



PUERTO RICO INSURANCE/RE-INSURANCE STUDY

2013

*HOW THE INSURANCE INDUSTRY IN PUERTO RICO IS POSITIONED IN THE EVENTUALITY OF
A CHRONIC NATURAL DISASTER EVENT*

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SECTION 1

Executive Summary

Executive Summary and Recommendations

The Puerto Rico Coastal Zone Management Program commissioned a study about the insurance industry in Puerto Rico and its ability to pay insurance claims in the event of a major disaster due to chronic weather related losses. The study was conducted within the coastal zone.

The main research question relies on the ability of the local insurance industry to absorb losses in case of a chronic weather related event. The answer for this query is yes, they can. Local insurance industry has not been motivated to generate and expose significant capital for underwriting catastrophe perils due to insurance business regulations. Typically, they limit their catastrophe risk retention levels to under 15 percent. The remainder is ceded to reinsurers.

The availability of reinsurance affects the excess profitability of Puerto Rico insurance companies, as it governs the ability to underwrite policies and thus, generate subsequent income from reinsurance commissions. Tight markets, i.e., high premiums, have a pass-through effect, including proportionately higher commissions. Policy coverage restrictions are generally designed and imposed by foreign reinsurers, and their effect falls on local insurers.

However, with this business structure, local insurance companies do not take more risk than they can afford to pay in an event of huge insurance claims due to chronic weather related losses. Passing their excess risk to a re-insurer makes the industry operate with soundness. No matter this practice of limited

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risk exposure, local insurers are still profitable, as described in the section “Puerto Rico Property Insurers: The Key Players.”

In the eventuality that significant claims arise from weather related disasters in Puerto Rico, the most probable scenario is that local insurers will not underwrite new businesses until they are profitable again. Local market will not be unattended. Other companies will occupy the market place. A situation like this hypothetical one happened in Florida. After 2004, a considerable number of storms affected the state and several insurance companies left the Florida market.

Besides patterned research questions, there are other contingencies that should be mentioned. The Permit Management Office (OGP), which is the management governmental instrumentality in charge of granting construction permits in Puerto Rico, as part of their daily work, issues building permits that will become real estate projects. When they become permanent projects, permits must be considered contingently since they will enter into the property insurance market as part of the demand for property insurance.

The way the insurance market operates in Puerto Rico is to put on resale (re-insurance) the surplus of 85% to sourced lines from their re-insurance partners.

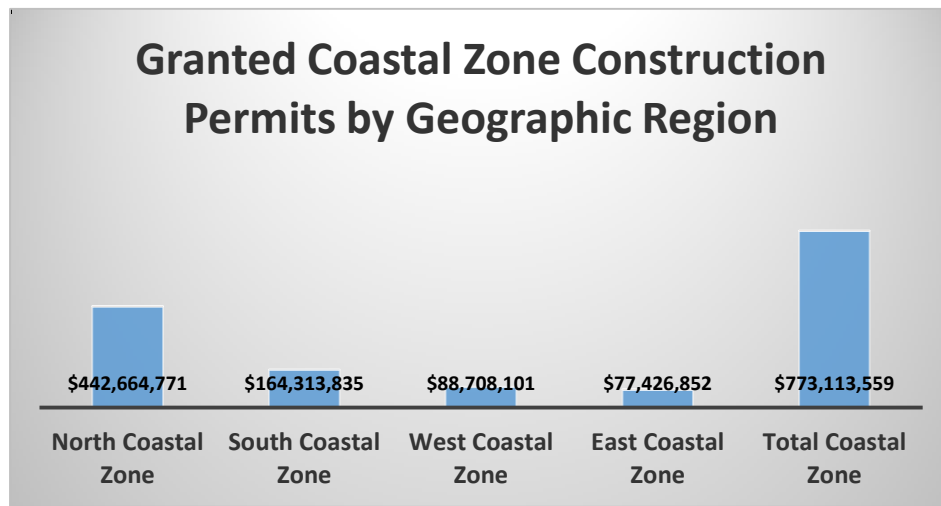
The number of permits approved on its way to become real projects is \$773.1MM in the coastal zone only. The greater number of permits approved

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is in the North Region by \$442.7MM, followed by \$164.3MM in the South Region, \$88.7MM in the West Region and \$77.426MM in the East Region.

In general terms, the average permit in dollars is \$269,111.00 which takes a little above the limit established by the "National Flood Insurance Program" of \$250,000. An alternative to insure these properties would be to enter in the program "Community Rating System" (CRS). Though, municipalities must comply with all conditions that minimize risks posed by the program.

Only the Municipality of Ponce is in compliance with the program. The largest contingency is recorded in the north and south where the average regional permit in terms of dollars is \$357,286 and \$321,553, respectively, both far above the "NFIP" limit of \$250,000. Without being in the program, insurance cost will be monumental. Below are descriptive graphs with data obtained from the The Permit Management Office (OGP).



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Construction Permits Granted by OGPe (2011 to July 2013)				
<i>Region</i>	<i>Permits Amount</i>	<i>Count</i>	<i>Average Permit</i>	
North Coastal Zone	\$442,664,771	1,528	\$357,286	
South Coastal Zone	\$164,313,835	511	\$321,553	
West Coastal Zone	\$88,708,101	348	\$182,529	
East Coastal Zone	\$77,426,852	360	\$215,074	
Total Coastal Zone	\$773,113,559	2,747	\$269,111	
Non-Coastal Zone:	\$535,673,352	2,529	\$248,064	
Total Coastal y Non Coastal Zone:	\$1,308,786,910	5,276	\$258,587	
Building Permits in Process:	\$335,800,494	1,530	\$219,477	
Grand Total:	\$1,644,587,404	6,806	\$239,032	

There are other research questions answered within the study. We are presenting in this summary a snapshot of the findings and their proper recommendations.

Findings and Recommendations

1. Taking into consideration that there is also inland infrastructure, we recommend expanding this study to include the inland area of the island.
2. We recommend a study to determine the capacity of assuming additional risk in the local market generated by granted construction permits which are still not real estate projects but are on the way to be.
3. There are some risks that insurers can take when their reinsurers reject to buy their surplus. In this case, we recommend the creation of local state government organizations like “Texas Windstorm Insurance Association”, an insurer which assumes high risk policies that the insurance industry rejects.
4. Basically, banks in Puerto Rico rely on insurance companies, in terms of hazard risks: they have a checklist of insurance policy requirements that the developer must provide to access funding for a development project, including the following:
 - a) Builders Risk Insurance
 - b) Flood Insurance
 - c) Performance Bond
5. To mitigate flood risk, banks and insurance companies rely on the Puerto Rico Flood Maps issued by FEMA.

There is no doubt that those natural disasters events hit the bottom line of insurers and re-insurers. But it will not make them wealth impaired and for sure they will still be operating. Insurance is a game of diversification of risk. Nowadays, insurers may lose money in natural disasters policies, but there are other lines of businesses in which they generate significant profits that will offset those losses.

6. There are no significant losses in Puerto Rico's market because it has been a long time since a major disaster hits the island. Strong capital accumulation of local insurance companies made its market's side offer a wealthy and robust one. We do not foresee major problems in the upward trend of the Puerto Rico Insurance Property Market.
7. The only active participant of FEMA's Community Rating System in Puerto Rico (according to FEMA's 2011 report) is the Municipality of Ponce, classified as Level 9 (from 10 to 1). Government should stimulate an active participation in this program because it makes property insurance cheaper than the average market.
8. There are several re-insurers in the property insurance sector. However, there is a small group which dominates the market: Munich Re, Swiss Re, Hannover Re, Lloyd's of London, Berkshire Hathaway and SCOR. The top six have a top notch credit rating level granted by A. M. Best, which is a worldwide financial evaluator for insurance companies.
9. There are several local insurers in the property insurance sector. However, there is a small group which dominates the market: MAPFRE PRAICO Insurance, Universal Insurance and Cooperativa de Seguros

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Multiples. The top three have a top notch credit rating level granted by A. M. Best.

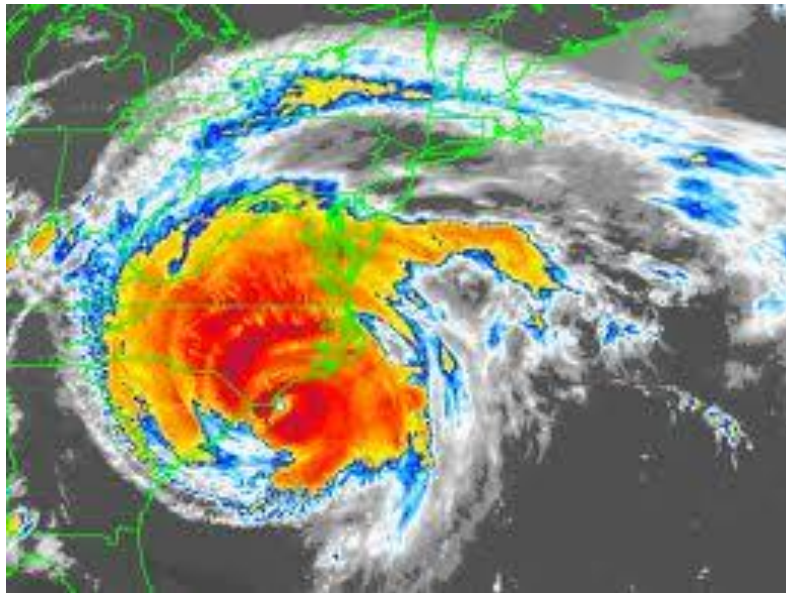
SECTION 1

Study Background

Study Background



La Perla, Old San Juan. Source: FEMA Website. Retrieved on June 12, 2013.



Source: FEMA Website. Retrieved on June 19, 2013.

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Source: FEMA Website. Retrieved on June 19, 2013.



Source: FEMA Website. Retrieved on June 19, 2013.

STUDY BACKGROUND

“Strengthening Activities on a Global Scale”, a recent assessment publication by the Wharton School’s Risk Center, revealed a dramatic surge in global economic losses from natural disasters, increasing from over \$50 billion during the ‘50’s to almost \$800 billion during the ‘90’s, with about \$420.6 billion so far in the current decade (through 2007). Munich Re, a key player in the re-insurance market, estimated worldwide economic losses from natural catastrophes of \$200 billion in 2008 to \$82 billion in 2007.

Lloyd’s of London and Risk Management Solutions (RMS), the other key players in the re-insurance market, predict that flood losses along tropical Atlantic coastlines would increase 80 percent by 2030 with about one foot of sea level rise – in line with the conservative estimates of the “Intergovernmental Panel on Climate Change” 2007 report.

An exceptional accumulation of very severe natural catastrophes made 2011 the highest-ever loss year on record, even after the first half of the year. The approximately US\$265bn in economic losses, up to the end of June 2011, easily exceeded the total figure for 2005, previously the costliest year with US\$220bn for the year as a whole. Most of the losses were caused by a single event, the earthquake in Japan on March 2011.

In Florida, property insurers have been operating in red on a cumulative basis since Hurricane Andrew struck in 1992. It took 11 years for insurers to break even after the losses paid out from Hurricane Andrew.

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Companies returned to profitability in 2003, and then slide back to red with back-to-back hurricanes in back-to-back years (2004, 2005).

It is currently unknown where Puerto Rico stands within these global trends.

This study will answer the questions derived from these worldwide investigations, but from Puerto Rico's insular point of view. We will answer the main investigation questions that follow in the best possible way:

1. Provide an understandable description of how insurance/reinsurance works in Puerto Rico, specifically in the coasts, the history of insurance and how insurance company operations compare to Florida, New York, and Texas. Included in the description, how insurers/reinsurers coordinate with the Planning Board, the Permits Management Office (OGP), FEMA, Natural & Environmental Resources Department (DRNA) and other permitting agencies.
2. What do Puerto Rico banks and insurers/reinsurers require from infrastructure developers.
3. How do banks assess investment risks and/or determine what projects can be funded in flood prone areas or coastal areas.
4. Can municipalities or the Commonwealth participate in the National Flood Insurance Community Rating System (CRS)?
5. If yes, which communities participate and what CRS class do they fall under?

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6. List of (re)insurance companies, their profiles, and activities.
7. What is the level of insurance penetration in Puerto Rico?
8. The role of micro-insurance in Puerto Rico.
9. Insurer/Reinsurer coordination with banks. What parameters are used to assess risk? Sources of information.
10. What parameters are used to assess risk? Sources of information.
11. Are disclosure laws in Puerto Rico requiring insurance companies to reveal their risk criteria or other information?
12. Example of typical underwriting criteria in Puerto Rico for coastal developments.
13. Trend analysis of insurance losses due to hazardous events.
14. Insurer/Reinsurer consideration of chronic risks like sea level rise. Participation in climate initiatives like other insurance companies statements on climate change such as Swiss Re, Lloyds of London and Munich Re.
15. Are insurance companies increasing or decreasing profits?
16. Do U.S. / Caribbean insurance loss studies accurately portray Puerto Rico's risk potential or are they based on erroneous data?
17. Are banks and insurance companies evaluating sea level rise, hurricane and flood projections to evaluate the need for funding or insuring of development projects?

18. List of knowledge gaps and recommendations to fill those gaps.
19. In case of a major natural disaster in Puerto Rico, will local insurers have the capability to cover the claims submitted by policy holders?

SECTION 1

How Insurance/Re-insurance Markets Work

How Insurance/Re-insurance Markets Work

Reinsurance is insurance that is purchased by an insurance company from one or more other insurance companies (the "reinsurer") as a means of risk management. The ceding company and the reinsurer enter into a reinsurance agreement which details the conditions upon which the reinsurer would take care and pay a share of the claims incurred by the ceding company. The reinsurer is paid a "reinsurance premium" by the insurance ceding company, which issues insurance policies to its own policyholders.

The reinsurer may be either a specialist reinsurance company, with an enormous economic wealth, which only undertakes reinsurance business, or another insurance company with an excess capacity to assume risk.

In a quantitative perspective, assume that an insurer sells 10 policies, each with a \$1 million policy limit. Theoretically, the insurer could lose \$1 million on each policy – totaling up to \$10 million. If it transfers 85% of the risks to a reinsurer, it will limit its possible losses to \$1.5MM, but it has to split the insurance premium with the reinsurer. It may be better to transfer some risk to a reinsurer as this will reduce the ceding company's exposure to risk.

There are two basic methods of reinsurance:

1. **Facultative Reinsurance** - negotiated separately for each insurance contract that is reinsured. Facultative reinsurance is normally purchased by ceding companies for individual risks not covered or insufficiently covered, by their reinsurance treaties, for amounts in

excess of the monetary limits of their reinsurance treaties and for unusual risks. Underwriting expenses, and in particular personnel costs, are higher for such business because each risk is individually underwritten and administered. However, as they can separately evaluate each risk reinsured, the reinsurer's underwriter can price the contract to more accurately reflect the risks involved.

2. **Treaty Reinsurance** - means that the ceding company and the reinsurer negotiate and execute a reinsurance contract. The reinsurer then covers the specified share of all the insurance policies issued by the ceding company that are within the scope of that contract. The reinsurance contract may oblige the reinsurer to accept reinsurance of all contracts within the scope (known as "obligatory" reinsurance), or it may require the insurer to give the reinsurer the option of reinsuring.

Almost all insurance companies have a reinsurance program, especially the small insurance firms. The ultimate goal of that program is to reduce their exposure to loss by passing part of the risk to a reinsurer or a group of reinsurers. In USA (including Puerto Rico), insurance, which is regulated at the state level, permits an insurer only to issue policies with a maximum limit of 15% of their surplus (net worth), unless those policies are reinsured. In other jurisdictions, allowance is typically made for reinsurance when determining the statutory margin of a required solvency.

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With reinsurance, the insurer can issue policies with higher limits than would otherwise be allowed, thus being able to take on more risk because some of that risk is now transferred to the reinsurer.

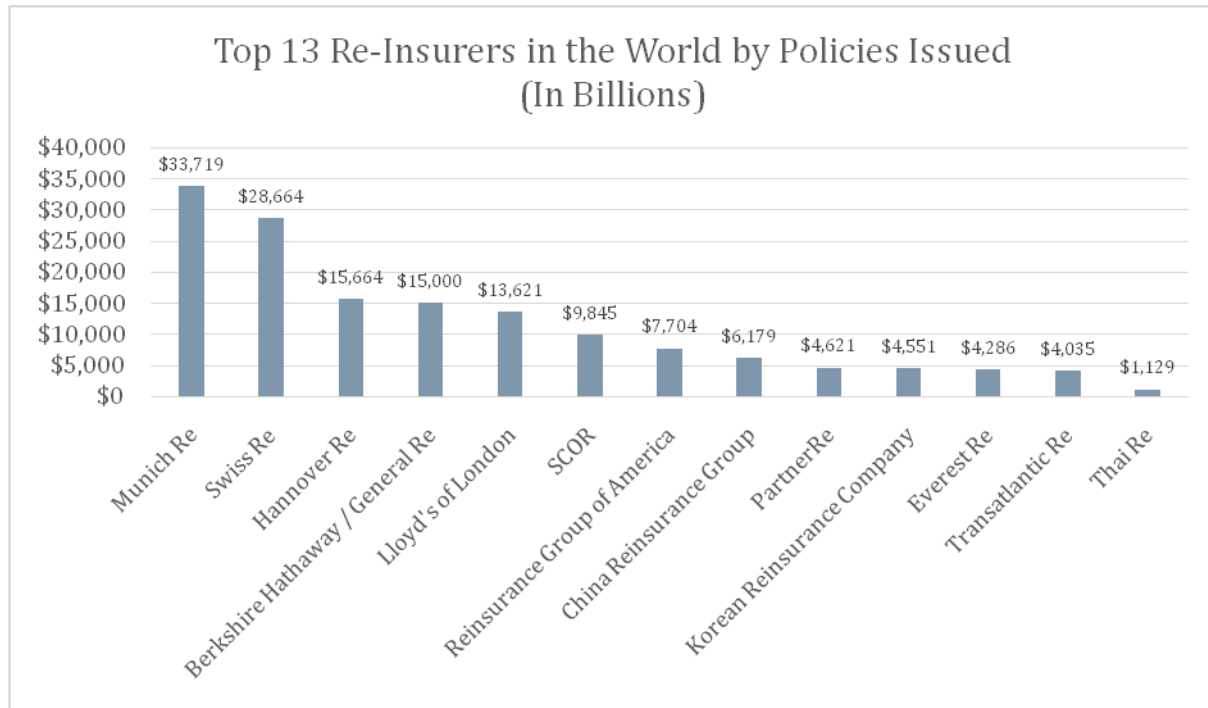
Over the years, there has been a tendency for reinsurance to become a science rather than an art: thus reinsurers have become much more reliant on actuarial and quantitative models and on tight review of the companies they are willing to reinsure. They closely review their finances, examine the experience of the proposed business to be reinsured, review the underwriters that will write that business, review their rates, and much more. Almost all reinsurers now visit the insurance company, review underwriting, claim files and more.

Reinsurance can make an insurance company's results more predictable by absorbing larger losses and reducing the amount of capital needed to provide coverage. The risks are diversified, with the reinsurer bearing some of the loss incurred by the insurance company.

Many reinsurance placements are not subscribed with a single reinsurer but are shared among a number of reinsurers. For example, a \$50,000,000 excess of \$40,000,000 layer may be shared by 40 or more reinsurers. The reinsurer who sets the terms (premium and contract conditions) for the reinsurance contract is called "Lead Reinsurer"; the other companies subscribing to the contract are called "Following Reinsurers."

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The graph below shows the thirteen (13) largest reinsurance companies sized by reinsurance policies issued:



Source: "Top 50 Reinsurers Revealed". Insurance Networking News. Retrieved 01/04/2013. Some conversions were performed from Euro to U.S. Dollar.

There's no certainty of reinsurance concentration by company in Puerto Rico because companies do not are enforced to disclaim their re-insurance treaties. However, is well known that Swiss Re & Munich Re have a big chunk of the world market. If we extrapolate this tendencies to Puerto Rico, if feasible to say that Swiss Re & Munich Re are the top reinsurers in Puerto Rico.

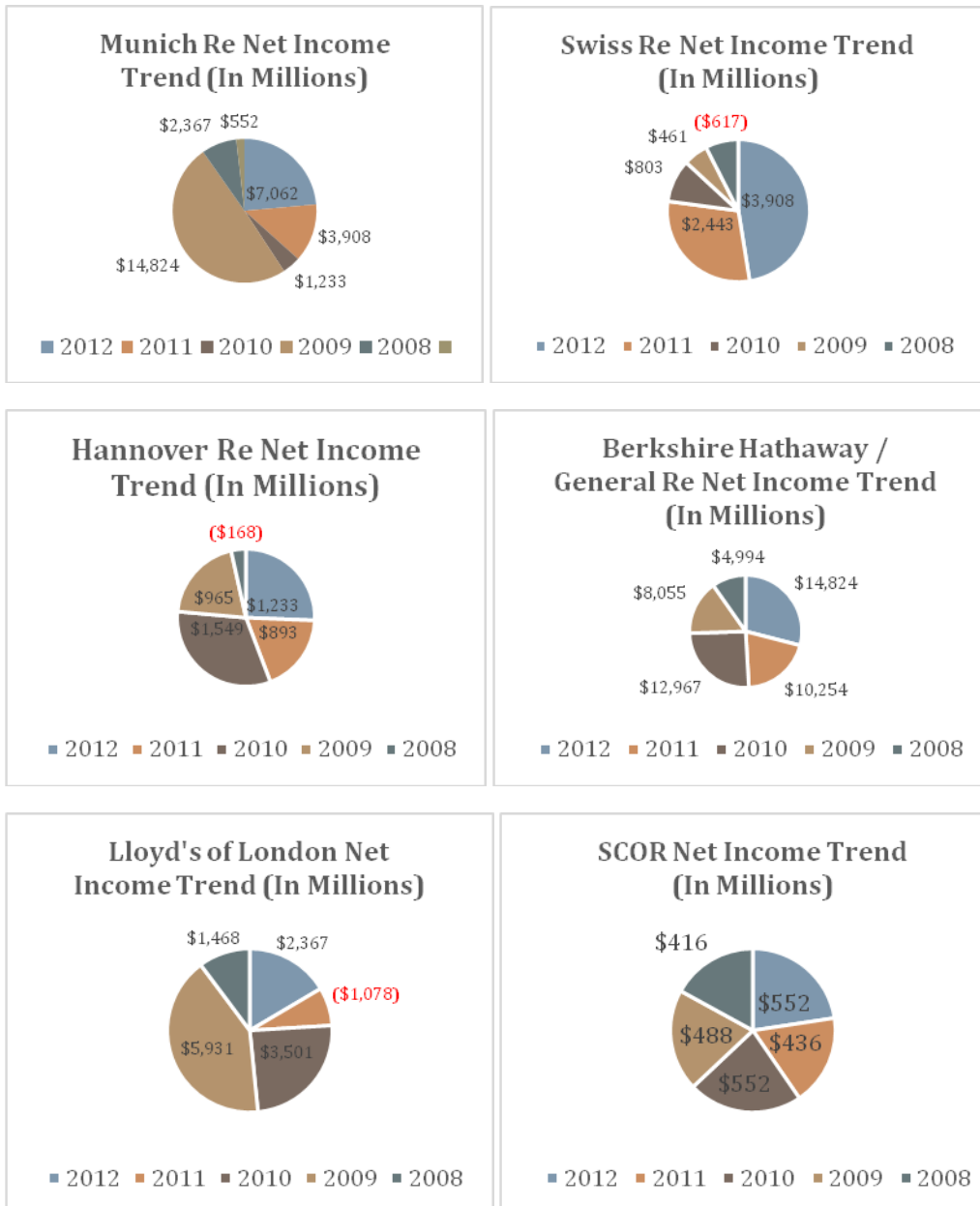
SECTION 1

Worldwide Re - Insurers: The Key Players by Figures

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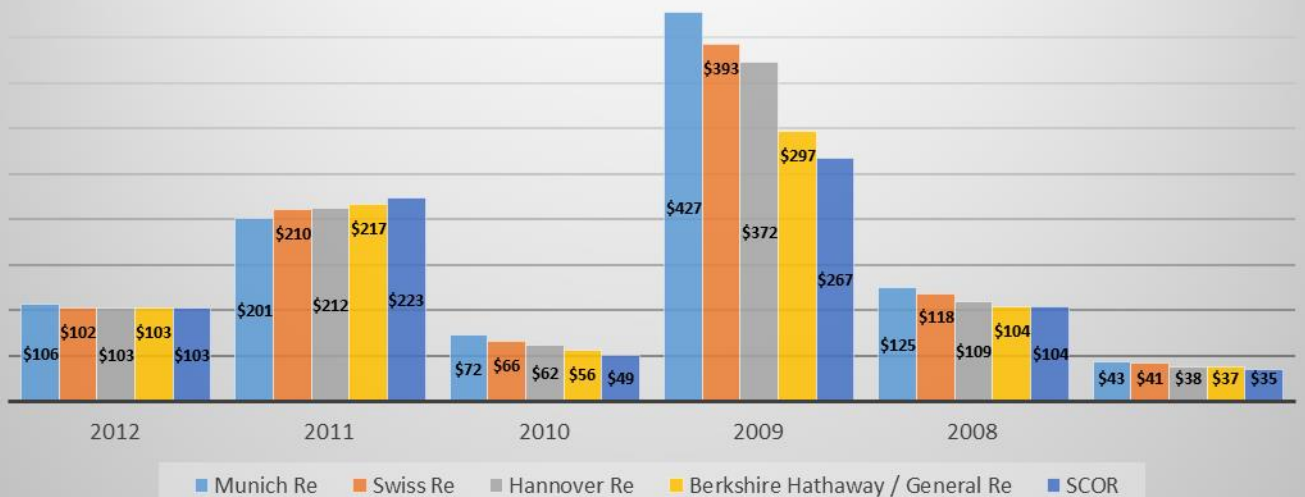
Worldwide Re - Insurers: The Key Players by Figures

The graph below shows the top five reinsurance companies sized by: Net Income and Assets Size:



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Worldwide Key Players of Re- Insurance Market By Insured Assets (In Billions)



Reinsurer	A.M. Best Rating	2012		2011		2010		2009		2008	
		Assets	Net Income	Assets	Net Income	Assets	Net Income	Assets	Net Income	Assets	Net Income
Munich Re	A+	\$80,509	\$5,350	\$77,525	\$1,180	\$77,838	\$3,978	\$77,838	\$4,721	\$77,838	\$3,834
Swiss Re	A+	\$215,785	\$4,201	\$225,899	\$2,626	\$228,403	\$863	\$232,748	\$496	\$239,877	(\$663)
Hannover Re	A+	\$54,811	\$933,723	\$49,867	\$676,788	\$46,725	\$1,174	\$42,264	\$731,185	\$37,490	(\$126,987)
Berkshire Hathaway / General Re	A++	\$427,452	\$14,824	\$392,647	\$10,254	\$372,229	\$12,967	\$297,119	\$8,055	\$267,399	\$4,994
Lloyd's of London	A	\$81,042	\$1,530	\$76,548	(\$697)	\$70,610	\$2,263	\$67,290	\$3,834	\$67,290	\$949
SCOR	A	\$32,590	\$418	\$31,319	\$330	\$28,722	\$418	\$27,989	\$370	\$26,534	\$315

Source: Results posted by their proper websites. Retrieve on 6/20/2013

SECTION 1

The Dynamics of Insurance / Re- insurance in Puerto Rico

The Dynamics of Insurance / Re-insurance in Puerto Rico

The Puerto Rico insurance industry has been operating for more than 100 years, principally as a component of the larger financial products and services industry. Relatively few independent insurers operate in the area.

Puerto Rico insurance companies have not been motivated to generate and expose significant capital for underwriting catastrophe perils. Characteristically, they limit their catastrophe risk retention levels to under 15 percent, the remainder being ceded to reinsurers. The availability of reinsurance affects the profitability of Puerto Rican insurance companies, as it governs the ability to write policies and thus generate subsequent income from reinsurance commissions. Tight markets, i.e., high premiums, have a pass-through effect, including proportionately higher commissions. Policy coverage restrictions are generally designed and imposed by foreign reinsurers, and their effect falls on the policy holders rather than on the insurance companies.

In recent years, Puerto Rico and the Caribbean area (mostly the Caribbean Area) have seen their share of natural disasters, and their insurance markets have been through one of their most difficult periods. As a result, Caribbean insurers need to evaluate their portfolio risks with greater precision so that they can prove to reinsurers their true exposures and thereby maintain reinsurance protection at reasonable costs.

It seems that the insurance industry needs to be rationalized as it is evident that there are far too many companies in proportion to population and Gross Domestic Product.

Although the importance of hazard and vulnerability mitigation measures is broadly accepted, Puerto Rican insurance companies are not inclined to take any initiative. They rely on the underwriting requirements laid down by reinsurers and view leadership in vulnerability reduction as a government function.

It is believed that reinsurance premium pricing and commission mechanisms can be adapted to encourage improvement in the quality of portfolios risk, hence, allowing discriminatory premium pricing for vulnerability reduction measures by policy holders. First, it is required a set of updated meaningful and workable risk-quality criteria and their incremental cost implications.

Means of preventing the consequences of natural disasters losses in Puerto Rico fall into two basic categories:

1. Hazard mitigation and vulnerability reduction measures adopted before a hazardous event to minimize losses (also known as a preventive strategy.) To achieve this goal, the following tools are needed.
 - a. Updated hazard-mapped locations.
 - b. Updated building type, structural vulnerability characteristics, and building contents.

- c. Engineering certification for individual risk characteristics.
2. Economic mechanisms such as insurance, which pre-finance the costs of reconstruction. The former are ultimately more efficient, although the latter can reduce economic volatility by spreading risks.

Regulatory measures for encouraging vulnerability reduction in the real estate sector include:

1. Non-structural measures such as identification of hazard-prone areas and limitations on their use, especially in rural areas.
2. Dissemination of hazard risk information, and use of incentives and disincentives (such as monetary fines) to promote safer development.
3. Structural measures, such as the use of updated building codes and materials specifications, the retrofitting of existing structures, and the use of protective devices. Strengthened insurance regulatory oversight in the region can also support the objectives of properly evaluating real-sector portfolio risks and ensuring the financial strength and solvency of the insurance industry.

The reinsurance product available to the Puerto Rican market is in essence designed and priced by foreign reinsurers (Munich Re, Swiss Re, et al) on the basis of their worldwide catastrophe experience. Puerto Rican insurers now face the need to evaluate their portfolio risks more precisely than before so as to demonstrate their true exposures to reinsurers, and thereby maintain reinsurance protection at justified and reasonable costs.

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Opportunities for further foreign investment and sustained growth in Puerto Rico are limited, due to the high rate of insurance penetration, according to Timetric's "The Insurance Industry in Puerto Rico, Key Trends and Opportunities to 2017."

The growth of the Puerto Rican insurance industry is the result of the government's health care reforms, the implementation of a Medicare program and compulsory third-party motor insurance.

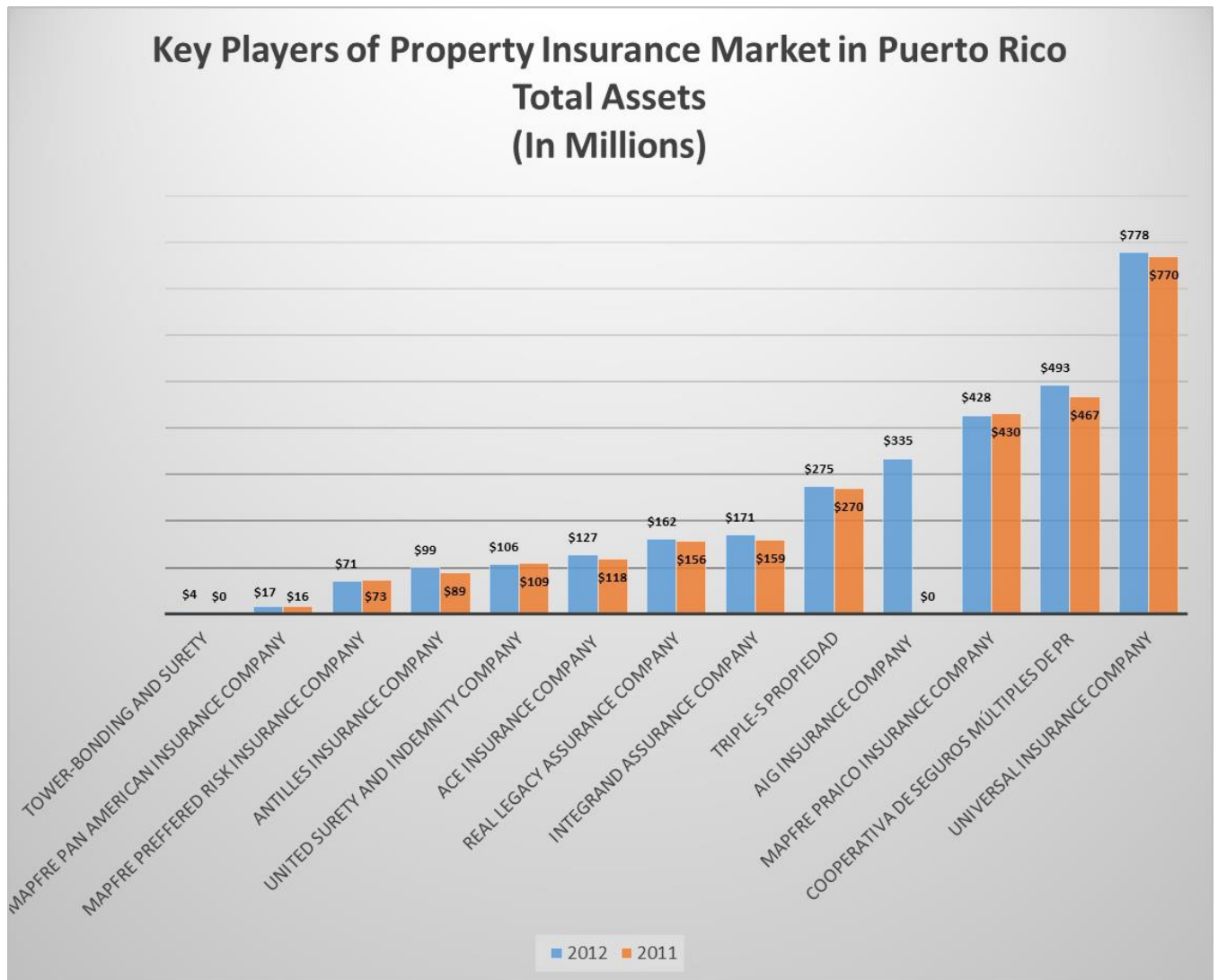
Among the local insurance players in the Puerto Rican Market, Universal Insurance Group is the leader entity with solid earnings of \$25 and \$28MM for 2012 & 2011, respectively, and secured assets for \$778MM & \$770MM for 2012 & 2011, respectively. Almost all of the insurance firms in Puerto Rico are rated by A. M. Best which shows soundness in business practices.

In the next pages you will see some financial highlights of the participants (from the side offer) in the property insurance market of Puerto Rico. In table I you will see the participant's insurance firm by assets size, Table II by Net Income and in Table III you will see a compilation of assets, income and credit rating. The credit rating shown was assigned by A.M. Best, who is the most rigorous and tough financial evaluator of the insurance industry. Credit Rating is an important issue because is the main criteria for regulators to keep chartering the company. Such chartering is necessary to do business in the insurance industry in Puerto Rico.

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Puerto Rico Property Insurers: The Key Players

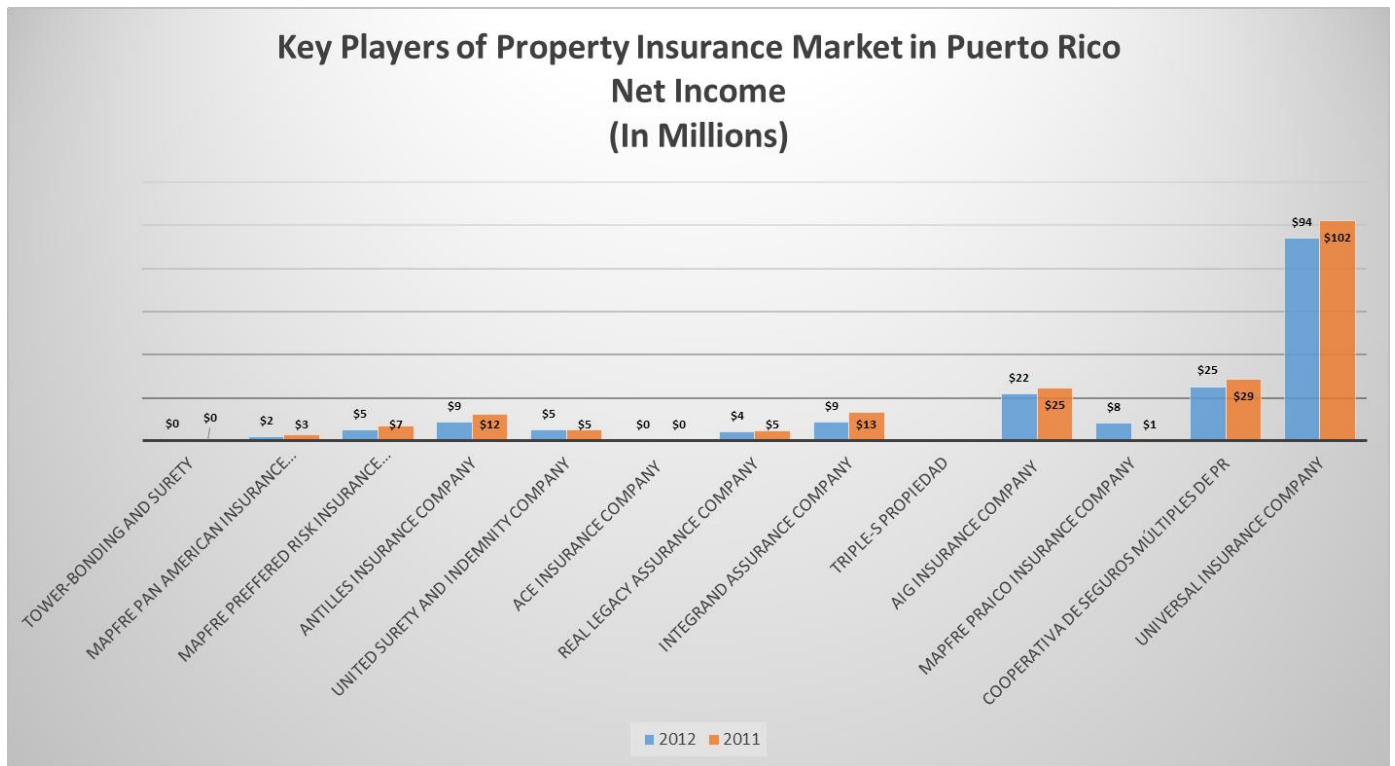
Table I



Source: A. M. Best website (www.ambest.com). Retrieved 06/19/2013.

Table II

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Source: A. M. Best website (www.ambest.com). Retrieved 06/19/2013.

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Table III

Puerto Rico Property Insurance Market Highlights

	A.M. Best Rating	2012 Assets	2011 Assets	2012 Income	2011 Income
Tower-Bonding and Surety	Non Rated	\$4,167,985	N/A	N/A	N/A
Mapfre Pan American Insurance Company	A	\$16,565,606	\$16,411,210	\$354,820	\$487,207
Atlantic Southern Insurance Company	C++	\$17,688,403	\$17,015,896	-\$517,276	-\$908,919
Multinational Insurance Company	B++	\$29,290,281	\$27,073,303	\$695,678	\$16,558
Popular Life RE	B+	\$66,249,957	\$61,749,744	\$4,116,996	\$3,635,660
Mapfre Preferred Risk Insurance Company	Non Rated	\$70,539,092	\$72,910,343	\$2,141,014	\$2,878,049
Antilles Insurance Company	A	\$99,015,838	\$89,012,800	\$5,070,702	\$6,793,731
United Surety and Indemnity Company	A	\$106,187,895	\$108,774,246	\$8,861,120	\$12,241,957
ACE Insurance Company	A+	\$127,262,515	\$117,613,162	\$5,015,568	\$5,029,726
Real Legacy Assurance Company	A-	\$162,234,164	\$156,147,002	N/A	N/A
Integrand Assurance Company	A-	\$171,079,744	\$158,915,123	\$4,363,500	\$4,512,620
Triple-S Propiedad	A-	\$274,533,961	\$270,344,477	\$8,786,482	\$13,272,467
AIG Insurance Company (Now Chartis)	A+	\$334,740,450	N/A	N/A	N/A
Mapfre Praico Insurance Company	A+	\$427,695,799	\$430,413,722	\$21,825,899	\$24,696,032
Cooperativa de Seguros Múltiples de PR	A-	\$492,888,708	\$467,182,214	\$8,236,477	\$1,087,815
Universal Insurance Company	Non Rated	\$778,286,593	\$769,664,445	\$25,214,376	\$28,552,814
Totals for Property Insurance Market		\$3,178,426,991	\$2,763,227,687	\$94,165,356	\$102,295,717

A+ Assigned to companies that have, in our opinion, an excellent ability to meet their ongoing insurance obligations.

A- Assigned to companies that have, in our opinion, an excellent ability to meet their ongoing insurance obligations.

A Assigned to companies that have, in our opinion, an excellent ability to meet their ongoing insurance obligations.

B++ Assigned to companies that have, in our opinion, a good ability to meet their ongoing insurance obligations.

B+ Assigned to companies that have, in our opinion, a good ability to meet their ongoing insurance obligations.

C++ Assigned to companies that have, in our opinion, a marginal ability to meet their ongoing insurance obligations.

Financial strength is vulnerable to adverse changes in underwriting and economic conditions.

Source: A. M. Best website (www.ambest.com). Retrieved 06/19/2013.

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Effect on Net Profits in Puerto Rican Property Insurers Companies Caused by Alien Reinsurers

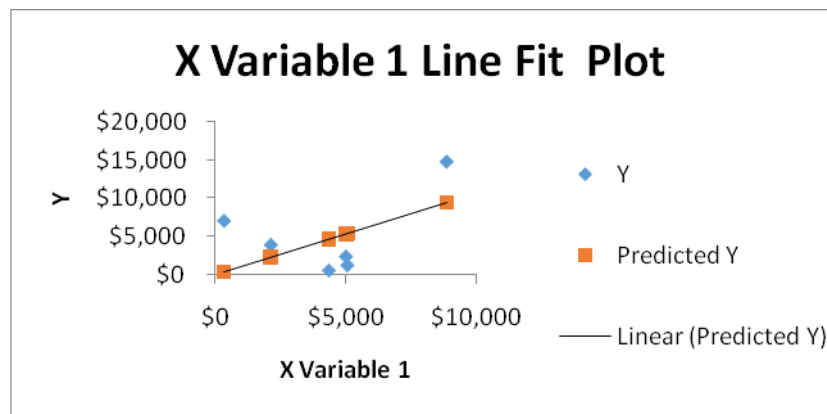
To prove the direct relation of local insurers' profits with the profits of the reinsurers, we performed a regression analysis using the R Square method shown here:

Table IV

Reinsurer	2012 Net Income in BB	Puerto Rico Insurer	2012 Net Income (000's omitted)
Munich Re	\$7,062	Mapfre Pan American Insurance Company	\$355
Swiss Re	\$3,908	Mapfre Preferred Risk Insurance Company	\$2,141
Hannover Re	\$1,233	Antilles Insurance Company	\$5,071
Berkshire Hathaw	\$14,824	United Surety and Indemnity Company	\$8,861
Lloyd's of London	\$2,367	ACE Insurance Company	\$5,016
SCOR	\$552	Real Legacy Assurance Company	\$4,364

Regression Statistics					
Multiple R	0.769261138				
R Square	0.591762698				
Adjusted R Square	0.391762698				
Standard Error	4885.4083				
Observations	6				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	172,984,279.35	172,984,279.35	7.247778374	0.054535165
Residual	5	119,336,071.28	23867214.26		
Total	6	292,320,350.63			
RESIDUAL OUTPUT			PROBABILITY OUTPUT		
Observation	Predicted Y	Residuals	Percentile	Y	
1	377.11	6684.89		8.33	551.76
2	2,275.53	1632.38		25.00	1,232.51
3	5,389.28	(4156.77)		41.67	2,366.91
4	9,417.84	5406.16		58.33	3,907.91
5	5,330.68	(2963.77)		75.00	7,062.00
6	4,637.65	(4085.89)		91.67	14,824.00

THE INSURANCE / REINSURANCE MARKET IN PUERTO RICO



Profits from Puerto Rican firms are determined by 59% (R Square .591762698) of their counterparts in re-insurance. We should remember that local insurance industry only keeps in its portfolio a 15% or less of insured risk. The remaining 85% was sold in the re-insurers market. So, reinsurance is a direct determinant of the profits of the local insurance market. The remainder 41% of the local insurers' profits is determined by other variables not dependable on the re-insurance market, like competition, market penetration, et al.

Local insurance companies had sound practices due to strong regulation. We do believe under these circumstances that any of the local insurers will be able to indemnify their policy holders.

SECTION 2

Main Investigations Topics

Research Topics & Questions with their Proper Answers

1. *How Insurance/Reinsurance works in Puerto Rico, Florida, New York & Texas.*

The dynamics of insurance/reinsurance in Puerto Rico, Texas, Florida and New York is basically the same: the subscribed policies and resale 85% of the risk insured in the reinsurance markets. However, there are some risks that insurers can afford because their reinsurers reject to buy their surplus.

For example, in Texas, rejected risks were accepted by The Texas Windstorm Insurance Association (TWIA), which was created by the State of Texas as an insurer of last resort for wind and hail damage for property owners on the Texas Gulf Coast. TWIA does not insure against water damage, including floods, tidal action or storm surges. TWIA was funded by a combination of premiums from policy holders, assessments on property insurers who write policies in Texas, reinsurance, and ultimately, state tax credits. The funding from premiums, assessments to insurers, and reinsurance were limited to predetermined levels. Any amounts that TWIA paid out above these levels were funded with tax credits that reduce the general revenue of the Texas State.

TWIA is not properly funded and is not in a financial position to meet its obligations. In January 2013, the general manager of TWIA John Polack, told the Texas House of Representatives Insurance

Committee the following statement; “TWIA had over \$75 billion in insured risks and less than \$80 million in available funds to cover these risks. If TWIA was a private insurer, the amount TWIA would need to have in reserves—that is, on hand and available—to insure \$75 billion in risk would be an amount on the order of \$25 billion. TWIA is not remotely close to having such an amount available to meet its obligations. If a large storm was to hit the Texas coast requiring TWIA to pay several billion dollars in claims, TWIA would not have the funds to do so. Nor is there any evidence that TWIA would be in a position to sell bonds in an amount to cover its obligations without the State of Texas and all Texas citizens guaranteeing repayment of the bonds.” (*House of Representatives Insurance Committee hearings, January 2013, Reference #15 in References Section*).

TWIA is, in fact, paying out more than it collects in premiums, assessments, reinsurance, and every other source of funding it has available.

Otherwise, in Florida, the current situation is that surplus growth and other factors should leave insurers better prepared to pay claims if a major storm makes landfall in Florida for the first time since 2005.

Still, the surplus growth isn't evenly spread among all of Florida's insurers; just two companies accounted for more than half of the 2012 increase in surplus.

In fact, the firm with the biggest cushion is state-run Citizens Property Insurance Corp., which has three times more money in reserve — \$6.3 billion — than Florida's top 20 private insurers, even though it covers only half as much property value as those firms. *(Reference #15 in References Section)*

Florida's property insurance market has been in turmoil in recent years, with large national carriers fleeing the state after eight hurricanes made landfall in 2004 and 2005.

The smaller, Florida-based companies that now dominate the market have not followed the traditional model of building large reserve funds in good years to pay claims in bad years.

Instead, Florida-based insurers act as intermediaries when it comes to hurricane risk. They pay huge sums to offshore reinsurance companies that agree to cover claims if a storm hits Florida.

Reinsurance costs can be extraordinary, roughly 40% to 50% of a homeowner's premium.

Building up surplus would allow companies to buy less reinsurance, relieving pressure to raise rates when reinsurance costs spike.

Florida's private insurers have long complained they have not been able to charge adequate rates despite escalating premiums during the last

several years. They also have repeatedly pushed for changes to Citizens, the state's largest insurer, arguing that it represented unfair competition and artificially constrained rates.

But the insurers are under fire for not reinvesting enough of the money they collect into reserves. They often divert profits into affiliates, reaping substantial gains while reporting paper losses and letting reserve funds languish.

In New York State, in the aftermath of Hurricane Sandy, New York City's administration announced the creation of the Special Initiative for Rebuilding and Resiliency, which aims to identify ways to significantly improve the city's resilience to severe weather and climate change. Prior to these, there was not a real concern about severe weather risks in New York. New York administration started from the premise that they were out of the geographical area of severe weather risk.

As part of this project, Swiss Re was commissioned to provide a quantitative assessment of potential climate related risks facing the City as well as measures that could reduce those impacts.

The report found that the annual expected weather-related loss for the five Boroughs of New York City is estimated at USD 1.7 billion, increasing to USD 4.4 billion by 2055. "The modeling suggests that the increase in losses is split evenly between losses driven by sea level rise and those driven by more severe hurricanes. The report relied heavily on Swiss Re's internal modeling tools to translate the meteorological

effects of climate change to a range of potential economic loss outcomes”. (*Reference # 12 in References Section*)

Insurance is an important component of any resiliency plan, and the administration plan is no exception. The report details how the insurance industry can play a significant role as the city rebuilds areas devastated by Hurricane Sandy, from education and outreach to consumers, to the incorporation of resiliency measures in rate setting and underwriting methodology.

In the case of Puerto Rico, insurance companies rely heavily on the reinsurance market; no matter that the underlined asset to be insured is in the coastal zone or inland. They ask for a quote to their reinsurer counterpart to price the insurance policy to be issued. To qualify for insurance, properties must pass a checklist of requirements which will be discussed further in the next topic.

2. Requirements from Puerto Rico Banks and Insurance Companies from Infrastructure Developers.

Basically, banks in Puerto Rico have a checklist of insurance policies items that the developer must provide to access funding for a development project.

The first standard that the project must pass is the flood zone location. These locations were categorized by FEMA. If the proposed development was placed in a flood zone, the bank will not finance the project. The second standard that the project must pass is the type of

material in which the structure is intended to be constructed. The only acceptable material to build up a structure and its foundations is concrete. If is not concrete it could not be financed or even insured. Every other concern despite flood locations, materials and government designated reserve areas is not take it in account.

Beyond that, the developer must provide the following:

- a. Builders Risk Insurance from various perils (fire, earthquake).
- b. Flood Insurance (No matter the development site is located out of identified flood sites. This insurance is mandatory to cover the time gap of updating the mapping of flood zones by FEMA).
- c. Performance Bond to ensure the continuity of the construction project. A Performance Bond is a written guaranty from a third party guarantor (usually a bank or an insurance company) submitted to a principal (client or customer) by a contractor upon winning the bid. A performance bond ensures payment of a sum (not exceeding a stated maximum) of money in case the contractor fails in the full performance of the contract.

Insurers just need the economic value and site of the development project to quote the policy in the re-insurers market.

3. Puerto Rico Banks Assessments of Real Estate of Investment Risks in Flood Prone and Coastal Areas

Flood Prone Areas or Coastal Areas Banks assess investments risks in development projects basically in four ways:

- a. The economic viability of the project
- b. The credit worthiness of the developer
- c. Banks in Puerto Rico require developers to buy an insurance policy named “Builders Risk Insurance” which covers natural disaster perils
- d. A payment and Performance Bond is required from the bank to cover their interest in the project.

Performance bonds usually cover 100 percent of the contract price and replace the bid bonds on award of the contract. Unlike a fidelity bond, a performance bond is not an insurance policy and (if cashed by the principal) the payment amount is recovered by the guarantor from the contractor; also called standby letter of credit / contract performance.

To mitigate flood risk, banks rely in the Puerto Rico Flood Maps issued by FEMA. These are maps designed by FEMA to categorize the different special flood hazard areas for coastal regions. If a project is located in a flood prone area, it can not be funded by the bank.

Current Flood Insurance Rate Maps (“FIRMs”) for Puerto Rico, effective since April 19, 2005, are being revised by FEMA. Updated

flood studies have produced new data concerning base flood elevations, special flood hazard areas and floodway limits for the following rivers:

- a. Rio Grande de Loiza and its principal tributaries: Rio Gurabo, Rio Valenciano, Rio Cagüitas, Rio Turabo and Rio Bairoa.
- b. Rio Sabana
- c. Rio Culebrinas
- d. Rio Grande de Añasco
- e. Rio Guanajibo
- f. Quebrada Honda de Mayagüez
- g. Quebrada Mabú
- h. Quebrada Cambute
- i. Rio Canas

FEMA will also revise Special Flood Hazard Areas for coastal regions. The Puerto Rico Planning Board and FEMA will be announcing additional public hearings if they become necessary before the official effective date of these new FIRMs.

With the release of the new maps, some property owners will learn that their risk is higher or lower than they thought. Flood insurance is a federally underwritten program that can help you repair or replace your structure and belongings after a flood. The federal government requires mortgage holders in high-risk areas (SFHAs) to carry flood insurance.

4. National Flood Insurance Community Rating System (CRS) and the Municipalities.



Source: FEMA Website. Retrieved on July 25, 2013

Can municipalities or the Commonwealth participate in the National Flood Insurance Community Rating System (CRS)?

The answer is yes, they can. But let's rationalize what is CRS and what is the criteria to be rated in the program.

The National Flood Insurance Act of 1968 allows FEMA to make flood insurance available only in those areas where the appropriate public body has adopted adequate floodplain management regulations for its flood-prone areas. Individual citizens can not regulate building or establish construction priorities for communities. Without community oversight of building activities in the flood plain, the best efforts of some to reduce future flood losses could be undermined or nullified by the careless building of others. That's why Puerto Rico only had a single participant as a county, which is the municipality of Ponce. In order to

be in compliance with CRS classifications huge investments should be made in municipalities of Puerto Rico. Most of them will like to be in compliance with the rating system, but they don't have the economic resources to do so. Puerto Rico as a whole county participates in the program. Currently, Puerto Rico is not up to "fit" the requirements of the CRS classes, but it's include in the system because the "government big muscle capacity" to enforce the requirements to be in.

How communities goes up in the rankings of the CRS ratings classes? Participation in the Community Rating System (CRS) is voluntary. By participating, communities earn credit points that determine classifications. There are 10 CRS Classes: Class 1 requires the most credit points and provides the largest flood insurance premium reduction (45%), while Class 10 means the community does not participate in the CRS or has not earned the minimum required credit points, and residents receive no premium reduction. The CRS Classes are based on completion of 19 creditable activities organized into 4 categories:

- a) Public information
- b) Mapping and regulations
- c) Flood damage reduction
- d) Flood preparation

CRS class changes occur on May 1 and October 1 of each year.

Unless the community as a whole is practicing adequate flood hazard mitigation, the potential for loss will not be reduced sufficiently to affect disaster relief costs. Insurance rates also would reflect the probable higher losses that would result without local floodplain management enforcement activities.

Community participation in the NFIP is voluntary (although some states require NFIP participation as part of their floodplain management program). Each identified flood-prone community must assess its flood hazard and determine whether flood insurance and floodplain management would benefit the community's residents and economy.

Suspension of a participating community occurs when the community fails to adopt an adequate ordinance, including adopting the most current FIRMs. The community is provided written notice of the impending suspension and granted 30 days in which to show why it should not be suspended. Suspension is imposed by FEMA. If suspended, the community becomes non-participating and flood insurance policies can not be written or renewed.

Policies in force at the time of suspension, however, continue in force for the term of the policy. FEMA may suspend a participating community when the community fails to enforce its floodplain management regulations for failure to adopt compliant floodplain management measures, or if it repeals or amends previously compliant floodplain management measures. New flood insurance coverage can

not be purchased and policies can not be renewed in a suspended community. Policies in force at the time of suspension continue in force for the policy term. If the community is suspended following a period of probation, the community is provided written notice of the impending suspension and granted 30 days in which to show why it should not be suspended.

5. National Flood Insurance Community Rating System (CRS) and Rating Classes.

A community's participation status can significantly affect current and future owners of property located in SFHAs. The decision should be made with full awareness of the consequences of each action.

The only active participant in Puerto Rico (as a municipality) in this classification is the Municipality of Ponce, classified as Level 9 (from 10 to 1).

We are including the current participants at nationwide levels in the Appendix Section.

THE INSURANCE / REINSURANCE MARKET IN PUERTO RICO

6. List of (Re) Insurance Companies, their Profiles and Activities.

There are several re-insurers in the property insurance sector. However, there is a small group who dominates the market. We will list the top six with their profiles and markets served. The top six have a top notch credit rating level granted by A. M. Best, which is the most rigorous of financial risk evaluators.



A. M. Best Rating:	A+	A. M. Best Rating:	A+
Country of Origin:	Germany	Country of Origin:	Switzerland
Assets Size:	\$80 BB	Assets Size:	\$216 BB
2012 Net Income:	\$5 BB	2012 Net Income:	\$4 BB
Markets Served:	All segments of Insurance and Re-Insurance	Markets Served:	All segments of Insurance and Re-Insurance



A. M. Best Rating:	A+	A. M. Best Rating:	A++
Country of Origin:	Germany	Country of Origin:	United States
Assets Size:	\$55 BB	Assets Size:	\$427 BB
2012 Net Income:	\$933 MM	2012 Net Income:	\$14 BB
Markets Served:	All segments of Re-Insurance	Markets Served:	All segments of Re-Insurance



A. M. Best Rating:	A	A. M. Best Rating:	A
Country of Origin:	United Kingdom	Country of Origin:	France
Assets Size:	\$81 BB	Assets Size:	\$33 BB
2012 Net Income:	\$1.5 MM	2012 Net Income:	\$418 MM
	All segments of Insurance and		All segments of
Markets Served:	Re-Insurance	Markets Served:	Re-Insurance

7. Insurance Penetration in Puerto Rico

The insurance industry in Puerto Rico had a compound-annual-growth-rate of 5.8 percent between 2007 and 2011, despite a contracting national economy, according to a report from “Timetric”, a provider of on-line data, analysis and advisory services on the financial services industry. However, opportunities for further foreign investment and sustained growth in Puerto Rico are limited, due to the high rate of insurance penetration, according to Timetric's "The Insurance Industry in Puerto Rico, Key Trends and Opportunities to 2017."

The growth of the Puerto Rican insurance industry is the result of the government's health care reforms, the implementation of a Medicare program and compulsory third-party motor insurance. In contrast, Puerto Rico's annual gross domestic product, at constant prices, fell between 1.9% and 2.3 % from 2007 to 2011, due to a decline in exports,

the global financial crisis, falling investment in construction and declines in government spending.

To boost investor confidence, legislation was enacted in 2011 as a part of collaboration between the government and the office of the Insurance Commissioner. The law placed a flat 4% tax rate for 15 years on all overseas insurers starting business in the 2012 tax year. Companies receive an option to renew the contract for two more 15-year terms. However, high levels of insurance penetration have dissuaded investment from new market entrants. At 11.3%, Puerto Rico's insurance penetration was the highest in Latin America. By comparison, Costa Rica's is 1.9%, Guatemala's 1.3%, the Dominican Republic's 1.2%, and the world average is 6.8%. As a result, insurers considering ventures in Puerto Rico will likely opt for countries with lower penetration levels.

8. The Role of Micro-Insurance in Puerto Rico

Micro insurance refers to an insurance policy with a super low premium, and a low coverage limit. Micro insurance is important because it is affordable to a person who can not afford a normal insurance policy.

Even when micro insurance is available, many people who qualify for it do not purchase it. Although the premiums are low, the clients are concerned about paying another bill, especially when the policy will

require additional payments for several years. Clients who do purchase a micro insurance policy are much more likely to submit a claim on the policy than other insurance clients.

Micro insurance involves loans to risky clients who can not afford to pay a high enough premium to cover the insurer's risk. An insurer who offers micro insurance must insure a large number of clients to earn a profit. When there are many members spread out across a country, the risk of a specific disaster such as fire, flood or hurricane is different in each area. According to the Wharton School of Business Risk Center, micro insurance policies are often not specific enough to provide useful coverage for an individual village.

There are two local experience as a reference for micro-insurance. One is the “Collision Liability Car Insurance” which serves the marginal segments of auto-collision insurers, and the “Corporacion de Seguros Agricolas which serve local agriculture and fishing entrepreneurs. Basically this kind of micro-insurance is a subsidize operation, granted and re-insured within the Federal Crops Insurance Corporation (FCIC), in which government pays a portion of the insurance premium up to \$1,750.00. This micro-insurance covers up to 65% of the crops (fishing) in the eventuality of a loss occurrence, excluding floods caused by heavy rainfall (unless the affected area was declared a “Disaster Area”). (It’s also includes the surplus production without consumers demand). Among products included are: café, guineo, cana de azucar,

vegetables, farinaceous and critics. There's an extended coverage which insure structures and buildings used in the production process. Business owners must have a limited income capacity. The program have a cap of \$20,000 of income in order to participate in this program. This cap is a huge limitation because almost all agriculture and fishing entrepreneurs, even the small ones, have incomes over \$20,000 in their business. Cause of this income cap defined in the requirements to participate in the program, many agricultures and fishing entrepreneurs are not allowed to buy the micro-insurance. (See reference # 12)

9. Insurance Companies Coordination whit Banks to Asses Risk

There is no direct coordination of insurers and banks. The project developer is the one who buy the insurance to cover banks' exposure. The developer is the one which deals with the insurance company (not the re-insurance). Please refer to the answer of question #3.

FEMA defines Risk, vulnerability and exposition in a specific way.

Vulnerability is divided in two classes: Physical vulnerability and Social vulnerability.

10. Associations and Partnerships where Insurers/Reinsurers Participate in Puerto Rico

Association of Insurance Companies Incorporated in Puerto Rico (ACODESE) is the organization that represents the insurance market in Puerto Rico. The Association of Insurance Companies in Puerto Rico was created in 1975, in a constituent congress which was represented by almost the entire insurance industry of Puerto Rico, known as the *Association of Insurance Companies Incorporated in Puerto Rico, Inc.*

Insurance companies need a domestic spokesman that would serve for industry representation on matters of special importance. But at the same time, they wanted the association from becoming an instrument of unity for the whole industry, while serving the people through collective benefit initiatives.

By creating the association, the insurance sector of the country ceased to be dispersed and began to have access to a dynamic partnership to ensure the best interests of the local insurance sector.

11. Parameters used by Banks to Assess Risk

Let's define first what "Risk" means. Risk management is the identification, assessment, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives, whether positive or negative) followed by coordinated and economical

application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities. Risks can come from uncertainty in financial markets, project failures (at any phase in design, development, production, or sustainment life-cycles), legal liabilities, credit risk, accidents, natural causes and disasters as well as deliberate attack from an adversary, or events of uncertain or unpredictable root-cause. Several risk management standards have been developed including the Project Management Institute, the National Institute of Standards and Technology, actuarial societies, and ISO standards. Methods, definitions and goals vary widely according to whether the risk management method is in the context of project management, security, engineering, industrial processes, financial portfolios, actuarial assessments, or public health and safety.

The strategies to manage risk typically include transferring the risk to another party, avoiding the risk, reducing the negative effect or probability of the risk, or even accepting some or all of the potential or actual consequences of a particular risk.

Many factors contribute to the proper risk assessment of the properties you insure. It takes market research, building insight and industry savvy. Additionally, proper risk assessment requires a strong foundation of information.

Insurance companies including Puerto Rico use the risk assessment concept to calculate premium rates for policy-holders. Using software that computes a predetermined algorithm, insurance underwriters gauge the risk that you may file a claim against your policy. These algorithms are based on key indicators about you and then measured against a data set to weigh risk. Insurance underwriters carefully balance the insurance company's profitability with your potential need to use the policy. Resources such as "Moody's Risk Analysis", an information services company, contain detailed data sets that help insurer's segment potential customer groups' predictive behaviors.

Moody's Predictive models are developed from past historical records of insurance policies, containing financial, demographic, psychographic, geographic information, along with properties of insured objects. From the past insurance policy information, predictive models can learn patterns of different insurance claim ratios, and can be used to predict risk levels of future insurance policies. It is important to note that statistical process requires a substantially large number of past historical records (or insurance policies) containing useful information. For example, third-party software vendors can pull verified data from this source to quickly calculate decisions about the creditworthiness and risk assessment of certain sub-segments of their audience.

Sub-segments could be males under the age of 25, a family history of certain illnesses or single women who fall into a particular income bracket.

Insurance underwriters seek to protect both policy holders and the companies that back these policies. Using verified research data helps underwriters evaluate an insurer's potential exposure to claims that could result in expensive payouts. Economic forecasting, wage and industry trending and market stability assessments are all part of the data that is ultimately used to calculate your insurance premium.

If there are criteria present that tend to result in more payouts, your payment increases. For example, smoking is a high-risk behavior because it is known that smokers are likelier to need hospitalization. Health insurance companies may charge smokers more because there is a statistical likelihood that the policy owner will cost them money.

Nearly 98% of U.S homeowners are covered by the basic homeowner's insurance package required by mortgage companies. Unfortunately, few homeowners realize just how minimal these basic plans really are. Until recently, standard plans covered just about any "act of nature". Insurance companies dropped this coverage because of the incidence of flood disasters rose dramatically over the last ten years. Now, you must purchase

coverage for disasters such as floods, storms or earthquakes separately.

Homeowners are choosing not to pay more for additional coverage. Now that insurance companies have eliminated flood coverage, only 12% of homes in flood prone areas are actually covered. For example, the percentage of homes covered against earthquakes in California is also just over 10%, according to the Insurance Information Institute.

You can buy plans that will cover home damages of up to \$250,000 from the National Flood Insurance Program. Flooding can happen anywhere, but if you happen to live in a lower-risk area, you can protect your home for as little as \$300-\$400 each year. The cheapest earthquake coverage might run slightly higher, from \$300-\$500. Either way, insurance underwriters will determine your coverage cost after evaluating the construction and stability of your home. Location in relation to fire stations, fire hydrants or sources of flooding is also factored into the equation.

Your credit history and your occupation, as well as the length of time you have held stable work, will also be judged as indicators of your responsibility. In areas prone to flooding, flood coverage is often mandatory.

12. *Disclosure Laws in Puerto Rico and Insurance Companies*

Are their disclosure laws in Puerto Rico requiring insurance companies to reveal their risk criteria or other information?

Yes, they must disclose their Risk Criteria besides certain other information. They must disclose the required information to the “Comisionado de Seguros de Puerto Rico”, (Insurance Commissioner), by law. Under section 26 L.P.R.A. § 8088, which is quoted here, “The Commissioner shall promulgate the rules that establish conditions and procedures according to which the official information and registers are to be disclosed to the public to be examined or copied. The Commissioner may promulgate additional rules according to which the registers and the information that otherwise would be exempt from being disclosed is to be disclosed to the federal and state agencies, including the law and order agencies, and may execute agreements with said agencies to receive and exchange information or registers subject to the provisions for non-disclosure and confidentiality.

Except for privileged information, registers and data, the laws of the subscribing states relative to confidentiality or non-disclosure shall not exempt the Commissioner of the subscribing state from his/her duty of disclosing any pertinent register, data or

information to the Commissioner, provided that said disclosure is not to be construed as constituting an exclusion nor that it shall otherwise affect the confidentiality requirement; and furthermore, except as otherwise provided, the Commissioner shall not be subject to the laws of the subscribing state relative to the confidentiality or non-disclosure with respect to the registers, data and information in its power. The information of the Commissioner shall maintain its confidentiality until it has been delivered to another Commissioner.

The Commissioner shall oversee the subscribing states to ensure compliance with the duly adopted statutes, regulations, uniform standards and operating procedures. The Commissioner shall notify the subscribing states in writing about their non-compliance with respect to the statutes, the regulations and the operating procedures. Should the subscribing state that has incurred such non-compliance does not remedy this situation within the term specified in the notice, it shall be understood that the subscribing state is in default as provided in § 8094 of this title.

The Commissioner of any state where the insurer is authorized to operate or is operating an insurance business shall continue to exercise his/her authority for overseeing the regulation of the market in which the activities of the insurer are conducted

according to the provisions of the state laws. The following provisions shall govern the actions of the Commissioner to ensure compliance with said laws.

13. Example of Typical Underwriting Criteria in Puerto Rico for Coastal Development

Underwriting consists of two components: risk assessment and pricing. Successful underwriting requires a system of risk selection to obtain a group in which loss results will be reasonably predictable by means of the law of averages. To accomplish this goal, there must be a balance between obtaining volume and obtaining homogeneous risks. If an insurance company issuing property insurance policies, for instance, adopted such strict standards that it would only accept individuals who live in non-flood areas, there would be only a very small group from which to choose. Such a group would be very homogeneous, with all the risk units--in this case the individual risks--subject to about the same chance of loss. But the mass or volume of risk units would be very small, and thus the predictability of loss might be adversely affected.

Another element entering into making selection of such a group impractical would be the selection procedures necessary to obtain this near-perfect set of individuals. The expense involved would

more than offset the savings from the flood occurrence rate of the group. In underwriting, selection expense is a factor to be considered. There has to be a balance between the strictness of selection standards and the necessity of having a large volume of risk units to be insured.

For example, property insurance selection standards are set up to achieve this balance. Usually, group insurance companies adopt selection standards broad enough to permit acceptance of the large majority of insurable risks at standard premium rates. Certain groups of properties in flood prone areas will have flood rates consistently higher than standard risks. They have to be classified as substandard risks and a policy covering them would have a higher premium rate. A risk may even be rejected entirely because the flood rate is too great or too unpredictable for insurance to be practicable. The chance of loss is never exactly the same for all risks or groups, even within the classification of insurable risks into the standard class and several sub-standard classes. In each class there are good risks and poor risks relative to the rest of the class.

It is the goal of the insurance underwriter to establish rules which will result in securing an average proportion of good risks. If the underwriter can accomplish this goal, the company's average claims cost will be lower and the company may be able to offer

insurance at a lower net cost. The practice of experienced rating helps in achieving this goal. The rules adopted by various companies to secure the desired result will vary, based as they are on the individual company's experience, research, judgment, and, at the end, intuition. But the aims they are trying to achieve are basically the same. For successful operation in the insurance field, the rules established by any company need to achieve the proper balance between mass and homogeneity of risks to achieve predictability of future results. The rules should establish standards permitting acceptance of the large majority of risks at standard premium rates. They need to secure the largest possible proportion of the average risks within each classification. In order to achieve this proportion, a company may establish a policy of accepting borderline cases which would not be a gain from the underwriting standpoint but would provide volume to spread out overhead expense.

The objective of underwriting is to produce a pool of insured, by categories, whose actual loss experience will closely approximate the expected loss experience of a given hypothetical pool of insured. That is, if an underwriter is told that a pool of exposures with specified characteristics (e.g., a pool of brick buildings located no more than 5 miles from a fire station) will produce a specified loss rate of, say, 1% of the value of the insured property,

then the underwriter should try to place in this pool all the exposures whose characteristics match the specifications. If the underwriter does the job well, the loss ratio of the insured accepted will closely approximate the expected 1% figure. Putting applicants for insurance in the classification or pool that most closely reflects the real costs of their losses is the essence of good underwriting. Contrary to some opinions, it is not the function of the underwriter to reject so much business that the company experiences no losses. If the underwriter rejects all but the exceptionally safe exposures, he or she has probably turned away much desirable business. The insurance company expects a certain number of losses to occur, and it is just as much an underwriting error to reject profitable business as it is to accept loss-prone business.

Underwriting has been defined as determining what loss exposures will be insured, for what amount of insurance, at what price, and under what conditions. To make an underwriting decision, there are six steps:

- a. **Evaluating Loss Exposures-** In this step, information is gathered about an applicant's loss exposures. Underwriters must understand the activities, operations, and character of every applicant. However, trade-offs are necessary to control underwriting expenses and to handle a reasonable

number of applications. Underwriters weigh the need for information against the cost to obtain it. For example, an underwriter is likely to thoroughly investigate a manufacturing facility whose raw material is petroleum products. Not quite so much information is needed for a retail facility in the local strip mall.

- b. **Determining underwriting alternatives-** Each alternative is carefully evaluated. The underwriter must choose the optimal one under the applicable circumstances. The three underwriting alternatives are:
 - i. Accept the submission as is.
 - ii. Reject the submission.
 - iii. Make a counter-offer to accept the submission subject to certain modifications. Four major types of modifications, discussed next, are as follows:
 - **Require loss control measures to reduce hazards-** Loss control measures are a set of defined practices that minimize the possibility of a loss. Some loss control measures are relatively inexpensive and simple to implement like anti-fire sprinklers, while others, such as, operational continuity programs and disaster recovery plans require considerable capital investment.
 - **Change insurance rates, rating plans, or policy limits-** A submission that is not acceptable at standard rates might be desirable if the underwriter can charge a different rate, use a different rating plan, or provide a different limit. A rate modification could either increase or decrease

the premium. Smokers will not get the best life insurance rates while a preferred risk program might be submitted to a desirable applicant who applies for coverage at standard rates.

- **Amend policy terms and conditions-** A submission might become acceptable by modifying the policy to exclude certain causes of loss, add or increase a deductible, or make another coverage change.
 - **Use facultative reinsurance-** If the applicant is in a class of business that is not covered by the underwriter's reinsurance treaty, or if the amount of insurance needed exceeds net treaty capacity, the underwriter might be able to transfer a portion of the liability for the applicant's loss exposure to a facultative reinsurer.
- c. **Selecting an underwriting alternative-** The underwriter must decide whether to accept the submission as offered, accept it with modifications, or reject it. Rejection is sometimes unavoidable; however, rejections produce neither premium nor commission, only expense. Therefore, underwriters try to make the submission acceptable because one of the insurer's goals is to produce profitable business.
- d. **Determining the appropriate premium-** Underwriters must ensure that each loss exposure is properly classified so that it is properly rated. Insurance loss costs are typically based on an elaborate classification system in which similar

loss exposures are combined into the same rating classification. Combining loss exposures into rating classifications enables the insurer to appropriately match potential loss costs with an applicant's particular loss exposures. Consequently, the insurer can develop an adequate premium to pay losses and operating expenses and to produce a profit. Accurate classification ensures a pooling of loss exposures whose expected loss frequency and loss severity are similar. Misclassification can produce adverse results, including insufficient premium to cover losses and expenses, inability to sell policies because prices are higher than competitors' prices, and charges that the insurer has violated regulations prohibiting unfair trade practices.

- e. **Implementing the underwriting decision-** Implementing underwriting decisions generally involves three steps:
 - i. Contact the producer (and others involved) with the decision, good or bad. If the decision is to accept the submission with modifications, the reasons must be clearly communicated to the producer or applicant, and the applicant must agree to accept or implement the modifications. If the application is rejected, a clear and logical reason why the particular applicant does not meet the insurer's underwriting requirements must be communicated.

- ii. Put coverage into effect. Issue a binder, send a policy worksheet to the policy unit, or prepare certificates of insurance.
 - iii. Record the policy and the applicant information for accounting, statistical, and monitoring purposes. Data entry personnel enter essential information into the insurer's information system. It must be coded so that the insurer and the industry can evaluate and accumulate information on all accounts for ratemaking, statutory filing, and financial accounting.
- f. **Monitoring the loss exposures-** After an underwriting decision has been made on a new business submission or a renewal; the underwriter must monitor activity on the individual policies to ensure that satisfactory results are achieved.

14. *Example of Typical Underwriting Criteria in Puerto Rico for Coastal Developments*

Basically, banks in Puerto Rico have a checklist of insurance policies items that the developer must provide to access funding for a development project, even is coastal development or not.

The first standard that the project must pass is the flood zone location. These locations were categorized by FEMA. If the proposed development was placed in a flood zone, the bank will not finance the project. The second standard that the project must pass is the type of material in which the structure is intended to be constructed. The only

acceptable material to build up a structure and its foundations is concrete. If is not concrete it could not be financed or even insured. Every other concern despite flood locations, materials and government designated reserve areas is not take it in account.

Beyond that, the developer must provide the following:

1. Builders Risk Insurance from various perils (fire, earthquake).
2. Flood Insurance (No matter the development site is located out of identified flood sites. This insurance is mandatory to cover the time gap of updating the mapping of flood zones by FEMA).
3. Performance Bond to ensure the continuity of the construction project. A Performance Bond is a written guaranty from a third party guarantor (usually a bank or an insurance company) submitted to a principal (client or customer) by a contractor upon winning the bid. A performance bond ensures payment of a sum (not exceeding a stated maximum) of money in case the contractor fails in the full performance of the contract.

Insurers just need the economic value and site of the development project to quote the policy in the re-insurers market.

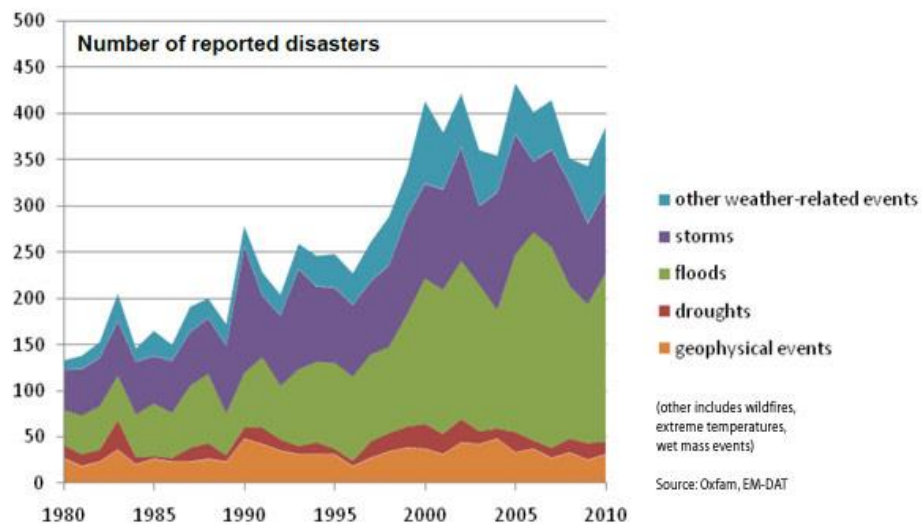
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15. Trend Analysis of Insurance losses due to Hazard Events

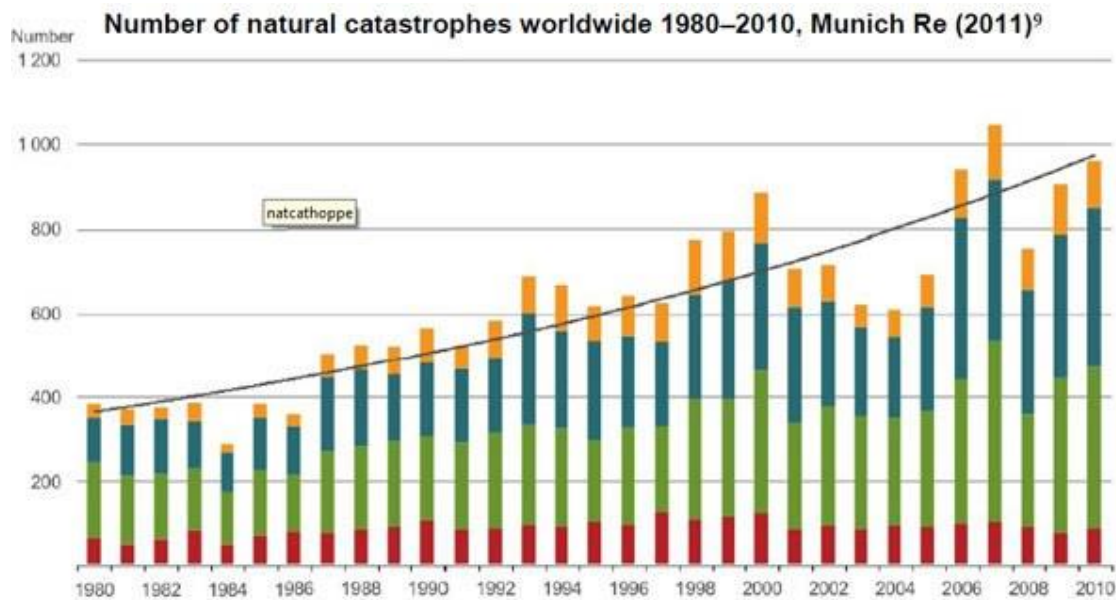


Source: FEMA website. Retrieved on July 20, 2013.

The number of weather related disasters has increased dramatically in the last 30 years. Here is shown some graphs with the trend of worldwide natural disasters:



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There is more than one possible explanation for this rise in the number of reported disasters. One is reporting. Perhaps reporting process was improved, and more countries are on board with the EM-DAT program, leading to more disasters. Possibly, but then we would expect the number of geophysical events to have risen too – more reported earthquakes and tsunamis. The fact that only the weather related disasters are on the rise suggests the reporting bias is not particularly strong.

Another possibility is population. EM-DAT's definition of a disaster requires any one of the following: "ten or more people reported killed; 100 people reported affected (i.e. requiring immediate assistance in a period of emergency); declaration of a state of emergency; or a call for international assistance." A larger population increases the likelihood of

people being affected by weather events, both more often and more people affected.

Oxfam's report analyses the data with this in mind, and finds that population is indeed a factor. "Weather-related disasters increase by 2.1 per year, compared with 3.4 per year in the non-normalized data, suggesting that increased exposure makes a considerable contribution to the increased trend in reported disasters. Nonetheless, the upward trend is still statistically significant".

In short, it would appear that the number of natural disasters is increasing, and a rising population is making it more likely that people will be affected. Current climate change theory predicts a rise in the number and intensity of weather events, including floods and storms.

But how does this affect the insurance industry? There is no doubt that those events hit the performance of the insurance industry. The following table shows the behavior of natural disasters and losses from 1980 to 2011.

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Disaster Type Across the 1980-2011 Period for all Billion-dollar Events

(Adjusted for Inflation to 2011 dollars)

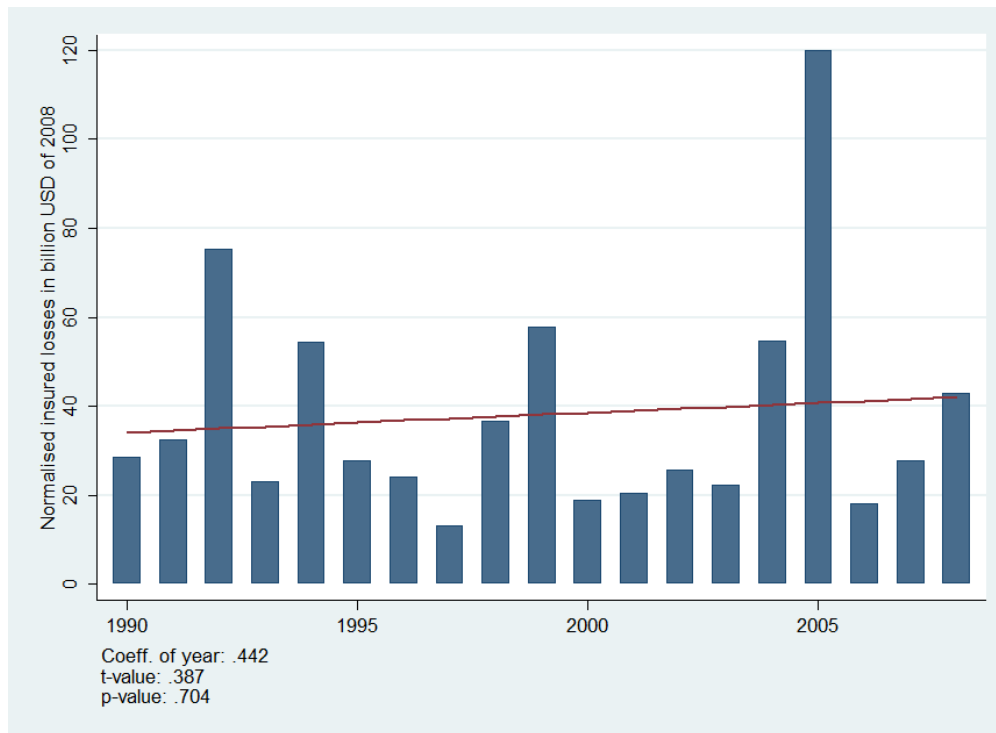
Events	Number of Disasters	CPI Adjusted Event Damages	Damage in %	Frequency of Event in %
Tropical Storms	31	\$417.9	47.4%	23.3%
Heatwaves	16	\$210.1	23.8%	12.0%
Severe Local Storms	43	\$94.6	10.7%	32.3%
Non-Tropical Floods	16	\$85.1	9.7%	12.0%
Winter Storms	10	\$29.3	3.3%	7.5%
Wild Fires	11	\$22.2	2.5%	8.3%
Freezes	6	\$20.5	2.3%	4.5%
	133	\$879.7	100%	100%

Source: FEMA and National Flood Insurance Program.

There is no doubt that those natural disasters occurrence hits the bottom line of insurers and re-insurers. But it will not make them wealth impaired and for sure they will still be operating. Remember that insurance is a game of diversification of risk. Insurer's may lose money in natural disasters policies these days, but there are other lines of business in which they are making a lot of money which will have the effect to offset those losses. We will recall the previously discussed topic of re-insurers profile. Every one of them is making billions of dollars in profits.

The following bar graphs show the "Global Normalized Insured Losses from all Disasters."

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Source: <http://eprints.lse.ac.uk/37600/> "Munich Re: A trend analysis of normalized insured damage from natural disasters".

16. *Chronic Risks Insurer/Reinsurer Consideration*

Chronic risks have been arising in the last hundred years. Risks like cyclone, storms, earthquakes; et al, are more likely to be the cause of huge loses. Not because in the past these disasters were less fierce, but because there are more economic development in the world and the economic base to which the loss is inflicted is greater. Re-insurers are the ones who take the lead in this issue, because they are the last stand in terms of insurance. They can not claim to another party if a loss was about to occur.

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Source: <http://www.env.gov.bc.ca/cas/adaptation/pdf/SLR-Primer.pdf>

Many re-insurers are promoting the theme; giants like Munich Re, Swiss Re, and Lloyds of London. But there are also initiatives of given geographical sectors such as “ALLIANCE OF SMALL ISLAND STATES” (AOSIS).

AOSIS Plan requires the Parties to address enhanced action on adaptation, including consideration of:

- a. Risk management and risk reduction strategies, including risk sharing and transfer.
- b. Mechanisms such as insurance.
- c. Disaster risk reduction and strategies and means to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change.

In the view of AOSIS, an essential part of the members' agreement must be a new Multi-Window Mechanism to Address Loss and Damage from Climate Change Impacts in SIDS (Small Island Developed States) and other developing countries particularly vulnerable to the impacts of climate change.

This Multi-Window Mechanism would consist of three inter-dependent components:

- a. **An Insurance Component**- needed to help SIDS and other particularly vulnerable developing countries manage financial risk from increasingly frequent and severe extreme weather events. Many SIDS either can not access insurance or find it increasingly difficult to afford commercial insurance to address impacts on national economies and require support in addressing the burden of increasing risks due to climate change.
- b. **A Rehabilitation/Compensatory Component** - needed to address the progressive negative impacts of climate change, such as sea level rise, increasing land and sea surface temperatures, and ocean acidification, which result in loss and damage. Even with financial risk management mechanisms in place and efforts to reduce physical risks

and exposure, some measure of loss and damage due to climate change impacts will be unavoidable and must be addressed.

- c. **A Risk Management Component**- needed to support and promote risk assessment and risk management tools and facilitate and inform the Insurance Component and Rehabilitation/Compensatory Component. Support for the establishment and maintenance of such a Multi-Window Mechanism to address Loss and Damage is appropriately viewed as adaptation assistance.

Guiding Principles:

- a. Principle of State Responsibility - States have the responsibility to ensure that activities under their jurisdiction or control do not cause damage to the environment of other states or areas beyond national jurisdiction (Principle 21 of the Stockholm Declaration; Principle 2 of the Rio Declaration). Where there is a breach of this international obligation, there is a duty to cease and repair.
- b. Principle 13 of the Rio Declaration - States shall cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.
- c. Polluter Pays Principle.
- d. Common but differentiated responsibilities and respective capabilities

- e. Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and minimize its adverse effects.
- f. Principles of equity and intergenerational equity.
- g. International solidarity.

17. Insurance Companies Profit's Trend

Are insurance companies increasing or decreasing profits?

In 2013, the uncertain economic environment and limited investment income opportunities will challenge US property/casualty insurers to improve underwriting results, while seeking growth. The continuing prospects for weak investment returns and low interest rates over an extended period compel carriers to improve underwriting margins, requiring difficult decisions concerning pricing and operating approaches. Organic growth continues to be a challenge, given the economic situation and the competitive landscape. Despite these impediments, growth opportunities are available through acquisitions, including international expansion plays, as well as product solutions targeting new insurable risks and coverage expansions.

As the US property/casualty sector addresses and reacts to these growth and profitability challenges in 2013, individual insurers confront greater competition, driven by an abundance of capital, uncertainty around the timing and scope of regulatory changes and

the continuing volatility caused by weather-related losses, highlighted most recently by so-called Super-storm Sandy. To outperform competitors by maximizing customer profitability and persistency, continuing investments in infrastructure and technology are required. Many companies are in the early stages of investing in internal data and systems capabilities, yielding information advantages and improved analytical and decision-making capabilities, thereby providing competitive opportunities. Carriers that have invested in outsourcing, for example, are making these decisions not solely for cost-effective reasons, but also increasingly for customer impact and retention purposes. US property/casualty insurers must approach these challenges and opportunities holistically, understanding their interplay and effect on underwriting, operations and investment considerations. Growth and profitability strategies need to be developed on an enterprise-wide basis and balanced against the risks they may produce.

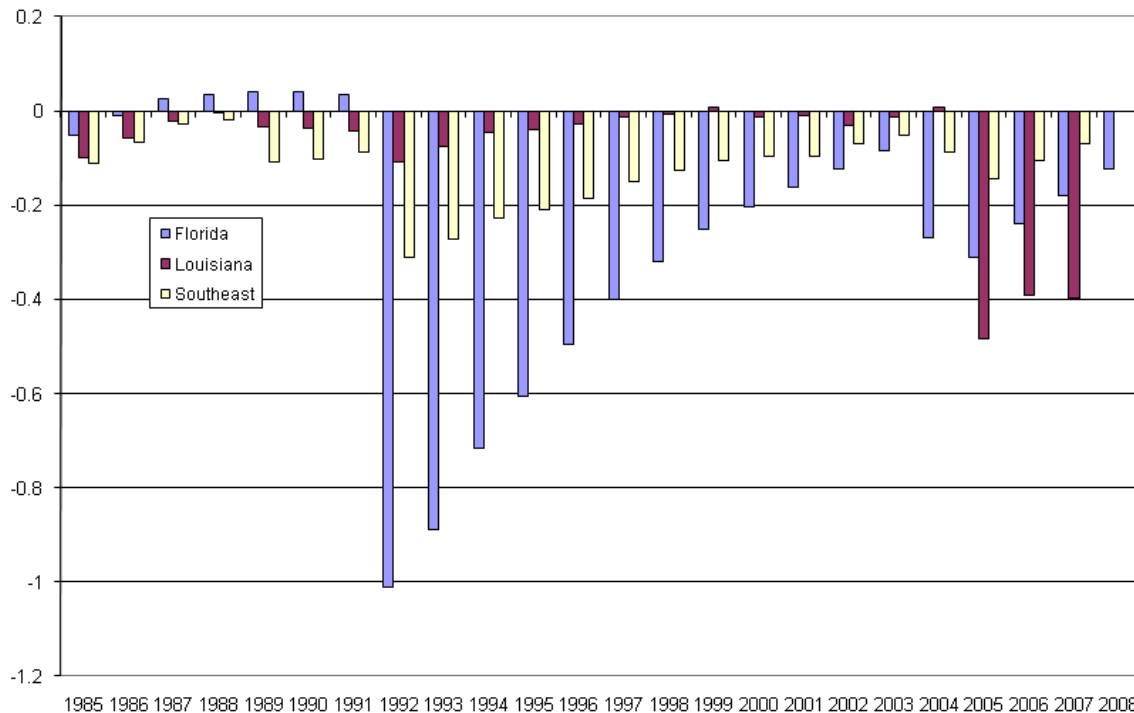
Insurers suffered substantial losses (negative profits) in 2004 and 2005 due to hurricanes that hit Louisiana, Florida and other Gulf states in these years. Cumulative profits in Louisiana and the Southeast region have been negative since 1985; they have been negative in Florida since 1992. (Yearly profits are computed as premiums plus investment income, minus claim costs and expenses. Cumulative profits/losses in 1987 (for example) are the total of the

sum of profits in 1985, 1986 and 1987.) These cumulative losses have contributed to insurers' price and underwriting adjustments and concerns about the economic feasibility of writing homeowners' insurance in high-risk areas under the prices and terms of coverage that preceded these storm seasons. Insurers were able to improve their positions in 2006 and 2007 as there were no damaging hurricanes in these years, but the 2008 storms had a significant negative effect in Texas and to a lesser degree in Louisiana.

Hence, many insurers will likely continue to view their situation as tenuous until their long-term profits approach a level that is more consistent with their cost of capital. This development is especially significant given the higher cost of capital associated with underwriting catastrophe exposures which leads to greater income volatility. It will take several more low-loss years to pull insurers back into the black.

There are no significant losses in the Puerto Rican market because it has been a long time since a major disaster occurs in Puerto Rico. Strong capital accumulation is described in the "Puerto Rico Property Insurers: The Key Players" Section. We will not see major problems in the upward trend in Puerto Rico Insurance Property Market. Next graph describes the dynamics of the property insurance market in southern states.

Cumulative Profits on Homeowners Insurance Transactions: 1985-2008



Source: NAIC Report on Profitability by Line by State, author's calculations.

SOURCE: Robert W. Klein (2009), "Hurricane Risk and Property Insurance Markets: An Update and Extension" Wharton Risk Center working paper #2009-10-07. This study examines market concentration, entry and exit, the cost and availability of insurance, and insurers' profitability (or lack of it) in Alabama, Florida, Louisiana, Mississippi, South Carolina and Texas.

18. Caribbean Insurance Loss Portrait

Do U.S. / Caribbean insurance loss studies accurately portray Puerto Rico's risk potential or are they based on erroneous data?

Yes, such data accurately describe Puerto Rico's risk potential. Government and the insurance industry rely on FEMA Data and "High Risk Zones Maps". FEMA updated their database in an event occurrence basis. However, potential insurance losses for Puerto

Rico are limited to a 15% of the total loss exposure by regulation. For further discussion, please refer to the topic:” *The Dynamics of Insurance / Re-insurance in Puerto Rico*”. (Page 28)

19. *Banks and Insurance Companies Considerations in Evaluating Loss Perils such as Sea level rise, Hurricane and Flood Projections to Evaluate Funding or Insuring of Development Projects*

Absolutely they are, but in a spot basis, not in future perspective. They do not take into account the future basis because it is out of their scope. Bankers see the sea level issue as a problem but in a long time future perspective. Insurance companies in Puerto Rico indirectly address the sea level problem, cause of their dependency of the reinsurance market. Giant reinsurers such as Munich Re, Swiss Re, et al; who are the ones to serve Puerto Rico’s market, had a lot of initiatives to face this problem and of course they consider the future effect of these perils in their reinsurance quotes.

Local banks do not finance any development in a hazard coastal zone if the location was classified as a High Risk Area or Flood Prone Area by FEMA. Local insurers may not say it explicitly, but they will charge a ridiculous insurance premium and may limit loss coverage.

Sound practices of business are the standard in Puerto Rico’s Insurance Industry and Banking Industry. Insurance is a much regulated industry in Puerto Rico. However, there is a possibility to see some individual private development in some Hazard Coastal Zone. Those kinds of developments belong to individual interest with private funding and the risk hazard responds directly to their wealth.

In various performed interviews with industry key players in the banking industry, their answer was the same: “If is not insured we can not fund it.”

20. Insurers’ capability to cover claims submitted by Natural Disasters policy holders of High Magnitude

In the case of a high magnitude natural disaster in Puerto Rico, do local insurers will have the capability to cover the claims submitted by policy holders?

Yes, as discussed in the topic describing the dynamics of Puerto Rico’s Insurance Market, the insurance industry in Puerto Rico is much regulated. Puerto Rico insurance companies have not been motivated to generate and expose significant capital for underwriting catastrophe perils. Characteristically, they limit their catastrophe risk retention levels to under 15 percent, the remainder being ceded to reinsurers. The availability of reinsurance affects the profitability of Puerto Rican insurance companies, as it governs the ability to write policies and thus generate subsequent income from reinsurance commissions.

Insurance revenues are a function of the risks assumed by insurers. That is, the risk assumed by the insurer is considered as a possible loss and is already discounted from the profits that would generate the insurer.

Therefore, the claims that are submitted to insurers will not erode the net income of the insurance company.

21. *List of knowledge gaps and recommendations to fill those gaps.*

In April 1994, in Barbados, the first Global Conference on Sustainable Development of SIDS adopted the Barbados Program of Action (UN, 1994), updated a decade later in the Mauritius Strategy (UN, 2005). These documents consolidated the grouping of island countries and territories labeled SIDS: Small Island Developing States. The SIDS group now comprises fifty-two (52) small countries and territories in the tropics and low-latitude sub-tropics. Those are:

- a. American Samoa
- b. Anguilla
- c. Antigua and Barbuda
- d. Aruba
- e. Bahrain
- f. Barbados
- g. Belize
- h. British Virgin Islands
- i. Cape Verde
- j. Commonwealth of the Northern Marianas
- k. Comoros
- l. Cook Islands
- m. Cuba
- n. Dominica

- o. Dominican Republic
- p. Federated State of Micronesia
- q. Fiji
- r. French Polynesia
- s. Granada
- t. Guam
- u. Guinea-Bissau
- v. Guyana
- w. Haití
- x. Jamaica
- y. Kiribati
- z. Maldives
- aa. Marshall Islands
- bb. Mauritius
- cc. Montserrat
- dd. Nauru
- ee. Netherlands Antilles
- ff. New Caledonia
- gg. Niue
- hh. Palao
- ii. Papúa New Guinea
- jj. Puerto Rico
- kk. Saint Kitts and Nevis

- ll. Saint Lucia
- mm. Saint Vincent and the Grenadines
- nn. Samoa
- oo. Sao Tome and Principe
- pp. Seychelles
- qq. Singapore
- rr. Solomon Islands
- ss. Suriname
- tt. The Bahamas
- uu. Timor-Leste
- vv. Tonga
- ww. Trinidad & Tobago
- xx. Tuvalu
- yy. U.S. Virgin Islands
- zz. Vanuatu

Despite the difficulties with defining both SIDS and climate change, SIDS' experiences with climate change are helping to frame discussions beyond SIDS. SIDS are seen as one of the globe's barometers of climate change, so plenty of attention is being focused on them, with the highest profile example being the sea-level rise potentially making several countries, such as Tuvalu and the Maldives, uninhabitable.

We will be listing the knowledge gaps discussed in this conference and propose recommendations:

- a. SIDS with much land area well above potential sea level rise, such as Puerto Rico, could have problems since most settlements and infrastructure are in the coastal zone while the hilly, inland regions would experience severe ecological changes in settling all the migrants.

Care must be taken before assuming island coastal destruction due to sea-level rise, because the expected physical changes to low-lying islands under sea-level rise scenarios have not been well-studied.

Significant geo-morphological changes are likely, but complete inundation and loss of all land is not inevitable (e.g. Harvey and Mitchell, 2003; Kench and Cowell, 2002). Yet, that does not necessarily imply that these islands will remain inhabitable over the long term.

Although Puerto Rico is listed on the high risk area (SIDS List) and had a list of potential danger of economic losses due to geo-morphological changes, we cannot assume that Puerto Rico is in an imminent danger in the short run.

However, the Puerto Rico Coastal Zone Management Program should commission a wide range quantitative study of coastal zone including the economic impact of losses due to structures placed in the coast line. The local insurance industry could

absorb the potential losses today, but we do not certainly know if they can absorb the losses in 50 years ahead.

- b.** Chemical, rather than geo-morphological changes could also reduce the low lying islands' inhabitability. Oceanic absorption of atmospheric carbon dioxide is leading to ocean acidification (Caldeira and Wickett, 2003; Royal Society, 2005) which is likely to harm coral reefs and to have detrimental effects on coral islands, including shingle beaches. These impacts are not well studied.

The Puerto Rico Coastal Zone Management Program should commission a research study of the viability to replace these natural barriers with man-made ones.

- c.** Precipitation changes over Puerto Rico are subject to large relative uncertainties and even the direction of the change is not certain. For instance, across all of the Caribbean, the projected change in precipitation by 2100 relative to 1961–1990 could range from –49.3% to +28.9% (Mimura et al., 2007). Downscaling such projections to a country level would not yield much confidence in the results.

However, infrastructure developments should take into account that the rain pattern will increase in volume and occurrences and build structures compatible with this phenomenon.

- d.** Increases or decreases, or changes in the nature of freshwater will affect SIDS islands, specifically Jamaica & Puerto Rico. If the cyclone regimes change to decrease the precipitation, Puerto Rico and Jamaica might also experience freshwater shortages too.

SECTION 3

Definitions of Terms

Definitions of Terms

- 1. Insurance-** is the equitable transfer of the risk of a loss, from one entity to another, in exchange for payment. It is a form of risk management primarily used to hedge against the risk of a contingent, uncertain loss.
- 2. Insurer, or insurance carrier,** is a company selling the insurance; the insured, or policy holder, is the person or entity buying the insurance policy.
- 3. Micro insurance-** Is the protection of low-income people against specific perils in exchange for regular premium payment proportionate to the likelihood and cost of the risks involved. This definition is exactly the same as one might use for regular insurance except for the clearly prescribed target market: low-income people. The target population typically consists of persons ignored by mainstream commercial and social insurance schemes, as well as persons who did not have previous access to appropriate insurance products. The institutions or set of institutions implementing micro insurance are commonly referred to as a micro insurance scheme.
- 4. Re-Insurance-** is insurance that is purchased by an insurance company (the "ceding company" or "cedant" or "cedent" under the arrangement) from one or more other insurance companies (the "reinsurer") as a means of risk management. There are two basic methods of reinsurance:

- a. Facultative Reinsurance** - which is negotiated separately for each insurance contract that is reinsured. Facultative reinsurance is normally purchased by ceding companies for individual risks not covered, or insufficiently covered, by their reinsurance treaties, for amounts in excess of the monetary limits of their reinsurance treaties and for unusual risks.
 - b. Treaty Reinsurance** means that the ceding company and the reinsurer negotiate and execute a reinsurance contract. The reinsurer then covers the specified share of all the insurance policies issued by the ceding company which come within the scope of that contract.
- 5. Risk-** is the potential of loss (an undesirable outcome, however not necessarily so) resulting from a given action, activity and/or inaction.
- 6. Risk Assessment** - The process of determining the likelihood that a specified negative event will occur.
- 7. Insurance Premium-** Financial cost of obtaining an insurance cover, paid as a lump sum or in installments during the duration of the policy.
- 8. FEMA-** the Federal Emergency Management Agency (FEMA) is an agency of the United States Department of Homeland Security, initially created by Presidential Reorganization Plan No. 3 of 1978 and implemented by two Executive Orders on April 1, 1979. The

agency's primary purpose is to coordinate the response to a disaster that has occurred in the United States and that overwhelms the resources of local and state authorities.

- 9. Infrastructure-** the basic physical and organizational structures needed for the operation of a society or enterprise.
- 10. National Flood Insurance Program-** The National Flood Insurance Program (NFIP) is a program created by the Congress of the United States in 1968 through the National Flood Insurance Act of 1968 (P.L. 90-448). The program enables property owners in participating communities to purchase insurance protection from the government against losses from flooding.
- 11. Community Rating System-** the National Flood Insurance Program's (NFIP's) Community Rating System (CRS) was implemented in 1990 as a voluntary program for recognizing and encouraging community floodplain management activities exceeding the NFIP's minimum standards. Any community that is in full compliance with the NFIP's minimum floodplain management requirements may apply to join the CRS.
- 12. Special Flood Hazard Area-** Special Flood Hazard Area (SFHA)- An area having special flood, mudflow, or flood-related erosion hazards, and shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map as Zone A, AO, A1-A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1-A30, V1-V30, VE, or V. For the

purpose of determining Community Rating System premium discounts, all AR and A99 zones are treated as non-SFHAs.

- 13. Performance bonds-** A performance bond is a surety bond issued by an insurance company or a bank to guarantee satisfactory completion of a project by a contractor.
- 14. International Standard Organization (ISO)** - Popular name for International Organization for Standardization (IOS), a voluntary, non-treaty federation of standards setting bodies of some 130 countries. Founded in 1946-47 in Geneva as a UN agency, it promotes development of standardization and related activities to facilitate international trade in goods and services, and cooperation on economic, intellectual, scientific, and technological aspects.
- 15. Hazard mitigation-** Hazard Mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects.
- 16. A.M. Best-** Financial worthiness evaluator for Insurance companies. The most respected analytics company for Insurance companies.
- 17. Regression analysis (R Square method)** - Mathematical equation which relates two or more sets of data and determines the direct effect of an independent set of data to a dependent set of data.
- 18. EM-DAT** – A data service collector of emergency situations such as earthquakes, storms, et al.

SECTION 4

Appendix

Appendix

1. List of CRA Participating counties by state (including Puerto Rico) as of May 2011.

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