Defect Liability in Construction Contracts

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Natures of Construction Projects
- Uncertain natural/physical conditions
- Complexity of process
- A number of sources of uncertainties

Sources of Contractual Risks
- Force Majeures
  - Legal change, War
- Force Majeures + Human Hazards
  - Earthquake, Adverse Physical Condition
- Human Hazards
  - Defects, Failure of performance achievement
    - Defect liability rule for remedy is needed.

Governing Law
- Defect liability rule provided by governing law is applied unless otherwise agreed between the parties
- Japan; Japanese Civil Code
- UK; Common Law
Defect Liability Rule in Governing Law

<table>
<thead>
<tr>
<th>Liability rule</th>
<th>Japanese Civil Code (Japan)</th>
<th>Common Law (UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent or latent at transaction time</td>
<td>Strict Liability for workmanship and material</td>
<td>Negligence for workmanship</td>
</tr>
<tr>
<td>Latent defect at transaction time</td>
<td>Both of patent and latent defect</td>
<td>Latent defect</td>
</tr>
</tbody>
</table>

Strict Liability and Negligence

- **Strict Liability**
  Contractors are liable for defects without regard for a level of care undertaken.

- **Negligence**
  Contractors are liable for defects only if he failed to take a minimum level of care, referred as the due standard of care.

Purpose of This Study

- Is either of defect liability rule in Japan and UK proper?
- If so, why?; Proposing an theoretical hypothesis
  - Existence of ‘institutional complimentarity’
- ‘Law and Economics’ approach

Defect Liability Model

- Cost of care undertaken by contractor $x$
- Probability of defect detection $p(x)$
- Amount of damage due to defect $D$
- Probability distribution function of $D$ $F(D)$
Efficient Level of care

- Social cost minimizing problem
  \[ \min_x x + p(x) \int_0^\infty DdF(D) \]
  (cost of care) + (expected damage due to defect)

  \[ p'(x^*) = -\frac{1}{\int_0^\infty DdF(D)} \]
  first-order condition

Characteristics of Japanese Const. Cont.(1)

- Article 1 of the Civil Code
  ‘a duty to transact in good faith’
- Article 18 of the GCW (Standard form of Construction Contract in Japan)
  “…the amount to be borne or to be reimbursed in this case (in case of Change of Work) shall be determined upon by negotiation between the Owner and the Contractor

Characteristics of Japanese Const. Cont.(2)

- Definition of ‘Good Faith’; economic point of view (Kobayashi et al. 2001)
  - An shared belief on behavioral premise between the government and the contractor,
    - The government’s leading role in change of work
    - Ability to identify defects and
    - to verify some faults as defects as neutral point of view
  - Prohibition of contractors’ strategic behavior:
    The contractor is supposed NOT to take opportunistic behavior, such as hold-up or moral hazard

Strict Liability with Good Faith

- Contractor’s cost minimizing problem
  \[ \min_x x + p(x) \int_0^\infty DdF(D) \]
  
- Selected cost of care coincides with the one of social optimum.
Negligence with Good Faith

- Contractor’s cost minimizing problem
  \[
  \min_x \begin{cases} 
  x & \text{if } x \geq z \\
  x + p(x) \int_{0}^{\infty} DdF(D) & \text{if } x < z
  \end{cases}
  \]

- If \( z = x^* \), selected cost of care coincides with the one of social optimum.

Efficiency of Defect Liability Rule with Good Faith

- Strict Liability
  - Verification of causation
- Negligence
  - Verification of causation
  - Verification of due standard care
    - which requires more administrative cost

- Strict liability rule is more efficient.

Defect Liability Model without Good Faith

- The contractor’s strategic behavior in decision to remedy
  - Accept to remedy if \( D < c_p \)
  - Reject to remedy if \( D \geq c_p \)
- Contractor’s cost minimizing problem
  \[
  \min_x x + p(x) \int_{0}^{\infty} DdF(D) \quad x^0 < x^*
  \]

Strict Liability without Good Faith

- The contractor’s strategic behavior in decision to remedy
  - Accept to remedy if \( D < c_p \)
  - Reject to remedy if \( D \geq c_p \)
- Contractor’s cost minimizing problem
  \[
  \min_x (x - c_p, -D - c_a)
  \]
Negligence without Good Faith

- Liability of the contractor is determined according to the level of care undertaken.
- Contractor’s cost minimizing problem
  \[
  \min_x \begin{cases} 
  x & \text{if } x \geq z \\
  x + p(x) \int_{c_p}^{\infty} DdF(D) & \text{if } x < z
  \end{cases}
  \]
- If \( z = x^* \), selected cost of care coincides with the one of social optimum.

Efficiency of Defect Liability Rule without Good Faith

Cost of applying strict liability rule
\[ \checkmark \]
Verification cost of due care under negligence
- Negligence is more efficient

Summary of Results

<table>
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<tr>
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<th>Defect liability rule</th>
<th>Care level</th>
<th>Range to be remedied</th>
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<td>Strict liability</td>
<td>Efficient</td>
<td>([0, \infty))</td>
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Conclusion

- Strict liability may be appropriate for defect liability rule under the environment with good faith.
- Negligence liability may be appropriate for defect liability rule under the environment without good faith.
- Strict liability may be appropriate for defect liability rule under the contract provision.