FACULTY

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THE EFFECTS OF STATE FARM RELIEF LEGISLATION ON PRIVATE LENDERS: THE EXPERIENCE OF THE 1930s

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No. 101

May 1987

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 The author is indebted in particular to Wally Thurman for insightful comments on numerous aspects of this paper. Others providing helpful comments include Lee Alston, Gerald Carlson, Robert Collender, Paul Fackler, Charles Knoeber, William Levedahl, E.C. Pasour, Jr., Daniel Sumner, Michael Wohlgenant, and participants in the Agricultural Economics Workshop at North Carolina State University.

A significant number of farmers have suffered severe financial stress in recent years (Boehlje, et al., Melichar). A variety of programs and policies have been proposed to alleviate these farm financial problems (Brake and Boehlje, Pederson, et al.). Predicting the likely effects of these proposals on farm failure rates and on the market for agricultural loans is a difficult problem. The most common approach taken by agricultural economists to this problem is to estimate the effects of different policy options using simulation models (Barry, Boehlje et al., Pederson, et al.). An alternative approach to the problem is to look to the past for similar experiences and use information from those experiences to obtain insights useful for understanding the present situation. Changes in agricultural financial markets over time preclude the possibility of using information from past experiences to make precise predictions concerning the effects of programs and policies currently under consideration. The past can, however, provide useful insights into the general magnitudes and directions of the responses to current policy options.

This alternative approach is used in the present paper to examine the likely effects of government-imposed measures that alter the terms of agricultural debt contracts. Examples of such measures include the new Chapter 12 bankruptcy law and moratoria on farm foreclosures like those enacted in Iowa in 1985 and considered by legislators in a number of other farm states. Such measures may provide short-term relief to farmers. They also, however, impose costs on lenders, and may induce them to reduce the supply of credit to the agricultural sector. Evidence consistent with such a response to the new Chapter 12 bankruptcy law is already being cited.[1]

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[1] See "Farm Bankruptcy Law Halts Some Loans and Stirs Fears About Farmers' Credit," The Wall Street Journal, January 19, 1987.

The period studied in this paper is the 1930s, the most recent period of severe agricultural distress in the United States. Included among the programs instituted during the 1930s to provide relief for the farm sector were the commodity programs of the Agricultural Adjustment Administration, federal credit programs, and state-legislated moratoria on farm foreclosures. This paper focuses on the effects state-legislated moratoria and other types of state relief programs had on the supply of agricultural loans in the 1930s.

The use of data from the past to glean insights into current problems has not been widely employed in the agricultural finance literature. Shepard and Collins used time series data to investigate the determinants of aggregate farm bankruptcy rates. They included a general agricultural policy variable (government support payments as a proportion of all farm revenues) as an explanatory variable in their empirical analysis but did not investigate the effects of particular programs on bankruptcy rates. Rucker and Alston employed pooled time series cross sectional data for the period 1929-1940 to investigate the effects of government programs on rates of farm failure during the 1930s. They found that state-legislated moratoria were successful in reducing farm failure rates. Alston (1984) used state-level cross sectional data to investigate the causes and consequences of state-legislated moratoria during the 1930s. His reduced form estimates of the consequences of moratoria indicated that they led to significant reductions in the quantity of private loans and (insignificant) increases in interest rates. The present paper extends Alston's work by estimating the structural effects of state relief legislation on different types of private lenders and

by investigating interregional differences in the effects of state relief legislation.

This paper is organized as follows. The mortgage foreclosure procedures and the different types of state relief legislation passed during the early 1930s are described in Sections I and II. In Section III a system of demand and supply equations for loans from government and private lenders is presented and testable hypotheses concerning the effects of relief legislation are developed. The data used for estimation are discussed in Section IV. Empirical results are presented in Section V and concluding remarks are contained in the final section.

I. The Process of Farm Mortgage Foreclosure in the 1930s

If an individual borrower fell behind (became delinquent) on his mortgage payments, the lender decided whether to grant the borrower an extension or to foreclose on the mortgage. If the lender chose to foreclose, then he initiated the process by applying for foreclosure with the court of jurisdiction.

The court, if it ruled in favor of the foreclosure, then ordered sale of the property. The sale was conducted through a sheriff's auction in which any interested parties, including the original lender, could bid on the property. If the winning bid at the auction exceeded the amount due in principal and interest on the first mortgage, then the lender received payment and the remaining funds were divided among other lenders holding liens on the property. Any funds remaining went to the borrower. In some states if the winning bid was less than the debt owed on the first mortgage, the lender was able to sue for a **deficiency judgement** for the difference.

After the auction, the borrower usually was granted a period of redemption during which he was allowed to remain on the property providing he met court-established rental payments. If, during this period he was able to pay off the mortgage plus any accrued costs, he could recover title to the property. If the borrower (or one of the junior lenders) did not pay off the mortgage during the redemption period, then the certificate of sale from the auction was approved by the court and the property title transferred to the high bidder at the auction.

II. Relief Legislation during the 1930s

Prior to the Great Depression there were isolated instances of states passing legislation to provide debtors relief from their contractual loan obligations during periods of depressed earnings.[2] The experience of the 1930s, however, was unique in two respects. First, it was unique in its magnitude: more than half the states enacted relief legislation. Second, this was the first time that this type of relief legislation was declared constitutional by the U.S. Supreme Court.[3] State-legislated relief for debtors during the 1930s generally took three forms: (1) moratoria on foreclosures, (2) extension of the redemption period, and (3) limitation (or abolishment) of deficiency judgements.[4]

[2] See Alston, Friedman, Skilton, and Woodruff for discussions of these instances.

[3] The landmark case on relief legislation was Home Building and Loan Association v. Blaisdell et al., in which the constitutionality of relief legislation enacted in Minnesota was upheld.

[4] At the federal level the Frazier-Lemke Act (48 Stat. 1289, sec, 75, subsec (s)) was passed in 1934 in an effort to provide relief to farmers filing for bankruptcy. This legislation was declared unconstitutional in May 1935 and a new version was enacted in August 1935. Because the courses of action opened to borrowers under this act were of little benefit to them

Legislation of the first type generally gave the courts discretionary power to postpone foreclosure proceedings over a specified period. Postponement periods established by different states varied in duration from three months to four years and sometimes were extended upon expiration of the initial legislation. Foreclosures were not completely prohibited under these laws. Borrowers were usually required to make certain payments to lenders - interest, taxes, and court-specified rents.[5] If they failed to make these payments, their mortgages could be foreclosed.

The second type of relief legislation temporarily increased the length of redemption periods. This type of legislation imposed costs on lenders by delaying the time at which clear title could be obtained by the new owner.[6]

The third type of state relief legislation restricted creditors' rights to deficiency judgements. In some states, e.g., North Dakota, deficiency judgements were abolished. In others the dollar value of deficiency judgements was limited, often by setting a minimum sale price for the property being auctioned.

Insofar as the three types of relief legislation described above were viewed by lenders as an attenuation of valued rights in future mortgage

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(especially under its original form - see Woodruff and Munger and Feder), this legislation is assumed to have had no impact during the early 1930s and is not considered further.

[5] Woodruff (pp. 114-115) noted that rents paid under these arrangements tended to be less than those paid by tenants renting under normal circumstances.

[6] The borrower was required to make court-specified payments to the lender during this redemption period. Woodruff (1937, pp. 114-115) felt that these payments were less than payments received under normal circumstances and also noted that under these arrangements borrowers were inclined to neglect the property and may have been willfully destructive in some instances.

contracts, decreases in the supply of loans should be observed following the enactment of such legislation. The magnitude of these decreases, and whether different classes of lenders were differently affected, are discussed below.

III. A Model of the Supply and Demand for Farm Mortgage Loans[7]

Supply

Consider the following structural equations for the supply of loans from government and private lenders,

$$(1)\quad Q^s_{GOV} = \alpha_0 + \underset{(+)}{\alpha_1}\text{FDRDUM} + \underset{(0)}{\alpha_2}\text{STRESS} + \underset{(+)}{\alpha_3}(\text{FDRDUM*STRESS}) + \epsilon_1$$

$$(2)\quad Q^s_{INDIV} = \beta_0 + \underset{(-)}{\beta_1}\text{RLFLEG} + \underset{(+)}{B_2}\text{INTINDIV} + \underset{(-)}{\beta_3}\text{INTALT} + \underset{(-)}{\beta_4}\text{TCOSTS} + \underset{(+)}{\beta_5}\text{COLLAT} + \epsilon_2$$

$$(3)\quad Q^s_{BANK} = \tau_0 + \underset{(-)}{\tau_1}\text{RLFLEG} + \underset{(+)}{\tau_2}\text{INTBANK} + \underset{(-)}{\tau_3}\text{INTALT} + \underset{(-)}{\tau_4}\text{TCOSTS} + \underset{(+)}{\tau_5}\text{COLLAT} + \epsilon_3$$

$$(4)\quad Q^s_{INSUR} = \delta_0 + \underset{(-)}{\delta_1}\text{RLFLEG} + \underset{(+)}{\delta_2}\text{INTINSUR} + \underset{(-)}{\delta_3}\text{INTALT} + \underset{(-)}{\delta_4}\text{TCOSTS} + \underset{(+)}{\delta_5}\text{COLLAT} + \epsilon_4$$

where Q^s_{GOV}, Q^s_{INDIV}, Q^s_{BANK}, and Q^s_{INSUR} are the quantities (dollar value) of farm mortgage loans supplied annually by government lenders, individuals, banks, and insurance companies; FDRDUM is a zero-one dummy variable to indicate whether Roosevelt was in office, STRESS is the degree of financial stress suffered by farmers; FDRDUM*STRESS is an interactive term between the

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[7]The system of supply and demand for loans presented in this section is an adaptation of the system posited by Alston. In that model, Alston did not distinguish among different classes of private lenders and was able to estimate only reduced form parameters.

Roosevelt dummy and stress, RLFLEG is a zero-one dummy variable for relief legislation; INTINDIV, INTBANK, INTINSUR, and INTGOV are the interest rates on loans issued by individuals, banks, insurance companies, and government lending agencies; INTALT is the interest rate available to lenders on alternative investments; TCOSTS are transactions costs associated with lending to farmers; and COLLAT is the value of collateral.

Predicted signs for the coefficients of the explanatory variables are indicated in parentheses above the coefficients. In the government supply equation, FDRDUM has a positive coefficient, reflecting the increased activity of federal lending agencies following Roosevelt's election in 1932. Prior to 1933, the mandate of federal credit agencies was to supply loans in regions where private funds were not readily available.[8] If the activities of these agencies did not vary with the degree of farm distress prior to 1933, the coefficient on STRESS is zero. Following 1932, a stated objective of federal lending agencies was to provide funds to those farmers suffering the most, suggesting that the coefficient on the interactive term is positive.[9]

In the three private supply equations, (2)-(4), the coefficient on the relief legislation variable is negative, indicating that private lenders will decrease their activities as mortgage contracts are altered to their detriment. The coefficients on the respective own interest rate variables are

[8]Federal lending agencies include the federal land banks and the Land Bank Commissioner. For a thorough account of the activities of these agencies during the 1930s and the changes that were instituted under Roosevelt, see Horton et al. (1942).

[9]Note that loans of federal credit agencies are not determined by the interest rate in this model. In price-quantity space (where the price received for a loan is the rate of interest), the supply of government loans is represented by a point.

predicted to be positive, reflecting the assumption that supply curves are upward sloping. An increase in the rate of return on alternative investments will reduce the supply of farm mortgage loans, hence the negative coefficients on INTALT. An increase in the transactions costs associated with making loans will lead to a reduction in the supply of loans, hence the negative predicted coefficients on TCOSTS. An increase in the value of the collateral of borrowers is predicted to lead to an increase in the supply of loans from private lenders, hence the positive coefficients on COLLAT.

Demand

The demand for loans from government and private lenders is modeled using the following equations,

$$(5)\quad Q^d_{GOV} = Q^s_{GOV} \quad \text{if INTGOV} < \text{INTPRIV}$$
$$= 0 \quad \text{otherwise}$$

$$(6)\quad Q^d_{RIV} = \underset{(?)}{\gamma_0} + \underset{(-)}{\gamma_1}\text{RLFLEG} + \underset{(-)}{\gamma_2}\text{INTPRIV} + \underset{(+)}{\gamma_3}Q_{GOV} + \underset{(-)}{\gamma_4}\text{EEARN} + \gamma_5\text{ALTINCOME} + \epsilon_6$$

$$(7)\quad Q^d_{INDIV} = \underset{(-)}{\phi_0} + \underset{(+)}{\phi_1}\text{INTINDIV} + \underset{(+)}{\phi_2}\text{INTBANK} + \underset{(+)}{\phi_3}\text{INTINSUR} + \underset{(+)}{\phi_4}Q^d_{RIV} + \epsilon_7$$

$$(8)\quad Q^d_{BANK} = \underset{(+)}{\theta_0} + \underset{(-)}{\theta_1}\text{INTINDIV} + \underset{(+)}{\theta_2}\text{INTBANK} + \underset{(+)}{\theta_3}\text{INTINSUR} + \underset{(+)}{\theta_4}Q^d_{RIV} + \epsilon_8$$

$$(9)\quad Q^d_{INSUR} = \underset{(+)}{\Omega_0} + \underset{(+)}{\Omega_1}\text{INTINDIV} + \underset{(-)}{\Omega_2}\text{INTBANK} + \underset{(+)}{\Omega_3}\text{INTINSUR} + \Omega_4 Q^d_{RIV} + \epsilon_9$$

where Q^d_{GOV}, Q^d_{INDIV}, Q^d_{BANK}, Q^d_{INSUUR} and Q^d_{RIV} are the quantities of farm mortgage loans demanded annually from government lenders, individuals, banks, insurance companies, and private lenders as a whole; INTPRIV is the average

interest rate on loans issued by private lenders; EEARN is expected farm earnings; and ALTINCOME is income earned by the nonfarm population in nonfarm activities.

In the demand for government loans equation, (5), borrowers are assumed to demand as many funds as federal credit agencies are willing to provide, as long as the interest rate on government loans is less than the interest rate on private loans (which was generally the case following the advent of Roosevelt's New Deal programs (USDA, 1938 and 1939).

Borrowers' decisions concerning their demands for loans from private lenders is viewed as a two-stage process. In the first stage (represented by equation 6) they decide how much to borrow from private lenders as a group. In the second stage they decide how to allocate their borrowing among the three different types of private lenders.

In the first-stage private demand equation, (6), the predicted coefficient of the relief legislation variable is uncertain. On one hand, the particular changes made in the early 1930s increased the attractiveness of mortgage loans to borrowers, suggesting that the enactment of relief legislation should increase the demand for mortgages. On the other hand, borrowers observed that state governments could legally change the terms of existing contractual arrangements between private parties. Because there was no guarantee that future relief measures would not benefit lenders, this may have increased debtors' uncertainties concerning the security of their property rights in future mortgage contracts, leading to a reduction in demand.

An increase in the average rate of interest on private loans will lead to a reduction in the quantity of private loans demanded, hence the negative

coefficient on INTPRIV. An increase in the present value of the expected future flow of income will increase the demand for loanable funds, implying that the coefficient on EEARN is positive. An increase in the level of income earned in nonfarm activities will make farm-related activities relatively less attractive, drive resources from agricultural activities, and result in a reduced demand for agricultural loans, hence the negative coefficient on ALTINCOME.

Figure 1 can be used to illustrate the effects on the demand for private loans of an increase in the supply of government loans. In the absence of government loans, the demand for private loans is D_0 and the market clears at an interest rate of i_0 and a quantity of Q_0. Now, suppose the government offers Q_G loans at an interest rate of i_G. The effects of these loans on the demand for private loans depends on how the government loans are allocated. If, for example, the government loans are allocated to those borrowers willing to pay the highest interest rates, the demand for private loans simply shifts to the left by Q_G units to D_1. In this case, the coefficient $\Upsilon 3$ is equal to -1. At the other extreme, if all the government loans are allocated to borrowers willing to pay less than i_0, the market-clearing private interest rate and quantity transacted will not be affected. If, for example, the government loans are allocated to those individuals between points B and C on D_0, then the demand for private loans will be $ABED_1$. In this case, because the data will not show any shift in the private demand curve, the coefficient Υ_3 is equal to 0. For intermediate cases in which government loans are divided among borrowers willing to pay more and less than i_0, the coefficient Υ_3 will be between 0 and -1.

In the second-stage demand equations, an increase in the interest rate on loans from a particular lender will decrease the quantity of loans demanded from that lender, and the coefficients ϕ_1, θ_2, and Ω_3 will be negative. If loans from different lenders are substitutes, an increase in the rate charged by one lender will lead to increases in the demand for loans from other lenders and the coefficients ϕ_2, ϕ_3, θ_1, θ_3, Ω_0, and Ω_2 will be positive. An increase in the total demand for private loans will result in increased demand for loans from each type of lender, hence the positive coefficients on Q^{d}_{RIV} in equations (7) - (9).

Additional Hypotheses

The model of supply and demand for agricultural loans presented above allows the investigation of two additional issues: (1) whether relief legislation had different effects on different types of private lenders, and (2) whether relief legislation had different effects in different regions. Concerning the first of these issues, differences in the estimated coefficients on RLFLEG in the supply equations (2) - (4) would indicate that relief legislation had different effects on different types of private lenders. There are at least two reasons to expect systematic differences in these coefficients. First, borrowers are more likely to borrow from a lender if they believe that lender will not foreclose on them if events occur that are beyond their control. Lenders therefore have an interest in establishing "goodwill capital." One way that lenders could establish such capital in the 1930s was to be lenient on farmers unable to meet their mortgage payments despite making good faith efforts to do so. The cost of granting extensions rather than foreclosing is expected to differ for different types of lenders.

In many instances, individual lenders relied heavily on mortgage payments for their income. The loss or delay of such payments would represent a significant reduction in their incomes. Most individuals probably had relatively limited access to capital markets, implying that the costs of borrowing to compensate for such losses would be high. Rural banks also had substantial portions of their assets tied up in mortgage loans in a particular region. Reductions in mortgage payments would therefore impose significant costs on them as well.

Insurance companies normally had mortgage loan portfolios that were sectorally diversified (Woodruff, p. 49). Because not all regions were equally hard hit during the 1930s, the effects of delinquent loans in a particular area would not have such a dramatic effect on their well-being. In addition, insurance companies were better diversified than other lenders in the sense that a smaller portion of their portfolios was tied up in mortgage loans. If these companies did have to turn to capital markets to compensate for delinquent payments, their cost of funds should have been lower than for individuals and banks. For these reasons, insurance companies were more likely than other lenders to grant extensions to borrowers delinquent for reasons beyond their control. Insurance companies therefore should have been affected less by moratorium legislation than other lenders.[8]

Second, as "outside" lenders whose centers of operations were often far from the location where loans were being made, insurance companies had higher

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[8]Woodruff comments several times on the efforts insurance companies made to be lenient towards borrowers during the early 1930s. Alston speculated that "individuals - and perhaps local banks - being less diversified and facing a more severe income constraint than insurance companies and federal financial institutions had more of an incentive to foreclose" (1984, p. 451).

costs of monitoring borrowers' behavior and would therefore tend to make lower risk loans.[9] Because lower risk borrowers were less likely to become delinquent in their loan payments, forceclosure rates on insurance company mortgages should have been lower, and the costs imposed on them by relief legislation should have been lower than for other lenders.

If the above hypotheses are correct, then relief legislation imposed a greater cost on individuals and local banks than on insurance companies. Such a difference in the impacts of relief legislation should have led to a larger displacement of individuals and banks from the mortgage market.

Concerning the second issue, one cause of differences in the impacts of relief legislation across regions may have been interstate differences in provisions of the legislation. The impact of relief legislation should have been the greatest in those states in which the most severe legislation was enacted. Because the laws differed in several dimensions and because the impact of the legislation was influenced by the strictness with which they were enforced by the courts, it is difficult to quantify the severity of the various states' legislation. A subjective measure of the relative severity of legislation was recently provided by Archibald Woodruff, a contemporary observer of farm credit conditions during the Great Depression. Woodruff suggested that from the perspective of banks and individual lenders, the most restrictive relief legislation was enacted in the two Dakotas, Minnesota and Wisconsin.[10] Insofar as the legislation enacted in these states imposed

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[9]See Alston (forthcoming) and Woodruff (pp. 37-39) for support for this line of reasoning.

[10]Letter from Archibald Woodruff (dated August 12, 1982) to Lee Alston and telephone conversation between Alston and Woodruff.

more severe restrictions on creditors, moratoria are predicted to have had greater impacts in these states than elsewhere.

IV. The Data

The system of equations (1) - (9) is estimated using pooled time series-cross sectional data for the period 1930-1935. The model employed for estimation is the dummy variable model described by Judge et al. (pp. 478 - 488) in a simultaneous equation setting. In this model cross-sectional units are distinguished through the inclusion of zero-one state dummy variables.

Insurance companies did not issue farm loans in all states during this period. Because these companies were an important source of loanable funds in many states and because the impact of relief legislation on these companies is of interest, the data set is restricted to the 32 states in which data for interest rates on mortgage loans issued by insurance companies are available for the years 1930-1935.[11] Of these states, nineteen passed moratoria during this period, while twenty-two legislated one or more of the three types of relief legislation discussed in Section II (see Table 1).

Definitions, summary statistics, and sources for the data used in the empirical analysis are presented in Table 2. Empirical measures of annual average interest rates for different classes of lenders are obtained directly from USDA publications. Although data on the quantity of loans (dollar value) issued annually by federal lending agencies (QGOV) are available, no

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[11] There are a few instances in which data on interest rates on insurance loans are not available for a particular year and in which the average interest rate on government loans exceeded the interest rate on loans from one of the three classes of private lenders. These observations are deleted from the data set used to estimate the model.

such data on loans by private lenders were published. Estimates of these quantities are constructed using data on the **percentage** of loans issued by government and private lenders (USDA, 1940b). Using data on the percentage and dollar value of loans closed by federal credit agencies, the total dollar value of all loans closed is calculated [total value = (QGOV/%GOV)100]. This, combined with data on percentages of total loans issued by different private lending groups, provides estimates of the dollar value of loans issued by the lenders of interest (e.g., QINDIV = [QGOV/%GOV]%INDIV).

The empirical measure of farm stress financial (STRESS) is an average of contemporaneous and lagged earnings. To control for the substantial interstate differences in the levels of state farm earnings, earnings in state i in year t are divided by earnings in state i during a base period (the average of earnings in 1924 and 1925).

The variable RLFLEG is assigned a value of one if any of the three types of state relief legislation were in effect in a given state in a given year.[12] The proxy used for the rate of return on alternative investments in year t ($INTALT_t$) is the rate of interest on commercial paper in year t. Transactions costs associated with agricultural lending are measured using the average dollar value of a farm in state i during year t ($VALFARM_{it}$). To the extent that lenders' total transactions costs of providing a loan do not vary substantially with loan size, the per-dollar transactions costs of

[12] Alston's analysis was limited to the effects of legislation that postponed foreclosures (moratoria). The discussion in Sections I and II suggests that the effects of legislation extending redemption periods and limiting deficiency judgements should also be considered. Attempts to separately measure the effects of these different types of relief legislation through the inclusion of a zero-one dummy variable for each of them did not provide any useful insights. Given that states often enacted two or three of these types of relief legislation at about the same point in time, it is not surprising that their individual effects cannot be distinguished.

supplying funds will decrease as loan sizes increase. Average loan size should increase and per-dollar transactions costs of providing loans should therefore fall as the value per farm increases, implying that the predicted coefficients on VALFARM are positive. The value of collateral for farm loans ($COLLAT_{it}$) is measured using the total value of farm land and buildings in state i in year t.

In the demand equations, the proxy for the discounted present value of expected earnings ($EEARN_{it}$) is the total value of farm land and buildings in state i in year t, i.e., the same proxy is used for this variable as for $COLLAT_{it}$. $ALTINCOME_{it}$ is measured as the per-capita income of the nonfarm population in state i in year t.

V. Empirical Results

Preliminary regression results for the supply equations (1) - (4) suggested the possibility that interest rates on loans of insurance companies were exogenous. Because insurance companies tended to operate on a larger scale than other private lenders and at a national rather than a local level (Woodruff, p. 49), interest rates on their loans may have been exogenous to borrowers in a particular state. A Wu-Hausman test failed to reject the null hypothesis that these interest rates were predetermined.[15] Given this result, the interest rate on loans by insurance companies is not affected by the demand for loans from insurance companies but may be influenced by such factors as relief legislation, interest rates on alternative investments, and so forth. The system of equations (1) - (9) therefore is estimated by replacing equation (4) with an equation in which interest rate on insurance

[15]The t-ratio from this test was equal to .24. See Thurman for discussion of the use of this statistical test.

company loans is regressed on the variables RLFLEG, INTALT, COLLAT, and VALFARM. Estimation results are displayed in Table 3.[16]

In the government supply equation, the estimated coefficient on FDRDUM indicates a statistically significant increase in new loans issued by government credit agencies following 1932. The statistically insignificant coefficient on STRESS suggests that federal credit agencies did not respond to differences in farm distress before 1933. The negative (and marginally significant) coefficient on the interactive variable between STRESS and FDRDUM provides weak support for the claim that federal credit agencies were more responsive to farm distress after 1932.

In the supply equations for individual and bank lenders, the coefficients on the INTALT variable have the predicted negative signs in both equations, while the coefficients on the own interest rate (INTINDIV and INTBANK) and collateral (COLLAT) variables have the predicted positive signs. The coefficient on the relief legislation dummy variable is negative and weakly significant in both equations.[17]

In the equation for insurance company interest rates, the coefficient on the interest rate on alternative investments (INTALT) is positive and significant. The coefficient on the relief legislation dummy variable is positive but is not statistically significant.

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[16]State dummies are also included in the private demand and supply equations to control for cross sectional differences in credit markets. Because the two-stage demand system for private loans, as represented by equations (6) - (9), implies a number of cross equation linear constraints, estimates are obtained by deleting one of the second-stage demand equations.

[17]The p-values (one-tailed) for the estimated coefficients of the RLFLEG variables in the individual and bank equations are .146 and .121.

In the first-stage demand equation in Table 3, the estimated coefficients on INTPRIV and EEARN have the predicted algebriac signs. The estimated coefficient on Q^{s}_{GOV} is both significantly less than zero and greater than -1. This suggests that a portion of government loans was granted to borrowers who were not willing to pay the market-clearing interest rates that would have prevailed on private loans in the absence of government credit. The estimated coefficient on RLFLEG is negative but not statistically significant. The coefficient on ALTINCOME does not have the predicted negative sign.[18] In the second-stage demand equations (whose estimated coefficients are not shown in Table 3), several of the estimated coefficients on the interest rate variables do not have the predicted algebraic signs.[19]

The system whose estimates are presented in Table 3 constrains slope coefficients to be equal across all states. This constraint is relaxed by estimating different systems of equations for different regions. Table 4 contains the coefficient estimates and t-ratios for the RLFLEG variables for each region in which insurance companies were active.

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[18] An interpretation of this result is that ALTINCOME may be measuring the effects of the availability of off-farm income on the demand for agricultural loans. An increase in off-farm earnings opportunities will increase borrowers' expected ability to meet future loan payments, thereby increasing their demand for loans.

[19] The inability to sort out the individual effects of the three interest rate variables may be attributable to the high degree of collinearity among them (the three pairwise correlation coefficients ranged from .6 to .8). Alternatively, these anomalous coefficient estimates may be an indication that the second-stage demand equations are misspecified. Because of this possibility, two-stage rather than three-stage least squares estimates are reported for the supply equations and the first-stage demand equation. The former estimates are consistent regardless of whether the second-stage equations are correctly specified (Theil, pp. 528-29).

The first two columns in Table 4 show the estimated effects of relief legislation on the supply of loans from individuals and banks. Eleven out of fourteen of the coefficients in these columns are negative, with eight of them negative and statistically significant at the 15 percent level. The third column indicates that in only one of the seven regions does relief legislation have a positive and statistically significant impact on the interest rate on loans from insurance companies.[20]

Table 4 provides information concerning the magnitude and significance of shifts in the supply curves of private lenders as a result of the passage of relief legislation in various states. Another useful measure of the impact of these laws is their effects on the market shares of private lenders. The market share of federal credit agencies increased during the 1930s both as a result of the expanded credit programs instituted by Roosevelt and because of the reduced lending by private creditors resulting from state relief legislation. Estimates of the effects of state relief legislation on the percentage of loans issued by individuals, banks, and insurance companies are presented in Table 5. These estimates are the reduced form coefficient estimates from a system of structural equations like (1) - (9) in which quantities of loans supplied by and demanded from different lenders have been replaced with percentages of loans supplied by and demanded from those lenders.

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[20]In five out of the seven regions, the estimated coefficient on the government supply variable in the first-stage demand equations was significantly greater than -1, implying (as did the coefficient in Table 3) that a portion of the government credit was allocated to borrowers not willing to borrow from private lenders. Also, the estimated coefficient on the relief legislation variable in the first-stage demand equation was negative in six of the seven regions but was statistically significant in only one region.

The rows of Table 5 contain the estimated coefficients on the RLFLEG variable for each of the seven regions. The estimated effects of this legislation on the percentage of loans issued by private lenders (shown in the 4th column) is negative in all the regions. The average reduction (across the seven regions) in the share of private lenders is 14.84 percent. The average reductions in the market shares of individuals, banks, and insurance companies are 9.17, 5.19, and .47 percent.

The hypothesis that banks and individual lenders were affected more than insurance companies by the state relief legislation of the 1930s receives support from the empirical estimates discussed above. In Tables 3 and 4, the general result is that the supply of credit from banks and individual lenders fell, while the rate of interest on insurance company loans did not increase significantly as a result of relief legislation. Although the estimates reported in Table 5 are reduced form estimates, their ranking is consistent with the structural hypothesis that insurance companies were affected less by relief legislation than banks or individuals.

Archibald Woodruff's assessment of the relative restrictiveness of relief legislation across states was that from the perspective of banks and individual lenders, states in the East North Central and West North Central regions (North and South Dakota, Minnesota, and Wisconsin) passed the most restrictive legislation. The hypothesis that these should therefore be the states in which the lending activities of banks and individual lenders were reduced the most receives mixed support from the estimates reported in Tables 4 and 5. In Table 4 the reported coefficients indicate that the reduction in the supply of loans from both individuals and banks in the West North Central region fell significantly (although the coefficient in the individuals'

equation is only significant at the 15 percent level). In the East North Central region only the reduction in the supply of loans from individuals is significant.

In Table 5, the estimated reduction in the percentage of loans issued by banks and individual lenders is the sum of the entries in the first and second columns. This estimated reduction is greater in the West North Central and East North Central regions (-24.81 and -21.75) than in any of the other regions.

VI Concluding Comments

Federal bankruptcy legislation has been enacted recently to provide relief from current farm problems. Another suggested remedy is to impose moratoria on mortgage loan foreclosures. Such measures may provide short-run relief for borrowers currently on the brink of failure. They also, however, impose costs on lenders. These increased costs will result in a reduction in the supply of loans to agriculture, thereby imposing costs on borrowers not currently on the verge of failing. Whether the reductions in the supply of agricultural credit will be large or small under current conditions is not known.

This paper has demonstrated, however, that similar legislation enacted in the 1930s did lead to substantial reductions in the supply of agricultural credit. The results also suggest that different types of private creditors reacted differently to the legislation of the 1930s. In particular, the reduction in the supply of credit by banks and individual lenders tended to be greater than the reduction by insurance companies. Finally, the results support the hypothesis that private creditors reduced their lending

activities the most in those regions where the most restrictive relief legislation was enacted.

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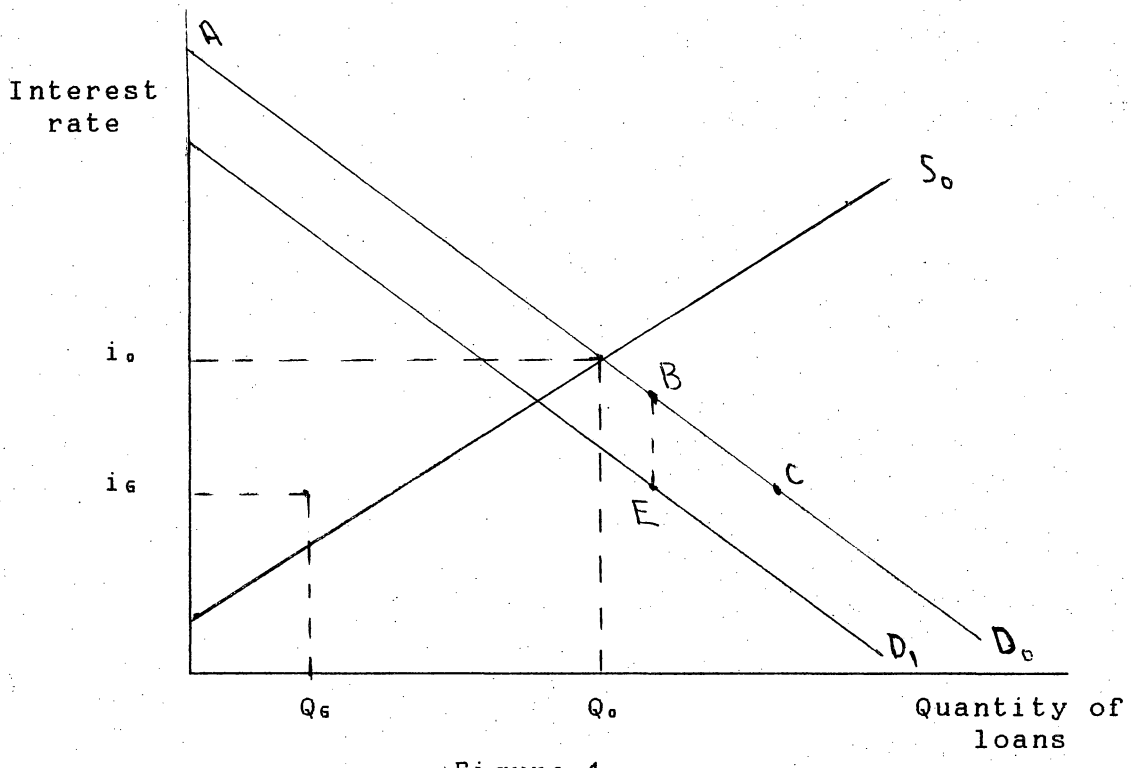

Figure 1

The Effect of Changes in the Supply of Government Loans on the Demand for Private Loans

Table 1
STATE RELIEF LEGISLATION

LEGISLATION IN EFFECT

STATE	POSTPONE FORECLOSURE	EXTEND REDEMPTION PERIOD	LIMIT DEFICIENCY
Ohio	x		
Indiana			
Illinois	x		
Michigan	x	x	x
Wisconsin	x	x	x
Minnesota	x	x	x
Iowa	x	x	
Missouri			
North Dakota	x	x	x
South Dakota	x	x	x
Nebraska	x		x
Kansas		x	x
Maryland			
Virginia			
North Carolina	x		x
South Carolina	x		x
Georgia			
Kentucky			
Tennessee			
Alabama			x
Mississippi	x		x
Arkansas			x
Louisiana	x		x
Oklahoma	x		
Texas	x		x
Montana	x	x	x
Idaho	x	x	x
Colorado			
Arizona	x		x
Washington			
Oregon			
California	x		x

Table 2
Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
$INTGOV_{it}$	5.25	.3514	4.60	6.00
$INTINDIV_{it}$	6.31	.7064	4.80	7.80
$INTBANK_{it}$	6.86	.8049	5.40	8.50
$INTINSUR_{it}$	5.93	.4823	5.00	8.30
$QGOV_{it}$	10,587	19,079	4	112,032
$\%GOV_{it}$	28.36	25.52	1	93
$\%INDIV_{it}$	33.59	14.15	3	68
$\%BANK_{it}$	19.42	10.45	1	50
$\%INSUR_{it}$	6.66	6.19	0	32
$QINDIV_{it}$	8,089	8,527	56	45,486
$QBANK_{it}$	5,301	7,715	19	46,000
$QINSUR_{it}$	1,998	3,217	0	18,135
$QPRIV_{it}$	15,389	17,539	77	92,050
$INTPRIV_{it}$	6.44	.699	5.02	7.84
$FDRDUM_{it}$	.5732	.4961	0	1
$STRESS_{it}$	.6446	.1867	.2890	1.16
$RLFLEG_{it}$	.3415	.4757	0	1
$INTALT_{it}$	2.33	1.38	.80	4.80
$VALFARM_{it}$	1.53	1.51	.23	7.24
$COLLAT_{it}$	198,433	225,196	17,958	1,484,013
$EEARN_{it}$	198,433	225,196	17,958	1,484,013
$ALTINCOME_{it}$	457	117	263	902

$INTGOV_{it}$, $INTINDIV_{it}$, $INTBANK_{it}$, $INTINSUR_{it}$ - average rates of interest charged on newly recorded farm-mortgage loans in state i in year t by federal lenders, individuals, banks and insurance companies. Source: individual state reports issued by the USDA (1938 and 1939).

$QGOV_{it}$ - quantity ($1000s) of loans closed by federal lending agencies in state i in year t. Sources: federal land bank loans - annual reports of the Federal Farm Loan Board (1930-1932) and the Farm Credit Administration (1934-1936), and Horton et al. (Table 78, p. 245): Land Bank Commisioner loans - Annual reports of the Farm Credit Administration (1934 - 1936).

$\%GOV_{it}$, $\%INDIV_{it}$, $\%BANK_{it}$, $\%INSUR_{it}$ - percentage of total loans issued by government lending agencies, individuals, banks, and insurance companies in state i in year t. Source: USDA (1940), "Lender Distribution..."

$QINDIV_{it} = \%INDIV_{it}(QGOV_{it}/\%GOV_{it})$ - quantity ($1000s) of loans issued by individual lenders in state i in year t. Sources: see above.

$QBANK_{it} = \%BANK_{it}(QGOV_{it}/\%GOV_{it})$ - quantity ($1000s) of loans issued by banks in state i in year t. Sources: see above.

$QINSUR_{it} = \%INSUR_{it}(QGOV_{it}/\%GOV_{it})$ - quantity ($1000s) of loans issued by insurance companies in state i in year t. Sources: see above.

Table 2 (continued)

$QPRIV_{it}$ = $QINDIV_{it}$ + $QBANK_{it}$ + $QINSUR_{it}$ - quantity ($1000s) of loans issued by private lenders in state i in year t. Sources: see above.

$INTPRIV_{it}$ = ($QINDIV_{it}/QPRIV_{it}$)$INTINDIV_{it}$ + ($QBANK_{it}/QPRIV_{it}$)$INTBANK_{it}$ + ($QINSUR_{it}/QPRIV_{it}$)$INTINSUR_{it}$ - average interest rate on loans issued by private lenders in state i in year t. Sources: See above.

$FDRDUM_t$ - dummy variable to indicate whether Roosevelt was in office. This variable is assigned a value of one after 1932, and a value of 0 otherwise.

$STRESS_{it}$ - extent of farm financial stress in state i as of year t. This variable is the simple average of $EARN_{it}$, $EARN_{it-1}$, and $EARN_{it-2}$, where $EARN_{it-k}$ is earnings (cash receipts from farm marketings and government payments) in year t-k as a proportion of earnings in a base period (average of earnings in 1924 and 1925) in state i. Source: USDA (January 1946).

$RLFLEG_{it}$ - dummy variable to indicate whether any sort of relief legislation was in effect in state i in year t. This variable is assigned a value of 1 if legislation postponing foreclosure proceedings or extending redemption periods, or limiting deficiency judgements was in effect in a given year, and a value of 0 otherwise. Source: U.S. Congress (April 1936)

$INTALT_{it}$ - Prevailing rates on customer's prime commercial paper (4-6 months) in New York in year t. Source: Federal Reserve Bulletins.

$VALFARM_{it}$ - index of the average value of a farm in state i in year t. This variable is calculated by multiplying an index of the per acre value of land and buildings (1977 = 100) by the total number of acres in farming and then dividing that number by the number of farms in state i in year t. Source for index of land values: USDA, Regan and Johnson (November 1942). Source for number of acres in farmland and number of farms in 1930 and 1935: USDA, Agricultural Statistics, 1937 (p. 390). Estimates for other years obtained by interpolation.

$COLLAT_{it}$ - index of the value of collateral (land and buildings) in the farm sector in state i in year t. Total value of land and buildings was calculated by multiplying an index of the per acre value of land and buildings (1977 = 100) by the number of acres of land in farming. Sources: see sources for $VALFARM_{it}$.

$EEARN_{it}$ - index of the discounted present value of expected future earnings in state i in year t. The same proxy is used for this variable as for $COLLAT_{it}$.

$ALTINCOME_{it}$ - per capita earnings of the nonfarm population in state i in year t. This variable is calculated by multiplying the difference between per capita personal income and per capita farm income (where each of these per capita variables has total population as its denominator) by the ratio of total population to nonfarm population. Source for per capita personal and farm income: Hanna, pp. 28 and 258. Source for total state populations: Bureau of the Census, Department of Commerce, p. 9. Source for farm population in state i during 1930 and 1935: USDA, Agricultural Statistics, 1940, p. 556. Estimates of farm population for other years obtained by interpolation.

Table 3

Two-Stage Least Squares Regression Results

Determinants of the Demand and Supply of
Government and Private Mortgage Loans

Supply Equations

Government: Q^s_{GOV} = 21832 − 2183 STRESS + 27113 FDRDUM − 23462(FDRDUM*STRESS)
(1.76) (.20) (2.16) (1.14)

R^2 = .4779

Individuals: Q^s_{INDIV} = −48120 − 1194 RLFLEG + 10528 INTINDIV − 1979 INTALT
(1.86) (1.04) (2.41) (2.91)

+ .054 COLLAT − 952 VALFARM
(6.62) (.93)

R^2 = .8515

Banks: Q^s_{BANK} = 9361 − 1290 RLFLEG + 3320 INTBANK − 497 INTALT
(.58) (1.31) (1.33) (1.14)

+ .032 COLLAT − 1425 VALFARM
(4.63) (1.74)

R^2 = .8682

Insurance Companies: INTINS = 6.12 + .070 RLFLEG + .102 INTALT
(22.5) (.84) (4.06)

+ (4.84E-07) COLLAT − .052 VALFARM
(.78) (.71)

R^2 = .7179

First-Stage Demand Equation

Total Private: Q^d_{PRIV} = 84452 − 1575 RLFLEG − 6954 INTPRIV + .055 EEARN
(2.70) (.69) (1.60) (3.06)

+ 2292 ALTINCOME − .249 Q^s_{GOV}
(2.90) (2.26)

R^2 = .867

Table 4
Effects of Relief Legislation on Supply of
Private Mortgage Loans
7 Regions

Region	$\frac{\partial Q^s_{INDIV}}{\partial RLFLEG}$	$\frac{\partial Q^s_{BANK}}{\partial RLFLEG}$	$\frac{\partial INTINS}{\partial RLFLEG}$
East North Central	-4957 (1.47)[a]	1842 (.27)	-.168 (1.16)
West North Central	-2640 (1.19)[b]	-3924 (2.21)[a]	-.332 (1.87)
South Atlantic	-1404 (.68)	-1464 (1.09)[b]	-.188 (1.08)
East South Central	-3955 (1.47)[a]	-10,001 (2.34)[a]	-.139 (.65)
West South Central	-806 (.27)	-16 (.006)	.639 (2.15)[a]
Mountain	5929 (2.38)	1974 (2.39)	.126 (.68)
Pacific	-8272 (1.31)[b]	-17,391 (2.41)[a]	-.244 (.25)

t-ratios in parentheses
[a]Columns 1, 2: significantly negative at the 10 percent level (one-tailed test).
Column 3: significantly positive at the 10 percent level (one-tailed test).
[b]Columns 1, 2: significantly negative at the 15 percent level (one-tailed test).
Column 3: significantly positive at the 15 percent level (one-tailed test).

Individual and bank loans were made in all states. Those states in each region in which insurance companies also operated are,

East North Central: Ohio, Indiana, Illinois, Michigan, and Wisconsin.
West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.
South Atlantic: Maryland, Virginia, North Carolina, South Carolina, and Georgia.
East South Central: Kentucky, Tennessee, Alabama, and Mississippi.
West South Central: Arkansas, Louisiana, Oklahoma, and Texas.
Mountain: Montana, Idaho, Colorado, and Arizona.
Pacific: Washington, Oregon, and California.

Of these states, moratoria were passed in Ohio, Illinois, Michigan, Wisconsin, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, North Carolina, South Carolina, Alabama, Mississippi, Louisiana, Oklahoma, Texas, Montana, Idaho, Arizona, and California.

Table 5
Effects of Relief Legislation on Market Shares of
Private Mortgage Loans

Region	$\frac{\partial \%INDIV}{\partial RLFLEG}$	$\frac{\partial \%BANK}{\partial RLFLEG}$	$\frac{\partial \%INSUR}{\partial RLFLEG}$	$\frac{\partial \%PRIV^*}{\partial RLFLEG}$
East North Central	-18.57 (1.98)[a]	-3.18 (.65)	7.00 (1.51)	-14.75
West North Central	-15.41 (1.85)[a]	-9.40 (1.79)[a]	-4.49 (1.17)[b]	-29.30
South Atlantic	-14.78 (1.99)[a]	-4.06 (.69)	- .41 (.21)	-19.25
East South Central	2.88 (.34)	-5.39 (.92)	-1.26 (.82)	-3.77
West South Central	-11.11 (1.77)[a]	.48 (.11)	.71 (.30)	-9.92
Mountain	-1.06 (.13)	-12.05 (2.11)[a]	-5.51 (1.61)[a]	-18.62
Pacific	- 6.17 (.53)	-2.74 (.21)	.67 (.10)	-8.24
Average	-9.17	-5.19	-.47	-14.84

t-ratios in parentheses
*The numbers in this column are obtained by summing the numbers in the first three columns.
[a]Significantly negative at the 10 percent level (one-tailed test).
[b]Significantly negative at the 15 percent level (one-tailed test).