Recent Theoretical Work on the Soft Budget Constraint

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The soft budget constraint is a syndrome that was identified and studied by János Kornai in his analysis of centrally planned economies (see, Kornai, 1980). The syndrome is said to arise when a seemingly unprofitable enterprise is bailed out by the government or the enterprise's creditors. In other words, the enterprise is not held to a fixed budget, but finds its budget constraint "softened" by the infusion of additional credit when it is on the verge of failure. Kornai viewed the soft budget constraint as a crucial ingredient for explaining the salient features of socialist economic performance, in particular, the pervasiveness of shortages.

One interesting puzzle is why centrally planned economies have been particularly susceptible to the influence of the soft budget constraint; the capitalist world is hardly immune, as the recent financial crisis in Asia attests, but on the whole it has proved less vulnerable. Indeed, the very origin of the soft budget constraint and the mechanism by which it gives rise to shortages and other undesirable effects are also obviously important questions.

Although Kornai's work has long been well known and appreciated, answers to these associated theoretical questions have been hazarded only recently. In Maskin (1996), I surveyed some of the initial efforts in this direction, including Mathias Dewatripont and Maskin (1995), which argues that centralization of credit can give rise to soft budget constraints because it facilitates the refinancing of

projects that should never have been funded in the first place; Yingyi Qian (1994), who shows how such refinancing may have contributed to the recurrent shortages suffered by the Soviet bloc economies; Qian and Chenggang Xu (1998), who demonstrate that soft budget constraints can help explain the relatively poor performance of the Soviet Union in developing new technology; Ilya Segal (1998), who places blame for soft budget constraints on the centralization of production; and David Li (1998), who models the idea that soft budget constraints may be linked to public ownership of capital. Mark Schaffer (1989) and Steven Goldfeld and Richard Quandt (1988) also model the soft budget constraint but do not attempt to explain its contrasting effects in centrally planned and market economies.

In this paper, I examine some theoretical analyses undertaken since my earlier survey (see also Dewatripont et al. [1998] for a review of work on transition).

I. Agency and the Soft Budget Constraint

Chong-en Bai and Yijiang Wang (1998) show that soft budget constraints can occur as a result of the centralization of capital ownership and the concomitant need to rely on agents to monitor the allocation of capital. Formally, suppose that the Center "owns" a large number of potential projects but must rely on an Agent to assess each project's profitability and hence whether or not it should be launched. Suppose that a project, if launched, takes two periods to complete and requires a capital input costing c each period. The Agent can exert (unobservable and costly) effort to pre-screen the expected gross returns of a fraction e of these projects *ex ante* (where e increases with effort). It then launches a number of the potential projects,

including, presumably, all projects that its pre-screening indicates are profitable (i.e., the projects whose expected gross return minus $2c$ is positive), but possibly also some projects that have not been pre-screened). At the end of the first period, it learns the expected gross returns of all launched projects and can choose to terminate some of them, thereby saving the cost c of continuing them for a second period. Presumably, any project that is terminated would be one that is unprofitable to complete (i.e., one for which the expected gross return minus c is negative), but as will be seen, not all unprofitable contracts ought to be terminated.

The Agent requires a fee from the Center to induce it to exert effort. But because effort is unobservable, the fee must be made contingent on the variables that the Center *can* observe: the total net return (which is assumed to be the sum of the expected gross returns of completed projects less the capital costs of all completed and terminated projects plus the realization of a shock common to all projects), the number of projects launched, and the number of projects terminated after the first period. In fact, since they are assumed to be observable, we can think of the launch and termination numbers as being chosen directly by the Center as part of the fee schedule. Assume that, on average, a project that is not pre-screened turns out to be unprofitable to complete. Bai and Wang (1998) show nevertheless that if the Agent is risk-averse, then the optimal fee schedule will have the properties that the Agent should (i) launch some projects that it has *not* pre-screened and (ii) allow some unprofitable projects to be completed.

To see why this is so, note that the crux of designing an optimal fee schedule is inducing the Agent to undertake sufficient pre-screening effort. Suppose, for example, that there are just two possible levels of effort: an optimal level and lower level. Then one would expect that, when confronted with the optimal fee schedule, the Agent will be left just indifferent between these two levels (i.e., the Agent's "incentive constraint" will be binding). Now suppose, contrary to the above claim, that when facing the optimal fee schedule, the Agent launches no project that it has not pre-screened (i.e., the set of projects

launched consists only of projects that pre-screening indicates are profitable). Suppose that the Center now slightly increases the number of projects it requires to be launched. This will, in effect, force the Agent to launch some projects that it has not pre-screened (it could alternatively launch some projects that have been pre-screened and shown to be unprofitable, but this option would be dominated). Since this change will reduce the overall net return on average, it will lower the Agent's expected fee. Thus, the Agent's expected utility will fall, whether it exerts the optimal or lower level of effort. But because its marginal utility of income is higher in the low-effort case (since the overall net return and, hence, the corresponding fee are lower in that case) its expected utility will fall more than when its effort is optimal; indeed, in the optimal-effort case, the fall in expected utility is zero to the first order. Hence, the Agent's incentive constraint will be relaxed, which, given that the fall in the Agent's utility when it exerts optimal effort is (almost) zero, means that the fee schedule could not have been optimal to begin with, and so property (i) is established. For exactly the same reason, if the Center slightly decreases the number of projects it requires to be terminated after the first period (i.e., slightly increases the number of projects it requires to be completed), starting from the point where (if the Agent exerts optimal effort) no unprofitable projects are continued to completion, the Agent's expected utility will again fall more for low than for optimal effort, implying the same sort of incentive constraint relaxation as before. This establishes property (ii).

That the Agent is induced by the optimal fee schedule not to terminate some projects it expects to be unprofitable is very much in the tradition of the soft budget constraint. Indeed, there is a sense in which the "softness" is even more striking in this model than in earlier formalizations such as that of Dewatripont and Maskin (1995). Specifically, in the Dewatripont-Maskin model, softness arises because projects are launched that then turn out to have been *ex ante* unprofitable (i.e., unprofitable before any capital has been sunk). Yet they are nonetheless completed because they are *ex post* profita-

ble (i.e., profitable after the first-period capital expenditure has already been made). In the Bai-Wang framework, by contrast, even some projects that are *ex post* unprofitable are nevertheless completed as a way of inducing the Agent to exert sufficient effort in pre-screening.

II. Multiple Financiers and the Soft Budget Constraint

In the Dewatripont and Maskin (1995) model, an entrepreneur may have the incentive to seek financing for a project that is *ex ante* unprofitable because its poor prospects are discovered by the financier only after she has already made a significant capital investment. At that point, the financier may well be better off allowing the project to be completed by making a further infusion of capital. The question then arises: how do capitalist economies succeed in "hardening" such a soft budget constraint, thereby discouraging entrepreneurs from proceeding with poor projects in the first place? The answer proposed by Haizhou Huang and Xu (1998a) is that a multiplicity of financiers can help constrain refinancing. Suppose that *two* financiers make the initial capital investment in an entrepreneur's project. Assume, furthermore, that the financiers arrange matters so that each receives private information about the best way to make any further investment. To be more concrete, imagine that each financier i, $i = 1, 2$ observes a private real-valued signal s_i. If additional investment later proves necessary, the project can be completed according to "plan A" or "plan B." However, which plan is better depends on the financier's signals: if $s_1 > s_2$, plan A is preferred, whereas the reverse is true if $s_1 < s_2$. Suppose that the financiers have set things up so that the difference between financier 1's gross payoffs (i.e., before any *ex post* transfer) from plans B and A is increasing in s_1, whereas the difference between financier 2's gross payoffs from plans A and B is increasing in s_2. Then it can be readily shown that there is no mechanism that both induces the financiers to reveal their signals truthfully and uses this information to make the efficient choice of A or B. (To see this intuitively, note that there is an inherent conflict between effi-

ciency and incentives: as s_1 rises, plan A becomes more likely to be efficient, but financier 1's preference for plan B grows stronger.) Of course, the financiers could choose between the plans by randomizing, but such a resolution might well be so inefficient as to be dominated by simply liquidating the project.

Hence, by deliberately ensuring that they have different information, the financiers may be able to commit themselves not to refinance a project that they have already invested in. That such multi-party financing arrangements are possible under capitalism may be one reason why capitalist economies seem better at hardening budget constraints than their socialist counterparts, where there is, in effect, only a single financier.

This point of view leads to the prediction, as Huang and Xu (1998a) note, that the riskier a project (the risk being the possible requirement of additional infusions of capital), the more likely it is to be financed by multiple investors (of course, such financing could also be explained by the wish to share risk). Huang and Xu also appeal to Korea and Taiwan as contrasting case studies (see Huang and Xu, 1998b, 1999). Korean corporate borrowing has typically entailed far fewer creditors than has been the case in Taiwan; and so, the authors argue, the Korean economy was more vulnerable to soft budget constraints when it was struck by the Asian financial crisis.

III. Government Decentralization and the Soft Budget Constraint

Qian and Gérard Roland (1998) argue that devolution of fiscal authority from central to local government (which they call federalism) works against soft budget constraints. They posit a three-level hierarchy, with central government at the top, a collection of independent local governments in the middle, and a set of state and non-state enterprises at the bottom. In the case of centralized authority, the central government taxes state enterprises and uses the proceeds for transfers to state employees, public infrastructure investment, and bailouts to state enterprises. In the case of federalism, each individual local government taxes and spends within its jurisdiction. In either case, it

is assumed that governments act to maximize welfare (although local governments are interested only in local welfare).

Certain state enterprises will be profitable only if they undergo restructuring. But restructuring is costly to an enterprise's manager and so will be undertaken only if the enterprise would otherwise go bankrupt. Therefore, if the manager anticipates that he will be bailed out by the government, he will not restructure. Whether or not a bailout occurs depends on the opportunity cost of the government's funds, in particular, the marginal benefit of investing in infrastructure. In the case of federalism, the various local governments must compete among themselves to attract outside capital to their non-state enterprises. Infrastructure investment raises the marginal product of capital and therefore is a useful instrument in the competition for capital. Indeed, under federalism, the private marginal benefit of investment will exceed its social marginal benefit (since a local government ignores the loss imposed on another jurisdiction when it lures capital away). Hence, the opportunity cost of bailing out failing firms is higher under federalism than under centralized fiscal authority (where infrastructure investment is efficient), and this implies that federalism entails a harder budget constraint. As Qian and Roland (1998) note, this contrast is consistent with the historical experience of the Chinese economy before and after reform.

IV. Market Information and Soft Budget Constraints

It is often taken for granted in discussions of privatization that the information generated by free markets (e.g., prices) is unequivocally a good thing. Antoine Faure-Grimaud (1996) shows, however, that such a conclusion is unwarranted in the context of soft budget constraints: such information can readily make things worse.

Consider a regulated firm undertaking a large investment project whose probability of success depends on (unobservable) effort by the firm's manager. Suppose that the regulator has the ability to divert capital to the firm (in a noncontractible way) to ensure the success

of the project. Diversion is costly, however, and so if there is a good chance that the project would succeed anyway, the regulator will refrain from such action. Indeed, assume that, when the manager chooses the optimal level of effort, the probability of success is high enough to deter the regulator from engaging in diversion.

But imagine that, owing to privatization, a stock market is created and that the firm becomes publicly owned. Thus, in addition to the regulator, there are now many other "monitors" of the firm's behavior, namely, its shareholders or potential shareholders. This additional scrutiny is likely to improve the quality of information about the firm. Assume that the firm's stock market value accurately predicts whether or not the firm's project will succeed. This advance warning enables the regulator to intervene selectively whenever the project seems likely to fail. But the guarantee of having the project bailed out in advance of any failure destroys the manager's incentive to exert effort. And thus the ultimate effect of the stock market may well be harmful to the firm.

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