Crony Capitalism and Financial System Stability

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I. Introduction

Prior to the Asian financial crisis, the cozy relationships between corporations, governments and banks were seen as a potent force for economic growth and development. In the wake of the crisis these same links were derogated as crony capitalism, and blamed for many of the economic ills suffered by the now wounded tigers.

In this paper, we examine the institution of crony capitalism. Under conditions in which the Second Welfare Theorem does not hold, there is a role for government. Some governmental institutions do encourage more risky, high payoff entrepreneurial activities. Our aim is to examine crony capitalism as a source of both economic growth and financial crisis.[1]

We begin with a characterization of the relationship between banks and firm, sans cronies. The economic environment is marked by moral hazard as borrowers have access to both positive and negative expected net present value projects. Competitive risk-neutral banks can induce risk-neutral borrowers to undertake the positive expected net present value projects by requiring that the borrowers take an equity stake in the projects. In equilibrium, only positive expected net present value projects are funded, banks earn zero profits, and, by appealing to the law of large numbers, there is no bankruptcy risk to banks.

We next introduce a crony system under which the government agrees to guarantee some percentage of its cronies' loan payments in the case of project failure. Crony status garners a firm pecuniary and, possibly, nonpecuniary benefits. The government's guarantees are off-balance sheet (both the government's and the banks') and are not the result of formal legislative or

[1] We forego an analysis of the optimal institutional arrangement. Rather, we take the existence of cronyism as given, comparing macroeconomic outcomes. See Haslag and Pecchenino(2002) for a detailed analysis of the welfare impacts associated with cronyism.

executive action or formal loan negotiation.[2] Rather, these guarantees can be seen as a mechanism by which the government makes *sub rosa* rewards to its friends and family and also buys their political loyalty. Crony lending makes up only a small part of a bank's balance sheet, so the attendant risk cannot be diversified away. To ensure their own solvency, banks must put their own capital at risk. Given a firm's crony status and the loan guarantee, the bank writes a crony-specific loan contract that takes the crony's incentives to undertake the high-risk project into account as well as the bank's need to remain solvent should a crony's project not pay off.

In this setup, we show that financial crisis will occur in only if the government fails to honor its guarantees. Such failure can occur because the government faces unforeseen external constraints (e.g., constraints imposed by the IMF and/or revenues are inadequate) or will not make good on its contingent liabilities because the government that had extended the guarantees has been removed. We extend the model economy by introducing crony effort. More specifically, crony firms improve the return distribution of the projects they undertake by putting forth unobservable effort in order to garner nonpecuniary benefits, such as political power and prestige. We also show that such crony systems, in and of themselves, may induce project quality improving effort if the nonpecuniary benefits to crony status are high enough. If this is the case, a crony system would not necessarily lead to reductions in output or increases in bank portfolio risk, but the demise of a crony system would.

While much has been written about the Korean *chaebol* and the Japanese *zaibatsu*, what some consider classic crony institutional forms, we use Occam's razor to pare the institutional structure of crony capitalism to its bare minimum: crony firms receive implicit financial support from the government. We model this as an explicit off-balance sheet guarantee on a crony firm's loan payments in the event of project failure. The relationship bears a strong resemblance to the government-public enterprise relationship explored in Shleifer and Vishny (1994). In Shleifer

[2] As the reader will see, taxes are legislated to back the government guarantees. That these tax revenues are so used is known to the government, but not to the taxpayers. "Off the books" refers to the fact that crony status is absent from the government's books and the banks' books.

and Vishny, the government makes direct transfers to firms to meet their expenses, we do not. Thus, their model is silent on the spillover effects from cronyism on the financial system. Faccio (2002) finds that such spillovers are pervasive in crony-type systems found in Indonesia and Malaysia, as well as Italy and France. Even in countries where cronyism/corruption is low, Faccio (2002) finds that politically connected firms (cronies) tend to have higher debt to equity ratios and lower profits that their less well-connected peers. Her empirical results are mirrored in our analysis.[3]

There is a large literature specifically on the Asian financial crisis. In a closely related paper, Corsetti, Pesenti, and Roubini (1999) examine a model with productivity shocks. They derive conditions under which a reduction in foreign loans is supplanted by government funding. To finance these loans, the government must rely more heavily on seigniorage. Thus, Corsetti, *et al.* proposes an explanation for the coexistence of a financial crisis and a currency crisis. Our model shares some key features with Corsetti, *et al.*; specifically, the presence of moral hazard and some implicit government transfer programs. However, the timing and purpose of the government intervention is different in their model. Further, and in contrast, our focus is on the financial system and optimal loan and deposit contracts banks write contingent on the government guarantee. The deposit contract guarantees depositors a certain, net of tax, return. Depositors are not immune to the ill effects of cronyism because of the tax burden. As such, a financial crisis—when the government stops supporting the crony and the bank's equity is gone—reduces the depositors expected tax payments, which is good, but may also obliterate their deposit accounts, which is bad.

Our model also bears some resemblance to the models of government loan guarantees.[4] There are at least two important differences between our work and the existing literature studying loan guarantees. First, the previous literature focuses on the effect that loan guarantees have with

[3] Faccio (2002) provides an excellent review of the literature on politically connected (crony) firms.
[4] See, for example, papers by Sosin, 1980; Chaney and Thakor, 1985; Innes, 1991; Lai, 1992; Li, 1998

regard to safeguarding jobs or protecting an essential industry (e.g. agriculture). In addition, previous work examines cases in which the guarantee is offered only after the firm has already defaulted on its loan. In other words, the guarantee is not a precondition for the loan being made. In our work, the loan contract is written contingent on the borrower having crony status, that is, a loan guarantee; the guarantee itself is the mechanism by which those in power redistribute wealth away from taxpayers to their cronies.

While the model design differs from previous work, our results are similar to other papers examining the effects of government transfer programs. For instance, Gale (1991) studies the efficiency costs associated with Federal credit programs that are broadly similar to the efficiency costs of cronyism. In both cases, the efficiency costs can be large; that is, the wealth transfers from taxpayers to the owners of the firm receiving the loan guarantee (Selby, et al., 1988) can be high as are the wealth transfers to cronies. In addition, a firm with a government guaranteed loan (Chaney and Thakor, 1985), like a crony, will choose riskier projects and a more highly levered capital structure. However, none of the previous work on loan guarantees asks how the financial system and overall economic performance may be affected, for good or ill. We do.[5]

Our main results are easily summarized in the following points:

(1) Higher loan guarantee rates lead to lower bank capital and a more risky financial system.

(2) Aggregate risk is, generally, higher in crony systems.

(3) Bank solvency is inversely related to the pervasiveness of cronyism and to crony borrowers' equity stake.

[5] The effects on the financial system of crony relationships are similar to those associated with deposit insurance. However, bank portfolio risk is not increased and risk is fairly priced when the crony guarantees are introduced. The ultimate impact on the financial system outcomes are similar if the government fails to honor the guarantees since it is banks and bank depositors who are hurt ex post.

(4) Moral hazard and the exigencies of the government's on-balance sheet commitments, imply that there are realizations that can destabilize an otherwise healthy banking system.

The paper is organized as follows. In Section 2, we describe the model economy, including the bank's decision rules. We analyze the effects produced by changes in the government's loan-guarantee rate in Section 3. We discuss the expected impact of the crony loan guarantee in terms of the redistribution of wealth in Section 4. In Section 5, we discuss the ramifications associated with an unexpectedly large number of crony defaults. Specifically, at some point the loan guarantee will swamp the government's revenue, the government will have to ration credit thus precipitating calls on capital and a potential collapse of the banking system. In Section 6, we modify the economy to consider the effects that nonpecuniary benefits of crony status could have on financial sector risk and aggregate output. A brief summary is presented and conclusions are drawn in Section 7.

II. The Model

The model is based on the standard model of banking under moral hazard. The economy exists for three periods: t = 0, 1, 2. There is a large number, N, of risk-neutral project owners. Each project owner has initial wealth of $w<1$ and has access to two projects, A and B, both of which require an initial investment of 1. If project A is funded in period 0 it will yield $R^A>1$ in period 1 with probability ϕ^A, and 0 with probability $(1-\phi^A)$. If project A is successful in period 1 then the project owner can continue the project (with an investment of 1) with payoff R^A with probability ϕ^A and 0 with probability $(1-\phi^A)$. If project A is unsuccessful, the project terminates. If project B is funded in period 0 it will yield $R^B>1$ in period 1 with probability ϕ^B and 0 with probability $(1-\phi^B)$. If project B is successful in period 1, a project owner can continue the project with an investment of 1. The distribution of payoffs is identical across time periods. If project B

is unsuccessful, the project terminates. Assume $\phi^A R^A > 1 > \phi^B R^B$, but $R^A < R^B$ (so $\phi^A > \phi^B$): project B is riskier (and has negative net present value). Assume cash flows are observable, but project choice is not. Further assume that project returns are i.i.d.

There is a large number, D, of risk averse individuals, hereafter labeled consumers. Each consumer is endowed with $d<1$ units of the consumption good in the initial period and zero in subsequent periods. Consumers have time-separable preferences, deriving utility from consumption in periods 1 and 2. Formally, consumer's preferences are represented by a utility function: $u(c_1) + u(c_2)$, with $u'(c_i) > 0$, $u''(c_i) \leq 0$, $u'(0) = \infty$ for $i = 1, 2$. Consumption takes place in periods 1 and 2 only. To consume in both periods, consumers lend their endowments to banks. Assume that $dD >> N$ and $\frac{1}{2}dD >> \phi^A N$ so that all projects could be funded initially with deposits alone and all successful projects can be refinanced with deposits alone: there are no liquidity problems inherent in the system.

There are many perfectly competitive, risk-neutral banks that can borrow at the risk free rate, 0, if they offer a certain return. Each bank is initially endowed with $\bar{k} \geq 0$ units of wealth (this can be thought of as equity capital).[6] Banks have access to a storage technology that allows them to transform units of time t goods into units of time t+1 goods one for one. In equilibrium, competition among banks will drive the interest rate paid on deposits to the rate of return on storage.

There is a government that may have a crony relationship with a positive fraction of the borrowers. If the government does have a crony relationship with a borrower, it agrees to guarantee some percentage, $\eta \leq 100$, of the borrower's loan payment in the event that the funded project fails. Any loans extended at period 1 are also guaranteed at the same rate. We will assume that the government does not extract any rents.

[6] See Hancock and Wilcox (1998) for an analysis on the interaction between bank size and loan guarantees operated by the Small Business Administration in the United States.

2.1 The Baseline (No Crony) Case

Assume initially that the government does not have a crony relationship with any of the borrowers. A bank prices a loan

(i) assuming that the borrower will choose project A

(ii) assuming that it will roll the loan over if A is chosen and is successful

(iii) knowing that if the borrower chooses project B and is successful the bank will know that it violated the contract (since cash flows are observable) and will not roll the loan over.

Then, the bank requires the firm to place its wealth in a risk free account, which reverts to the bank should the project fail, and demands repayment n_1 such that its expected first period gross return is 1

$$\phi^A n_1 + (1-\phi^A)w = 1 \Rightarrow n_1 = [1- (1-\phi^A)w]/ \phi^A. \tag{1}$$

Equation (1) simply says that the bank is willing to loan goods if and only if expected receipts from loan repayment and collateral confiscation equal the guaranteed return from storage.

If A is undertaken and is successful, the firm as of period 1 has wealth of R^A+w-n_1, which may exceed unity. If so, the firm can and will self-finance. Suppose, however, that $R^A+w-n_1<1$. The bank prices a loan to the firm (now locked into project A) requiring the repayment of n_2 such that

$$\phi^A n_2 + (1-\phi^A)[R^A+w-n_1] = 1 \Rightarrow n_2 = [1- (1-\phi^A)(R^A+w-m)]/ \phi^A. \tag{2}$$

For the borrower to be willing to accept the initial loan, it must be the case that its expected value at the beginning of period 1, $(R^A+w-n_1)\phi^A$, exceeds its wealth, w (the participation constraint is satisfied). At date $t=0$ the borrower also evaluates the value of the initial loan package, subsequent rollover and repayment. We assume the net proceeds from the successful first-period project are applied as collateral for the second period loan. Thus,

$$(\phi^A)^2(R^A+(R^A+w-n_1)-n_2) > w \Rightarrow (1+\phi^A)(\phi^A R^A-1) > 0. \tag{3}$$

Conditioned on the first-period loan being acceptable, the date $t=0$ agent is willing to participate in a rollover loan if the expected revenues from the rollover loan plus the expected proceeds from the first-period loan are greater than the endowment. The loan package is acceptable.

Given that the bank has priced the loan as if Project *A* is chosen, the natural question is whether the borrower will indeed choose Project *A* over Project *B*? The borrower will accept the loan and choose project *A* if the expected value of the firm is higher than if it were to choose project *B*. The expected value of the firm if it chooses project *B* given that the bank priced the loan assuming that project *A* would be chosen is $(R^B+w-n_1)\phi^B$, since if the borrower does choose *B* and is successful the bank will not roll the loan over (since cash flows are observable), and the borrower never chooses to self-finance a negative expected net present value project. Thus the borrower will choose *A* if

$$(\phi^A)^2\,(R^A+(R^A+w-n_1)-n_2) > (R^B+w-n_1)\phi^B$$

$$\Rightarrow \qquad (1+\phi^A)(\phi^A R^A-1) + w > (\phi^A R^B+w-1)\phi^B/\phi^A$$

Assume that this condition holds (otherwise the bank will not lend and the market will collapse).

By the law of large numbers and i.i.d. project returns, the bank earns zero profits with certainty, can repay depositors at the risk free rate of return (the return on storage) with certainty, and the individual borrower earns positive expected profits. Bank capital, either stored or invested, also earns the risk free rate of return, and is not at risk.

2.2 Cronies with (Ironclad) Government Guarantees

In this section, we modify the model economy. Suppose the government has crony relationships with N_2 borrowers, and has no relationship with the other N_1 borrowers; note $N_1 + N_2 = \text{N}$. If the government has a crony relationship with a borrower, it guarantees η% of the borrower's loan payment in the event that the funded project fails. A crony borrower is costlessly identifiable to the bank but not necessarily to depositors or non-crony borrowers.[7]

For non-crony borrowers the situation is as before. With N_2/N_1 small, the law of large numbers still applies to non-crony lending. For cronies, however, the situation has changed since the government now guarantees some fraction of their loan payments if their projects do not succeed. Because the number of cronies is small, the risk associated with crony loans cannot be diversified away. As a result, for the bank to be able to meet its contractual obligations to its depositors, it may need to put its capital at risk and/or to require that cronies collateralize their borrowing.

With government guarantees in place, the government's budget constraint becomes especially important. For simplicity, we assume that the government does nothing at date $t = 0$. We assume the government commits to a pattern of tax collections, imposing a lump sum tax of τ_t on all depositors at dates $t = 1,2$. It can also borrow at date $t = 1$. (Obviously, borrowing is not an option in period 2.) The government also sets the crony loan guarantee rate, η. Note that whatever the government guarantee does not cover, the bank and/or its depositors must absorb.

Table 1 summarizes expenses and revenues at each relevant date.

Table 1

Period-by-period Government Activity

Date	Expected Expenses	Revenues
1	$(1-\phi)N_2\eta c_1$	$N\tau_1+b$
2	$\phi(1-\phi)N_2\eta c_2 + R^b b$	$N\tau_2$

[7] There are plenty of examples of government loan guarantees that do not require crony status. See, for example, discussions in Riding (1997) and Thornton (1997).

We adopt the following notation: b is the quantity of government debt issued, R^b is the real return on government bonds, τ_t is the date-t lump-sum tax, and c_t is the loan repayment in period t. Thus, the expected present value government revenues are

$$N\tau_1 + \frac{N\tau_2}{R^b} \tag{5}$$

while expected present value government expenditures are

$$N_2\phi\eta c_1 + \frac{\phi(1-\phi)N_2\eta c_2}{R^b}\,. \tag{6}$$

Throughout our analysis, we will assume that the gross real return to government bonds is equal to the risk-free rate; thus, $R^b = 1$. In addition, the government smooths taxes across periods so that $\tau_1 = \tau_2 = \tau$. Hence, if the expected present value of expenses is equal to or less than the present value of revenues the government can meet its expected contingent liabilities

$$N_2(1-\phi)\eta c_1 + \phi(1-\phi)N_2\eta c_2 \le 2N\tau \tag{7}$$

otherwise the banks and possibly their depositors must absorb the losses. We assume throughout our analysis that τ and η are known and the government can pre-commit to each level. Should tax revenues exceed the value of the government's realized liability, the excess is returned to depositors.

By fixing government revenues that can be used to meet the government's implicit liability, we introduce the possibility that its realized liability will exceed its ability to pay. Clearly, a government could impose additional taxes or borrow to meet its liability. But, there are circumstances where such actions would not be feasible (for example, IMF scrutiny of government spending) or, perhaps, as a result of a change in government, not politically expedient.

Unlike the no-crony case, there are a number of contracts banks can offer crony borrowers. The actual contract offered is the result of a one-on-one negotiation between the bank and the crony firm. The outcome will depend on the bargaining strength of the two parties.

Assume, for simplicity, that at period zero crony borrowers are randomly matched to banks. If the crony and the bank cannot come to an agreement, the crony can revert to noncrony status or exit the market. To keep the analysis simple, we will not model the bargaining process, but present three contracts that could arise. Under Contract I the bank puts its own capital at risk but does not require the crony borrower to collateralize the loan. Under Contract II the bank puts its capital at risk and requires the crony to collateralize the loan. Under Contract III the bank does not put its capital at risk but requires the crony to collateralize the loan. We will examine the three contracts in turn. For notational simplicity we will drop the project identifying superscripts unless required for clarity.

2.3 Loan Contract I: Bank Capital, No Collateral

The bank sets contract terms: loan repayment, c, interest rate, r, and its capital holdings per crony loan, k, such that $k \leq \tilde{k}$, where $\tilde{k} = \frac{\bar{k}}{N_2}$ is bank capital per crony loan, in period 0 and then again in period 1 (since, from the perspective of the bank, the loans are identical). For the bank to be willing to lend three conditions must be satisfied. First, the sum of actual crony payments and bank capital must meet the deposits backing the crony loans in all states. This solvency condition is written as:

$$\eta c + k = 1 \tag{8}$$

Because the bank is putting up its own capital, the expected return to crony loans must exceed the return to storage to compensate the bank for risk taking. That is,

$$\phi c + (1-\phi)\eta c = 1 + r \tag{9}$$

Lastly, on average, the bank's capital stock is unchanged. In the "good" state, the bank receives (net) r goods from the crony loans and in the bad state there is a net loss of ηc-1 goods such that the following condition holds

$$\phi r + (1-\phi)(\eta c - 1) = k \tag{10}$$

Together equations (8) – (10) can be used to solve for the repayment level, the size of bank capital, and the real interest rate.

$$c = \frac{2}{2\eta + \phi^2(1-\eta)} \tag{11}$$

$$k = \frac{\phi^2(1-\eta)}{2\eta + \phi^2(1-\eta)} \tag{12}$$

$$r = \frac{\phi(2-\phi)(1-\eta)}{2\eta + \phi^2(1-\eta)} \tag{13}$$

The expected value of the crony firm under this contract is

$$[(1+\phi)\left[\phi R - \frac{2}{2\eta + \phi^2(1-\eta)}\right] + w] \tag{14}$$

The firm chooses to undertake project *A* or *B* depending on which generates the highest firm value. The bank first prices *A* assuming the crony will choose *A*, and then determines whether the crony will instead choose *B*. If so, the bank prices *B*. Thus the bank offers the crony the contract consistent with the crony's profit maximizing choice, taking as given that the crony undertakes the project for which the loan is priced. If the crony firm chooses to undertake project *B* and the bank chooses to lend on project *B* it is because the guarantee has distorted the payoff on the project from negative to positive net expected present value from the perspective of both bank and borrower.[8]

2.4 Loan Contract II: Collateral and Bank Capital

Should the bank require that the firm put up collateral and the bank puts up capital as well, it must be that $w<1-\eta$ since if the loan fails repayment is less than what is required to repay

[8] In short, the crony is the beneficiary of a government transfer program that Krugman (1998) referred to as "a game of heads I win, tails the taxpayer loses."

depositors in full. The bank sets contract terms in period 0, given $k_1 \leq \tilde{k}$, such that it is solvent in all states

$$\eta c_1 + w + k_1 = 1 \tag{15}$$

that it compensates its owners for risk taking

$$\phi c_1 + (1-\phi)\eta c_1 + (1-\phi)w = 1 + r_1 \tag{16}$$

and that the expected value of its capital is unchanged

$$\phi r_1 + (1-\phi)(\eta c_1 + w - 1) = k_1 . \tag{17}$$

Together equations (15) – (17) can be used to solve for the repayment level, the size of bank capital, and the real interest rate.

$$c_1 = \frac{2 - w(2-\phi^2)}{2\eta + \phi^2(1-\eta)} \tag{18}$$

$$k_1 = \frac{\phi^2(1-\eta-w)}{2\eta + \phi^2(1-\eta)} \tag{19}$$

$$r_1 = \frac{\phi(1-\eta-w)}{2\eta + \phi^2(1-\eta)} \tag{20}$$

If R-c_1+w>1-η, then c_2=1, k_2=0, and r_2=0 since the bank does not need to put its capital at risk to ensure that depositors are paid in full. Assume this is the case.

2.5 Loan Contract III: Collateral, No Bank Capital

If w>1-η the bank can require that the crony put up collateral, and that collateral will, along with the government payments, fully cover the bank's costs. The bank sets contract terms in period 0 and period 1 to solve

$$\phi c + (1-\phi)\eta c + (1-\phi)(1-\eta)c = 1 \Rightarrow c = 1 . \tag{21}$$

III. Comparative Statics: The Effects of Loan Guarantees

In this section, we analyze the effects that changes loan guarantee rate, η, would have on the features of the optimal loan contract and on the expected level of bank capital.

Proposition 1: *Consider an increase in the crony loan guarantee rate,* η*. Under Contracts I and II, one sees (i) a decrease in bank capital, (*k*); (ii) a decrease in the real interest rate (*r*); and (iii) and a decrease in the loan repayment, (*c*). A change in the crony guarantee rate, however, has no effect on loan repayment schedule for contract III.*

Proof: The proof follows immediately from equations (11)-(13) for contract I, equations (18)-(20) for contract II, and equation (21) for contract III.■

The loan guarantee reduces the risk to the bank of lending. Thus, the greater the guarantee, the less capital the bank needs to ensure its solvency, the lower the return required on its capital, and the lower the repayment required from the borrower. The lower repayment schedule increases the expected return to the borrower, thus making the crony better off.

3.1 Deadweight Loss of Cronyism

The government guarantee of some fraction of a crony's loan payments affects the loan contract the bank writes as well as the project that generates the highest profits for the crony firm. What is not altered is the number of risky loans financed by the banking industry. We interpret the product generated by the projects as GDP. With this interpretation and with all banks operating competitively, it is straightforward to compute expected *ex ante* GDP generated on risky lending.[9] Formally,

[9] Here, competition means that there is no incentive for any bank to write a different contract. Consequently, all banks write the same contracts. *Ex ante* is formalized in the notion of the expected level of GDP conditioned on what agents know at date $t = 0$.

$$E_0 GDP\Big|_{nocronies} = N[\phi^A[(1+\phi^A)R^A - 1] + w] \tag{22}$$

$$E_0 GDP\Big|_{cronies\ all\ do\ A} = N[\phi^A[(1+\phi^A)R^A - 1] + w] \tag{23}$$

$$E_0 GDP\Big|_{cronies\ all\ do\ B} = N_1[\phi^A[(1+\phi^A)R^A - 1] + w] + N_2[\phi^B[(1+\phi^B)R^B - 1] + w] \tag{24}$$

where E_i is the mathematical expectation taken as of period i. Clearly, if all cronies undertake project A there is no deadweight loss of cronyism to the economy. However, if all cronies undertake project B the expected deadweight loss of cronyism is

$$E_0 DWL = N_2[\phi^A(1+\phi^A)R^A - \phi^B(1+\phi^B)R^B - (\phi^A - \phi^B)]. \tag{25}$$

We summarize our findings with respect to the deadweight loss associated with crony loan guarantees in the following proposition.

Proposition 2: *(i) The expected deadweight loss created by crony loan guarantees is positively related to the number of cronies designated; (ii) all else equal, the expected deadweight loss is positively related to the variance of returns for project B.*

Proof: (i) Obvious. (ii) Holding ϕ^A and R^A constant, and subjecting the return distribution of project B to a mean preserving spread ($\phi^B R^B$ constant via a reduction in ϕ^B and an increase in R^B) yields

$$\frac{\partial E_0 DWL}{\partial \phi^B}\Big|_{MPS} = N_2(1 - \phi^B R^B) > 0 .\blacksquare$$

IV. Wealth Redistribution

Because the government imposes taxes to pay for the contingent liabilities generated by its crony relationships, cronyism redistributes wealth away from taxpayers to cronies and their bankers. All taxes are imposed on depositors. To compute the redistributions of wealth as a result of cronyism we first have to compute depositor, bank, and firm wealth without cronies, and then compute each group's wealth with cronyism, and then compute the difference. Throughout this section we will maintain the assumption that the government's tax revenues are sufficient to cover all its expected as well as realized liabilities. We will examine the expected wealth distribution as a result of risky lending only. The derivations are relegated to the appendix.

In the no-crony case, depositors earn the risk free rate of return on their deposits, bank capital is not put at risk (it is stored or replaces depositor funds one to one), and firms are rewarded for their risk taking.

Assume that the government sets the lump-sum tax high enough so that it can meet all its contingent liabilities, at least in expectation. Then, under contracts I and II, wealth is transferred from depositors to banks and cronies. Banks receive part of the redistributed wealth as a result of their need to put some or all of their capital at risk to meet their contractual liabilities to their depositors under the crony system. Since banks do not put their capital at risk under contract III, the expected transfer payment from depositors goes entirely to crony firms.

Clearly, the institution of crony lending funded via taxes on depositors impoverishes taxpayers, but it need not undermine the stability of the financial system should tax revenues be sufficient in all states to cover the government's contingent liability. Moreover, it may be difficult to distinguish a financial system characterized by cronyism from one absent cronyism. In both systems, collateralized lending may be the norm and crony lending can actually improve bank profitability.

V. Government Revenue Shortfall

Now suppose that the government's tax revenues are inadequate to meet its realized liability to the banks. As a result, the government is unable to honor some of its crony loan guarantees in period 1.[10] Specifically assume that γ_1% of crony loans are successful (γ_1 may

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[10] We are not thinking of the government as practicing time-inconsistent behavior. Remember, the government commits to a path of tax collections. In come circumstances, the small number of crony loans

differ from ϕ since the law of large numbers does not apply), γ_2% of crony loans fail and the government does not honor its implicit guarantees of these loans, and $(1-\gamma_1-\gamma_2)$% of crony loans fail and the government honors these guarantees. The question is, do the banks have the capital to absorb the losses and remain solvent? Clearly for contract III, the bank will fail because the bank does not hold capital. For both contracts I and II, there is the possibility of solvency.

5.1 Conditions for Solvency under Contract I

Proposition 3: *The bank is more likely to remain solvent the more successful crony loans there are and the smaller the share of the crony loans the government had promised to guarantee.*

Proof: Under contract I the banks' revenues are

$$N_2[\gamma_1 c + (1-\gamma_1-\gamma_2)\eta c] = N_2\left[\frac{2}{2\eta+\phi^2(1-\eta)}\right][\gamma_1 + (1-\gamma_1-\gamma_2)\eta]$$

and the bank's costs that must be covered are

$$N_2(1-k) = N_2\left[\frac{2\eta}{2\eta+\phi^2(1-\eta)}\right]$$

Thus, to remain solvent it must be the case that

$$\gamma_1\frac{1-\eta}{\eta} > \gamma_2 . \blacksquare$$

Should the bank remain solvent, its capital is depleted. In other words, its $t=1$ capital stock is smaller than k units per successful crony loan. The bank must either ration credit to cronies or raise more capital. Should the government want the banks to continue to lend to all remaining cronies given the banks' depleted capital position, the government would have to

means there is uninsurable aggregate risk. Suppose the tax-commitment technology keeps the government from changing its tax revenues by enough to support the revenue shortfall. This could be because the tax rate is set too low given the guarantee rate, the guarantee rate is set too high given the tax rate, or because an exceptionally large percentage of crony loans fails. See Cowling (1995) for an analysis of the United Kingdom's loan guarantee program.

increase its guarantee rate on the remaining crony loans. Otherwise, capital levels are insufficient to insure solvency.[11] Thus, any attempt to dismantle the crony system may put the stability of the financial system at risk. For instance, if the government reduces tax revenues dedicated to funding the system, bank solvency is at risk.

5.2 Conditions for Solvency under Contract II

Proposition 4: *The bank is more likely to remain solvent the more successful crony loans there are and the smaller the share of the crony loans the government had promised to guarantee and/or the lower firms' equity share.*

Proof: Under contract II the bank's revenues are

$$N_2[\gamma_1 c_1 + \gamma_2 w + (1-\gamma_1-\gamma_2)(\eta c_1 + w)] = N_2\left[\frac{2-w(2-\phi^2)}{2\eta+\phi^2(1-\eta)}\right][\gamma_1 + (1-\gamma_1-\gamma_2)\eta] + N_2(1-\gamma_1)w$$

and the bank's costs under contract II are

$$N_2(1-k) = N_2\left[\frac{2\eta-\phi^2 w}{2\eta+\phi^2(1-\eta)}\right].$$

The bank remains solvent if

$$\frac{\phi^2 w + \gamma_1(1-\eta-w)}{\eta[1-w(1-\phi^2)]} > \gamma_2 . \blacksquare$$

The final result appears at first to be counterintuitive. However, the greater firms' equity share the smaller the bank's required capital holdings, and thus the less able the bank will be to withstand a loss of government funds.

[11] Recall in Proposition 1 that the bank's capital is decreasing in the loan-guarantee rate.

5.3 Bank Solvency in a Riskier Environment

Corollary to Proposition 2: *All else equal, an increase in the riskiness of Project B, increases the probability that the government will be unable to honor its implicit loan guarantees.*

Proof: By Proposition 2, holding ϕ^A and R^A constant, and subjecting the return distribution of project *B* to a mean preserving spread yields a higher deadweight loss of the crony system, that is an increase in the government contingent liability. Since tax rates do not adjust, there is a greater chance that the government's revenues will be less than its liabilities.■

5.4 Capital Adequacy Requirements

The contracts analyzed above require that the banks' remain solvent in all states conditional on the government meeting its contingent liability. Clearly, externally, rather than internally, set capital requirements (say those set by international agreement such as the Basel Accords) that do not take the particular institutional structure of the banking market into account need not be adequate to achieve bank solvency. A risk-based capital requirement that did not account for the possibility of the government failing to honor its implicit contract would generally set capital requirements too low. Capital requirements that ignored the implicit guarantee altogether (ignored the guarantee and just evaluated banks' portfolios without taking off balance sheet contingent assets into account) would set capital requirements too high and would induce the usual effect of making banks' portfolios more risky.

VI. Nonpecuniary Benefits and Firm Effort

Heretofore in this paper we have assumed some firms are cronies and others are not, and the only value of cronyism is that it increases the cronies' wealth. We now consider a case in which cronies obtain nonpecuniary as well as pecuniary benefits.[12] These nonpecuniary benefits

[12] Such benefits would include factors not included in loan guarantees for investment projects. For instance, cronies may have special privileges that raise welfare. We leave these specific details out and simply include as being determined outside the model economy.

could be political power or proximity to power. As such, they would be decreasing in the number of other cronies to whom such benefits were available, and increasing in the expected longevity of the government in power. If the nonpecuniary benefits are valuable enough, firms will want to maintain their crony status. To do so, suppose that crony status is linked to a crony firm's project being successful.[13] Consider a case in which all firms have the ability to improve the return distribution on their projects (the probability that a project will be successful) by putting forth unobservable effort. Since this effort is unobservable (it does not change observable cash flows), loan contracts cannot be written contingent upon it. Thus, loan contracts in this revised scenario will be written on the underlying distribution, as in the basic model, not the effort-enhanced distribution.

Define e_i as the effort expended by a firm in period i, $i = 0, 1$ and let $\phi(e)$ be the probability of a project being successful, $\phi'(e)>0$, $\phi''(e)<0$, and $V(e)$ be the cost of undertaking that effort, $V'(e)>0$, $V''(e)>0$. A noncrony firm, taking the loan repayment schedule as given, chooses $e_0 \geq 0$ and $e_1 \geq 0$ to solve

$$\max \phi(e_0)[R - n_1 + \phi(e_1)(R - n_2)] - V(e_0) - \phi(e_0)V(e_1) - \mu_0 e_0 - \mu_1 e_1$$

where the μ_i *for* $i=1,2$ is the Lagrange multiplier for inequality constraint i. If the following condition is satisfied,

$$\phi'(0)(1+\phi)R < V'(0) \tag{26}$$

then non-cronies will never find it to their benefit to undertake effort. If the inequality in equation (26) holds, a non-crony firm at date 0 will not put forth effort to increase the probability

[13] The implicit bargaining in the background could be as follows. The government promises a crony a loan guarantee which enables the crony to receive financing at below market rates. For this favor, the crony promises to provide members of the government with pecuniary benefits: the tax funds are laundered by the cronies. The members of the government add the inducement of political power, or proximity to that power, but only so long as the pecuniary benefits continue to flow to the members of the government.

that the project will succeed in period 1. The intuition is straightforward; equation (26) represents the condition under which the marginal cost of effort exceeds the marginal benefit.[14]

Crony status is awarded in period 0 prior to the initial loans being granted. Cronies, taking the loan repayment schedule as given, choose $e_0 \geq 0$ and $e_1 \geq 0$ to solve

$$\max \phi(e_0)[R - c_1 + \phi(e_1)(R - c_2)] + \phi(e_0)\beta - V(e_0) - \phi(e_0)V(e_1) + \lambda_0 e_0 + \lambda_1 e_1$$

where β is the nonpecuniary benefit of maintaining one's crony status in period 1, and the λ_i, i=1,2 is the Lagrange multiplier associated with the inequality constraint *i*. The first-order conditions are

$$\phi'(e_0)[R - c_1 + \phi(e_1)(R - c_2) + \beta] - V'(e_0) + \lambda_0 = 0$$

$$\phi'(e_1)(R - c_2) - V'(e_1) + \lambda_1 = 0 \,.$$

Under the condition for no effort by non-cronies, $e_1=0$ and $e_0>0$ if β is large enough. Clearly, if projects could be renewed for more than two periods, the incentives provided by the nonpecuniary benefits of crony status would potentially induce effort beyond the initial period.

What this extended model suggests is that as long as crony status brings with it adequate additional benefits, cronyism can generate increases in output and imply only small contingent liabilities for the government (taxpayers). The banking system would be stable and profitable, and portfolio risk would be low. The knowledge that a bank had lent to cronies would not undermine confidence in the bank. On the contrary, banks that were part of the crony system would be more profitable than their counterparts who eschewed the system.

Should, however, the nonpecuniary benefits fall, as a result, for example, of a long governing party being voted out of office or its grip on power slipping, as in Mexico and Taiwan, then the incentives to put forth effort would also fall. In addition, the potential that the government will not honor its guarantees would rise. Thus, a financial crisis may be the outcome

[14] Equation (26) is stated in terms of a local result. With strict concavity of the benefit function and strict convexity of the effort's cost function, the result implies a global result.

of improvements in democracy (or of a changing of the guard in which loyalty to the old guard may put one out of favor with the new).

VII. Conclusion

The model developed in this paper examines the effects of cronyism on financial system stability and economic output and its distribution. We find that crony systems are not inherently unstable, and need not lead to reductions in GDP or extortionate taxation, although in practice they may lead to both. Externally, crony systems may appear much like non-crony systems. Thus, there may be no clear early warning signal of an impending collapse. Whatever the causes and effects of cronyism, the system itself has a potentially fatal flaw. It benefits those in power who are expected to remain in power. Anything that undermines this power, be it IMF dictate or the death of a long serving ruler with no clear successor, also undermines the system.[15] We here characterize this by the government being unable to honor its crony loan guarantees, and/or being unable to provide nonpecuniary benefits of enduring value. Either puts the financial system at risk.

The collapse or weakening of a crony system places great strain on the financial system. This being the case, policies aimed at reforming financial systems characterized by pervasive cronyism must take the institutional features of this system into account in designing the reform process. Banks as well as firms must be weaned off the crony system. Banks must be given the time to build up their capital reserves so that they can remain solvent when crony payments are no longer forthcoming. Crony firms must be given the time to transfer their resources into positive net present value projects. Depositors and non-crony borrowers' interests should be

[15] This result is very similar to that found by Rajan and Zingales (2001) in their study of financial development. There, insiders are adverse to change as it increases competition thus reducing their oligopoly rents. Here, cronies and their banks will also be adverse to change, and must be given time to change to ensure a smooth transition and forestall financial collapse.

protected, and maintaining while reforming the financial system will do this. Shock treatment or a short timetable for reform may root out the cronies but take down everyone else as well.

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Appendix

A.1 Wealth Distributions for the No-Crony Case

$$E_0(DepositorWealth) = N$$

$$E_0(BankWealth) = 0$$

$$E_0(FirmWealth) = N[(1+\phi^A)(\phi^A R^A - 1) + w]$$

In the no-crony case, depositors earn the risk free rate of return on their deposits, bank capital is not put at risk (it is stored or replaces depositor funds one to one), and firms are rewarded for their risk taking.

A.2 Wealth Distribution/Redistribution for Crony Case Contract I

We assume that the government sets the lump-sum tax high enough so that it can meet all its contingent liabilities, at least in expectation. The distribution of wealth is as follows.

$$E_0(DepositorWealth) = N - N_2\left[\frac{2\eta(1-\phi^2)}{2\eta+\phi^2(1-\eta)}\right] \tag{A1}$$

where the second term in equation (A1) is the expected net tax liability as a result of all crony lending and where superscripts are absent both cases (project A undertaken or project B undertaken) are simultaneously represented.

$$E_0(BankWealth) = N_2(1+\phi)\left[\frac{\phi(2-\phi)(1-\eta)}{2\eta+\phi^2(1-\eta)}\right] \tag{A2}$$

$$E_0(NoncronyFirmWealth) = N_1[(1+\phi^A)(\phi^A R^A - 1) + w] \tag{A3}$$

$$E_0(CronyFirmWealth) = N_2\left[(1+\phi)\left(\phi R - \frac{2}{2\eta+\phi^2(1-\eta)}\right) + w\right] \tag{A4}$$

Because the tax scheme transfers wealth from depositors to banks and cronies, the second term in equation (A1) represents the size of the expected transfer payment. Banks receive part of the redistributed wealth as a result of their need to put some or all of their capital at risk to meet their contractual liabilities to their depositors under the crony system.

A.3 Wealth Distribution/Redistribution Crony Case Contract II

$$E_0(DepositorWealth) = N - N_2\left[\frac{(1-\phi)\eta[2-w(2-\phi^2)]}{2\eta+\phi^2(1-\eta)} + \phi(1-\phi)\eta\right] \qquad \text{(A5)}$$

$$E_0(BankWealth) = N_2\left[\frac{\phi(1-\eta-w)}{2\eta+\phi^2(1-\eta)}\right] \qquad \text{(A6)}$$

$$E_0(NoncronyFirmWealth) = N_1[(1+\phi^A)(\phi^A R^A - 1) + w] \qquad \text{(A7)}$$

$$E_0(CronyFirmWealth) = N_2\left[\begin{array}{c}\phi(1+\phi)R - \phi^2 - (1-2\phi)w - \left(\dfrac{2-w(2-\phi^{2)}}{2\eta+\phi^2(1-\eta)}\right) \\ -(1-\phi)(1-\eta) \\ \end{array}\right] \qquad \text{(A8)}$$

Again, equation (A5) indicates that depositors expect a transfer payment from themselves to banks and cronies in contract II.

4.4 Wealth Distribution/Redistribution Crony Case Contract III

$$E_0(DepositorWealth) = N - N_2(1-\phi^2)\eta \qquad \text{(A9)}$$

$$BankWealth = 0 \qquad \text{(A10)}$$

$$E_0(NoncronyFirmWealth) = N_1[(1+\phi^A)(\phi^A R^A - 1) + w] \qquad \text{(A11)}$$

$$E_0(CronyFirmWealth) = N_2[\phi(1+\phi)(R-1) + w - (1-\phi^2)(1-\eta)] \qquad \text{(A12)}$$

Since banks do not put their capital at risk under contract III, the expected transfer payment from depositor [see equation (A9)] goes entirely to crony firms.