Third-Party Opportunism and the (In)Efficiency of Public Contracts

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Characteristics of Public Contracts

- inefficient
- low quality
- delays
- expensive
- corruption, favoritism
- bureaucratic, red tape

- politics
- intricate, convoluted
- scrutiny, regulation
- controls, inspections
- protests, courts
- ...

Moszoro & Spiller (IESE, Berkeley)
... third parties...

Figure: Monster-in-Law

... not necessarily interested in the success of the relationship (political opponents, excluded bidders, and interest groups)
Findings

- Third-party opportunism (TPO) as key hazard of public transactions
- Specificity and rigidity in public contracting are a political risk adaptation by public agents
  - Public agents limit the risk of third parties’ challenges through formalities and rigidities
  - ... externalizing the associated costs to the public at large
- Scrutiny increases public contracting efficiency in costly litigation environments, concentrated (politically) contestable markets, and with upwardly biased beliefs about benefits of challenge
Signaling Process: Hazards into Rigidity—Agents

Preliminaries:

- Public agent’s perspective
- Simple short-term contract for standard good/service
- Ignore sunk costs to abstract from governmental opportunism

Four agents explicitly and implicitly involved in public contracting:

1. Incumbent public agent
2. Private contractor
3. Third-party challengers, i.e., political opponents to the incumbent public agent, competitors to the contractor, and interest groups (“anti-arbitrators”)
4. Public at large, i.e., voters and courts
Signaling Process: Hazards into Rigidity—Timing

Public agent:
1. Receives project features and budget $P_{bud}$
2. Perceives threat of potential TPO challenges
3. Minimizes political risks by contract specificity and rigidity $R^*$

Private contractor:
3. Observes contract specificity and rigidity $R^*$
4. Less adaptability equals higher contracting and implementation costs, and hence higher final price $P_{min}$

Third parties:
5. Privately perceive benefits from potential challenge
6. Contract features $R^*$ affect third parties’ strategies, thereby affecting political outcomes
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<td>$= T_0 \rho \tau$  Expected political costs of the loss of office, reputation, and support</td>
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We define the following objective functions for the agents:

\[
\begin{align*}
\text{Incumbent public agent:} & \quad \minimize_{R} & & \mathbb{E}[T(R) \mid \tau] + K(P, R) \\
& & \text{subject to} & K = K_{pr}(R) + K_{pu}(P, R), P^{bud} \geq K_{pr} \\
\text{Private contractor:} & \quad \maximize_{P} & & (P - K_{pr}) \mid R \\
& & \text{subject to} & P^{bud} \geq P \geq K_{pr} \\
\text{Third-party challengers:} & \quad \maximize_{q \in \{0,1\}} & & q[\widetilde{T}_0 \zeta \tau - c] \mid R \\
& & \text{subject to} & 0 < \zeta \leq 1
\end{align*}
\]

where $\zeta$ is the political (market) concentration and $\widetilde{T} = \widetilde{T}_0 \zeta \tau$ reflects opportunistic third party’s beliefs about her potential internalization of the incumbent public agent’s costs.
Given $T_0, \tilde{T}_0, \tau, c, \zeta$, and $K$, the equilibrium $\{q^*, \rho^*, R^*, P^*\}$ is such that:

(a) $R^* = \arg\min_R[T_0\rho(R)\tau(R) + K(P, R)]$
(b) $\rho^* \equiv \mathbb{E}(q^* | R^*) \equiv \Pr[\tilde{T}_0\zeta\tau(R^*) > c(R^*)]$
(c) $P^* \in [P_{\text{min}}, P_{\text{bud}}] = K_{pr} | R^*$

This solution can be achieved intuitively backwards. Starting from $R^*$, any deviation from equilibrium makes the public agent worse off:

(a) If $R < R^*$, then $\tau(R) > \tau(R^*), c(R) < c(R^*)$, therefore $\rho > \rho^*$ and $\mathbb{E}[T(R)] - \mathbb{E}[T(R^*)] > K(P^*, R^*) - K(P, R)$, i.e., $\mathbb{E}(T)$ increase offsets gains in $K$ decrease

(b) If $R > R^*$, then $\mathbb{E}[T(R^*)] - \mathbb{E}[T(R)] < K(P, R) - K(P^*, R^*)$, i.e., $K$ increase outmatches gains in $\mathbb{E}(T)$ decrease
Lemma

The sum curve of expected third-party opportunism costs $E(T)$ plus adaptation costs $K$ is U-shaped and has an interior global minimum at $R^*$

Corollary

In the presence of TPO, the sequential equilibrium public contract that minimizes political and adaptation costs is specific and rigid, ergo more expensive in its design, implementation, and control than the theoretical first-best in the absence of TPO

Remark If $E(T)$ does not fall faster in $R$ than $K$ increases in $R$ for low $R$ states, TPO is irrelevant for the outcome of the contract (e.g., relational contracts). If TPO is a relevant hazard for the public agent, Lemma 1 implies that the optimal contract is partly flexible and of finite rigidity.
Figure: This graph plots expected third-party opportunism costs $\mathbb{E}(T)$ (red solid line) falling in rigidity and specificity $R$, costs borne by the contractor $K_{pr}$ (blue dash line) and adaptation costs $K$ (blue double-solid line) rising in $R$, and the U-shaped sum of $\mathbb{E}(T) + K$ (green dot line) as the objective function of the public agent minimizes.
An increase in specificity and rigidity $R$ carries two effects:

1. It lowers the likelihood of success of a TPO challenge $\tau$ (downward probabilistic shift of the cumulative distribution curve of third-party opportunism benefits $\tilde{T}$)

2. It increases cost of challenge $c$ (rightward move of cost of litigation)

Thus it decreases the probability at which an opportunistic challenge pays off
Figure: This graph plots the cumulative probability ($y$ axis) of the public agent’s beliefs about third parties’ benefits from an opportunistic challenge ($x$ axis): blue solid line for low rigidity and red dot line for high rigidity contracts. The likelihood of a TPO challenge $\rho$ is the complementary cumulative probability of the third parties’ benefits from an opportunistic challenge being lower than the cost of challenge, i.e, $\rho = 1 - \Pr(\tilde{T} < c) = \Pr(\tilde{T} - c \geq 0)$. The cumulative distribution function at high rigidity is first-order stochastically dominated by the cumulative distribution function at low rigidity.
Satisfies and proves the assumption of convexity of $\rho$ in $R$

Provides contractual properties consistent with public contracting practice:

(a) Larger contracts $\rightarrow$ higher expected political benefits for opportunistic third parties (higher mean $\mu$) $\rightarrow$ higher $\rho | c$

(b) The more dispersed TPs’ beliefs (high informational asymmetry states), lower [higher] $c$ leads to lower [higher] $\rho$

(c) $\rho$ is sensitive to the institutional environment determining $\tau$ and $c$: the higher $\tau$, the higher $\rho$; the higher $c$, the lower $\rho$; the more $\tau$ decreases in $R$, the more $\rho$ will fall in $R$

(d) The rule of law implies, ceteris paribus, higher $\rho$

(e) Exogenous institutional changes (e.g., environmental norms) produce a new cumulative probability of challenge distribution, which will first-order stochastically dominate the former distribution when the legal system becomes more restrictive
Figure: This graph plots the likelihood of opportunistic challenge $\rho$ for different levels of specificity and rigidity $R$, assuming the same distribution functions of third parties’ benefits from an opportunistic challenge and the same cost of challenge as in Figure 3.
An increase in scrutiny—i.e., critical public observation and accountability through transparency and public participation—lowers the informational asymmetry between the actual political costs for the incumbent public agent and the third parties’ beliefs about the political benefits from an opportunistic challenge

- First, $\uparrow$ scrutiny $\rightarrow$ calibration of beliefs $\rightarrow\downarrow \sigma$ of the distribution of expected political benefits $\rightarrow$ second-order stochastically dominant distribution, with the inflection point at the mean expected political benefits
- All other things being kept constant (particularly, $\mu^L = \mu^H$), an increase in scrutiny leads to an increase in the likelihood of challenge $\rho$ at low litigation costs $c$ and to a reduction in $\rho$ at high $c$
Figure: This graph plots the cumulative probability ($y$ axis) of the public agent’s beliefs about third parties’ benefits from an opportunistic challenge ($x$ axis): blue solid line for low scrutiny states and red dot line for high scrutiny states. The distribution function at high scrutiny (red dot line) second-order stochastically dominates the distribution function at low scrutiny (blue solid line). All other things being kept constant, an increase in scrutiny leads to an increase in the likelihood of challenge $\rho$ at low litigation costs $c$ and to a reduction in $\rho$ at high $c$. 
Second, an increase in scrutiny updates third parties’ distribution of beliefs about the political benefits from an opportunistic challenge.

If expected political benefits downwardly biased (underestimated) by third parties ($\mu^L < \mu^H$) → upward adjustment (first-order stochastic dominance given the same $\sigma$)

If expected political benefits upwardly biased (overestimated) by third parties ($\mu^L < \mu^H$) → downward adjustment.

High scrutiny regimes efficient (lower $\rho$, thus lower $R^*$ and $P$) for high litigation costs environments $c$

High scrutiny regimes inefficient for low $c$

High scrutiny leads to public contracting efficiency (lower $\rho$, thus lower $R^*$ and $P$) with upwardly biased third-party beliefs.
Figure: This graph plots the cumulative probability ($y$ axis) of the public agent’s beliefs about third parties’ expected benefits from an opportunistic challenge ($x$ axis): blue solid line for low scrutiny states, red dot line for high scrutiny states and neutral beliefs adjustment, green dash line for high scrutiny states and upwardly adjusted beliefs, and black dash-dot line for high scrutiny states and downwardly adjusted beliefs. Upwardly adjusted beliefs (green dash line) first-order stochastically dominate neutral beliefs adjustment (red dot line). Generally, an increase in scrutiny leads to public contracting efficiency (lower $\rho$, thus lower $R^*$ and $P$) with upwardly biased third-party beliefs.
On the one hand, better informed third parties due to scrutiny may increase or decrease the likelihood of TPO, depending on calibration and update of beliefs.

On the other hand, scrutiny increases the level of internalization of adaptation costs by the public agent.

⇒ It is equivocal whether open information policies (as the case of California or Berlin) lead to more efficient public contracts.

**Proposition**

Assuming away administrative scrutiny costs, an increase in scrutiny reduces contract rigidity $R^*$ only if the internalization of adaptation costs effect is larger than the increase of political costs due to calibration and update of beliefs by opportunistic third parties.
If the political opposition is fragmented, benefits from a challenge can go to any of the political competitors, not necessarily to the challenger who bears costs $c$.

As $\zeta \approx 0$ (atomized political opposition), there will be no TPO challenges (mono-partisan or autarky system).

Analogically, a loser bidder will challenge a contract output only if benefits $\tilde{T}$ are higher than litigation costs $c$.

In this case, $\zeta$ describes the challenger’s market structure: $\zeta = 1$ for symmetrical Bertrand duopolies (one’s contractor losses are the gains for the other), $\zeta < 1$ for oligopolies, and $\zeta \approx 0$ for perfect competition, where an individual competitor has no incentives to challenge a public tender outcome.
Bureaucracies

Fixed-Price vs. Cost-Plus Contracts

Public-Private Partnerships

External Consultants and Certification of Contractors

Efficient Small Communities and Authoritarian Regimes

Privatization of Government-Owned Companies
In theory, fixed-price: adverse selection < moral hazard
- Fixed-price: standardized goods and low informational asymmetry
- Cost-plus: technological uncertainties > inefficiencies from incomplete monitoring

In practice, cost-plus criticized for cost overruns
- GAO 2008 on defense acquisition: cost overruns of 26% ($295B)
- More flexible to adaptation, but also potential abuse ("blank check")
- US Presidential Memorandum of 3/4/2009: “there shall be a preference for fixed-price type contracts. Cost-reimbursement contracts shall be used only when circumstances do not allow the agency to define its requirements sufficiently to allow for a fixed-price type contract”

TPO → preference for fixed-price where cost-plus more efficient
- Fixed-price $\sim$ adaptable risk-sharing mechanisms
- Costs underestimation in 9/10 of transport projects: rail +45%, tunnels and bridges +34%, and road +20% (Flyvbjerg et al. 2002)
- Event study—Poland: 29% of contracts to lowest price bidder in 2004; 91% in 2010: EU increased frequency and depth of controls
Public-Private Partnerships

- PPPs: *ex ante* flexibility in contracting to gain efficiency
- *Ex ante* flexibility makes PPPs vulnerable to TPO ($\uparrow \rho \rightarrow \uparrow P$
- Response: KPIs as *ex post* quality control and signal that service remains publicly accountable
  - Australia (2001): the PPPs inferior—more expensive or lower quality of services—than the standard model of public procurement
  - Response: formal procedures for *ex ante* assessment using the Public Sector Comparator (PSC) and Value-for-Money (VfM), i.e., more contractual *ex ante* specificity and costs
  - New Zealand (2009): “there is little reliable empirical evidence about the costs and benefits of PPPs” and that “the advantages of PPPs must be weighed against the contractual complexities and rigidities they entail”
- TPO $\rightarrow$ PPPs only when gains from contract flexibility and better private management $>$ costs of compliancy with *ex ante* cost-benefit assessment and *ex post* KPIs
Concluding Remarks

TPO theory combines political hazards and adaptation costs to explain apparent inefficiencies in public contracts

- High *ex ante* payment volatility or *ex post* flexibility in implementation may trigger drawbacks, leading to contract failure or costly adaptation by the public official, whether in terms of time or political career.

- High specificity and rigidity, and high prices of public contracts is a sequential equilibrium: public agents minimize political third-party costs with contract specificity and rigidity, which induce high contracting prices.

- True inefficiency in public contracting should pass Williamson’s (1999) remediableness test.