

Economic Instruments to Help Finance Resilience Against Mega-Disasters

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Tokyo, 7 September 2023

Economics of Disasters: What have we learnt since 1923?

Great Kanto earthquake (1923) innovated recovery instruments:

- Successful post-disaster liquidity interventions from BoJ (Okazaki et al 2023)

Lesson 1: build resilience prior to disasters:

- **Absorptive resilience** to limit initial impact: mitigate, anticipate, warn, coordinate relief - Japan already world #1!
- **Adaptive resilience** to speed up recovery: insurance cover and own-protection to allow quick restart of private investments.
- **Transformative resilience** to deal with extreme shocks (Kates et al 2014): new approaches, such as collective local protection, relocation and decentralisation

Lesson 2: unlock private sector financing by economic instruments:

- Using behavioural economics, incentives and financing for retrofitting investments
- Developing insurance markets (including through Catastrophe bonds)
- Public-private partnerships for transformative resilience

Building an integrated public-private approach to natural disaster prevention and climate change adaptation

- *Close policy convergence between Sendai Framework, Paris Climate Agreement, and Sustainable Development Goals (Yamazaki-Honda 2022):*
 - **Risk-informed integrated approach to complex interactions of natural disasters with climate factors e.g. Great Kanto earthquake and typhoon**
 - **Complementarities of instruments: e.g. flood/tsunami protection works, emergency energy and water networks etc.**
 - **Climate-proofing needed to ensure longer-term sustainability of disaster-mitigation investments (EU Commission 2023)**
- *Scope to encourage greater public-private focus on complementarities:*
 - **Banking and insurance risks from climate change and natural disasters already increasingly integrated (e.g. BoJ / FSA 2022).**
 - **Scope for common public-private activities focussed on common goals and common values: corporate social responsibility, protection of most vulnerable, preservation of environment, better governance.**

Strengthening household insurance to provide incentives for earthquake proofing investments

Households are not investing enough in earthquake retrofitting:

- **Only 8% households benefit from retrofitting-related discounts (source GIROJ 2022)**
- **Only 5.4% household benefit from maximum 50% retrofitting discount (ibid)**
- **Some 200,000 post-1981 wooden houses in Tokyo not retrofitted, despite generous subsidies**

Earthquake insurance premia might give too optimistic view of actual earthquake risks (Naoi et al 2010):

- **Premia set at prefecture-level and not closely related to localised seismic hazard risks or likely damages**
- **Pattern of household insurance take-up rates is paradoxical (see chart): lower take-up in riskiest areas**
- **Artificially low insurance rates could affect perceived incentives for retrofitting properties**

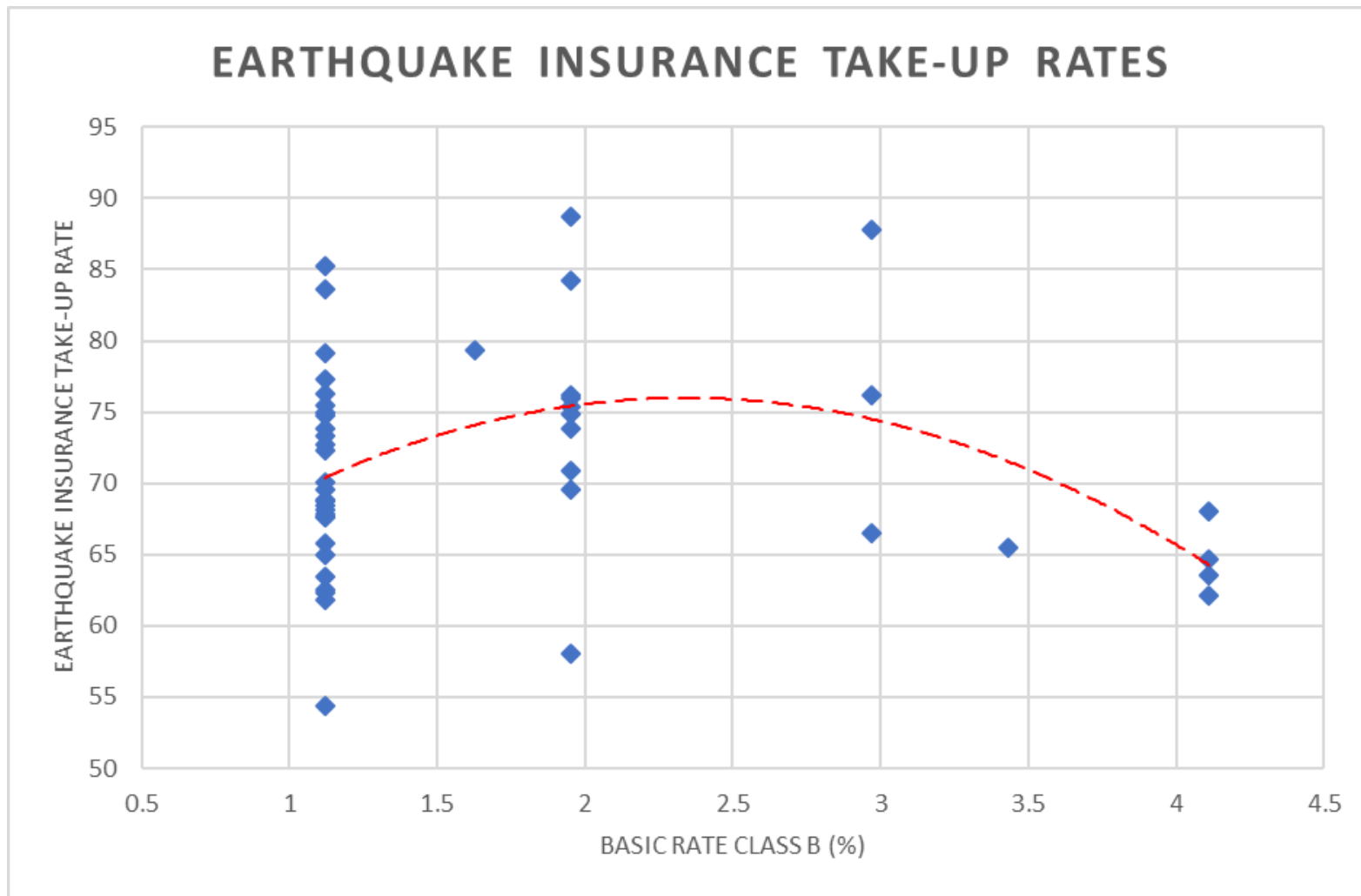
Provide households better information on seismic and climate change risks:

- **Calculate implied subsidies on insurance premia, e.g. where actuarial rate would be > 30% higher than current premium**
- **Directly provide information on local seismic and related local risks (e.g. possible liquefaction risks and tsunami risks)**

Consider providing households with more obvious incentives (“nudging”) to invest in earthquake retrofitting:

- **Consider more targeted insurance discounts e.g. favouring priority retrofitting investments, such as upgrading wooden buildings in line with latest building standards**
- **Consider providing incentives/ requirements for retrofitting of rental buildings (not eligible for building insurance), helping to address earthquake risks for 22.2% of households who are tenants.**

Pattern of household insurance take-up rates is paradoxical: lower take-up in riskiest areas



Strengthening Small and Medium-sized Enterprises (SEM) resilience to natural disasters

Under-use by SMEs of insurance and mitigation measures (Yamori 2019)

- **Earthquake insurance: 20%**
- **Seismic strengthening: 12%**
- **Business continuity plan: 21%**
- **Supply chain management: 12%**

SEM Insurance is expensive and difficult

- **Largely financed by reinsurance (or CAT bonds) in absence of public support.**
- **Very low limits for property exposures**
- **Limited availability of business continuity insurance**

Tohoku earthquake (2011) showed high vulnerability of SEMs lacking insurance:

- **Insurance payments arrive much quicker than government subsidies**
- **Insurance helps to finance recovery after a disaster (Asai 2019)**
- **Insurance protection helps avoid “double debt” problem (Uechiro 2018)**

Possible options for increasing SEM earthquake mitigation investments:

- **Provide subsidy for disaster consultancy support of SEM Business Continuity Plans**
- **Provide local information on earthquake hazard risks and associated factor (liquefaction and tsunami risks)**
- **Consider enhanced tax incentives for disaster mitigation investments.**

Possible options for increasing SEM insurance take-up:

- **Potential for limited SEM insurance scheme e.g. requiring prior investments in mitigation measures**
- **Potential for government support for additional CAT bond issues, but possibly expensive option (ECB/EOIPA 2023). Japan insurers already make up some 7½% of world reinsurance market.**

Stimulating local private-public partnerships for large-scale mitigation investments

- *Private-public disaster partnerships successful in Kobe and elsewhere.*
- *SEM Resilience law 2019 supports local government/SEM partnerships.*
- *Private-public cooperation for disaster resilience with local government proved successful internationally, often involving insurers (Sugiura 2019)*
- *Competitions for public subsidies can provide the incentives to develop local partnerships (Friendly 2016)*

Possible rules for Competitions

- *Local government, business sector in high risk areas can compete for public subsidy prizes (overall public budget subsidy fixed in advance).*
- *Initial proposals for financing mitigation works, retrofitting for housing and public buildings, improved disaster management planning etc.*
- *Final details of project action plan agreed with central government*
- *Governance structure, involving businesses, emergency services, citizens*

Transformational resilience: is there a possible role for decentralisation?

- *Business continuity is a major preoccupation for Japanese businesses and banks, particularly in light of potentially major natural disaster risks (Wakatabe 2019).*
- *Changing agglomeration economics improves competitiveness of decentralised cities*
 - **Networked offices and the increasing importance of innovation and design for competitiveness has improved**
 - **Canada has started developing a series of smaller specialised cities with infrastructure spending reinforced by an Innovation Superclusters challenge (Canada Innovation 2016) to develop regional business clusters: digital, crop genetics, manufacturing, AI, ocean tech.**

This might be an idea that might have some relevance for Japan faced with potentially large scale disasters and a declining population.

- **Development of small regional cities (100,000+) to safeguard government and business continuity, research and innovation, based upon existing regional centres with lower natural disaster risks**
- **Potential to restart regional economies, with excellent environment for families, high quality urban design, sustainability and earthquake resilience**

Potential Role of Private Financing in Mitigating Natural Disasters

There are a number of ways that private financing might help build resilience to natural disasters, particularly for household and SEMs:

- ***Households underestimate likelihood of natural disasters (also in EU and US)***
 - Targeted insurance incentives and authoritative information and may help improve insurance participation and mitigating investment
- ***SEMs underinvest in disaster mitigation and are often locked out of insurance***
 - Better facts, professional advice, and financing to stimulate retrofitting
 - Examining how to provide disaster insurance at least for those investing
- ***Building successful local-level private-public partnerships***
 - Competitions with government subsidies for local economic developments can provide the catalyst for successful partnerships
- ***Decentralising to protect against the unexpectedly large disaster***
 - Safeguarding business continuity, whilst providing opportunities to help reverse existing regional population divergences and provide a favourable environment for improving family life.

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