

Conference Paper

Game Theoretical Analysis of Corruption on the Road in Indonesia

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Abstract

This paper aims to analyze the empirical mechanism of the bribery and extortion on the roads in Indonesia. Using a game theoretical approach, the game is played by two representative agents, namely Police and Rider. The mechanism is modeled into two stage games. Stage 1 adopts the 2x2 simultaneous Tsebelis' inspection game refined by Pradiptyo. Stage 2 illustrates two scenarios of sequential game. Stage 1 proposes that the benefit of enforcing the law gained by the police becomes rider's important consideration to violate the traffic laws and rules while stage 2 proposes that the benefit of enforcing laws and rules is the important point to avoid bribery. Stage 2 also suggests that the law enforcement institutions may think carefully before increasing the severity of penalties and sanctions suffered by riders because it would increase the likelihood of police to extort the riders.

Keywords: Bribery, Extortion, Game Theory, Inspection Game

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Received: 27 December 2019

Accepted: 15 April 2020

Published: 23 April 2020

Publishing services provided by
Knowledge E

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Selection and Peer-review under the responsibility of the 3rd IRCEB Conference Committee.

1. Introduction

Economic analysis has widely used to model criminal behavior in order to deter individuals to commit crimes. It is Gary Stanley Becker, an American economist, who is known as a pioneer of the economic analysis of criminal behavior. In his seminal paper, *Crime and Punishment: an economic approach*, Becker (1968) argued that the expected utility of committing illegal acts (or crimes) is determined by the probability of being caught and the severity of punishment. The argument corresponds to decision theory in which the individual's preference is based on the benefit-cost analysis disregarding other individuals. Another economic approach used to analyze the criminal behavior is Game Theory. By conducting a game called 'Inspection Game', Tsebelis (1989) stated that the use of decision theory to analyze the phenomena in criminal law enforcement is not appropriate as the individual's decision is regarding to the others'. In a criminal case, individual's decision is regarding to the law enforcement agencies' decision. Thus, the game theory should be used instead of decision theory.

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The above-mentioned approaches can be used for all type of offenses including corruption. It has been a very long time that Indonesia has been suffering from corruption. In Indonesia, corruption almost happens at all levels of the bureaucracy. Not only committed by the executives and legislatives, is corruption also committed by those who in judicial institutions. Based on its intensity, corruption can be divided into several groups: small, medium, and large scales of corruption. Pradiptyo (2009) argued that the classification of the groups depends on the intensity of misallocation of resources owing to corruption in Indonesia. There are many judges, prosecutors, and other law enforcers to be the defendant(s) of corruption cases.

Concerning the small cale of corruption, according to Transparency International (TI) Global Corruption Barometer survey report in Asia-Pacific in 2017, the 32 percents of Indonesians have been committed bribery. The bribery behavior of Indonesians mostly targeted the polices by 25 percent of the respondents. In 2013, Transparency International Indonesia released the results of the survey which concluded that as many as 47 percents of respondents had experience with bribes when trying to avoid ticket sanctions (*KOMPAS*, 2013). This paper aims to analyze the phenomena of a (very) small scale of corruption in Indonesia. Using game theoretical approach, this paper focuses on analyzing the phenomena of the case of bribery and extortion on the roads committed by the riders and polices on the roads.

2. Literature Review

2.1. The Economics of Crime

Becker (1968), in his seminal paper, concluded that any attempt to either increase the probability of conviction or the severity of punishment or both would reduce the likelihood of potential offenders to embark on offending behaviour. Becker's proposition is not without criticism. Tsebelis (1989) stated that that the use of decision theory to analyze the relationship between potential offenders and the polices is not appropriate as both players are rational. To analyze the decision of both parties, Tsebelis proposed a game theoretical approach to analyze it. Tsebelis (1989, 1990, 1991) analyzed phenomena in criminal justice as a one-shot 2x2 inspection game, played simultaneously. Contrary to Becker, Tsebelis (1989) argued that any attempt to increase the severity of punishment would reduce the likelihood of police to enforce the law and the policy does not affect the likelihood of potential offenders to commit crime.

The use of the game theory to analyze the phenomena of criminal behavior has widely been appreciated. Yet, Tsebelis' proposition of the ineffectiveness of penalty has been criticized by many. Tsebelis's argument, that payoff changes for one player do not affect that player's behavior at a mixed-strategy equilibrium, holds in some cases but not in other cases (Weissing and Ostrom, 1991). Another criticism was issued by Bianco and Ordeshook (1990) who believed the model should be set up as an iterated, rather than a one-shot, game.

The discrepancies between the Tsebelis and Becker models do not arise solely due to the use of different analytical tools. Indeed, the discrepancies are mostly attributable to the fact that the approaches start with different assumptions (Pradiptyo, 2007). Polinsky and Shavell (2000, 2007) and Pradiptyo (2007) identified that there are four basic factors which make the models proposed by Becker and Tsebelis not comparable:

1. *Players and the roles.* In Becker's, the players are namely individuals and the criminal justice authority (CJA), in which police is part of the CJA. In Tsebelis', however, the police is an independent organization.
2. *Endogeneity of punishment.* The CJA, in Becker's, determines the levels of punishment and enforcement of the law endogenously. On the contrary, Tsebelis' considers the levels of punishment as an exogenous factor.
3. *Sequence of play.* Becker assumed implicitly that the CJA moves first by setting the level of enforcement and severity of punishment. Tsebelis, however, assumed that the game was played simultaneously by the players.
4. *Objective function.* In Becker's model, an individual maximizes his own payoff, but the CJA maximizes the social welfare function. In Tsebelis' model, however, both players maximize their own utility.

Considering the above-mentioned conditions, Pradiptyo (2007) proposed the refinement of Tsebelis' inspection game by disaggregating the game payoffs and then using findings from empirical studies to reconstruct the game. He models the phenomena in criminal justice as a 2-player 2x2 one-shot game played by representative agents, namely public and enforcer. He assumed enforcer to be a broader institution than the police and a part of a higher institution, namely the CJA. Using those assumptions, he found that any attempt to increase the severity of punishment is going to reduce the likelihood of violating only if certain condition hold.

Applicative studies in Indonesia concerning law enforcement of crime activities using game theoretical approach are made by Nugraha (2012) who modelled law enforcement

mechanism of tackling money laundering in Indonesia, Maytandi (2016) who analyze corrupt activities within public procurement process of goods and services in Indonesia, Handoyo and Kautsar (2016) who identified the corruption eradication strategies in Indonesia, and Abbas (2017) who modelled the tax evasion phenomenon in Indonesia.

2.2. Corruption: Bribery and Extortion

According to the rational choice theory, individuals would always conduct the analysis of benefits-costs before deciding to do or not to do something. In the case of committing corruption, the term 'costs' means the cost and the risk of committing corruption, for instance, the cost paid for bribes and the risk of being convicted. Whereas, the term 'benefits' refers to the advantages of committing corruption, for example; the economic agent bribes the bureaucrats in exchange for reducing the amount of red tape, so the process of business licensing is faster.

In the Oxford English Dictionary, corruption is defined as "perversion or destruction of integrity in the discharge of public duties by bribery or favour". By the definition, we find that the term "public duties" implicitly refers to the civil servants or the government officials. The meaning of "bribery" is negotiable and elastic. The concept assumes that A conveys a payment, gift or favor to B, and B makes some decision, provides some service, or takes some action that improves A's welfare, and can do so because he occupies some organizational position (see Granovetter, 2004). Again, the Oxford English Dictionary defines bribery as "dishonestly persuade (someone) to act in one's favour by a gift of money or other inducement" while extortion as "the practice of obtaining something, especially money, through force or threats". From the definition of the three words, we find that the bribery is a part of corruption, and there is a similarity between bribery and extortion—individual has to give something to other to get his wants. We can say that the 'bribery' itself is an active bribery while the 'extortion' is a passive bribery—because individuals pay bribes by force.

2.3. Legal Review and Practices Concerning Traffic in Indonesia

In Indonesia, driving rules are set out in Law number 22 year 2009 concerning traffic and road transport. There are many rules that have to be obeyed by riders. They would receive sanctions and penalties if they violate the rules. The rules on sanctions for traffic violators has been coded in the laws. Chapter 20 of the laws defines the sanctions and penalties for violating the rules. For instance, those who do not wear

standard helmets would be penalized to pay maximum of Rp 250.000,00 as fines or one month imprisonment.

The unique thing done in Indonesia is that in certain moments, for instance Eid day and Christmas day, motor vehicle inspection would be conducted by traffic polices. it is based on Government Regulation No. 80 year 2012 concerning Procedures of Inspection of Motor Vehicles on the Road and the Violation of Traffic and Road Transportation. In practices, riders who violate traffic laws and regulations are not actually penalized in accordance with laws and regulations. Many of them voluntarily bribe police officers or are extorted by the police officers to pay bribes.

3. Method

To analyze the phenomena of bribery and extortion on the roads, this paper uses game theoretical approach. The common model of the game theory used in crime economics analysis is the inspection game. The inspection game introduced by Tsebelis (1989) is a 2-player one shot 2x2 simultaneous game played by two representative agents. Referring to the laws, regulations, experiences and observation, the game would be played in two stages. Stage 1 would expand the inspection game adopted and refined by Pradiptyo (2007) while stage 2 would describe the bribery and extortion game when the law enforcer plays 'enforce' and public plays 'offend'. The following is the inspection game model:

		Police	
		<i>Enforce</i>	<i>Not Enforce</i>
Public	<i>Offend</i>	a_1, a_2	b_1, b_2
	<i>Not Offend</i>	c_1, c_2	d_1, d_2

Where: $c_1 > a_1, b_1 > d_1, a_2 > b_2,$ and $d_2 > c_2$

Figure 1: Inspection Game (Source: Tsebelis (1989)).

The game doesn't reflect any pure strategy equilibrium, but it has mixed strategy equilibrium. Considering x as the probability of public to offend and y as the probability of police to enforce the law, the mixed strategy of the game is described as the following:

$$x = \frac{d_2 - c_2}{a_2 - b_2 + d_2 - c_2} \tag{1}$$

$$y = \frac{b_1 - d_1}{b_1 - d_1 + c_1 - a_1} \tag{2}$$

The equations show that, Tsebelis argued, any attempts to increase the severity of punishment would only change the public's payoff— a_1 reduced. It indicates that the probability of public to offend (x) is unaffected. Nevertheless, the probability of police to enforce the law (y) is lowered.

Refining the game of Tsebelis, Pradiptyo (2007) expands each payoff into a more specific identity:

$$a_1 = U_O - U_D \tag{3}$$

$$b_1 = U_O + U_R \tag{4}$$

$$c_1 = d_1 = U_R \tag{5}$$

$$a_2 = B_E - C_E - C_S \tag{6}$$

$$b_2 = 0 \tag{7}$$

$$c_2 = B_R - C_E \tag{8}$$

$$d_2 = B_R \tag{9}$$

Whereby,

U_O = Immediate utility arises from committing crime.

U_D = Disutility of serving direct punishment.

U_R = Reputational effects to public for not to be convicted.

B_E = Benefits of enforcing the law. it includes the detection of incidents and any deterrence effects.

B_R = Reputational benefits for achieving objectives set by the Criminal Justice Authority.

C_E = Costs of enforcement of the law.

C_S = Costs to deliver courts' sentences, including direct and indirect punishments (e.g., the list of positions that cannot be taken by ex-offenders, the length of probationary period, and the length of period offenders have to report to police about their mobility).

4. Result and Discussion

4.1. Game Specification: Stage 1

Stage 1 is the 2x2 one-shot simultaneous inspection game played by police and rider who are representative agents. Police has two strategies, “enforce” and “not enforce”. Hence, rider has the strategy to “violate” or “not violate”. As explained above, when rider choose to violate, the game would continue to stage 2. Otherwise, it would not.

By committing violation, the rider would generate immediate utilities (U_V), for instance, money saved for not proposing a driver license, buy a helmet and etc. In such condition, when the police choose to enforce the law, the rider would acquire immediate utilities (D_V) meaning that the rider would receive penalty(s) under the laws and rules concerning traffic and road transports and the rider would also loss his/her time because he/she has to wait the process of receiving traffic ticket. $U_V - D_V$ would be net-benefit of the rider when he violates the rules while the police plays “enforce”. If the rider choose not to violate the rules, then he/she would receive the time benefit (U_T)—the rider would arrive in her destination faster because he doesn’t stop to wait the process of receiving traffic ticket. However, when the rider violate the rules while the police doesn’t enforce the law, he/she would enjoy the immediate utility along with the time benefit for not stopping to wait the process of receiving traffic ticket ($U_V + U_T$).

From the police perspective, by enforcing the law, when there are riders violating the rules, the police would gain the benefit of enforcing the law (B_E) i.e. the deterrence effect. Enforcing the law costs money, human resources, and time (C_E) which are spent for conducting inspection. The police would get nothing (0 = null) if he plays “not enforce” and the rider plays “violate”. In the case when the rider does not violate the rule, the police would gain reputational benefits (B_R) from his institution because of achieving the objectives from his chief leader (to make riders obey traffic rules), whether or not he conducts inspection. $B_E - C_E$ is the police’s net benefit of enforcing the laws when the rider violate the rule. In other hand, when the police conducts inspection while the rider doesn’t violate, the police’s net benefit is $B_R - C_E$.

The following figure is the normal form of the game:

Considering y to be the probability of the police to enforce by conducting inspection, the rider tends to commit violation if:

$$(U_V - D_V)y + (U_V + U_T)(1 - y) \geq U_T y + U_T(1 - y)$$

$$U_V \geq y(D_V + U_T) \tag{10}$$

		Police	
		Enforce (y)	Not Enforce (1-y)
Rider	Violate (x)	$U_V - D_V,$ $B_E - C_E$	$U_V + U_T, 0$
	Not Violate (1-x)	$U_T, B_R - C_E$	U_T, B_R

Where: $U_T > U_V - D_V, U_V + U_T > U_T$ and $B_E - C_E > 0, B_R > B_R - C_E$

Figure 2

Equation 10 indicates that Rider would commit violation if the immediate utility of violating (U_V) exceeds the expected cost of direct punishment and the lost of time for stopping to wait ticketing process [$y(D_V + U_T)$].

The police decides whether or not to enforce the law by using the same method. Considering x to be the probability of the rider to violate the rules, thus the inspection would be conducted if:

$$(B_E - C_E)x + (B_R - C_E)(1 - x) \geq B_R(1 - x)$$

$$xB_E \geq C_E \tag{11}$$

Equation 11 shows that the police would enforce the rules/law—by conducting inspection—if the expected benefits of enforcement (xB_E) are higher than its cost (C_E).

By adopting the equation (1) and (2), we find the Mixed Strategy of the game:

$$x = \frac{B_R - (B_R - C_E)}{B_E - C_E - 0 + B_R - (B_R - C_E)} = \frac{C_E}{B_E} \tag{12}$$

$$y = \frac{U_V + U_T - U_T}{U_V + U_T - U_T + U_T - (U_V - D_V)} = \frac{U_V}{U_T + D_V} \tag{13}$$

$x, y \in (0,1)$

Where:

U_V = Immediate utilities arise for violating the law and rules.

D_V = Disutilities of serving direct punishment because of violating.

U_T = Time benefits of rider for not being stopped to get ticketed and arriving in his/her destination faster.

B_E = Benefits of law enforcement including any deterrence effects.

B_R = Reputational benefits in achieving objectives set by the Institution.

C_E = Costs of enforcement, including, for instance, times spent for conducting inspection, costs to hiring police officers, and etc.

From the equations (12) (13) we generate two propositions:

Proposition 1:
 The likelihood of the rider to violate the law (x) is **positively correlated** with the police’s cost of law enforcement (C_E). In the other hand, it has a **negative correlation** with the benefit of law enforcement (B_E).

and,

Proposition 2:
 The likelihood of the police to enforce the law (y) is **positively correlated** with the rider’s utility or benefit of violation (U_V). Conversely, it has a **negative correlation** with rider’s time benefit (U_T) and the disutility of violation (D_V).

4.2. What Would Happen if the Severity of Punishment and Sanction Increase?

Referring to the law and the rules concerning traffic and road transport, it is possible to increase the severity of punishment and sanction. The authority could propose rule amendments to the legislatives. Hence, the authority which in the game is represented by the police is able to increase the severity of punishment and sanction (however, D_V increase: $D_V \rightarrow D_V^*$, where $D_V < D_V^*$).

Any attempts to increase the severity of penalty and sanction is costly, especially when it is done through law amendments— C_E increase, where $C_E < C_E^*$. The increasing of enforcement cost along with the rider’s disutility of violating would also change its benefit ($B_E \rightarrow B_E^*$). But, it is unclear whether $B_E > B_E^*$ or $B_E < B_E^*$. As a result, by denoting x^* and y^* as the new equilibriums we find:

$$x^* = \frac{C_E^*}{B_E^*} \tag{14}$$

$$y^* = \frac{U_V}{U_T + D_V^*} \tag{15}$$

$x^*, y^* \in (0,1)$

From the equation (14) (15), we could interpret that:

Proposition 3:
 The likelihood of the rider to violate the law (x) would **decrease only if** the change of police’s benefit of law enforcement (ΔB_E) exceeds the change of police’s cost of law enforcement (ΔC_E), ($\Delta B_E > \Delta C_E$).

and,

Proposition 4:

Increasing the disutility of violating (D_V) by **increasing the severity of punishment and sanction would decrease** the likelihood of the police to enforce the law (y) since $U + D^* > U + D$.

4.3. Stage 2 of the Game: Bribery and Extortion Game

As I explained above, the game will continue to stage 2. Stage 2 is the game that interacts the two players after the police chose the strategy “enforce” and the rider chose “violate”. It happens because, in practices in Indonesia, when traffic polices stop riders to inspect him/her while the riders violate the riding laws/rules, the riders often try to bribe the police officers or the police officers extort the riders to pay bribes in order that the riders be free from sanctions and penalties coded in traffic rules/laws.

Considering the above-mentioned conditions in practices, the stage 2 will be played sequentially and be simulated in two scenarios, called Bribery Game (Stage 2a) and Extortion Game (Stage 2b).

4.3.1. Stage 2a: Bribery Game

In this game, it is assumed that after being stopped because the police chose ‘enforce’ and the rider chose “violate”, the rider has two strategies, “bribe” or “not bribe”. Whereas, the police has two strategies, “accept” or “not accept” the bribe.

If the rider decides not to bribe the police, he/she would suffer the disutility of violating ($-D_V$). If he/she chooses to bribe the police, the police has to choose whether to “accept” or “not accept” the bribe”. If the police choose to accept the bribe, the rider would get back the utilities of violating (U_V) along with the benefit of paying bribes (U_B). But he also has to spent cost to bribe (C_B). In this scenario, the rider bribes then the police accepts it, the rider would get payoff $U_V + U_B - C_B$. In the other hand, if the police chooses “not accept”, the rider would get the disutility of violating ($-D_V$) along with the disutility of committing bribery ($-D_B$), ($-D_V - D_B$).

From the police perspective, he would get the initial payoff of enforcing while the rider chooses “violate” ($B_E - C_E$) when the rider, in this stage, choose to “not bribe”. Let assuming that the rider chooses “bribe”. The police has two possible strategies, accept or not accept. If accepting the bribe, he would not only get the benefit from the

bribe paid by the rider (B_A) but also get the negative reputational effect ($-R_A$)—meaning that the public would know him as a corrupt police. However, if not accepting bribe, he would get the initial payoff ($B_E - C_E$).

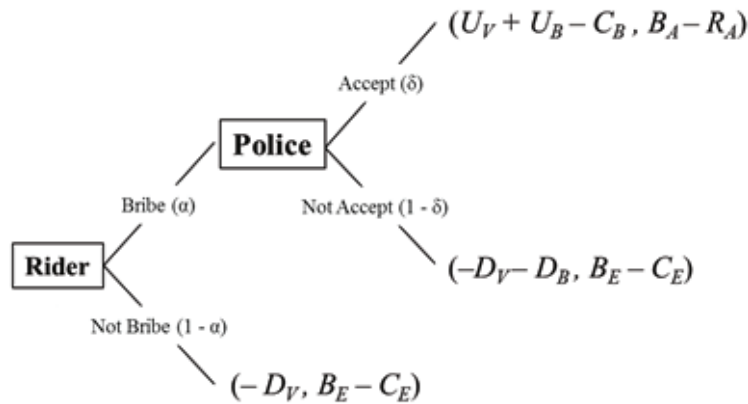


Figure 3: Stage 2a: Bribery Game.

Where:

U_V = Immediate utilities arise for violating the law and rules.

D_V = Disutilities of serving direct punishment because of violating.

U_B = Utilities or benefits of bribing the police.

C_B = Cost spent for paying bribes.

D_B = Disutilities of bribing police.

B_E = Benefits of law enforcement including any deterrence effects.

C_E = Costs of enforcement, including, for instance, times spent for conducting inspection, costs to hiring police officers, and etc.

B_A = Benefits of receiving bribe.

R_A = Reputational effect for receiving bribe.

In responding to bribery offered by Rider, the police has two strategies by the following condition:

Accept: No Accept

$$\delta(U_V + U_B - C_B) = (1 - \delta)(-D_V - D_B)$$

$$\delta = \frac{-D_V - D_B}{(U_V + U_B - C_B) + (-D_V - D_B)} \tag{16}$$

The equation (16) implies that police’s likelihood to accept the bribe is positively correlated with rider’s disutility of committing violation and bribery ($-D_V - D_B$).

Lets move backward from the last node of the game to the next one. In response to police’s decision to enforce the law, the rider has two strategies—“bribe” or “not bribe”

the police. To deciding whether to bribe or not, the rider also considers police’s strategy in the case that the rider decides to bribe. The rider’s decision in this sub-game is based on the following condition:

Bribe: Not Bribe

$$\alpha[\delta(B_A + R_A) + (1 - \delta)(B_E - C_E)] = (1 - \alpha)(B_E - C_E)$$

$$\alpha = \frac{B_E - C_E}{\delta[B_A + R_A - (B_E - C_E)] + 2(B_E - C_E)} \tag{17}$$

Assuming that $\alpha, \delta \in \{0,1\}$, it can be inferred from the equation (17) that:

$$\delta[B_A + R_A - (B_E - C_E)] + 2(B_E - C_E) \geq B_E - C_E$$

$$\delta \geq \frac{-(B_E - C_E)}{B_A + R_A - (B_E - C_E)} \tag{18}$$

The equations (17) and (18) show that police’s net benefit of enforcing the law ($B_E - C_E$) is a crucial thing that would affect rider’s likelihood to bribe and police’s likelihood to accept the bribes.

Proposition 5:
 The higher that the police would get net benefit from enforcing the law ($B_E - C_E$)— for instance, by conducting inspection— the higher the likelihood of rider to attempt to bribe (α) and the lower the likelihood of police to accept the bribe (δ).

4.3.2. Stage 2b: Extortion Game

After stopping the rider, it is assumed that the rider doesn’t attempt to bribe the police, the police has two strategies which are to “extort” or “not extort”. However, the rider should react upon the extortion by choosing whether to “accept” or “not accept”. The police would gain the benefits of extortion (B_Z) but would suffer the negative reputation ($-R_Z$) if the rider accepts the extortion— in this case, ($B_Z - R_Z$) would be the net benefit of the police. When the rider reject (does not accept) the extortion, the police could move on to enforce the law and get the net benefit of enforcing traffic laws and rules ($B_E - C_E$) but he could suffer from the negative reputational effect of extorting ($-R_Z$).

In the other hand, the rider, when being extorted and he/she reject the extortion, would only get the disutility of committing violation ($-D_V$). If the rider chooses to accept the extortion, he/she would maintain the utilities of violating (U_V) and get the additional benefit of accepting the extortion along with its cost ($U_C - C_C$). In the situation in which

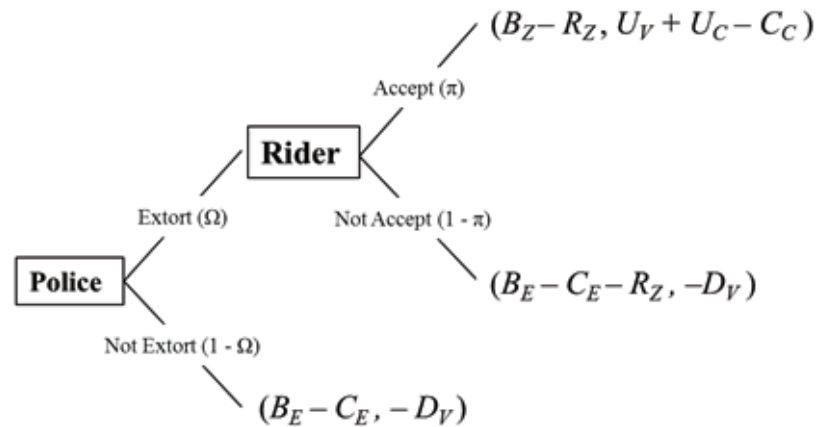


Figure 4: Stage 2b: Extortion Game.

the police doesn't extort the rider, the rider would only suffer the disutility of committing violation ($-D_V$).

The rider would make the decision based on the following condition:

Accept: No Accept

$$\pi(B_Z - R_Z) = (1 - \pi)(B_E - C_E - R_Z)$$

$$\pi = \frac{B_E - C_E - R_Z}{B_Z + B_E - C_E - 2R_Z} \tag{19}$$

The equation (19) indicates that there is a positive correlation between the likelihood of the rider to accept extortion (π) and the net benefit of the police when his extortion is rejected ($B_E - C_E - R_Z$).

Moving backward, the police's decision is based on the following:

Extort: Not Extort

$$\Omega[\pi(U_V + U_C - C_C) + (1 - \pi)(-D_V)] = (1 - \Omega)(-D_V)$$

$$\Omega = \frac{-D_V}{\pi(U_V + U_C - C_C + D_V) - 2D_V} \tag{20}$$

It is assumed that $\Omega, \pi \in \{0,1\}$. Therefore:

$$\pi[U_V + U_C - C_C + D_V] - 2D_V \geq -D_V$$

$$\pi \geq \frac{D_V}{U_V + U_C - C_C + D_V} \tag{21}$$

The equation (20) and (21) generate the next proposition:

Proposition 5:

The important reason for the police and the rider in dealing with extortion is the disutility of violating law (D_V). As the rider's disutility of violating (D_V) increases, the likelihood of police to extort (Ω) increases and the likelihood of rider to accept it (π) decreases.

5. Conclusion and Recommendation

This study models the mechanism of traffic law and rule enforcement in Indonesia using game theoretical approach. It begins with the fact that there are many riders in Indonesia violate the laws and the rules of traffic and road transports. The analysis is built in two stages of game. The game is modeled as 2x2 game played by two representative agents, namely the police and the rider. The stage 1 of the game is constructed by the same assumption as an inspection game proposed by Tsebelis (1989). However, the stage 2 of the game is modeled into two scenarios, called Bribery Game and Extortion Game which played sequentially by the agents.

The result of the stage 1 suggests that any attempts to increase the severity of punishments and sanctions would result mathematically in an unclear condition. It could decrease or increase the likelihood of riders to violate depending on the changes of costs spent by the police and benefits gained by the police of enforcing the law—i.e. by conducting traffic inspections.

In the case when the police enforces the laws/rules, the two agents—police and rider—have two possible condition occurred. The rider might try to bribe the police or the police might extort the rider to pay bribes in order that the riders be free from sanctions and penalties coded in traffic rules/laws. Therefore, the game is continued to the stage 2.

Stage 2a analyzes the condition when the rider try to bribe the police. It results that the important point affecting the bribery incidents is the net benefit of enforcing laws/rules. The higher the net benefit, the lower the probability of bribery occurred because it would decrease the likelihood of the police to accept bribes. Stage 2b constructs the game in condition when the police extorts the rider. In order to avoid the extortion occurred, it is suggested for the law enforcement institutions to think carefully before increasing the severity of penalties and sanctions suffered by riders (D_V increase), because it would increase the likelihood of police to extort the riders.

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