International Finance 8:1, 2005: pp. 57–86

Passive Creditors*

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Abstract

Creditors are often passive because they are reluctant to show bad debts on their balance sheets. We propose a simple general equilibrium model to study the externality effect of creditor passivity. The model yields rich insights in the phenomenon of creditor passivity, both in transitional and developed market economies. Policy implications are deduced. The model also explains in what respect banks differ from enterprises and what this implies for policy. Commonly observed phenomena in the banking sector, such as deposit insurance, lender of last resort facilities, government coordination to work out bad loans and special bank closure provisions are interpreted in our framework.

I. Introduction

Creditors often remain passive in the face of overdue claims. Although the problem is of a general nature,[1] it has been particularly pronounced in

*We wish to thank participants of the LICOS seminar, the SITE seminar, the Moscow Annual conference for Transition Economists, the Ghent University seminar and two anonymous referees for useful comments.

[1]Recall how hiding bad assets was crucial to the demise of several corporate empires in developed market economies. Notorious examples are Enron in the US and Parmalat in Europe, but they are only the tip of the iceberg.

transition countries. All transition countries have experienced periods of large and persistent wage and pension arrears. Tax arrears have risen and fallen again. Interenterprise arrears (that is, involuntary trade credit) have emerged in all countries concerned and are still present in some. The passivity of creditors in the face of widespread overdue claims is exemplified by the low number of bankruptcies in the region with the notable exception of Hungary (see Kornai 2001). In short, relatively little enforcement seems to have taken place in the first decade of transition. Creditor passivity was not unexpected because transition countries had to make do without several standard institutions of contract enforcement and corporate governance. Ultimately, the threat of bankruptcy is the only legal way to impose financial discipline on defaulting debtors. By 1995 most countries in the region did have commercial law and bankruptcy regulation in place (Burniaux 1995). Still, creditor passivity persisted because of continued intransparency, uncertainty and inefficiency in the enforcement of the new rules by the judiciary.[2] This has been referred to as the softness of legal constraints (e.g. Perotti 2002). Gradually, legal constraints were hardened, and the problem of creditor passivity faded, with the notable exception of the banking sector, where the problem turned out to be quite persistent. Today, the problem of overdue bank loans still looms in many transition countries. The repeated bad loan problems and subsequent bailouts of the Chinese state-owned banks are a case in point. The problem persists in state-owned or local banks as well as private and/or foreign-owned banks. The Polish subsidiary of the largest bank in Central Europe (the Belgian bank KBC), for example, has been plagued by persistent bad loan problems. On 20 November 2003, KBC announced that, in the first three quarters of 2003, it had booked 195 million euros in provisions for non-performing loans in Poland and was setting aside a further 155 million euros for the fourth quarter (*The Banker*, 3 February 2004, p. 74), eating away most of the profit of its Eastern European banking operations. Furthermore, creditor passivity in the banking sector is widely observed not only in transition countries, but also in developed market economies.

We try to capture all these features in a simple general equilibrium model of passive creditors. We show that enforcement by one agent affects the expected proceeds of enforcement by others. This could be formalized by postulating economies of scale or learning effects in the provision of public goods, such as contract enforcement by the judiciary. In our model, however, the dependence of the value of enforcement on the proportion of

[2]The recent EBRD's Legal Indicator Survey suggests that the choice of insolvency system is less important than the progress and effort put into effectively implementing a chosen system.

enforcing agents arises endogenously. This approach highlights the adverse externality effect of creditors' passivity on other creditors' incentives. Our main insight is that this externality may lock the economy in a stable, though inefficient, equilibrium (a passivity trap), characterized by low enforcement and low incentives for each individual creditor to enforce. In the passivity trap creditors remain passive because other creditors remain passive, too. Our analysis relates to the literature on soft budget constraints. Passive creditors extend soft budget constraints to their debtors. After Kornai, there are two conceptually different soft-budget-constraint models: one based on sunk investments (see Dewatripont and Maskin 1995; Berglöf and Roland 1997; Maskin and Xu 1999) and another explicitly based on creditor passivity (Mitchell 1993, 1998, 1999). In Mitchell (1998, 1999) creditors are passive exactly because they are aware of showing bad debt on their balance sheets. There is another strand of literature that focuses on collusion between economic agents to explain the build-up of arrears. Agents may collude and voluntarily extend credit to each other with the knowledge that it will not be repaid because they expect the government to offer a collective bailout if too many firms are threatened with collapse (see Perotti 1998).

After developing insights about the general equilibrium aspects of creditor passivity we concentrate on banks, which are in a league of their own. Contrary to tax arrears and interenterprise arrears, bad loans have not faded in transition countries and are present in developed market economies too. It is bank passivity that makes bad loans accumulate and spill over in a banking crisis. The incidence of bank crises and twin crises (a currency crisis combined with a bank crisis) has increased substantially since 1973 (Bordo et al. 2001). The consequences of banking crises are often severe. Kaminsky and Reinhart (1999) find that banking crises typically precede a currency crisis, while the currency crisis deepens the banking crisis, activating a vicious spiral. In our model, banks are special because they have very liquid liabilities. Taxpayers cannot withdraw paid taxes, workers cannot withdraw contributions paid to the government pension fund, neither banks nor enterprises can easily withdraw credit granted to other economic agents. Depositors, however, can very easily withdraw deposits. This pronounced liquidity of bank liabilities makes banks' creditworthiness vulnerable in the eyes of the depositors. Enforcement involves signalling the presence of bad loans on the balance sheets. Banks are aware of this and fear the reaction of depositors. If all banks announce some bad loans in their portfolios, enforcing an individual loan poses no problem. Enforcement of bad loans by only a few, however, might be interpreted by depositors as a signal of fundamental problems and trigger deposit withdrawals or ultimately a bank run. Our model does not offer a new explanation for bank runs. Rather, we

focus on how the sheer possibility of a bank panic affects banks' incentives to deal with bad loans on their balance sheets.

It is concluded that banks' innate fears of abrupt illiquidity and closure may render them more passive. To break this adverse incentive banks may need special bankruptcy regulations. Also, there may be a largely neglected role for deposit insurance. Although deposit insurance has been shown to provoke the moral hazard of banks and depositors, our findings suggest that if deposit insurance is effective in making deposits less liquid, it may also contribute to banking sector stability. In the framework of our model, deposit insurance gives banks an incentive to be active creditors and, hence, renders the build-up to a systemic crisis less likely. Further, we elaborate the model of passive banks by focusing on the effects of liquidity shocks. It turns out that a liquidity shock may not only function as a catalyst for enforcement and restructuring and pull the banking sector out of the passivity trap, but it may also reinforce creditor passivity. The outcome depends on the severity of the crisis and the presence of an effective bank closure mechanism.

The rest of this paper is organized as follows: Section II introduces a simple general equilibrium model; Section III deals with the special case of banks as creditors and the effects of liquidity constraints and liquidity shocks; and Section IV concludes.

II. Equilibrium Analysis

A. *Set-up*

There is a continuum [0, 1] of heterogeneous agents, of which a measure of γ has a bad asset (bad loan, overdue trade credit, other overdue claim) on its balance sheet. Each agent has investors that provide finance (bank debt, trade debt, tax arrears, capital, deposits) and receive a payment R per dollar of finance provided. If the agent is a bank, we have a measure of γ banks with a bad loan and a deposit liability of R. We assume that $\gamma \geq \frac{1}{2}$, which means that the number of banks with problems on their balance sheets is significant. Agent i has the opportunity to initiate an enforcement procedure to recover its overdue claims. Enforcement, however, reveals the probability that it will be able to meet its obligations $\theta_i < 1$. So, if enforcement is announced, the agent's investor expects to get $\theta_i R + (1 - \theta_i)0 = \theta_i R$ per dollar of liabilities. θ_i is a measure of the agent's efficiency in recovering bad assets or alternatively its capitalization. Let $F(\cdot)$ be the cumulative distribution function for θ_i. The distribution is common knowledge but, prior to the announcement (if any), θ_i is the bank's private information. For simplicity, we assume that an agent maximizes the amount of investors that stay with

the agent, which is equivalent to assuming that the agent receives the same premium on all of its funds (the return on assets is assumed constant). Also, we assume that agents neglect the potential effect of their own actions on the economy as a whole, that is they do not internalize external effects.

Each agent has a continuum [0, 1] of heterogeneous investors, each of which has a non-negative switching cost, distributed, from the agent's viewpoint, randomly with some cumulative distribution function $G(\cdot)$. If an agent announces overdue claims (by initiating enforcement), then investors observe the effective rate of return $\theta_i R$ (the recovery rate) on their credit. The expected return for the investor if the agent has not initiated enforcement is $R_{\mathrm{NA}}(A) = \gamma E[\theta_j | j \notin A]R + (1-\gamma)R$, where A is the set of agents that have already announced the amount of bad assets on their balance sheets, and R is the expected return from a healthy agent. (Recall that the measure of agents with no bad assets is $1-\gamma$.) An investor with a switching cost c stays with the agent if $R_{\mathrm{NA}}(A) - c < \theta_i R$, or otherwise switches to another agent. Then, given the set A, the expected value of announcement for the agent net of enforcement costs and losses due to other agents' announcements is

$$V_i(a, A) = 1 - G(R_{\mathrm{NA}}(A) - \theta_i R)$$

The indirect costs that make agents heterogeneous with respect to efficiency are reflected in the recovery rates $\theta_i R$. The value of hiding bad assets is

$$V_i(n, A) = \frac{1}{1-|A|} \int_{j \notin A} G(R_{\mathrm{NA}}(A) - \theta_j R)\, \mathrm{d}F + B$$

The last formula reflects the fact that, if the agent does not announce its balance sheet problems, it has a chance to attract some investors who switch from agents that started enforcement. We assume that investors will only switch to agents that have not announced any bad assets, which can be either healthy agents or passive agents that hide their balance sheet problems. B is the private benefit that accrues to the agents' managers if they do not have to restructure. Alternatively, B might be interpreted as the negative of the direct cost of efforts associated with enforcement.

The timing is as follows: First, agents decide whether to announce bad assets and start enforcement procedures. Second, the agents' investors decide whether to stay with the agent. Then all payoffs are realized. An *equilibrium* is characterized by a set $A \subset [0,1]$ such that for any $i \in A$, $V_i(a, A) \geq V_i(n, A)$, and $i \notin A$, $V_i(a, A) < V_i(n, A)$.

To study the effect of a monetary stabilization, we need to model the possibility that investors keep their money in an alternative technology. Let r denote the return on investors' capital in the alternative technology, say the risk-free return. In particular, a higher inflation rate corresponds to a lower

value of r. If there is no risk-free asset available, inflation may even render r negative, for example given the return of holding cash dollars under the mattress. Then the above formulas will include $\max\{R_{\mathrm{NA}}(A), r\}$ instead of $R_{\mathrm{NA}}(A)$.

B. Incentives to Enforce

A rational agent chooses to enforce the overdue claim if $V_i(a, A) \geq V_i(n, A) + B$. Each equilibrium corresponds to a situation, where for each agent $i \in A$, the set of agents that enforce, one has $V_i(a, A) \geq V_i(n, A) + B$, and for each $i \notin A$, $V_i(a, A) < V_i(n, A) + B$. To analyse equilibrium behaviour of banks, we need to establish some general properties. The first proposition states that more efficient agents have incentives to enforce first.

Proposition 1. *For any set of agents that enforce, A, agents i, j with* $\theta_i \geq \theta_j$ *have* $V_i(a, A) - V_i(n, A) \geq V_j(a, A) - V_j(n, A)$.

Proposition 1 tells us that it is plausible to assume that if an agent i has to decide whether to enforce bad assets, agents with $\theta_i > \theta_j$ have already decided to enforce. Thus, we could use a parameter λ, the share of agents that enforce: $\lambda = \gamma \Pr\{\theta_j | \theta_j \geq \theta_\lambda\}$. We focus on two equilibria: the non-enforcement equilibrium, $\lambda^{\mathrm{E}} = 0$, and the enforcement equilibrium, $\lambda^{\mathrm{E}} = \gamma$. First, we note that if

$$1 - G(R - \max_i \theta_i R) < B \tag{1}$$

then $\lambda^{\mathrm{E}} = 0$ (all creditors are passive) is the unique equilibrium. The condition shows that even if all other agents enforce, the most efficient agent has no incentives to enforce. This bad outcome is more likely when $\max_i \theta_i R$ is low (agents' recovery technology is inefficient) and B is high (private benefits of passivity are high).

If condition (1) fails, there exists a threshold value λ^*, the barrier to enforcement, that is the minimum share of agents that make enforcement self-sustainable. This gives room to the existence of a stable non-enforcement equilibrium that is sustained as long as less than λ^* of the agents enforce, although a coordinated effort would make enforcement attractive to all agents. In other words, we have a passivity trap where it is optimal not to enforce as long as a sufficiently large proportion of other agents does not enforce either. λ^* satisfies the following equation:

$$1 - G(R_{\mathrm{NA}}(\lambda) - \theta_\lambda R) = \frac{1}{1-\lambda} \int_{\theta_j < \theta_\lambda} G(R_{\mathrm{NA}}(\lambda) - \theta_j R)\, \mathrm{d}F + B$$

which shows that in equilibrium the agent with the effective recovery rate $\theta_{\lambda^*}R$ is indifferent between starting enforcement or not.

To analyse the comparative statics of this barrier to enforcement, we make specific assumptions about distribution functions. Namely, we assume F is a uniform distribution on [0, 1], and G is a uniform distribution on [0, 1]. Then one can calculate $R_{\mathrm{NA}}(\lambda)$ as follows. First, note that θ_λ defined by $\lambda = \gamma \Pr\{\theta_j | \theta_j \geq \theta_\lambda\}$ is $\theta_\lambda = (1 - \lambda/\gamma)$. (Since $\Pr\{\theta_j | \theta_j \geq \theta_\lambda\} = 1 - F(\theta_\lambda) = 1 - \theta_\lambda$ and hence $\lambda = \gamma[1 - \theta_\lambda]$.)

In general, agent i faces the following options. He can either wait or enforce. The value of announcing enforcement is

$$\begin{aligned} V_i(a, \lambda) &= 1 - G(R_{\mathrm{NA}}(\lambda) - R_i) \\ &= 1 - R + \tfrac{1}{2}\gamma R + \tfrac{1}{2}\lambda R + \theta_i R \end{aligned}$$

$V_i(a, \lambda)$ is an increasing function of λ. With a decreasing function $V_i(n, \lambda)$, for any agent i, there exists some λ_i such that $V_i(a, \lambda_i) \leq V_i(n, \lambda_i)$ and $V_i(a, \lambda_i) > V_i(n, \lambda_i)$. This λ_i is the minimal share of agents that has to start enforcement so that it becomes profitable for agent i to enforce. Proposition 1 asserts that for efficient agents (agents with higher θ's), this minimal share is smaller than for less-efficient agents. The value of enforcement for an individual agent increases in the proportion of enforcing agents. This implies a positive externality effect of an individual agent's enforcement on other agents' incentives to enforce. Precisely this externality effect drives the result of a stable non-enforcement equilibrium and a stable enforcement equilibrium, separated by a threshold λ^*. The fact that the value of enforcement $V_i(a, \lambda)$ is increasing in the proportion of enforcing agents λ could have been postulated on the ground of economies of scale and learning effects in public good provision. Indeed, bankruptcy courts and lawyers have to learn and need a sufficient level of enforcement to function efficiently. In our model, however, the dependence of V_i on λ arises endogenously from first principles and has nothing to do with learning effects or economies of scale. Agents can also opt not to enforce. The value of non-enforcement to agent i is

$$\begin{aligned} V_i(n, \lambda) &= \frac{1}{1-\lambda} \int_{(1-\lambda/\gamma)R}^{1} G(R_{\mathrm{NA}}(\lambda) - \theta_j R)\, \mathrm{d}F + B \\ &= \frac{\lambda}{1-\lambda} R \left[\frac{1}{2\gamma} - 1 \right] + B \end{aligned}$$

since by assumption $\gamma \geq \frac{1}{2}$, $V_i(n, \lambda)$ is a decreasing function of λ. Figure 1 shows how $V_i(a, \lambda)$ and $V_i(n, \lambda)$ are related.

The cut-off point λ^* is determined by the following equation:

$$V_{\lambda^*}(a, \lambda^*) = V_{\lambda^*}(n, \lambda^*)$$

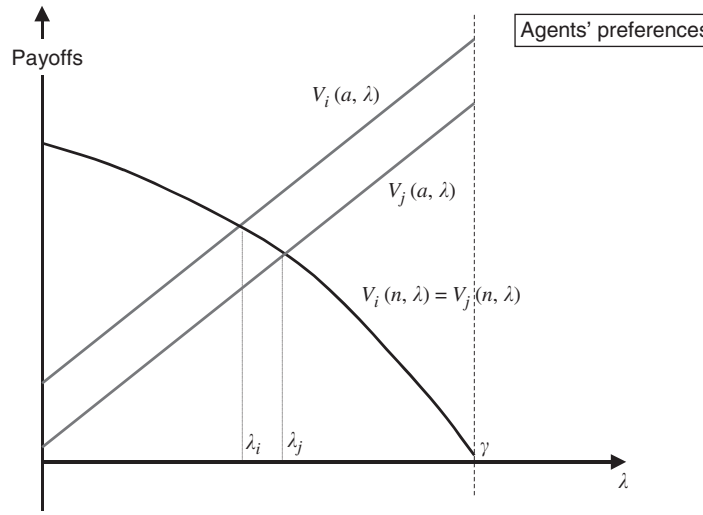

Figure 1: The incentives of individual agents

which is equivalent to

$$\frac{1}{2}\gamma - \lambda^*\left(\frac{1}{\gamma} - \frac{1}{2}\right) = \frac{\lambda^*}{1-\lambda^*}\left[\frac{1}{2\gamma} - 1\right] + \frac{B-1}{R}$$

We focus on the case

$$\gamma \leq \frac{B-1}{R} \leq \gamma + \frac{3\gamma - 2}{1-\gamma} \tag{2}$$

which guarantees the existence of two equilibria, separated by a unique threshold. A non-degenerate range of parameters B and R satisfying the above conditions exists for any γ exceeding some threshold $\overline{\gamma}$. (With our specific assumptions about distributions, $\overline{\gamma} \in (\frac{1}{2}, \frac{3}{4})$.) If B is large enough, then, obviously, $\lambda^{\mathrm{E}} = 0$ is the only possible equilibrium, while a sufficiently small B makes $\lambda^{\mathrm{E}} = \gamma$, the equilibrium with full enforcement the only equilibrium.

Proposition 2. (i) *If conditions* (2) *are satisfied, there exists a unique* λ^* *such that for any* $\lambda < \lambda^*$, *the* λ*th agent has incentives not to enforce, and therefore the system converges to the non-enforcement equilibrium,* $\lambda^{\mathrm{E}} = 0$. *For any* $\lambda > \lambda^*$, *the* λ*th agent has incentives to enforce, which implies that if more than* λ^* *enforce, the system converges to the enforcement equilibrium,* $\lambda^{\mathrm{E}} = \gamma$.

(ii) *The barrier to enforcement* λ^* *increases with B, private benefits of non-enforcement, and decreases with R, which characterizes the efficiency of the system.*

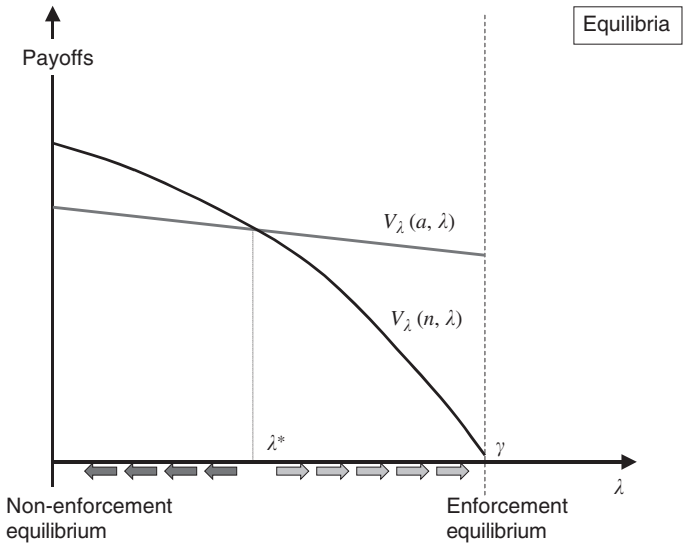

Figure 2: The passivity trap and the enforcement equilibrium

Figure 2 illustrates the first part of Proposition 2.

The second part of the above proposition, albeit trivial, shows that proper punishment (criminal or regulatory) ex post, which reduces private benefits of non-enforcement B, provides incentives to restructure ex ante. In other words, the presence of sound corporate governance structures and ex post punishment seems important to give managers proper incentives to restructure rather than to hide problems. This is very pertinent even in developed economies, as shown by some recent outbreaks of long-hidden problems, for example in Enron or Parmalat. Severe punishment in these cases seems necessary to provide proper ex ante incentives for future restructuring.

The passivity trap described in this model describes creditor passivity in transition countries very well. Overdue claims of individuals (wage arrears, pension arrears), overdue claims of the government (tax arrears), overdue receivables (interenterprise arrears) and overdue bank loans (bad loans) are all captured by our model. All transition countries by necessity started transition without a functioning bankruptcy code, which implies the creditors started the game in $\lambda^{\mathrm{E}} = 0$ and $\lambda < \lambda^*$, that is the passivity trap. In this situation, bad debts persist because bad debtors persist and restructuring stalls. In a later period, bankruptcy codes and proceedings were introduced in all countries at different dates (see the EBRD annual transition reports for regular updates on progress on this front), but passivity persisted for some time. Kornai (2001) gives an excellent overview

of how the budget constraints were gradually hardened in transition countries. Wage and pension arrears have been present in all countries in the region but are now falling, although slower in some countries than others. Russia has been one of the slow enforcers as described by Pailhe and Pascal (2001), Brana and Maurel (2001), Desai and Idson (2000) and Lehmann et al. (1999). Tax arrears have arisen in all countries and have fallen again. Perotti (2002) shows data for Russia, and Schaffer (1998) shows that in Poland tax arrears are concentrated in non-profitable firms. Tax arrears may be slow to fall because they provide a subtle way to conduct industrial policy.[3] Interenterprise arrears (that is involuntary trade credit) have emerged in all countries concerned (see Rostowski 1994). Some countries have faced rapid accumulation of interlocking webs of arrears that on some occasions triggered collective bailouts by the government, as for example in Poland (see Rostowski 1994), Romania (Clifton and Khan 1993; Daianu 1994) or Russia (Ickes and Rytermann 1992) during early transition. Perotti (1998) describes how firms can collude and rationally extend trade credit that is not likely to be repaid if they expect to be bailed out by a government unwilling to accept the demise of good firms linked by arrears to bad firms. Other countries tackled this problem of interenterprise arrears by immediate enforcement. Hungary, for example, installed a tough bankruptcy code in 1992 that caused an initial wave of bankruptcies (Bonin and Schaffer 1995) and installed enforcement once and for all, although the law was later revised by removing the 'automatic trigger' for bankruptcy (Burniaux 1995). By now trade credit, which is a normal market practice, has become voluntary in most transition countries (Schaffer 2000). Nonetheless, there are still countries that exhibit involuntary trade credit with negative spillover effects. Hildebrandt (2002) shows empirically that the problem of interlocking effects of trade credit is more pronounced in countries that are less committed to economic reform. In Romania payment arrears were a serious problem until recently (IMF 2001; OECD 2002).

In short, creditor passivity and hence soft budget constraints persisted some time after commercial law and enforcement rules were introduced, but then gradually disappeared.[4] This phenomenon is very well captured by our model that complements earlier work by providing a common explanation for all types of passivity. Creditor passivity is persistent because creditors are

[3]Ponomareva and Zhuravskaya (2004) show that if explicit subsidization is forbidden, one can arrive at very much the same result by extending tax arrears.

[4]This practice is not limited to transition countries. In Belgium, professional soccer teams have been holding huge social tax arrears for decades, before the government finally decided to clamp down on the protruders. Being held responsible for the demise of a soccer team is off course not the top priority of any politician.

trapped in a non-enforcement equilibrium (the passivity trap) with $\lambda < \lambda^*$ and $\lambda^E = 0$. Creditors have been hesitant to use the new enforcement instrument because the existing level of enforcement was below λ^*. One can interpret our externality effect of enforcement as a first-mover cost of enforcement in the non-enforcement equilibrium. λ^* can then be interpreted as the amount of creditor coordination needed to jump from passivity ($\lambda^E = 0$) to full enforcement ($\lambda^E = y$). Since the cost of coordination is an increasing function of the number of agents to be coordinated, λ^* can be understood as a barrier (a measure of the coordination cost) that keeps creditors in the passivity equilibrium.

Note that debtors could react strategically to agents' actions, which could mitigate the problem of creditor passivity. Indeed, debtors might benefit, if they know how agents behave. If the economy is in the passivity trap, a debtor has additional incentives not to pay back, as he knows that the agents holding his debt are not likely to enforce anyway. Some debtors will not pay back, even if they have the money to do so, because the opportunity cost of default has fallen if agents are less likely to enforce. Still, the probability of being paid back might be non-zero as other incentives remain to pay back: for example, a default might affect future access to credit and capital. On the other hand, if the economy is in the high-enforcement equilibrium, debtors have very strong incentives not to default because of the all-too-real threat of bankruptcy.[5]

C. Stabilization

How does macroeconomic stabilization affect creditors' incentives? We define stability as a situation with low inflation expectations and positive real interest rates. Stabilization is the process of creating stability. In our model, instability implies a low or even negative r, while stabilization means that r increases. Recall that the value of starting enforcement and waiting are

$$V_i(a, A) = 1 - G(\max\{R_{\mathrm{NA}}(A), r\} - \theta_i R)$$

and

$$V_i(n, A) = \frac{1}{1 - |A|} \int_{j \notin A} G(\max\{R_{\mathrm{NA}}(A), r\} - \theta_j R)\, \mathrm{d}F + B$$

[5]Without loss of generality one could formalize this by letting the recovery rates θ_i depend on λ, the share of enforcing creditors, but we do not pursue this issue for the sake of simplicity.

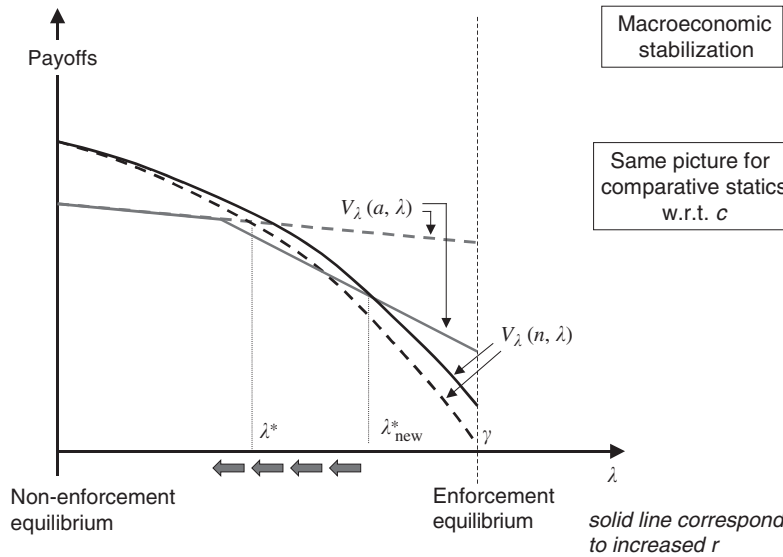

Figure 3: The effect of stabilization

respectively. Hence, the value of hiding bad assets (that is waiting) increases in r. Stabilization therefore increases the value of waiting and reduces creditors' incentives to enforce.

Proposition 3. *A macroeconomic stabilization (an increase in r) leads to an increase in λ^*, the barrier to enforcement.*

The logic is illustrated by Figure 3.

It follows from Proposition 3 that macroeconomic stabilization might provide a creditor with additional incentives to wait, as can also be seen in Figure 1. If the pre-stabilization equilibrium has $\lambda^E = 0$, stabilization does not change the equilibrium and raises the amount of coordination λ^* needed to leave the inefficient non-enforcement equilibrium. This is exactly what happened in Russia from 1995–97. During this period the country enjoyed an exchange-rate-based macroeconomic stabilization, but the problem of creditor passivity and bad loans persisted (see Perotti 2002 for an overview of the relevant data). In our view of the world this is what should have been expected and economically intuitive: If the economy is still in the bad equilibrium, stabilization will only make this equilibrium more persistent, as creditors can rationally wait longer to enforce and try to 'grow their way out of bad debts'. Although a stable macroeconomic environment is an important pre-condition for development of a market economy, stabilization alone does not solve the problem of creditor passivity; quite to the contrary.

D. Policy Implications

Propositions 2 and 3 carry a number of fascinating policy implications. What should the government do if faced with the problem of passive creditors?

First, the government could focus on making bankruptcy proceedings more efficient, which would shift $V_i(a, \lambda)$ upward for each i and hence λ^* to the left. Eventually the economy will shift to the state with $\lambda^* = 0$. Making bankruptcy proceedings more efficient requires appropriate laws and a well-functioning judiciary. In Russia, for example, it was very hard for creditors to lay their hands on collateral and sell it before the housing law package approved in the Duma's last session of July 2004. After the change takes effect, banks will be in a better position to liquidate collateral when loans go sour, provided that the new law is properly enforced by the judicial system.

Second, the government should, once stabilization is accomplished, commit to no more bailouts, which will decrease $\theta_i R$ for every bank i and hence shift λ^* to the left. A firm commitment to hard budget constraints by the government (no more automatic subsidies to loss-making enterprises) would encourage the bank-led restructuring and/or liquidation of these loss-making firms. The reverse also holds. The continued expectation of future bailouts of bad debtors ($\theta_i R$ rises) would raise the value of waiting, $V_i(n, \lambda)$, and would make enforcement less likely. Repeated bailouts of enterprises are therefore likely to produce the usual soft budget constraint adverse effects: creditors will be more inclined to wait and see and might be seduced to gamble for another opportunistic bailout (Perotti 1998).

Third, even with unchanged $V_i(a, \lambda)$ and $V_i(n, \lambda)$ (and hence λ^*) the government can shift the economy to the enforcement equilibrium by introducing some $\lambda^G > \lambda^*$. One way of accomplishing this is a hard stance on tax arrears or on bank supervision by the government. If the government enforces its overdue taxes by means of bankruptcy proceedings, it would introduce a level of enforcement in the economy that might be sufficient to shift the economy from passivity to enforcement. As regards the banking sector, the government could, through its bank supervision powers, force banks to restructure their loan portfolios and thereby impose sufficient enforcement to shift the economy to the good equilibrium. An example of this is what happened during the Swedish banking crisis. Unfortunately, governments sometimes tend to do exactly the opposite as witnessed by China's repeated and almost unconditional recapitalization of its state-owned banks and Russia's very peculiar method of bank supervision (see Claeys et al. 2004). Another way of accomplishing this equilibrium shift is direct government coordination of enforcement and restructuring of a

proportion of $\lambda^G > \lambda^*$. This is what Germany has tried to accomplish by means of the Treuhandanstalt (for an overview of the economics of German reunification, see Sinn and Sinn 1992). A third way of achieving $\lambda^G > \lambda^*$ is the introduction of an automatic trigger in the bankruptcy code. Hungary introduced a very tough bankruptcy code with an automatic trigger clause in 1992. The clause stipulated managers were required to file themselves for bankruptcy within eight days after they had arrears exceeding 90 days (see Gray et al. 1996). This policy enabled Hungary to escape the passivity trap early on. Once enforcement had exceeded the threshold λ^*, the economy left the passivity trap and the automatic trigger was removed from the bankruptcy code by the end of 1993 (Burniaux 1995). Kornai (2001) compares the number of bankruptcies in the Czech Republic, Hungary and Poland from 1992–96. As a proportion of total firms, Hungary has much more bankruptcies, but not at the cost of lower economic growth. Clearly, creditor activity has become the standard in Hungary.

There is a fourth way for the government to install $\lambda^G > \lambda^*$. In several successor states of the Soviet Union, there are tax arrears in the form of energy sector quasi-fiscal activities. In a 1999 World Bank paper, it is shown that payment problems in the electricity sector were widespread in Eastern Europe and the former Soviet Union during the period of 1990–97. Petri et al. (2002) show that a decade into transition, many successor states of the Soviet Union still provide large implicit and untargeted subsidies in the form of low-energy prices and tolerance of payment arrears for energy bills. Because the energy companies are often state owned, the government could install $\lambda^G > \lambda^*$ by no longer accepting payment arrears on energy bills. Note, however, that governments often lie at the heart of the arrears chain. Many governments run expenditure arrears, not only to government personnel and pensioners but also to suppliers, notably energy suppliers. Ramos (1998) shows that expenditure arrears are distinctively present in the successor states of the Soviet Union and that these arrears are often owed to energy companies. This suggests that governments are in a bad position to enforce payment arrears on energy bills because they are one of the main debtors. Breaking this chain of arrears and in general eliminating government expenditure arrears are preconditions to achieving creditor activity. Russia is a good example of a country where implicit subsidies are channelled to enterprises and households, although no longer through payment arrears but rather through cheap energy prices, mainly for electricity and gas. As long as the sector remains unreformed and competition stalled, this situation will not change. Russia has been planning to overhaul its electricity and utilities sector for a long time, but the execution of the plans has been repeatedly revised or put on hold and the future remains uncertain.

III. Why Are Banks Different?

A. Market Discipline

Enforcement involves a public announcement by the agent of his overdue claims. If the public has imperfect information on the quality of the agents' claims, it lowers the value of the agents' capital in the public's perception. In our model, as in real life, agents are also debtors and governments have payables and debt, enterprises have payables and loans, and banks have deposits. However, deposits are exceptionally liquid in comparison to the debt of other agents. Indeed, nobody can easily cancel credit granted to the government, nor can trade credit granted to an enterprise be withdrawn, but deposits can easily be withdrawn and reinvested. This liquidity difference ensures banks will behave fundamentally different from other agents in the presence of a signalling effect of enforcement.

There are two large strands of literature that support the claim that bank deposits are more liquid than other debts, namely the literature on bank runs and on market discipline. Models of a bank run are provided by Diamond and Dybvig (1983), Postlewaite and Vives (1987), Wallace (1988, 1990), Chari (1989), Champ et al. (1996), Alonso (1996), Allen and Gale (1998) and many others, with explanations of why a bank run occurs ranging from sunspots to business cycle fundamentals. Market discipline refers to the phenomenon of lower deposit growth and higher deposit rates caused by the revelation of some bank fundamental, in our case the announcement of a bad loan. Empirical evidence of market discipline in developed banking markets is reported by Park and Peristiani (1998) for the case of US savings and loan associations. Their findings indicate that riskier thrifts not only pay higher interest rates on uninsured deposits but also attract a smaller quantity of uninsured deposits. They even find that risk has an adverse effect on the growth and pricing of insured deposits, although the effect is less pronounced. Berger (1995) provides indirect evidence for the presence of market discipline by arguing that it may partly account for the observed positive relationship between capital and earnings of US banks in the 1980s. For emerging market economies, evidence of market discipline in the banking sector was found by Peria and Schmukler (2004). For a recent overview of market discipline, see Borio et al. (2004).

Proposition 4. *Due to market discipline, the barrier to enforcement is higher for banks than for other creditors. Formally, suppose that switching costs are distributed on* $[c, c+1]$ *rather than on* $[0, 1]$. *The lower the c, the higher the barrier to enforcement* $\lambda^*(c)$. *Thus, if a bank has* $c_B < c_N$ *(where N stands for a non-bank), then* $\lambda^*(c_B) > \lambda^*(c_N)$.

This result is very intuitive. Since the bank's decision to enforce a contract is connected to a higher cost in the form of market discipline, the value of waiting is higher and the externality effect is more severe for banks. This implies that the barrier to enforcement is higher for banks than for other agents. Banks are *ceteris paribus* less likely to leave the passivity trap than enterprises, that is bad loans are more persistent than interenterprise arrears. This fits reality very well. Interenterprise arrears have ceased to pose a problem in Central Europe (see Schaffer 2000), while bad loans are still very much a problem as shown in Table 1.[6]

This carries interesting policy implications. The mere introduction and implementation of efficient bankruptcy proceedings and hard budget constraints by the government (the policy recommendations implied by Propositions 2 and 3), may be insufficient to give banks an incentive to leave the passivity trap. To escape from the passivity trap, a sufficiently high number of banks $\lambda^*_{\overline{G}} \geq \lambda^*_G$ needs to coordinate enforcement. A straightforward way to organize this coordination is government intervention. Indeed, most transition countries have seen government intervention to solve the problem of systemic bad loans in the banking sector. In most cases loan workout units were organized either inside the bank, as in Poland (see Bonin 2001), or outside the bank in a collective loan hospital such as in the Czech Republic (see Matousek 1995 for an analysis of the Czech consolidation bank experience). This was always combined with some form of recapitalization, conditional on operational restructuring and enforcement. This is economically rational. Aghion et al. (1999) show that the second-best recapitalization policy involves recapitalization transfers conditional on the liquidation of non-performing loans and find that this policy creates the same incentives for prudent lending as tough bank closure rules. Schoors (1995) gives an overview of early bank reform in the Czech Republic, Hungary, Poland and Slovenia. Bonin and Wachtel (2002) review a broader set of country experiences. In this case $\lambda^*_{\overline{G}}$ has the following economic interpretation: it is the minimum share of banks the government should restructure, if the government wishes to shift the banking sector from passivity to enforcement.

Creditor passivity among enterprises has only occasionally been solved by a direct coordinated approach by the government in transition countries and never in developed economies. In the banking sector, on the other hand, government intervention has been common practice in developed market economies. The solution of bank crises in the US (the S&L crisis), the Nordic banking crisis (in Sweden, Norway and Finland in the early 1990s) and the ongoing Japanese banking crisis involved substantial government interfer-

[6]See also *Euromoney*, June 1999, for an overview of bad loan problems in the region.

Table 1: Non-Performing Loan in Per Cent of Total Loans for Selected Transition Countries

Country	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bulgaria	6.7	6.8	12.5	15.2	13.0	11.8	17.5	10.9	7.9	10.4
Croatia	n.a.	12.2	12.9	11.2	8.2	12.6	20.6	19.7	15.0	11.5
Czech Republic	n.a.	n.a.	26.6	21.8	19.9	20.3	21.5	19.3	13.7	9.4
Estonia	n.a.	3.5	2.4	2.0	2.1	4.0	2.9	1.3	1.2	0.8
Hungary	29.6	20.2	12.1	9.0	5.3	6.8	4.4	3.1	2.9	4.6
Latvia	n.a.	11.0	19.0	20.0	10.0	6.8	6.8	5.0	3.1	2.1
Lithuania	n.a.	27.0	17.3	32.2	28.3	12.5	11.9	10.8	7.4	5.8
Macedonia	n.a.	n.a.	n.a.	66.1	59.5	50.3	62.6	46.5	44.4	35.7
Poland	36.4	34.0	23.9	14.7	11.5	11.8	14.5	16.8	20.1	24.6
Romania	n.a.	18.5	37.9	48.0	56.5	58.5	35.4	3.8	3.4	2.3
Russia	n.a.	n.a.	12.3	13.4	12.1	30.9	28.1	16.1	12.2	11.4
Serbia & Montenegro	n.a.	10.3	12.0	12.3	15.1	13.1	10.2	27.8	24.4	28.5
Slovakia	12.2	30.3	41.3	31.8	33.4	44.3	32.9	26.2	24.3	11.2
Slovenia	n.a.	13.8	9.3	10.1	10.0	9.5	9.3	9.3	10.0	n.a.
Ukraine	n.a.	n.a.	n.a.	n.a.	n.a.	34.6	34.2	32.5	n.a.	n.a.

Source: EBRD Transition Report, various issues.
Note: n.a., not available.

ence and the allocation of budget money. More contemporaneous banking-sector problems in transition countries have been addressed by coordinated government efforts, as for example in China where bad loans have been transferred to four asset management companies (Bonin and Huang 2001). This omnipresent government interference in bank restructuring is commonly attributed to the systemic importance of the banking system. We add to this explanation that banks, because of their very liquid liabilities, need more coordination to leave the passivity trap. Government intervention may be instrumental in providing this coordination.

Proposition 4 also provides a new rationale for deposit insurance. Deposit insurance reduces the liquidity of bank deposits and hence stimulates enforcement by banks by decreasing the cost of enforcement. It has been well documented that deposit insurance provokes the moral hazard of participating banks and may in fact contribute to banking crises. Keeley (1990), Mishkin (1992) and Demirgüç-Kunt and Detragiache (2002) have all found links between deposit insurance and bank crises. Repullo (2004) shows that deposit insurance may reduce rather than increase individual banks' incentives to take risks. Our model suggests that the absence of deposit insurance may also have a moral hazard cost in the form of increased bank passivity. It is not clear how the moral hazard cost of no deposit insurance, namely less enforcement, can be contained without direct

intervention. It might well be that, in countries with strong market discipline and little trust, the combination of properly priced deposit insurance and good prudential control is superior to no deposit insurance.

We observe this problem clearly in the Russian banking system. Russia had no deposit insurance until October 2004, except for the state-owned banks (with Sberbank on top) that enjoy a state guarantee on their obligations. A leaked analysis of Russian banks after the crisis of August 1998 shows that the major loss of bank capital did not come from the devaluation of the rouble or the government default on Treasury bills (the famous GKO), but from bad loans that had been in their balances for quite some time.[7] The banks had been concealing their bad loan problems for a long time and had not used bankruptcy proceedings to enforce overdue loans before the crisis of August 1998. Our interpretation is that banks feared enforcement would be a signal of bank insolvency to depositors and would encourage them to shift deposits to Sberbank, the safe, though not very solvent, deposit haven. Indeed, the market share of Sberbank in the household deposits market rose steadily from below 50% in mid-1994 to above 85% in 1999. Every major financial scandal or banking crisis is clearly mirrored in a jump of Sberbank's market share (see Schoors 1999); therefore, banks were very cautious not to signal bad loan problems to depositors, as they knew from firsthand experience what the punishment would be. Clearly, the Russian banking system was stuck in the passivity trap described in this paper. This was reinforced by the policy of discriminatory deposit insurance (state guarantee for Sberbank and the other state banks, nothing for the rest). After the August 1998 devaluation, the Russian banking sector was in a dire state. The restructuring of the banking sector seemed imminent but has stalled ever since.

Russia has recently adopted a deposit insurance scheme that became operational in October 2004. Banks had to apply for membership to the Deposit Insurance Agency. To qualify for the scheme, banks have to undergo far more stringent audits than was previously the case in the supervision process (Pryde 2004). The CBR was granted the right to veto membership. This created a window of opportunity for the CBR. For the first time in history it held the key to something of value to the commercial banks under its supervision, namely membership to the insurance scheme. The CBR seems to have used this real and very effective power to bring banks in line. In this sense deposit insurance has been a genuine improvement for the Russian banking sector. For banks, membership of the scheme is very important, as the slightest rumours of problems are still capable of creating a

[7]See 'The Newly Wed and the Nearly Dead', *Euromoney*, June 1999.

credit crunch on the interbank market and a deposit run. An indication of the lack of trust in the banking system was offered by the June 2004 crisis, where the withdrawal of two licences by the CBR[8] so scared other banks that the interbank market collapsed. The general public reacted to the rumour of problems by running on some of the larger non-state deposit banks (e.g. Alfa-bank and Gutabank), finally prompting the CBR to step in and cool the situation by lowering the refinancing rate and the mandatory reserve requirement (Pryde 2004). Still, Gutabank ended up between a rock and a hard place and was saved through acquisition by Vneshtorgbank, the state-owned sister of Sberbank. President Putin also needed to assure the public on national television in an effort to restore trust. This very harsh punishment by depositors of even the faintest doubt about banks' reliability fits our model well. This equilibrium prohibits enforcement and sustains the passivity trap. The operation of a credible deposit insurance scheme might offer a way out of this catch.

Our model also provides a rationale for having different bankruptcy codes for banks and non-banks. Around the world we observe special provisions for bank failures. Our model suggests that bankruptcy codes should offer more Chapter 11-type protection to banks than to ordinary enterprises. This additional protection performs the function of shielding banks from the immediate punishment of enforcement. This would encourage enforcement and restructuring by banks and avoid the cyclical accumulation of bad loans and passivity, characteristic of banking crises around the world. The savings and loans crisis in the USA (Akerlof and Romer 1993) and contemporaneous problems of the Japanese banking system (Hoshi and Kashyap 2000) show that our story might be relevant for developed economies as well. In cases of large-scale bank problems in developed economies, governments have been eager to step in with ad hoc government actions and arrangements and have often committed fiscal resources to solve the crisis.

B. Liquidity Constraints

Liquidity constraints constitute an additional barrier to enforcement. Let D denote the maximum amount of losses that allows a bank to continue its operations. In essence, D represents the bank-specific distance to a regula-

[8]The licences of Sodbiznesbank and KreditTrust were withdrawn in May 2004, reportedly because they were engaged in criminal activities. It is the first time after the 1998 crisis that the CBR withdrew a licence before the bank concerned had defaulted.

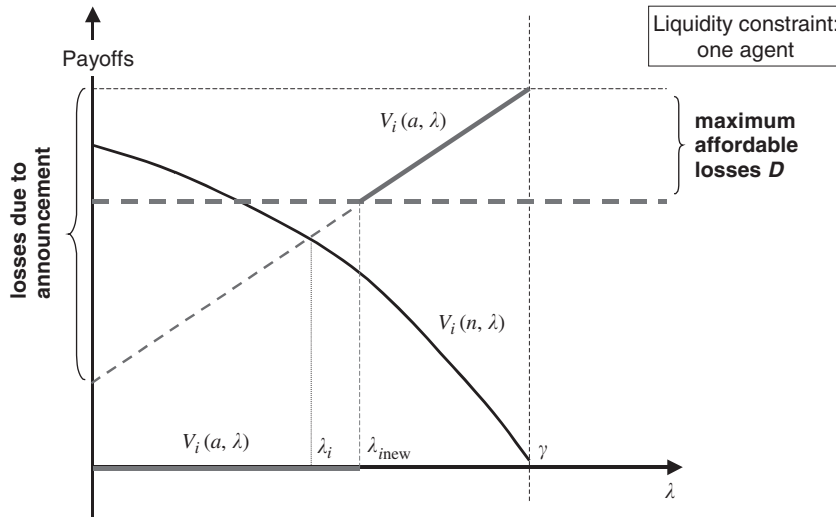

Figure 4: The effect of the liquidity constraint on an individual agent's incentives

tory standard (such as the minimum required capital or bank liquidity standards), that is its regulatory capital or liquidity buffer.[9] In the absence of effective regulation, D represents the bank's liquid assets. If losses are too large, $V_i(a, \lambda) > D$, the bank is closed, since it either violates the regulatory norm or it has become illiquid, and the agent's payment is zero. The value of enforcement becomes

$$V_i(a, \lambda) = \begin{cases} 1 - G(R_{\mathrm{NA}}(\lambda) - \theta_i R) & \text{if } 1 - G(R_{\mathrm{NA}}(\lambda) - \theta_i R) > D \\ 0 & \text{otherwise} \end{cases}$$

while the value of hiding remains the same. Let λ^* have the same meaning as before. Now λ^* is a function of D.

Proposition 5. *The barrier to enforcement λ^* is inversely related to the liquidity constraint D, that is the more losses a bank can afford (the higher is D), the less banks are needed to start enforcement (the lower is λ^*).*

The logic is illustrated by Figure 4.

What is the effect of a liquidity crisis (due to some exogenous shock, e.g., a sudden increase of short-term interest rates, a foreign exchange crisis, a default by the government on its Treasury bills, or a bubble of asset prices)

[9]The Russian bank regulation, for example, includes not less than four standards on bank liquidity.

on bank passivity? Suppose that $D = D_0$, that is each bank can absorb short-term losses not higher than D_0. If an exogenous liquidity shock $(D_1 - D_0)$ changes D to some $D_1 < D_0$, it follows that $\lambda^*(D_1) > \lambda^*(D_0)$. If the banking sector is currently in the passivity trap, a liquidity crisis raises the cost of coordination needed to leave the trap. If the sector is in the enforcement equilibrium, a liquidity shock might shift the whole sector to the passivity trap. In short, a liquidity crisis can push the banking sector from the efficient equilibrium (enforcement) to the passivity trap. This fits the empirical evidence on systemic banking crises in developed and emerging market economies alike. The American S&L crisis, the Swedish banking crisis of the early 1990s and the banking system crises in Asian countries were all triggered by an external shock that affected bank liquidity and/or capital. Our model predicts this can trigger a non-enforcement equilibrium, where banks start to hide their bad loans instead of enforcing them. This also explains why Japanese banks persist in hiding their bad loan problems until they are threatened by bankruptcy. Note that in this equilibrium, banks with bad assets do not necessarily replenish the bad loans (Dewatripont and Tirole 1994), but may just wait and gamble for resurrection by investing the remaining funds in more risky projects (Kane 1989).

We found that the liquidity constraint will make creditor passivity more likely and more persistent (in the sense that an equal or higher amount of coordination λ^* will be needed to leave the passivity trap). Hence, liquidity crises can create a negative externality in the form of less enforcement and restructuring by banks. The government can solve this liquidity problem by providing a Bagehot-type lender of last resort. The good old Bagehot rule of 1873 – lend freely to illiquid but solvent banks at a penalty rate – is still defended by many authors. Insolvent banks are not entitled to liquidity support, which is ensured by only providing short-term and collateralized liquidity support. Goodhart (1988, 1995) puts forward the argument that liquidity should not be denied to any bank a priori, since the difference between illiquidity and insolvency is sometimes hard to tell. Goodhart and Huang (1999) propose to employ a policy of constructive ambiguity in the bailout decision to reduce moral hazard. Other authors do not agree with this harsh policy and claim that softer policies would induce truthful reporting of asset quality and in the end would lead to higher systemic stability (see Povel 1996; Aghion et al. 1999). Cordella and Yeyati (2003) claim that an ex ante central bank commitment to a bailout contingent on adverse macro-shocks is welfare superior to the policy of constructive ambiguity.

In our framework, the Bagehot-type lender of resort ensures that liquidity shocks cannot create binding constraints to solvent banks. By consequence,

liquidity shocks will not affect enforcement by solvent banks. This role cannot be taken up by the interbank market if the liquidity crisis is system-wide, as is often the case (see Freixas et al. 2000 on this). Therefore, a developed banking sector should be provided with lender-of-last-resort facilities. Also, any government programme seeking a coordinated and efficient solution to the creditor passivity problem should select a sufficiently high proportion of the most liquid banks and work out their loans in order to reach λ^* and leave the passivity trap. This implies that government programs to address systemic creditor passivity crises should involve the most liquid banks and not the least liquid ones to create sustainable, though not necessarily full, enforcement. Over time, attrition will take care of the remaining non-enforcing illiquid banks, as their illiquidity is revealed and they are bankrupted, if bank closure is allowed.

C. Bank Bankruptcy

In the long run, liquidity shocks may cause not only passivity (the short-run consequence) but also a systemic meltdown and ultimately bank closure and bank restructuring. Assuming there is an adverse liquidity shock and there has been no government coordination sufficient to establish the level of enforcement, λ^*, needed to leave the bad equilibrium, then some proportion of banks will ultimately be put in bank bankruptcy, the worst banks first. If bank closure occurs, the receiver will enforce the remaining bad loans, as he does not need to take into account the signalling effect of enforcement. His role is legally defined as enforcement to the benefit of the creditors. In effect, bank closure will introduce a certain exogenous level of enforcement in the economy. Formally, we assume that a proportion of 'bad' banks β goes into bankruptcy and that all 'bad' banks are equally likely to go bankrupt. Then the following proposition can be proven.

Proposition 6. *The more severe the liquidity crisis (the higher is β), the more likely that the economy will shift to the high-enforcement equilibrium.*

The proof is trivial. Bank closures work as an exogenous increase in the number of banks that choose to enforce. If the resulting number of enforcing banks exceeds the threshold λ^*, all banks find it more attractive to enforce than to wait. Note, however, that a liquidity shock will only have this effect if it is severe enough to cause bank closure. Hence, moderate liquidity crises seem to decrease the level of enforcement, while severe crises introduce, through bank closure, a level of enforcement that may be high enough to shift the economy to the enforcement equilibrium. Note that a severe

liquidity crisis can only function as a catalyst to leave the passivity trap if insolvent banks are actually closed. We give an example. Estonia faced two severe banking crises very early in transition, one in 1992 and one in 1994. The crises ultimately led to the closure of insolvent banks, North Estonian bank and Union Baltic bank in November 1992 and Social bank in 1994 (Niinimäki 2002), and to the introduction of very tough capital adequacy rules. As a consequence, the bad loan problem has basically disappeared in Estonia, and creditor activity is the standard. We observe in Table 1 that since 1994 bad loans have been between 1.5% and 4% of the total loan portfolio in Estonia. Compare this to the experience of Russia, which also faced several banking crises (October 1994, August 1995, August 1998, May–August 2004). The first two Russian crises did not lead to the demise of all insolvent banks. Some insolvent banks did go under, but many more were allowed to struggle on, often the largest ones. In the August 1998 crisis, the banking system again collapsed, but most banks were allowed to survive despite blatant insolvency. A law on bank bankruptcy became effective only in March 1999, so the healing effect of Proposition 6 did not produce, and the long overdue restructuring is still incomplete. In fact, some banks abused the new bankruptcy code to dump their 'inconvenient liabilities' (see Schoors 1999). During 1999–2002, Russia enjoyed a gradual stabilization and substantial economic growth that made the passivity trap more persistent (see Proposition 3). Because of economic growth the proportion of bad loans may have fallen, but it is still well above 10%. Unless the CBR allows bank bankruptcy provisions to do their magic or alternatively the government makes a coordinated attempt to sort out the banking mess, the next banking crisis may be waiting around the corner of the next recession. The May–August 2004 mini-crisis in the Russian banking sector hints at what could be in store if restructuring is further postponed.

On the other hand, bank supervisors may have rational motives for forbearance that lie beyond systemic stability considerations. Boot and Thakor (1993) indicate that regulatory discretion urges reputation-seeking regulators to show more forbearance than optimal because they are inclined to avoid failures on their books in order to leave the job with a clean slate. But this does not seem to explain the Russian experience, because many failures did take place. Mailath and Mester (1994), on the other hand, show that, if regulators cannot commit themselves, temporary forbearance may be the equilibrium outcome. Along the same line, Acharya (1996) finds that regulatory forbearance may be optimal if the dead-weight losses of closure are important. Kane (2000) indicates that some banks may simply be too big to discipline adequately (TBTDA), which creates a problem of undesired *de facto* forbearance. This has certainly been a problem in Russia.

IV. Conclusion

In this paper, we analyse creditor passivity from a new perspective, namely the adverse externality effect of creditors' passivity on other creditors' incentives to enforce. This can lead to stable non-enforcement equilibrium, that is a passivity trap. All economic agents in transition countries started in the passivity trap, and the question was how to break out. Stabilization does not render creditors more active, as shown by the case of Russia. The government can contribute to the solution of creditor passivity by investing in smoothly functioning bankruptcy proceedings, committing to hard budget constraints for corporate debtors and enforcing its own tax arrears. Settling government expenditure arrears and enforcing energy bill arrears would be very helpful in this respect. Direct government coordination is also an option.

Interenterprise and tax arrears were ultimately solved by market discipline and bankruptcy proceedings. This did not, however, suffice to rid the economy of passive banks. The difference between banks and other creditors is that banks face (1) an additional cost of enforcement, imposed by very liquid depositors who exert stronger market discipline on the banks by withdrawing deposits and (2) an additional liquidity constraint, for example in the form of liquidity or capital rules. Together these constraints ensure that the amount of coordination needed to make banks leave the passivity trap is strictly higher than the amount of coordination needed for enterprises. Therefore, government intervention is *ceteris paribus* more desirable in the banking sector. Deposit insurance can be instrumental in alleviating the cost of enforcement. Although deposit insurance may have a moral hazard cost, it may also improve bank incentives to restructure bad loans. The presence of a Bagehot lender of last resort also improves the incentives of solvent banks to be active in the face of bad loans. Such an institution alleviates the liquidity constraint to creditor activity in the banking sector. This also explains why banks need a bankruptcy code that provides more protection from their creditors, as this will improve ex ante bank incentives to enforce.

A liquidity shock may shift the banking sector to the passivity trap. A severe enough liquidity shock may act as a catalyst to enforcement, since a portion of the least-liquid banks is forced into bankruptcy, with a receiver appointed by the judge. The receiver is not concerned about the liquidity constraint and will enforce the bad loans to protect the bank's creditors. This injects a level of enforcement into the banking sector that might be instrumental in pulling the most liquid banks out of the passivity trap. However, this beneficial effect can only be realized if an effective bankruptcy code for banks exists. This was unfortunately not the case for Russia, where

no effective code was in place at the right time, and many insolvent banks were granted yet another life.

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Appendix

Proof of Proposition 1. By definition,

$$V_i(a,A) - V_i(n,A) = 1 - G(R_{\mathrm{NA}}(A) - \theta_i R) - \frac{1}{1-|A|}\int_{j\notin A} G(R_{\mathrm{NA}}(A) - \theta_j R)\,\mathrm{d}F(\theta) - B$$

Then $V_i(a,A) - V_i(n,A) \geq V_j(a,A) - V_j(n,A)$ if and only if $G(R_{\mathrm{NA}}(A) - \theta_i R) \leq G(R_{\mathrm{NA}}(A) - \theta_j R)$, which is in turn equivalent to $\theta_i \geq \theta_j$. The proof is complete.

Proof of Proposition 2. (i) Since $\gamma \geq \frac{1}{2}$, both functions

$$\varphi(\lambda) = \frac{1}{2}\gamma - \lambda\left(\frac{1}{\gamma} - \frac{1}{2}\right)$$

and

$$\psi(\lambda) = \frac{\lambda}{1-\lambda}\left[\frac{1}{2\gamma} - 1\right] + \frac{B-1}{R}$$

are decreasing in λ. If conditions (con2) are satisfied, then $\varphi(0) \leq \psi(0)$ and $\varphi(\gamma) \geq \psi(\gamma)$. Therefore, they have a unique intersection at some $\lambda^* \in [0, \gamma]$.

(ii) By inspection. The proof is complete.

Proofs of other propositions are straightforward exercises.