

$\alpha - \beta$

# **SOFT BUDGET CONSTRAINTS AND TRANSITION**

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## **I. Introduction.**

“Soft budget constraints” - the refinancing of loss-making enterprises - were a key feature of socialist economies. Janos Kornai (1979, 1980, 1992) has coined this term and shown the role of soft budget constraints in explaining the emergence and reproduction of shortages in socialist economies. The concept of soft budget constraints now belongs to the vocabulary of economics. Its importance and relevance is acknowledged beyond socialist economies. There are well known examples of soft budget constraints in big corporations (for example the famous Chrysler case) or in the banking sector (for example the bailout of the US S&L's).

Soft budget constraints have naturally been an important concern in transition economies, in Eastern Europe as well as in Asia. For example, the following ideas have been stressed in the context of the transition process :

- continued soft budget constraints may prevent loss-making enterprises from restructuring because they lack the negative incentives related to the threat of bankruptcy;
- soft budget constraints may be an obstacle to the process of sectoral reallocation as continued subsidies to loss-making State-Owned-Enterprises (SOE's) may prevent efficient private firms from outbidding them for workers (see Sachs and Woo, 1993; Castanheira and Roland, 1996);
- macroeconomic stability may be jeopardized because continued soft budget constraints in SOE's make it difficult to keep government expenditures under control, as illustrated by the case of Russia in its first years of transition (Litwack, 1993).

The necessity of hardening budget constraints of enterprises in economies in transition has clearly been recognized in the by now large literature on transition. How to effectively harden budget constraints has however less been the subject of detailed analysis. Hardening budget constraints is often presented in “reduced form”, as a direct choice of action on an exogenous policy variable. In other words, it is as if, when policy-makers decide to harden budget constraints and make such announcements, hard budget constraints automatically follow. The question of the

credibility of such announcements and decisions has been given little attention. This is partly because, in an important part of the literature on transition, soft budget constraints are identified with subsidies<sup>ii</sup>. Seen in that perspective, hardening budget constraints is then nothing else than a decision to cut subsidies. It is then not astonishing to see the hardening of budget constraints as an exogenous policy variable.

Another line of research, initiated by Dewatripont and Maskin (1995), views soft budget constraints as endogenous to specific institutions. Soft budget constraints are seen as a dynamic incentive problem where a funding source, be it a government or a bank, cannot commit to keep an enterprise to a fixed initial budget. Soft budget constraints represent an inefficiency in that the funding source would like to commit ex ante not to bail out firms, but they know they will be tempted to refinance the firm ex post because the initial injection of funds is sunk. Here, the interesting question becomes that of the institutional conditions under which one has hard or soft budget constraints. Hardening budget constraints is thus not simply a direct policy variable, but rather the result of institutional design.

This distinction is important for the transition process. Indeed, if soft budget constraints are the result of a dynamic commitment problem, decisions to harden budget constraints cannot be credible unless institutions are in place to this effect. Kornai (1995) himself insists very much on this point in the context of transition: "There are a great many influences on the government tempting it to loosen the financial discipline and soften the budget constraint. (...) Since the period of tougher financial discipline began, exceptional procedures have been followed in several cases, in many of which the bargaining led to agreement. The remnants of the soft budget constraint are clearly visible. There is a danger that the frequency of the exceptions will undermine the credibility of the government's pledges concerning the tough financial discipline." (p. 150).

An area where this question is particularly sensitive is the bailout of banks. Indeed, if macrostabilization programs have drastically cut subsidies, loss-making SOE's have continued to be bailed out via different channels such as interenterprise credits, and most importantly via bank

credit. As a consequence, the quality of bank portfolios has sharply deteriorated, and created a “bad loan problem”. This problem illustrates very well the soft budget constraint phenomenon. Early analysts of the bad loan problem have emphasized the need for bank recapitalization as the appropriate solution (Begg and Portes, 1992, Mitchell, 1994).<sup>iii</sup> At the same time, analysts acknowledged that such recapitalization could only occur once since otherwise expectations of future bailouts would seriously dampen banks’ incentives. Despite these clear warnings, there have been repeated bank bailouts, in Hungary for example. Accumulation of bad loans indeed strengthens pressures to bail out banks and expectations of bailouts give fewer incentives to banks to improve their loan portfolio. This is a clear example of the soft budget syndrome. Table 1 gives data on bad loans in Poland, Hungary and the Czech Republic. These data indicate that the level of bad loans remains high and has even increased in the Czech Republic.

INSERT TABLE 1 HERE ( TABLE 3 from Anderson et al., 1996)

In this paper, we survey the incentive literature on soft budget constraints and we analyze its relevance for transition. In section II, we survey the Dewatripont-Maskin model and discuss some of its applications to the socialist economy. In the next sections, we look at the effects of various reforms on the hardening of budget constraints: privatization in section III, product market competition in section IV, government reform in section V and banking reform in section VI. Section VII concludes.

## **II. Soft budget constraints as a time-consistency problem.**

Kornai’s work has focused mainly on the consequences of the soft budget constraint, namely the emergence of pervasive shortages under socialism. He primarily attributes the **causes** of the soft budget constraint to political constraints, that is, to the desire of « paternalistic » governments to avoid socially and politically costly layoffs. Dewatripont and

Maskin (1995)'s analysis of the soft budget constraint stresses instead dynamic commitment problems in the presence of irreversible investment (see also Schaffer, 1981 and Qian and Xu, 1991).<sup>iv</sup>

They consider the following adverse selection problem. The government faces a population of firms, each needing one unit of funds in initial period 1 in order to start their project. A proportion  $\alpha$  of these projects are of the « good, quick » type : after one period, the project is successfully completed, and generates a gross (discounted) financial return  $R_g > 1$ . Moreover, the manager of the firm (possibly also workers) obtains a positive net (discounted) private benefit  $E_g$ . In contrast, there is a proportion  $(1 - \alpha)$  of bad and slow projects which generate no financial return after one period. If terminated at that stage, managers obtain a private benefit  $E_t$ . Instead, if refinanced, each project generates after two periods a gross (discounted) financial return  $\pi_b^*$  and a net (discounted) private benefit  $E_b$ . Initially,  $\alpha$  is common knowledge but individual types are private information. A simple result easily follows : if  $1 < \pi_b^* < 2$  and  $E_b > 0$ , refinancing bad projects is sequentially optimal for the government, and bad entrepreneurs who expect to be refinanced apply for initial financing. The government would, however, be better off if it were able to commit not to refinance bad projects, since it would thereby deter managers with bad projects from applying for initial financing, provided  $E_t < 0$ .

Termination is here, by assumption, a discipline device which allows the uninformed investor (creditor) to turn away bad types and only finance good ones<sup>v</sup>. The problem is that termination is not sequentially rational if  $\pi_b^*$  is bigger than one : once the first unit has been sunk into a bad project, its net continuation value is positive so that, in the absence of commitment, the soft budget constraint syndrome arises. In this setup, because irreversibility of investment is such a general economic feature, the challenge for theory is more to explain why hard budget constraints prevail rather than why budget constraints are soft in the first place.

One can use this analysis as a starting point to understand how transition strategies can alleviate the soft budget constraint problem. We now turn to several such strategies.

### III. Privatization.

One interpretation of the above problem is to consider that  $\pi_b^*$  internalizes a political bias of socialist governments, for example towards excessive employment. Under this interpretation, a profit-maximizing creditor would **not** refinance bad firms. Moreover, if there were any refinancing, it would be accompanied by different restructuring measures from those that would be chosen if the government were directly in control of the firm.

How can a reformist government constrain the ability of future governments to exercise a political bias in economic activity? Boycko et al. (1992) and Shleifer and Vishny (1994) argue that privatization, namely the allocation of control rights and of profit streams to managers, provides the solution. In this case, governments will find it harder and more costly to move firms away from profit-maximizing behavior, since they will have to « bribe » firms instead of simply dictating their behavior. If such bribing is costly for governments, for example because it must be financed through distortionary taxation, one should expect less refinancing of bad firms and fewer deviations from profit-maximizing outcomes. In this story, the ability to bribe managers is reduced if the government is poorer, which then argues for giveaways as opposed to sales as a method of privatization, as is advocated in Boycko et al. (1995).

Note, however that privatization *per se* does not always solve soft budget constraint problems inside firms. Indeed, if these problems reflected the political bias of government towards excessive unemployment, privatized firms may exploit the government's softness to still obtain funds. This issue is particularly relevant in transition economies where governments have gone for "insider privatization", giving away control to existing management teams, as in Russia. In this case, Debande and Friebe (1996) stress the fact that managers may have a bias in favor of excessive size (i.e. be "empire-builders"), which is the equivalent of the government bias in favor of employment, and that the reluctance of the government to hand out funds is, if anything, *reduced* by the fact that its financial stake in the company is diminished by

privatization : since the government does not get the financial reward of profit-maximizing strategies after privatization, why should it care at all about the profit consequences of the firm's actions ? Faure-Grimaud (1996) stresses moreover the fact that, by offering more precise signals about the firm's future profitability (through stock market valuation), privatization may enhance the soft budget constraint problem : if the manager is confident that the stock market will value future profits  $\pi_b^*$  appropriately, he will not be afraid to have to report zero profit in period 1, while otherwise he might abstain altogether !

#### IV. Product market demonopolization.

The opportunity cost of refinancing a bad project can also be raised by reducing the cost of terminating it. The cost of termination is in turn related to substitution possibilities across projects, as stressed by Segal (1993). While Segal makes the point that the soft budget constraint can at times be seen as the result of underprovision of cost-reduction effort by a monopolist in order to extract subsidies from the government, the argument can also be made directly in our framework. Indeed, assume that the government can split each project it finances into two halves at some efficiency cost, for example because of increasing returns to scale. In other words, two entrepreneurs are selected, and each receives  $\frac{1}{2}$ . In case of a good project, the gross return will only be  $\frac{1}{2} \theta R_g$  with  $\theta < 1$ , and similarly, in case of a bad project that is refinanced by injecting  $\frac{1}{2}$  in the second period, the gross return will be  $\frac{1}{2} \theta \pi_b^*$ . If we assume that there is demand only for the equivalent of one full project, the game stops if both entrepreneurs have good projects. But what if one project is bad ? The soft budget constraint problem could remain if  $\frac{1}{2} \theta \pi_b^* > \frac{1}{2}$ . Assume however that, if only one project is good, it is optimal for the government to expand its activities instead of refinancing the bad entrepreneur. In other words, if an increase in capacity of the good project through injection of another  $\frac{1}{2}$  yields  $\frac{1}{2} (2-\theta) R_g > \frac{1}{2} \theta \pi_b^*$ , bad projects will not be refinanced whenever they have been financed together with a good project. Bad projects thus get refinanced only with probability  $(1-\alpha)$ . If  $\alpha E_t + (1-\alpha)E_b < 0$ , then there is always a unique equilibrium where only good entrepreneurs apply for funds, because then a bad entrepreneur will not find it profitable to submit a project in the first place.

## V. Decentralization of government decisions.

Qian and Roland (1994) take a similar perspective to that in section III above, assuming  $\pi_b^*$  to be too high because of political bias. However, instead of privatization, they investigate **decentralization** as a method for reducing  $\pi_b^*$ . Government remains in control of the financing decisions, and the focus is on altering its incentives by creating competition between local governments through decentralization. Qian and Roland argue that this is one of the main specificities of Chinese reforms so far. Indeed, important improvements in enterprise incentives have taken place in China despite the absence of privatization programs. Most of these improvements have taken place in the township and village enterprises which are not privately owned but started booming after the beginning of the reform process (see, e.g. Weitzman and Xu, 1993 ; Che and Qian, 1994 ; Bolton, 1995 and Li, 1995).

Qian and Roland insert the setup of section II in a general equilibrium framework with the following objective function  $W$  for the government :

$$W = x(K,I) + y + u(z)$$

where  $K$  is the level of foreign capital investment into the area and  $I$  and  $z$  are, respectively, the level of public infrastructure investment and public consumption. Moreover,  $y$  is the net return of financing and refinancing firms (including managerial private benefits), while  $x(\cdot)$  and  $u(\cdot)$  are the net returns of the two forms of investment and of public consumption. Assume positive decreasing marginal returns as well as **complementarity** between  $K$  and  $I$ .

The degree of decentralization of decisions can be seen to influence the budget constraint firms face through the intensity of capital mobility across regions. Maximizing the objective function  $W$  implies refinancing bad firms, and thus a soft budget constraint, if and only if :



$$E_b + \pi_b^* - 1 \geq \frac{\partial x(K, I)}{\partial I} + \frac{\partial x(K, I)}{\partial K} \frac{dK}{dI} = u'(\tilde{z})$$

where the left-hand side ( $E_b + \pi_b^* - 1$ ) is the net increase in  $y$  when one unit of funds is used to refinance bad firms, while the right-hand side is the net return to infrastructure investment or public consumption ( $\tilde{z}$  being the equilibrium level of public consumption). Decentralization can then harden the budget constraint of firms because local governments will compete with one another to attract foreign capital to their region by investing more in infrastructure. In other words, decentralization leads to an increase in  $dK/dI$  (for simplicity, Qian and Roland assume that  $dK/dI$  is zero for the country as a whole, but positive at the regional level). Regional governments will thus divert funds towards infrastructure investment and away from public consumption for the purpose of fiscal competition. Simultaneously, refinancing bad firms will have a higher opportunity cost, since  $u'(z)$  has increased. Call  $\tilde{z}$  the equilibrium level of public consumption with decentralized government. Provided  $u'(\tilde{z}) > (E_b + \pi_b^* - 1)$ , only good projects are financed under decentralization, since bad entrepreneurs expect to be terminated.

It is interesting to compare the results of Qian and Roland (1994) with those of Wang (1991), who sees decentralization as increased autonomy given to enterprises. These receive from the central planner fixed investment and circulating capital which are combined using a Cobb-Douglas production function. Increased autonomy allows enterprises to decide how to allocate funds between fixed investment and circulating capital, thereby raising the risk that firms might strategically misallocate their funds in order to force the government to increase spending in their favor, which can lead to inflation if government spending is financed by money creation. Partial enterprise autonomy can thus lead to a softening of budget constraints because it gives more room for strategic distortions.

## VI. Decentralization of credit and banking reform.

### Decentralization of credit

The setup of section II is also compatible with a  $\pi_b^*$  that reflects pure profit-maximization motives. Indeed, in the presence of sunk costs, sequential profit maximization can be inferior to *ex ante* profit maximization. In this case, privatization alone will not solve the soft budget constraint problem unless it is accompanied by other institutional changes. Dewatripont and Maskin (1995) show that the decentralization of credit may be a crucial element in hardening budget constraints. As in the previous sections, this is achieved through a reduction in  $\pi_b^*$ .

Assume that the continuation value of bad projects depends on an effort level “a” to be exerted by the initial creditor. Specifically, assume that the gross (discounted) financial return of a bad project that is refinanced is either 0 or  $\bar{R}_b$ , and that the probability of  $\bar{R}_b$  is a. Finally, assume a to be private information to the initial creditor, who incurs effort costs  $\Psi(a)$ , assumed to be increasing and convex in a.

In this case, **centralization** of credit means that the initial creditor will also be the one refinancing a bad firm, so that the chosen effort level  $a^*$  will fully internalize the benefit of monitoring :

$$\pi_b^* = \text{Max}_a \{ a\bar{R}_b - \Psi(a) \}, \text{ and } \bar{R}_b = \Psi'(a^*).$$

Under **decentralization**, the initial creditor is liquidity constrained, and refinancing has to be performed by a new creditor who has not observed monitoring effort. Given an expected effort  $\hat{a}$  and limited resources for the firm and the initial creditor under perfect competition among new creditors, the refinancing contract will grant  $1/\hat{a}$  deducted from  $\bar{R}_b$  whenever the bad project ends up being « successful » (since, by assumption, no resources are available if the

project is unsuccessful). Given  $\hat{a}$ , the effort level privately chosen by the first creditor will lead to :

$$\pi_b^{**} = \text{Max}_a \left\{ a \left( \bar{R}_b - \frac{1}{\hat{a}} \right) - \Psi(a) \right\}$$

In equilibrium, this effort level  $a^{**}$  is equal to  $\hat{a}$ , and satisfies :  $\bar{R}_b = \Psi'(a^{**}) + 1/a^{**}$ . Consequently,  $a^{**}$  is lower than  $a^*$ , and the associated continuation value of the project  $\pi_b^{**}$  is lower than  $\pi_b^*$ . If  $\pi_b^{**} < 1 < \pi_b^*$ , decentralization of credit, as defined above, hardens the budget constraint of the firm.

The general insight behind this result is that decentralized finance may lead to externalities that reduce the attractiveness of refinancing. This suggests that bond or equity finance will typically involve a harder budget constraint than bank finance, a point also stressed by von Thadden (1995). Other models explaining why multiplicity of creditors can change refinancing outcomes include Bolton and Scharfstein (1995), Berglöf and von Thadden (1994), Dewatripont and Tirole (1994) and Hart and Moore (1995).

Note that, in the above setup, if  $\pi_b^{**}$  is bigger than 1, decentralization of credit is **worse** than centralization, since the refinancing of bad projects is not prevented, but occurs with inefficiently low monitoring. If one allows endogenous creditor size in a market economy, it is however possible to show that, in this case, a market economy will simply replicate the centralized financing pattern : in equilibrium creditors will have sufficient resources to perform the refinancing themselves (see Dewatripont and Maskin (1995)). While the market system is thus unambiguously better than exogenous centralization, this is not always true under alternative model specifications<sup>vi</sup>.

### **Competition from new projects**

In transition economies, the creation of a decentralized system of credit and financial intermediation has been at the heart of recent policy debates aimed at hardening budget

constraints of enterprises. The literature on soft budget constraints in banking has emphasized the importance of the quality of the loan portfolio in determining whether banks are effective in disciplining enterprises. For example, Berglöf and Roland (1997) take a variant of the model in section II but endogenize banks' opportunity cost of refinancing. Assume at time 0 a capital of  $C_0$  is handed over by government to a profit-maximizing bank. This capital is used to finance  $C_0$  projects with the same characteristics as above. At time 1, the bank can use the returns generated in the first period to finance new projects (assumed to be in infinite supply) and/or to refinance bad projects financed at time 0. After time 1, everything is exactly like in section II: new projects financed at time 1 can be refinanced at time 2 and will be since  $\pi_b^* > 1$ .

Will bad projects be submitted at time 0? This depends on the opportunity cost of refinancing these projects at time 1 given the possibility to finance new projects. Since there will be soft budget constraints at time 2, the expected net return to a new project financed at time 1 is  $\alpha(R_g - 1) + (1 - \alpha)(\pi_b^* - 2)$  while the net return to refinancing a bad project is  $\pi_b^* - 1$ . One easily sees that hard budget constraints obtain at time 1 (and thus no bad project are submitted at time 0) if:

$$\alpha > \bar{\alpha} = \frac{1}{R_g - (\pi_b^* - 1)}.$$

Instead, if  $\alpha < \bar{\alpha}$ , soft budget constraints obtain at time 1. One also sees that  $\bar{\alpha}$  increases with  $\pi_b^*$  but decreases with  $R_g$ . In other words, if the expected quality of projects is high enough, hard budget constraints obtain because, even though refinancing a bad project is in itself profitable, it is less so than financing a new project. Note that by assuming that new projects would be subject to soft budget constraints at time 2, we have made the financing of new projects less attractive than if hard budget constraints were expected.

The first lesson is that soft budget constraints are not an issue if new projects are of sufficiently good quality. This may explain why soft budget constraints are not a more pervasive phenomenon in advanced market economies and why they still are in transition economies, where entrepreneurial skills are only developing. The second lesson is that, when there are soft budget constraints at time 1, new projects are crowded out by the refinancing of bad projects. Indeed, under hard budget constraints, funds in amount of  $C_0(R_g - 1)$  can go to

new projects. Instead, under soft budget constraints, it is only  $C_0 (\alpha R_g - 1) - (1 - \alpha)$  that is available for new projects because: (i) fewer returns are generated from the projects financed at time 0, and (ii) bad projects must be refinanced.<sup>vii</sup>

### Rent-seeking by banks

Another important issue in transition economies is the relation between banks and government. We have seen above that banks may be soft because of sunk costs. Berglöf and Roland (1995) show that enterprises may still have soft budget constraints even in the case where banks have no intrinsic interest to refinance firms, i.e. when  $\pi_b^* \leq 1$ . Indeed, even in that case, banks may benefit from exploiting the softness of government. This will be the case if the government, who cares about total welfare, would favor refinancing because  $\pi_b^* + E_b > 1$ . Banks may then, under certain conditions, prefer rent-seeking, in order to obtain subsidies for bailout, rather than being hard towards enterprises. Softness of banks is here related to the weakness of government. As above, softness will depend on the average quality of projects as expressed by  $\alpha$ .

Take the same framework as the one just analyzed above. Assume that the government first gives a bank funds to finance  $n$  projects at time 0. At time 1, the bank can decide to be hard and liquidate bad projects or instead to ask the government for subsidies to refinance bad projects. Assume that the bailout money provided by government just covers the difference between the total refinancing requirements of the bank and its total funds at time 1, that is  $(1 - \alpha)n - \alpha n R_g$ , which we shall call  $G$ . Assume moreover that the government cannot recover this bailout money, which in effect represents subsidies. The government can however monitor the use of funds so that the bank cannot “take the money and run” but has to refinance firms.

Assume the bank has initially attracted a proportion  $(1 - \alpha)$  of bad projects. At time 1, it will prefer rent-seeking towards government and softness towards enterprises compared to termination of bad firms if :

$$G - (1 - \alpha)n(1 - \pi_b^*) = n((1 - \alpha)\pi_b^* - \alpha R_g) \geq 0,$$

or :

$$\alpha < \overline{\alpha^H} = \frac{\pi_b^*}{R_g + \pi_b^*}.$$

As above, one obtains soft budget constraints when the proportion of good projects is below a given threshold. In this case, it is because a lower  $\alpha$  generates less revenue at time 1 for the bank and thus enables it to obtain more subsidies. In other words, the lower the  $\alpha$ , the lower the share of the bank in the costs of refinancing bad projects.

Berglöf and Roland (1995) further show that initial bank recapitalization allows to harden budget constraints provided banks are free to choose the number of projects they want to finance. It is then in the interest of banks to set aside enough reserves as a commitment to be hard. The lower the  $\alpha$ , the higher this level of reserves must be, and thus the smaller the number of projects that can be financed. Low initial average project quality thus implies that hardening budget constraints has a high cost in terms of enterprise liquidity. Moreover, hard budget constraints can be obtained if at time 1, a proportion of bad loans are taken away from banks and put into a “hospital bank”, which can remove banks’ incentives for rent-seeking and softness. It is however costly for the government, who will then bear all the cost of refinancing. One can show that such a solution is attractive for the government only if  $\alpha$  is above a given threshold.<sup>viii</sup>

## VII. Concluding remarks.

This short survey has considered the soft budget constraint syndrome as a dynamic commitment problem. It has stressed the various uses this approach can be put to in the context of analyzing the process of transition towards market decentralization. This approach can deliver insights when evaluating instruments such as privatization, demonopolization, government sector reform and credit market reform. In all cases, taking a dynamic commitment perspective leads one to stress the institutional dimensions of the transition process : hardening

budget constraints is by no means a simple mechanical decision, but instead requires credibly altering the incentives of the government and of market participants.

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## Endnotes

i This paper builds upon Maskin (1996) and Dewatripont and Roland (1996).

ii For example, Aghion, Blanchard and Burgess (1994, p. 1331) write "...subsidies, a plausible characterization of a soft budget constraint". Boycko, Shleifer and Vishny (1995, p. 314) write "...subsidies from the Treasury to firms, also known as soft budget constraints".

iii Mitchell (1994) shows, with the help of a formal model that banks tend to be soft with enterprises because initiation of bankruptcy would signal their fragile financial position.

iv Qian (1994) has shown how this formalization of the soft budget constraint problem may lead to the rational use of shortages by the planner as a way to alleviate this problem.

v This differs from a static problem à la Stiglitz-Weiss (1981) where creditors can at best finance all types, and at worst solely finance bad types.

vi While hard budget constraints can deter bad entrepreneurs from starting projects, von Thadden (1995) and Dewatripont and Maskin (1995) have pointed out that they can induce short-termism among good entrepreneurs. Specifically, introduce into the above framework the ability for good entrepreneurs to choose between their good, quick

project that yields  $R_g$  and  $E_g$  after one period and a good but slow project that yields 0 after one period (and  $E_t < 0$  if terminated) but a gross financial return  $R_l > 2$  and a positive private benefit  $E_l$  if refinanced. These projects thus have a positive net present value but, at the end of period 1, they cannot be distinguished from bad projects. This can in fact introduce a coordination problem among good entrepreneurs. Indeed, consider the case of section II where decentralization of credit is

necessary and sufficient for a hard budget constraint, that is,  $\pi_b^* > 1 > \pi_b^{**}$ . One can then show that: (a) there always exists an equilibrium where credit is

decentralized, the budget constraint is hard and all good entrepreneurs choose short-run projects; (b) for  $R_l$  sufficiently large, there also exists an equilibrium where credit is centralized, the budget constraint is soft and all good entrepreneurs choose long-run projects; (c) the second equilibrium Pareto-dominates the first one. Intuitively,

when  $\pi_b^* > 1 > \pi_b^{**}$ , decentralized financing is the only way to deter bad projects from being started. Expectations by creditors that all long-term projects are bad are self-fulfilling, since good entrepreneurs expect termination if they do not choose quick projects. Another equilibrium is, however, possible if financing all long-term projects, good and bad, is more profitable than financing solely good, quick projects. In that case, creditors' expectations that all good entrepreneurs choose long-term projects are also self-fulfilling. In this case, the hard budget constraint equilibrium induces « short-termist » behavior which more than offsets the gain from deterring bad long-term projects from being started.

vii We assume  $a > 1/R_g$  so that the returns from the good projects can always serve to refinance the bad projects.

viii For an analysis of the hospital bank solution, see also Aghion, Bolton and Fries (1996).