

Thema

UMR 8184

Théorie Économique, Modélisation et Applications

Thema Working Paper n° 2013-18
Université de Cergy Pontoise, France

How can non-life insurance linked securities be sustainable?
(Mexico Case Study)

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March, 2013

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ABSTRACT

The world is experiencing the development of new financial instruments to cope with natural catastrophes economic losses, this paper contributes to the forward movement of the discussion about the sustainability of one of these instruments known as non-life insurance linked securities. It shows a deep analysis of Mexico CAT bonds issuances and the application of a case event model that evaluates the correlation between the overall Mexican stock market and catastrophes in Mexico.

Keywords: Sovereign risk; Natural disasters; Catastrophe cover; Public finance; Financial risk; Management; Insurance; Catastrophe bond.

JEL Classification: G22, G23, G30

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INTRODUCTION

Large-scale of disasters have taken place requiring that governments, insurers and entities select from among a variety of financing instruments for reducing their financial vulnerability, such as reserve fund, contingent credits, risk transfer instruments or mechanisms composed with private and public participation.

The risk transfer through the insurance market has allowed entities with exposure to natural disaster risk raising resources if a disaster occurs; however reinsurance market behavior is emphasized by long duration shortage of capacity, broadly and changeable prices (see Sigma, 2002). Some reinsurers are throwing out of the market after strong catastrophes happen, and the transference of risk is more difficult to generate until the market is recovered¹, so it has required the development of new financial tools for mounting fast risk-transfer capacity further than the resources allocated by traditional methods.

The insurance linked securities (ILS), appear as these new financial tools, however, the ILS market is slowly evolving², and efforts at developing this market have been required for different reasons. First, the development of new instruments for the transference of natural risk requires financial innovation. Second, sponsors require instruments that allow administration of their portfolios, and ILS generate flexibility and capital is raised through them.

This paper find out considerations that contribute to the sustainability of the ILS market in the long term; their scope is limited to securitization of catastrophic risks through CAT bonds, it provides an overview codifying five categories of impediments to growth and the Mexican case is presented, it examines the correlation between Mexican stock market and the occurrence of natural disasters, finally the conclusion and considerations are presented contributing to go forward the debate and establishing links among the analysis of the impediments to growth and possible solutions for the development of the ILS.

1. ILS IMPEDIMENTS TO GROWTH

Among the ILS the most outstanding instruments in the market are Industry Loss Warranties, Side Cars, Weather Derivatives Cat Swaps, Catastrophic Equity Puts, and Catastrophe bonds (Cat bonds), instruments under analysis. This market has required different approaches for understanding various essential fundamentals that could reduce its enlargement, several institutional, regulatory and psychological factor have some influence on the lack of acceptance that these securitized have encountered from investors and sponsors. Next major factors are examined.

1.1 Accounting and regulatory treatment

The discussion is about the reduction of transaction cost through onshore accounts, the clarifying whether ILS are under reinsurance regulation or derivatives and the development of a specific tax regulation of ILS income.

The valuation of ILS requires particular knowledge of the risk covered and models, the complexity that involves the instrument is time consuming, the methodology is not completely

¹ The global average growth premium rate since 1980 is 3.2% with a standard deviation of 3.5%.

² Cummins (2008) established the factors that affects negatively: a) the narrowness of the industry, b) the probability of interrupting the relationships that had been established with reinsurers and c) the likelihood of excessive basis risk.

reliable for investors and the assets that cover the technical reserves have certain restrictions but the requirements are not specified in isolation.

1.2 Basis risk

ILS, if not indemnity based, expose the issuer to basis risk. ILS with modelled damage, industry loss or parametric triggers are tools with basis risk and sidecars and CAT bonds with an indemnity based trigger have a limited basis risk.

The problem is the appraisal and quantification of the risk for being minimized, Harrington and Niehaus 1999 found that individual insurer homeowner's damage ratios are commonly correlated with state disaster damage ratios, Bouriaux 2002 concluded that index based insurance derivatives could diverge by the statistical method selected, and Croson, Kunreuther (1999), described that-if the index turn into a better version of insurer's actual risk, it open a chance to elaborate customized contracts to minimize basis risk.

1.3 Pricing

Consistent with Fitch Catastrophe Bond Ratings criteria (1998), it is unlikely that a bond will be assigned an 'AA+' or 'AAA' rating if a single catastrophic event can cause a loss of bond principal regardless of how low the probability of that event.

Jaffe Rusell (1997) said that as the market has disagreements about the probabilities of catastrophes, a given quantity of accumulated capital which might appear conservative to an insurer may well appear excessive to a regulator.

ILS instrument should reach a covering cost acceptable but wide spreads above LIBOR in other capital market instruments cause investor to require similar spreads in CAT bonds, and unfortunately, ILS are affected by the pricing of reinsurance covering and there seems to be a pricing floor in ILS driven by the cost of capital of specialised according to Barrieu, Albertini (2009).

The World Economic Forum (2008) said that ILS are difficult to compare and (Froot, 2001 cited in Cummins 2008) establishes that the yields of CAT bonds are not publicly available so the parameters are given by the secondary market but few ILS are transacted in it creating inefficient markets.

At the first time of Cat bonds issuance the cost is high but Finken, Laux (2009) proved that transaction costs alters the equilibrium frontier but the qualitative advantages are unaffected.

1.4 Data quality and transparency

Some of the problems for evaluating ILS are data provided by missing records, erroneous values, file corruption, lack of standardized and available methodology for making comparisons of ILS with the market. In several markets indices do not exist, however new initiatives have been issued, the most important are Paradex and Perils AG.

The reliability, credibility and transparency of the information for the ILS issued regain high importance as the final output is the expected loss from the instrument and in specific locations data is not disclosed because this information is valuable to competitors, this problem is made more intense by regulation when it allowed other prospectus publication only for institutional investors and some specific individuals. Vivek J, et al, (2000) said that

deriving a probability distribution of damages is difficult for developing markets, so this market does not present a probability distribution of default statistics to check.

The majority of deals are still customized operations, insurance policies are not homogeneous increasing the time used up to arranging, analyzing and making comparisons between different instruments, according with The World Economic Forum (2008) the standardization of policies is perceived with unwillingness, as product characteristics could symbolize competitive advantages for insurers.

1.5 Human Behaviour

A common language between insurer's sponsors and investor is required for the ILS market growth, since parameters influence psychological decisions. Olsen (1998 cited in Rode et al, 2000) based on the exaggeration of control over catastrophic events mention that people underestimating risks. Tversky and Kahneman (1973 cited in Rode et al, 2000) proposed that, the absence of certainty of an event makes agents judge based on their memory, so potential investors in ILS rely on their own judgments.

The nature of disasters create a combination of risk notion among investors scared of losing part or the whole investments as the way of describing a task influence in people's risk choices [Turner & Martin, (1984); Poulton, (1989); Fischhoff, (1991); Schwarz, (1999) Tversky and Kahneman's (1981) cited in Rode et al, 2000].

Kahneman and Tversky (1979, cited in Rode et, al 2000) show how ILS investors stand a reasonable small likelihood of loss and thus demand a elevated return. Bantwal, Kunreuther (2000) found that the main cause for the unattractiveness of these instruments is the elevated level of default probabilities.

Fox and Tversky (1995) cited in Bantwal, Kunreuther (2000) show that when people contrast two events the more common bet is more unknown. Rode, et al (2000) point out that ILS do not fit into the group of products where investors feel secure. ILS are seem to be very dangerous although the model results specify that the probability of occurrence is low (Slovic 1987, cited in Bantwal, Kunreuther, 2000), if investors spend time tormenting about the likelihood of losing and the possibly of creating a bad reputation they could be reluctant to put their money in these instruments.

2. METHODOLOGY AND DATA

This study is carried out through the phenomenological style of research under the grounded theory, seeking steps that contribute to the sustainability of ILS instruments in the long term. The question of what are the impediments for the growth of the ILS market was presented as the starting point; the process was developed by a research through the Thomson Reuters Insurance Linked Securities (ILS) Community where the data was coded.

A data market analysis was realized focus on the development of the market and in a case study, through the Swiss RE with its Sigma publication from January 1, 2001 to December 31, 2009, 43 Mexican disasters were found. Database the economic damage amount was adjusted to the base year of 2002 in Mexican Pesos. A synopsis of the attributes of these disasters is presented in Table 3.1.

Variable	Mean	Median	SD	Skewness	Kurtosis	Min	Max	Cases
Floss*	61,147	7,3	202,125	5.4	32.1	0	1,270,830	43
Victims	147	36	346	3.5	11.9	0	1,648	43

Table 3.1 Mexico Natural Disasters variables attribute - Millions Mexican constant 2002 pesos

Complementary to the impact on the stock market of financial losses (Floss), it also assessed the impact of missing, death and injury persons through a dummy category as follow: Victims dummy data (Victims, 0 if no victims), when disasters have influence in more than one country, it is expected to affect the regional economy, MexDm, without value when only Mexico was affected by the catastrophe.

The division between natural or manmade disasters was included as another dummy variable to evaluate if the market had any uncertainty about human impact of disasters, it is the CatDm with a value of 0 when the origin of the catastrophe was specifically natural. Table 3.2 shows the correlation between the variables.

	Floss	VicDm	MexDm	CatDm
Floss	-			
VicDm	0.513	-		
Mexm	0.316	0.194	-	
CatDm	-0.083	-0.050	-0.2553	-

Table 3.2 Variables correlation in the model

Stock returns are obtained from the Mexican stock exchange (BMV) from January 1, 2001 to December 31, 2009 for the complete Mexican market through the prices and quotation index (IPC) and the Median Capitalization Index (IMC30).

This paper assesses the impact on the stock return on the following day after the disaster happen. $R_{i,t}$ Constitutes the return for the Mexican Stock index i at day t . For each disaster a maximum of 250 daily return observations for the period around its respective event is used. Returns on the trading day following the disaster are then regressed on the independent variables (Financial loss, Victims, MexDm, and CatDm) for the entire stock market and for low market capitalization companies. The regression equation is:

$$R_{i,t} = a_i + b_{1,i}Floss + b_{2,i}VicDm + b_{3,i}MexDm + b_{4,i}CatDm + \varepsilon_{i,t/c} \quad (2)$$

Where i denotes a specific index, t is the trading day immediately following a specific catastrophe c .

3. ANALYSIS TEST AND FINDINGS: MEXICO CASE STUDY

This chapter presents the analysis, test and findings through three different approaches: a) Market analysis, b) Study case analysis and test, and c) Alternatives solutions to cope with the impediments to growth.

3.1 Market test and analysis

The significance of the catastrophe bond industry is showed by the \$27.5 billion of capital available since 1997, with an average growth of 30.7% per year. In 2006, the market began its takeoff, with 23 issues for a total of \$4.6 billion and one year later 32 issues of approximately \$7.6 billion, (figure 4.1). This take off gave the perspective that the securitization of catastrophe risk was going in the right way, but the years 2006 and 2007 generated a positive environment for market

While the quantity of new catastrophe bond issuance reach an unexpected point in 2007, the reduction in 2008 about of \$2.7 billion was not what experts had anticipated following. During 2009, when markets began to become stabilise, the issues of CAT bonds also began to recover a 26% increase over 2008, outstanding CAT bonds finally totalled in the year 2009 at \$12.2 billion, \$0.2billions more than the year before.

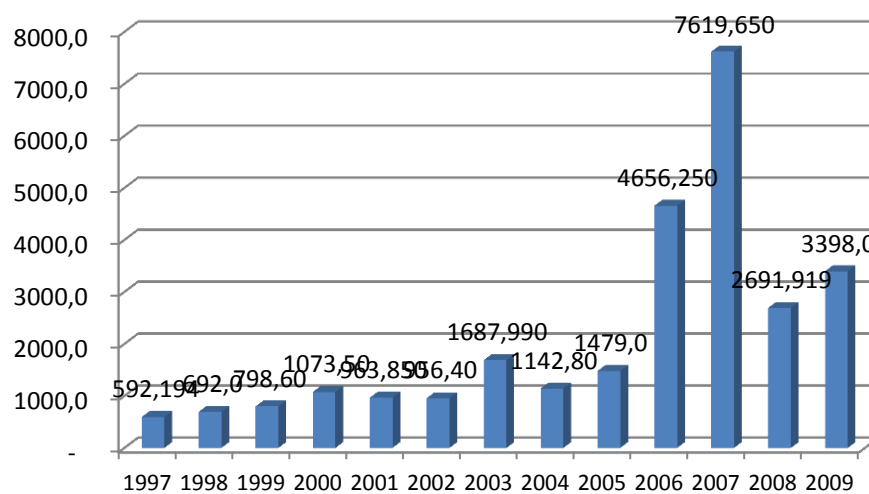


Figure 4.1 CAT bonds Capital Issued 1997-2009 (Millions USD).

Sources: Fitch Ratings, Aon.Benfield Securities.

Figure 4.2 shows how the number of tranches have increase substantially per issue as players design more specific structures and features targeted at interesting investors, thus it can be observed how regulation is a difficult issue to solve, the market has found ways to deal whit it and every year new but few players are incorporated into the market.

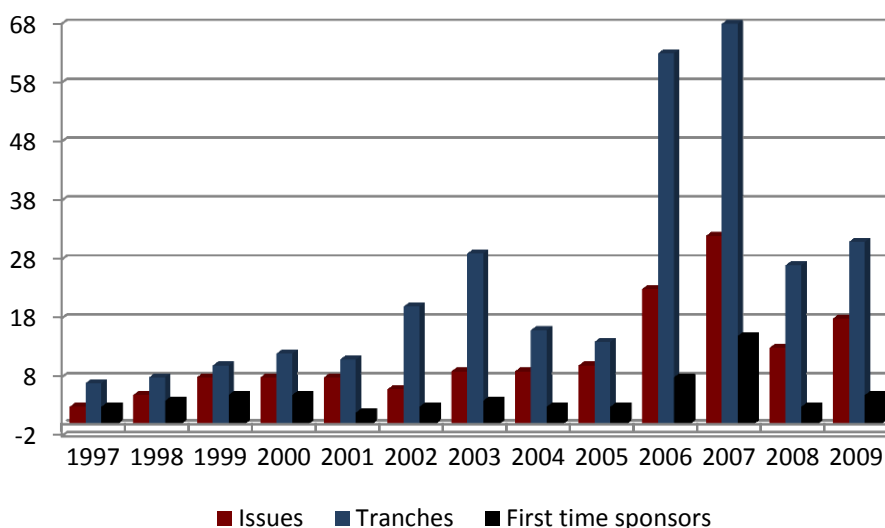


Figure 4.2 CAT bonds by issuance, tranches and by first time sponsors. Sources: Fitch Ratings, Bloomberg, Aon, Reuters.

The type of standardization that the players are looking for is not obvious, for the dates shown in Figure 4.3, from the total issues the indemnity trigger represented 31% percent. The maximum point was obtained in 2008, when a record amount of 54% of the issues were represented by indemnity triggers (\$1.44 billion of the total \$2.6 billion issued).

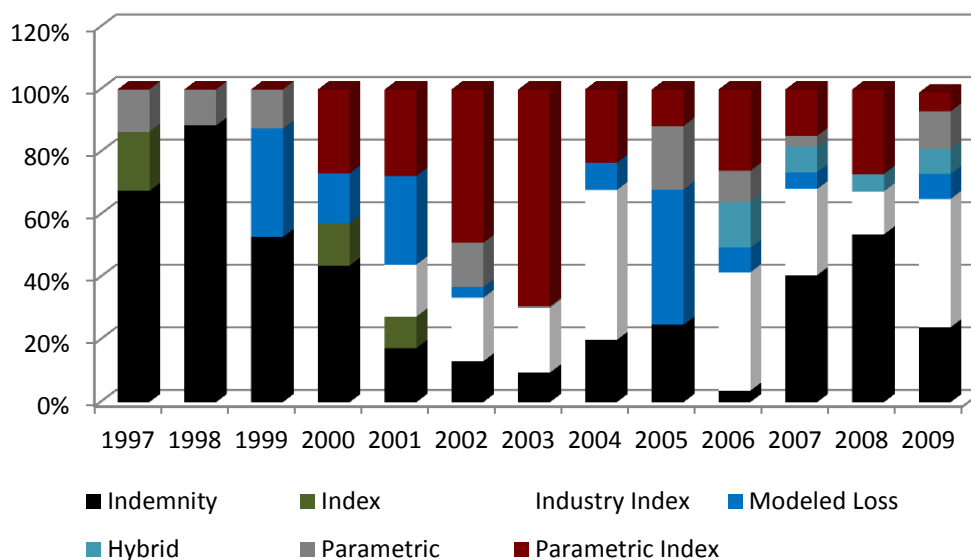


Figure 4.3. CAT bonds issues by trigger type Sources: Fitch Ratings, Aon.Benfield, Securities, Bloomberg, transaction documents, Aon , Reuters.

Sponsors needed to minimize basis risk and that investors were happy with such a possibility because they were looking for opportunities to incorporate it into the CAT bond industry, allowing more convenient conditions for issuers. The most important type of index by issue amount is the industry index, accounting for 25 percent of total issuance. In contrast, the parametric index gave evidence of an accelerated reduction, as the market presented an increase in the participation of multiple trigger bonds issued.

The major proportion of CAT bonds issued has been lower than investment grade (ratings under BBB); 62 percent of the issuances volume was rated BB, however a rating under investment grade is generally unattractive to investors, but in the case of CAT bond market it is no so inconvenient as CAT bond are fully collateralized.

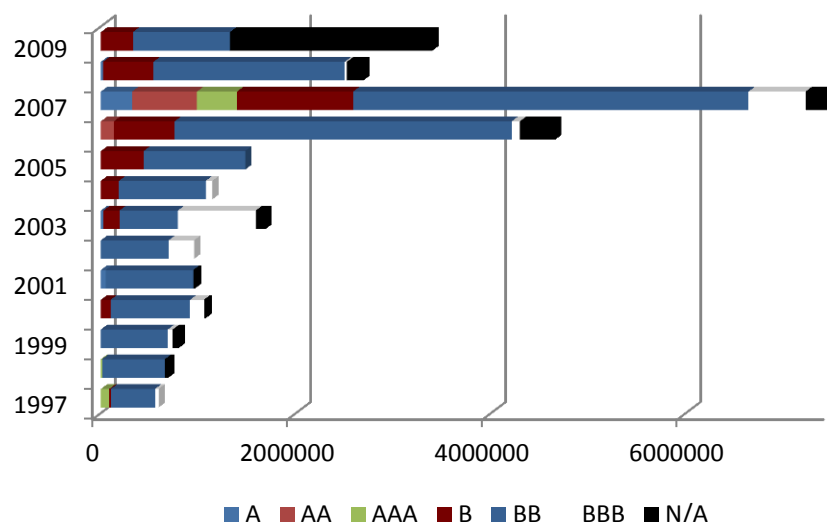


Figure 4.4 CAT bond issues by financial ratings.

Sources: Fitch Ratings, Aon.Benfield Securities, Bloomberg, Transaction documents, Aon

CAT bond issuances continue with a high level of concentration. Only five sponsors have issued 55 CAT bonds which represents the 42.8% from the total value. Additionally and more complex is the number of modeller recognized by the market, there are four, among such entities are AIR Worldwide that modelled more than 50% of the issuances, the others are RMS, EQECAT, and Catlin

Sponsor			Issues	Tranches	Valued USD Miles
Swiss Re			31	109	4,407,740
USAA			13	24	3,310,994
CEA			7	19	2,027,650
State	Farm	Mutual	1	6	1,180,600
Automobile Ins					
Travelers indemnity Co			3	3	1,000,000

Table 4.2 Main sponsors. Sources: Fitch Ratings, Aon.Benfield Securities, Bloomberg, Transaction documents, Aon.

The overwhelming majority of CAT bonds have been for covering events, such as windstorms and earthquakes. The bonds have been issued for single or multiple peril. Between the single peril CAT bonds the most important have been for covering The California Earthquake, with 13 issued since 1997 for a value close to \$2.26 billion following by Japan EQ for \$1.7 billion.

The largest proportions of bonds outstanding are for multiple perils, for instance the Turkey, Greece, Israel, Cyprus and Portugal earthquake risk is covered by only one bond since 2007.

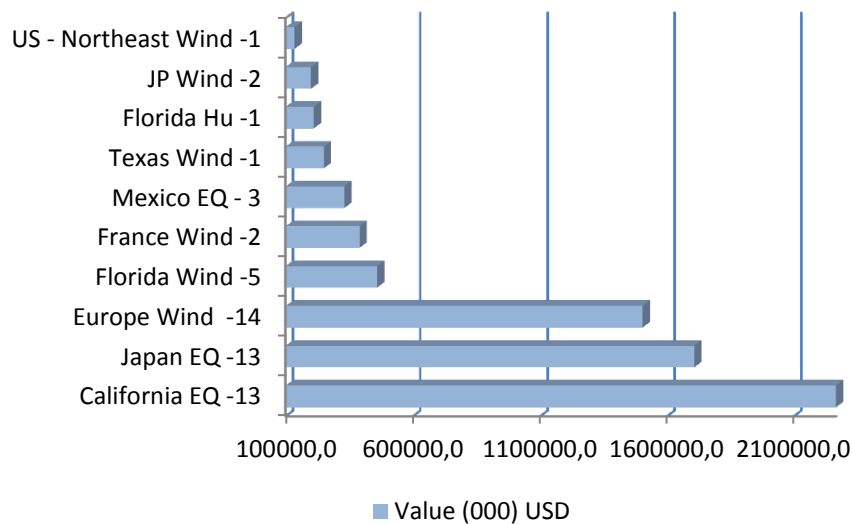


Figure 4.5 CAT bonds issuance by single peril
Sources: Fitch Ratings, Aon.Benfield Securities, Bloomberg, Transaction documents, Aon.

The education factor could explain why investors' spatial allocation of securities transactions has not experienced radical change; In 2009, 56% of the transactions were managed by U.S. investors in comparison with 45% in 2007 and 2008. The other owners are Bermuda with a participation of 19%, Switzerland 14% and The United Kingdom 6%.

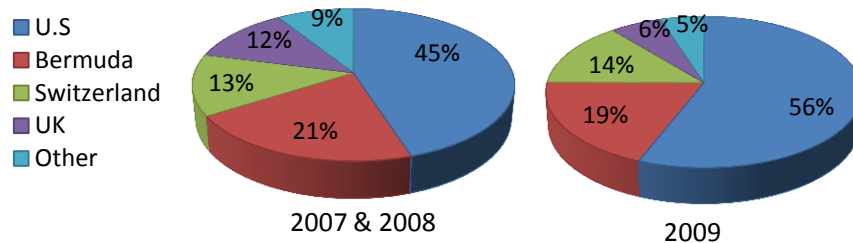


Figure 4.6 Investor by country.
Source: Aon Benfield Securities.

An assessment of investors' types reveals that hedge fund contribution has increased from 7% to 29% in one year, displacing institutional investors and reinsurers, illusion of control, confidence in accessibility, overestimation of unlikely possibilities and the rising of risk premiums generated similar market movements to post Hurricane Katrina.

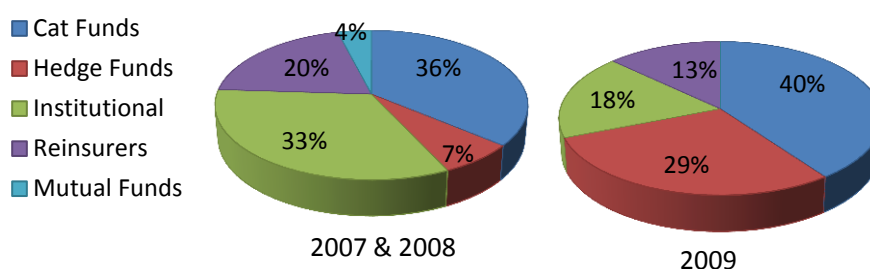


Figure 4.7 Investors by type (% of new transactions).
Source: Aon Benfield Securities.

In 2008 a decline of fifteen percent in the participation of institutional investors was seen, also, mutual funds left the market after having owned four percent of total CAT bonds in 2008. CAT bonds were perceived less attractive than other alternatives.

3.2 Mexican evaluation of impediment to growth

Mexico is exposed to different natural disasters, in 1996 the FONDEN program was created in order to cope with disaster spending and the CAT bond issued. Mexico selected the kind of instruments through which this transfer could be with the cost of the whole risk transaction minimized. The Mexican government compared reinsurance and catastrophe bonds by their pricing and credit capacity, the comparison of both instruments gave the following result:

CAT bond	Reinsurance
More advantageous for dropping the probability of a financing fissure	More attractive to the projected discretionary budget.
Higher cost	
Same performance for reducing the volatility budget resources.	

Table 4.3. Mexico instruments appraisal

The Mexican government has issued two CAT bonds. The first one in 2006 for \$160 million and the second one in 2009 for \$250 million (see table 4.4). It should be emphasised that despite the complex factors surrounding the Mexico CAT bond issues have been successful.

DATE	TRANCHE	PERIL	TRIGGER	SIZE (000 USD)	RATING
11/05/2006	Class A	Mexico EQ	Parametric	150,000	BB+
	Class B	Mexico EQ		10,000	BB+
31/10/2009	Class A	Mexico EQ		140,000	B
	Class B	Mexico Pacific Wind		50,000	B
	Class C	Mexico Pacific Wind		50,000	B
	Class D	Mexico Atlantic Wind		50,000	BB-

Table 4.4 Mexico CAT bond Sources: Fitch Ratings, Aon.Benfield Securities, Reuters

The bonds were issued through a Cayman Island based SPRV and were sponsored by Mexico's Fund for Natural Disasters, which entered into an insurance contract with

Agrosamex S.A., which was then reinsured by Swiss Reinsurance Co and at the same time the bond was issued, the issuer entered into an ISDA-based counterparty contract.

The Mexican basis risk is represented by the trigger selected. The Mexican CAT bond issued in 2006 was linked to a parametric trigger stimulated by an earthquake's physical parameters, for example depth of seismicity. The Zones were categorized as follows:

Zone/ Factor	Zone A	Zone B	Zone C
Magnitude (Mw)	8.0	8.0	7.5
Max. Focal Depth (km)	200	200	150
Insurance amount	150 m (reinsurance)	160 m (bonds)	150 m (reinsurance)

Table 4.5 Mexico CAT bond issue 2006, triggers.

In the second issue the class A notes will cover \$140 million of earthquake risk in a three-zone region in Mexico. The remaining B,C, and D notes of the bond will cover hurricane risk across the Atlantic and Pacific shores of Mexico for losses up to \$50 million each.

The bonds issued by the Swiss Re, paid 245 basis points over the Libor, according to Standard and Poors, this bond presented an inferior spread to the older CAT bonds issued, for the second bond the interest paid ranges from 1,025 to 1,150 basis points.

For the second bond the estimated probability of loss modelled by AIR Worldwide Corp was 4.89% for class A, for class B, 4.25%, 4.41% for class C and finally 2.45% for class D, where the corresponding rating was B for class A, B and C, and BB- for Class D. This success could generate confidence in the rating but left the responsibility on the model that determine the probability of loss.

Jose Antonio Gonzalez A, the Mexican finance ministry, specified that Mexico spend more than three years trying to configure the first CAT bond deal and the last Mexico CAT bond offered may be the first of many multi-peril bonds issued by governments in the coming years.

Multi-Cat Mex was the first catastrophe bond to use the Mexico Cyclone Model created by AIR, however Standar and Poors said that the AIR model remains untested and includes assumptions based on Caribbean models because of the lack of data on Pacific storms. As was demonstrated by Mexico, CAT bonds are under constant improvement, in these cases despite the preceding Cat-Mex structure, Multi Cat-Mex covers both earthquake and hurricane risk through multiple share classes.

Investors are fundamentally gambling that an earthquake will not strike Mexico in the following years, and the market want to see if the bond will spur other governments to take the plunge. The move is part of an interesting trend, which is that having experience with the process of CAT bond issuance and establishing relationships with players in the market offers some advantage to participants when they choose to make repeat visits.

3.2.2 Model results Mexican stock market change to natural disasters.

There is no correlation between the loss amount of a catastrophe in Mexico and the stock market as the p-value for the IPC model is 0.2443 and for the median capitalization index the financial loss p-value is 0.1631 (Table 4.6). The overall stock market has capacity to absorb disaster losses without a direct alteration of its trend.

Additionally, any independent variables do not have an effect on the return of the market segment with low market capitalization, without taking into account if the disaster has been man-made or natural; has involved Mexico alone or also other countries, has affected people. The p-values for all the independent variables range from 0.1631 to 0.3835 for returns none of which are statistically significant.

Variable	Exp sign	Coef. est	SD	t-Stat	p-value
Model 1: The Prices and quotations returns model					
Intercept	+	0.001086	0.000336	3.23326	0.0012
Floss	-	-6.06E-12	5.21E-12	-1.164723	0.2443
VicDm	-	-0.006545	0.002080	-3.146521	0.0017
MexDm	+	0.005800	0.002468	2.350442	0.0188
CatDm	+	0.020303	0.008609	2.358323	0.0185
Model 2: The median capitalization index returns model					
Intercept	+	0.001023	0.000337	3.037090	0.0024
Floss	-	-7.29E-12	5.22E-12	-1.395163	0.1631
VicDm	-	-0.002249	0.002087	-1.077729	0.2813
MexDm	+	0.001900	0.002476	0.767293	0.4430
CatDm	+	0.007528	0.008637	0.871602	0.3835

Table 4.6. Overall Mexican market returns answer to disasters.

The results over the IPC return indicate that there is a significant negative correlation between the existence of victims and the market return, the impact of manmade catastrophes and a regional rather than local location of the disaster could have influence on the most marketable stocks.

This finding provides support to disaster securitization interregional but not locally. For an investor with a well diversified portfolio, CAT bonds constitute an additional enhancement of their portfolio risk/return profile, as these mechanisms; consist of a wide range of uncorrelated risks that produce diversification reimbursement.

However if an investor has a well diversified portfolio in Mexico and buys CAT bond issued by the government of Mexico, their portfolio could be affected if a disaster occurs as it will have a double penalty; the loss of part or the whole bond and secondly the correlation between the damage caused by the disaster and the reaction of the Mexican stock market to it.

3.3 Alternative to ILS sustainability

Finally, some considerations for improving the growth of ILS, resulting from the evidence set out in this paper, are presented. These actions are generally of medium and long term and are structured around every impediment to growth.

Market wants a facilitation of onshore securitizations by reducing extreme regulatory obstacles and uses it for legitimate purposes. Governments should simplify accounting and tax management, use of solvency II, evade commanding any superfluous normative, allow sponsors to provide bond prospectuses to researchers and developed a common language between market players.

Homogenization of ILS, requiring the estimation of basis risk through a customized index that incorporate deviations from the model's forecasting, incorporate a "model gap" where reinsurance policy will compensate the insurer for differentiation between the CAT bond

reimbursement of concrete claims and to discover an alternative way for a second event cover at a cost that will still allow more attractiveness in the economic cost of the whole transaction compared with traditional reinsurance.

The generation of recognized models with more accurate losses output, standardized and published documentation, and the developing of indices will improve transparency and will generate the reliability required for the market, always that rating agencies establish clear and reliable requirements, methodologies for calculating the assessment of risk.

These actions joining the construction of some indices for evaluation the price tendency, the increase in liquidity and standardization and the use repeated issues and shelf offerings could reduce transaction cost.

Effectively and efficiently capture new data through unified data formats with quality standards for data reporting, the development of a string of rules to identify unrealistic data, realize data benchmarking, to identify information deviations between individual portfolios and industry averages, realize more frequent data updates and cleaned, improve data reporting processes and formats, will allow the creation of a system for data accumulation that would be accessible to market players

In complex environments decision making has a limitation to function correctly, so by incorporating specific education in the capital market, the investor will be interested in ILS despite the complex structures. Education fixed cost is required before the agent decide participate in the market, which will reduce in size and will be minimum for new issues of the same category. As the education cost is realized just once.

As ILS is an innovative market, there must be training in order to educate the market participants about the advantages, and technical and legal complexities of such instruments, periodical publications with the details about, and processes of existing transactions and further education needs to be directed outside to reach new investor types.

This and the development of supporting CAT model for developing regions that incorporate triggers that avoid the adverse selection problem and models that reduce the sponsor basis risk for shrink the cost of entry will be possibly generating discussion spaces between market players to reach standardization and providing the information reports for events to a governmental entity or multilateral organization.

CONCLUSION

The convergence of financial strategies for covering natural disasters through the capital markets has been a theme of debate since the last decade, during which time there have been advances, but not the explosion that might have been expected. From the analysis it was found that every impediment to growth was presented in the development of the ILS, however the industry has demonstrated a shift in the perception of the capital markets as a risk transfer solution, investors, sponsors and other participants have been able to overcome the obstacles presented.

The complexity of the transactions and regulations has allowed a few new issuers per year, sponsors have required minimisation of basis risk, the market performance also found its explanation in human behaviour where it is observed that the geographic distribution of investors has not experienced drastic change.

Mexico assessed its financial vulnerability and decided to issue two CAT bonds in preference to traditional insurance system, despite the complexity involved in instruments Mexico CAT

bonds have been successful. Part of the success of Mexico could be attributed to the little correlation of catastrophic securities with stock and bond markets and the attractions to investors of other countries providing a good diversification of risks. CAT bonds constitute an additional enhancement of their portfolio risk/return profile, as these mechanisms consist of an ample range of uncorrelated risks that produces diversification reimbursement.

It has been concluded that different alternatives should be implemented; however these impediments will not be simple, fast or easy to overcome. Concerted action will be required from all market participants over a long time frame. This can be accomplished not only by making risk instruments simpler and more attractive, but also by opening up the debate on this asset class to a wider investor audience.

The number of investors must increase, a broad focus on educating will be required, a reduction of transactional costs is necessary and transactions must be made more transparent through better data and more market communication. This will require all parties in the transaction chain to cooperate, reducing of the human behaviour biases with a wide dissemination of these products and techniques, otherwise the adjustment may never take place, because investors are often constrained in their ability to understand and process the necessary information.

Thus, it makes sense to predict that the CAT bond market will continue to grow if some actions are taken in the long term as the market has shown this trend. So investors will be able to overcome these obstacles only after they are comfortable with both the complexity and the uncertainty of the CAT bond market.

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