging countries is meant to re-direct private financial capital and resources towards public sustainability benefits.

#### **4. On the Realm of Pioneering ART Solutions in Romania**

Regarding the case of Romania, to the authors knowledge, one of the first attempts regarding the inception of a index-based market for covering the risk associated to weather-related events was a feasibility study performed by GlobalAgRisk on opportunities for using area-yield and rainfall index insurance for financing catastrophic yield risk for Romanian farmers, as part of a USAID project in 2001-2002.

A study of Spaulding et al. (2003) refers to a precipitation weather derivative contract as an alternative to traditional crop insurance to combat risks due to drought in Southeastern Romania for *corn and wheat*. The precipitation contract is designed to trigger payments to the insured when monthly rainfall falls below a set trigger amount. The calculation of the pure premium is based on the pure loss cost history and does not cover for the transaction costs or risk preference of partners. Preliminary results suggest that if sufficient partnerships are forged to share risk, such contracts can prove useful in Romania. Hou et al. (2004) provide prospects of rainfall-indexed insurance in Romania, considering the trade-off between moral hazard and basis risks. The article analyzes the rainfall risks’ effect on the *corn* outputs in five departments of Southern Romania, which are often facing the most serious drought. To deal with the risk, two types of indexes are analyzed: one based on Key Season’s Rainfall, and another based on Rainfall along the Crop Growth Cycle. They determine the basic

parameters and measure the effectiveness. Results show that indexed insurance based on key season's rainfall had less power to reduce output risk though it is specialized for the most risky season in each department. Indexed insurance based on rainfall along the crop growth cycle does a better job in reducing the output risk. Finally, they propose micro-finance programs, combined with indexed insurance to deal with the basis risk problems (Bielza Diaz-Caneja, Conte, Catenaro and Gallego Pinilla, 2008).

In 2008, there was initiated a partnership research project between Bucharest Academy of Economic Studies, Institute for Agricultural Economics, Research Institute for Soil Science and Agro-chemistry and National Meteorological Administration. The project, called "Research and Extension regarding the Agricultural, Soil and Climatic Risks through Weather Derivatives" (rom.: *Cercetări și extensie privind managementul riscurilor agropedoclimatice prin derivate pe factori climatici*) is financed through The Competitive Grant Scheme developed with the support of the Modernizing Agricultural Knowledge & Information Systems Project (MAKIS)<sup>1</sup>. The main purpose of this pilot project is to launch innovative alternative solutions concerning the management of agricultural, soil and climatic risks by creating some index-based contracts and developing a pilot platform for their employment within the South East Romanian Development Region. The project will consider five crops regarded as representative for the above mentioned Region, respectively, wheat, barley, maize, sunflower and rapeseed.

According to Margareta Wahlström (2009), UN Assistant Secretary-General and Special Representative for Disaster Risk Reduction, with respect to natural disasters, the vulnerability of the population is precisely what kills and destroys. The second biannual session of the Global Platform for Disaster Risk Reduction, which opened in Geneva, on 16 June, this year, has adopted the slogan "*Invest today for a*

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<sup>1</sup> A partnership between the World Bank and Romanian Government through the Ministry of Agriculture and Ministry of Public Finance.

*safer tomorrow*” and has introduced a radically updated mortality risk index (MRI), which uses computer modelling to assess which countries are most at risk from hazards (earthquakes, floods, tropical cyclones and landslides) in both frequency and severity, human exposure.

The Mortality Risk Index situates Romania within the second group of the world’s countries which are most at risk from hazards. The other countries of this group are: Afghanistan, Guatemala, Iran (Islamic Republic of), Pakistan, Peru, Philippines, Uzbekistan. Taking into account these aspects, the ART solutions implemented at international level, both in developed and developing countries, if properly designed, could constitute feasible answers in addressing the vulnerability of Romania to natural disasters, with regard to the agricultural sector and beyond it.

## **5. Conclusions and Further Research**

The market of the socially responsible investments (SRI) reflected a noteworthy development with respect to the widening of the asset classes and the strategies reflected by the investment decisions. Nonetheless, the current economic crisis seems to affect SRI, fact that negatively influences the approaches concerning the commitment to sustainability.

The alternative risk transfer (ART) solutions, reflecting the convergence of the insurance and capital markets, assumed a remarkably role for the (re)insurance industry in addressing the challenges related to capital, liquidity and transparency, especially while confronting with the global climate change.

In conclusion, through the employment of ART solutions, social and environmental objectives are also achieved, proving the ART sustainable and responsible character.

Further research envisages an empirical analysis regarding the assessment of the social, environmental and governance impact of the

ART solutions for the entities involved in their employment at international level.

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