SURVEYING BANKS ABOUT AGRICULTURAL LENDING

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Introduction:

In this paper we employ the bootstrap methodology to estimate the weighted average interest rate of farm loans and its standard error from data collected on the Fed's Survey of Terms of Bank Lending to Farmers. We use several versions of the bootstrap that have been developed for complex surveys (Rao and Wu 1988), and we compare the various estimates with those from the older estimation procedure that currently is in place. Theoretically, the greater computing power that makes the bootstrap and other computer–intensive methods feasible should allow one to estimate more precisely the parameters of interest when closed–form expressions for the parameters are difficult or nonexistent.

The next section provides a brief review of the history of the survey and the changes that it has undergone over time. We then turn to the bootstrap procedures, which also may be viewed as part of the ongoing evolution of the survey. After developing the bootstrap methodology, we consider how to adapt the panel design and bootstrap procedure to accommodate requests for regional estimates of the terms of lending that arose after the current survey was designed.

Background:

A. Original Survey Design

In 1977, the Federal Reserve Board requested a quarterly survey of banks to gauge the cost, volume, terms, and purpose of credit extended to both commercial businesses and to farmers. A single longitudinal survey panel of banks was selected to gather information about both types of lending. These dual objectives that were to be served by the single panel led to several incongruities in the survey design and the data set that shall be discussed below. Partly as a result of concerns about decreasing coverage of agricultural lending by the survey, separate panels were created in 1989, one for business lending and one for farm lending. In the discussion that follows, we shall examine some of the constraints that we faced and the procedures that we employed in revising the panel. However, we focus primarily on the construction of the new panel, omitting discussion of the original design except where it overlaps or influences the panel renovation.

A sample of 350 insured commercial banks was selected in 1977 from a universe of about 14,400 banks. At that time (as continues to be the case), the volume of loans outstanding was highly skewed across the universe of commercial banks, making the inclusion of the largest institutions very important to the success of a statistical survey. As a result, the largest 50 banks measured by commercial and industrial (C&I) loans were placed in a certainty stratum. The remaining banks in the universe were separated into five additional strata, with the stratum limits chosen so that the variance of the volume C&I loans outstanding across banks in each stratum was roughly equal[1]. Sixty banks were to be chosen from each of these five strata, completing the panel of 350 banks. However, in response to concerns expressed by data users who also were interested in farm lending, banks in the smallest two strata (denoted strata 5 and 6) were re–sorted by the volume of farm loans that they held. Then, the stratum boundary between strata 5 and 6 was chosen to equalize the variance of farm loans across the two strata.

Within strata (2) through (4), the population of banks were ranked by business loans and then divided into 10 zones containing approximately an equal number of banks. An identical approach using farm loans was used in strata 5 and 6. Within each zone, six banks were selected at random for the panel. Thus the design, already stratified by size, was further balanced by a uniformly distributed draw within each stratum.

Replication was built into the design to estimate the standard errors of the average interest rate in the following manner. First, each of the six banks selected from a zone was assigned randomly to a different subsample (numbered 1 through 6). The fifty large banks from the first stratum were added to each subsample, providing one hundred banks (fifty large banks plus fifty others) in each of the six subsamples. The mean rate of interest for each subsample was calculated, and the standard deviation of the subsample means (divided by $\sqrt{6}$) was taken as the standard error of the average interest rate.

While the willingness to report on Board panel surveys generally has been high, the substantial loan volume at the largest banks and the detailed information reported for each loan made the burden of reporting an important concern. Indeed, the results of a presurvey questionnaire indicated that the managers of many large and medium–sized banks might decline to participate in the survey because of the burden of reporting. To alleviate some of this burden and to help ensure high response rates, banks were allowed to report loans for 2, 3, 4 or 5 days, depending on institution size. Reporting days were assigned to banks that reported less than the full survey week such that an approximately uniform

1. When the variance across banks in each stratum is equal, Cochrane (p. 130) suggests that the simple rule of allocating an equal number of panel banks to each stratum is satisfactory.

distribution of days was obtained. In addition, some banks with multiple branches were required to report for only a subset of the branches.

B. Farm Panel Problems

At least initially, collecting data for farm loans was a secondary objective of the survey. Indeed, the universe originally was stratified according to the volume of C&I loans that each bank held, and small banks (in terms of C&I loans) that held more farm loans were folded into strata five and six almost as an afterthought. In addition, one–hundred panel banks were excused from reporting farm loans altogether, and the remaining banks that did report farm loans generally were either large (stratum 1) banks that were located in the western US or small banks in strata five and six. Also, collecting farm banks as a subset of all banks in a stratum may have contributed to coverage and estimation problems with the farm panel.

To illustrate the coverage problems in the initial survey design, Table 1 shows the numbers of banks and the volumes of farm loans in six key farm states in June 1977. In total, 14,425 insured commercial banks held $25.6 billion in agricultural loans in mid 1977. Although the banks in the mid–western states that are shown in the table held almost 40 percent of agricultural loans, banks in these states accounted for fewer than one of every five of the banks on the panel. The panel design led to substantial undersampling in regions where a large proportion of agricultural activity took place.

Exacerbating these initial problems that arose from the dual coverage imposed on the stratification, an additional concern was the deterioration of farm lending coverage over time. The ratio of farm loans to total loans was not used to select new banks to replace those on the panel that failed, merged with another bank, or asked to be removed from the panel. Table 2 follows over time the coverage and number of loans reported by all panel banks and by panel banks in the six farming states shown in the previous table. Both the number of loans reported in the survey (the first line) and the number of banks on the panel that reported making a farm loan (the second line) decreased considerably between 1982 and 1987 when widespread financial difficulties in the farm sector led to many bank failures and reorganizations. Coverage in the six farming states mentioned earlier, initially allocated fewer banks than if the allocation had been based on the proportion of farm loans outstanding, deteriorated further as new banks were added without regard to their level of farm lending. Indeed by 1987, only about 3/5 of panel banks reported any agricultural loans during the survey week, and only about half of the banks regularly reported at least one loan for the survey. The improvement of farm coverage after 1987 reflects the division of the survey into separate panels in 1989, one exclusively for business lending and another for farm lending.

In 1988 we were given the opportunity to begin a separate panel for agricultural lending. Although the particular banks were different, the distribution of the volume of agricultural loans across banks exhibited skewness that was similar to that shown by the distribution of C&I loans. As a result, we kept a general panel structure that was similar to the previous survey. The same survey form was used so that banks that were both on the new and old panels would not notice any difference. Thus the main changes were in the data processing procedures, panel maintenance, and methods of estimation based on the new panel.

Many banks have no farm loans, and others have very few. Because we were mainly interested in the terms of agricultural loans, we selected a cutoff of $1 million in farm loans to specify the sampling frame. Banks with the volume of farm lending below this level did not contribute much data to the survey anyway, because these banks seldom closed a loan during the survey period. This policy of selection reduced the size of the sampling frame of insured commercial banks from 12,500 to about 6,500 farm lending banks.

The panel sample size remained set at 250, the same sample size that was budgeted for the original farm survey in 1977. The ten largest agricultural lenders were placed in a certainty stratum, and the remaining 240 sample banks were selected from the remaining banks in the universe of farm lenders. Concern about good coverage when the switch to the new panel occurred led us to retain most of the banks from the old panel that regularly reported farm loans. Only those banks that rarely reported loans were dropped as initial candidates for the new panel. Thus, a total of 120 banks continued reporting without interruption. For the 130 new reporters joining the panel, the request of 5 days of data and 100 percent branch reporting where applicable was imposed.

Next we determined to fix the undercoverage of farm lending data from farm states. First, we allocated the 250 bank sample to the 12 Federal Reserve District Banks, where the data are collected and first processed, by the share of the volume of farm lending held within each District. Then, we allocated the number of banks that were assigned to each District to the states within that District, again in proportion to the volume of farm lending in each state. Table 2 shows the improvement for the 6 farm states that were shown earlier.

The 120 reporters from the original panel were assigned to the proper District and state. Then, the 130 new reporters were selected to fill gaps in the size distribution within each state. The calculation of the standard errors followed the spirit of the original design. A certainty stratum was allocated 10 banks, and four size strata, each with approximately the same variance in the volume of agricultural loans outstanding, were allotted 60 panel banks a piece. Within this structured framework, the remaining 130 banks were randomly selected to receive invitations to join the panel.

Replacements for banks that refused to participate were drawn randomly from the replacement pool of banks with similar characteristics to maintain the budgeted sample size of 250. Banks continue to be replaced on an ongoing basis to maintain coverage in the presence of mergers, closings, and requests to discontinue reporting.

Empirical:

A. Data Collection

During the first week of the middle month of each calendar quarter, panel banks report for each new loan: 1) the dollar amount of the loan, 2) the interest rate, 3) the maturity date, 4) whether the loan was made under a commitment, 5) whether the loan was insured by a

government agency, 6) how the loan was secured, 7) whether the loan was shared with other banks, and 8) the purpose of the loan. It should be noted that we receive no data regarding loan applications that the bank rejects. Auxiliary data on the volume that is outstanding of commercial and industrial loans and farm loans (the sum of loans to finance agriculture production and loans secured by farmland), are reported as of the last day of each quarter by all insured commercial banks on the Report of Condition (Call Report). The volume of either C&I or farm loans that were outstanding at each bank was used in the original stratification of banks, and the most recent readings on these loan totals currently are used to construct stratum weights for each survey.

B. Estimated interest rates and standard errors

We focus in this paper on the estimation of the weighted average interest rate and its standard error. Under the system that now is in use, the interest rate for each loan that is reported is weighted by the reported amount of the loan times a stratum weight times any applicable adjustment factor for a bank that reports for less than the full survey week or for a subset of its branches. The overall weighted average interest rate is:

$$1) \qquad \bar{r} = \Sigma \frac{(r_{hip} * (A_{hip} * W_h * S_{hi}))}{\Sigma (A_{hip} * W_h * S_{hi})}$$

where, r_{hip} = reported effective rate of interest,
A_{hip} = reported amount of a loan,
W_h = stratum weight for stratum h,
S_{hi} = partial days or branch factor, bank i.

Under the current system, which in large part follows the procedure that was put in place in 1977, standard errors for this estimator have been computed using the replication that was built into the design. Each of the six banks selected from a zone was assigned randomly to a different subsample (numbered 1 through 6). The ten large agricultural lenders from the first stratum also were assigned randomly to different subsamples, in contrast to the older procedure, which placed all banks from the first stratum in each subsample. This procedure provided about 41 banks (one or two large agricultural lenders plus forty others) in each of the six subsamples. The inverse of farm loans held by the banks in the subsample to the holding of all banks in the stratum served as the weighting factor for estimation. The mean for all the loans that were made by the banks in each subsample was calculated, and the variance of these subsample means was taken as the variance of the estimates of average interest rates.

C. Bootstrap Estimation I (resampling banks):

Recently we have experimented with the bootstrap methodology to generate estimates and standard errors of average interest rates. We have applied the methodology in Rao and Wu (1988) (RW) to the farm lending survey. In particular, we have implemented the resampling procedure outlined in section 4 of their paper to the weighted average interest rates for each bank on the panel. That is, we randomly chose (with replacement) from the set of banks that had reported a loan on the survey, and used the weighted average interest rate for the bank that was rechosen to calculate a new overall weighted rate of interest. As an alternative, we also resampled loans at each resampled bank, following section 6 of the paper with each bank considered a cluster and each loan as an element in that cluster. To facilitate the exposition, we set up our model using, as closely as possible, the notation employed by RW. We discuss some peculiarities of our dataset as they become relevant to the development of the model.

To set up some notation, the universe for each stratum h comprises N_h banks, and n_h of these are on the panel. The weight for each stratum, W_h , is constructed from data reported by all banks on the most recent Call report. This weight is independent of the survey data, and it represents the amount of farm loans reported by all of the banks in a stratum divided by the amount of loans reported by panel banks in that stratum. During each survey, panel banks report data for all of the P_{hi} loans that each bank closes. An adjustment for banks that report less than the full survey week or for a subset of their branches is summarized as S_{hi}, which is equal to unity for a bank that reports for all of its branches on every day of the survey.

The parameter of interest is the weighted average interest rate. This quantity may be calculated for every bank i in stratum h:

$$2) \qquad \bar{r}_{hi} = \sum_{p=1}^{P_{hi}} \left[\frac{r_{hip} * A_{hip} * S_{hi}}{\sum_{p=1}^{P_{hi}} A_{hip} * S_{hi}} \right]$$

We kept the denominator of equation 2 for each bank. This quantity, denoted as Z_{hi} for bank i in stratum h, is used in aggregating banks.

Following RW, first we calculate the mean for each stratum with no resampling:

$$3) \qquad \bar{r}_h = \sum_{i=1}^{n_h} \left[\frac{\bar{r}_{hi} * Z_{hi}}{\sum_{i=1}^{n_h} Z_{hi}} \right]$$

Note that we carry through the sum of the weights for loans at each bank, preserving the weighted average feature of the original survey. Thus, larger loans receive more weight, as do the terms that prevail at banks that close a large volume of loans.

Now, draw a simple random sample $[r^*_{hi}, Z^*_{hi}]_{i=1}^{m_h}$ of size m_h with replacement from $[\bar{r}_{hi}, Z_{hi}]_{i=1}^{n_h}$. Adjust the weights as in RW to calculate:

4) $$\bar{r}_h^* = \bar{r}_h + m_h^{\frac{1}{2}} \left[\frac{1 - f_h}{n_h - 1}\right]^{\frac{1}{2}} [r_h^* - \bar{r}_h]$$

where $f_h = n_h / N_h$ is the sampling fraction in stratum h, r_h^* is calculated using (3) above and substituting r_{hi}^* and Z_{hi}^* for r_{hi} and Z_{hi}, and Z_h^* collects the sum of weights for each stratum in the resampled data.

Combining the collected weights from the resampled data with the survey–invariant stratum weights, one can construct the analog of the RW estimator that reflects both the resampling and the weighted–average nature of the published, non–resampled estimate. Thus,

$\bar{r}^* = \sum_1^L [W_h * \bar{r}_h * Z_h^*]$, and the variance of r, the estimated weighted average interest rate, is given by the variance of its Monte Carlo approximation, $\hat{\sigma}_b^2(r) = \frac{1}{B-1} \sum_{b=1}^{B} \left[\bar{r}_b^* - \bar{\bar{r}}^*\right]^2$, over B replications. In implementing these procedures, we found that convergence occurred very quickly—little difference was found in results from 20, 100, and 200 replications. Consequently, in the results that follow, we always use 100 replications, a level that is within the range recommended in the theoretical literature and apparently sufficient for our dataset.

Considerable attention was given in RW to the selection of the size of the resample, m_h. The choice $m_h = n_h - 1$ gives $\bar{r}_{hi} = r_{hi}^*$, which reduces to the naive bootstrap. RW show that matching the third moment of the bootstrap estimate, $E_*(\bar{r} - \bar{\bar{r}})^3$, with the unbiased estimate of the third moment of $\bar{r}$ gives $m_h = (n_h - 2)^2 / (n_h - 1)$. For $n_h \geq 5$, this expression gives $m_h \approx n_h - 3$. In all of our strata, $n_h > 5$. In table 3 we show the effect on the estimated standard errors of setting m_h to n_h, $n_h - 1$, $n_h - 2$, and $n_h - 3$. Although some reduction of the standard errors seemed to occur as the resample size was trimmed, the reduction was slight and varied substantially across strata.

D. Bootstrap Estimation II (resampling banks and loans):

The overall variability of interest rates may be decomposed into two parts: variability across banks and variability in loans at a single bank. The resampling procedure that is described above deals with the first type. One way of handling both types of variability, is to treat panel banks as clusters and loans as elements (subunits) in each cluster. The procedure outlined here generally follows section 6 of RW. The notation changes slightly—m_i now refers to the number of sample elements (loans) from M_i total elements. The RW paper did not consider resampling less than the full number of clusters or loans, and we are unaware of extensions in this direction in the theoretical literature. As a result, in this paper, the size of our resample is set equal to the original sample size.

Some peculiarities of our sample change our interpretation of m_i and M_i slightly. For banks that report for all days and for all branches, we set $m_i = M_i$. That is, for these banks, we receive all the information that is available during the survey week. For other banks, we set the sampling fraction for loans to $1/S_{hi}$.

The procedure is as follows. First, resample the loans for each bank that appears in the first stage resample (Observations from this second–stage resample are marked with "**".). That is, draw a simple random sample $[r_{hj}^*, Z_{hj}^*]_{j=1}^{n_h}$ of size n_h with replacement from $[\bar{r}_{hi}, Z_{hi}]_{i=1}^{n_h}$, and then for each bank j in the resample, draw a simple random sample $[r_{hjp}^{**}, Z_{hjp}^{**}]_{p=1}^{P_{hj}}$ of size P_{hi}^* with replacement from $[r_{hjp}, Z_{hjp}]_{p=1}^{P_{hj}}$. In this notation, Z_{hjp}^{**} is simply Z_{hj} from equation 2 above, calculated using the resampled loans for bank j. Our version of equation 6.6 of RW is:

5) $$\bar{\bar{r}}_{hi} = \bar{r}_{hi} + \sum_1^{n_h} \left[\frac{[1 - f_h]^{\frac{1}{2}}}{n_h} * [r_{hi}^* - \bar{r}_h]\right] + \sum_1^{n_h} \left[\frac{\left[\left[1 - f_m\right]\left[\frac{M_i}{M_i - 1}\right]\right]^{\frac{1}{2}}}{n_h} * [r_{hi}^{**} - r_{hi}^*]\right]$$

where $f_m = m_i / M_i$.

Table 4 compares the estimates obtained from both one and two stage resampling to estimates calculated under the older system. Generally, the two stage resample provides smaller estimates of the standard errors. Some of the reduction in the standard errors occurs because the two stage procedure dampens the effect of large loans (which also tend to carry rates of interest that are towards the low end of the range for each survey). The effect on the results of these large loans, which have been appearing in most quarters in recent years, may best be seen in the far–right column of the table. For these larger loans, the standard error of the estimates from the two–stage procedure is well below those of the single stage resample. In contrast, the differences between the two procedures are much less noticeable for smaller loans. Nevertheless, the reduction in the estimated standard error occurs even in the smaller classes of loans, and this difference between the estimates from the one–stage and two–stage resampling comes from the last term on the right–hand side of equation 5. Note that this term drops out when $m_i = M_i$, that is when banks report for all branches and for all the days of the survey (About 80 banks report for less than the full five days, and less than 10 report for a subset of branches.).

The single–stage resample always includes large loans at a particular bank, while the existing two–stage resample gives large loans a weight that is proportional to the number of loans that were made by the bank. An intermediate approach is shown in the final row of table 4, which shows an estimate constructed by choosing the loans in the second stage resample with a probability that is proportional to the size of the loan (PPS). The probability that a particular loan is rechosen during the second stage resample is set to the share of all loans that

were closed by that particular bank during the survey period. In contrast, the previous loan resampling procedure assigned an equal weight to all sizes of loans. The PPS selection procedure seems to provide estimates that fall between the bank level resampling and the resampled bank–resampled loan (equal probabilities of loan reselection) procedure.

E. Regional estimates

Within the past few years, some users of the data have requested estimates of the terms of farm lending by USDA regions. Demands for estimates in subregions that were not considered in the original design seem likely in other establishment surveys, and in this section we address some questions that might be common to such requests. First, one must be concerned about the coverage within a subregion. In our survey, subregions that happened to have been shortchanged on coverage or had many large farm lenders (relative to other banks in the region) that were not on the survey panel would be expected to exhibit more variability in estimates.

Another question is how to stratify banks in the regions to produce estimates. Two possible methods are: 1) collapsing the strata used in the national design and 2) set stratum limits in each subregion separately using the cum root f method, a widely used approximation for the optimal choice of stratum limits (Cochrane). One also must select the number of strata to use in each subregion. Of course, the national panel already was in place, and we had no reason to expect that the panel members in each subregion would correspond to those that would have been chosen if the members and stratum limits for each region had been chosen separately. In our case, the small sample size within the subregions forced us to use a small number of size strata—we chose two strata within each region. We also chose the second alternative for stratification—we mimicked the original procedure and chose the stratum limits using the cum root of f rule. The stratum limits that we chose and the coverage that we achieved are shown in table 5.

In the national survey, we placed a high proportion of the largest agricultural lenders in the first stratum in order to improve precision. Indeed, we originally specified a certainty stratum of the 10 largest farm lenders, but over time, several nonpanel banks came to hold more agricultural loans than the tenth panel bank. Thus, the stratum with the largest agricultural lenders now contains 10 of 13 banks. When we broke the panel into regions, however, we were not guaranteed that most of the largest banks within each region would be on the panel, likely reducing the precision of the regional estimates. The far right column gives the coverage of the largest banks within each region.

Table 6 shows the regional estimates of the weighted average interest rates for the past six surveys. In the midwestern, farm–oriented states, the interest rates that are charged for farm loans seem to be substantially more homogenous. In contrast, the standard errors of the weighted–average interest rates in the Appalachian and Southeast regions generally were much larger than in other regions. Some of these differences likely arise from the larger average size of loans (shown for August, 1992 in the third line of the table) that are made in the Northeast, Appalachian, and Pacific regions. This observation would be consistent with the data that were presented in table 4, which indicated that rates of interest tend to decline as the size of the loan increases. However, it is clear from table 6 that solely the average size of the loans does not account for all of the differences between the regions. Differences in the types of farming and farm returns, as well as differences in the structure and performance of commercial banks, across regions likely account for an additional portion of the variation in the terms of lending.

Conclusions:

In this paper we applied several forms of the bootstrap methodology to farm loan data from the Survey of Terms of Bank Lending to Farmers. We find that the more modern, computer–intensive estimation procedures provide more precise estimates of the weighted average interest rate. In addition, the resampling procedure tends to discount the effect of very large loans on the estimate of the mean interest rate. Most of the reduction in the standard errors of the weighted average interest rate seemed to come from the bank–level variability rather than from loan–level variability. That is, most of the reduction in standard errors relative to the old method occurred when one resampled banks; The standard errors did not fall appreciably more when one also resampled loans at each resampled bank.

The bootstrap methodology also was easy to adapt to the estimation of average interest rates for various USDA–defined farm production regions across the United States. This application indicated that interest rates on farm loans in the Midwest were, on average, about 2 percentage points higher than those in the Pacific region. Furthermore, the standard error of interest rates in the Midwest was smaller than in most other regions. Given the average sizes of loans in each region and the negative correlation of the size of loans and the rate of interest that they carry, some, but not all, of this difference appears to arise purely from the sizes of loans.

Bibliography

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TABLE 1
Coverage of the Survey of Terms of Bank Lending to Farmers
June 1977

State	Panel #banks	Panel %	Universe #banks	Universe %	Universe Ag Loans (billion dollars)	% US Ag Loans
Kansas	2	.8	615	4.3	1.6	6.2
Illinois	10	4.0	1,229	8.5	1.7	6.6
Iowa	15	6.0	650	4.5	2.6	10.2
Minnesota	6	2.4	752	5.2	1.3	5.1
Nebraska	11	4.4	450	3.1	1.9	7.4
South Dakota	0	.0	156	1.1	0.8	3.1
(total, 6 states)		17.6		26.7		38.6

TABLE 2
STBL Panel Changes Over Time

	May 1977	May 1982	May 1987	May 1992 *
# of loan records:	3,411	3,613	2,087	5,495
# of reporting banks:	187	182	151	222
% of ag panel	74.8	72.8	60.4	88.8
Number of panel banks in:				
Kansas	2	5	5	14
Illinois	10	12	8	17
Iowa	15	15	14	19
Minnesota	6	7	5	13
Nebraska	11	11	11	16
South Dakota	0	0	0	6

* Data for 1992 reflect the new panel.

TABLE 3
Effect of Resample Sizes, August 1992 Survey
(100 replications)

		Lower Survey Stratum Limit (Million $)				
	All Banks	133.0	19.8	8.2	3.7	1.0
n_h	213.	9.	58.	53.	50.	43.
n_h / N_h * 100	3.3	75.0	17.7	4.3	2.4	1.5
Resample Size (m_h)	Weighted Average Interest Rate					
n_h	7.87	6.75	6.90	9.23	8.96	9.60
n_h - 1	7.89	6.76	6.92	9.25	8.99	9.57
n_h - 2	7.89	6.76	6.92	9.25	8.99	9.57
n_h - 3	7.93	6.75	6.94	9.21	8.97	9.52
	Standard Error					
n_h	.206	.062	.386	.181	.254	.174
n_h - 1	.233	.060	.383	.157	.230	.190
n_h - 2	.235	.060	.369	.181	.220	.199
n_h - 3	.194	.058	.349	.195	.247	.170

TABLE 4
Comparison of Estimation Methods
Weighted Average Interest Rates, August 1992

Estimation Method	Loan Size (thousand dollars)						
	All Sizes	$1-9	$10-24	$25-49	$50-99	$100-250	>$250
Original	7.82 (.27)	9.42 (.12)	8.97 (.24)	8.64 (.16)	8.44 (.32)	7.95 (.31)	6.88 (.20)
Resample* Banks	7.89 (.257)	9.47 (.084)	9.04 (.144)	8.68 (.091)	8.40 (.194)	7.96 (.194)	7.03 (.359)
Resample* Banks & Loans	8.45 (.162)	9.46 (.081)	9.01 (.096)	8.80 (.088)	8.57 (.190)	8.13 (.170)	7.23 (.250)
Resample* Banks & Loans (PPS)	7.95 (.177)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Standard errors are in parenthesis below each estimate.
n.a. not available.
* All resampling procedures use 100 replications.

TABLE 5
Regional Distribution of the Survey Panel

USDA Region	Size * Group	Total Banks	Panel Banks	Status of Largest Banks
North East	under $8 M	193	3	
	8 & over	44	7	2 of 5 on panel
Lake States	under $8 M	637	14	
	8 & over	219	13	2 of 5 on panel
Corn Belt	under $10 M	1411	32	
	10 & over	425	31	2 of 3 on panel
Northern Plains	under $10 M	734	23	
	10 & over	260	20	2 of 8 on panel
Appalachia	under $8 M	389	7	
	8 & over	91	10	3 of 9 on panel
South East	under $8 M	361	4	
	8 & over	74	9	2 of 6 on panel
Delta States	under $8 M	275	6	
	8 & over	109	4	1 of 5 on panel
Southern Plains	under $8 M	690	18	
	8 & over	151	11	1 of 5 on panel
Mountain States	under $10 M	285	7	
	10 & over	84	10	3 of 5 on panel
Pacific States	under $18 M	108	3	
	18 & over	44	12	9 of 9 on panel

* Note: Of the largest 8 farm lenders in the USA, 7 are in the Pacific States.

TABLE 6
Survey of Terms of Bank Lending to Farmers, (selected quarters)
by USDA Farm Production Regions

	USDA Region*									
	NE	LS	CB	NP	AP	SE	DL	SP	MN	PA
Proportion of farm loans outstanding, Aug. 1992 survey	3.3	10.4	26.3	17.3	6.3	5.4	4.5	9.9	6.8	9.7
Sample Coverage, Aug. 1992 survey (%)	17.6	5.2	7.1	9.6	11.3	9.5	5.5	7.8	24.5	75.3
Average Amount, Aug. 1992 survey ($1000)	387.3	11.5	14.5	25.0	189.5	22.1	16.2	45.4	31.3	69.5
Survey date:	Weighted Average Interest Rate During Sample Week (bootstrap results, 100 replications)									
Nov. 1991	10.1 (.46)	11.1 (.17)	10.7 (.13)	10.4 (.31)	9.1 (.44)	9.8 (.40)	9.7 (.40)	10.5 (.30)	9.9 (.50)	8.8 (.23)
Feb. 1992	8.7 (.30)	10.3 (.17)	9.5 (.12)	9.4 (.24)	8.2 (.47)	8.5 (.28)	8.9 (.47)	9.5 (.32)	8.7 (.35)	7.3 (.17)
May 1992	8.8 (.27)	10.1 (.19)	9.2 (.15)	9.4 (.26)	8.1 (.54)	8.9 (.65)	8.6 (.43)	9.6 (.40)	8.8 (.46)	7.7 (.14)
Aug. 1992	7.8 (.27)	9.7 (.16)	9.2 (.12)	9.3 (.27)	7.9 (.67)	7.2 (.16)	8.3 (.33)	8.9 (.48)	8.4 (.47)	7.4 (.27)
Nov. 1992	8.2 (.36)	9.7 (.18)	8.9 (.10)	8.8 (.25)	7.8 (.65)	7.7 (.32)	8.5 (.12)	8.6 (.34)	8.3 (.45)	7.4 (.22)
Feb. 1993	7.8 (.19)	9.4 (.21)	8.4 (.13)	8.7 (.22)	7.4 (.52)	8.5 (.37)	8.3 (.40)	8.3 (.36)	8.1 (.33)	7.1 (.23)

* NE is Northeast, LS is Lake States, CB is Cornbelt, NP is Northern Plains, AP is Appalachia, SE is Southeast, DL is Delta States, SP is Southern Plains, MN is Mountain States, and PA is Pacific.

Standard errors are in parentheses below each estimate.