

## CHAPTER 3

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# The Political Economy of Debt Moratoria, Bailouts and Bankruptcy

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Throughout much of the history of the United States, states passed laws providing for debt moratoria and for other forms of debtor relief (Rothbard 1962; Domowitz and Tamer 1997). During the Great Depression, for instance, states passed laws permitting debt moratoria for farm mortgages. To further improve farm income, the Roosevelt administration moved to devalue the dollar against gold. Devaluation would have triggered clauses giving creditors the option of demanding repayment in gold then present in almost US\$100 billion of outstanding private debt and most likely would have triggered a wave of corporate bankruptcies. Congress, however, abrogated all gold payment clauses, relieving debtors of \$69 billion in additional payments generated by the devaluation (Kroszner 1998). More recently, bankrupt industrial firms and financial institutions have been the beneficiaries of similar government actions, this time in the form of bailouts and takeovers. This chapter models such ex post political intervention in debt contracts in a democracy.

Two types of factors can cause firms to fail and individuals to default: firm-specific factors such as incompetent management and poor product design, and macroeconomic factors that are correlated across firms. The motivation for ex post political intervention is to correct for incomplete contracts and to remedy possible externalities that arise when there are many simultaneous failures during a downturn in the economy. The presence of ex post intervention, however, influences interest rates and the volume of lending ex ante. Ex ante, are there benefits to having political institutions that permit ex post intervention in debt contracts?

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where:

- $x^t$  is period  $t$  wheat output;
- $\theta$  is a farmer-specific productivity shock (it can be interpreted as the result of either the farmer's ability or the land's fertility);
- $k^{t-1}$  is the amount of wheat planted (or invested) in the farm in period  $t-1$  (alternatively,  $k^{t-1}$  could represent the amount of tilled land); and
- $1 + l^{t-1}$  is the quantity of labor employed in period  $t-1$ ; it includes the farmer's labor plus the labor from  $l^{t-1}$  workers.

Note that the only relevant productivity parameter is the farmer's productivity type. Laborers' productivity types are irrelevant. This feature captures in a stark way the idea that what matters most is organizational and entrepreneurial talent.

Again for simplicity the analysis uses the following piecewise-linear production function:

$$\theta f(k^{t-1}, (1+l^{t-1})) = \begin{cases} \theta \{ \min[k^{t-1}, 1+l^{t-1}] + \alpha(\max[0, 1+l^{t-1} - k^{t-1}]) \} \\ \text{for } k^{t-1} \leq \bar{k}, \text{ where } \bar{k} > 1 \\ \theta \{ \min[\bar{k}, 1+l^{t-1}] + \alpha(\max[0, 1+l^{t-1} - \bar{k}]) \} \\ \text{for } k^{t-1} > \bar{k} \end{cases}$$

This is the simplest function with diminishing marginal productivity of labor (on any given farm). This production function models a competitive agricultural economy. To obtain strictly positive profits in equilibrium, at least one scarce factor is needed (here it is wheat) and diminishing marginal productivity with respect to one of the more abundant factors.

The function above exhibits diminishing marginal productivity of labor whenever  $\alpha < 1$ , for then a marginal increase in labor produces an increase in output of only  $\alpha\theta$  when

$$1 + l^{t-1} \geq k^{t-1}, \text{ as opposed to } \theta \text{ when } 1 + l^{t-1} < k^{t-1}.$$

This production function also exhibits decreasing returns to scale (or more precisely, none) beyond the level of wheat investment  $\bar{k} > 1$  so that there is no benefit to investing more than  $\bar{k}$  on a farm. As will become clear

This chapter addresses that question in a two-period model and considers in turn the case of an economy without and with aggregate shocks. In each case, equilibrium in the economy is first characterized in the absence of political institutions that permit ex post intervention. The properties of the equilibrium are then analyzed when debt moratoria or bailouts can be declared by a majority or supermajority vote of the citizens. It is found not only that political intervention can improve the allocation of resources in the second period but also that the anticipation of intervention can, surprisingly, increase lending and improve the allocation of resources in the first period. Finally the model is confronted with the historical evidence from the Panic of 1819, a major economic downturn in the United States.

### The Model

Three periods are required to model debt and default:  $t = 0, 1, 2$ .

- At  $t = 0$ , borrowing, lending, and investment occur.
- At  $t = 1$ , a first set of production flows is realized. Borrowers repay or default. In the case of default, lenders make a continuation or liquidation decision. At the end of period 1, some borrowers may become laborers and enter into labor contracts for production at  $t = 2$ .
- At  $t = 2$ , a second set of production flows is realized. All accumulated production is consumed.

### *Technology, Preferences, and Markets*

To keep things as simple as possible, the model considers a one-commodity economy in which, to fix ideas, the commodity is wheat. To produce wheat, farmers need labor and wheat (land is not a scarce resource). On any given farm there can be at most two wheat crops, one at date  $t = 1$  and the other at date  $t = 2$ .

### *Technological Assumptions*

The production function on any given farm is given by:

$$x^t = \theta f(k^{t-1}, (1 + l^{t-1}))$$

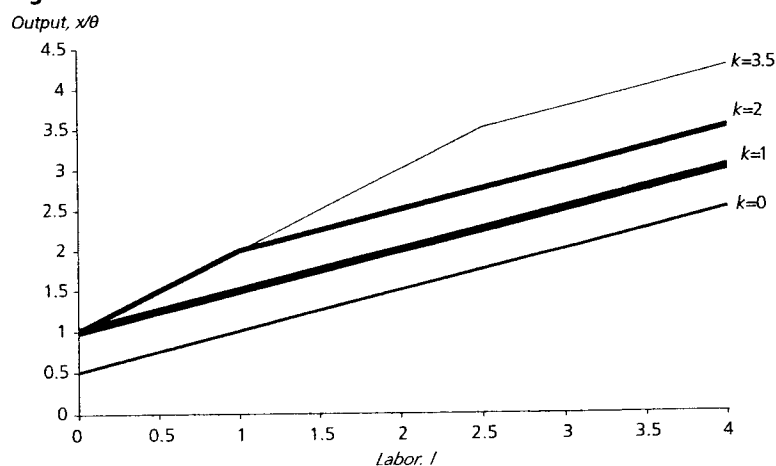
below, decreasing returns to scale are essential to inducing wealthy farmers to lend wheat to poor farmers. The production function is illustrated in Figure 3.1, assuming that  $\alpha = 0.5$  and  $\bar{k} = 3.5$ .

Farmer-specific productivity shocks are independently and identically distributed and take the values  $0 \leq \theta_b < \theta_a < \theta_g$  with probabilities  $m_b, m_a, m_g \equiv 1 - m_a - m_b$ . Three types of farmers are introduced to provide a potential role for political intervention. The good type ( $\theta_g$ ) may always remain solvent. The bad type ( $\theta_b$ ) will always go bankrupt if he or she borrows wheat, and the average type ( $\theta_a$ ) may go bankrupt only if an unfavorable macroeconomic shock occurs.

It is assumed that farmers do not know their type at date  $t = 0$ . They are all equally ignorant about their talents and expect an average productivity of  $\bar{\theta} = m_b\theta_b + m_a\theta_a + m_g\theta_g$ . That is, not only are lenders unable to screen borrowers according to type, but also borrowers cannot use information about their own type in deciding whether to borrow. At date  $t = 1$  farmers do learn their individual types, but this information remains private to each farmer. It is also assumed that the total population of farmers is large enough to make the proportions of farmer types in the population approximately the same as the probabilities  $m_a, m_b, m_g$ .

Besides farm-specific productivity shocks, the model also introduces a common macroeconomic shock such as weather conditions. This shock shifts the values of the farm-specific productivity shocks. This shock is de-

**Figure 3.1. The Production Function**



noted as  $v \in \{H, L\}$ , with state  $H$  occurring with probability  $\lambda$  and state  $L$  occurring with probability  $1 - \lambda$ . The productivity shocks are then fully described as  $\theta_i^v$  with  $\theta_i^H > \theta_i^L$ .

The production function and productivity shocks completely describe the technological structure of the economy.

#### *Assumptions on Preferences and Endowments*

The model assumes identical risk-neutral preferences, mostly for technical convenience. But risk neutrality combined with limited liability induces behavior, contracting arrangements, and qualitative features similar to those common to risk aversion. For simplicity all consumption is assumed to take place at the end of the second period. Consequently each farmer maximizes expected lifetime wealth.

The model assumes  $M$  farmers, each able to supply costlessly one unit of labor in each period. Farmers differ only in their endowments of wheat. Some rich farmers are potential lenders or employers; poorer farmers are borrowers or laborers. There are  $N$  wealthy farmers with a per capita endowment of wheat  $\bar{W} > 1$  and  $M - N$  poor farmers with 0 endowment. Farmers know their endowments at  $t = 0$ . The poor are substantially more numerous than the rich—specifically,  $M > N(1 + \bar{W})$ . In addition:

$$0 \leq \frac{\alpha\theta_g(M - N)}{N(\bar{W} - 1)} < \theta_b < 1 < \theta_a < 1 + \alpha\theta_g < \theta_g.$$

Under the given technology, this assumption guarantees that:

- Bad types, if they do not default, will continue farming rather than work for wage  $\alpha\theta_g$ .
- Bad types will never make any additional investment at  $t = 1$ .
- Only good types will hire additional labor.

#### *Assumptions on Contracts and Markets*

Rich farmers face the following decision at date  $t = 0$ : should they use their wheat to hire poor farmers as laborers, or should they invest it, either in lending to poor farmers or in adding capital to their farm via increased  $k$ ?

Reciprocally, poor farmers must make an occupational choice: should they borrow and remain independent farmers, or should they become laborers?

Although both markets could be open in equilibrium, the model demonstrates the existence of an equilibrium in which only the credit market is open at  $t = 0$ .<sup>1</sup> Such situations arise when all poor farmers prefer to borrow and work on their own farm rather than work as laborers, and all rich farmers prefer to lend rather than to hire workers at the prevailing equilibrium market terms. At date  $t = 1$  the same two markets might be open. But under the contractual assumptions made in the model, only the agricultural labor market is open at this interim stage. There is no market for land, because the economy considered is one where land is abundant but wheat and labor are relatively scarce. Such an economy is a fairly realistic representation of much of North and South America around 1800. A model with a market for land would be more realistic, but the basic economics of the more elaborate model would be essentially the same as in the simpler setup.

The model is based on the following assumptions about the enforceability of these contracts.

#### *Credit Contracts*

A farmer can lend wheat in exchange for repayment at date  $t = 1$ . It is assumed that the macroeconomic shock cannot be described in a contract or verified by the courts, so that the repayment cannot be conditioned on the realization of the shock. In addition, wheat output on any given farm is not observable, let alone verifiable. These two assumptions immediately imply that a debt contract is simply the borrower's promise to make a unit repayment of  $D$  at  $t = 1$  and the creditor's right to foreclose on the farm in case of default (Hart and Moore 1994, 1998; Bolton and Scharfstein 1990, 1996). In addition at  $t = 1$  it is not legally possible for a farmer to acquire some other piece of land and continue to produce there unless he or she has repaid all debts. Thus by foreclosing on the debtor's land a creditor can prevent the debtor from continuing production.

This threat will induce the farmer to repay his debts when he can. The borrower has an incentive to repay, for otherwise he would lose his second-period output. For the debtor then the unit repayment  $D$  at date  $t = 1$  is

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<sup>1</sup> This chapter does not discuss uniqueness.

almost like purchasing the right to continue producing wheat on the land. Because there is no production beyond date  $t = 2$ , the borrower has no incentive to repay a loan at that date. In anticipation the creditor insists that repayments take place only at date  $t = 1$ . If the debtor does not produce enough wheat to repay  $D$  at date  $t = 1$ , default occurs and the creditor forecloses. At that point the debtor simply runs away with whatever wheat is available and becomes an agricultural laborer. As will become clear, in equilibrium the creditor does not gain by renegotiating the debt contract and allowing the debtor to stay and produce on the land.

### *Employment Contracts*

The question of enforcement is an issue with labor contracts as well as with debt contracts. In this analysis wage contracts are enforceable because they require a simultaneous exchange of work for wages. Laborers are paid when, figuratively, the seeds are sown or the soil tilled—that is, the workers are paid before the farmer has output to show.

This completes the description of the economy with no political institutions. As will be seen below, such an economy may give rise to excessively high bankruptcies at date  $t = 1$ , when the economy is hit by a large negative macroeconomic shock. This outcome results from the contractual incompleteness of debt contracts, a factor that precludes state-contingent repayments. To overcome this inefficiency the farmers in this economy may be willing to set up political institutions that can intervene *ex post* to suspend, delay, or cancel debt repayments. Because political decisions are made *ex post*, after the macro shock is realized and the individual farmers learn their types, political institutions can serve as a mechanism to remedy the contractual incompleteness of debt contracts. A potential drawback of such institutions, however, is that they may undermine the proper enforcement of debt contracts *ex post*.

### *Political Institutions*

The political institution considered here is majority voting on either debt moratoria or bailouts financed with proportional consumption taxes. The vote takes place at  $t = 1$ , after production is realized but before debt repayment or default takes place. The model considers the effects of restricting the franchise to those with invested capital and of allowing the size of the

majority needed to enact a moratorium or a bailout to be larger than a simple majority. Both moratoria and bailouts have adverse selection problems. For example as a farmer's wheat production is private information, good farmers may choose not to repay during a moratorium. Consequently alternative institutions that reduce adverse selection may be preferable. Specifically individual debtors may apply to an independent authority (say a bankruptcy court) for leniency. The bankruptcy court can learn, at a cost, the type of debtor and the nature of the macroeconomic shock. Repayment would be adjusted to reflect the severity of the macro shock. Bankruptcy courts were notoriously costly mechanisms in the 19th century and remain somewhat so today (Balleisen 1996). In any event, this chapter leaves the analysis of bankruptcy and other institutions to future researchers.

In addition to investigating equilibrium under moratoria, bailouts, and the base case of no political intervention, the model compares the relative efficiency of the institutions. This comparison suggests which institutions might be chosen *ex ante*, behind a so-called veil of ignorance where endowments, productivity types, and the nature of the macroeconomic shock are all unknowns. Also considered is the institutional choice at an interim level where endowments are known but not productivity or the macroeconomic shock.

### No Aggregate Uncertainty

This section assumes that  $v = L$  with probability 1 ( $\lambda = 0$ ), so that there are no aggregate shocks. With no aggregate uncertainty, there is no role for *ex post* majority voting on debt moratoria (or bailouts) as a way of completing debt contracts. At best, voting on debt moratoria may help correct an *ex post* pecuniary externality in the labor market at  $t = 1$ . At worst, majority voting on debt moratoria undermines the efficient enforcement of debt contracts and introduces time inconsistency problems. Anticipation of majority voting on debt moratoria may improve *ex post* efficiency by limiting indebtedness and therefore the number of bankruptcies. Similarly anticipated bailouts can improve efficiency (both *ex ante* and *ex post*) by reducing the extent of credit rationing at date  $t = 0$ .

To show the effect of these two forms of political intervention, the model first considers the benchmark economy with no political institutions.



### *Economy without Political Intervention*

The equilibrium being solved for is driven by technological assumptions of diminishing returns. It has the following characteristics:

- At  $t = 0$ , rich farmers invest  $k = 1$  on their own farms and lend  $\bar{W} - 1$  to poor farmers.
- The labor market shuts down at date  $t = 0$ , as it is more profitable not only for the rich to lend than to hire laborers at the going market rate, but also for the poor to borrow wheat and till their own land than to become laborers.
- The equilibrium repayment rate in the loan contract is such that bad and average types cannot repay. Thus at date  $t = 1$ , both bad and average poor farmers become laborers. Rich farmers get a unit repayment of  $m_g D$ . To simplify the analysis, it is supposed that rich farmers have a well-diversified loan portfolio so that  $m_g D$  can be taken as a sure repayment. This assumption is not entirely realistic, but it is innocuous and convenient.
- At  $t = 1$  bad and average rich farmers remain as farmers, but neither group increases its investment or hires laborers. Good poor farmers plow back all their net earnings to increase investment to  $k_{pg} < \bar{k}$ . They hire  $k_{pg} - 1$  laborers. Good rich farmers increase investment to  $\bar{k}$  and hire all remaining laborers.
- Laborers at  $t = 1$  work on  $\theta_g$  type rich and poor farms and earn equilibrium wage  $r_1 = \alpha \theta_g$ . That is, laborers earn their marginal product on good farms.
- At  $t = 0$ , a poor farmer borrows:

$$k_p = \frac{N(\bar{W} - 1)}{M - N}.$$

Note that, since  $M > N(1 + \bar{W})$ ,  $k_p < 1$ .

- The equilibrium repayment rate is given by the maximum incentive compatible repayment at  $t = 1$ .

The rest of this section determines the conditions under which such an equilibrium holds. The section begins by considering good poor farmers' incentives to repay their debt, then proceeds to determine conditions under which average and bad farmers default, addressing the issue of renegotiation. Subsequently, it considers rich farmers' decision to lend to poor farmers or employ them as agricultural laborers. The section ends by deriving the aggregate wheat output in equilibrium.

#### *Good Farmers' Incentives to Repay*

In the equilibrium being solved for, poor farmers borrow  $k_p$  for a repayment  $Dk_p$  at date  $t = 1$ . They repay only if they turn out to be good farmers. These good-type borrowers derive output  $\theta_g k_p + \alpha \theta_g (1 - k_p)$  from their initial investment at date  $t = 0$ . They can possibly expand production further by increasing their capital investment and hiring labor at date  $t = 1$ . They can also choose to default on their loans, keep their first period output, and work as laborers in the next period. The repayment terms  $D$  must be incentive-compatible with their not defaulting.

To see the intuition of the following analysis, consider the special case of  $\alpha = 0$ . In this case the good poor farmer cannot earn anything as a laborer in the second period. Thus the lender can demand all of the first-period output, so  $D = \theta_g$ . Now for  $\alpha > 0$ , the borrower's ability to earn wage income in the second period forces the lender to lower  $D$  and leave the borrower some surplus, which is reinvested in the farm. For sufficiently large  $\alpha$ , the surplus is large enough for the borrower to hire labor.

Specifically, under the technological assumptions used here, second-period output for good poor farmers for sufficiently low  $D$  is:

$$\theta_g + \theta_g \left[ \frac{(\theta_g - D)k_p - (1 - \alpha\theta_g)(1 - k_p)}{1 + \alpha\theta_g} \right].$$

The first term in the expression above represents the output obtained by increasing capital to 1, at which point the capital fully matches the farmer's own labor. The numerator of the bracketed portion of the second term is the amount of wheat available for investment after the debt has been repaid and capital increased to 1. Beyond one unit of capital, the farmer will match

capital and labor.<sup>2</sup> The cost of a unit of capital and a unit of labor is the denominator. To keep things as simple as possible attention is restricted to parameter values such that:

$$\alpha \geq \frac{1 - k_p}{2 - k_p}.$$

Under this assumption Bolton and Rosenthal (1999) show that the equilibrium repayment  $D^*$ , for which the good farmer's incentive constraint binds is such that:

$$D^* = \theta_g - \frac{(1 - k_p)(1 - \alpha\theta_g)}{k_p} - \Delta$$

for  $\Delta$  given by:

$$\theta_g \left( 1 + \left[ \frac{\Delta k_p}{1 + \alpha\theta_g} \right] \right) = \theta_g k_p + \alpha\theta_g (2 - k_p).$$

This repayment is the one in this equilibrium, as at date  $t = 0$  there is excess demand for loans at that rate. Poor farmers would like to expand investment beyond  $k_p < 1$ , but not enough funds are available to cover their investment demand. Repayment rates cannot increase to clear the market, as any higher repayment would not be incentive compatible.

#### *Average and Bad Farmers' Incentives to Default and Debt Renegotiation*

Bolton and Rosenthal (1999) show that average farmers will default unless the repayment rate is below  $\hat{D}$ , where:

$$\hat{D} \leq \frac{\theta_a - (1 - k_p) - \alpha\theta_g}{k_p}.$$

<sup>2</sup> The bracketed expression indicates that good poor farmers are so constrained financially that they cannot expand capital beyond  $\bar{k}$ . Satisfying this constraint may require additional restrictions on the model's parameters.

In addition, bad farmers will default unless the repayment rate is below  $\bar{D}$  where<sup>3</sup>

$$\bar{D} \leq \frac{\theta_b [k_p + \alpha(1 - k_p)] - \alpha\theta_g}{k_p}.$$

Thus it is not in the creditors' interest to forgive debt at date  $t = 1$  if

$$m_g D \geq (m_g + m_a)\bar{D} \text{ and } m_g D \geq \bar{D}.$$

It is therefore assumed that the  $\theta_i$  and  $\alpha$  are such that

$$(3.1) \quad D^* \geq \max \left[ \left( 1 + \frac{m_a}{m_g} \right) \bar{D}, \left( \frac{1}{m_g} \right) \bar{D} \right].$$

Note that this necessary condition for equilibrium is satisfied when  $\theta_g$  is large relative to  $\theta_a$  and  $\theta_b$ .

#### *Borrowers' Ex Ante Expected Payoff*

Because bad and average types default at date  $t = 1$ , run away with their first-period wheat production, and earn wage  $\alpha\theta_g$  by working as agricultural laborers in the second period, a poor farmer's expected payoff at date  $t = 0$ , denoted  $R_p$ , is:

$$R_p = m_g \theta_g \left( 1 + \left[ \frac{\Delta k_p}{1 + \alpha\theta_g} \right] \right) + m_a (\theta_a k_a + \alpha\theta(1 - k_p) + \alpha\theta_g) + m_b (\theta_b k_p + \alpha\theta_b(1 - k_p) + \alpha\theta_g)$$

#### *Rich Farmers' Investment and Employment Decisions*

Consider next the rich farmers' investment decisions. Note first that rich farmers never want to lend more than  $\bar{W} - 1$ , because the marginal return

<sup>3</sup> This inequality differs from the previous one since, by assumption,  $\theta_b < 1$ , and "bad" types do not increase their capital.

on capital  $k > 1$  invested on their own farm is at least  $\bar{\theta} < m^s D$ . But they want to lend  $\bar{W} - 1$  if they cannot hire any additional labor, because the first-period marginal return on capital  $k > 1$  would be 0 (by the present assumptions). They would not want to expand investment on their farms and hire additional labor if by lending  $k^p$  they could expect a higher net return than they could expect from investing an additional  $k^p$  on their own farm. That is:

$$k^p \bar{\theta} \geq (m^s D - 1)k^p \geq \bar{\theta} \frac{1+w}{k^p}$$

or

$$w \geq \frac{\bar{\theta}}{1 - m^s D - 1}$$

where  $w$  denotes the minimum wage at which a rich farmer can hire a poor farmer. Note that the rich farmer's second-period production decision is the same whether or not laborers are hired in the first period. Therefore the first-period decision to employ or lend is determined entirely by the relative first-period return of the two contracts.

Given that poor farmers can borrow and work on their own farms, they will consider working as agricultural laborers instead only if the wage exceeds the payoff from borrowing, or

$$w + \alpha\theta^s \geq R^p$$

Assuming the lowest possible equilibrium wage prevails, then

$$w = R^p - \alpha\theta^s.$$

Substituting for  $R^p$  and  $w$  and substituting  $D^*$  for  $D$ , a rich farmer prefers a credit contract to an employment contract if and only if:

$$\frac{\theta k^p}{m^s ((\theta^s - \Delta)k^p - (1 - k^p)(1 - \alpha\theta^s)) - k^p} \leq 1 + \theta k^p + m^s \theta^s \left[ (1 - k^p) + \frac{1 + \alpha\theta^s}{\Delta k^p} \right] + (m^s \alpha \theta^s + m^p \alpha \theta^p)(1 - k^p) + (1 - m^s) \alpha \theta^s. \quad (3.2)$$

Note that conditions (3.1) and (3.2) are mutually compatible for a subset of the parameter space. Both hold when  $(\theta_g - \theta_a)$  is large enough (and  $\alpha$  is commensurately small), so that the equilibrium exists for this subset of parameters.

#### *Equilibrium Wheat Production*

The economy's total wheat output in this equilibrium is then given by the following expression (see Bolton and Rosenthal 1999 for details):

$$(3.3) \quad (M - N)(\bar{\theta}k_p + \alpha\bar{\theta}(1 - k_p)) + N\bar{\theta}$$

at date  $t + 1$ , and

$$(3.4) \quad (M - N)m_g\theta_g \left( 1 + \left[ \frac{(\theta_g - D^*)k_p - (1 - \alpha\theta_g)(1 - k_p)}{1 + \alpha\theta_g} \right] \right) + Nm_g\theta_g\bar{k} + \\ \alpha\theta_g \left( (M - N) \left[ (1 - m_g) - m_g \left( \frac{(\theta_g - D^*)k_p - (1 - \alpha\theta_g)(1 - k_p)}{1 + \alpha\theta_g} \right) \right] - Nm_g(\bar{k} - 1) \right) \\ + N(m_a\theta_a + m_b\theta_b)$$

at date  $t = 2$ .

In this equilibrium the good poor farmers plow all their first-period surplus back into their farms, and the good rich farmers take up the remaining labor supply. There may be a misallocation of labor ex post, as a fraction of laborers produce only  $\alpha\theta_g$  when they can produce more elsewhere. This misallocation is partly due to the liquidity constraints of good poor farmers, which result in those rich farmers with the highest ability to pay crowding out the poor farmers with the highest marginal returns from labor. Moreover, if the number of defaulted farmers is so large that not all can be used efficiently on good farms, the most efficient option is to allow some defaulted farmers to remain independent farmers.

Yet this equilibrium results in the efficient allocation of resources ex ante, as all available capital is used at the highest expected marginal (and average) productivity  $\bar{\theta}$ . (Although poor farmers have less capital than rich ones, capital cannot be reallocated in a way that increases total expected output. This outcome is a consequence of the production function. With

other production functions, the possibility of default leads to an inefficiently small transfer of capital from rich farmers to poor.)

### **Economy with Political Intervention**

The equilibrium without political intervention produces potentially massive defaults by average and bad poor farmers. With a large number of defaults, political pressure builds to introduce some form of relief for the unfortunate. This relief can be in the form of additional subsidies or tax breaks, government guarantees on new loans (or possibly even new government loans), debt moratoria, and bailouts. This section covers the last two forms of government relief for debtors.

The main difference between a moratorium and a bailout is that a moratorium does not require government transfers and a bailout does. A moratorium is simply a form of debt cancellation that amounts to a direct ex post transfer from creditors to debtors. Under a bailout the government aims to repay existing debts—in this case those of poor farmers—by raising taxes on all citizens, both creditors and debtors. In this model a bailout amounts to an indirect ex post transfer from solvent debtors to creditors.<sup>4</sup>

Relief can be introduced if a majority of voters support it. The relief granted is nonselective—that is, it cannot be conditioned on the productivity type of the farmer. All farmers can vote on whether to introduce some form of debt relief at date  $t = 1$ , following the realization of crops and each farmer's acquisition of private information about his or her own type. The analysis focuses on simple majority rule, with brief comments on the effect of supramajority rule.

#### ***Debt Moratoria***

For economic efficiency, debt moratoria are best targeted only to certain types of farmers and should be limited to the amount of debt these farmers cannot repay. In practice both discriminating between types and limiting the scope of debt forgiveness are difficult. Once a moratorium is proposed,

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<sup>4</sup> In equilibrium, all agents have positive pre-tax returns. This model posits a proportional tax on consumption, so all agents have strictly positive final consumption in equilibrium.

proponents can maximize political support for the initiative by including all debtors in the scheme and by forgiving 100 percent of their debts. More precisely, farmers who will vote for partial cancellation of the debt prefer total to partial cancellation. Accordingly the analysis begins by considering a vote on 100 percent debt relief for all poor farmers. It starts with the case where a debt moratorium is unanticipated at date  $t = 0$ . A second step solves for equilibrium at date  $t = 0$  when debt moratoria are anticipated.

#### *Winners and Losers from a Moratorium*

Identifying potential supporters of such an initiative requires first considering the effects of the moratorium on the labor market equilibrium at date  $t = 1$ . Suppose that the population of bad poor farmers is relatively high, so that:

$$m_b(M - N) > Z \equiv (\bar{k} - 1)Nm_g + (M - N)m_g \left( \frac{(\theta_g k_p - (1 - \alpha\theta_g)(1 - k_p))}{1 + \theta_b k_p + \alpha\theta_b(1 - k_p)} \right).$$

Bolton and Rosenthal (1999) show that the labor market equilibrium following a moratorium will be such that  $Z$  bad poor farmers become laborers for good (rich and poor) types at equilibrium wage  $\theta_b k_p + \alpha\theta_b(1 - k_p)$  and the remainder stay on their farms. At that wage all average poor farmers remain on their land and expand investment to  $k = 1$ . Average and bad rich types do not expand investment. No average or bad type hires labor. Good rich types expand investment to  $\bar{k}$ , but liquidity problems constrain good poor types who want to expand.

Under this scenario the moratorium creates a positive pecuniary externality for bad and average poor farmers, who see their second-period wheat income increase from  $\alpha\theta_g$  to, respectively,  $\theta_b k_p + \alpha\theta_b(1 - k_p)$  and  $\theta_a$ . These farmers therefore clearly favor a moratorium. Note that this pecuniary externality comes at the expense of good farmers. Therefore all good rich farmers oppose this initiative even if the moratorium is limited only to bad and average poor farmers and therefore does not involve a direct loss in debt repayments. All rich farmers, a fortiori, oppose a moratorium that also includes the solvent good poor farmers. These farmers support a moratorium if the gain in debt forgiveness is greater than the increase in the wage bill, or if:



$$\frac{(\theta_g D^*)k_p - (1 - \alpha\theta_g)(1 - k_p)}{1 + \alpha\theta_g} \leq \frac{\theta_g k_p - (1 - \alpha\theta_g)(1 - k_p)}{1 + \theta_g k_p + \alpha\theta_b(1 - k_p)}$$

This inequality holds for sufficiently large  $\theta_g$ . In this case  $(M - N)$  voters favor a moratorium, and a majority favors the moratorium ex post.

#### *Ex Post Efficiency of Moratoria*

Moratoria always increase ex post efficiency, as measured by total wheat output. Indeed, by allowing defaulting farmers to stay on their farms, moratoria improve the allocation of labor at date  $t = 1$ . Under the assumptions used here, it is efficient to have all bad farmers in excess of  $(\bar{k} - 1)Mm_g$  as well as all average defaulting farmers remain on their farms. An unanticipated moratorium equilibrium achieves this. The only remaining inefficiency is that good poor farmers are liquidity constrained and cannot expand to  $\bar{k}$ . The general observation here is simply that the moratorium eliminates any distortions on the real economy resulting from nominal debt obligations. In other words, moratoria increase aggregate production by redistributing funds from rich creditors to poor borrowers. Thus the main (potential) problem with moratoria is not ex post efficiency but ex ante efficiency when moratoria are anticipated.

#### *Ex Ante Equilibrium with Anticipated Moratoria*

When moratoria are anticipated, they give rise to credit rationing. Indeed, rich farmers never lend if they expect a moratorium. Now, by lending to fewer poor farmers, rich farmers may guarantee that the number of debtors will not exceed the number of creditors, so that in a vote comprising only debtors and creditors, rich farmers have a majority to defeat any moratorium. But voting is not restricted to debtors and creditors, and the outcome of the vote depends on how the remaining agricultural laborers vote.

From the laborer's perspective, a moratorium is always good news, since it reduces the supply of labor. Thus laborers always weakly favor moratoria. If they vote in favor when they are indifferent, there will always be a winning majority for a moratorium, so that the credit market shuts down at  $t = 0$ . In that case the economy achieves a lower aggregate output in both periods. This output is:

$$N\theta \left[ \bar{k} + \alpha \left( 1 + \frac{M-N}{N} - \bar{k} \right) \right]$$

at date  $t = 1$ .<sup>5</sup> It is

$$N\theta \bar{k} + \alpha \theta_g (M - N\bar{k})$$

at date  $t = 2$ .<sup>6</sup>

If laborers who are indifferent vote against moratoria, an equilibrium with credit rationing obtains at date  $t = 1$ , where  $n < M - N$  poor farmers get credit of  $k_p = 1$  (the efficient scale for a poor farmer working on his own). The number  $n$  is such that a majority against debt moratoria exists at date  $t = 1$  (that is,  $2n \leq M$ ).

This equilibrium obtains only if laborers are indifferent. They are indifferent only if the equilibrium wage at date  $t = 1$  is unaffected by an increase in the supply of labor as poor farmers default. In other words this equilibrium obtains only if  $w = \alpha \theta_g$ , whether a moratorium is approved or not. Consequently the equilibrium with credit rationing is extremely fragile and depends entirely on the assumed piecewise-linear structure of the production technology. Any small change in equilibrium wage resulting from a change in the supply of labor results in a majority that favors moratoria ex post and leads to a shutdown of the credit market.

An alternative way of ensuring that a majority against moratoria exists ex post is to lower the repayment for some farmers to  $D^\#$  so that the cost of repayment is less important than the increased labor costs under a moratorium. In other words  $D^\#$  solves:

$$\frac{(\theta_g - D^\#)k_p - (1 - \alpha\theta_g)(1 - k_p)}{1 + \alpha\theta_g} = \frac{\theta_g k_p - (1 - \alpha\theta_g)(1 - k_p)}{1 + \theta_b k_p + \alpha\theta_b(1 - k_p)}$$

Good farmers borrowing at  $D^\#$  also oppose the moratorium. If this group is large enough, a majority can emerge to oppose a moratorium. Under this scenario an ex post moratorium imposes a constraint on the terms

<sup>5</sup> Note, in particular, that  $N(\bar{w} - \bar{k})$  of the initial endowment is not invested at date  $t = 0$ .

<sup>6</sup> At date  $t = 1$ , all bad and average rich farmers hire  $(\bar{k} - 1)$  laborers at wage  $\alpha\theta_g$  to produce additional output of (respectively)  $\theta_b(\bar{k} - 1)$  and  $\theta_a(\bar{k} - 1)$ . Because they need to increase the labor force to reach maximum efficient scale, and because by assumption  $\theta_b > \alpha\theta_g$ , this choice is profitable. All other laborers are employed on good rich farms.

of lending but does not necessarily mean that credit rationing will be inefficient *ex ante*.

Implementing a two-tier loan structure is not feasible with decentralized lending and uncertainty about the number of borrowers who will be good types. Free riding will cause a two-tier structure to unravel. A two-tier structure could be supported if there were a single financial intermediary who would make the appropriate trade-off between increasing the probability of a moratorium and the benefit of obtaining  $D^*$  rather than  $D^\#$  from borrowers at the margin. The solution to the maximization problem of the intermediary is provided in Bolton and Rosenthal (1999). When  $M$  is large, the probability of a moratorium will be close to, but not exactly, 0. Thus, a small chance exists of observing a moratorium on the equilibrium path.

The equilibrium with an intermediary leads to greater *ex post* efficiency even when the effects of a moratorium are fully anticipated and the moratorium does not occur. The gain comes from good poor farmers who have borrowed relatively cheaply; they can use retained earnings to expand at  $t = 1$ .

Interestingly, if the threat of a moratorium results in  $D^\# < \theta_a$ , then even average types would repay their loans *ex post*.<sup>7</sup> In this case, there is an additional *ex post* efficiency gain with the political institution of a moratorium. The threat of a moratorium allows average poor farmers to keep their farms.

### *Restricting Voting Rights*

When repayment rates that are low enough to produce a majority opposed to a moratorium are not profitable for the rich, and when credit rationing is infeasible, credit markets collapse when moratoria are anticipated. To avoid a complete shutdown of the credit market at date  $t = 0$ , the authorities must restrict voting rights in some way. In fact voting rights were generally restricted at the beginning of the nineteenth century. Only landowners and men deemed sufficiently wealthy were allowed to vote. In this model re-

<sup>7</sup> The fact that average types will repay for low values of  $D^\#$  makes reduced terms more feasible for creditors. If only good types repay, then  $m_g D^\# > 1$ . But if both good and average types repay, it suffices that  $(m_g + m_a) D^\# > 1$ .

stricting the franchise to those having capital, either endowed or borrowed, improves ex ante efficiency. This restriction eliminates the votes of agricultural laborers altogether and thus makes lending to a maximum number of poor farmers possible, where  $\hat{n}(1 - 2m_g) = N$ .

Another way to make moratoria more difficult is to require more than a simple majority in voting for enactment (under direct democracy). This approach can also be used in a representative democracy with a bicameral legislature in which property interests are overrepresented in one chamber. Measures to make a moratorium more difficult, however, are not desirable when the threat of a moratorium leads to an equilibrium with an interest rate that is lower than interest rates in an environment with no political intervention.

When there is no aggregate uncertainty, a debt moratorium will always improve ex post efficiency. But allowing for voting on a moratorium causes lenders to adopt strategies that always result in a majority that opposes a moratorium. Moratoria do not occur on the equilibrium path. The threat of a moratorium undermines credit markets, and ex ante efficiency is reduced if credit rationing occurs. The threat of a moratorium may lead to lower repayment rates, however, leaving ex ante efficiency unchanged and ex post efficiency improved.

### *Bailouts*

Suppose again that farmers vote on whether to bail out defaulting debtors at date  $t = 1$ , following the realization of crops and the revelation of farmer types. Like moratoria, bailouts are difficult to target only to average and bad poor farmers. Accordingly, the analysis considers a vote on a bailout of  $D$  for all poor farmers financed with a proportional tax on consumption at date  $t = 2$ . That is, the government is able to run a deficit at date  $t = 1$  by borrowing against receipts from a tax on accumulated consumption in the second period.

A consumption tax is a logical choice because consumption is easier to monitor than income. Just like any creditor, a government has difficulty observing or verifying the actual revenues individual farms generate, so an income tax gives rise to widespread evasion. This analysis assumes that all consumers are taxed at tax rate  $\tau$ , with a maximum tax of  $\bar{\tau} < 1$ .

If taxing consumption were as difficult as taxing income, the tax base might be too small to finance a bailout—one reason debt moratoria ap-

peared to be the preferred choice of relief in the Panic of 1819. Nevertheless suppose that an efficient consumption tax (or an inflation tax) is available, and consider who would support or oppose such a tax *ex post*.

#### *Winners and Losers in a Bailout*

Ignoring the tax implications of a bailout, average and bad poor farmers benefit to the extent that they both receive higher wages and have the option of remaining on their farms. Similarly, good poor farmers may oppose a bailout if it raises wages too sharply. But poor farmers have another more basic reason to oppose it: the extra tax burden. Rich farmers, however, now have a reason to favor bailouts: their loans are repaid. As long as the amount of repayment rich farmers receive exceeds the additional tax burden and wage bill, they will support a bailout.

Because the tax burden is spread over the entire population, creditors always end up getting more from a bailout than they pay out in the additional tax burden on their own consumption. The rich thus favor a bailout if it does not entail an overly steep wage hike. As the technological assumptions used here maintain that only good types hire labor, only these types would be likely, among the rich, to oppose a bailout. These types bear a disproportionate share of the bailout.

Thus if the wage effects of a bailout are relatively minor, rich creditors favor it, and some if not all poor farmers oppose it. The bad poor farmers, who would have defaulted and become agricultural laborers anyway, mainly see their tax bill increase and therefore oppose a bailout. Average poor farmers oppose a bailout if they value the option of staying on their land less than the increase in taxes. Finally good poor farmers oppose it because their tax burden is likely to exceed the nominal value of their debts. If a bailout has relatively strong effects on wages, all good farmers may oppose it and all average and bad types may support it. Thus the political coalitions that form to support or oppose a bailout are very different from those formed in support of or opposition to a moratorium.

#### *Ex Post Efficiency of Bailouts*

An unanticipated bailout has efficiency properties very similar to those of a moratorium. By removing the nominal debt overhang, a bailout allows bad

poor farmers and average farmers to make efficient economic decisions. Following a bailout these farmers decide to become laborers only if they are more productive somewhere other than on their farm. As for the other farmers, their investment decisions are unaffected at date  $t = 1$  because they get taxed only at date  $t = 2$  and because a consumption tax is neutral with respect to investment decisions. Admittedly the ex post efficiency of a bailout depends to a large extent on the method of taxation used to finance them. If taxes are sufficiently distortionary, then a moratorium will likely be preferred.

*Ex Ante Equilibrium with Anticipated Bailouts*

To fix ideas suppose that wage effects are small so that all rich lenders and average poor farmers favor a bailout, but bad and good poor farmers oppose it. Suppose, in addition, that a majority favors a bailout, or  $N > \frac{1}{2}M(1 - m_a)$ . This implies that lenders are always fully repaid ex post and have every incentive to lend ex ante. In other words the ex ante response to a bailout is the opposite of the ex ante response to a moratorium. A bailout gives rise to more rather than less investment.

In fact, an anticipated bailout raises issues involving the existence of equilibrium. To see this, note that all poor farmers seek to borrow  $\bar{k}$  no matter how high the required repayment  $D$ , because they know they will not have to repay out of their own money anyway. Now if  $D > \bar{\theta}$  the rich prefer to lend all their endowment rather than invest in their own farms. But even if rich farmers lend everything, aggregate demand for loans exceeds supply, for by assumption  $N(1 + \bar{W}) < M$ . Consequently an equilibrium may obtain only at the maximum rate  $\bar{D}$  that the government can actually repay. Such an equilibrium is sustainable, however, only if the bailout rule gives priority to bailing out debts of lower denominated interest rates. In that case no lender will sign a lending contract with  $D > \bar{D}$  when all other contracts specify repayment  $\bar{D}$ .

To characterize this equilibrium further, suppose that all poor farmers borrow:

$$k_p^B = \frac{N\bar{W}}{M - N} < 1$$

in exchange for a unit repayment of  $\bar{D} > \bar{\theta}$  at date  $t = 1$ . Then the total bailout bill for the government at date  $t = 1$  is:

$$\bar{D}k_p^B(M - N) = \bar{D}N\bar{W}.$$

Denote by  $x$  the total accumulated output at date  $t = 2$ . In equilibrium, then:

$$\bar{D}N\bar{W} = \bar{\tau}x$$

or

$$\bar{D} = \frac{\bar{\tau}x}{N\bar{W}}$$

(assuming that the government can costlessly tax all private consumption at date  $t = 2$  as well as borrow costlessly on international markets).

As long as equilibrium lending terms  $\bar{D}$  are greater than  $\bar{\theta}$  rich farmers prefer to lend all their wheat rather than invest in their farms. At these terms poor farmers obtain a strictly positive total expected before-tax payoff of:

$$\bar{\theta}k_p^B + m_g[\bar{k}\theta_g - (\bar{k} - k_p^B) - (\bar{k} - 1)\theta_b k_p^B] + m_a[\theta_a - (1 - k_p^B)] + m_b\theta_b k_p^B,$$

which is more than anything they can hope to get by working as agricultural laborers in both periods. (Indeed they would prefer to borrow more at these terms.)

Bolton and Rosenthal (1999) characterize in more detail the existence of this ex ante equilibrium with maximum lending. Note that ex ante efficiency follows from  $k_p^B < 1$ . An ex post bailout may improve both ex post and ex ante efficiency because the debt contract is inefficient under no bailout. The inefficiency stems from the fact that creditors are unable to appropriate ex post all the output produced with their investment on poor farms. A bailout allows for potentially superior collection technology ex post by complementing the creditors' debt-collection technology with the government's taxation technology.

In a world with costless tax collection, then, bailouts are more desirable than moratoria. Bailouts here occur along the equilibrium path, whereas moratoria are almost always an off-the-path possibility that constrains the equilibrium outcome. But with aggregate uncertainty moratoria can occur on the equilibrium path. Perhaps more interestingly, with aggregate uncertainty the equilibrium with bailouts may be such that with bad macroeconomic shocks total accumulated debts are too high for a government bailout

that rescues everybody. In other words, anticipating a bailout in some states may trigger massive defaults in others.

### Aggregate and Individual Uncertainty

This section extends the model by assuming that  $0 < \lambda < 1$ . Recall that  $\lambda$  denotes the probability that state  $H$  occurs, and  $1 - \lambda$  denotes the probability that state  $L$  is realized. In state  $H$  the productivity of all farmers is higher than in state  $L$ . With aggregate uncertainty, ex post majority voting on debt relief may complete debt contracts, which are constrained to be independent of the state of nature. To keep the analysis tractable, the extreme assumption is made in this section that  $\alpha = 0$  (and that  $\theta'_a > 1$  for  $j = H, L$ ).<sup>8</sup> Although this assumption eliminates many interesting effects, it helps highlight the main observation of this section: that ex post political intervention can play a beneficial role in completing debt contracts.

### *Economy without Political Intervention*

As in the case without aggregate uncertainty, the focus is on an equilibrium where:

- Rich farmers invest 1 on their own farms and lend the remainder,  $\bar{W} - 1$ , to poor farmers, and each borrows  $k_p = \frac{N(\bar{W} - 1)}{M - N}$ .
- The labor market shuts down at  $t = 0$ .
- Because  $\alpha = 0$  there is only limited demand for labor at date  $t = 1$ .

Moreover, with aggregate uncertainty:

- The two states are distinguished by deriving an equilibrium repayment rate in the loan contract  $D$  such that bad and average types cannot repay in state  $L$ , but only bad types default in state  $H$ .

<sup>8</sup> In the previous section, with  $\alpha > 0$ , it was assumed that  $1 < \theta'_a < \alpha\theta'_g$ . Clearly with  $\alpha = 0$  one of the inequalities has to be dropped. It is most natural to drop the second one.



With the restriction that  $\alpha = 0$ , deriving the conditions for such an equilibrium to obtain is straightforward. Poor farmers are considered first.

*Poor Farmers' Ex Ante Expected Payoff and Ex Post Default Decisions*

In state  $L$  good farmers repay their loans if and only if  $\theta_g^L \geq D$ , and average and bad farmers cannot repay if  $D > \theta_a^L$ . Similarly in state  $H$  good and average farmers repay their loans if and only if  $\theta_g^H \geq D$  and poor farmers cannot repay if  $D > \theta_b^H$ . If good poor farmers retain some earnings after repaying their debts, they invest to expand capacity and possibly to hire labor. Because  $\alpha = 0$ , labor is essentially free and good farmers want to expand up to  $\bar{k}$ . Thus, assuming that:

$$\theta_g^H > \theta_g^L \geq \theta_a^H = D^* > \theta_a^L,$$

a poor farmer's ex ante payoff from borrowing  $k_p$  is given by:

$$R_p = [\lambda \bar{\theta}^H + (1 - \lambda) \bar{\theta}^L] k_p + m_g [\lambda (\theta_g^H - \theta_a^H) \theta_g^H + (1 - \lambda) (\theta_g^L - \theta_a^L) \theta_g^L].$$

To ensure that lenders do not wish to renegotiate the debt contract in either state, it is now assumed that:

1. In state  $L$  the  $\theta_i^L$  are such that:

$$(3.5) \quad \theta_a^H \geq \max \left[ \left( 1 + \frac{m_a}{m_g} \right) \theta_a^L, \left( \frac{1}{m_g} \right) \theta_b^L \right].$$

2. In state  $H$  the  $\theta_i^H$  are such that:

$$(3.6) \quad \theta_a^H \geq \left( \frac{1}{1 - m_b} \right) \theta_b^H.$$

*Rich Farmers' Lending Decisions*

As in the case with no aggregate uncertainty, rich farmers never want to lend more than  $\bar{W} - 1$ . Bolton and Rosenthal (1999) show that a rich farmer prefers credit contracts lending  $\bar{W} - 1$  to a labor contract if and only if:

$$k_p \geq \frac{1}{[(\lambda(m_g + m_a) + (1-\lambda)m_g)\theta_a^H - 1]} - \frac{1}{[\lambda\bar{\theta}^H + (1-\lambda)\bar{\theta}^L]} - \frac{m_g[\lambda(\theta_g^H - \theta_a^H)\theta_g^H + (1-\lambda)(\theta_g^L - \theta_a^H)\theta_g^L]}{[\lambda\bar{\theta}^H + (1-\lambda)\bar{\theta}^L]}.$$

Again, this condition is jointly satisfied with the renegotiation-proofness conditions 3.5 and 3.6 for a nonempty subset of the parameter space (e.g., for  $m_g$ ,  $\theta_a^H$ , and  $\theta_g^H$  large enough).

#### *Equilibrium Wheat Production in Each State of Nature*

In state  $L$  the total equilibrium output is now simply:

$$(M - N)\bar{\theta}^L k_p + N\bar{\theta}^L$$

at date  $t = 1$ , and:

$$(M - N)m_g \theta_g^L (k_p + \theta_g^L - \theta_a^H) + N\bar{\theta}^L + N(\bar{k} - 1)(m_g \theta_g^L + m_a \theta_a^L)$$

at date  $t = 2$ . In state  $H$  total output is:

$$(M - N)\bar{\theta}^H k_p + N\bar{\theta}^H$$

at date  $t = 1$ , and:

$$(M - N)[m_g 2\theta_g^H k_p \left(1 + \theta_g^H - \frac{\theta_a^H}{k_p}\right) + m_a \theta_a^H k_p] + N\bar{\theta}^H + N(\bar{k} - 1)(m_g \theta_g^H + m_a \theta_a^H)$$

at date  $t = 2$ . Recall that  $\alpha = 0$  (and labor is essentially free), so both good and average rich farmers now find it worthwhile to expand their farm capital up to  $\bar{k}$  at date  $t = 1$ . Similarly, good poor farmers expand capacity by  $\max[(\theta_g^H k_p - \theta_a^H); \bar{k} - k_p]$  (assuming that  $\bar{k} > (\theta_g^H + 1)k_p - \theta_a^H$ , the expression above is obtained).

#### **Economy with Political Intervention**

This section considers, in turn, debt moratoria and bailouts.

### Debt Moratoria

The analysis is restricted to parameter values that allow for a majority in favor of moratoria only in state  $L$ . More precisely, it determines an equilibrium repayment  $D$  such that good poor farmers oppose a moratorium in state  $H$  to get  $L$ . Then as long  $(M-N)m_g + N > (M-N)(1-m_g)$ , there will be a majority against moratoria in state  $H$  and a majority in favor of moratoria in state  $L$  (as by assumption  $(M-N) > N$ ).

In state  $H$ , a good poor farmer opposes a moratorium if the benefit in cheap labor outweighs the cost of repaying the loan. Assuming that the population of bad poor farmers is relatively high, so that:<sup>9</sup>

$$(M-N)m_b > M(\bar{k} - k_p)(m_g + m_a),$$

the equilibrium wage following a moratorium will equal  $\theta_b k_p$ . Therefore good poor farmers oppose a moratorium if:

$$(\theta_g^H - D)k_p \theta_g^H \geq \theta_g^H \left[ (1 - k_p) + \frac{\theta_g^H k_p - (1 - k_p)}{1 + \theta_b^H k_p} \right]$$

or:

$$D \leq \theta_g^H - \frac{1 - k_p}{k_p} - \frac{\theta_g^H}{1 + \theta_b^L k_p} + \frac{(1 - k_p)}{(1 + \theta_b^L k_p)k_p}.$$

Thus, assuming that:

$$\begin{aligned} \theta_g^L - \frac{1 - k_p}{k_p} - \frac{\theta_g^L}{1 + \theta_b^L k_p} + \frac{(1 - k_p)}{(1 + \theta_b^L k_p)k_p} &\leq \theta_a^H \\ (3.7) \quad &\leq \theta_g^H - \frac{1 - k_p}{k_p} - \frac{\theta_g^H}{1 + \theta_b^H k_p} + \frac{(1 - k_p)}{(1 + \theta_b^H k_p)k_p}, \end{aligned}$$

an equilibrium repayment of  $D^* = \theta_a^H$  gives rise to no moratorium in state  $H$  and a moratorium in state  $L$ . In the moratorium equilibrium, poor farmers' ex ante expected payoff is then:<sup>10</sup>

<sup>9</sup> A weaker, necessary and sufficient condition is straightforward but algebraically messy.

<sup>10</sup> Note that an implicit assumption here is that  $(\theta_g^L + 1)k_p \leq \bar{k}$ .

$$R_p^m = \lambda[\bar{\theta}^H k_p + m_g(\theta_g^H - \theta_a^H)\theta_g^H] + (1-\lambda)[m_b 2\theta_b^L k_p + m_a(\theta_a^L + 1)k_p\theta_a^L + m_g(\theta_g^L + 1)k_p\theta_g^L].$$

Rich farmers prefer to lend ( $\bar{W} - 1$ ) instead of hiring laborers if and only if:

$$(3.8) \quad R_p^m \geq \frac{\lambda\bar{\theta}^H + (1-\lambda)\bar{\theta}^L}{(\lambda m_g \theta_a^H - 1)} - 1.$$

Thus as long as  $(M - N)m_g + N > (M - N)(1 - m_g)$  and conditions (3.7) and (3.8) hold, the equilibrium with moratoria is such that:

1. Rich farmers continue to lend at repayment terms  $D^* = \theta_a^H$ .
2. No moratorium is voted in state  $H$ , with good and average types repaying their loans.
3. A moratorium is voted in state  $L$ .

This equilibrium dominates the equilibrium without political intervention in both ex ante and ex post efficiency. Ex post efficiency is improved in state  $L$  by allowing average and bad poor farmers to stay on their farms and thus remain productive. Ex ante, the likelihood of state  $L$  occurring  $(1 - \lambda)$  is sufficiently small that it does not affect rich farmers' lending decisions, so that efficiency is not impaired. Interestingly, the possibility of an ex post moratorium involves a transfer of rents to poor farmers both ex ante and ex post. The reason that poor farmers also benefit ex ante has to do with the threat of default or a moratorium in state  $H$ , which can be avoided only by giving poor farmers better lending terms ex ante. As suggested earlier, political intervention plays a critical role here in completing financial contracts that are constrained to be state independent.<sup>11</sup>

<sup>11</sup> Recall that repayments cannot be made contingent on aggregate shocks because courts cannot verify whether state  $H$  or  $L$  has occurred. The state of nature is certified only by the outcome of majority voting on debt moratoria. If no majority in favor materializes, it becomes common knowledge that state  $H$  has occurred (or that state  $L$  has occurred if a majority in favor of a moratorium is formed).

### *Bailouts*

The most interesting case here is where a majority is in favor of a bailout in state  $L$  and a majority is opposed to one in state  $H$ . In this case the equilibrium with a bailout is similar to the equilibrium with a debt moratorium as long as  $\lambda$  is small. To see why, note first that the ex ante equilibrium outcome with anticipated bailout in state  $L$  is then the same as the equilibrium outcome with no bailout—that is, rich farmers continue to lend  $(\bar{W} - 1)$  at equilibrium repayment terms  $D^* = \theta_a^H$ . The reason that equilibrium terms do not exceed  $\theta_a^H$  is simply that higher terms would trigger default by average poor farmers in state  $H$  and therefore would not be profitable. More precisely, if  $\lambda$  is large the anticipated increase in repayments in state  $L$  (through bailouts) is outweighed by the anticipated fall in expected repayments in state  $H$ .

In sum, anticipated bailouts in state  $L$  do not affect the ex ante equilibrium and lead to an ex post welfare improvement in state  $L$ , just like moratoria. In this case the sharp distinctions between the effects of bailouts and moratoria observed in the previous section disappear with the introduction of aggregate uncertainty.

### **The Political Economy of Debt Relief in the Panic of 1819**

The empirical motivation for the model came from the observation that state legislatures in the United States frequently voted for debt moratoria in the late 19th and early 20th centuries. Most notably, many states intervened in private debt contracts as a result of the severe downturn known as the Panic of 1819. Between October 1818 and April 1822, Illinois, Kentucky, Louisiana, Maryland, Missouri, Pennsylvania, Tennessee, and Vermont passed stay laws imposing debt moratoria. Rhode Island made seizing the assets of debtors more difficult by repealing “summary process.” Minimum appraisal laws in Indiana, Kentucky, and Pennsylvania made auctioning debtors’ assets more difficult (Rothbard 1962). At the same time Congress delayed repayments of land debts to the federal government. But proponents of federal relief for private debts lost. Although the United States constitution explicitly gives bankruptcy powers to the federal government, no bankruptcy law existed between 1803 and 1842.

This section analyzes the politics of the Panic in light of the model, which closely approximates the economy of the United States in the period around 1820, particularly in the South and West. The frontier states, where new settlers borrowed to finance agricultural investment, were much more likely to provide debt relief than the older states, and congressional preferences on relief of land debts paralleled those leading to debt moratoria at the state level. Most of the data used here are political—either state legislation or congressional roll-call votes. As Domowitz and Tamer (1997) point out, there does not appear to be economic data before 1830 that would provide evidence of private defaults. However, there are ample data on political outcomes, which can be informative about the preferences of economic agents and their reaction to macro shocks.

#### *The Economy at the Time of the Panic*

The major cause of the Panic, according to North (1961, pp. 182-83), was the collapse of the world price for cotton. Between January 1918 and June 1919, cotton prices fell by more than 50 percent. Cotton dominated both American exports and the economy of the South. The decline of cotton prices also affected the West, as the economy there was driven largely by sales of -heat and livestock to the South. Bulk commodities were transported to the outh on the Mississippi and its tributaries, as neither canals nor railroads rossed the Appalachians before 1825. The Northeast provided nonbulk anufactured goods as well as banking, shipping, and other services to the arious regions.<sup>12</sup>

oth the South and the West correspond roughly to the technological tructure of the model. In a nation that was still almost entirely rural, the est and western portions of the South were particularly so (99 percent in 820). The Atlantic seaboard portion of the South was also 95 percent rural. hat little urban population existed was concentrated mainly in the New ngland and Middle Atlantic states (10.5 and 11.3 percent, respectively). In a national labor force of 2,900,000 people, more than two-thirds worked on farms (United States Bureau of the Census 1975). Given the low technologi-

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<sup>12</sup> North (1961) defines the South at this time as Alabama, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Virginia; the West as Illinois, Indiana, Kentucky, Missouri, Ohio, and Tennessee; and the Northeast as all other states.

cal level of agriculture at this time, it is not too far-fetched to regard the South and West as single-commodity regions with labor (often slaves) as the major input factor.

Commodity prices are made endogenous when new land is brought into cultivation. Some of the drop in cotton prices reflects an expansion in production from 157,000 bales in 1812 to 377,000 in 1821. But over a longer period, cotton production was able to expand tremendously as whites prospered in the so-called Cotton Kingdom. In 1859 some 5,337,000 bales were being produced. Clearly the world market price was also determined by shifts in foreign demand. (World price shocks from that time are similar to the macroeconomic shock in the model.)

An important omission from the model is a market for land. The 13 former colonies had ceded all their western land claims to the federal government. Almost all of the Louisiana Purchase was government land. Sale prices and property rights for government-controlled virgin land were then and are today (as in Brazil) an important issue of economic policy. One argument maintained that the government should charge a zero price and regulate only quantities. But until 1860 the government sold land, and rising prices for cotton and other sources of prosperity stimulated land sales at the end of the Napoleonic Wars. Receipts from land sales in the South increased from \$332,000 in 1815 to \$9,063,000 in 1818. In the West, the jump was from \$2,078,000 to \$4,556,000 (North 1961).

With the Panic, land sales fell abruptly, never regaining their 1818 level in the South and passing it in the West only in 1835. The receipts were in large part only down payments, and some of this money was borrowed in private markets. Private debt was also used to finance investment on the land, including slave purchases.<sup>13</sup> In addition many citizens in the South and West were in debt to the federal government, with payments due on the outstanding balance of land purchases. Before the passage of the Land Act

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<sup>13</sup> In the model there is no market for land (there is an abundance of land), so this story does not quite fit these events. It is innocuous, however, to introduce a market for land in the model. At date  $t = 0$  all such a market will mean is a higher investment outlay for farmers. As for date  $t = 1$ , default will give rise to an excess supply of land, and consequently property prices will collapse, as seen in the Panic of 1819. But the main complication with introducing land in the model is the possibility of strategic behavior by rich buyers, such as waiting for panics to buy land on the cheap. Addressing these somewhat peripheral issues is beyond the scope of this chapter.

of 1821, such debtors owed the federal government some \$23,000,000 (Rohrbough 1968). The land debt to the government exceeded annual federal expenditures (around \$20,000,000 in 1820) and was an appreciable fraction of the government debt of \$90,000,000 in 1821 (United States Bureau of the Census 1975).

When the Panic occurred the frontier branches of the privately owned Second Bank of the United States had been extending easy private credit. Credit tightening by the Philadelphia headquarters led to substantial resentment on the frontier.

### *Debt Relief at the State Level*

The pressure to provide debtors with some relief generated a legislative response, but mainly in frontier states: Alabama, Illinois, Indiana, Kentucky, Louisiana, Missouri, Mississippi, Ohio, and Tennessee. (These states are distinguished from the states on the Atlantic seaboard that were once British colonies.) Six of these nine frontier states were listed by Rothbard (1962) as providing some form of relief for debtors in response to the Panic. In contrast, only four of the remaining 15 states passed a "stay law" or some other measure ( $\chi^2_1 = 3.70$ ,  $p$ -value  $< 0.10$ ). This chi-square statistic and those later refer to the 2 x 2 contingency table of, for example, (*[frontier, nonfrontier]* x *[law, no law]*).

Because the great preponderance of new agricultural investment was taking place in frontier states, and because these states were overwhelmingly rural, debtors were likely to dominate the electorate there. In addition, the frontier was more likely than the older states to have universal male suffrage rather than suffrage restricted on the basis of property holding or wealth (McCoy 1989). It is thus not surprising that most ex post intervention occurred on the frontier.

However, debt relief was largely a northern and border state matter. Of the eight states in North's (1961) southern region, only two, Louisiana and Tennessee, both on the frontier, granted debt relief, as opposed to eight of the 16 other states. Indeed, debt relief measures were passed in four of the nine New England and Middle Atlantic states, which in many historical accounts are regarded as pro-creditor.

The absence of debt relief in the South may have been the expression of a reaction to stay laws that were passed by southern state legislatures im-



mediately preceding the formation of the United States. McCoy (1989, p. 41) notes, referring to James Madison,

Madison vehemently condemned . . . popular legislation . . . in the wake of a commercial depression that overtook much of the country in the mid-1780s. Paper money laws, so-called "stay" laws that offered relief to debtors, laws that impugned the sanctity of contracts; all may have expressed the immediate will of a people suffering the consequences of economic hard times, but they just as clearly violated the rights of both individuals and minorities. And in Madison's judgment, he and other critics of this debtor legislation were defending much more than the specific interest of creditors . . . By wantonly disregarding the rules of property and justice that raised men from savagery to civilized order, these laws threatened to bring republican government in America into profound disrepute.

Madison's economic conservatism may have carried over to state legislatures in the South, which were dominated by property owners in the older regions of the states, the high-endowment types in the model. Within the South, the one-white-man, one-vote ideology applied only in the four frontier states (Freehling 1989). In Virginia, for instance, about half the white males were disenfranchised by a property requirement. Moreover, the legislature was not reapportioned to reflect greater population growth beyond the Tidewater. South Carolina had universal white male suffrage, but severe property qualifications for office holding, and the state Senate was malapportioned to give control to the older coastal region.

Suffrage and apportionment may be an important reason stay laws and other forms of debt relief were most prevalent in frontier states. A larger fraction of the population may have been in default in those states, and those debtors may have had a relatively strong political voice.

### *Relief for Purchasers of Land*

A national consensus emerged that the Panic required a policy adjustment for land debtors. Despite this consensus there was a sharp debate over the degree of leniency, with close roll-call votes in 1821 on amendments defin-

ing the terms of the new policy. Disappointed in 1820, the thinly populated frontier obtained better terms in 1821.

The initial federal reaction to the massive defaults by those buying land on credit was the Land Law of April 24, 1820. The law eliminated future sales on credit but reduced the minimum purchase price from \$2 to \$1.25 per acre. At the same time forfeiture on outstanding debt was delayed until March 21, 1821. Just before this deadline (March 2), another act was passed. Debtors could either repay at a 37.5 percent discount (the price reduction of 1820), give up part of their land as payment for the remainder, or extend the time required to pay. This bailout or moratorium was, like the savings and loan bailout of the 1980s, a substantial transfer between regions. The beneficiaries were concentrated on the frontier, but the entire nation bore the costs to the Treasury.

There were many roll-call votes on the floor of Congress on the 1820 and 1821 land bills. The 1820 bill was largely uncontroversial in the Senate, passing on a 31-7 vote. Although the bill granted a one-year moratorium on outstanding debt, its provisions banning future sales on credit were not to the liking of the frontier states. Amendments were introduced to make the law more lenient; one, by Senator Ninian Edwards (Illinois), reduced the purchase price to \$1 an acre.<sup>14</sup> It failed 24-11, and of the 11 favorable votes, 10 came from the frontier (only five frontier senators cast negative votes). All eight of the frontier states (Missouri had not yet been admitted) had one senator voting for cheaper purchase prices. This voting pattern was repeated on other votes. For example, amendments by Edwards to give purchase preferences to squatters and by Senator James Noble (Indiana) to eliminate the cash payment requirement both failed 28-8. Of the eight favorable votes, seven came from the frontier. Of the seven votes cast against final passage of the bill, six came from frontier senators dissatisfied with its lack of leniency.

The House of Representatives also had a lopsided majority in favor of the 1820 bill. Only one amendment led to a recorded roll call. As in the Senate, frontier representatives wanted the cash payment provision eliminated. The nonfrontier states voted overwhelmingly (123-7) to maintain the cash payment, and they were joined by all six members of the Ohio delegation. Elsewhere on the frontier representatives sought, 12-6, to eliminate the new requirement for cash payment. The bill then passed. The bill won

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<sup>14</sup> Vote #119, 2/18/19. All roll-call data are taken from VOTEVIEW at <http://voteview.UH.edu>.

overwhelming support in the older states (122-10), but lost on the frontier (13-11). The frontier won a temporary reprieve for its debtors as well as lower prices, but the terms of future purchases became much stricter.

The 1821 bill was more lenient. In the Senate, Walter Lowrie (Pennsylvania) failed by only one vote to reduce the discount for prompt payment from 37.5 to 25 percent. All 15 senators from the frontier voted against the amendment, which was supported by the older states 20-6 ( $\chi_1^2 = 22.52$ , p-value < 0.001). Although the amendment vote clearly delineates the frontier's desire for leniency, the passage of this bill—like the 1820 bill—was largely uncontroversial. On February 27, 1821 the House also voted on the 37.5 percent discount provided in the amendment offered by Richard C. Anderson, Jr. (Kentucky).<sup>15</sup> The amendment passed 72-62; the 20-4 margin from the frontier states was pivotal. The bill itself passed 97-40, winning 21 of the 24 votes from the frontier.

#### ***No Federal Relief for Private Debt: The Failure to Pass a Bankruptcy Bill***

Although the federal government provided relief to those in debt to the government, Washington failed to provide a fresh start or even a breathing spell for those in default on private debts (in contrast to stay laws at the state level). The federal government's inaction is somewhat surprising. As noted earlier, the Constitution adopted in 1787 clearly gave the federal government power to pass bankruptcy laws. Moreover, in contrast to many other aspects of the Constitution, the bankruptcy clause was not in controversy during the ratification process. Before the enactment of a stable, permanent law, bankruptcy legislation tended to be short-lived and generally served to write off severe downturns in the economy. Creditors obtained very little in court proceedings (Balleisen 1996). Bankruptcy in the nineteenth century therefore resembled a moratorium, subject to the inefficiency of court costs. If bankruptcy is perceived as a moratorium, however, it is not surprising that an interim conflict over federal bankruptcy law developed despite the initial consensus that Congress could indeed enact such legislation.<sup>16</sup>

<sup>15</sup> VOTEVIEW #135.

<sup>16</sup> See Berglöf and Rosenthal (1998) for details of the congressional politics of bankruptcy legislation in the 1840s and 1890s.

The Panic of 1819 occurred during the so-called Era of Good Feelings, when the United States was virtually a one-party state. The Jeffersonian Democrat-Republicans were in control and, despite the Panic, the Electoral College reelected President Monroe in 1820 with only one dissenting vote. With the political ascendancy of the "left," it is not surprising that no bankruptcy law was passed, although the Jeffersonians were particularly strong on the debt-ridden frontier. The bill under consideration in 1822, for example, was, in the view of Representative James Blair (South Carolina), very similar to the 1800 law that the Jeffersonians had repealed on taking control of both the executive and legislative branches in 1803.<sup>17</sup>

In the 15th Congress, the Senate held no recorded floor votes on bankruptcy. The House held just one, voting in February 1818 to postpone consideration of a bill indefinitely. The 16th Senate did pass a bankruptcy bill by the narrow margin of 23-19 on February 19, 1821. Floor votes took place over ending the imprisonment of bankrupt individuals, including classes of debtors other than merchants, and applying the bill to contracts written before the legislation was passed. The Senate bill was reported unamended to the floor of the House by the Judiciary Committee but was tabled in seven procedural votes between February 28 and March 2, 1821.<sup>18</sup> The 17th House had amendment voting on the treatment of debtors other than merchants and on whether creditor majorities would be needed to approve voluntary bankruptcies. No action took place in the Senate. Substantive votes did occur in the 18th and 19th Senates on earlier issues and on the treatment of banks, but in these sessions the House took no action.

The voting patterns on bankruptcy did not match those on the land debt, so there was no clear conflict between frontier states and the older part of the country. The old South was as opposed to a federal bankruptcy law as the frontier South. House votes indicate that the main trading centers—Boston, Charleston, New York, and Philadelphia—voted together, frequently in opposition to rural districts in their own states. Representatives of these trading centers argued that it was especially necessary to provide a fresh start for merchants who, unlike farmers, were subject to circumstances beyond their control, including domestic and foreign political changes that involved uninsurable risk.<sup>19</sup>

<sup>17</sup> History of Congress (HC), 1822, 663. Information is for the House of Representatives.

<sup>18</sup> HC, 1821, 1193.

<sup>19</sup> Bureau of the Census (1975).

Merchants, it was argued, were also heavily engaged in interstate commerce and thus required a uniform national law.<sup>20</sup> A national law would give geographically distant creditors the same protection as creditors nearer the debtor.<sup>21</sup> Those opposed to a national law objected strongly to the "fresh-start" provision, in large part because they foresaw substantial opportunities for fraud.<sup>22</sup> The arguments for a bankruptcy law made in 1818 were remade, to no avail, in the 1821 and 1822 debates.<sup>23</sup> Why, then, did no bill materialize? Several explanations are possible.

First, amendments were offered that provided differential treatment for various classes of debtors, merchants, manufacturers, and banks or that set a debt threshold for declaring bankruptcy. For example, during the 1818 debate in the House a proposal was put forward that included merchants. But the proposal also set a threshold of \$5,000 in debt—a measure designed to deter very small artisan manufacturers from taking advantage of bankruptcy. The threshold in fact turned small merchants against the proposal. But the most divisive item was a provision that required two-thirds of creditors to agree on a bankruptcy before the debtor could file, as some representatives preferred to allow debtors to declare bankruptcy on their own. The final House bill had 64 sections in all.<sup>24</sup> As Speaker Henry Clay remarked, "It was very probable the bill would be lost by the variance of opinion on some of its important details."<sup>25</sup>

In such a setting, it can be difficult to construct a stable majority combining a diverse set of groups. To take a more recent example, the modern underpinning of the banking industry in the United States, the Glass-Steagall Act, was not changed legislatively between 1933 and 1999. Kroszner and Strattman (1998) have recently argued that the legislative status quo prevailed because banks, insurance companies, and securities firms had distinct interests in any changes, and each group vetoed detrimental changes. In economies more diverse than that of this simple model, then, forming majorities to change the status quo on bankruptcy may be difficult.

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<sup>20</sup> HC, 1818, 1018.

<sup>21</sup> HC, 1818, 1019.

<sup>22</sup> HC, 1818, 1023.

<sup>23</sup> HC, 1822, 967, 986.

<sup>24</sup> HC, 1818, 1010-1011.

<sup>25</sup> HC, 1818, 1011.

Second, one way to maintain the status quo is to use one house of Congress to block a bill that has majority support in the other house. While New York, Massachusetts, Pennsylvania, and Virginia had 25, 22, 23, and 25 representatives, respectively, the five frontier states of Indiana, Illinois, Alabama, Mississippi, and Louisiana each had only a single representative. Under these circumstances crafting legislation that would win a majority in both chambers was often difficult.

Third, the Supreme Court began ruling on the constitutionality of stay laws only in the late 1820s. In states where most of the debt was owed to foreigners or lenders residing in other states, debtors may have had a preference for maintaining state institutions. States' rights arguments were invoked frequently in the congressional debate.<sup>26</sup> Part of the argument was that the bankruptcy clause in the Constitution was intended not to extinguish contracts but to prevent debtors from evading payment by moving assets across state lines.

Fourth, if interstate or foreign debtors in a state had an interest in resisting federal intervention, intrastate creditors may also have wanted to avoid federal intervention if they believed that a federal bankruptcy law would be more debtor-friendly on intrastate debt. In particular, creditors in the old South may have had greater confidence in their gentry-controlled state legislatures.

Finally, the issue of states' rights was connected to slavery. Concerns about federal intervention on slave issues may have led to a preference for limiting federal intervention on other issues. Representative Samuel H. Woodson (Kentucky) did not mention slavery explicitly but did indicate that the bankruptcy issue was bound up with a much broader debate about states' rights.<sup>27</sup>

In addition to the long-term concern over slavery, the role of the federal government in economic matters was open to debate. The federal government was extremely small in 1820, with only 6,900 employees, most of them in the military.<sup>28</sup> The government provided defense and conducted foreign affairs, collected taxes through tariffs, managed the western lands,

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<sup>26</sup> Representative Andrew Stevenson (Virginia), HC, 1822, 770, Representative Alexander Smyth (Virginia), HC, 1822, 792.

<sup>27</sup> HC, 1822, 1120.

<sup>28</sup> Bureau of the Census (1975).

and ran the post office. Federal bankruptcy courts would have represented an important expansion in federal regulation. In particular, a federal role in bankruptcy would have reduced the rents enjoyed by local assignees, receivers, sheriffs, and auctioneers (Balleisen 1996). In contrast, when a stable bankruptcy law was finally passed in 1898, a number of events had changed the overall situation. The Civil War had resulted in the abolition of slavery and the acceptance of federal predominance over state governments, one national and no state currencies existed, and federal economic regulation had been accepted through the Interstate Commerce Act of 1887 and the Sherman Anti-Trust Act of 1893.

### Some Final Thoughts

With incomplete contracts there is an obvious case for governmental intervention in markets. Contracts cannot be contingent on individual productivity. Consequently, there will be excessive defaults. In this setup the total output of the economy is higher if average-type defaulting farmers are allowed to remain on their land. Contracts also cannot be conditioned on the state of the economy. In the equilibrium with uncertainty about the state of the economy, average farmers remain on their land in good times but default in bad times. With state-contingent contracts, average farmers are able, for some sets of parameters, to remain on their land in both states. Political intervention can remedy the inefficiencies that arise from both sources of contractual incompleteness. Not only is aggregate production increased ex post but, ex ante, the total output of the economy is increased by allowing for debt relief. The stay laws observed in the Panic of 1819 might well have been an anticipated response to aggregate uncertainty rather than an inefficient form of expropriation that would deter future lending.