Rule of Law, Institutional Quality and Information*

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Abstract

The focus of this paper is the analysis of the persistent lawlessness attitude observed in some transition and developing countries where an overall increase in the quality of institutions is recorded. The mechanism of information diffusion on institutional quality is explored using a model where the state confronts a continuum of agents prone to either strip assets or to invest. The model predicts that high uncertainty and potential sunk costs in a situation of rule of law enforcement push the economy towards anarchy, a Pareto-dominated equilibrium. Viceversa, if the assets' value and the cost of asset-stripping are high, this is instrumental to a rule of law enforcement, a Pareto-dominant equilibrium. High institutional quality can increase the likelihood of rule of law enforcement if there is enough information about the strength of institutions. On the other hand, if good institutions and good information about institutions do not come together, there is scope for the puzzled co-existence of advancement in reforms and poor property rights protection.

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1 Introduction

This paper focuses on the relationship between rule of law and institutional quality in countries in the process of transition from planned to market economy as well as underdeveloped countries with weak property rights' institutions. Starting from the suggestion of Weingast (1997) that little is known on "[...] the remarkable variation among states in the rule of law, a set of stable political rules and rights applied impartially to all citizens", we aim to answer the following research questions: first, is it possible to avoid the trap of bad democratic governance, low property rights protection, strong power concentrated in the hands of a few rich oligarchs, no clear mechanism for enforcing checks and balances and no clear separation between legitimate and illegitimate actions? Second, what is the key to the explanation for the persistence of lawlessness in many transition and developing countries despite the fact that they are experiencing a progress in the quality of their institutions?

This paper starts from the assumption that good institutions, in a broad sense, are not enough for the development of good "rules of the game" in the realm of property rights enforcement. On the one hand, bad institutions are instrumental to a likely decrease in property rights protection. On the other hand, good institutions might contribute to an improved rule of law enforcement *only if* there is enough information about the strength of precisely those institutions. In other words good institutions and good information about institutions are not necessarily found together.

The model presented in this paper shows how in a first stage a continuum of agents acquires the control over enterprises after privatisation of state-owned activities and evaluates strategically whether to build value by making an irreversible investment, or to strip assets by illegally tunneling value. Incomplete information on the institutional quality entails a blurred perception of other players' action. In a second stage, the model shows the state faced with the choice of either implementing well-defined enforced property rights under the rule of law by recovering the assets, or abandoning the economy to anarchy by allowing the perpetuation of illegal activity. Players' payoffs are affected by strategic complementarities, between state and agents as well as among agents. The model predicts that high uncertainty and sunk costs in rule of law enforcement push the economy towards a lack of rule of law, a Pareto-dominated equilibrium, and that high economy's assets value and cost in asset-stripping lead to rule of law enforcement, a Pareto-dominant equilibrium.

The results of this paper analysis are key to our understanding of the transformation process from a centralised to a democratic society, as well as of the development process within countries with weak institutions. In fact, an abrupt structural change might well result in a window of opportunity for pro-development reforms, such as the

enforcement of the rule of law, a fundamental component of a democratic society, i.e. "the principle that all members of society, both citizens and rulers, are bound by a set of clearly defined and universally accepted laws. In a democracy, the rule of law is manifested by an independent judiciary, a free press and a system of checks and balances of leaders through free elections and separation of powers among the branches of government"[1]. However, rule of law has hardly emerged in some transition economies and the level of corruption -a mirror image of the absence of the rule of law- is a persistent phenomenon (see Figure 1[2]).

The following three points explain the aim of this paper. First, the theory proposed is rooted in the stream of research about countries where information on the institutional development of the economy is limited, and uncertainty impinges on the possibility to enforce the rule of law[3]. Second, the debate on the role of institutions is far from having reached a wide consensus. At the start of the transition process, some scholars (e.g. Boycko, Shleifer and Vishny (1995)) argued that the rule of law enforcement was a "second order phenomenon": as soon as the property rights had been sufficiently widespread (despite the fact that they were not yet protected), citizens and economic agents like firms, corporations, etc would have formed political constituencies acting as social pressure groups that in turn would have lobbied politicians to adopt policies with the aim of protecting those property rights. These authors' position has been challenged by Hoff and Stiglitz (2004a). However, the recognition that the country could be bound to underdevelopment in the long run if burdened by a potentially predatory state and weak rule of law finds some consensus. Finally, the results of this paper can apply to a wide range of economic situations within the heterogenous context of transition economies and developing countries, although the Russian example might be particularly relevant. Russia still appears to have some aspects belonging to a purely state-controlled economy, despite the fact that it has been struggling (at least according to the political class) in order to reinforce market institutions and property rights protection laws since the start of the privatisation process. Looking at Russia in

[1] $http://usinfo.state.gov/dhr/democracy/rule\_of\_law.html$.

[2] The European Bank for Reconstruction and Development has been working on the 'Transition Indicators' of institutional development for over a decade. A joint EBRD-World Bank project has been conducted with the aim of collecting and analysing data and related information on the "Business Environment and Enterprises Performance surveys" (BEEPs) in 27 transition economies. One of the questions the study has been trying to answer is the reason behind the weak enforcement of property rights and, consequently, the feeble penetration and respect of the "rule of the game" in the legal, judicial or court systems of ex-centralised economies. See European Bank for Reconstruction and Development (2005).

[3] See Roland (2004), who investigates the role of different institutions in different transition phases and recognizes the difficulty in assessing the magnitude of the institutional development of a country.

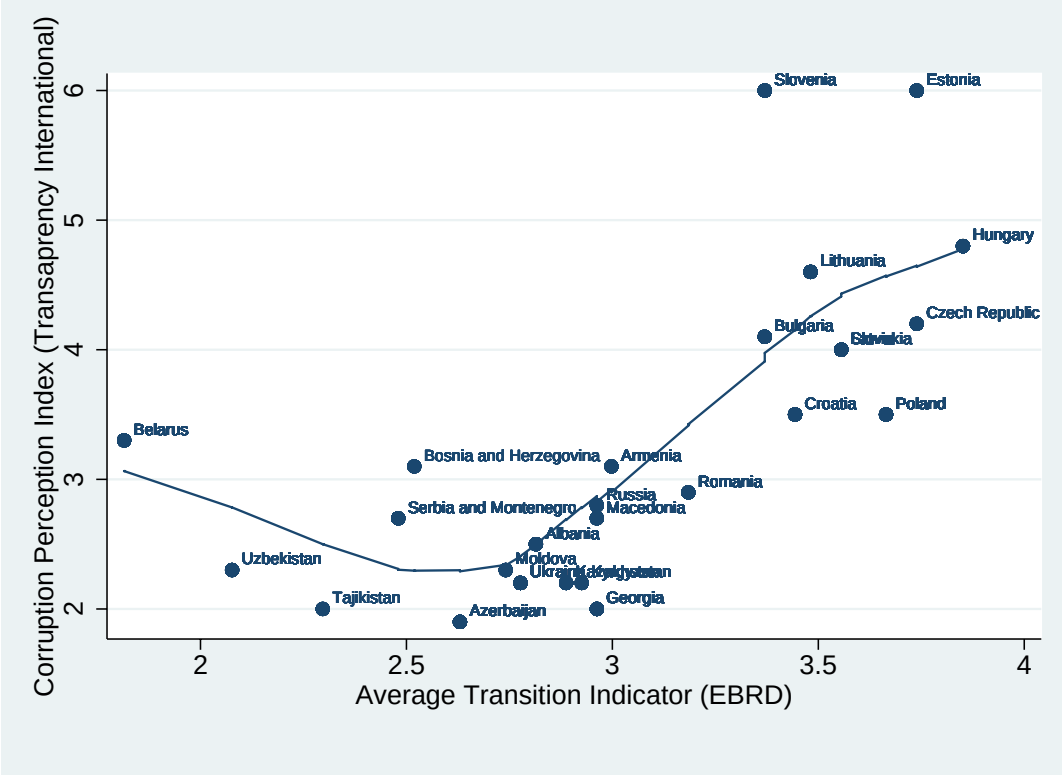


Figure 1: Corruption Index and EBRD Transition Indicator, 2005

The corruption Index is measured on an inverted scale (6 = low corruption). The EBRD Transition Indicator is measured on an increasing scale (4 = high score, strong institutions) as an average of 9 Transition Progress Indicators. *Sources*: Transparency International and EBRD.

the aftermath of mass privatisation programmes, it is noticeable that law enforcement was not effective, and there was no clear sign of progress towards its implementation.

This paper is organised as follows: section 2 reviews the literature on the rule of law and the role of information in games with strategic complementarities. Section 3 presents the building blocks of the model, that is solved for the equilibrium under complete and incomplete information in sections 4 and 5, respectively. Section 6 suggests some points as conclusion.

2 Literature

The political science discipline has widely investigated the role the rule of law, for example in the realm of historical events connected to abrupt political changes. North and Weingast (1989) analyse the historical context of the 1688 Glorious Revolution in England, which entailed a delicate interaction between state and civil society, and

Weingast (1997) models this interaction -on the theoretical ground- in a coordination game framework, where a self-interested sovereign state decides in favour of the rule of law towards two generic groups of citizens. The Pareto optimal equilibrium of rule of law enforcement is not always reached due to a coordination failure. The forward looking state expects both groups to challenge its decision to enforce the rule of law and therefore it maximises its payoffs by transgressing, rather then implementing the rule of law.

In a similar game theoretic context, Cooter (1997) argues about the differences between *rule of law state* and *rule of state law*[4]. The former is considered a good equilibrium involving the enforcement of property rights, widespread respect of the law, and low level of corruption. The latter is a bad equilibrium with the opposite outcome, namely anarchy. Economies show a tendency to move to one or the other equilibrium, according to the expectations of the citizens.

A comprehensive review of literature contributions on the phenomenon of "lawlessness" attitude is drawn by Dixit (2004), who points out that, even under well functioning laws, "imperfect information, externalities and imperfect competition are well-recognised causes of market failures, and they can exist *regardless* of whether a government adequately protects property rights and enforces contracts." On the other hand, Murphy, Shleifer and Vishny (1993) and Sonin (2003) focus on the rent-seeking behavior of the state or of oligarchs in presence of individual incentives to break the rule of law, i.e. by paying bribes and avoiding taxes. Roland and Verdier (2003), Hoff and Stiglitz (2004a) and Hoff and Stiglitz (2005) adopt a political economy approach in models where strategic complementarities imply the existence of multiple equilibria. As the authors recognise, multiple equilibria outcomes do not allow for clear policy recommendations, the reason being that there is no specific indication on which equilibrium is selected.

A broad literature has investigated coordination problems and multiple equilibria in the context of the developing process of poor countries. Rosenstein-Rodan (1943) investigates external economies in the industrialisation process of depressed-underdeveloped areas. In such contexts, industries might fail to coordinate because they do not internalise crucial pro-development forces. The author suggests , this could be avoided when a *big push* of investments into many industries is implemented

[4]Cooter (1997): "The Soviet Union exemplified the rule of *State law*, [...]. Since state law did not respond to morality, spontaneous support for law by citizens was weak. Soviet citizens, who were accustomed to a low level of spontaneous support for law by citizens, must have expected this tradition to continue after the Soviet government collapsed. These expectations created a self-fulfilling prophesy and caused the system to equilibrate with low private support for state law, which in turn made state law ineffective. The situation is the opposite of the rule of *law State* [...]".

by a benevolent state. Murphy, Schleifer and Vishny (1989) analyse a similar context of un-coordination of investment across sectors in a model of imperfect competition and demand spillover: full industrialisation[5] and lack of industrialisation are two possible equilibria.

Different ideas have been proposed within the literature on equilibrium selection (Cooper (1999)), for example on the trade-off between Risk dominance and Pareto dominance. The Harsanyi-Selten criterium of *risk dominance* (Harsanyi and Selten (1988)) has been proposed when dealing with multiple equilibria[6]. Kandori, Mailath and Rob (1993) analyse the equilibrium selection via evolutionary learning and adaptation. Carlsson and van Damme (1993a), Carlsson and van Damme (1993b) study a theoretical framework of incomplete information, the so called *global games theory*: in this context the hypothesis of common knowledge is removed and each player observes the fundamentals of the game with a noise. Morris and Shin (1998) apply the global games tool to the context of *currency attacks*, where the hypothesis of incomplete knowledge of the economy 'fundamentals' is introduced, and the traditional multiple equilibria result is dismissed. This theoretical framework has wide applications, not only in currency attacks, but also in bank runs, liquidity black hole (Postlewaite and Vives (1987); Morris and Shin (2004); Angeletos and Werning (2004)[7]), as well as debt crises, financial crashes, riots and political regime changes.

This papers starts from a context of coordination failure *á la* Carlsson and van Damme (1993a) as far as the multiple equilibria phenomenon in the presence of coordination failure/strategic complementarities is concerned. In other words, this paper aims to investigate further and more in depth the phenomenon of political regime change and it's consequences on rule of law by exploiting Morris and Shin (1998) contribution.

3 The Model

This paper builds on the framework outlined by Hoff and Stiglitz (2004a) in the post-privatisation context of transition economies: "Individuals with control rights over privatized assets can collectively bring about the rule of law simply by voting for it.

[5] A case for a unique equilibrium is possible when pecuniary externalities are manifested through profits only, therefore unprofitable investments have the effect of reducing the size of other sectors. In their model, this kind of externalities can conduce to a unique equilibrium.

[6] An equilibrium risk-dominates an other if it is associated with the largest product of deviations losses, *viz* it implies a higher joint loss in the counterfactual case in which every agent plays the alternative action.

[7] Angeletos and Pavan (2007) have recently challenged the unique equilibrium result within the global game literature.

These individuals are concerned with the wealth they can obtain from the privatized assets, and have two alternative strategies: building value and stripping assets. Building value under the rule of law yields higher benefits to a majority than stripping assets under no rule of law. But uncertainty about when the rule of law will be established may lead some individuals to choose an economic strategy - stripping assets, including converting corporate assets to private use - that gives them an interest in postponing the establishment of the rule of law." In this set up complete information on the ability of asset-stripping is assumed. In this paper, on the contrary, I assume incomplete information on the economy institutional quality that, in turn will affect the ability to strip assets. In the following sections the model is unfolded starting from players' strategies.

3.1 Agents' Strategies

In the model presented here a continuum of agents acquires the temporary control of assets[8] as a consequence of the privatisation process, and decides on either building value or stripping those assets. The state as the ultimate owner of the monopoly of public order and law, will decide whether to protect property rights via rule of law or not to protect them.

θ is the economy institutional quality, uniformly distributed on the [0,1] interval. High θ is attached to strong 'advanced' economies, while low θ characterises weak 'laggard' economies. Neither the agents nor the government actions have any effect on this variable. However, agents must guess the value of θ, while the state has always complete knowledge, i.e. there is no uncertainty whatsoever on the parameter of the game for the government.

Agents have expectations on the establishment of the rule of law: as a general rule, they strip assets and whisk capital if they expect not to get full property of the controlled assets in the future[9], as Stiglitz explains: "If you got \$1-\$2 billion in assets through illegal privatisation, you would fear the next government in power would take it back so the best thing to do is *not* to reinvest in the country but to take it out as fast as you can. By moving assets to western countries, oligarchs enjoyed the best of two worlds: they had property rights protected abroad and weak rule of law at home."

Government and agents compete for the same assets because the state enforcing

[8]See Hoff and Stiglitz (2005) on the difference between control and property in the context of transition countries.

[9]In line with Hoff and Stiglitz (2004a) the story behind the demand for law enforcement is a simplification the hypotheses put forward by the vast literature on rule of law and property rights protection.

the rule of law is fully capable of recovering the illegally stripped assets[10] and it is in turn capable to redistribute them in the form of a public good. In other words, it contributes to the wealth of the economy in the form of recovered stolen goods. Given this set up, social surplus is the sum of private and public goods and is maximised when the rule of law is implemented and there is building of value. Summing up:

- **Agents** Agents, after acquiring control over γ assets *via* privatisation, choose to strip illegally (whisk capital in a safe place, tunnel value out) or to build value by investing;

- **State** The state decides whether to fully enforce the rule of law by recovering economy's assets valued γ[11], or to abandon the economy to anarchy[12];

3.2 The Enforcing and Stripping Technology

The payoff of both government and agents is linked to other players' action. The former gains in two cases: the economy has a high institutional quality (high θ), and the percentage of stripping agents $\alpha \in [0, 1]$ is low. In other words, it is easier to enforce the rule of law in a high institutional type economy, and in the case of few stripping assets. Agents face the opposite situation. Their payoff is proportional to the prevailing behavior of other agents (high α), and inversely correlated to the institutional type of the economy (low θ).

The government faces a cost in enforcing, while the agents face a cost in stripping. Two cases are explained below:

- In an economy where θ is *fixed*, the higher the number of strippers, the higher the enforcing cost for the government, and the lower the stripping cost of the agents. This stripping asset spillover effect is negative between state and agents and positive among agents[13];

[10] It is possible to think at agents evading taxes according to the expectation to be detected and punished by the enforcement of the state.

[11] Weingast (1997) would call it "social surplus" that is a rival good. The hypothesis that the state "prevails" on agents action is not crucial, the reason being that once the state succeeded in protecting γ, it could re-distribute it through fiscal instruments.

[12] I refer to the anarchy concept as in Hoff and Stiglitz (2004a) and Hoff and Stiglitz (2004b) Hoff and Stiglitz (2005).

[13] The direct spillover effect among agents is *not* necessary to obtain the coordination failure result in Morris and Shin (1998). On the contrary, in this paper that effect does matter in terms of equilibrium outcome. Strategic interactions among players have been modelled in a similar theoretical fashion by Cooter (1997) and Roland and Verdier (2003).

- Consider now a fixed percentage of strippers α: the stronger the economy institutional environment, the lower the government enforcing cost, and the higher the players stripping cost.

It is now possible to compute government's and agents' payoff as the difference between the value and the cost of their actions (given the actions of all others players). I will review case by case and summarise payoffs in table 1.

- **state enforcing** The assets recovered/protected under the rule of law is γ. In the case in which the government enforces the rule of law, it pays a cost split in two components: k is the sunk cost -it is independent from agents' action-, and $c(\alpha, \theta)$ is the variable cost, being α the proportion of stripping agents and θ the economy institutional quality. The overall cost is increasing in k, α and decreasing in θ, $\frac{\partial c}{\partial \alpha} > 0, \frac{\partial c}{\partial \theta} < 0$. If the government enforces the property rights, its payoff is the assets' value minus the cost of the enforcement action, $\gamma - [k + c(\alpha, \theta)]$;

- **state not enforcing** It does not protect any asset and does not pay any cost. Its payoff is 0 and anarchy prevails[14];

- **agents stripping** The agents pay a cost split in two components: a fix cost t; a variable cost increasing in θ and decreasing in α. In other words, they pay t and gain $c(\alpha, \theta)$ (the opposite of government variable costs)[15]. However, they are rewarded differently according to the state's action:

  - **state enforcing** The value of stripping is 0, the reason being that the state neutralises their action and "recovers" γ, the payoff of stripping is therefore $0 - [t - c(\alpha, \theta)]$;
  - **state not enforcing** The value of stripping is γ, i.e. private agents indeed strip all assets: the payoff is $\gamma - [t - c(\alpha, \theta)]$[16].

[14] It would be possible to consider an out of equilibrium outcome in which the state gets γ in case nobody strips even if the rule of law is not implemented. However this out of equilibrium outcome has a zero *de-facto* probability, i.e. there will always be a noise stripper, and it is then irrelevant in the analysis of equilibria selection in the multiple agents game. This is not the case in a single agent game (see appendixes (7.2) and (7.3)).

[15] The hypothesis that the agents' variable costs are equal in value and opposite in sign with respect to the government's variable costs is a simplification taken for convenience. Any other couple of costs functions with the above characteristics, increasing in α and decreasing in θ for the government and viceversa for the agents would lead to the same conclusions. For an interpretation see Appendix 7.1.

[16] The hypothesis underneath table 1 is that each agent i strips a tiny fraction of the whole γ, being the population a continuum of size 1. However, this is just a *scale effect* that is not affecting any result in the equilibrium solution.

- **agents not stripping** They get 0, having no gain and no costs.

$1 \diagdown 2$	Rule of Law	not Rule of Law
Build Value	$0; \gamma - [k + c(\alpha, \theta)]$	$0; 0$
Strip Assets	$-[t - c(\alpha, \theta)]; \gamma - [k + c(\alpha, \theta)]$	$\gamma - [t - c(\alpha, \theta)]; 0$

Table 1: Basic Payoff Matrix: (1) Agent(s) & (2) State

Beyond Morris and Shin (1998) Hitherto I have assumed a generic monotonic variable cost function $c(\alpha, \theta)$, in order to keep the analysis as general as possible. Introducing a linear function, both monotonic and continuous, conditions for the existence of a unique equilibrium are satisfied and the analysis is simplified. I assume that $c(\alpha, \theta) = \alpha - \theta$. This is indeed the simplest linear function increasing in the proportion of strippers α and decreasing in the economy institutional quality level θ.

The model is therefore a subcase of Morris and Shin (1998) and the analysis is close to their model. They derive and prove the result for a generic monotonic and continuous function $c(\alpha, \theta)$ (not necessarily *linear*). However, the model presented in this paper is mainly different in respect to Morris and Shin (1998): the agents' cost of stripping is endogenously determined by the number of strippers, in line with Cooter (1997) and Roland and Verdier (2003) models of rule of law. There is a "positive" externality in case of many agents stripping, in other words the cost of asset-stripping depends on α. This extension of the model does have relevant implications. Coordination failure among agents and uncertainty are deeply connected: if agents could coordinate, e.g. by forming a coalition in a cooperative game framework (toy model), they could pool their idiosyncratic pieces of information and overcome the individual uncertainty for the sake of the common knowledge. Viceversa, in a non-cooperative and more realistic framework (fully-fledged model) each and every agent exploits the idiosyncratic piece of information to maximize their own utility *vis-a-vis* the behavior of all other players.

The aim of this paper is twofold: on the one hand it will show that the lack of coordination failure (i.e. of uncertainty) is conducive to an unique equilibrium only in a sequential play, i.e. time structure matters; on the other hand it will show that coordination failure among agents is always conducive to an unique equilibrium, regardless of the time structure and the existence of uncertainty *á la* Morris and Shin (1998). The paper novelty is rooted in the latter finding, by partially extending Morris and Shin (1998) result and by enriching our understanding of the role of uncertainty *versus* coordination failure in a model of rule of law as analysed in Cooter (1997), Roland and Verdier (2003) and Hoff and Stiglitz (2004a).

Tripartite Space Given $c(\alpha, \theta) = \alpha - \theta$, strictly dominated strategies emerge for a particular set of parameters.

- $\theta = 0$**, i.e. worst economy institutional quality:** when the economy has the minimum "institutional type" ($\theta = 0$), the number of stripping agents is irrelevant. Even with $\alpha = 0$, the cost for the government is higher than the value of the rule of law and therefore the state's payoff is $\gamma - k - c(\alpha, 0) < 0 \quad \forall\alpha \Rightarrow \gamma - k - c(0, 0) < 0 \Rightarrow k > \gamma$;

- $\alpha = 1$**, i.e. all agents strip:** in the case in which all agents strip assets, the government has a negative payoff despite the fact that the economy type could be the best ($\theta = 1$) and therefore the state's payoff is $\gamma - k - c(1, \theta) < 0 \quad \forall\theta \Rightarrow \gamma - k - c(1, 1) < 0 \Rightarrow k > \gamma$;

- $\theta = 1$**, i.e. best economy institutional quality:** when the economy has the maximum "institutional type" ($\theta = 1$), no matter how many agents decide to strip (even $\alpha = 1$), the stripping fixed cost will always overcome the gain, and the agent's payoff is $\gamma - t + c(\alpha, 1) < 0 \quad \forall\alpha \Rightarrow \gamma + c(1, 1) - t < 0 \Rightarrow t > \gamma$.

From figure 2 and 3 it also turns out that $k - \gamma \leq 1, t - \gamma \leq 1, \gamma + 1 - t \leq 1, \gamma + 1 - k \leq 1$, rearranging:

$$\gamma \leq k \leq \gamma + 1 \tag{1}$$

$$\gamma \leq t \leq \gamma + 1 \tag{2}$$

Following Obstfeld (1996) and Morris and Shin (1998) I can now divide the parameter θ space in three intervals:

- **hell** $[0, \underline{\theta}]$. I derive the conditions under which anarchy is the dominant strategy for the State: a) $k + c(\alpha, \underline{\theta}) > \gamma \quad \forall\alpha \Rightarrow \underline{\theta} = (k - \gamma | \alpha = 0) > 0 \Rightarrow k > \gamma$ as in the worst economy institutional environment case. Below $\underline{\theta}$ "not to enforce" is a dominant strategy for the government;

- **heaven** $[\overline{\theta}, 1]$. I derive the conditions under which building value is a dominant strategy for the agents: a) $\gamma - t + c(\alpha, \overline{\theta}) < 0 \quad \forall\alpha \Rightarrow \overline{\theta} = (\gamma + 1 - t | \alpha = 0) > 0 \Rightarrow t > \gamma$ as in the best economy institutional environment case. Above $\overline{\theta}$ agents have no incentive to strip, their costs outweigh their benefits, then "building value" is a dominant strategy for the agents;

- **no corner solutions' area** $[\underline{\theta}, \overline{\theta}]$. This is the interval within which not trivial solutions appear, and a multiplicity of equilibria shows up.

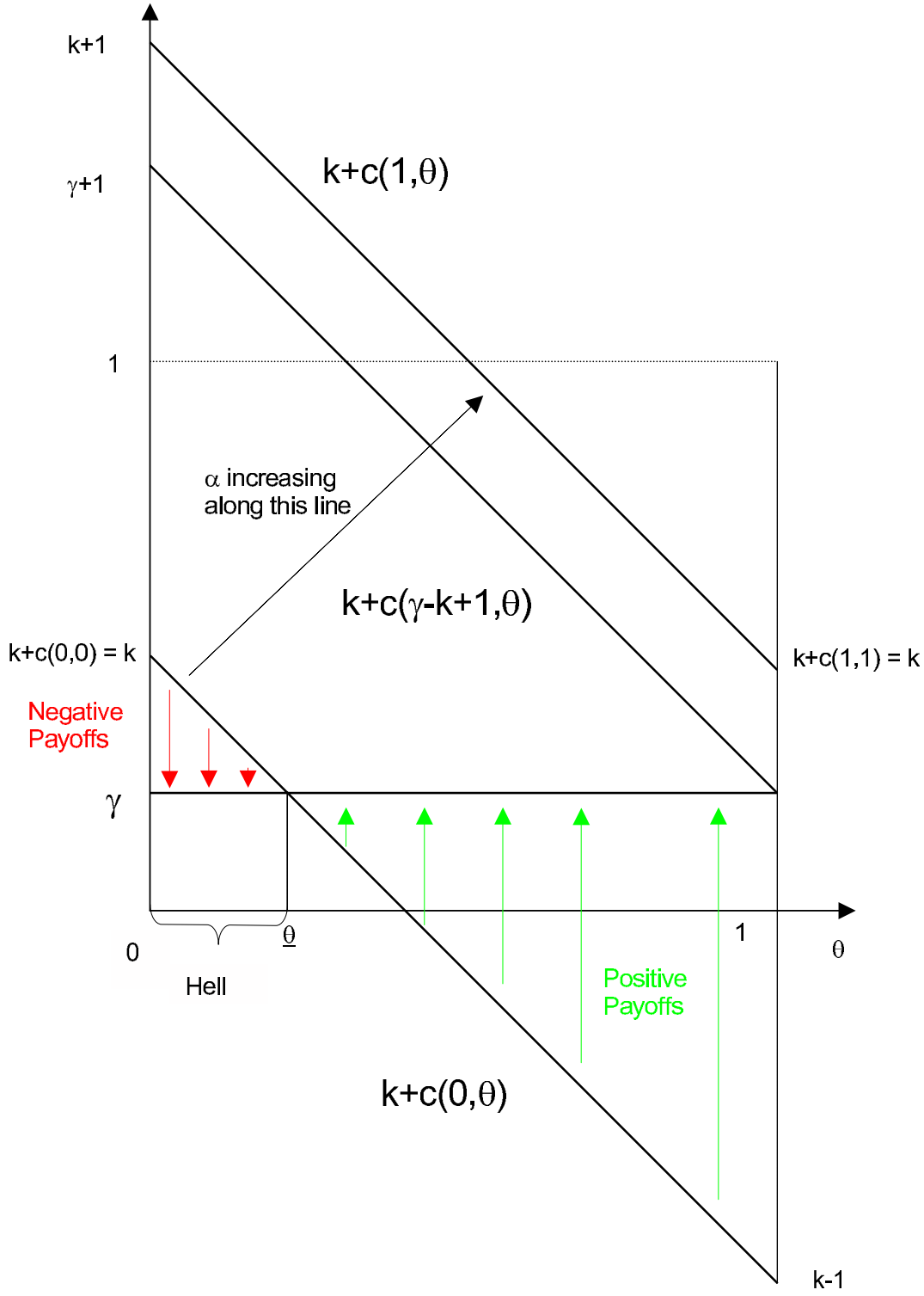


Figure 2: State Payoff: $\gamma - [k + c(\alpha, \theta)]$ & $c(\alpha, \theta) = \alpha - \theta$

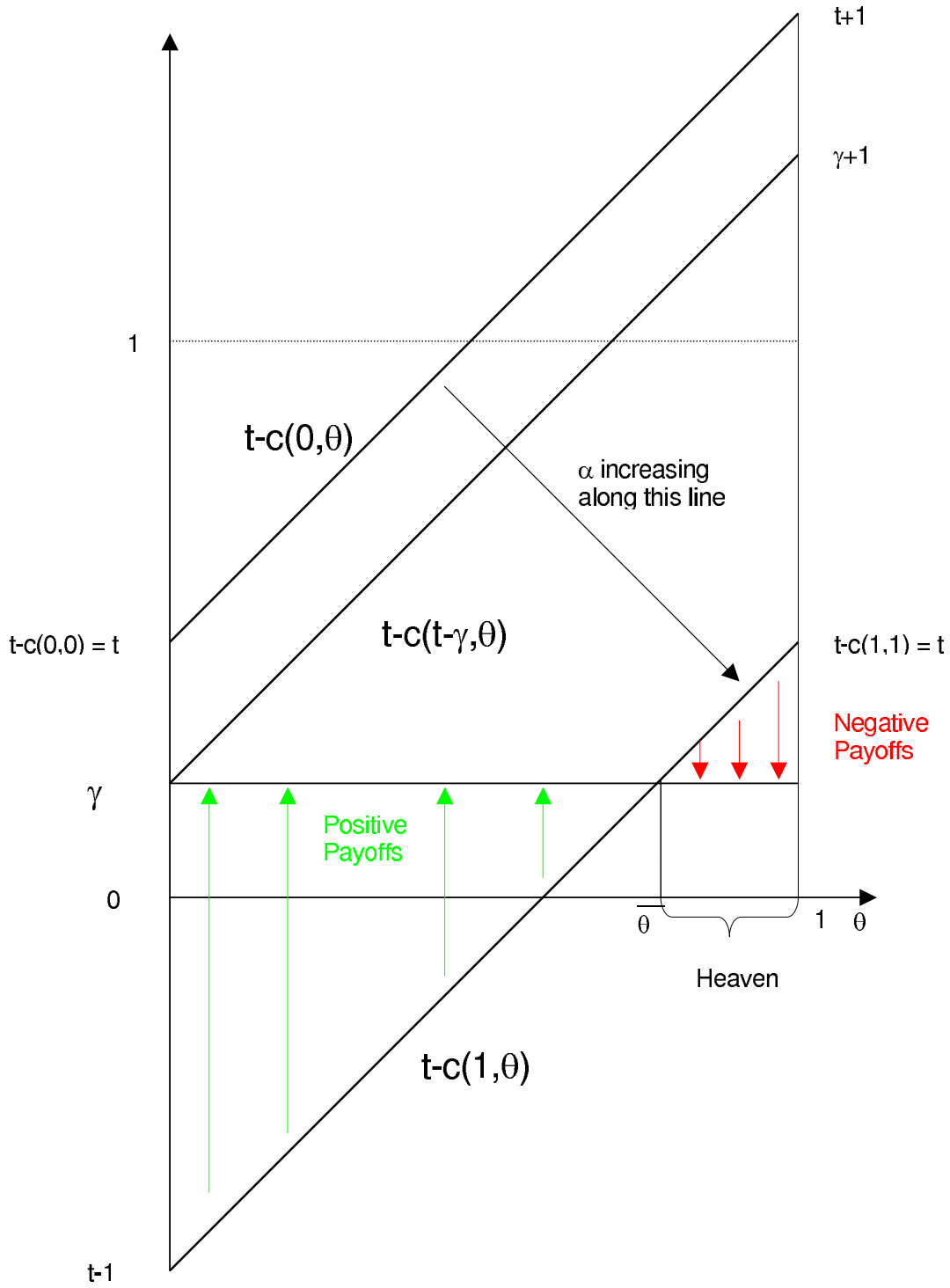


Figure 3: Agents Payoff: $\gamma - [t - c(\alpha, \theta)]$ & $c(\alpha, \theta) = \alpha - \theta$

Non strictly dominant strategies emerge if

$$\theta \in [max\{0, k-\gamma\}, min\{1, \gamma+1-t\}] \tag{3}$$

Outside these thresholds there are strictly dominant strategies and corners solutions appear as shown in figures 2 and 3 "Hell" and "Heaven" areas.

4 Complete Information: the Toy Model

Players actions are strategic complements when an increased activity of some players affects the payoff structure of other players, who will be better off by increasing their own activity (Cooper (1999)). If a coordination game is played in a complete information setting, i.e. every agent knows the other agents' payoff, and the so called common knowledge hypothesis is valid, then there are multiple equilibria.

In fact, if we suppose that conditions (1), (2) and (3) are satisfied[17] and further suppose that a unique agent plays against the State, then the coordination failure *among* agents vanishes, while the coordination failure *between* the single agent and the State remains in place. This means that $\alpha \in \{0, 1\}$ and no longer $\alpha \in [0, 1]$, i.e the corner case in which all agents strip or build value in a cooperative manner through a coalition.

The equilibrium outcome will indeed be different according to the time structure, be it simultaneous or sequential, of the "collapsed" two players' (one agent and the State) game with complete information. At this stage there is no role for uncertainty, in other words the lack of coordination failure does imply the lack of uncertainty, θ is predetermined and perfectly known by all players involved.

4.1 Sequential Game

Consider a sequential setting as depicted in figure 4, the government plays in period 2.

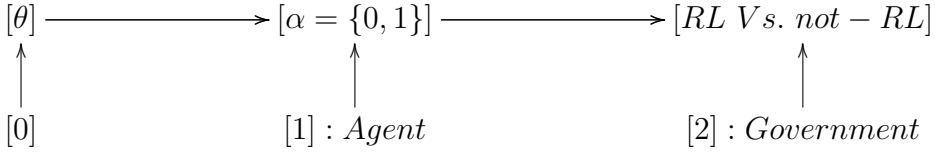


Figure 4: Timing: Sequential Play

[17] See Appendix 7.1 for an interpretation.

Proposition 1 *In a sequential game in which a single agent faces no uncertainty about the economy institutional quality and therefore no coordination failure (i.e. one agent, dynamic game with complete information) there is* ***one Sub-Game Perfect Nash Equilibrium (SPNE)*** *where the agent strips assets and the rule of law is not enforced.*

Proof 1 *See Appendix 7.2.*

The uniqueness of the equilibrium is generated by the sequential structure of the game. The agent exploits the *first mover's advantage* and strips, this in turn leads the economy to a SPNE with full stripping of assets and lack of rule of law.

4.2 Simultaneous Game

Let now suppose that the government and the agent play simultaneously in period 1 as described in figure 5.

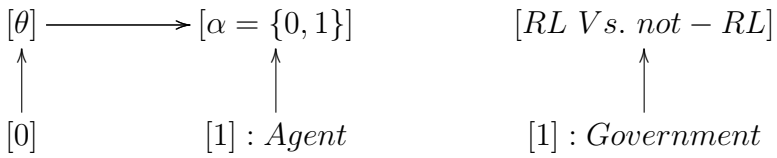


Figure 5: Timing: Simultaneous Play

Proposition 2 *In a simultaneous game in which a single agent faces no uncertainty about the economy institutional quality and therefore no coordination failure (i.e. one agent, static game with complete information) there are* ***two Nash Equilibria*** *for* $k < \theta$[18]*: one in which the government leaves the economy to anarchy and the agent strips assets, and an other in which the Rule of Law is enforced when the agent builds value.*

Proof 2 *See Appendix 7.3.*

The multiplicity of equilibria is generated by the *coordination failure* between the government and the single agent due to the agent's decision on the variable cost of the government, namely the negative externality.

5 Incomplete Information: the Fully-fledged Model

In this section I will present a model in which an idiosyncratic perception of a noisy signal of the economy institutional environment by each and every agent determines

[18]The unique equilibrium solution is not ruled out for the restricted set of parameters, i.e. $k > \theta$, see appendix 7.2 for an interpretation.

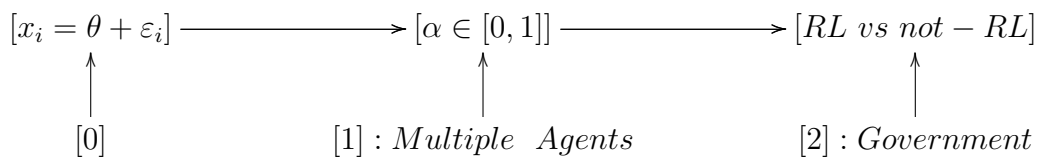


Figure 6: Timing: Sequential Play and Uncertainty

a blurred perception of other agents' action. In other words, this allows for the heterogeneity in perception about the economy institutional quality and, as a direct consequence, about other players' actions. The model will be solved in an incomplete information sequential game framework. In other words, the unrealistic hypothesis of an unique agent and complete information is now dismissed and a non-cooperative framework with incomplete information (Dixit (2004)) is employed.

Multiple agents receive an idiosyncratic information about economy institutional type, as in Morris and Shin (1998), namely agent i receives the signal $x_i = \theta + \varepsilon_i$ ($x_i \sim Uniform$ on $[\theta - \varepsilon, \theta + \varepsilon]$ with $\varepsilon > 0$). The signal x is uniformly drawn on the interval $[\theta - \varepsilon, \theta + \varepsilon]$ with $\varepsilon > 0$. Conditions (1), (2) and (3) are again satisfied.

5.1 Sequential Game

I first consider the sequential game: each and every agent receives an incomplete information about the economy institutional quality and the government plays only *after* having observed α and θ as shown in figure 6.

Agents are conscious that the decision of the State is simply based on the observed α and θ. However $\alpha(\varepsilon_i)$ depends on ε_i, which is a random variable. To simplify the analysis I assume that each agent chooses in the following manner[19] (indicator function):

$$I_{x^*}(x_i) \begin{cases} 1 & \text{if } x_i < x^* \quad \Rightarrow StripAssets \\ 0 & \text{if } x_i \geq x^* \quad \Rightarrow BuildValue \end{cases}$$

Proposition 3 *In a sequential game in which a continuum of agents faces uncertainty about the economy institutional quality and coordination failure among themselves (dynamic game with agents' incomplete information) there is* ***one Sequential Nash Equilibrium*** *determined by:*

[19] It turns out that this is the "optimal" strategy, see Morris and Shin (1998).

$$x^* = \theta^* + \frac{\varepsilon[3\gamma - 2(k+t)]}{\gamma + 2t + 1} \tag{4}$$

$$\theta^* = \frac{\varepsilon[1 + 2(k-\gamma)] + \gamma(1+k-\gamma) - t + \frac{1}{2}}{\gamma + 2\varepsilon + 1} \tag{5}$$

The rule of law is enforced if the value of θ is greater than θ^*. Otherwise anarchy prevails.

Proof 3 *Follows.*

Government Action By backward induction we start looking at the decision rule of the government. This is in fact extremely simple, namely to implement the rule of law if a sufficiently low number of agents strip assets, and viceversa if too many of them strip assets, where $c(\alpha, \theta) = \alpha - \theta$[20].

$$\gamma - k - \alpha + \theta \geq 0 \Rightarrow RL \tag{6}$$

$$\gamma - k - \alpha + \theta < 0 \Rightarrow not - RL \tag{7}$$

The proportion of stripping agents (α) whose actions are sufficient to induce the abandonment of the rule of law by the State[21], is:

$$\alpha(k, \theta, \gamma) \begin{cases} 0 & \text{if } 0 \leq \theta < k - \gamma \\ \gamma - k + \theta & \text{if } k - \gamma \leq \theta \leq \gamma + 1 - t \end{cases}$$

The function $\alpha(k, \theta, \gamma)$ is increasing in θ (the higher the economy institutional quality, the easier the implementation of the rule of law) and γ (the higher the value of the assets, the higher the effort in property rights protection). The function is negatively affected by the sunk cost k. The State observes the proportion of strippers in the economy and it compares it with $\alpha(k, \theta, \gamma)$, the maximum number of strippers before anarchy prevails. The higher the economy institutional quality, the fewer the strippers and the higher the likelihood of rule of law enforcement. Viceversa, the lower the economy institutional quality the higher the number of strippers and the lower the likelihood of rule of law enforcement.

[20]The state is able to know the exact number of agents stripping assets because it can measure the amount of investment in the economy. The lower the investment, the higher the stripping. An other way to think at this possibility is the tax evasion: stripping assets do not allow the state to apply taxes on evaded (e.g. tunneled abroad) money. The low tax collection is a indirect sign of high evasion.

[21]The attribution of the equal sign to the RL or not-RL is irrelevant. The probability that $\gamma - [k + c(\alpha, \theta)] = 0$ is zero.

Agents' Action Recalling the indicator function for each agent:

$$I_{x^*}(x_i) \begin{cases} 1 & \text{if } x_i < x^* \quad \Rightarrow StripAssets \\ 0 & \text{if } x_i \geq x^* \quad \Rightarrow BuildValue \end{cases}$$

Each agent receives a noisy signal about the economy institutional type and she strips or not according to a simple threshold rule: strong signal, above $x^* \Rightarrow$ build value; weak signal, below $x^* \Rightarrow$ strip assets. The number of agents who will *actually* strip assets (call it $S(.,.)$) depends on the distribution of the signal, uniformly distributed in the interval $x_i \sim U[\theta-\varepsilon, \theta+\varepsilon]$ and on the economy institutional quality θ. I distinguish three cases:

- $x^* > \theta + \varepsilon \Rightarrow \theta < x^* - \varepsilon$, the economy institutional quality is lower than the minimum signal any agent can see and everyone strips;
- $x^* < \theta - \varepsilon \Rightarrow \theta > x^* + \varepsilon$, the economy institutional quality is higher than the maximum signal any agent can see and building value prevails;
- $x^* \in [\theta - \varepsilon, \theta + \varepsilon]$ the stripping assets choice derives from the expected value of α, i.e. the overall level of stripping assets:

$$E(\alpha) = \frac{1}{2\varepsilon}\int_{\theta-\varepsilon}^{\theta+\varepsilon} I_{x^*}(x)dx = \frac{1}{2\varepsilon}\int_{\theta-\varepsilon}^{x^*} I_{x^*}(x)dx + \frac{1}{2\varepsilon}\int_{x^*}^{\theta+\varepsilon} I_{x^*}(x)dx = \frac{1}{2\varepsilon}\left[x^* - (\theta-\varepsilon)\right] = \frac{1}{2} - \frac{(\theta - x^*)}{2\varepsilon}$$

Summarising, the share of agents stripping assets is:

$$S(\theta, I_{x^*}(x_i)) \begin{cases} 1 & \text{if } x^* > \theta + \varepsilon & \theta < x^* - \varepsilon \\ \frac{1}{2} - \frac{1}{2\varepsilon}(\theta - x^*) & \text{if } x^* \in [\theta - \varepsilon, \theta + \varepsilon] & \theta \in [x^* - \varepsilon, x^* + \varepsilon] \\ 0 & \text{if } x^* < \theta - \varepsilon & \theta > x^* + \varepsilon \end{cases}$$

5.1.1 Equilibrium

The two functions $\alpha(k, \theta, \gamma)$ (increasing in θ) and $S(\theta, I_{x^*}(x_i))$ (decreasing in θ) cross at the equilibrium point θ^*:

$$\gamma - k + \theta = \frac{1}{2} - \frac{1}{2\varepsilon}(\theta - x^*) \Rightarrow \tag{8}$$

$$\theta^* = \frac{1}{1+2\varepsilon}\{x^* + \varepsilon[1 + 2(k-\gamma)]\} \tag{9}$$

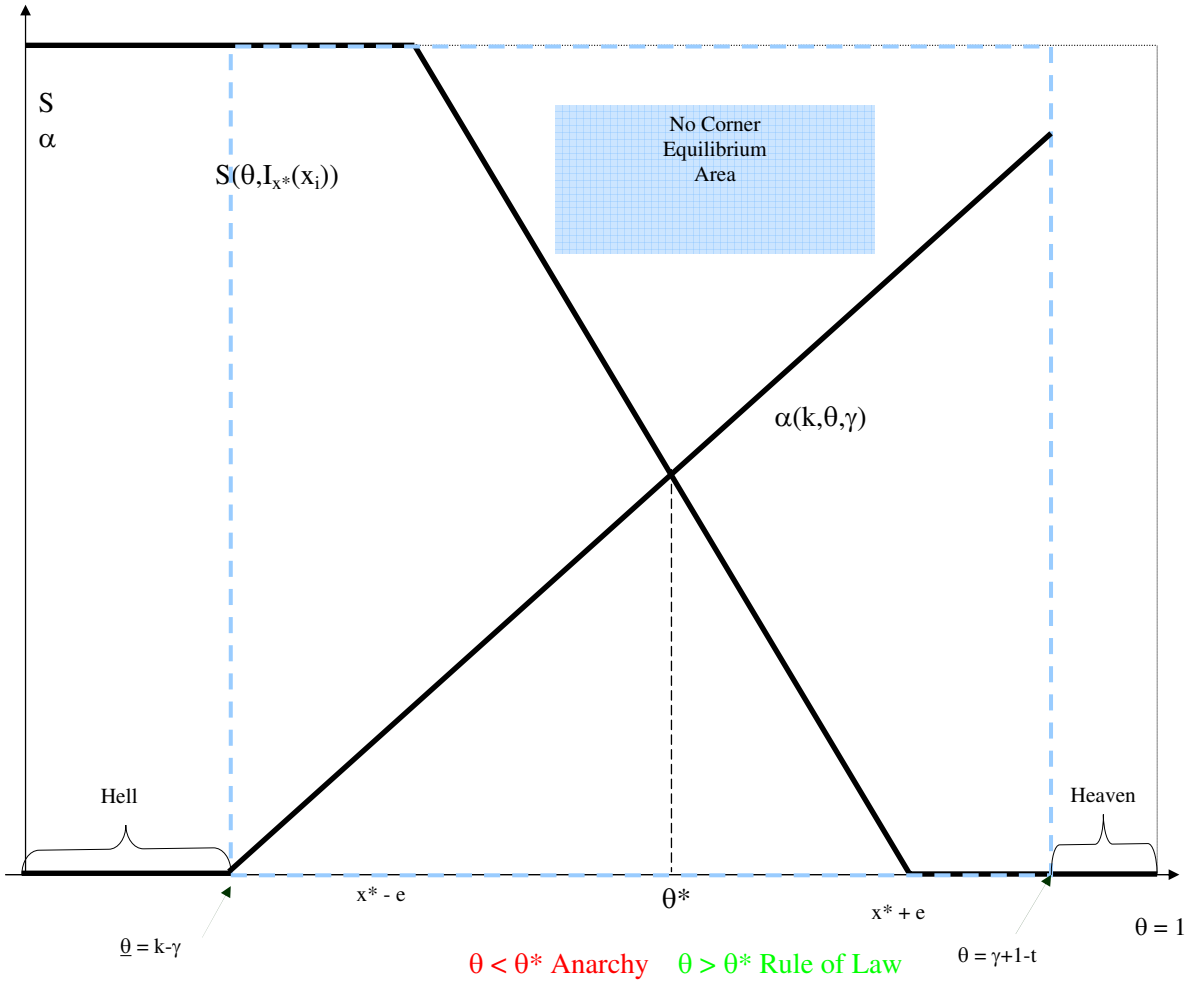


Figure 7: Equilibrium: θ^*

$$\begin{cases} \theta > \theta^* & \Rightarrow \alpha(k,\theta,\gamma) > S(\theta, I_{x^*}(x_i)) \quad RL \\ \theta < \theta^* & \Rightarrow \alpha(k,\theta,\gamma) < S(\theta, I_{x^*}(x_i)) \quad Not-RL \end{cases}$$

The Government defends property rights and the rule of law is established if the proportion of agents stripping assets (S) is lower then the maximum bearable percentage (α). The opposite happens if the inequality is reversed and anarchy prevails, see figure 7[22].

Agents' payoff Finally, I analyse the agent's uncertain payoff. I start from the payoff in case of asset-stripping, which depends on the subsequent action of the state with regards to the implementation or not of the rule of law.

$$h(\theta, x^*) = \begin{cases} \alpha - \theta - t & ;\theta > \theta^* \quad ;\alpha(\theta) > S(\theta, I_{x^*}(x)) \quad RL \\ \gamma + \alpha - \theta - t & ;\theta < \theta^* \quad ;\alpha(\theta) < S(\theta, I_{x^*}(x)) \quad Anarchy \end{cases}$$

$h(\theta, x^*)$ represents the realised payoffs in case of common knowledge (no uncertainty). On the contrary, agents observe an idiosyncratic noisy signal, taking their stripping vs. build decision on the basis of $E_i\{h(\theta, x^*)|x_i\} = u(x_i, x^*) \lessgtr 0$. Solving for the expected value of the indifferent agent, I will show that x^* is indeed unique and that the strategy summarised by the indicator function $I_{x^*}(x)$ is the optimal strategy.

Every agent is identical and knows that the other agents face exactly the same problem, therefore a generic agent (I dropped the subscript i for simplicity) will compute the following expected value, knowing that the signals are distributed around $x_i \sim U[\theta - \varepsilon, \theta + \varepsilon] \Rightarrow \theta \in [x - \varepsilon, x + \varepsilon]$:

$$\frac{1}{2\varepsilon}\int_{x-\varepsilon}^{\theta^*}[\gamma + \alpha - \theta - t]d\theta + \frac{1}{2\varepsilon}\int_{\theta^*}^{x+\varepsilon}[\alpha - \theta - t]d\theta =$$
$$\frac{1}{2\varepsilon}\left[\int_{x-\varepsilon}^{x+\varepsilon}[\alpha - \theta - t]d\theta + \gamma\int_{x-\varepsilon}^{\theta^*}d\theta\right]$$
$$\frac{1}{2\varepsilon}\left[\int_{x-\varepsilon}^{x+\varepsilon}[\alpha - \theta - t]d\theta + \gamma(\theta^* - x + \varepsilon)\right]$$

The indifferent agent is the one observing exactly x^* (this agent exists due to the uniform distribution hypothesis of the noisy signals) and she does not gain nor lose from stripping, in other words $E_i\{h(\theta, x^*)|x_i^*\} = u(x_i^*, x^*) = 0$.

[22] If the θ^* was implicitly derived through $\alpha(k,\theta,\gamma) = S(\theta, I_{x^*}(x))$, then it could be shown that $0 < \frac{\partial\theta^*}{\partial x^*} < 1$: any increase in the agents' threshold rule positively affects (less then proportionally) the economy institutional quality threshold under which there is asset-stripping.

$$\frac{1}{2\varepsilon}\left[\int_{x^*-\varepsilon}^{x^*+\varepsilon}[\alpha-\theta-t]d\theta+\gamma(\theta^*-x^*+\varepsilon)\right]=0 \tag{10}$$

Solving for θ^* and exploiting 9:

$$x^*=\theta^*+\frac{\varepsilon[3\gamma-2(k+t)]}{\gamma+2\varepsilon+1} \tag{11}$$

$$\theta^*=\frac{\varepsilon[1+2(k-\gamma)]+\gamma(1+k-\gamma)-t+\frac{1}{2}}{\gamma+2\varepsilon+1}.\blacksquare \tag{12}$$

End of the proof.

5.2 Simultaneous Game

Suppose now that the game is simultaneous as figure 8 shows.

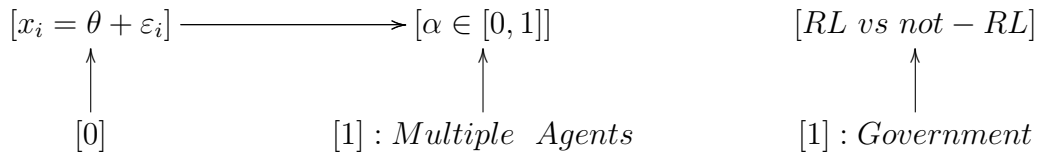


Figure 8: Timing: Simultaneous Play and Uncertainty

Proposition 4 *In a <u>simultaneous</u> game in which a continuum of agents faces uncertainty about the economy institutional quality and coordination failure among themselves (static game with incomplete information) there is* ***one Bayes-Nash Equilibrium*** *determined by:*

$$x^*=\theta^*+\frac{\varepsilon[3\gamma-2(k+t)]}{\gamma+2t+1}$$

$$\theta^*=\frac{\varepsilon[1+2(k-\gamma)]+\gamma(1+k-\gamma)-t+\frac{1}{2}}{\gamma+2\varepsilon+1}$$

The rule of law is enforced if the value of θ selected by nature is greater than θ^*. Otherwise anarchy prevails.

Proof 4 *See proof of proposition (3) and the following discussion.*

5.2.1 Discussion

The sequential model was solved by backward induction. In that case I looked at state's action, whose disadvantage relies in moving *only* in period 2, passively facing agents' actions taken in period 1. However it has the advantage of playing without uncertainty, θ is perfectly known by the state. In fact, the government will enforce only if θ falls below a threshold that is computed in the proof of in Proposition (3), namely equation (12). In turn, agents strip assets only if their signal falls below a threshold x^*, equation (11), the reason being that they know that the state has complete information and that it will play according to the observed α and known (by the state...but not by them) θ.

Given $E(\alpha) = S(\theta, I_{x^*}(x_i))$

$$S(\theta, I_{x^*}(x_i)) \begin{cases} 1 & \text{if } x^* > \theta + \varepsilon & \theta < x^* - \varepsilon \\ \frac{1}{2} - \frac{1}{2\varepsilon}(\theta - x^*) & \text{if } x^* \in [\theta - \varepsilon, \theta + \varepsilon] & \theta \in [x^* - \varepsilon, x^* + \varepsilon] \\ 0 & \text{if } x^* < \theta - \varepsilon & \theta > x^* + \varepsilon \end{cases}$$

Is there any reason for which the observed α (sequential game) could be different from the expected α (simultaneous game)? The state's information set is unchanged and the optimal strategy is independent from playing simultaneously or sequentially; also agents know that the state will not change its strategy and, will not change their strategies either.

Propositions (3) (4) are indeed identical, and the simultaneous and sequential games have the very same equilibrium outcome. ■

5.2.2 The case with No Uncertainty

Refer now to the limit of equilibria as the noise vanishes, $\varepsilon \to 0$.

Corollary 1 *In a simultaneous (sequential) game with no uncertainty about the economy institutional quality (i.e. $\varepsilon = 0$) and coordination failure among agents, there is **one Sub-Game Perfect Nash equilibrium** (**one Sequential Nash Equilibrium**) determined by:*

$$x^* = \theta^* = \frac{\gamma(1 + k - \gamma) - t + \frac{1}{2}}{\gamma + 1} \tag{13}$$

The rule of law is enforced if the value of θ selected by nature is greater than θ^*, otherwise anarchy prevails.

Proof 5 *This is the case in which agents observe perfectly θ and choose according to the known θ: from propositions (3) and (4) the function describing the share of agents attacking would become a step function $S(\theta^*, I_{x^*}(\theta))$, i.e. $\varepsilon \to 0 \Rightarrow x^* = \theta^*$,*

$$S(\theta, I_{x^*}(\theta)) \begin{cases} 1 & if\ x^* = \theta^* > \theta \\ 0 & if\ x^* = \theta^* < \theta \end{cases}$$

and (13) immediately follows.■

Note that proposition 1, i.e. no uncertainty and no inter-agents coordination failure, implied the uniqueness of the equilibrium, namely anarchy, regardless of the value of θ. On the other hand, according to corollary 1 in a simultaneous or sequential game with coordination failure among agents, the advancement of the reform process *does* determine which equilibrium prevails, anarchy or rule of law.

5.3 Comparative Statics

The derivatives of the threshold for the signal (x^*) and the threshold for the economy institutional quality (θ^*) with respect to ε (the degree of uncertainty), γ (the value of assets in the economy), k (the sunk cost of the government enforcing the rule of law) and t (the fixed cost of stripping) provide the mapping of the comparative static exercise on the model, that allows for the following:

Corollary 2 *The increase in uncertainty (ε) and enforcement fixed cost (k) expand the area (likelihood) of the equilibrium for anarchy, whilst the increase in assets value γ and stripping costs t expand the area (likelihood) of the equilibrium for the rule of law.*

Proof 6 *See appendix 7.4.*

Predation by the State The parameter γ has been so far interpreted as a public good, that is shared by the economy as a whole. However it could be possible to think that the action of the state in recovering the assets is in reality motivated by expropriation and rent-seeking (or alternatively by a weak bureaucratic apparatus). If agents know that the rule of law enforcement might well turn to be an ex-post predation (low or zero γ) by the state instead of redistribution in the form of a public good, they would steal as much as possible and leave the state to have an ex-ante low incentive to actually protect property rights themselves. This might well happen in case of politicians who are non credible in their commitment to a non-expropriation action by the state they represent. In other words, the corner solution of $\gamma = 0$ always leads to an anarchy state, as it would reasonably be expected.

On the same token, if the state is going to redistribute the entire value of assets (γ) and this value is sufficiently high, agents expect the redistribution of γ in the form

of a public good by the enforcement of the rule of law. In this case, agents anticipate this effect and refrain from stripping assets by investing.

Sunk Costs of Enforcement and Stripping Assets High sunk cost in enforcement of the rule of law increases the likelihood of anarchy and high asset-stripping fixed cost induces lower stripping and higher probability of rule of law establishment.

The scope of Information In case of high uncertainty, more agents receive signals far away from the true value of the institutional quality, and this determines a higher proportion of asset-strippers. This is true notwithstanding the decrease of x^*, an effect that would *per se* increase the probability of the rule of law enforcement, but it is not enough to counteract the simultaneous increase of ε, i.e. the *uncertainty* area.

Using equations 11 and 12 it is possible to get the level of uncertainty, call it ε^T (where T stands for threshold), over which there is anarchy and under which there is enforcement of property rights:

$$\varepsilon^T = \frac{\theta(1+\gamma) - \gamma\left(k+1-\gamma\right) + t - \frac{1}{2}}{1+2(k-\gamma-\theta)} \tag{14}$$

The above is an increasing function of the quality of institutions θ, the sunk cost of stealing t, while it decreases with k, the cost of enforcing the rule of law. In a country where the combination of these parameters is not favorable (bad bureaucracy and bad institutions), even a low level of uncertainty can lead to anarchy and information becomes crucial. On the contrary, within a solid economic context (good enforcement by bureaucracy, no expropriation risk, good general institutional quality) the above threshold is pushed upward, and the likelihood to end up in a bad equilibrium is extremely low.

Rule of Law Enforcement and Information This model allows for tentative policy implications in terms of what is needed to counteract the risk of anarchy, namely many agents stripping and government not enforcing property rights or even expropriating. If the economy is a laggard as far as the implementation of reform is concerned (low economy institutional environment), there are really few options in order to lead to economy towards a virtuous path. This is probably the case in countries where institutions change very slowly (Roland (2001); Roland (2004)) and the economy is not recovering fast enough from a negative shock of the transition period, a sort of hysteresis effect. These are the countries that in figure 1 are laying at the bottom left. In other words, in economies where the institutional quality is poor, and hence the expectation

of the rule of law implementation is low, the anarchy outcome is unfortunately the most likely equilibrium result.

The best case scenario is less interesting: if good bureaucracy and fast reform development pro-good institutional environment are jointly showing up, this simply allows for an easier establishment of the rule of law, as it was the case in the Visegrad countries, the Baltics and Slovenia, shown at the top right of figure 1.

However, the mixed cases are the more interesting. Russia, that is laying in the middle part of figure 1, whilst registering among the highest corruption rate, is probably a good example. In this country, the economy is sufficiently "institutionally sound" and still unable to enforce domestic investors compliance with the rule of law, i.e. weak contract enforcement implementation and lack of emphasis on the importance of cooperation and on property rights respect prevail. Two observations follow. On the one hand the effort should be put on pushing forward the reform process in a broad sense. The government and the civil society must seize any chance of the reciprocal collaboration. This is because the overall cooperative action guarantees higher payoffs for everybody (social surplus is maximised via cooperation as in Weingast (1997)). However, this is not straightforward. On the other hand, the policy maker should work on the reduction of any distorting information signals, by allowing free media and information flows[23]. The *big push* argument *á la* Murphy, Schleifer and Vishny (1989) in this context would be justified by the need to escape from the coordination failure characterising the collective action problem. Depending on the combination of economic conditions and institutional development, the outcome of the coordination failure will be more or less severe.

6 Concluding Remarks

At the beginning of the transition process from the central planning system to a market economy, some countries witnessed the separation between control and property of the assets obtained through the mass privatisation process (Hoff and Stiglitz (2005)). The state confronted a context of massive stripping of assets, privatisation in favour of few big businessman, whisking of capital, tunneling and difficult contract enforcement. At the end of the 90s, some countries were still characterised by widespread "corruption", and a limited rule of law implementation.

This paper tries the understand why the above phenomenon occurs by extending the Hoff and Stiglitz (2004a) model of the quest for the rule of law and by exploiting the global games approach (Morris and Shin (1998)) to solve a coordination game with

[23]If media are pluralistic and independent from the state control.

incomplete information. The quality of institutions and the information on such quality jointly determine whether anarchy or rule of law prevail. In this model, information conveys a noisy signal to agents, whose choice is based on the expectation of other players' actions. Some agents will strip assets if they expect many others to do the same. Viceversa, other agents will build value if they expect few others to strip assets. Countries in the reform process pro-good institutions will guarantee the enforcement of the rule of law, while laggard countries will be confronted with anarchy.

This paper shows, on the one hand, that high uncertainty and sunk costs of law enforcement have an overall negative effect on the rule of law, by pushing the economy towards a Pareto-dominated equilibrium. On the other hand, the high value of economy's assets and the extent of redistribution in the form of a public good of recovered assets has a positive influence, by leading to a Pareto-dominant equilibrium.

The stylised framework of this paper offers a representation of the period of uncertainty and poor reform commitment in some transition countries and low/middle income countries where property rights' protection is low, despite a relative advanced stage of convergence to pro-market economy institutions. In a context of sound institutional quality, the policy implication would be to require the government to intervene in order to decrease uncertainty by promoting the diffusion of information. Conversely, in a context of poor institutional quality, the sole reduction of uncertainty would not be sufficient. This riddle will stand, however I believe the model proposed in this paper gives a more realistic and in-depth representation of the complex situation experienced by transition countries showing a relative advanced stage of convergence to pro-market economy institutions but lacking in an effective property rights protection.

7 Appendix

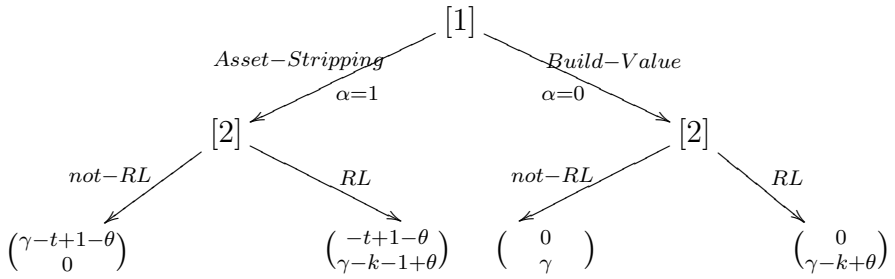
7.1 Sunk costs in Asset-Stripping and Enforcement

Linear Cost Functions The linear cost function $c(\alpha, \theta) = \alpha - \theta$ has a simple interpretation. The government benefits whenever the θ are "higher" than the number of strippers ($\alpha < \theta$), given that the population size is normalised to 1. Viceversa, each agent benefits whenever the opposite happens ($\alpha > \theta$). Think of α as the total number of strippers out of a pool of θ potentially honest agents, as if the economy showed a natural level of dishonest people $1 - \theta$. If all the potentially honest people were stripping ($\alpha > \theta$), then the government would be paying a cost to enforce, while the agents would benefit by widespread dishonesty. By the same token, if $\alpha < \theta$, then the government is in a stronger position and agents lose from stripping.

Lower bond conditions on k and t In the text I derived the condition $k > \gamma$ and $t > \gamma$ for the determination of dominant/dominated strategies. An interpretation is the following: in an economy where the enforcement depends only on the variable part $c(\alpha, \theta), k = 0$, the government will take a chance to enforce, despite the fact that the economy is extremely weak in terms of reform process. A possibility that I want to rule out when $k > \gamma$ (there will always be a Hell). Conversely, I have a condition $t > \gamma$ on the agents, who are no more attracted by the asset-stripping option in a strong economy (there will always be a Heaven).

7.2 Proof of Proposition 1

I can write the game in extensive form by taking into account the **out of equilibrium outcome** in case of only one agent (see note (14)). Substituting for the functional form $c(\alpha, \theta) = \alpha - \theta$ the following game appears under conditions (1), (2) and (3):



Using backward induction, the government will choose to give up the enforcement of the Rule of Law if the agent strips, and viceversa, it will enforce if she does not for $\theta > k$. The agent, exploiting the *first mover's advantage*, will strip and the Sub-Game

Perfect Nash equilibrium (Strip Assets; Not-RL) prevails. For $\theta < k$ the state will not enforce facing a non-stripping agent, however the equilibrium will be again (Strip Assets; Not-RL).

7.3 Proof of Proposition 2

The game can be represented in strategic (normal) form again by taking into account the **out of equilibrium outcome** in case of only one agent (see note (14)). Substituting for the functional form $c(\alpha, \theta) = \alpha - \theta$ the following payoffs matrix appears under conditions (1), (2) and (3):

$1 \diagdown 2$	RL	Not-RL
Build Value	$0; \gamma - k + \theta$	$0; \gamma$
Strip Assets	$-t + 1 - \theta; \gamma - k - 1 + \theta$	$\gamma - t + 1 - \theta; 0$

Table 2: Nash Equilibria in Strategic Form: (1) Agent & (2) State

For $\theta > k$ two Nash equilibria emerge : (Build-Value; RL), (Strip Assets; Not-RL), whilst $\theta < k$ implies an unique equilibrium (Strip Assets; Not-RL). However, this latter result is much less likely given that the condition (3) imposes $k < \gamma + \theta$, true only if the state is overburden by sunk costs -lowering incentive to act for the rule of law at all- *and* γ is particularly high.

7.4 Proof of Corollary 2

$$\frac{\partial x^*}{\partial \varepsilon} = \frac{\gamma[3\gamma - 2(t+k)]}{\gamma + 2\varepsilon + 1} < 0, \frac{\partial \theta^*}{\partial \varepsilon} = \frac{2(k+t) - 3\gamma}{(\gamma + 2\varepsilon + 1)^2} > 0; \tag{15}$$

$$\frac{\partial x^*}{\partial \gamma} = \frac{[2\varepsilon(1 + k + t + \varepsilon) + k + t + 1/2 - \gamma(2 + \gamma + 4\varepsilon)]}{(\gamma + 2\varepsilon + 1)^2} < 0, \tag{16}$$

$$\frac{\partial \theta^*}{\partial \gamma} = \frac{1/2 + k + t - \varepsilon[4(\varepsilon + \gamma) + 1] - \gamma(\gamma + 2)}{(\gamma + 2\varepsilon + 1)^2} < 0; \tag{17}$$

$$\frac{\partial x^*}{\partial k} = \frac{\gamma}{(\gamma + 2\varepsilon + 1)} > 0, \frac{\partial \theta^*}{\partial k} = \frac{2\varepsilon + \gamma}{\gamma + 2\varepsilon + 1} > 0; \tag{18}$$

$$\frac{\partial x^*}{\partial t} = -\frac{2\varepsilon + 1}{(\gamma + 2\varepsilon + 1)} < 0, \frac{\partial \theta^*}{\partial t} = -\frac{1}{\gamma + 2\varepsilon + 1} < 0 \tag{19}$$

The inequalities' signs are determined by exploiting the conditions $k > \gamma$, $t > \gamma$ and the fact that the sunk cost and asset-stripping fixed cost are bounded from above, according to the conditions $\gamma < k < \gamma + 1$, $\gamma < t < \gamma + 1$ and the possibility that γ is not too small. Suppose k and t assume their upper bounds values in equation 16:

$$2\varepsilon(3+2\gamma+\varepsilon)+2\gamma+\frac{5}{2}-2\gamma-\gamma^2-4\varepsilon\gamma<0$$
$$6\varepsilon+2\varepsilon^2+\frac{5}{2}-\gamma^2<0$$
$$\gamma^2>6\varepsilon+2\varepsilon^2+\frac{5}{2}.$$

Therefore, inequality 16 is always true for $\gamma>\sqrt{6\varepsilon+2\varepsilon^2+\frac{5}{2}}$ (sufficient condition).

In turn suppose k and t assume their upper bounds values in equation 17:

$$\frac{5}{2}+2\gamma-\varepsilon(4\varepsilon+4\gamma+1)-\gamma^2-2\gamma<0$$
$$\frac{5}{2}-4\varepsilon^2-4\varepsilon\gamma-\varepsilon-\gamma^2<0$$
$$\frac{5}{2}-\varepsilon-[(2\varepsilon+\gamma)^2]<0$$
$$(2\varepsilon+\gamma)>\sqrt{\frac{5}{2}-\varepsilon}.$$

We get that 17 is always true for $\gamma>\sqrt{\frac{5}{2}-\varepsilon}-2\varepsilon$ (sufficient condition).

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