18th HydraMeeting

Miltiadis Nektarios,
Professor of Insurance,
University of Piraeus,
(GREECE)

Public-Private Partnerships in EQ Insurance: The Case of Greece".

Miltiadis Nektarios,

Professor of Insurance,

University of Piraeus.

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Contents

- Objectives and PPP schemes
- The dividing line: EQUALIZATION RESERVE
- The Greek Case: the Numbers
- Alternatives: Premium poll VS. Loss pool
- Lessons for Greece

I. Objectives of the Management of Catastrophe Risks

- Timely availability of funds needed for recovery, reconstruction and compensation of victims.
- Reduction of volatility in the Government Budget.
- Liquidity for individuals during times of economic crises caused by the natural disaster.
- Reduction of reliance on foreign/external aid.
- Therefore, it is eminently sensible to evaluate "funding strategies" **prior** to the occurrence of catastrophic events and establish strategic alliances of the public with the private sector.

Public-Private Partnerships

- THE PUBLIC SECTOR:
  - Political and administrative "unity of purpose".
  - What is the purpose of the scheme and the PPP ?
  - Is the project given a national priority that transcends cross-party-politics ?
- THE PRIVATE SECTOR:
  - Has the financial resources to absorb the financial impact
  - Geographic diversification and diversification in time is generally not available to the Public sector.
  - An opportunity for wider market penetration through statutory requirements.
  - The appropriate risk/reward for services (selling, retention of risk, governance, management) provided by private organizations (insurers, reinsurers, brokers, risk modelers).

II. The dividing line: EQUALIZATION RESERVES

- Insurance premiums are calculated as follows:
  - **Premium= Expected loss + Cost of Capital + Expenses**
- It is in the nature of CAT business that most of the time the claims will be much below expectation.
- Once in a while, though, a catastrophe will occur with claims much above expectations and the annual premiums would not suffice to cover the liabilities.
- To survive such situations, insurance companies have learned to diversify geographically (reinsurance)
- Reinsurance will not suffice to avoid large fluctuations in the results. Uncertainty in the results will increase the cost of attracting new capital.

Time Diversification Helps

- Traditionally, insurers have built Equalization Reserves to dampen the effects of NAT CATS on their balance sheets.
  - This is the meaning of diversification over time
- Many countries particularly exposed to NAT CATS even require their insurance companies to hold equalization reserves (e.g., Japan) or they allow the State insurance NAT CAT insurer to hold such reserves (e.g., Turkey, Spain, Romania).
- Since the probability of occurrence is low, it is possible to build substantial reserves before large claims happen.
- Clearly, it is to the benefit of the policyholders to keep an extra cushion.
  - Is it also true for shareholders ? Or Taxpayers ?

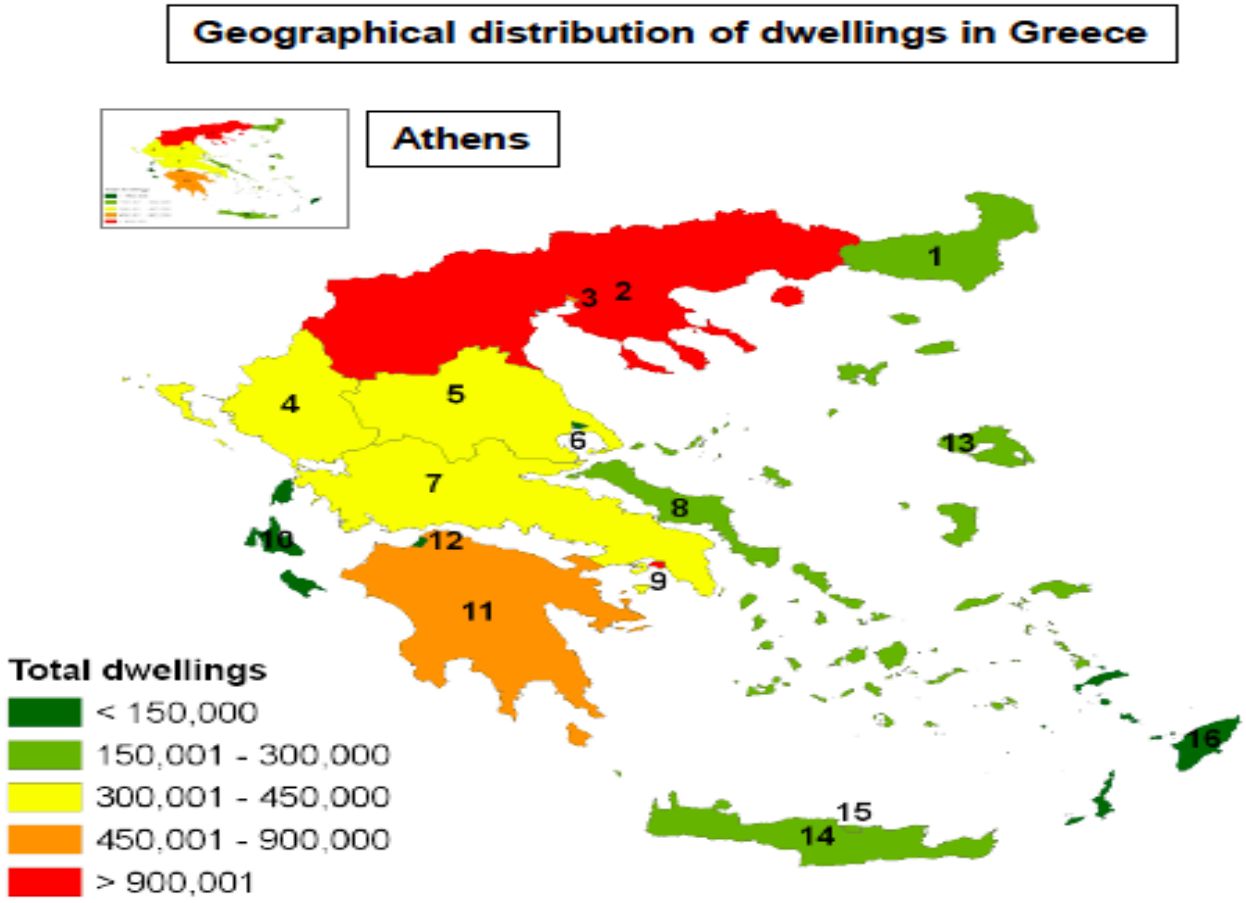
But Regulators and Accountants…

- As far as reserving is concerned, Solvency II does not allow to carry over reserves for future business. If no loss has occurred during the year, then the reserves must be released: equalization reserves are not allowed anymore.
  - Two main arguments speak for the introduction of these rules:
    - Shareholders are interested in diminishing the cash at the disposal of managers, and
    - The tax authorities want to avoid artificial reserve increase that diminishes tax payments.
- The purpose is to protect the policyholders (Regulators) and to bring more transparency in the evaluation of liabilities (through mark-to-model valuation) in the insurance industry (Accountants).
- It may be proven that in the long-run, both shareholders and tax authorities may be satisfied by time diversification.

III. The Greek Case: The Numbers

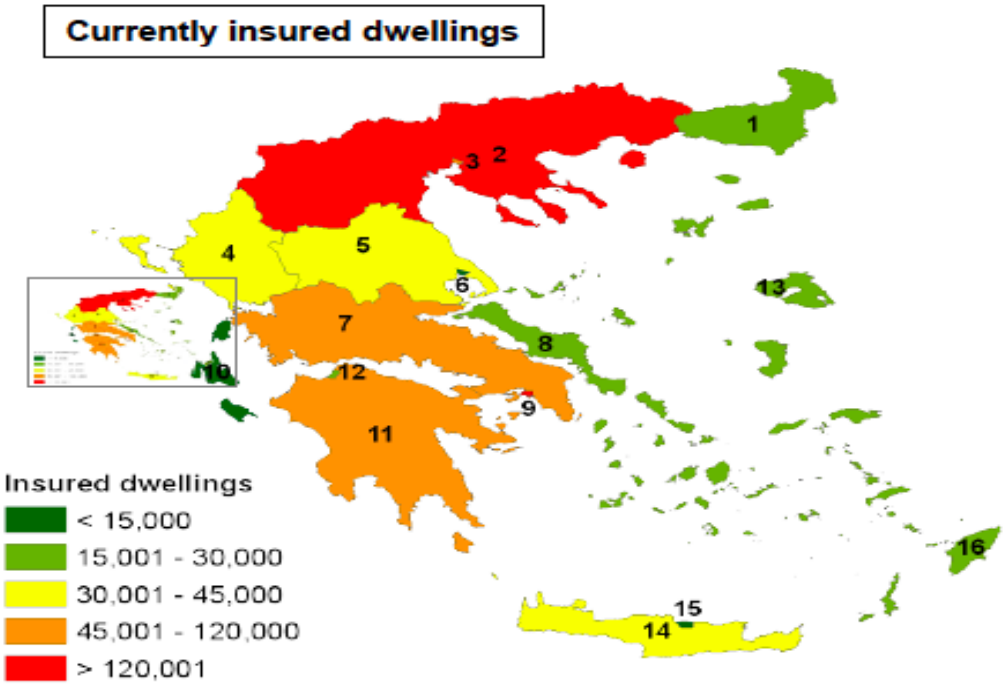
- Exposure information based on 2000 census and 2010 data of the Ministry of Finance
- Information available in statistical data:
  - Number of dwellings per CRESTA zone
  - Construction material, age, number of stories
  - Floor area
- **Total number** of residential dwellings units: **7.504.000**
  - Dwellings in both pure **residential** and **mixed** buildings were included
  - Approx. 30% vacancy rate
  - 56% of exposure concentrated in three regions: Athens & Piraeus, Thessaloniki and Macedonia
- Estimated replacement cost: **€ 694 billion**
  - Average floor area: 85 sq m
  - Average replacement cost per sq m: € 1.000

Residential Exposure in Greece



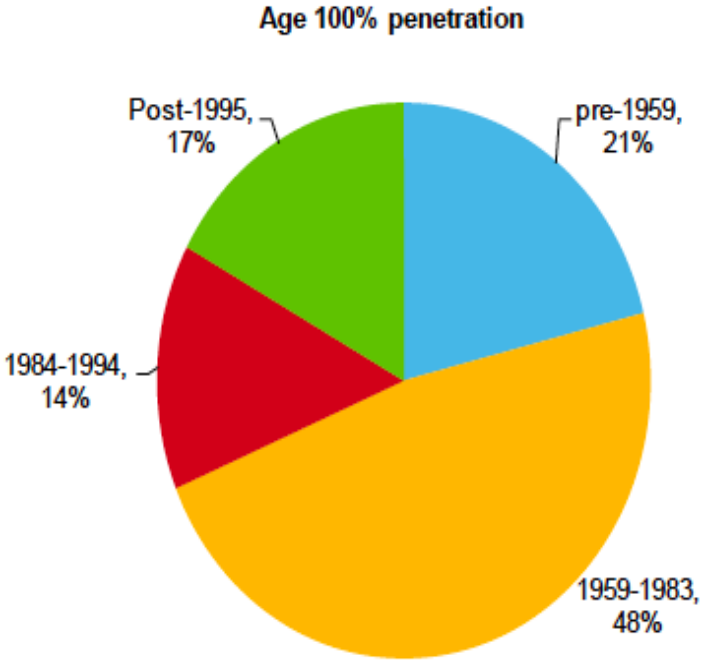
Greece – Current Insurance Penetration

- Number of currently (2013) insured dwellings: **approx. 982.000**
- Actual insurance take-up rate: **13%**
- Relatively small regional variations in the insurance **take up rate**:
  - **Lowest**: Evia, Thessalia and Iraklion
  - **Highest**: Sterea Hellas, Patras and Dodecanese

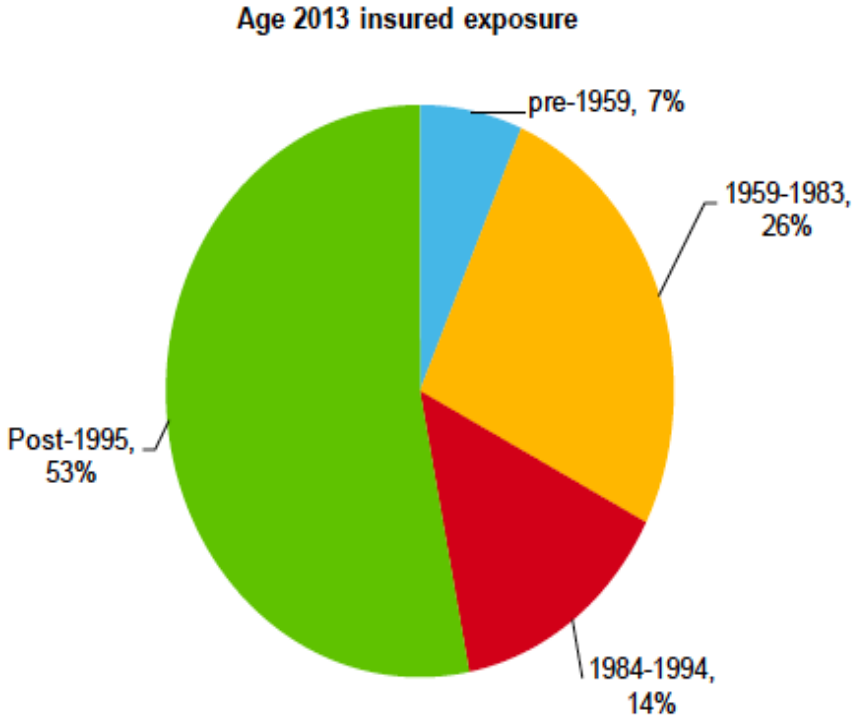


Greece – Exposure Benchmarking / Age of Dwelling Unit

All Dwellings



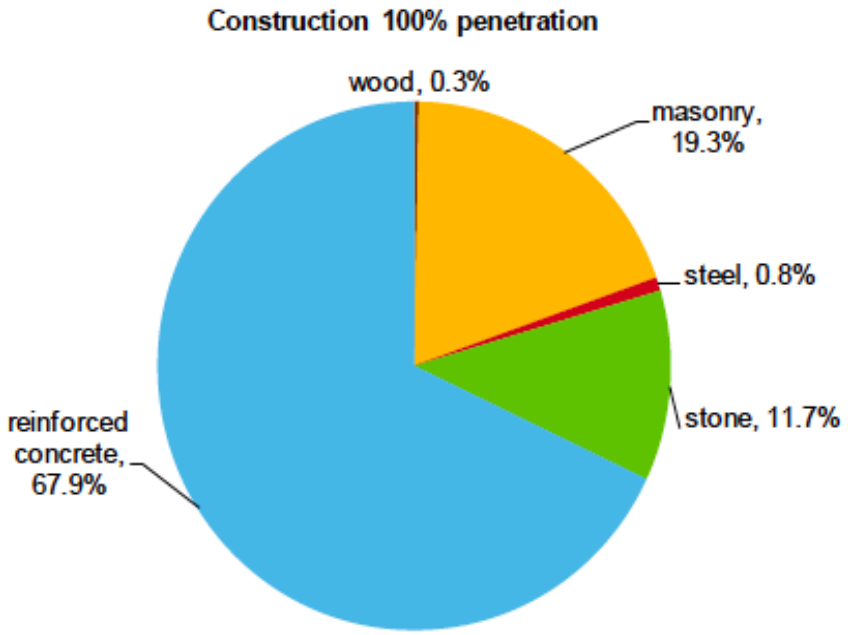
Insured Dwellings



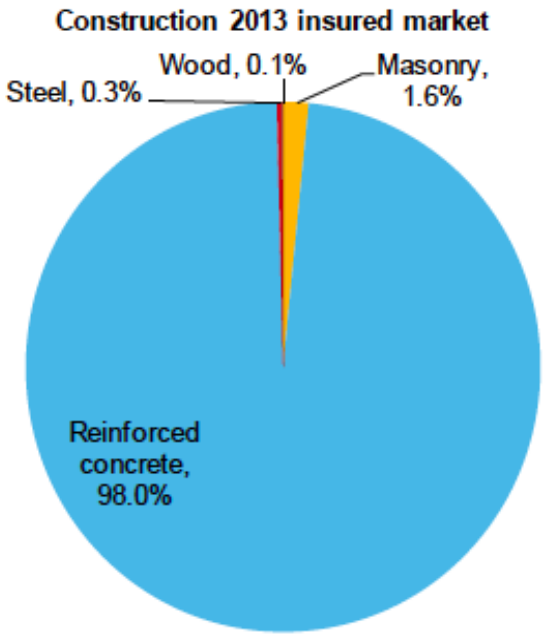
- **Insured dwelling** stock exhibits considerably **higher proportion of modern** (post-1984) risks: **67%** against 31% in overall dwelling stock
- Proportion of **insured no-code** (pre-1959) risks is **negligible**: **6,5%**

Greece – Exposure Benchmarking / Construction Type

All Dwellings



Insured Dwellings



- **Insured dwelling** stock is almost **missing stone and masonry** constructions, relatively frequent in overall building stock → logical **implication of different age structure**

Greece – Modelling Assumptions

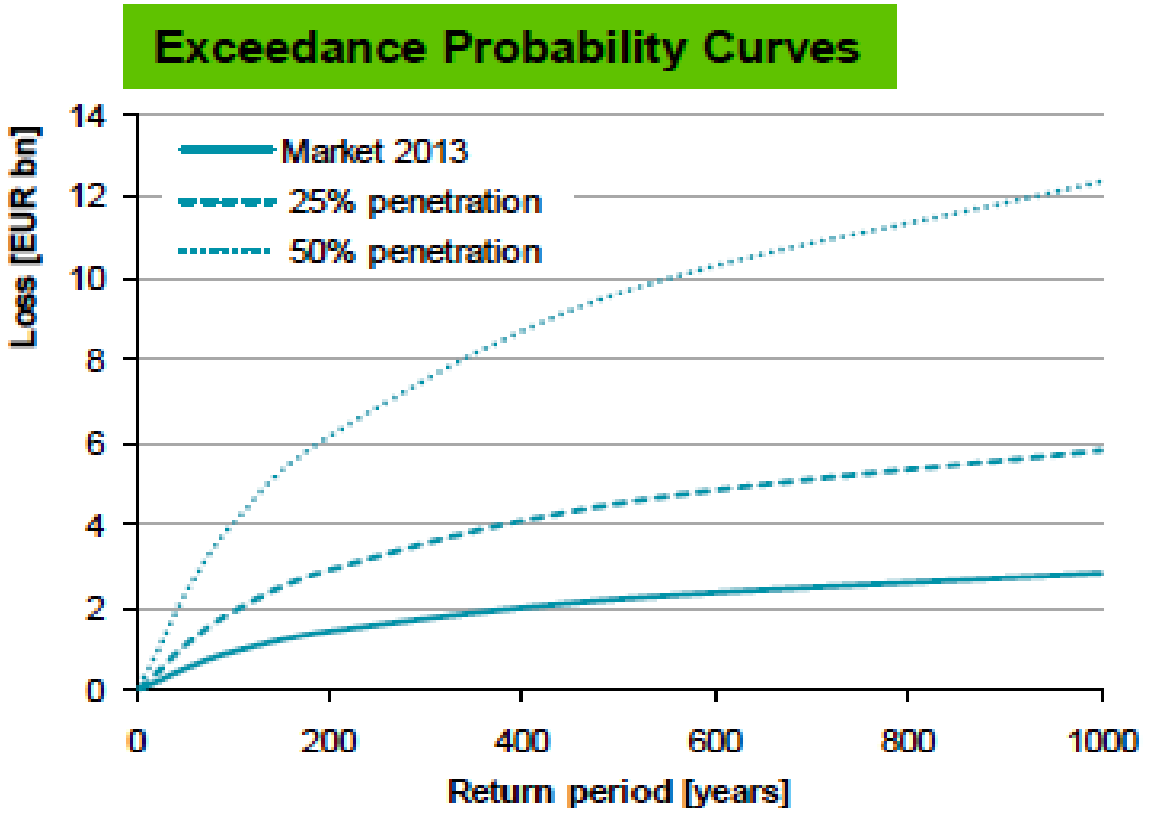
- **Modelled options:**
  - **Currently insured** residential buildings (2013 status)
  - **25%** insurance penetration
  - **50%** insurance penetration

- **Modelling assumptions**
  - **RMS v11 model** without loss amplification used
  - Contents not included
  - Deductible = 2% of sum insured
  - **Currently insured dwellings are always in**cluded in 25% and 50% penetration option
  - Additional "inflow" of non-insured risks is independent on current take-up rate and uniform across all construction types and age bands.

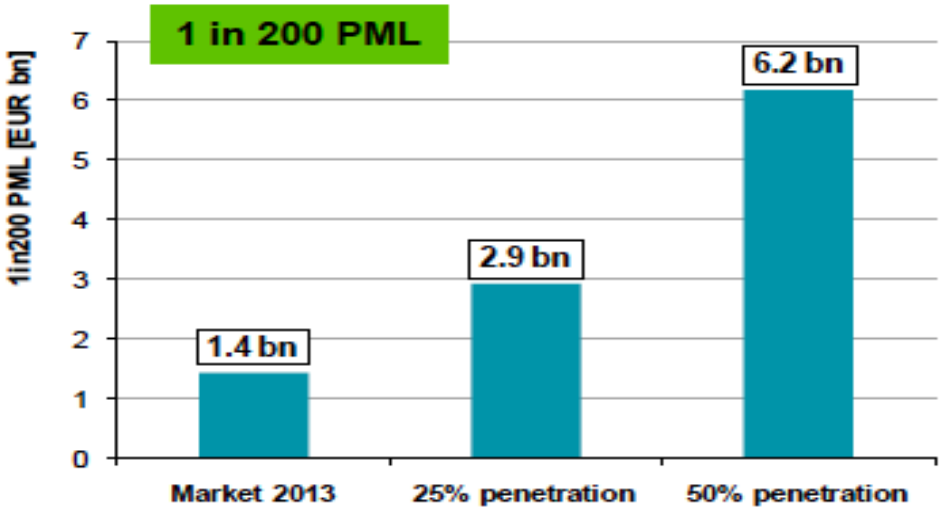
Option 1: Current status 13% penetration	Option 2: 25% penetration	Option 3: 50% penetration
Number of dwellings: 982,000	Number of dwellings: 1,876,000	Number of dwellings: 3,752,000
Total sum insured EUR 86 bn	Total sum insured EUR 169 bn	Total sum insured EUR 342 bn

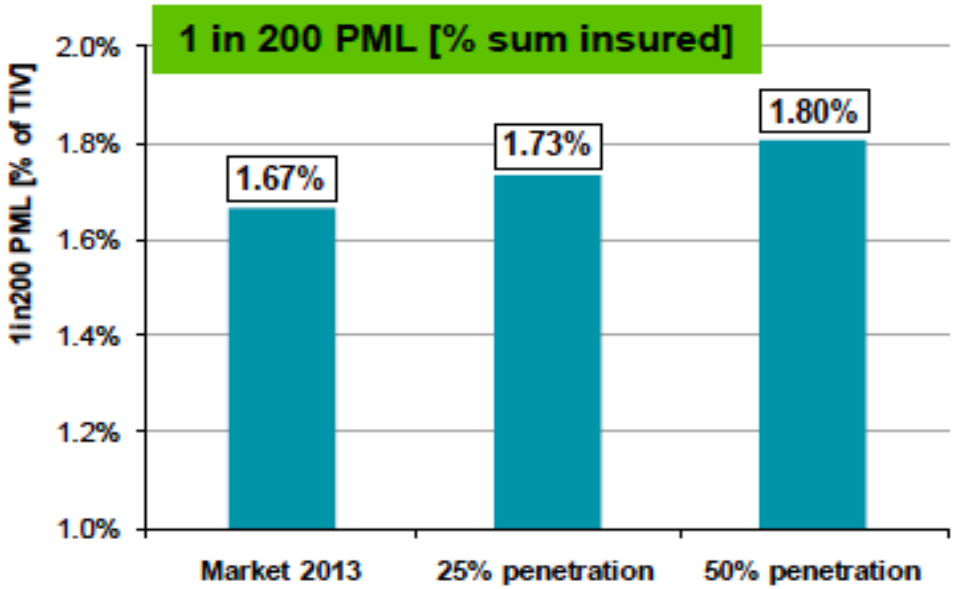
Greece – Modelled Losses

- **Modelled PMLs as % of TIV are increasing with the insurance penetration, due to increasing proportion of more vulnerable risks** (low code buildings, stone and masonry constructions)



Greece – Modelled Losses





Greece – Proposed Reinsurance Treaty

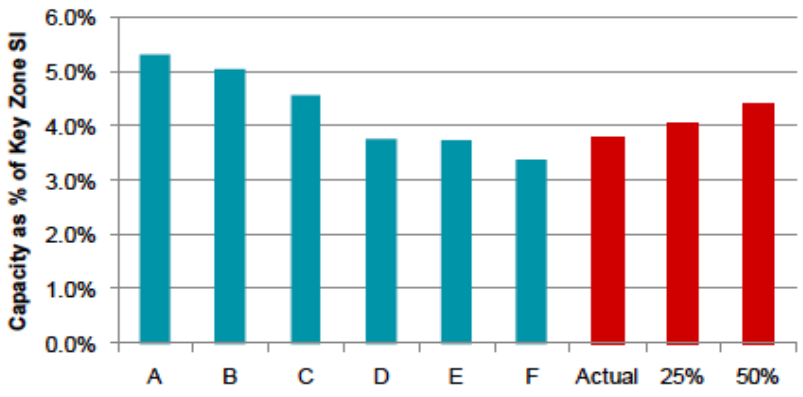
- For each modelled option **capacity set to 200 years** return and **retention to 3 years** according to RMS v11 without LA
- Three different structures proposed for each modelled option:

1. Current status: € 1.415 bn xs 35 m
2. 25% penetration: € 2.835 bn xs 65 m
3. 50% penetration: € 6.070 bn xs 130 m

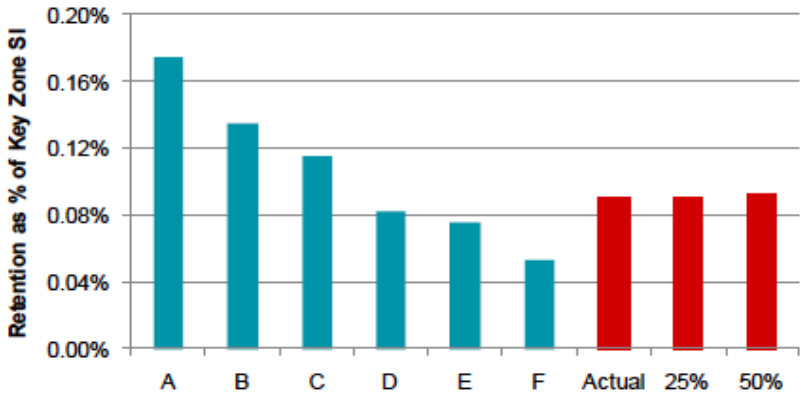
Key Zone = CRESTA 7 (Sterea Hellas) and 9 (Athens & Piraeus)

Benchmarking against of Greek >150 m capacity Cat XL placements

Treaty capacity as % of Key Zone SI



Treaty retention as % of Key Zone SI



Greece – Reinsurance Pricing

Option 1: Current status

Limit: EUR 1.415 bn

xs

Retention: EUR 35 m

Estimated price: EUR 32 m

ROL: 2.26%

Option 2: 25% Penetration

Limit: EUR 2.835 bn

xs

Retention: EUR 65 m

Estimated price: EUR 66.5 m

ROL: 2.35%

Option 3: 50% Penetration

Limit: EUR 6.070 bn

xs

Retention: EUR 130 m

Estimated price: EUR 142.5 m

ROL: 2.35%

- ✓ **Estimated price based on Expected loss x ROL benchmarking database covering 38 Cat XL layers in Greece**

IV. Alternatives for Greece: "Premium Pool" VS. "Loss Pool"

- PREMIUM POOL:
  - High State intervention
  - **Main examples: Spain, Turkey, Romania**
  - Compulsory EQ insurance: distribution by private insurers (Turkey and Romania). In Spain, compulsory EQ for existing policies.
  - Compulsory reinsurance to State Insurer: Spain, Turkey, Romania. The same applies in Japan.
  - Equalization reserve: allowed only for State insurer.
  - Unlimited State guarantee in Spain; Limited State guarantee in Turkey; no State guarantee in Romania.
  - Compensation: First-loss basis.
  - Risk-based premiums

The "Liberal" Approach

- LOSS POOL:
  - More reliance on the private insurance sector.
  - **Main example: France**
  - EQ rider is compulsory in existing Fire Policies (but, very high penetration in fire insurance).
  - Private insurers distribute the EQ rider and **must** reinsure with the State Reinsurer CCR on the basis of "50%-50% Quota Share". No reinsurance commission.
  - Equalization reserve: in the past, it was allowed for both primary insurers and the CCR. It is not available anymore for insurers, due to Solvency II.
  - Risk-based premium.

Lessons from France: 1982 - 2004

- Before 1996:
  - Unique (not risk-based) premium, 9% of "fire premium".
  - Reinsurance to CCR **not** compulsory; but "carrot" of "state" unlimited coverage provided incentive for private insurers not to chase only "good risks". Reinsurance commissions: 24%.
  - Retention increased from 17% in 1983 to 60% in 1996.
  - Equalization reserve of CCR increased from € 223 million in 1985 to € 300 million in 1996; max. value € 525 million in 1992.
  - This reserve was wiped out in the huge losses of 1993. The French Government had to contribute € 500 million.
- After 1996:
  - The unique premium was raised to 12% (rider).
  - Compulsory Quota Share 50%-50%.
  - Zero reinsurance commissions.

Lessons from France /2

- Average loss ratio for period 1982 -2004 has been 58%. Hence, **the loading factor is huge**.
  - The loss ratio for the Spanish State Fund has been 98% (period 1971 – 1999).
- The accumulated profits for the period 1982 – 2004 have been about to € 7.2 billion; they were distributed in annual profits.
  - They could have been used to built up the Equalization Reserve.
- The only major loss in the 20-year period (in 1993)had to be financed by the taxpayers.
- With an adequate Equalization reserve in 1993, there would have been not need at all to increase the premiums by 33%.

V. Lessons for Greece

- Greece is the most exposed country of the EU in the EQ risk, and has suffered the largest EQ Loss in the EU in 1999 (4,5 billion euros); yet, it is the only country without any insurance arrangement for the residential stock.
- The PPP Scheme should be of the "Premium Pool".
- The STATE INSURER should design and price the EQ Policy, which may be distributed by the private insurers (multi-channel distribution).
  - The compensation should be on a first-loss basis.
- The State Insurer should accumulate the Equalization Reserve; yet, the State Insurer could retrocede a part of the risk to interested private insurers.
- The management of the State Insurer should be undertaken by a qualified private insurer, on a tender basis, on a five-year contract.
- **Adopt the Turkish (2000)/Romanian(2014) model, which is the Greek model of 1998.**