Japanese Experience

regarding Economic Impact of Building Regulations

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1. Background

1-1 Importance of Building in Economy

1-2 Features of Japanese Building Regulations

1-1 Importance of Building in Economy

- The amount of construction investment in FY 2014 is estimated to reach 51,770,000 million yen (470,000 million US dollars), or approximately 10% of the gross domestic product, of which building investment accounts for 51.3%.
- Building investment has secondary effects on the overall economy because related industries are wide-ranging.
- Building investment has been expected to provide underpinning for the regional economy including traditional local industries.

1-2 Features of Japanese Building

- The Building Standard Law (BSL) was enacted in 1950. Building regulations under BSL needed to secure high productivity to cope with postwar vigorous reconstruction and massive population shift into urban areas.
- Features of building regulatory system under BSL are:
  - ✧ applies to all regions in Japan,
  - ✧ covers not only the building code but also the planning/zoning codes, and
  - ✧ enforced through "building confirmation" paired with "*Kenchikushi* qualification system"

1-2 Features of Japanese Building Regulations

- Building Confirmation is
  - the procedure similar to ‘building permit’, and
  - non-discretionary action in principle.
- Confirmation is to be based on prescriptive (DTS) provisions or concrete verification methods stipulated in BSL.
- For alternative solutions, ministerial approval scheme is available and widely used, which exempts confirmation bodies to check innovative solutions.
- Ministerial approvals are also available for prior checking substitutable for building confirmation.

1-2 Features of Japanese Building Regulations

- Building confirmation body needs to check the application plans/documents within 35 days (7 days for small houses, 70 days for large-scale buildings) in principle.
- After the private confirmation system was introduced in 1999, applicants can choose the building official (the local government) or private bodies.
- Since then, building confirmation has been streamlined by market mechanisms (private bodies competed with one another in price, speed, etc.).

1-2 Features of Japanese Building Regulations

- *Kenchikushi* qualification system:
  - A building (except very small houses, etc.) need to be designed by an expert licensed and registered by the Law as a *kenchikushi.*
  - A *kenchikushi* is to have all-around ability for both architect and engineer.
  - *Kenchikushis* have to design buildings conforming to BSL and other regulations, which, in a sense, makes streamlining of building confirmation procedures possible.
  - Building confirmation bodies don't need to check compliance with the building code of small houses designed by a *kenchikushi*.

1-2 Features of Japanese Building Regulations

- Japan is located in the most active earthquake-prone area in the world. Traditionally houses has been constructed using wooden structure and there remain a number of densely built-up areas of wooden houses.
- Emphasis has been given to safety against earthquake, fire and other natural disasters to prevent loss of lives and severe damage to buildings and urban areas.
- Requirements of structural safety and fire safety have been strengthened after major disasters.

2. Experience

2-1 Past Amendments considering Economic Impact

2-2 Lessons from “Aneha Scandal”

2-3 Current Measures and Examples

2-1 Past Amendments considering Economic Impact

- As investment stimulus measures by the government, series of relaxation have done of requirements in planning/zoning code such as height limit control, floor-area ratio control, etc.
- Provisions on necessary procedures to get “building confirmation” have been reviewed and amended to be more streamlined. The most effective amendment was the introduction of the private confirmation scheme in 1999.
- Building code has been amended with a view to improve productivity. Introduction of performance-based code in 2000 is a typical example.

2-1 Past Amendments considering Economic Impact

- Some of such amendments with the intention of streamlining or relaxing regulations were based on the proposals from the industry collected through variety of channels including:
  - "hotline on regulatory reform" opened by the government to receive proposals concerning regulatory system in general through internet, and
  - "contact point" opened by MLIT (the Ministry of Land, Infrastructure, Transport and Tourism) to receive concrete proposals for amendments of building regulations.

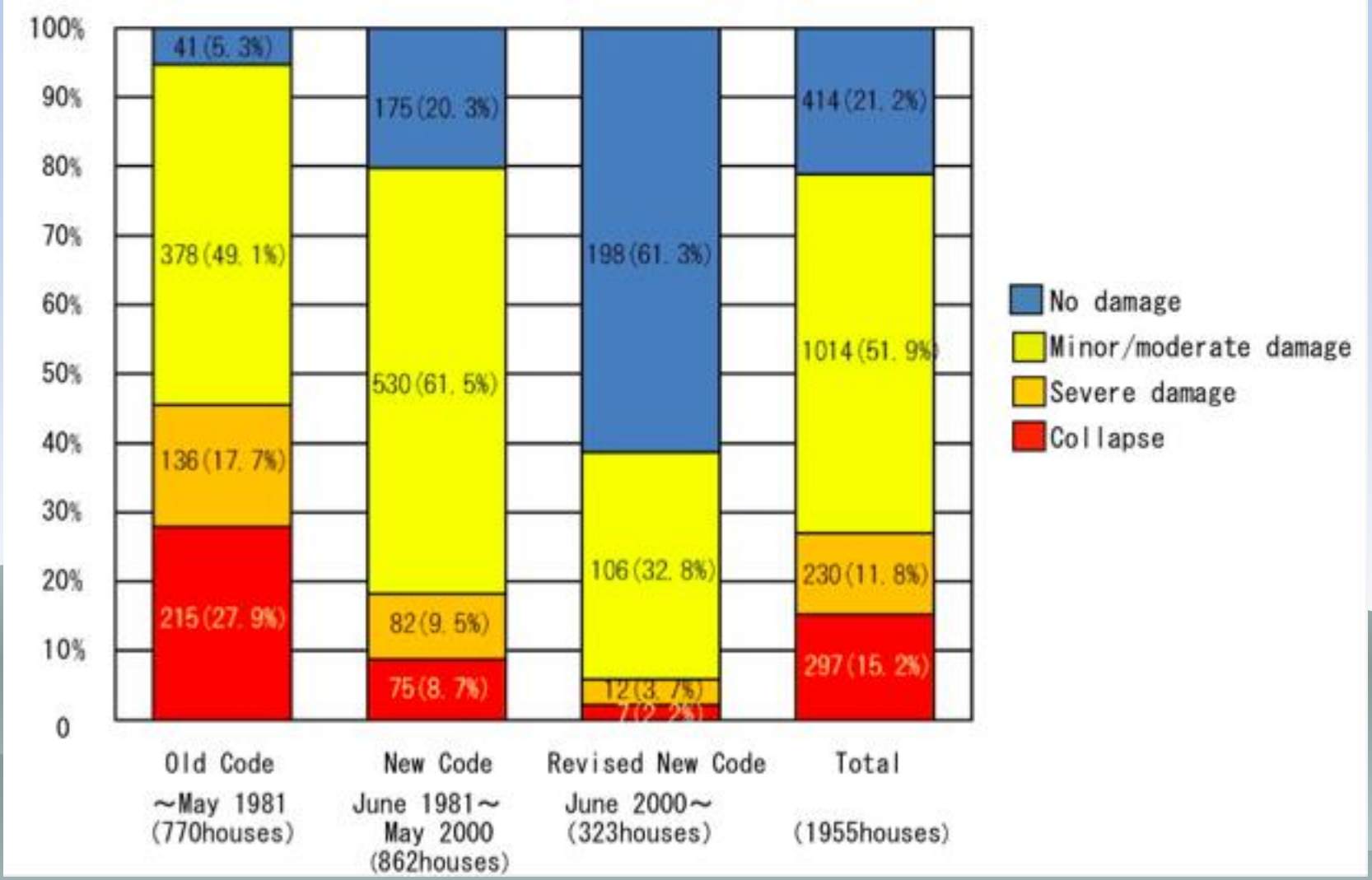
2-1 Past Amendments considering Economic Impact

- We have been *conservative in strengthen requirements* of building code because it would increase building costs and have a negative effect on an economy.
- But requirements for disaster prevention would consequently be highly effective in avoiding economic loss due to earthquakes and other disasters. The report on the damage of wooden houses by Kumamoto earthquake in 2016 has proved the effectiveness of the amendments of the seismic code.

2-1 Past Amendments considering Economic Impact

Collapsed Wooden Houses in Mashiki Town (Kumamoto Prefecture)

2-1 Past Amendments considering Economic Impact



Wooden Houses in Mashiki Town
classified by damage level and type of seismic code

2-1 Past Amendments considering Economic Impact

- In principle, amended (strengthened) requirements will not apply existing buildings unless enlargement or major alteration work is conducted.
- But we have relaxed retroactive application rules of existing buildings meeting some conditions to facilitate both investment and the betterment of building stock.

2-2 Lessons from “Aneha Scandal”

- A *kenchikushi* whose name was Aneha had falsified the results of structural calculations to cover up his faulty work as a subcontracted structural engineer until it was uncovered in November 2005.
- No one had discovered the falsifications for ten years, including the original contracting *kenchikushis*, builders, building officials or private building inspectors.

2-2 Lessons from “Aneha Scandal”

- About 100 buildings - high-rise condominiums and hotels - insufficient in structural capacity had been constructed based on his inadequate designs.

Examples of buildings to be demolished

Percentage: earthquake resistance against the required level

2-2 Lessons from “Aneha Scandal”

- MLIT and local governments conducted sampling inspections of the structural calculation documents, and found out that some other *kenchikushi*s had engaged in similar misconduct or inappropriate structural calculations.
- Because it became a big social problem and the ordinary consumers became victims, the government received strong pressure to take measures immediately.
- The Advisory Council examined measures to be taken and submitted the reports to the Minister in February and August 2006.

2-2 Lessons from “Aneha Scandal”

Schedule

Aneha Scandal Nov. 2005

Amendment to the BSL

Promulgation
Jun. 21, 2006

Full Enforcement
Jun. 20, 2007

Advisory Council

1st report
Feb. 2006

2nd report
Aug. 2006

Amendment to the *Kenchikushi* Law

Promulgation
Dec. 20, 2006

Partial Enforcement
Nov. 28, 2008

Full Enforcement
May 27, 2009

2-2 Lessons from “Aneha Scandal”

- Amendments to the Building Standard Law:
  - Introduction of expert review on structural calculation (excluding small buildings verified by simple methods)
  - Introduction of mandatory inspection during the construction work for collective housing of more than 3 stories
  - Issuance of guidelines for building confirmation, inspection and structural review requiring stricter checking and review

2-2 Lessons from “Aneha Scandal”

- Review of structural calculation program approval system to prevent falsification
- Amendment of regulations on structural calculation methods to make them more detailed and concrete to avoid inappropriate application
- Strengthening of superintendence of private confirmation/inspection bodies
- Intensification of penalties

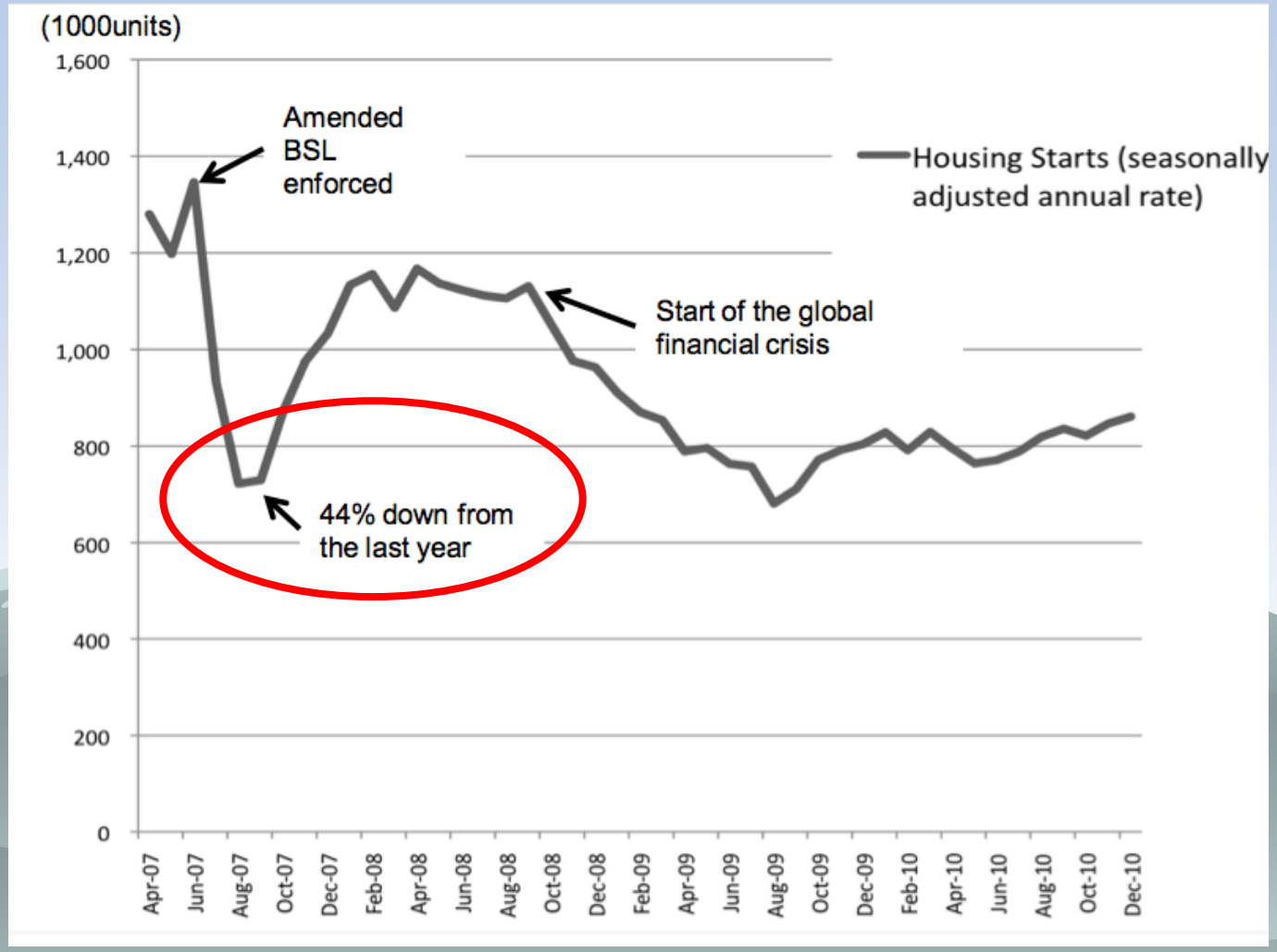
2-2 Lessons from “Aneha Scandal”

- Amendments to the *Kenchikushi* Law:
  - Introduction of new qualification for specialized design: structural design *kenchikushi* and equipment design *kenchikushi* (equipment: plumbing and electrical/mechanical services)
  - New regulation to require the participation of structural/equipment *kenchikushi*s to design work of buildings (excluding small buildings)
  - Introduction of compulsory periodical courses for *kenchikushi*s to learn necessary updated knowledge

2-2 Lessons from “Aneha Scandal”

- Side effect of the amendments:
  - The amount of work by building confirmation applicants and designers has increased greatly, and the burden of the confirmation bodies has also grown much larger.
  - It caused a huge drop of over 40% in the number of housing starts after the enforcement of the revised provisions, which has been criticized as having a negative impact on the economy, coupled with the lengthening of the confirmation period by the introduction of a structural calculation review.

2-2 Lessons from “Aneha Scandal”



Number of housing starts (seasonally adjusted annual rate)

2-2 Lessons from “Aneha Scandal”

- Side effect of the amendments:
  - The major cause was lack of preparedness due to insufficient training and information for practitioners of both sides: *kenchikushi*s and building certifiers.
  - After the enforcement, comprehensive program to provide information and technical support for practitioners was started.
  - The new guideline was also believed to be the cause of the decrease and the strict application was reconsidered to be partially relaxed.

2-2 Lessons from “Aneha Scandal”

- The program to provide information and technical support for practitioners has been continued for not only BSL amendment but also *Kenchikushi* Law to prevent similar side effects.
- The regulations on structural calculation methods and their application rules have reviewed and relaxed to some extent.

2-3 Current Measures and Examples

- Procedures to give opportunities to be checked from the view of economic impact:
  - ✧ Major amendment of BSL has been based on a report from the Advisory Council, which would reflect opinions of the members representing building-related industry.
  - ✧ When the amendment is related to control, a RIA (Regulatory Impact Analysis) report of the draft should be made and published (from 2007). And it is necessary to publish the draft to invite public comments (from 1999).

2-3 Current Measures and Examples

- Recently, practicability of the revised provisions not only for new buildings but also existing ones has been considered more seriously when drafting. Examples are:
  - ✧ Some middle-sized buildings have been exempted from the expert review on structural calculation (since 2015).
  - ✧ Buildings subject to new requirements for seismic design of ceilings were limited to the ones with huge inner space (in 2014).

2-3 Current Measures and Examples

- There has been a tendency to adopt a policy to improve safety and other performance of buildings not by mandatory requirements but by voluntary guidelines and incentive measures. Examples are:
  - ✧ seismic retrofitting of existing substandard buildings facilitated through guidelines, subsidies, etc., and
  - ✧ promoting housing with higher seismic safety through “performance indication system” and preferential premium rates for the earthquake insurance.

3. Future Direction

- Both achievement of the objectives of building regulations and prevention of negative effect on economy are important and often conflicting each other. To keep them well-balanced, we need
  - ✧ to better the regulatory system as a whole to meet the changing societal needs efficiently,
  - ✧ to improve the review/amendment process of building regulations so that it would be more transparent and could reflect needs of parties concerned properly,

- to raise the preparedness for change of regulations through improving accessibility of information and systems of education and training
- to continue efforts to streamline building confirmation and other related procedures especially for new requirements being introduced such as energy, accessibility, etc. , and
- to develop practical analysis methods to evaluate the cost and benefit balance of possible options.

Thank you for you attention!

感謝！

- For Japanese building regulatory system see IRCC related documents/files or “Introduction to the Building Standard Law” (BCJ: http://www.bcj.or.jp/en/services/reference.html)
- For “Aneha Scandal” see “The Aneha Scandal - building fraud in Japan” (W.Gojo: Forensic Engineering Volume 164 Issue FE4)