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EVOLUTION OF THE INSTITUTION OF BANKRUPTCY IN RUSSIA: CREDITORS' CHOICE OF DEBT REPAYMENT STRATEGY

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The bankruptcy law and relevant coercive system determine the nature and scale of accompanying transaction expenses that play, in our opinion, a key role in choosing debt recovery mechanisms. We consider two basic scenarios of debt recovery: judicial procedures provided by the relevant laws and informal mechanisms worked out by direct participants of the relations. These strategies generally imply that parties are primarily interested in recovering debts rather than retaining any partnership relations. The application conditions of the strategies largely overlap: low confidence of partners, need to rely on a third party to settle the conflict, insufficient role of partners' reputation. The work provides for the model describing relations of creditors underlying the decision between informal (private compulsion) and formal rules (applicable procedure of bankruptcy). The author shows that a private compulsion is generally steady equilibrium provided lesser restrictions of the parameters compared to that providing for the creditors who prefer judicial procedure. However, the government still has an ability to influence the situation.

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Introduction

The bankruptcy laws play a significant role in forming modern economic systems. The effectiveness of any institution of bankruptcy is determined in many respects by the underlying bankruptcy laws. The laws together with national corporate culture make economic agents to have definite expectations which are the keystone of their decisions. The bankruptcy law and relevant coercive system determine the nature and scale of accompanying transaction expenses that play, in our opinion, a key role in choosing debt recovery mechanisms. We consider two basic scenarios of debt recovery: judicial procedures provided by the relevant laws and informal mechanisms worked out by direct participants of the relations. It is necessary to maintain a definite balance of formal or informal approaches to solve the insolvency problem. Using them separately is not sufficient as the informal mechanisms often fail to consider interests of all parties connected with insolvency of a company.

Let us trace development of the bankruptcy (insolvency) institution. The institution of bankruptcy occurred as a necessity to settle relations between the economic agents, which borrow funds, and those that provide such funds, i.e. between the borrowers or debtors and the creditors. The XIII century is considered as beginning of formal institution of bankruptcy although it is obvious that such sort of economic relations existed much earlier. In the previous periods, the relations were subject to informal arrangements between individual agents. Increasing development of economy determined the enlarged scale of activities and extended delegation of powers from one agent to another. The need in unified rules applicable to the relations of debtors and creditors occurred. Such rules would decrease an uncertainty in their relations and ensure predictability of actions by securing individual interests in the event that any party conducts opportunistically.

From view point of the law, a formal side of the institution of bankruptcy is a competition law implying «a system of standards regulating relations in respect of insolvency (bankruptcy), i.e. the relations between debtor failing to fulfill his/its obligations, his/its creditors and third parties»[1]. The competition law includes civil, criminal, administrative and labor standards. The first attempts to legalize the relations falling into the area of competitive law were made in Italian cities in the middle of the XIII century. G.F. Shershenevich[2] calls economical prosperity and political dissociation enabling debtors to move from one city to another without any problem and to avoid repaying debts to creditors from other cities one of possible impulses in development of competitive relations. Thus, a need to have the standards, which could be applied to the creditors, arose, emphasizing the proce-

[1] Telyukina M.V., 2000.
[2] Ibid.

dure promptitude. It is not a coincidence that the term «bankruptcy» was borrowed from the Italian. A banker or merchant, who could not repay his debts, was usually called «banca rotta»[3].

The first laws emphasized interests of creditors and, correspondently, a promptitude of a debtor bankruptcy procedure, but such laws did not provide that all creditors should receive their funds back[4]. Creditors acted separately, they did not need to clarify if the debtor has any other creditors; the principle was: the first claimed, the first received. The creditor was expected to have a «satisfaction»in case he did not recover the debt. It meant not only a pecuniary compensation. Debtors were extensively subject to death penalties and hard labor. Any bankruptcy was considered equal to a theft for a long time so the attitude to bankrupt debtors was as they were thieves and swindlers. In England, debtors becoming bankrupt were deprived of many political and economic rights; only creditors could initiate the bankruptcy procedure.

Subsequently the bankruptcy law became to be considered as one of basic mechanisms solving the problem of common property in case the creditors were numerous and the debtor's property was insufficient to cover all debts. In particular, Finch (2001) writes about insolvency of that period as follows:

«Insolvency was thus seen as an offence little less criminal than a felony. From Tudor times onwards, insolvency has been driven by three distinct forces:

- impulsion to punish bankrupts,
- wishes to organize administration of their assets so that competing creditors are treated fairly and efficiently,
- the hope that bankrupt would be allowed to rehabilitate himself» [Finch V., 2002, p. 8].

Up to the XVIII century a punitive approach prevailed in the bankruptcy law. It means that it primarily provided for the opportunity to punish a debtor. In the XVIII century the rudiments of the idea that bankruptcy should enable a debtor to rehabilitate himself rather than to return funds to creditors by any means appeared. In particular, the laws on insolvency containing the idea that the bankruptcy laws should consider both interests of creditors and debtors were adopted in the USA. The principle of limited liability enabling a debtor to begin his business from a scratch also appeared. However, the law was applied only to the activities not connected with trading relations[5].

Starting from the Roman law, the legislation on debt recovery consisted of two components: bonorum venditio and bonorum cession, which subsequently formed the basis for division of the insolvency and bankruptcy laws. The bankruptcy laws was developed to protect creditors and applied in respect of the persons engaged in the trade. It was assumed that any failure to repay a debt is a consequence of illegal activities of the debtor. The insolvency laws were designed to protect interests of a debtor and applied to other activities (except trade). It was assumed that a failure to pay debt is caused by unforeseen events and the debtors' fault is minimum[6].

Furthermore, a bankrupt could be an individual only as the notion of corporate bankruptcy did not exist at the first stages. The corporate laws began to develop a little later. For example, in England, the first laws on corporate insolvency appeared in 1855. Separation of corporate and individual insolvency appeared. The notion of limited liability of a debtor was initially introduced for the corporate insolvency. Subsequently, a part of principles used for individual bankruptcy was transferred to the legislation on corporate insolvency and the notion of insolvency became to be used for all economic agents rather than those connected with trade. Such fusion of the terms took place in England and the USA in the middle of the XVIII century and in continental Europe – a little earlier.

The insolvency laws appeared in the XIII and XVI centuries in most European countries. In Russia, similar laws began to appear in the XVIII century. They have been developing on the basis of European laws up to 1917 when the radical change took place. The institution of bankruptcy was not applicable due to the planned economy so the notion was excluded from the laws.

Summarizing how the bankruptcy (insolvency) laws develop during the period from medieval ages up today, we can conclude that most laws tended to pass from punitive to rehabilitation practices[7]. The consequence was complication of procedures and extended period of the bankruptcy procedure. In particular, it was caused by increasing number of economic agents connected with the insolvency of a specific company. When a company is under bankruptcy process, the interests of bankrupt employees, consumers, suppliers and state are involved in addition to those of creditors and debtor. It is obvious that it is impossible to achieve informal arrangement between all participants due to extreme spread of interests. So applying informal procedure often caused excluding a number of interested agents and

[3] The term «bankrupt» comes from Italian «banca rotta». The term came from medieval custom to break bench of insolvent banker or merchant (Baird & Jackson, 1985, p. 21.).

«Banca» means board or bench which was used by merchants to seat and sell goods or to exchange money in medieval towns. «Rotta» means to break, crash, ruin. «Banca rotta» literally means broken shop of the merchant after his hiding or broken crown of the bankrupt under the medieval English tradition». NIOKR Collection. Subject code 8.06.1.2004.

[4] So called problem of common property. The first laws on bankruptcy were not designed to solve the problem of common property. Each creditor had the right to recover debt from the debtor's property but if there were a lot of creditors and the debtor had no sufficient property to satisfy all of them, creditors were inclined to maximize their benefits to the detriment of other creditors. Each creditor tried to recover the full amount of the debt as soon as possible. Thus, the last creditors run chances to go empty-handed.

[5] The trade included merchants, bankers, trade agents and insurers.

[6] MERT materials, NIOKR Collection, Subject code 8.06.1. 2004.

[7] It was also noted by [Finch V., 2001, p. 14].

infringing their interests. In our opinion, comparable attractiveness of formal and informal procedures was preconditioned by associated expenses. The government plays a key role here as it presets the formal limits. If a bankruptcy law is extremely expensive to be applied, companies would prefer to use other methods.

This thesis emphasizes comparison of two approaches to solving the insolvency problem, namely private and judicial compulsion. These strategies generally imply that parties are primarily interested in recovering debts rather than retaining any partnership relations. The application conditions of the strategies largely overlap: low confidence of partners, need to rely on a third party to settle the conflict, insufficient role of partners' reputation. The ability of the government to influence the choice of creditors (private or judicial compulsion) is considered.

Institute of bankruptcy

This work uses the bankruptcy notion to describe the possible ways (both formal and informal) to solve the insolvency problem. However, a main role is assigned to the bankruptcy laws as a basic body of rules determining incentives for the parties trying to solve the appropriate problems.

The *institute of bankruptcy* consists of the body of rules (both formal and informal) which regulate relations between economic agents in respect of insolvency, mechanisms of enforcement and of a set of possible interpretations of such rules providing for the manner of their further application[8].

All rules may be divided into three groups. First, the rules, which appear in the course of bilateral relations between economic agents, and which are divided only by the parties entering into the business relations under review. Second, the alternative rules developed for a specific community, for example, for various associations (it is assumed that the community includes more than two companies). Third, the bankruptcy laws and associated acts of law regulating relations in respect of insolvency.

It is impossible that all persons could observe the rules in every period of time without compulsion. There is a definite set of possible mechanisms of compulsion for each group under review. In case of bilateral relations, any conflict is to be considered in the course of negotiations of the parties and the main sanction is a possible cease of the relations. In the second case, when it comes to the community, the fundamental distinction from bilateral relations is an independent arbiter (relative to participants of transaction), namely, a formal or informal group including the participants. Any conflict in the case is to be settled by negotiations and the participants resort to the third party controlling the negotiations. Finally, the last group of

[8] See for details Podkolzina, 2006.

rules is a bankruptcy law and associated acts of law. The compulsion mechanisms and agents executing such compulsion are legislated.

On what do the parties trying to choose the mechanism for settlement of insolvency problem prefer to bottom and why do the parties not always resort to the bankruptcy law and even they resort, their behavior in not always that expected by the law creators?

Let us start from the last question. In addition to the compulsion mechanisms required to execute the rules, it is necessary to understand their underlying meaning. As a rule, the economic agents interpret the same rule, law or standard differently. It may be explained by different interpretations. The difference in interpretation is caused by three factors: cognitive, strategic and information. Any decision made by the economic agent is based on the available information so the characteristics of such information are extremely important. It is necessary to note primarily an maldistribution of information between economic agents. If we refer sociological studies in corporate awareness of existing legislative provisions, we can note that, in 90s, not all companies knew of the bankruptcy laws that came into effect. And not all persons, who knew of such laws, read them. The other aspect connected with the uneven distribution of information is that alternative rules applicable to settlement of conflicts were known to acting participants of the associations and were not known to exterior economic agents. So the information, which agents uses to make their decisions, was generally incomplete and asymmetrically distributed. The second aspect (cognitive) is connected with individuals, who use different mental models to analyze information and make their decisions, and the fact should not be left out the account. So the decisions made by an individual (manager or owner) are influenced by the cultural norms, customs and notions of behavior of other participants he spare. As a rule, the mental models are inert and insensitive to exterior influence. Thus, a mental model spared by most members of a society can considerably influence any perception of laws. The last fundamental reason of difference in interpretations is strategy. As a rule, all economic agents try to maximize their utility function rather than that of the society so they treat existing rules in their favor. They try to use existing discrepancies in the laws to increase own benefits affecting other members of the society. For example, using informal mechanisms may be illegal and provide for excluding some interested persons during the process of decision-making.

Thus, we can conclude that the economic agents use available information and decide between existing rules in the most beneficial for them way. Several groups of rules and the difference in interpretations enable us to explain the difference between the theory and practice of application, and the bankruptcy laws are not exemption to the rule.

The state (government) preferring some mechanisms to other ones when applied plays a key role. The state (government) provides the coverage of the problem un-

der review by the laws and ensures execution of the rules provided by the laws. The rules provided by the laws determine the transaction expenses associated with their application by the parties involved in the problem. The more the rules proposed by the government agree with the interests of economic agents facing the problem of insolvency, the higher probability that they will resort to the formal procedures of solution. The expenses associated with following the rules also influence the choice of the rules made by economic agents. The higher such expenses, the less attractive rule is for the agents.

Description of corporate behavior strategies applicable to insolvency

Let us give a short description of the principal strategies used to compel fulfilling contractual obligations and stress the strategies providing for private or judicial compulsion. Our analysis of corporate behavior is based on the work of K. Hendley, P. Murrel and R.Ryterman[9], who, in our opinion, described the most comprehensive range of possible strategies. The strategies considered successively from informal to formal ones are the following:

- relation contraction;
- network (or group) compulsion[10];
- private compulsion;
- administrative levers;
- operation of law.

Private compulsion

To solve arising problems, parties usually appeal to a third party (non-governmental) which does not have any business relations with parties and it not connected with the subject of the transactions under review. The basic idea is that the parties make preliminary arrangement that, in case of any conflict, they will appeal to an independent arbiter who must make a decision and settle the conflict. Both companies undertake to obey the decision although it may have no legal effect. The arbitration generally plays its role in the developed countries. Private structures prevail in transitional economies and their activities are based on a threat of violence[11]. It means that organized criminal groups/gangs or so called «mafia» or «roof» act

[9] Handley K., Murrell P., Ryterman R., 1999; Hendley K., 1999.

[10] Menard C, 2004; Thorelli H.B., 1986; Podolny J. and Page K., 1998.

[11] It is important to note that the private structures should not be included in the companies and should not be a one party of the transaction otherwise it should be considered as a case of relation contraction.

as a private compulsion mechanisms. The mechanism may operate in two ways. First, all companies know that their contracting party has so-called «roof» which may apply force in case of any conflict to ensure fulfillment of obligations (i.e. the threat of violence operates). The other way is that suffering party appeals to the «roof» to force the contracting party to fulfill its obligations. The principal idea is that a party fears a possible violence caused by its failure to fulfill obligations. Considering the behavior strategy, it is necessary to emphasize two aspects. First, the payment for the «services» rendered by the «roof», i.e. the amount of transaction expenses associated with enforcement of obligations. Second, the expenses associated with protection from a third party becomes the most actual. In particular, it is widely accepted practice in Russia when the «roof» imposes its services and once a company appeals to the «roof», it pays for the services on a continuous basis although it does not need it. Vareze (2005) notes that relations with enforcing partner are generally long-term ones[12]. Summarizing the data on the strategy based on private mechanisms of enforcement, we can describe it as follows: a company tries to get fulfilled a lawfully made contract by unlawful methods (for example, tries to get an arbitration decision). It is obvious that that such attempt takes place in case a state enforcement procedure is not available or extremely expensive. The strategy is applied in case of insufficient confidence both in trade partner and the state judicial system.

According to the studies conducted in Russia in 1996 and 1997[13], 11 percent of enterprises were ready to use private compulsion and 42 percent had such experience. 53 percent of respondents said that the expenses of such services are rather high. Volkov (2002) explains so high demand for the private services by general weakness of judicial enforcement procedures and notes that, according to the interviews conducted by him, many businessmen, who appealed to entrepreneurs using force, obtained a court decision to be enforced.

Vareze provides a rather detailed study in the mafia activities in Russia (2005). The work is based on the periodical press data and some profound interviews taken by the author in Perm Region. The study evidences that a rather high demand for such services takes place in Russia. One of the services rendered by organized crime groups is a debt recovery[14]. Numerous organized criminal groups frequently coming into collision are typical for the Russian economy. It frequently happens that the companies that try to settle a conflict have different enforcing partners. We cannot however conclude that there are general rules applicable to settling conflicts of two groups as at Sicily[15].

[12] Vareze, 2005, p. 15.

[13] Radaev, 1998, p. 129, 174, 185.

[14] Vareze, 2005, p. 113.

[15] Ibid, p. 120.

Legislation area

The law may operate in two ways. First, it is use of the laws as a threat. The enforcement mechanisms provided by the government such as trial are used as a threat for contracting company failing to fulfill its obligations. The company should enter into the contract that may be used as the basis for reference to the court in case of failure to fulfill it or, to put it more precisely, as a basis for a threat to go to court in case of failure to meet terms and conditions, to pay penalty for delayed supply etc. As a rule, companies list definite negative consequences of such failure to fulfill obligations in time to be able to threat by arbitration for any failure to pay penalty. Any threat of court is connected with minor expenses than direct reference to the court; but both companies must be sure that the threat is relevant, otherwise it will not have a proper effect[16]. The companies should have a personal confidence or an ability to rely on reputation of each other to apply the strategy.

Second, it is a court intervention. As a rule, a company chooses the strategy if it does not confident in its contracting party and does not have any information on its reputation or the contracting party has a bad reputation. Companies are ready to rely on the decision made by the court and cannot achieve consensus in other way. Under the circumstances, it is also important to made a contract as any trial may be based on the contractual provisions. Furthermore, the strategy is connected with high transaction expenses directly associated with the trial. They are explicit costs (for example, lawyer commission) and time expenses. The amount of such transaction expenses is determined in many respects by existing legal system of the country and its effectiveness. The problems caused by the contracting party, which refuses to fulfill the court decision, may arise in the case. So the companies relying on the mechanism should believe in efficiency of state mechanisms of compulsion.

An integral publicity of the trial is one of possible minuses of judicial way. It is almost impossible to go to the court and to avoid publicity. On the one hand, it may cause inevitable bankruptcy of the company which could recover solvency without any disclosure of the data evidencing its financial difficulties. On the other hand, the publicity stimulates companies to fulfill their undertakings bona fide and increases efficiency of the first component of the strategy (threat to go to the court).

Lambert-Mogiliansky, Sonin and Zhuravskaya (2000)[17] demonstrated that application of the bankruptcy law successfully operating in the countries where the laws are observed may cause unpredictable consequences in a corrupt economy. The article considers the Russian economy in which arbitrations are subject to influence of regional administrations and managers of the large regional enterprises

[16] Therefore the company threatening to go to the court will do so if its demands are not met. Thus we turn to the second scenario.

[17] Lambert-Mogiliansky, Sonin and Zhuravskaya, 2000.

and analyzes operation of Russian law of 1998 *On Bankruptcy*. The authors built up a theoretical model of the relations involving managers, creditors, government and external investors[18]. According to the model, it is conduces to a collusion of the state and manager if the court is subjected to governmental influence. The data on the Russian economy collected by the authors confirm the conclusions: managers of large enterprises collude with regional administration and use bankruptcy to eliminate intervention of the national government and external investors in corporate management and that Russian law of 1998 *On Bankruptcy* does not stimulate the managers to made restructuring. It evidences a wide application of administrative levers in the course of trials. The researches show that the Russian companies not always believe in judicial settlement of conflicts[19].

As a rule, the parties try to foresee several ways of conflict settling. However, it is not always possible to rely on several strategies simultaneously. Table below summarizes the observations on possibility of consistent and joint corporate application of the strategies.

The strategies of private and legislative enforcement are of a special interest for our contrastive analysis. Thus, both strategies provide that the transaction parties have a low confidence in each other, they cannot us their reputation mechanism to compel each other to fulfill obligations and have a high confidence in a third party. It means that the strategies coincide in many respects (by parameters, characteristics, conditions they intend to lay down). What does determine the decision between judicial and private compulsion mechanisms and what the government needs to do to shift the choice in favor of judicial settlement of conflicts?

Table. Successive application of strategies

Sequent application of strategies			
1	**2**	**3**	**4**
Relation contraction	Network enforcement	Administrative levers	Private enforcement
		Legislation area	
Network enforcement	Administrative levers	Private enforcement	
	Legislation area		
Administrative levers	Private enforcement		
	Legislation area		
Private enforcement			
Legislation area			

[18] The authors call the creditor in respect of which a company has the largest debt an external creditor.

[19] Simachev Y., 2003, Radygin A., and Simachev Y., 2005.

Choice of creditors: mafia against law. Evolution model

An evolutional interaction of creditors sharing assets of their debtor enables us to describe the influence exerting by «the society» on any choice of the strategy. The main questions we should answer on the basis of built model are the following: What equilibriums are possible? Are they steady? What can influence transfer of one equilibrium into another?

Background

Each creditor may use two strategies:
– services of private structures («roof», mafia, shadow arbitration);
– initiated judicial procedure of bankruptcy.

It is assumed that any interaction between creditors is anonymous, creditors are identical and aware of what strategies were chosen in the course of previous interactions.

The debtor's assets are sufficient to satisfy only one creditor. Each creditor claims for recovery from the debtor's assets to the amount D, which includes the principal and accrued interest.

The interaction of two creditors may be described as the following game matrix:

		Creditor 2	
		Private enforcement	Initiated procedure of bankruptcy
Creditor 1	Private enforcement	$\alpha P_m D\delta^{t_m} - C_m/(1-\delta)$; $(1-\alpha)P_m D\delta^{t_m} - C_m/(1-\delta)$	$P_m D\delta^{t_m} - C_m/(1-\delta)$; $-C_l$
	Initiated procedure of bankruptcy	$-C_l$; $P_m D\delta^{t_m} - C_m/(1-\delta)$	$\beta P_l D\delta^{t_l} - C_l$; $(1-\beta)P_l D\delta^{t_l} - C_l$

Where,

α and $\hat{\beta}$ are the funds falling to creditor's 1 share. Thus, α and β define the manner of debt distribution between creditors.

The parameters reflect the ability of creditors to influence the decisions to be made, i.e. they describe their negotiation position. It may differ due to different po-

tentials of enforcing partners. It causes the situation when one partner receives more than other one. If we speak about the legislation area, we should note the model involving administrative lever described above. The person, who is connected with more powerful persons, has more powerful negotiation position.

P_n is a probability that the debt will be repaid in case of private compulsion.

P_l is a probability that the debt will be repaid in case of initiated procedure of bankruptcy.

The probabilities depend on institutional structure of a country (the compulsion system that in particular determines the existing private groups/gangs), features of the bankruptcy law and accompanying legislation, private compulsion mechanism (power of the group/gang, its ties and size). The government determines the institutional structure by creating the rules of play and rules observation enforcement mechanisms and thus it can influence probability of debt repayment. We shall talk about it later.

t_m is a period after expiration of which creditors can recover the debt in case of private compulsion (the period required to conduct the procedure and execute the decision).

is a period after expiration of which creditors can recover the debt in case of initiated legal procedure of bankruptcy (the period required to conduct the procedure and execute the decision).

Let us assume that $t_m < t_l$ following empirical studies. An opportunity to get a quick solution of a problem is quite a thing that attracts creditors and debtors choosing powerful partner to solve their problem in practice. So if one of creditors chooses private compulsion and another one initiates judicial procedure of bankruptcy, the latter creditor has nothing.

C_m is the expenses of private compulsion.

C_l is the expenses of judicial procedure of bankruptcy.

At that $C_m < C_l$. It is assumed that creditor pays once at the beginning of the formal procedure and the private compulsion shall be paid continuously to be able to use it. As the studies show, a company, which resorted to the private mechanism, was lately obliged to make regular payment in favor of a third party. It is analogous to payment of taxes.

Let us consider several models of interaction:
– relations of creditors can be described by symmetric game matrix;
– relations of creditors can be described by asymmetric game matrix;
– one of creditors has more powerful position reflected by ratio of α and β.

Symmetric game

Let us start from building a symmetric case model ($\alpha = \beta = 1/2$). It reflects the essence of relations maintained by minor and medium businesses. It is the case

when minor banks or companies act as creditors. The game matrix shall be the following:

		Creditor 2	
		Private compulsion (p)	Initiated procedures of bankruptcy ($1-p$)
Creditor 1	Private compulsion (p)	$\frac{1}{2}P_m D\delta^{t_m} - \frac{C_m}{1-\delta}$; $\frac{1}{2}P_m D\delta^{t_m} - \frac{C_m}{1-\delta}$	$P_m D\delta^{t_m} - \frac{C_m}{1-\delta}$; $-C_l$
	Initiated procedures of bankruptcy ($1-p$)	$-C_l$; $P_m D\delta^{t_m} - \frac{C_m}{1-\delta}$	$\frac{1}{2}P_l D\delta^{t_l} - C_l$; $\frac{1}{2}P_l D\delta^{t_l} - C_l$

To simplify our calculations, let us introduce the following designations: $P_m D\delta^{t_m} = M$ and $P_l D\delta^{t_l} = L$. Let us find all possible equilibriums (Appendix 1 provides for search of equilibriums and stability analysis of drawn equilibriums). We draw that the following strategies will be equilibrium:

- $p = 0$
- $p = 1$
- $p = \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)}$.

Equilibriums <0,0> and <1,1> will be steady, provided that $\begin{cases} P_l > P_m \\ \delta^{t_m} > \delta^{t_l} \end{cases}$. Equilibrium $< \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)}, \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)} >$ will be unsteady provided the same restrictions.

Thus, if the possibility to recover a debt is higher for the case of judicial solution, there are three equilibriums in the game under review, of which the equilibriums providing that both creditors simultaneously choose either strategy of private compulsion or that of initiated procedure of bankruptcy will be steady.

The equilibrium to which players will came shall be determined subject to what side of probability the decline from unsteady equilibrium takes place $< \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)}, \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)} >$. Fore example, if p value is higher than steady-state one as a result of deviation, the equilibrium in which both creditors will prefer to use private compulsion to recover debts will be established. If p value is less than steady-state one, the equilibrium in which both creditors will prefer law to solve the problem will be established.

Asymmetric game

Unlike symmetric case when creditors were absolutely identical, an asymmetric game provides for different types of creditors. The type difference may be caused by location of creditors (one creditor acts in one region and another acts in other one) influencing their behavior. For example, reference to the court is more popular in one region than in another and thus creditors will have different preferences in choice of the strategies. In addition to regional differences, we can also consider the differences connected with specific models of conflict settlement in various countries, i.e. relations of minor and medium domestic and foreign creditors can be described by the game. The differences may also be caused by difference types of institutional creditors (one creditor is a bank, and another is a trading company). It preconditions their choice of different strategies.

Let us consider the interaction in general:

		Creditor 2	
		Private compulsion (q)	Initiated procedures of bankruptcy ($1-q$)
Creditor 1	Private compulsion (p)	$\alpha P_m D\delta^{t_m} - \frac{C_m}{1-\delta}$; $(1-\alpha)P_m D\delta^{t_m} - \frac{C_m}{1-\delta}$	$P_m D\delta^{t_m} - C_m/(1-\delta)$; $-C_l$
	Initiated procedures of bankruptcy ($1-p$)	$-C_l$; $P_m D\delta^{t_m} - C_m/(1-\delta)$	$\beta P_l D\delta^{t_l} - C_l$; $(1-\beta)P_l D\delta^{t_l} - C_l$

To simplify our calculations, let us introduce the following designations: $P_m D\delta^{t_m} = M$ and $P_l D\delta^{t_l} = L$. We can establish 5 equilibriums for given game:

$$< p,q >= \begin{cases} < 0,0 > \\ < 1,1 > \\ < \dfrac{(1-\beta)L - M - C_l + \dfrac{C_m}{1-\delta}}{(1-\alpha)M - M + (1-\beta)L}, \dfrac{\beta L - M - C_l + \dfrac{C_m}{1-\delta}}{\alpha M - M + \beta L} > \\ < 0,1 > \\ < 1,0 > \end{cases}.$$

Only the equilibrium in combined strategies regardless of relation of parameters will be a saddle point as relevant derivatives are equal to zero for it.

Equilibriums <0,0> и <1,1> will be simultaneously steady provided that $M - L < 0$ и $\delta^{t_m} > \delta^{t_l}$, and equilibriums <1,0> и <0,1> will always be unsteady at given relation of parameters. Also, it is necessary to note that the following restrictions shall be observed: $0 < -C_l + \dfrac{C_m}{1-\delta} < \dfrac{M}{2}$.

Thus, if expenses of private compulsion exceed legal ones but less half as expensive than the amount of debt recovered by using private compulsion, five equilibriums should be established in the game and the equilibrium providing that both creditors chose private compulsion will always be steady.

Let us see how differences of negotiation positions described by parameters α and β influence on establishing equilibriums and their stability.

Equal negotiation positions

Similarly to a symmetric game, let us assume that $\alpha = \beta = 1/2$. The case describes interaction of minor and medium creditors. All four equilibriums in pure strategies are retained and the equilibrium in combined strategies becomes: $< \dfrac{\frac{1}{2}L - M - C_l + \frac{C_m}{1-\delta}}{-\frac{1}{2}M + \frac{1}{2}L}, \dfrac{\frac{1}{2}L - M - C_l + \frac{C_m}{1-\delta}}{-\frac{1}{2}M + \frac{1}{2}L} >$. Thus, it coincides with equilibrium in combined strategies in case of symmetric game and will be unsteady equilibrium at all values of the parameters as the parameters determining the negotiation positions do not influence on stability of equilibriums.

Different negotiation positions

Parameters α and β reflect the differences in negotiation positions of creditors. The differences in parameter α may be explained by various powerful partners which have different powers and, correspondingly, one of creditors may come into possession of major part of the debt than other ones. The more powerful partner the more will fall into the creditor's share as a result of the problem solution by private compulsion.

The differences in parameter β may be explained by administrative levers of the parties. If one creditor has administrative levers and another does not have them, the negotiation position of the first creditor will be more powerful and it will be able to have a greater share of the debt. The differences in parameter β may also be caused by greater experience of one creditor in trials, his/its more experienced lawyers, obtaining private information unavailable for other creditor.

Let us analyze how the differences in negotiation positions influence choice of optimal strategy by creditor.

Let us consider $\alpha = \beta \neq \frac{1}{2}$, i.e. coincidence of negotiation positions at legislative and private compulsion. One of creditors a priori has more opportunities to influence decisions than another one. All four equilibriums in pure strategies are retained and the equilibrium in combined strategies becomes:

$$< p,q >=< \frac{M - (1-\alpha)L + C_l - \frac{C_m}{1-\delta}}{\alpha M - (1-\alpha)L}, \frac{M - \alpha L + C_l - \frac{C_m}{1-\delta}}{(1-\alpha)M - \alpha L} > .$$

We can note two terminal cases $\alpha = \beta = 1$, $\alpha = \beta = 0$. The matrix will become the following for $\alpha = \beta = 1$:

$\alpha = \beta = 1$		**Creditor 2**	
		Private compulsion (q)	Initiated procedures of bankruptcy ($1-q$)
Creditor 1	Private compulsion (p)	$P_m D\delta^{t_m} - \frac{C_m}{1-\delta}$; $-\frac{C_m}{1-\delta}$	$P_m D\delta^{t_m} - C_m/1-\delta$; $-C_l$
	Initiated procedures of bankruptcy ($1-p$)	$-C_l$; $P_m D\delta^{t_m} - C_m/1-\delta$	$P_l D\delta^{t_l} - C_l$; $-C_l$

In case when $\alpha = \beta = 1$, the following equilibriums will be established:

$$\begin{cases} \dfrac{dp}{dt} = p(1-p)\left[q(L) + M - L + C_l - \dfrac{C_m}{1-\delta}\right] = 0 \\ \dfrac{dq}{dt} = q(1-q)\left[p(-M) + M + C_l - \dfrac{C_m}{1-\delta}\right] = 0 \end{cases} \Rightarrow$$

$$\Rightarrow < p, q >= \begin{cases} < 0,0 > \\ < 1,1 > \\ < \dfrac{M + C_l - \dfrac{C_m}{1-\delta}}{M}, \dfrac{L - M - C_l + \dfrac{C_m}{1-\delta}}{L} > \\ < 0,1 > \\ < 1,0 > \end{cases}$$

It is necessary to note that any change in parameters in this case will have antipodal influence on behavior of creditors. If, other things being equal, the amount of debt to be recovered increases after choosing private compulsion or the trial expenses increase, the possibility that private compulsion strategy will be chosen by the first creditor will increase and the possibility that private compulsion strategy will be chosen by the second creditor will decrease.

The distribution of forces will considerably complicate state of affairs for the government planning to increase attractiveness of the bankruptcy procedure initiation for creditors.

Two other terminal cases provide that negotiation positions of creditors vary depending on applied mechanisms. Let as assume that one has powerful force partner and another has ties enabling him/it to settle the case in his/its favor.

$\alpha = 0, \beta = 1$		**Creditor 2**	
		Private compulsion (q)	Initiated procedures of bankruptcy ($1 - q$)
Creditor 1	Private compulsion (p)	$-\dfrac{C_m}{1-\delta}$; $P_m D\delta^{t_m} - \dfrac{C_m}{1-\delta}$ *	$P_m D\delta^{t_m} - C_m/1-\delta$; $-C_l$
	Initiated procedures of bankruptcy ($1 - p$)	$-C_l$;* $P_m D\delta^{t_m} - C_m/1-\delta$ *	$P_l D\delta^{t_l} - C_l$; $-C_l$

We find here that equilibriums in combined strategies will not exist. Equilibriums are possible only on pure strategies:

$$\begin{cases} \dfrac{dp}{dt} = p(1-p)\left[q(-M+L) + M - L + C_l - \dfrac{C_m}{1-\delta}\right] = 0 \\ \dfrac{dq}{dt} = q(1-q)\left[M + C_l - \dfrac{C_m}{1-\delta}\right] = 0 \end{cases} \Rightarrow < p, q >= \begin{cases} < 0,0 > \\ < 1,1 > \\ < 0,1 > \\ < 1,0 > \end{cases}$$

Similar conclusions are made for $\alpha = \beta = 0$ and $\alpha = 1, \beta = 0$.

Influence of government on establishing equilibrium

Creditors' profits may be determined by a series of parameters which they cannot directly influence[20] but characteristics of a third party (mafia, «roof» or government) may influence them. We assume that the government is responsible for forming legislation in the country so we consider provisions of the bankruptcy law as a component of governmental policies.

The government can influence discount factor by changing its policies. What is the purpose of the reforms, is the battle against corruption fight, how do the foreign partners perceive Russia, etc. All factors influence expectations of economic agents. Conditionally we can say that the discount factor is a possibility of economic agent existing in the next period so the value of the discount factor influences behavior of economic agents and their choice of strategy. For example, if and agent considers that chances of his/its company to conduct activities in future are low, the strategy of private compulsion will be more attractive to him/it as it implies faster solving the problem.

Other three parameters, which may be influenced by the government are determined in many respects by a design of bankruptcy laws (we mean duration of the procedure, possibility of debt recovery and expenses associated with the procedure).

Increasing expenses of judicial procedure of bankruptcy cause more frequent resort to the private compulsion strategy. Increasing discounting factor and increasing confidence of individuals in the future as well as growing possibility of debt recovery and contracting terms of judicial procedure decrease resorting to the private structures.

To form any policy, it is necessary to consider what balance the system experiences currently. In particular, if a steady equilibrium exists and all creditors choose private mechanisms of compulsion, it will be impossible to withdraw the system

[20] Creditors may determine how much they are ready to lend but the parameter in our model does not affect establishing equilibrium.

by change of any parameter. It is necessary to think through detailed package for a long-term period.

Reforms of bankruptcy laws in Russia: judges against thieves

Modern history of Russian bankruptcy law descends from the bankruptcy law of 1992 which was valid up to 1998. At the very beginning of the transition period (in November of 1992) the law *On Insolvency (Bankruptcy) of Enterprises* was adopted and came into effect in March 1993. The practice revealed its defects so a new bankruptcy law was developed, adopted in January 1998 and came in force in March of the same year. Currently the amendments and alterations to the law of 1998 are being developed. Amended law was adopted in 2002. However, the law is still a subject of numerous disputes. Let us consider the laws operating in 90s and a new law to be constituted in more details.

The bankruptcy law of 1992 did not make a bankruptcy a series threat for top managers of most Russian enterprises and did not ensure the rights of external creditors. The definition of insolvency used in the law of 1992 defaced functions of the institution of bankruptcy. According to the law of 1992 «the insolvency meant inability of the debtor to satisfy claims of his/its creditors by paying goods (work, services) including his/its inability to ensure mandatory payments to the budget and off-budget funds due to excess of the debtor's obligations over his/its property or in connection with unsatisfactory structure of the debtor's balance sheet»[21]. The definition implied that the companies unable to pay goods and services may exist and thus limited application of bankruptcy to the companies, enterprises and organization. The law established a complicated procedure of initiation, conduction and making final decision on bankruptcy. According to the law of 1992, the amount of overdue debt shall exceed the total balance sheet of the company assets was a condition to be met to start the bankruptcy procedure. As management of the companies had an opportunity to manipulate the data on total balance sheet value of the company assets (for example, by issue of debentures without real value but with high nominal values for their own company, the condition eliminated real threat of bankruptcy.

According to the statistics, the status of bankruptcies in Russia[22] for the period from 1992 to beginning of 1998, was the following: the number of bankruptcy cases was insufficient but, in the course of time, it grows. According to the data on end of

[21] Comments to Federal Law *On Insolvency (Bankruptcy)*, p. 7.

[22] The statement is based on the statistics of site www.budgetrf.ru provided in Overviews of Russian Economy from II quarter of 1996 to I quarter of 2000.

August of 1997, over 80 percent of all failures to pay were debts with three months exempt period after which creditors were entitled to lay a claim for bankruptcy. But the cases of initiation of proceedings were extremely rare.

Let us consider the most essential changes in the legislation which took place after adoption of the bankruptcy law of 1998. The criteria for definition of an enterprise insolvency were changed. According to the new law, a bankruptcy procedure may be initiated against any enterprise which has liabilities overdue over three months. It disables managers to manipulate the company value and avoid or otherwise initiate the bankruptcy procedure. It is necessary to note that initiation of the procedure was simplified, in particular, the bankruptcy procedures for the debtor which is under liquidation or absent were simplified. The changes were very actual for Russia due to the nature of its economy. Another important aspect of the bankruptcy law of 1998 is the priority given to claims of the debtor employees for compensation for health injuries, dismissal pays, and salaries/wages over the claims of creditors for the liabilities secured by a pledge. Let us refer to the statistics of the law application. The number of bankruptcy cases increased dramatically after adoption of the new law on insolvency in 1998. The increasing tendency took place up to constitution of the third bankruptcy law.

Thus the bankruptcy law of 1998 became more applicable in practice but not necessarily for proper purposes so a new draft law was made.

The principal changes were applied to arbitration managers. The requirements for candidates were made tougher, the duties of arbitration managers were established, the insurance of their duties was introduced, the procedure of manager appointment was changed. The law provides for creation of self-regulating organizations with mandatory membership for arbitration managers. The law provides that the debtor is an equal member of any bankruptcy process able to participate in any meeting of creditors without right to vote, appeal actions of arbitration managers, object to creditors' claims. Summarizing above said, we can note that the law strengthens the position of debtors, extends governmental control and increases expenses associated with initiation of a bankruptcy procedure.

Thus, we can conclude that, in the model terms, the feature of the laws of 1992 and 2002 is a high expense of judicial procedure of bankruptcy making the private compulsion more attractive for creditors. It is necessary to not that expenses were higher for the law of 1992 and possibility of debt recovery were extremely low and the procedure was long. So we can conclude that it is most likely that, in spite of the balance, creditors prefer to use private compulsion.

The law of 1998 was characterized by the lowest expenses of judicial procedure and shorter terms for considering bankruptcy cases. However, it was the law which widely applied administrative levers in respect of the bankruptcy cases. It is necessary to note that the balance, which took place on the date of the law introduction, provided for prevailing of private compulsion and was steady. It means that the changes

should be fundamental to enable the system to change it. In our opinion, we cannot answer the question as to whether the government succeeded in changing the existing practice by the law of 1998 unambiguously. In addition to the changes being introduced by the government, we should consider that compulsion structures also change and develop extending their abilities to recover debts.

Conclusion

In conclusion, it is necessary to say that the institution of bankruptcy plays a key role in development of any economy. The bankruptcy laws codify the basic rights of debtors and creditors forming respective incentives to economic activities. However, they are not a unique way to solve the problem of insolvency. So when we speak about the institution of bankruptcy, we imply not only the bankruptcy laws but also a full set of rules, both formal and informal, which may be used by the companies. The work provides for the model describing relations of creditors underlying the decision between informal (private compulsion) and formal rules (applicable procedure of bankruptcy).

The author tried to show that there are equilibriums in the interaction and such equilibriums provide for the choice of the creditors. Furthermore, a private compulsion is generally steady equilibrium provided lesser restrictions of the parameters compared to that providing for the creditors who prefer judicial procedure. However, the government still has an ability to influence the situation.

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Appendix 1

Let us find all possible evolutionary equilibriums $< p, p >$.
Replicator equations for both creditors are the same and are given by:

$$\frac{dp}{dt} = p(u_m - \bar{u}).$$

$$u_m = p\left(\frac{1}{2}M - \frac{C_m}{1-\delta}\right) + (1-p)\left(M - \frac{C_m}{1-\delta}\right),\ u_l = p(-C_l) + (1-p)\left(\frac{1}{2}L - C_l\right)$$

$$\bar{u} = pu_m + (1-p)u_l,$$

$$\bar{u} = p^2\left(\frac{1}{2}M - \frac{C_m}{1-\delta}\right) + p(1-p)\left(M - \frac{C_m}{1-\delta} - C_l\right) + (1-p)^2\left(\frac{1}{2}L - C_l\right)$$

So we have

$$\frac{dp}{dt} = p(u_m - \bar{u}) = p(1-p)(p\frac{1}{2}(L-M) + M - \frac{1}{2}L + C_l - \frac{C_m}{1-\delta}).$$

In equilibrium replicator's expression is equal zero: $\frac{dp}{dt} = 0$. The following strategies will be equilibrium:

– $p = 0$
– $p = 1$

– $p = \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)}$.

Let us test equilibriums for stability. By theorem an equilibrium is steady if the following condition is hold: $\left.\dfrac{dp/dt}{dp}\right|_{P^*} < 0$.

$$\frac{d\dot{p}}{dp} = (1-p)(p\frac{1}{2}(L-M) + M - \frac{1}{2}L + C_l - \frac{C_m}{1-\delta}) +$$
$$+ p(1-p)\frac{1}{2}(L-M) - p(p\frac{1}{2}(L-M) + M - \frac{1}{2}L + C_l - \frac{C_m}{1-\delta})$$

Let's examine mathematical character of this expression for all equilibriums.

If $p = 0$, $\frac{d\dot{p}}{dp} = M - \frac{1}{2}L + C_l - \frac{C_m}{1-\delta}$

If $p = 1$, $\frac{d\dot{p}}{dp} = -\frac{1}{2}(L-M) + M - \frac{1}{2}L + C_l - \frac{C_m}{1-\delta} = 1\frac{1}{2}M - L + C_l - \frac{C_m}{1-\delta}$

If $p = \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)}$,

$$\frac{d\dot{p}}{dp} = (\frac{1}{2}L - M - C_l + \frac{C_m}{1-\delta})(\frac{1}{2}M + C_l - \frac{C_m}{1-\delta})$$

Let analyze characteristics of parameters to make obtained equilibriums steady. Here it is a condition of existence of equilibrium in mixed strategies:

$0 < \dfrac{\frac{1}{2}L - M - C_l + C_m/(1-\delta)}{\frac{1}{2}(L-M)} < 1$. Due to our assumptions we also have $\delta^{t_m} > \delta^{t_l}$.

The equilibrium <0, 0> will be steady, if

$$\begin{cases} \delta^{t_m} > \delta^{t_l} \\ 0 < \dfrac{1/2\, L - M - C_l + C_m/(1-\delta)}{1/2\,(L-M)} < 1 \\ M - \dfrac{1}{2}L - C_l + \dfrac{C_m}{1-\delta} < 0 \end{cases} \Rightarrow$$

$$\Rightarrow \begin{cases} \delta^{t_m} > \delta^{t_l} \\ L > M \\ -\dfrac{1}{2}M - C_l + \dfrac{C_m}{1-\delta} < 0 \\ M - \dfrac{1}{2}L - C_l + \dfrac{C_m}{1-\delta} < 0 \end{cases} \Rightarrow \begin{cases} P_l > P_m \\ \delta^{t_m} > \delta^{t_l} \end{cases}$$

Let look, whether the rest equilibriums are steady. We got that the equilibrium <1,1> will be steady too, and the equilibrium

$$< \frac{1/2\, L - M - C_l + C_m/(1-\delta)}{1/2\,(L-M)}, \frac{1/2\, L - M - C_l + C_m/(1-\delta)}{1/2\,(L-M)} >$$ will be unsteady.

Appendix 2

Let us find all possible evolutionary equilibriums $< p, q >$.

Replicator equations for 1st creditor is given by $\frac{dp}{dt} = p(u_m - \bar{u})$, for 2d creditor $-\frac{dq}{dt} = q(u_m - \bar{u})$.

$$u_m = q\left(\alpha M - \frac{C_m}{1-\delta}\right) + (1-q)\left(M - \frac{C_m}{1-\delta}\right),\ u_l = q(-C_l) + (1-q)\left(\beta L - C_l\right)$$

$$\bar{u} = p\left[q\left(\alpha M - \frac{C_m}{1-\delta}\right) + (1-q)\left(M - \frac{C_m}{1-\delta}\right)\right] +$$

$$+(1-p)\left[q(-C_l) + (1-q)(\beta L - C_l)\right]$$

$$u_m = p\left((1-\alpha)M - \frac{C_m}{1-\delta}\right) + (1-p)\left(M - \frac{C_m}{1-\delta}\right),$$

$$u_l = p(-C_l) + (1-p)\left((1-\beta)L - C_l\right)$$

$$\bar{u} = q\left[p\left((1-\alpha)M - \frac{C_m}{1-\delta}\right) + (1-p)\left(M - \frac{C_m}{1-\delta}\right)\right] +$$

$$+(1-q)\left[p(-C_l) + (1-p)\left((1-\beta)L - C_l\right)\right]$$

Inserting obtained expressions we get

$$\frac{dp}{dt} = p(1-p)\left[q(\alpha M - M + \beta L) + M - \beta L + C_l - \frac{C_m}{1-\delta}\right]$$

$$\frac{dq}{dt} = q(1-q)\left[p((1-\alpha)M - M + (1-\beta)L) + M - (1-\beta)L + C_l - \frac{C_m}{1-\delta}\right]$$

In equilibrium replicator's expressions are equal zero:

$$\begin{cases} \dfrac{dp}{dt} = p(1-p)\left[q(\alpha M - M + \beta L) + M - \beta L + C_l - \dfrac{C_m}{1-\delta}\right] = 0 \\ \dfrac{dq}{dt} = q(1-q)\left[p((1-\alpha)M - M + (1-\beta)L) + M - (1-\beta)L + C_l - \dfrac{C_m}{1-\delta}\right] = 0 \end{cases} \Rightarrow$$

$$< p, q >= \begin{cases} < 0,0 > \\ < 1,1 > \\ < \dfrac{(1-\beta)L - M - C_l + \dfrac{C_m}{1-\delta}}{(1-\alpha)M - M + (1-\beta)L}, \dfrac{\beta L - M - C_l + \dfrac{C_m}{1-\delta}}{\alpha M - M + \beta L} > \\ < 0,1 > \\ < 1,0 > \end{cases}.$$

We got five equilibriums in this game. Let us test them for stability. By theorem an equilibrium is steady if the following condition is hold in equilibrium: $\begin{cases} \dfrac{d\dot{p}}{dp} < 0 \\ \dfrac{d\dot{q}}{dq} < 0 \end{cases}$.

So we have

$$\frac{d\dot{p}}{dp} = (1-p)\left[q(\alpha M - M + \beta L) + M - \beta L + C_l - \frac{C_m}{1-\delta}\right] -$$

$$-p\left[q(\alpha M - M + \beta L) + M - \beta L + C_l - \frac{C_m}{1-\delta}\right] =$$

$$= (1-2p)\left[q(\alpha M - M + \beta L) + M - \beta L + C_l - \frac{C_m}{1-\delta}\right]$$

$$\frac{d\dot{q}}{dq} = (1-2q)\left[p((1-\alpha)M - M + (1-\beta)L) + M - (1-\beta)L + C_l - \frac{C_m}{1-\delta}\right]$$

Here are becoming characteristics for each equilibrium:

$$\left.\frac{d\dot{p}}{dp}\right|_{<0,0>} = M - \beta L + C_l - \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{q}}{dq}\right|_{<0,0>} = M - (1-\beta)L + C_l - \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{q}}{dq}\right|_{<1,1>} = -(1-\alpha)M + M - (1-\beta)L - M + (1-\beta)L - C_l + \frac{C_m}{1-\delta} = (\alpha-1)M - C_l + \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{p}}{dp}\right|_{<1,1>} = -\alpha M + M - \beta L - M + \beta L - C_l + \frac{C_m}{1-\delta} = -\alpha M - C_l + \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{p}}{dp}\right|_{<0,1>} = \alpha M - M + \beta L + M - \beta L + C_l - \frac{C_m}{1-\delta} = \alpha M + C_l - \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{q}}{dq}\right|_{<0,1>} = -M + (1-\beta)L - C_l + \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{p}}{dp}\right|_{<1,0>} = -M + (1-\beta)L - C_l + \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{q}}{dq}\right|_{<1,0>} = (1-\alpha)M - M + (1-\beta)L + M - (1-\beta)L + C_l - \frac{C_m}{1-\delta} = (1-\alpha)M + C_l - \frac{C_m}{1-\delta}$$

$$\left.\frac{d\dot{q}}{dq}\right|_{<\frac{(1-\beta)L-M-C_l+\frac{C_m}{1-\delta}}{(1-\alpha)M-M+(1-\beta)L}, \frac{\beta L-M-C_l+\frac{C_m}{1-\delta}}{\alpha M-M+\beta L}>} = 0\ ,\quad \left.\frac{d\dot{p}}{dp}\right|_{<\frac{(1-\beta)L-M-C_l+\frac{C_m}{1-\delta}}{(1-\alpha)M-M+(1-\beta)L}, \frac{\beta L-M-C_l+\frac{C_m}{1-\delta}}{\alpha M-M+\beta L}>} = 0$$

Let analyze characteristics of parameters to make obtained equilibriums steady. The equilibrium in mixed strategies will be saddle point regardless of relations between parameters. The equilibrium <0, 0> will be steady, if

$$\begin{cases} M - \beta L + C_l - \dfrac{C_m}{1-\delta} < 0 \\ M - (1-\beta)L + C_l - \dfrac{C_m}{1-\delta} < 0 \end{cases} \Rightarrow \quad 2M - L + 2C_l - 2\frac{C_m}{1-\delta} < 0 \Rightarrow$$

$$\Rightarrow \quad -C_l + \frac{C_m}{1-\delta} > \frac{2M - L}{2}$$

If $M - \beta L + C_l - \dfrac{C_m}{1-\delta} < 0$, then equilibrium <1,0> will be unsteady; if $M - (1-\beta)L + C_l - \dfrac{C_m}{1-\delta} < 0$, then equilibrium <0,1> will be unsteady. So if equilibrium <0, 0> is steady, then both equilibriums <1,0> and <0,1> are unsteady.

The equilibrium <1,1> will be steady, if

$$\begin{cases} (\alpha-1)M - C_l + \dfrac{C_m}{1-\delta} < 0 \\ -\alpha M - C_l + \dfrac{C_m}{1-\delta} < 0 \end{cases} \Rightarrow \quad -M - 2C_l + \frac{2C_m}{1-\delta} < 0 \quad \Rightarrow \quad -C_l + \frac{C_m}{1-\delta} < \frac{M}{2}$$

If $(\alpha-1)M - C_l + \dfrac{C_m}{1-\delta} < 0$, then equilibrium <1,0> will be unsteady; if $-\alpha M - C_l + \dfrac{C_m}{1-\delta} < 0$, then equilibrium <0,1> will be unsteady. So if equilibrium <1,1> is steady, then both equilibriums <1,0> and <0,1> are unsteady.

Equilibriums <0,0> and <1,1> will be steady simultaneously, if the following conditions are hold

$$\begin{cases} 2M - L + 2C_l - 2\dfrac{C_m}{1-\delta} < 0 \\ -M - 2C_l + \dfrac{2C_m}{1-\delta} < 0 \end{cases} \Rightarrow \quad \begin{cases} M - L < 0 \\ \delta^{t_m} > \delta^{t_l} \end{cases} .$$

Under this conditions both equilibriums <1,0> and <0,1> are unsteady.

The following conditions should be held for the equilibrium in mixed strategies:

$$\begin{cases} 0 < \dfrac{(1-\beta)L - M - C_l + \dfrac{C_m}{1-\delta}}{(1-\alpha)M - M + (1-\beta)L} < 1 \\ 0 < \dfrac{\beta L - M - C_l + \dfrac{C_m}{1-\delta}}{\alpha M - M + \beta L} < 1 \end{cases} \Rightarrow \begin{cases} 0 < -C_l + \dfrac{C_m}{1-\delta} < (1-\alpha)M \\ 0 < -C_l + \dfrac{C_m}{1-\delta} < \alpha M \end{cases}$$

$$\Rightarrow \quad 0 < 2(-C_l + \frac{C_m}{1-\delta}) < M \quad \Rightarrow \quad 0 < -C_l + \frac{C_m}{1-\delta} < \frac{M}{2}.$$

Подколзина Е.А. Эволюция института банкротства в России: выбор кредиторами стратегии возврата долга: Препринт WP10/2007/05. — М.: ГУ ВШЭ, 2007. — 32 с. (in English).

Закон о банкротстве и соответствующая система принуждения к его исполнению определяют характер и размер сопутствующих трансакционных издержек, которые играют, по нашему мнению, ключевую роль в выборе механизма возврата долга. Мы рассматриваем два основных варианта возврата долга: путем легальных механизмов, зафиксированных в соответствующих законодательных актах, а также неформальные механизмы, разработанные непосредственными участниками взаимоотношений. Данные стратегии во многом совпадают по параметрам, характеристикам, условиям, в которых стороны склонны прибегать к ним. В работе построена модель взаимодействия кредиторов, в ходе которого осуществляется выбор между неформальными правилами (частным принуждением) и формальными правилами (существующей в стране процедурой банкротства). Показано, что всегда во взаимодействии присутствуют равновесия, в которых кредиторы будут предпочитать судебную процедуру и частное принуждение. Более того, частное принуждение, как правило, является устойчивым равновесием при более мягких ограничениях на параметры, нежели чем равновесие, в котором кредиторы предпочитают судебную процедуру. Несмотря на это, государство имеет возможности повлиять на то, какое в результате установится равновесие.

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