Endogenous Detection of Collaborative Crime: the Case of Corruption

I will show…
…what happens if we endogenise detection in a corruption game with asymmetric penalties.

You will see…
…surprising results of how (not) to deter corruption.
Consider three cases where $\alpha = 0.5$:
If $F > 10$, then offend
If $F = 10$, then indifferent
If $F < 10$, then not offend.
Therefore: optimal deterrence at min $\alpha$ and max $F$.
An orthodox Becker-type model\(^2\) of corruption.

\[
v - b - \alpha(p_B^1 + p_B^2) \\
b - \alpha(p_O^1 + p_O^2) + r
\]

\(v = \text{benefit from reciprocation}\)
\(b = \text{bribe}\)
\(p^n_i = \text{penalty, where } i = (\text{Briber, Official})\) and \(n = (\text{bribe/accept bribe, reciprocate/accept quid pro quo})\)
\(r = \text{moral payoff for keeping with social norm of reciprocity}\)
\(\alpha = \text{probability of inspection/detection}\)

\(^2\)This model with asymmetric penalties and specifically the idea of including the social norm of reciprocity as a decisive motivation for the completion of a corrupt deal is adapted from Lambsdorff and Nell (2007) “Fighting Corruption with Asymmetric penalties and Leniency”.
An Endogenous Detection Model.

\[ \beta_1 = \text{bribe, } 1-\beta_1 = \text{not bribe} \]
\[ \beta_2 = \text{reciprocate, } 1-\beta_2 = \text{not reciprocate} \]
\[ \alpha = \text{inspect, } 1-\alpha = \text{not inspect} \]

\[ \begin{align*}
\beta_1 & = \text{bribe, } 1-\beta_1 = \text{not bribe} \\
\beta_2 & = \text{reciprocate, } 1-\beta_2 = \text{not reciprocate} \\
\alpha & = \text{inspect, } 1-\alpha = \text{not inspect} \\
\end{align*} \]
Results.

Higher penalty on briber:
• Bribing
• Accepting quid pro quo

Lower bribery, but...
• Even higher reciprocation!

Thus:
• Overall reciprocated bribery increases (corruption)!

Higher penalty on official:
• Accepting bribery
• Reciprocating

Although higher bribery...
• Even lower reciprocation!

Thus:
• Lower overall reciprocated bribery (corruption)!
Thank you!
Appendix.

• Tsebelis’ inspection game
• Other equilibria
Consider a raise in the penalty:
There is only one equilibrium – a mixed-strategy equilibrium.
As F goes up, $\alpha$ goes down and $\beta$ remains constant.

Thus, raising $F_{\text{max}}$ does not deter anymore.

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For the eager people: 3 types of equilibria.

Whichever is lowest:

• The level of inspection $\alpha$ at which the entrepreneur is indifferent.
• The level of inspection $\alpha$ at which the bureaucrat is indifferent.
• Or $\alpha = 1$, as the meaningful boundary, since 1 reflects definite detection and any value higher than that is not intelligible.
\[
\begin{align*}
\frac{r}{p_o^2} & \\
\frac{v-b}{p_B^1 + p_B^2} & \\
\end{align*}
\]

\[
\begin{align*}
\alpha & \\
\beta_1^* & \\
\beta_2^* & \\
\end{align*}
\]

\[
\begin{align*}
\alpha^* & = \frac{r}{p_o^2} \\
\beta_1^* & \\
\beta_2^* & \\
\end{align*}
\]

\[
\begin{align*}
\alpha & \\
\beta_1^* & \\
\beta_2^* & \\
\end{align*}
\]

\[
\begin{align*}
\alpha^* & = \frac{v-b}{p_B^1 + p_B^2} \\
\beta_1^* & \\
\beta_2 & = 1
\end{align*}
\]

Everybody happy:
\[
\begin{align*}
\alpha & = 1 \\
\beta_1 & = 1 \\
\beta_2 & = 1
\end{align*}
\]

Indecision:
\[
\begin{align*}
\alpha^* & \\
\beta_1^* & \\
\beta_2^* & \\
\end{align*}
\]

Equilibrium

Type I

Type II

Type III

Tsebelis-type:
\[
\begin{align*}
\alpha^* & \\
\beta_1^* & \\
\beta_2 & = 1
\end{align*}
\]