CATASTROPHE BONDS AS INNOVATIVE TOOLS OF CORPORATE FINANCIAL MANAGEMENT – APPLICATION AND LIMITATIONS[1]

Dr. Joanna Błach

Dr. Monika Wieczorek-Kosmala

University of Economics in Katowice, Department of Finance, **Poland**

ABSTRACT

This conceptual paper is based on the document analysis aimed at systemizing knowledge about the potential application of catastrophe bonds (cat bonds) by non-financial companies, together with the identification of the limitations of their usage. We also analyse market data to provide information about the current state and development of cat bonds. After examining theoretical publications and the available market data, we have identified several areas of cat bonds application within corporate financial management. First of all, cat bonds can be applied in investment decisions as a financial instrument that provides an opportunity to generate higher return compared to traditional bonds. After accepting a catastrophe event risk, cat bonds can be applied in order to diversify the investment portfolio. Cat bonds can be also used by companies as a financing instrument, when and if traditional sources of debt capital are not available due to unfavourable market conditions. In addition, cat bonds can be used to combine the process of acquiring funds with risk management by transferring insurable risk to the capital market.

Keywords: catastrophe bonds, corporate finance, financial innovation, insurance-linked securities,

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INTRODUCTION

Financial innovations are inherent attributes of a contemporary financial system. Volatile business environments, globalized markets and technological progress increase the pace of financial innovations. New financial instruments represent one group of financial innovations, that are created initially by financial intermediaries for their own purposes but subsequently they spread to non-financial companies. One example of such instruments are catastrophe bonds, originally created by insurers and reinsurers to increase the liquidity of the insurance market but now transformed and adjusted to the needs of non-financial companies. The application of cat bonds outside the insurance market is still a relatively new issue.

Therefore, this conceptual paper aims at systemizing the knowledge about the potential application of cat bonds in non-financial companies, together with the consequences when viewed from a company's financial. Based on document analysis, we indentify the areas of corporate financial management in which cat bonds may be successfully applied. We also analyze the current market data to present the development of a cat bonds market and the importance of non-financial companies in this market. Finally, we recognize the main limitations in cat bonds implementation by non-financial companies.

The paper is structured as follows. In the first section we introduce catastrophe bonds as a type of insurance-linked securities. The potential application of cat bonds in corporate financial management is discussed in section two, while the fundamental limitations hampering the implementation of cat bonds are presented in section three. The fourth section concludes the paper.

CATASTROPHE BONDS AS A TYPE OF INSURANCE-LINKED SECURITIES

Insurance-linked securities (ILS) are financial innovations that were created originally by insurers and reinsurers in order to transfer an insurance risk to capital markets. ILS can be regarded as an alternative to reinsurance or the way to fill gaps in traditional reinsurance programs, as they provide the possibility to reduce the volatility of operating results, to acquire sources of funds and to increase the capacity of insurers.

As a result of ILS issuance, insurers and reinsurers obtain the possibility to acquire funds that can be used to pay claims arising from great catastrophe and other loss events [1]. Over time several types of ILS have evolved and now they are classified into two broad categories: financial instruments and hybrid financial products (see fig. 1). Historically, the first ILS appeared in the market in the 1980's in the form of Industry Loss Warranties (ILW). However, the dynamic development of risk-linked securities started in early 90's after Hurricane Andrew. The first insurance derivatives were introduced by the Chicago Board of Trade (CBOT) in 1992 in the form of catastrophe futures and options. However, due to lack of trading, these instruments were withdrawn within two years. The next attempt to introduce risk-linked securities was undertaken in 2007 by three separate exchanges – The Chicago Mercantile Exchange (CME), the Insurance Futures Exchange (IFEX) and the New York Mercantile Exchange (NYMEX) – they introduced futures and options contracts on US hurricane risk [1]. Nowadays, catastrophe bonds are the most successful and most recognized type of ILS [3]. Together with other non-traditional risk financing instruments, such as: industry loss

warranties and sidecars, cat bonds represent a significant part of the property-catastrophe reinsurance market.

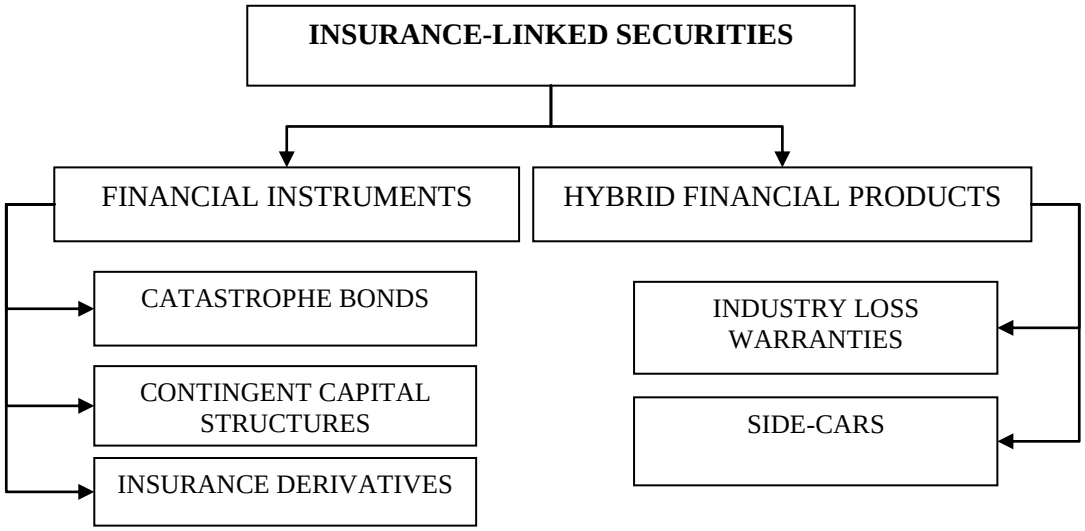

Figure 1. Basic types of ILS

Source: [3].

Catastrophe bonds are fully collateralized instruments, which constitute an exchange of principal for periodic coupon payments wherein the payment of the coupon and/or the return of the principal to investors is linked to the occurrence of a defined catastrophic event [2]. Cat bonds are fixed income securities which offer high income to investors (mostly in a form of interest payments), but with the condition that should a specific predetermined event (e.g. natural or human-inspired disaster) occur, the coupon payment is cancelled and the bondholder (investor) may even lose its entire capital invested in the bonds. If no trigger event occurs, the investor get the interest and the principal at the maturity. From the perspective of the bond issuer, cat bonds spread risk to the investors, who agree to accept part of this risk in return for extra income relative to traditional bonds [7].

Cat bonds are part of a broader class of bonds – event-linked bonds, in which the pay off depends on the occurrence of the specified event. Event-linked bonds issued to date have been linked to catastrophes (hurricanes, earthquakes), mortality events, personal automobile insurance and claims made in casualty insurance [1]. The first successful cat bond placement was a US$100 million issue by Hanover Re in 1996 which involved a portfolio of catastrophe risks: Japanese earthquake, Australian and Canadian earthquake and windstorms, European windstorms and aviation disasters worldwide [2].

From this time several cat bonds have been issued testing various design features (e.g. Reliance, St. Paul Re, Winterthur, Swiss Re and USAA). However, more recently cat bonds have become more standardized in order to meet the requirements of the most important stakeholders, such as: sponsors, investors, rating agencies and regulatory bodies [1]. The market of cat bonds is growing steadily as more and more insurers and reinsurers search for the possibility to transfer risk to the capital market. The new non-

life cat bonds issues have grown from less than US$1 billion per year in 1997 to more than US$7 billion per year in 2007 and again to US$4,8 billion in 2010 after the decline in 2008 due to financial crisis [1].

The construction of cat bonds usually involves three parties: (1) a sponsor (or ceding company), (2) the special purpose vehicle and (3) the investors [6]. The issuance of cat bonds begins with the establishment by the sponsor (e.g. insurer) an offshore special purpose vehicle (SPV) which issues bonds to investors and invests the proceeds in safe, short-term securities, such as Treasury securities. These securities are held in a trust account. The purpose of the SPV is to provide loss protection to the sponsor.

Cat bonds include a call option that is triggered by a defined catastrophic event. There are several types of defining the triggers: (1) indemnity triggers – based on the size of the sponsor 's actual losses; (2) index triggers – based on the index not directly tied to the sponsor's losses (e.g. indexes provided by Property Claims Services); (3) parametric triggers – based on the physical characteristics of the defined catastrophic event (e.g. magnitude and location of an earthquake); (4) modelled loss triggers – based on the results of a simulation model (provided by major catastrophe modelling firms such as: Risk Management Solutions, EQECAT or Applied Insurance Research Worldwide; and (5) hybrid triggers – using more than one trigger in a single cat bond [1], [4], [6]. The type of applied trigger influences the transparency of cat bonds to investors and the level of protection for the sponsor. Investors prefer industry index triggers as these are more transparent to them, while sponsors favour indemnity triggers as these give the opportunity to minimize the basis risk. According to the market data (as of 30 June 2011), the leading type of trigger is the industry index trigger, representing 37% of outstanding cat bonds. The second most popular trigger is the indemnity trigger representing 27% of outstanding cat bonds [1].

On the occurrence of the event, proceeds are released from the SPV and used to pay claims by the sponsor (insurer). In most cases, the bond principal is fully at risk, which means that if the trigger event is significant, the investors may lose the entire capital invested in bonds (principal). In return for this option, the insurer pays a premium to the investors (principal-at-risk bonds). In order to protect, both the insurer and the investor, against interest-rate risk, the fixed returns on securities held in trust are usually swapped for floating returns based on the market rate e.g. LIBOR. As a result, the investor receives LIBOR plus the risk premium in return for the capital provided to the trust. If no loss event occurs during the term of the bonds, the principal is returned to investors at maturity [1]. In some cases there are distinguished bonds tranches, in which the return of the principal is guaranteed – these cat bonds include principal protected tranches. In these tranches the trigger event may affect the interest payments and the timing of the repayment of the principal. As a result, these tranches may be assessed by investors as less risky, but they offer lower coupon payments compared to principal-at-risk tranches.

Cat bonds may be issued with various maturities, some even longer than 60 months. However, the majority of the outstanding instruments are three year bonds [1]. Sponsors prefer bonds with longer maturity, as these can provide a steady source of risk capital to issuers and offer an opportunity to amortize costs of issuance over a longer period of time. On the other hand, investors favour bonds with a maturity below five years in order to maintain the opportunity to re-evaluate the catastrophic risk periodically and recognize the changes to the risk profile of the sponsor.

Cat bonds may be linked to various types of perils and cover risk for different geographic regions. However, the US market dominates as the primary source of demand for cat bonds issues, representing 79% of all outstanding bonds. The biggest part of outstanding cat bonds covers US earthquakes (45%). The next part of bonds is linked to US windstorms (25%), US tornados (5%) and US winter storms (4%). Smaller parts of outstanding bonds cover European windstorms (7%), Japanese earthquakes (4%) and typhoons (3%) or Mexican earthquakes and hurricanes (7%) [1].

The biggest group of sponsors in the case of cat bonds placement is represented by insurers and reinsurers. However, non-financial companies and governments may also issue cat bonds. During the period of 1997-2007 there were 110 issues of cat bonds organized by insurers and reinsurers and only 6 corporate issues. The first government issue of cat bonds worth US$160 million was organized in 2006 by the Government of Mexico to transfer earthquake risk to the capital markets [1].

POTENITAL APPLICATION OF CATASTROPHE BONDS BY NON-FINANCIAL COMPANIES

As it was stated above, cat bonds were originally created by the insurers and reinsurers. However, due to their specific construction and pay off pattern linked to defined catastrophic event, cat bonds may be also applied successfully by non-financial companies.

The potential application of cat bonds by a non-financial company may be manifold as it can be introduced in all areas of corporate financial strategy, including financing and investment decisions integrated with the risk management process.

First of all, cat bonds can be used by a non-financial company in order to combine risk management and financing decisions. The construction of cat bonds enables a company to acquire protection from a pre-defined catastrophic risk and to get access to debt capital, when traditional sources of debt (such as bank loans or straight bonds) are not available.

The first cat bond issued by a non-financial company occurred in 1999 and covered earthquake losses in the Tokyo region for Oriental Land Company, the owner of Tokyo Disneyland. In 2007 cat bonds were issued by East Japan Railway and in 2011 by Electricité de France, Tokio Marine and mylotto24 [1]. Table 1 presents basic information describing the corporate issues of cat bonds organized up until 2012.

Table 1. Corporate issues of cat bonds

Date of issue	Company (sponsor)	SPV	Value	Peril/risk	Trigger type
April 1999	Oriental Land co. (Disneyland Tokyo)	Concentric Ltd.	100m$	Japan earthquakes	Parametric
September 2003	FIFA	Golden Goal Finance Ltd.	400m$	Event cancellation risk (World Cup 2006 in Germany)	?

December 2003	Electricité de France	Pylon Ltd.	190m$	European windstorm	Parametric
October 2007	East Japan Railway company	Midori Ltd.	260m$	Japan earthquake	Parametric
August 2011	Electricité de France	Pylon II Capital Ltd.	150m$	European windstorm	Parametric
August 2011	Tokio Marine	Kizuma Re Ltd.	160m$	Japan typhoon	Indemnity
September 2011	Mylotto24	Hoplon Insurance	70,5m$	Lottery winnings	Indemnity

Source: based on data from http://www.artemis.bm/deal_directory/ accessed 10.07.2014.

Electricité de France (EDF) is the only non-financial company that has decided to organize the issue of cat bonds twice – in 2003 and in 2011. Both issuances were linked to the risk of European windstorm and based on parametric triggers. Cat bonds issued by EDF got the financial rating assessed by S&P agency: BBB+ and BB+ for two classes of bonds issued in 2003 and respectively B+ and B- for two classes of bonds issued in 2011.

From the sponsor (non-financial company) point of view, the application of cat bonds give access to capital markets that have the ability to offer a larger capacity for catastrophe risks than the traditional insurance market. Cat bonds can be also regarded as more flexible instruments than traditional financial instruments or other types of ILS available to non-financial companies (such as insurance-linked derivatives or contingent capital facilities), as cat bonds can be customized to meet the requirements of a particular sponsor.

The advantage of cat bonds as financing mechanisms is that corporate tax costs are lower than for financing by equity capital (interest paid on bonds are tax deductible). In addition, cat bonds pose less financial risk to the future financial ratings and capital structure of the issuer than financing by the subordinated debt. It should be also stressed that the financial rating of cat bonds, which is quite important for investors, is mostly determined by the probability that the principal will be lost due to the catastrophic event rather than the credit rating of the issuer [1].

The application of cat bonds in an integrated risk management and financing strategy is justified in two situations: (1) when cat bonds offer a better solution than traditional insurance agreement or (2) when cat bonds provide protection against risk for which a traditional insurance policy is not available.

Cat bonds can also be applied in an investment strategy, as they can be used to diversify the investment portfolio. Cat bonds are fully collateralized, so they eliminate concerns about credit risk [1]. The pay-off on the bonds comes from the assets in the trust so the bond sponsor is interested in the quality of assets backing the bonds. Therefore, cat bonds are regarded as more transparent than other types of asset-backed securities and with a lower level of moral hazard [1]. The issue of bonds by the SPV isolate the catastrophic risk from the issuers (sponsor) general business and insolvency risk. Cat bonds are also attractive to investors because catastrophic events have low correlations

with returns from traditional financial instruments [5], [6]. In addition, the bond rating may allow investors to assess the relative risk and return on this investment compared to other traditional bonds [2]. These features result in broad market interest in cat bonds among institutional investors, mainly: dedicated ILS funds (representing 64% of market in the period between 1 January 2008 and 30 June 2011), money managers and hedge funds (21% of market in the same period), insurers and reinsurers (13% of market) [1]. However, non-financial companies may also invest in the cat bonds market improving the investment portfolio and increasing the potential rate of return. The analysis of market data proved that cat bonds offered a rate of return higher than similarly rated corporate bonds [4].

LIMITATIONS OF A CATASTROPHE BONDS APPLICATION BY A NON-FINANCIAL COMPANY

As it was mentioned above, cat bonds may be applied both in the financing and investment decisions of a company integrated with the risk management process. Non-financial companies can play the role of an issuer/sponsor and an investor in the cat bond market. Thus, the limitations that increase difficulty of the successful implementation of cat bonds by a non-financial company should be analyzed from these two perspectives separately, that is from issuer perspective and investor perspective

The limited interest of non-financial companies in issuing cat bonds can be determined by several factors, both external and internal ones. First of all, cat bonds are mostly customized contracts, individually designed in order to meet the needs of particular issuer. Thus, it may take some effort and time to find the intermediary (investment bank) willing to organize such issuance and then the investors willing to invest their capital in company's bonds. Cat bonds are regarded as quite expensive solutions. There are costs connected with setting up the SPV, getting the bonds rated and paying provisions and fees to the investment bank [2]. These transaction costs may lead to the situation in which a traditional insurance arrangement would be cheaper than transferring risk to capital markets through a cat bonds issuance. Thus, cat bonds can be applied only by large, international companies. It should also be stressed that very few companies in the world have peak risk exposures that can be protected better by cat bonds than by traditional insurance arrangements [4]. Another problem arises from the information requirements. In the case of a public offering of cat bonds, the information about a company's potential losses due to the catastrophic event may become relatively public information which may decrease the company's competitive advantage. Also, the accounting guidelines and tax regulations may deter companies from issuing cat bonds. The application of cat bonds as instruments combining both risk management and financing decisions requires professional knowledge on insurance and capital market instruments, together with the understanding of risk factors and risk treatment techniques. Each decision of a cat bonds issuance should be preceded by the detailed cost-benefit analysis and comparison of alternative solutions.

The limited interest of non-financial companies in investing in cat bonds can be explained by their complex construction and relatively short market history. Successful investment in the cat bond market requires deep understanding of the financial impact of the particular event risk linked to the cat bond. The investor has to understand the risk-return profile of particular cat bonds and accept the risk of losing invested capital

on the occurrence of the catastrophe event. Thus, investing in cat bonds requires access to expertise which may be challenging for some companies, particular smaller ones. This also explains the dominant role of institutional financial investors in the cat bonds market.

CONCLUSIONS

Based on the theoretical analysis, we may state that cat bonds as financial innovations may be applied by non-financial companies as part of their financial management in order to improve its efficiency and thus support a value-creation process. The application of cat bonds may be manifold, as they can be used within investment and financing decisions integrated with the risk management process. However, there are several limitations and obstacles that should be taken into account while considering the application of cat bonds. One should remember that the application of financial innovations (including cat bonds) is justified in two situations: firstly – if traditional financial instruments performing the same function as financial innovations are no longer available, secondly – if traditional financial instruments performing the same function are less time- and cost-effective compared to the new solutions. As cat bonds are still quite expensive instruments due to their complexity, both for issuers and investors, their practical application by non-financial companies is limited.

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