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# **Effects of the Third Party Errors**

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# Motivation

- Depersonalized exchanges (on D.North) with third-party enforcement as a way for Pareto-improvement of outcomes (natural way of analysis under assumptions of the lack of information on counterparts )
- Optimal deterrence (on G.Becker) by the means of sanctions for rules violators (in the light of errors of type II) within the framework of strategic interaction
- The problem of type I errors in economic exchanges from the cooperation (but not only deterrence) effects perspective

# The aim

- To identify not only distributive but also coordination effects of economic exchanges (strategic interaction between players) with third party enforcement and enactment errors of both I and II types

# Tasks

- Effects of I&II types errors in third-party enforcement within the context of strategic interaction of participants of economic exchanges
- Errors of I&II types within the context of rules enactment and enforcement interrelations

# **1. Effects of I&II types errors in third-party enforcement within the context of strategic interaction of participants of economic exchanges**

# Basic definitions and assumptions on errors in enforcement

## Errors of I type in enforcement:

- *Strong form: prosecution of innocent*
- Weak form: excessively hard prosecution for rules violation

## Errors of II type in enforcement:

- *Strong form: non-prosecution of rules violator,*
- Weak form: too low sanctions for violations

# Pay-off matrix for one shot «Prisoners' dilemma» game

$$A_3 > A_1 > A_4 > A_2$$

$$B_2 > B_1 > B_4 > B_3$$

Nash equilibrium ( $A_4; B_4$ ) Pareto-non-optimal

		<b><i>B</i></b>	
		Abide Rules (rights)	Violate Rules (rights)
<b><i>A</i></b>	Abide Rules (rights)	$A_1$ $B_1$	$A_3$ $B_3$
	Violate Rules (rights)	$A_2$ $B_2$	$A_4$ $B_4$

# The new game parameters - 1

- T – cost of third-party enforcement for players (A&B)
- Equal distribution of the service cost burden among players
- Y – sanctions for rules (property rights – both absolute and relative) violation
- Z – restoration of rules (property rights) violated (compensations)



# Pay-off matrix with new parameters

		<i>B</i>	
		Abide	Violate
<i>A</i>	Abide	$A_1 - \frac{T}{2} \quad B_1 - \frac{T}{2}$	$A_2 - \frac{T}{2} + Z \quad B_2 - \frac{T}{2} - Y$
	Violate	$A_3 - \frac{T}{2} - Y \quad B_3 - \frac{T}{2} + Z$	$A_4 - \frac{T}{2} - Y + Z \quad B_4 - \frac{T}{2} - Y + Z$

# Comments

- Third-party enforcement (TPE) is a tool for Nash equilibrium Pareto-improvement under depersonalized exchanges
- There are both coordination and distribution effects of TPE
- Services effectiveness of non-discriminating enforcer doesn't mean Pareto-efficiency (or even improvement) within the new game structure by default under assumption of pay-offs comparability
- The context of initial game does matter for qualification of subsequent game modifications (Competition on Bertrand vs. Collusion  $\neq$  Rules (rights) abiding vs. unenforced rules (rights)).

# The new game parameters - 2

Errors of non-discriminating enforcer:

- $\rho_1$  – probability of errors of I-st type
- $\rho_2$  – probability of errors of II-nd type

# Pay-off matrix with non-zero probabilities of errors of I & II types

		<i>B</i>	
		Abide	Violate
<i>A</i>	Abide	$A_1 - \frac{T}{2} - \rho_1(Y - Z)$ $B_1 - \frac{T}{2} - \rho_1(Y - Z)$	$A_2 - \frac{T}{2} + (1 - \rho_2)Z - \rho_1Y$ $B_2 - \frac{T}{2} - (1 - \rho_2)Y + \rho_1Z$
	Violate	$A_3 - \frac{T}{2} - (1 - \rho_2)Y + \rho_1Z$ $B_3 - \frac{T}{2} + (1 - \rho_2)Z - \rho_1Y$	$A_4 - \frac{T}{2} - (1 - \rho_2)(Y - Z)$ $B_4 - \frac{T}{2} - (1 - \rho_2)(Y - Z)$

# Threshold for improvement: *comparing(!)* error-free and erroneous enforcement outcomes

Probabilities of I & II errors types are zero:

$$(A_1 + B_1) - (A_4 + B_4) = T$$

Probabilities of I & II errors types are above zero:

$$(A_1 + B_1) - (A_4 + B_4) = T + 2\rho_1(Y - Z)$$

# Discriminating enforcer ( $n \neq 0,5$ )

		<i>B</i>	
		Abide	Violate
<i>A</i>	Abide	$A_1 - nT$ $B_1 - (1-n)T$	$A_2 - nT + Z$ $B_2 - (1-n)T - Y$
	Violate	$A_3 - nT - Y$ $B_3 - (1-n)T + Z$	$A_4 - nT - Y + Z$ $B_4 - (1-n)T - Y + Z$

# «Everything is for friends, the law is for others»

		B	
		Abide	Violate
A	Abide	$A_1$ $B_1 - T$	$A_2 + Z$ $B_2 - T - Y$
	Violate	$A_3$ $B_3 - T$	$A_4 + Z$ $B_4 - T - Y$

# **Variants of consequences under multidimensional discrimination**

1. Restoration of rules absence/universal violation as in initial game. It is possible if sanctions are not high as compared with pay-off for discriminated party(ies).
2. Rules violation by “friends” and rules abiding by “others”. Sanctions are high for those who are prosecuted = illusion of Rule of Law outcomes under imperfect rules enforcement



# Errors of I&II types with discrimination

		B	
		Abide	Violate
A	Abide	$A_1 - nT - \rho_1(a_1Y - a_2Z)$ $B_1 - (1-n)T - \rho_1(b_1Y - b_2Z)$	$A_2 - nT + (1 - \rho_2)a_2Z - \rho_1a_1Y$ $B_2 - (1-n)T - (1 - \rho_2)b_1Y + \rho_1b_2Z$
	Violate	$A_3 - nT - (1 - \rho_2)a_1Y + \rho_1a_2Z$ $B_3 - (1-n)T + (1 - \rho_2)b_2Z - \rho_1b_1Y$	$A_4 - nT - (1 - \rho_2)(a_1Y - a_2Z)$ $B_4 - (1-n)T - (1 - \rho_2)(b_1Y - b_2Z)$

# Threshold conditions for multidimensional discrimination

$$(A_1 + B_1) - (A_4 + B_4) = T + \rho_1[(a_1 + b_1)Y - (a_2 + b_2)Z]$$

$$2(Y - Z) = (a_1 + b_1)Y - (a_2 + b_2)Z$$

$$2(Y - Z) > (a_1 + b_1)Y - (a_2 + b_2)Z$$

$$2(Y - Z) < (a_1 + b_1)Y - (a_2 + b_2)Z$$

# Conclusions - 1

- The service on rules (rights) enforcement is composite good and consists of (1) deterrence based on credible threat of violator prosecution, (2) restoration of the rule (rights) violated.
- Enforcement errors of I & II types influence both benefits distribution (including enforcer) and equilibrium efficiency.
- Errors of type I is especially important due to effects of higher enforcement cost for socially desired cooperation.

# Conclusions - 2

- The harder error of I type the narrower limits for welfare increase, and weaker deterring sanctions effects even without any risk aversion effects
- While discrimination in TPE cost of services for players doesn't effect on cooperation effects discrimination on other enforcement dimentions is not cooperation coordination effects neutral

## **2. Errors of I&II types within the context of rules enactment and enforcement interrelations**

# Errors in rules enactment

## **Error of I type:**

- *Strong form: enactment of prohibition or restrictions where unnecessary*
- Weak form: to hard prohibition or restriction

## **Error of II type:**

- *Strong form: no prohibition or restrictions where ones are necessary*
- Weak form: to easy prohibitions or restrictions

# Errors of I & II types in enactment and enforcement: the map

		Enforcement		
		No errors	I	II
Enactment	No errors	1.1	1.2.	<b>1.3.</b>
	I	2.1.	2.2.	<b>2.3.</b>
	II	<b>3.1.</b>	<b>3.2.</b>	<b>3.3.</b>

# Some effects of various interrelations of errors in enactment and enforcement

- Consequences of errors in enactment may be amplified/compensated by errors in rules enforcement.
- BUT in both cases the common result is *bad institutions*
- Various errors combinations may influence both distributive and coordination results of economic exchanges.
- While enforcement errors are qualified as such within the framework “the rule-reglamented action”, enactment errors as such are related to estimates of opportunities for Pareto-improvement, correspondence to Kaldor-Hicks or Kaldor-Hicks-Zerbe criteria.



# Errors of I & II types within the context of market failure remedies

		Policy	
		Deregulation	Regulation
Market failures	Avoidable	Deregulation remedies (increase of the market perfectness as a mechanism of economic agents coordination)	Sustaining/establishment of regulation (excessive administrative barriers, price regulation, the ban of particular types of economic activities) – <b>errors of the I type</b>
	Unavoidable	Deregulation under unavoidable market failures (increase of market imperfections, for example, due to total cease of inspections) – <b>errors of the II type</b>	Sustaining/establishment of regulation under unavoidable market failures (as in case of cartels producing price fixing, market sharing etc)

# Errors of I & II types in enforcement within the context of interplay “enforcement-enactment”

		Action (non-action) in relation to rules enacted	
		Abiding	Violation
Action (non-action) evaluation by enforcer	A* (no violation recognized)	The action in accordance with rules enacted is recognized lawful/The action, recognized as rules abiding, is in fact abiding	Violation of rules is recognized as a rule abiding action (error of II type)/ /The action recognized as rule abiding in fact is rule violating
	V* (violation recognized)	The action in accordance with rules enacted is recognized as violation (error of I type)/The action, recognized as rules violation, is in fact abiding	The action violating rules enacted is recognized as unlawful/The action, recognized as rules violating, is in fact violating

# Conclusions - 2

- Rules enforcement is not whole story and rules enactment does matter too from the perspective of errors of I&II types
- There are opportunities not only for substitution but also complementarities of types I&II errors
- Two types of errors in regulatory perspective is related to two types of fundamentalism in theory

**Thank you!**