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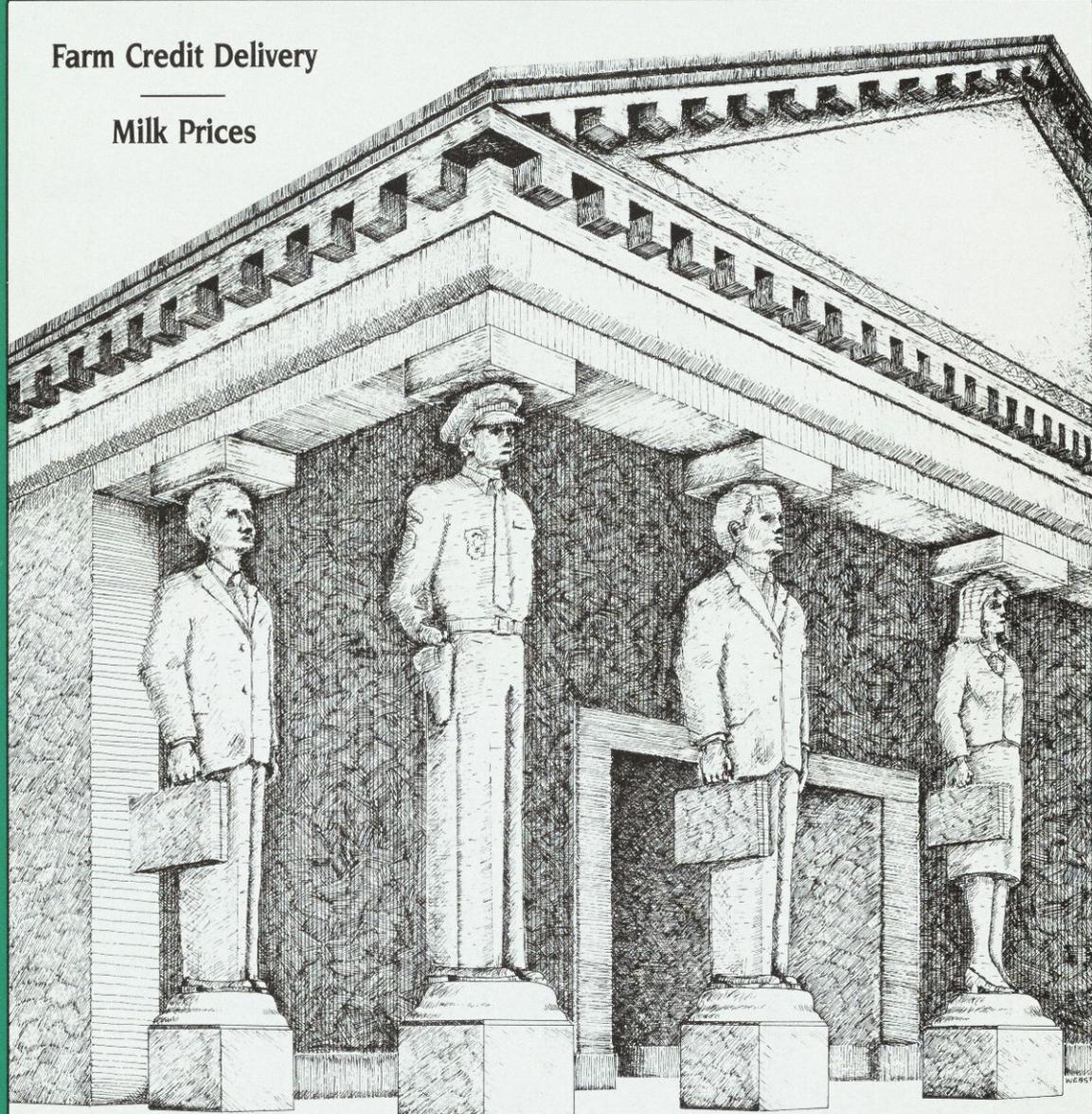
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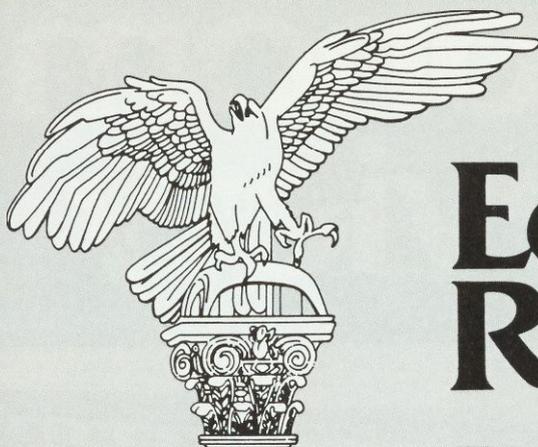
JANUARY/FEBRUARY 1990

Farm Credit Delivery  
Milk Prices



## MEASURING BANK PERFORMANCE

The Labor Yardstick



# Economic Review

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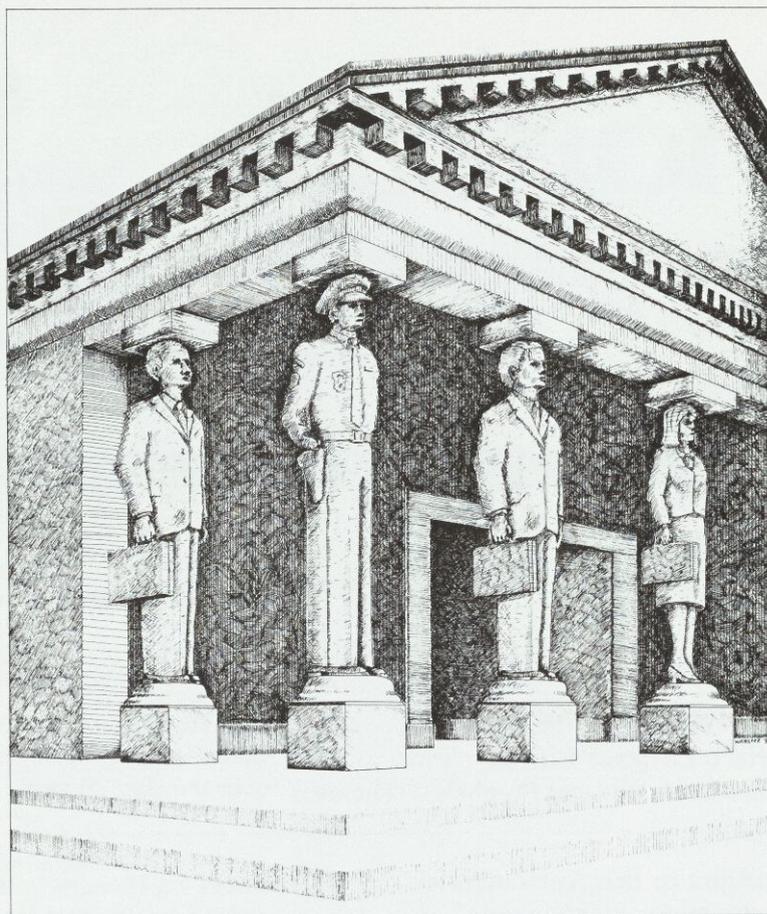
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# Employment in the World's Largest Banks

William C. Hunter and Stephen G. Timme

*Analyzing labor utilization patterns has been a common method of measuring the performance of the world's largest commercial banks. This article expands and updates research on this subject by describing changing employee utilization patterns of banks from industrialized countries since the late sixties. The authors find that large U.S. banks have come to need significantly more workers to produce the same level of services than banks in many other industrialized nations. This research has important implications regarding the effects of country-to-country differences in regulatory structure on bank efficiency.*

One aspect of banking system performance that has received continued attention is the use of labor among the world's largest banks. Findings in this area of research have implications for a wide range of banking-related activities, from the effects of different regulatory regimes on banks to the possibilities of substituting capital for labor. This article updates and extends earlier analyses of employment at the world's largest banks; such research is especially important in this time of accelerating change in the financial services industry.

George G. Kaufman initiated this approach to analyzing bank operations in a 1970 study of the labor intensiveness of large banks from several industrialized and less developed countries. In an effort to understand how efficiently banks utilize labor in producing financial services, the researcher found that banks headquartered in the United States required the fewest employees to produce the same level of financial services. The study used 1967 data and controlled for differences in exchange rates, total assets, and number of worldwide offices. Banks headquartered in Japan were among the least efficient in their use of labor, and banking organizations in less developed countries generally lagged far behind industrialized nations' banks in terms of efficient labor utilization.

In 1971 Brock K. Short extended Kaufman's research, using data for the same year but including banks from more countries. Sang-Rim Choi and Adrian Tschoegl (1984) eventually updated Short's work with 1979 data. From their research came the rather surprising result that, over the 12 years following the Kaufman study, U.S. banks needed significantly more employees to produce financial services than banks headquartered in many other industrialized countries, including those headquartered in Japan. Once again, these results emerged after controlling for differences in exchange rates,

assets, and the number of worldwide offices, as well as for inflation.

Given the potential for such dramatic changes in employment utilization in the production of financial services, economists' and policymakers' ongoing interest in this topic is not surprising. In part, this focus reflects a desire to understand better the extent to which capital can be substituted for labor in the banking industry and whether certain regulatory structures in place in one country are more conducive than those in other countries to promoting efficiency, particularly in the use of labor.

One implication of such a differential effect would be the potential for structural arbitrage on the part of international bank managements. If the regulatory structures imposed by various countries affect bank production differently, banks operating in a location where regulations detract from production efficiency would be at a competitive disadvantage vis-a-vis banks in locations with more favorable regulations. Over time bank managers are likely to move their production activities "off-shore" to countries whose regulatory climates are more amenable to efficient production. Under such a scenario, these competitive advantages and disadvantages would presumably disappear over time, and international banks—regardless of their particular country of charter—would all have similar performance characteristics.

In the literature examining differences among the world's largest commercial banks, the choice of employee utilization as the performance measure reflects the fact that detailed micro-production and financial data of the type examined in typical bank production efficiency studies of domestic banks are not readily available for foreign banks. However, by relating bank employment to available key determinants other than wages and capital costs—such as total assets and number of worldwide offices—one can gain insight into questions related to labor intensiveness, productivity, and efficiency across banks under a variety of regulatory regimes.

This article updates and extends the studies by Kaufman, Short, and Choi and Tschoegl. Under analysis are shifts in employee utilization among banks headquartered in industrialized countries from 1980 to 1986; these movements are then related to bank size. This research has

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potential importance for providing insights into international competitive viability, the effects of technical progress and deregulation, and changes in equilibrium market structures.

Empirical results indicate that banks in industrialized nations still have significantly different employee utilization patterns from those in developing countries. Even among industrialized countries substantial differences in this aspect of banking performance persist. These differences are present in both a dynamic and a static sense. That is, the research uncovers significant differences in the rate of change in employee utilization as well as variations across time. One might expect that employee utilization in banks from industrialized nations differs from that in less developed countries, given the disparities in cultures, values, and market orientation that characterize the two categories of countries. In less developed countries close ties usually exist between banks and the state, for example, and bank regulation is often used as a tool of social policy, especially in the employment policy area.

A more surprising finding is the presence of significant differences in employment patterns among banks from the industrialized countries. Besides suggesting that bank regulation may have a significant effect on bank production efficiency, this research implies that free entry by foreign banks into domestic banking markets may not be without its costs since structural arbitrage by international bank managements has not yet equalized performance.

This article also reports that employment at U.S. banks increased significantly over the 1980-86 period, taking into account the effects of asset size and number of branches, while banks from other industrialized countries displayed significant annual declines in employment. Perhaps large U.S. banks, using traditional measures of efficiency, are becoming increasingly less productive or efficient relative to their major international competitors. However, this finding may result from other factors, including differences in product mixes that mask U.S. banks' true efficiency or by the timing of investments in bank production technology.

The research in this article is presented in two major sections. First, the analyses conducted by Kaufman, Short, and Choi and Tschoegl are updated, using 1986 data to compare employee

utilization differences between banks from both the industrialized or developed countries and from the less developed nations. Next, information is provided on the time-series properties of employee utilization for banks from several different countries, including an examination of the relationship between bank size and employment.

## Employment in the World's Largest Banks: 1986

Before examining the results of this article's research, it is useful to look at earlier efforts and their methodologies. Kaufman, Short, and Choi and Tschoegl studied data for number of employees, total assets, and worldwide offices for the world's largest 150 banks as published annually in the *American Banker*. Table 1 shows the regression model used to examine the relationships among these variables. Differences in employee utilization among the sample banks—after controlling for total assets and worldwide offices headquartered in each country represented in the sample—are captured by the coefficient on the country indicator (dummy) variable. The estimated parameter values of the employment model used by Short, as well as Choi and Tschoegl, appear in Table 1, along with updated estimates for 1986. In updating the Kaufman study, Short added banks from several additional countries. Since Choi and Tschoegl's study updated Short's work using the same model, Table 1 does not report on Kaufman's original study.

For each study reflected in Table 1 total assets for the sample banks were converted into millions of U.S. dollars using either end-of-year or end-of-third-quarter spot exchange rates. In the Choi and Tschoegl update and the current study total assets are expressed in 1967 U.S. dollars, using the GNP deflator to make the results comparable to those of Kaufman and Short.

The results in Table 1 (the  $b_{TA}$  parameter values) suggest that—other things being equal—the number of employees per million 1967 dollars of total assets fell significantly over the measured period. The index dropped from 1.22 in 1967 to 0.66 in 1979 and fell further to 0.34 in 1986. On the other hand, the index relating

**Table 1.**  
**Comparative Regression Results for the Bank Employment Model**  
*(standard errors in parentheses)*

$$EMP = b_{TA} TA + b_{BR} BR + d_{US} D_{US} + d_J D_J + d_{BI} D_{BI} + d_{OLDC} D_{OLDC} + d_{UKP} D_{UKP} + d_{DE} D_{DE} + d_{SPG} D_{SPG}$$

Parameter	Short (1967)*	Choi-Tschoegl (1979)*	Hunter-Timme (1986)*
$b_{TA}$	1.22 <sup>‡</sup> (0.10)	0.66 <sup>‡</sup> (0.08)	0.34 <sup>‡</sup> (0.07)
$b_{BR}$	9.81 <sup>‡</sup> (0.62)	7.69 <sup>‡</sup> (0.74)	10.95 <sup>‡</sup> (0.86)
$d_{US}$	-411 (566)	5,592 <sup>†</sup> (2,117)	11,236 <sup>‡</sup> (2,451)
$d_J$	1,633 <sup>†</sup> (731)	-1,689 (1,781)	-4,215 (2,499)
$d_{BI}$	35,169 <sup>‡</sup> (3,381)	87,834 <sup>‡</sup> (6,456)	112,850 <sup>‡</sup> (9,577)
$d_{OLDC}$	4,295 <sup>‡</sup> (1,052)	12,375 <sup>‡</sup> (1,912)	950 (4,336)
$d_{UKP}$	585 <sup>†</sup> (991)	16,109 <sup>‡</sup> (2,495)	19,567 <sup>‡</sup> (2,904)
$d_{DE}$	-19 (578)	-2,008 (1,418)	2,012 (1,729)
$d_{SPG}$	4,749 <sup>‡</sup> (1,481)	2,957 (8,110)	-5,581 (4,940)
$R_2$	0.89	0.87	0.92
Mean Employees	8,582	17,290	19,567

*EMP* is number of full-time employees, *TA* is total assets, and *BR* is the number of worldwide offices. Total assets are measured in millions of 1967 U.S. dollars. The dummy variables equal one for a bank in the respective country and zero otherwise. Following Short and Choi-Tschoegl, the dummy variables are defined as the United States (*US*); Japan (*J*); Brazil and India (*BI*); Other Less Developed Countries (*OLDC*); the United Kingdom, Canada, Australia, and South Africa (*UKP*); Developed European countries and Israel (*DE*); and Spain, Portugal, and Greece (*SPG*).

\* The results in the "Short (1967)" column are for the year 1967 from Short (1971), the "Choi-Tschoegl (1979)" column for the year 1979 from Choi and Tschoegl (1984), and the "Hunter-Timme (1986)" column for the year 1986 from the current study.

† Significant at the .05 percent level.

‡ Significant at the .01 percent level.

employees to offices was mixed, dropping from 9.81 in 1967 to 7.69 in 1979 but then increasing to 10.95 in 1986. Thus, while employee productivity or efficiency appeared to improve significantly between 1967 and 1979, the efficiency gains were somewhat diminished between 1979 and 1986 because of the increased number of employees per bank office. This branch office labor intensity parameter,  $b_{BR}$ , measures the marginal impact on total employment of one bank office.

**Reasons for Changes in Efficiency.** As Choi and Tschoegl noted, three important causes of

efficiency gains are economies of scale, changes in firm product mix, and technological change. In their study, these two researchers concluded that economies of scale do not appear to be a major contributing factor to apparent increases in employee efficiency. Recent analyses of costs and production efficiency imply that this conclusion is still valid. Studies by Alan Berger, Gerald Hanweck, and David Humphrey (1987) for small U.S. banks, and by the authors of this article (1988) for very large U.S. banks, cast additional doubt on scale economies as an important explanation of employee efficiency gains. Ber-

ger, Hanweck, and Humphrey found no evidence of scale economies for U.S. banks with \$10 million to \$1 billion in total deposits. Hunter and Timme (1988) found evidence of mild diseconomies of scale for U.S. banks with more than \$5.0 billion in total assets stated in 1986 dollars. The average asset size of the sample banks in the current study is \$57.8 billion (in 1986 dollars) ranging from a bank with \$15.6 billion in total assets to an institution with total assets of \$239.6 billion. The finding that the employment effects of bank offices served to diminish employee efficiency gains over the 1979-86 period is consistent with 1986 research conducted by authors of this article. In that study, bank offices were found to have a negative impact on bank efficiency in a sample of large U.S. bank holding companies over the period 1972-82.

With respect to many of the banks examined in this article, changes in product mixes might provide a more appealing, though less than complete, explanation of measured employee efficiency gains. By 1979, Eurocurrency markets had matured; most major banks (except for those owned by the Japanese) had already penetrated the wholesale banking markets, and these institutions could now increase their assets without necessarily adding significantly to their work forces. On the other hand, increases in off-balance sheet banking products during the 1980s and the movement into other investment-banking-type services—in an effort to increase fee-based income while simultaneously lowering total balance-sheet assets—should have led to a net increase in the ratio of employees per million 1967 dollars in total assets. This result would occur because increases in off-balance sheet assets and investment banking activities tend to boost labor inputs without commensurately raising output as measured by total assets. Since these two observed trends in product mix changes lead to opposite conclusions concerning employment efficiency gains, the product mix explanation appears to be less than complete.

Another way to explain the measured efficiency gains might be through the substantial investment in technology that has occurred in the banking industry over the past two decades. Technological change is embodied in more efficient computer hardware and software, better-

educated and more knowledgeable work forces, and new vintages of telecommunications equipment. Even the liberalization of various bank restrictions can be thought of as disembodied technological change in the sense that bank managers can implement a wider array of efficiency enhancing procedures, products, and technological applications in a less restrictive regulatory environment. More descriptive tests of bank efficiency gains are reported below.

**Country Variables.** An analysis of the country variables in Table I by specific years reveals that significantly different bank employment patterns continue to exist between countries. This evidence does not lend much support either to the hypothesis that employment utilization is independent of regulation or to the notion that world banking markets are sufficiently open to permit effective structural arbitrage. As would be expected, banks in the less industrialized countries of Brazil and India have significantly higher employment indexes than banks in other countries. A similar relationship holds for banks from other less developed countries for the years 1967 and 1979, and for banks from Spain, Portugal, and Greece in 1967. The trend, however, toward less significant differences in employment patterns observed for the banks from these countries could be due to the diffusion of technology and overall liberalization of the domestic economies of these nations, such as with the removal of trade restrictions. On the other hand, the differences could also result from endogenous changes in preferences for financial performance and economic growth in these countries.

The results indicate that banks headquartered in both the developed European countries and Israel had higher employment indexes in each of the three years examined. U.S. banks also had a significantly higher index for 1979 and 1986. These results are examined in further detail in the next part of this article.

## Extension of Previous Studies

The data in Table I indicate that the country-specific employment index for banks in industrialized nations is different and somewhat mixed during the years under study. This sec-

tion examines employment utilization in a more detailed fashion in order to determine if the annual differences observed in Table 1 are being eliminated or perhaps exaggerated over time. That is, this research studies the dynamic time series trend in employment for the sample banks during more recent years. This analysis also allows better determination of what effects technological change and other factors may have had on employment in the sample banks.

**The Model.** Conducting the dynamic analysis required specifying the following model of the bank employment function, where  $\ln$  represents natural logarithms:

$$\begin{aligned} \ln EMP = & b_0 + b_{TA} \ln TA + b_{BR} \ln BR + b_T T \\ & + b_{T, TA} T \cdot \ln TA + b_{T, BR} T \cdot \ln BR \\ & + \sum_i d_i D_i + \sum_i d_{TA, i} D_i \cdot \ln TA \\ & + \sum_i d_{BR, i} D_i \cdot \ln BR \\ & + \sum_i d_{T, i} D_i T + e, \end{aligned} \quad (1)$$

for  $i = US, J, GER, CAN,$  and  $UK$ .

In equation (1),  $T$  is a measure of time (0, 1, . . . , 6) for the years 1980-86,  $EMP$  is the number of full-time employees,  $TA$  is total assets,  $BR$  is the number of offices worldwide, and  $e$  is an additive error term. Time is used as a measure of efficiency, or more precisely a residual efficiency index, in the sense that, holding all other variables in equation (1) constant, any changes in the number of employees can be attributed to efficiency gains associated with technological change or changes in product mix and relative factor input prices. The  $D_i$ s are dummy or indicator variables as used previously. If a bank is headquartered in the United States, Japan, West Germany, Canada, or the United Kingdom,  $D_i$  is set equal to one; otherwise, the dummy variable is set equal to zero. The dummy variables measure employment differences of banks headquartered in these countries relative to banks headquartered in a base or reference group. The "Base Group" comprises those banks not headquartered in any of the countries explicitly modeled—Australia, Austria, Belgium, Finland, France, Italy, the Netherlands, Spain, Switzerland, and Sweden.

Based on equation (1), the annualized percentage change in employees for banks headquartered in country  $i$ , holding constant the

effects of total assets and branches, is measured by:

$$\begin{aligned} \%CHEMP_i = & \partial \ln EMP / \partial T \\ = & b_T + b_{T, TA} \ln TA_i \\ & + b_{T, BR} \cdot \ln BR_i + d_{T, i} D_i, \end{aligned} \quad (2)$$

where  $TA_i$  and  $BR_i$  are the geometric mean values of total assets and number of offices for banks headquartered in country  $i$  over the period 1980-86. For the Base Group, the annualized percentage change in employees is measured by dropping the dummy variable term in equation (2) and using the geometric mean value of  $TA$  and  $BR$  for banks headquartered in the Base Group countries. The 1980-86 period—characterized by significant changes in regulation, monetary policies, and financial innovation—was chosen because it is more germane to current policy and managerial decision making than a period inclusive of much earlier years. In addition, the analysis is restricted to banks in developed countries since such banks are assumed to have more incentive to improve efficiency given the overall increase in financial services competition during the 1980s. Finally, special emphasis is placed on the major trading partners of the United States.

The  $\%CHEMP_i$  index given by equation (2) represents a modified measure of technological change; it gauges the annualized percentage change in employees, holding all the determinants of employment (with the exception of factor input prices and product-mix) constant.<sup>1</sup> Thus, this index captures the effects on employment of changes in technology, management, and organizational processes, as well as relative factor prices. The inclusion of the geometric mean values of total assets and number of offices in equation (2) facilitates the examination of any scale bias associated with employment changes. Scale bias involves the relationship between bank size and the modified measure of technological change,  $\%CHEMP$ . Examining scale bias can help answer the question of whether the impact of modified technological change on employment in the large sample banks is different from its impact on employment in the smaller sample banks. A finding of scale-biased employee change has important implications for optimal bank size and, in turn, market structures and regulation.

**Table 2.**  
**Estimated Regression Coefficients for the**  
**Bank Employment Model for Industrialized Countries**  
*(standard errors in parentheses)*

$$\ln EMP = b_0 + b_{TA} \ln TA + b_{BR} \ln BR + b_T T + b_{T,TA} T \cdot \ln TA + b_{T,BR} T \cdot \ln BR + \sum_i d_i D_i + \sum_i d_{TA,i} D_i \cdot \ln TA + \sum_i d_{BR,i} D_i \cdot \ln BR + \sum_i d_{T,i} D_i T,$$

for  $i = US, J, GER, CAN,$  and  $UK$

Parameter	Estimate	Parameter	Estimate	Parameter	Estimate
$b_0$	3.075 <sup>‡</sup> (0.273)	$d_{T,US}$	0.031 <sup>‡</sup> (0.008)	$d_{CAN}$	-0.861 (0.882)
$b_{TA}$	0.356 <sup>‡</sup> (0.030)	$d_J$	0.122 (0.381)	$d_{TA,CAN}$	-0.207 <sup>†</sup> (0.086)
$b_{BR}$	0.446 <sup>‡</sup> (0.019)	$d_{TA,J}$	-0.055 (0.037)	$d_{BR,CAN}$	0.448 <sup>‡</sup> (0.119)
$b_T$	0.043 (0.028)	$d_{BR,J}$	0.114 <sup>‡</sup> (0.039)	$d_{T,CAN}$	0.014 <sup>†</sup> (0.006)
$b_{T,TA}$	-0.059 <sup>†</sup> (0.028)	$d_{T,J}$	-0.050 <sup>‡</sup> (0.005)	$d_{UK}$	0.419 (1.584)
$b_{T,BR}$	0.002 (0.002)	$d_{GER}$	-2.362 <sup>‡</sup> (0.857)	$d_{TA,UK}$	0.367 <sup>†</sup> (0.155)
$d_{US}$	-0.775 (0.647)	$d_{TA,GER}$	0.332 <sup>‡</sup> (0.083)	$d_{BR,UK}$	-0.483 <sup>‡</sup> (0.090)
$d_{TA,US}$	0.246 <sup>‡</sup> (0.064)	$d_{BR,GER}$	-0.244 <sup>‡</sup> (0.024)	$d_{T,UK}$	-0.036 (0.024)
$d_{BR,US}$	-0.233 <sup>‡</sup> (0.040)	$d_{T,GER}$	0.008 (0.009)	$R_2$	0.98

*EMP* is the number of full-time employees, *TA* is total assets, and *BR* is the number of worldwide offices. Total assets are measured in millions of 1980 U.S. dollars. The dummy variables equal one for a bank headquartered in the respective country and zero otherwise. The dummy variables are defined as the United States (*US*), Japan (*J*), Germany (*GER*), Canada (*CAN*), and Great Britain (*UK*).

† Significant at the .05 percent level.

‡ Significant at the .01 percent level.

Assuming that the number of offices is a function of total assets ( $BR = f(TA)$ ), the scale biasedness of this modified technological change index is measured by:

$$\begin{aligned} \partial \%CHEMP_i / \partial TA &= \%CHEMP_{PSB} \\ &= \partial^2 \ln EMP / \partial T \partial \ln TA \\ &\quad + (\partial^2 \ln EMP / \partial T \partial \ln BR_i) \\ &\quad \cdot (\partial \ln BR_i / \partial \ln TA_i) \\ &= b_{T,TA} + b_{T,BR} \\ &\quad \cdot (\partial \ln BR_i / \partial \ln TA_i). \end{aligned} \quad (3)$$

A  $\%CHEMP_{PSB}$  index less than (greater than) zero indicates that technological change caused

larger banks to achieve a larger (smaller) percentage reduction in employees than smaller banks.

**Data and Empirical Results.** To carry out this extended analysis, data on number of employees, total assets, and offices were collected for each of the world's top 200 banks for the period 1980-86 as reported in the *American Banker*. Only those banks headquartered in developed countries and having complete data for the entire sample period were retained. The final sample consists of 112 banks.<sup>2</sup> The results of estimating the employment model in equation (1) are shown in Table 2.

Summarizing the results in Table 2, Table 3 reports estimates of the percentage change in

employees, %CHEMP in equation (2), for the Base Group and each of the countries explicitly modeled.<sup>3</sup> After adjusting for total assets and number of offices, the number of employees was reduced by approximately 0.6 percent per year for the Base Group over the sample period. Employment at Japanese banks dropped at an annual rate of approximately 6.0 percent, and for U.K. banks employment dropped 4.0 percent per year. The increase in efficiency for the Japanese banks probably reflects gains associated with changes in product mix as well as pure efficiency gains. Over the sample period, Japanese banks became major lenders of dollars in both the European and U.S. markets, in part because of the massive Japanese dollar trade surplus. Over the same period, yen-denominated credits to non-Japanese residences rose sharply as a result of increased trade financing and liberalization of the Japanese financial system. Substantial measured efficiency gains for the Japanese banks would, therefore, be expected to the extent that economies exist between loan size and number of employees.

The U.K. banks in the sample are dominated by the four large clearing banks: Barclays, Lloyds, Midland, and National Westminster. These banks operate extensive branching networks that, in the early 1980s, exhibited one of the highest ratios of employees to total assets among banks headquartered in the industrialized countries. The clearing banks also experienced increased competition over the sample period from, for example, the U.K. building societies and foreign banks. In this regard, the significantly reduced number of employees at these banks reflects, to a large degree, an attempt by these firms to increase efficiency in order to stay viable competitively.

The results in Table 3 show that, for U.S. banks, employment increased approximately 2 percent per year over the sample period (%CHEMP = 2.30 percent). This significant increase in employee utilization for the U.S. banks is somewhat surprising given these banks' investment in automation. For example, over the 1981-85 period U.S. banks invested approximately \$30.0 billion in systems technology; during this same time, systems expenses at U.S. banks were rising at an average annual rate of 17.6 percent as compared to a 10.5 percent annual increase in overall operating expenses.<sup>4</sup>

**Table 3.**  
**Estimates of Percentage Change in**  
**Bank Employment (%CHEMP) and**  
**Scale Bias (%CHEMPSB) for**  
**Industrialized Countries**

Country	%CHEMP	%CHEMPSB
United States	2.30 <sup>†</sup>	-0.53 <sup>†</sup>
Japan	-5.89 <sup>†</sup>	-0.56 <sup>†</sup>
Germany	0.33	-0.44 <sup>†</sup>
Canada	0.84	-0.57 <sup>†</sup>
United Kingdom	-4.38 <sup>†</sup>	-0.50 <sup>†</sup>
Base Group*	-0.59 <sup>†</sup>	-0.55 <sup>†</sup>

\* The Base Group is made up of banks in Australia, Austria, Belgium, Finland, France, Italy, the Netherlands, Spain, Switzerland, and Sweden.

<sup>†</sup> Significant at the .05 percent level.

However, this finding may reflect a significant change in output mix at U.S. banks, as was the case for the Japanese banks. During the sample period, U.S. banks lost a substantial amount of wholesale lending to Japanese banks and the commercial paper market, which—without an accompanying reduction in employment—would serve to lower employee efficiency. At the same time, off-balance sheet activities for large U.S. banks accelerated significantly. Many large U.S. banks also began to build employment ranks at European offices in the early and mid-1980s in anticipation of greater investment banking activity. As noted earlier, increases in off-balance sheet assets and investment banking activities could serve to boost labor inputs without commensurately raising output as measured by total assets, thus giving the impression of lower employee efficiency.

Table 3 also reports estimates of the scale bias measure of the change in employee utilization, %CHEMPSB. The results show that banks from all countries exhibited significant scale bias, indicating that the larger (smaller) sample banks experienced a larger (smaller) percentage reduction in employment as a result of modified technological change. To derive robust policy prescriptions from these results, one must assume that product mixes for the largest banks in a given country are approximately the same. With this assumption, the results suggest

that public policies allowing freer banking combinations do not necessarily run counter to the public interest. In fact, these policies may permit the existence of larger banks and thus increase bank employee efficiency. This environment would promote banks' long-run competitiveness and, through lower prices and increased quantities of bank services, improve public welfare.

## Conclusion

This article updates and extends the analyses of employment in the world's largest banks reported by Kaufman, Short, and Choi and Tschoegl. Now evidence on employment utilization at the world's largest banks covers almost two decades. The empirical results presented here indicate that statistically different employment patterns and patterns of employment efficiency gains persist among banks headquartered in industrialized countries. These findings indicate that similar differences exist between banks headquartered in the less developed countries as well.

While much of the observed efficiency gains seems to be attributable to modified technical change—that is, factors such as changes in production technology, organizational and managerial processes, and relative factor prices—this research is not able to dismiss changes in product mix as an alternative, or at least partial, explanation for some countries. In particular, the finding that U.S. banks increased employment utilization over the sample period while banks in other industrialized countries reduced

employment utilization is surprising and, while suggestive of inefficiencies, could result from significant changes in product mix.

The results point out the critical nature of product mix differences among international banks and underscore the importance of having measures that account for differences in product mix when examining production in financial intermediaries. Berger, Hanweck, and Humphrey have recently developed such measures to account for product-mix differences in bank efficiency studies. However, the application of these measures to efficiency studies of international banks must await the availability of detailed microproduction data from these institutions.

The varying patterns of employment utilization observed for banks headquartered in different industrialized countries suggest that country-specific bank regulation has important differential effects on bank production efficiency. Although value-maximizing bank managers would be expected, over time, to move their production activities to climates most favorable to efficient production, our empirical results suggest that such structural arbitrage, if indeed present, has not worked to equalize differences in employment utilization and efficiency across the world's largest banks. One conclusion based on this finding is that domestic banking markets have not achieved the degree of openness to foreign banks that would be required for structural arbitrage to equalize performance. These results should encourage ongoing efforts to coordinate international banking regulation and thus provide a more level playing field across national boundaries.

## Notes

<sup>1</sup>For examples of studies examining technological change, see Berndt and Khaled (1979); Blackorby, Lovell, and Thursby (1976); Hunter and Timme (1986, 1988); and Stevenson (1980).

<sup>2</sup>To mitigate the effects of inflation and changes in the real exchange rate, total assets for each bank were adjusted as follows: U.S. dollar total assets, as reported in the *American Banker*, were converted into nominal home country currency values using end-of-year exchange rates. Nominal home currency values were next converted into real terms by using each country's GNP deflator, setting 1980

as the base year. Finally, all real home currency values were converted into real U.S. dollars by applying the 1980 exchange rate to all years. For U.S. banks, total assets were expressed in real terms by deflating the nominal values by the GNP deflator with 1980 as the base year.

<sup>3</sup>The model in equation (2) was estimated using a generalized least squares procedure, which adjusts for heteroskedasticity and first-order autocorrelation. See Kmenta (1971): 508-14.

<sup>4</sup>See Salomon Brothers (1986, 1987).

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# Changes in the Agricultural Credit Delivery System

Gene D. Sullivan

*U.S. agricultural producers and the institutions that serve their credit needs faced serious financial problems during the 1980s as inflation diminished and the rising dollar caused the foreign market share of U.S. farm products to fall. As a result, the agricultural credit delivery system, which had remained almost unchanged from the Great Depression until the 1980s, has been forced to modify not only its physical structure but also its methods of operations and its purposes. Though there are fewer credit outlets in the revised system, the remaining lending institutions, along with new features such as a secondary market for farm loans, should be stronger and more efficient.*

**E**arly in the 1980s U.S. agriculture underwent wrenching economic change. The dollar's rising value from 1980 to 1985 caused U.S. farm products to lose price competitiveness against those of other countries. When the foreign market share for U.S. producers shrank, domestic prices of grains and soybeans fell rapidly under the weight of excess supplies. As a result, many farmers became unable to repay debts incurred at the high interest rates of the late 1970s. Land values also dropped. A large volume of debt-financed real estate purchases had been made in the late 1970s and early 1980s at prices that income from agricultural production could no longer justify by mid-decade. Both borrowing farmers and their lenders were then faced with a high, inade-

quately secured debt volume, much of which could not be repaid.

Farmers and farm communities were not the only groups to suffer economic hardships during the period. Off-farm businesses related to agriculture, especially farm credit institutions, have also been severely affected. The situation forced many farm credit companies to change their methods of operation, purposes and objectives, or physical structure. In some cases, such firms closed down altogether. In short, because of the upheavals of the last decade, the 1990s' agricultural credit delivery system will be significantly different from the system that until the 1980s had undergone only minor structural changes since the Great Depression. This article studies the evolving agricultural credit delivery system and gives an idea of how it will be structured to meet the needs of the 1990s.

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## The Origin of Specialized Agricultural Lenders

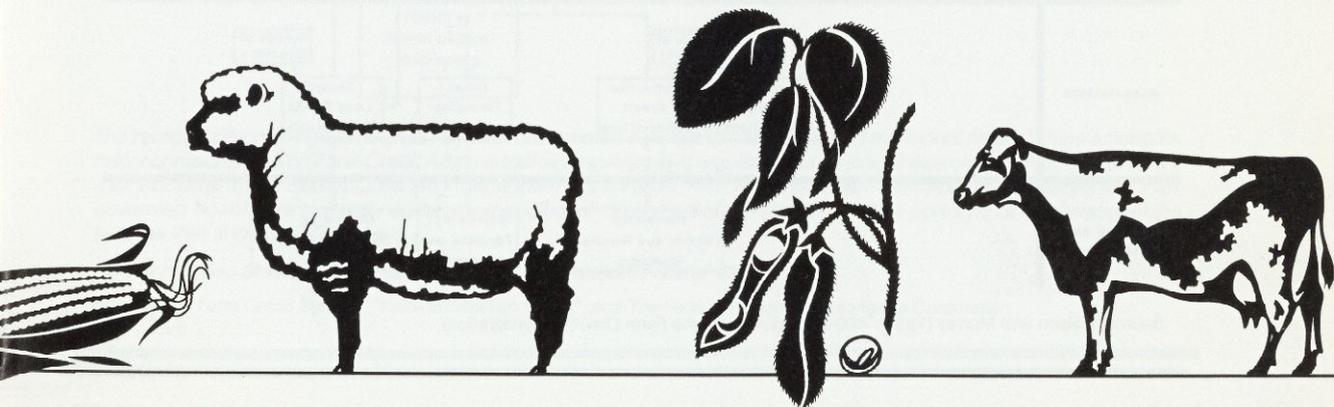
The economic turmoil of the 1980s probably affected the Farm Credit System more severely than other groups of lenders. This system has traditionally been composed of the Farm Credit Administration and cooperative lending agencies it supervises that extend credit to borrowing members (see Chart 1a). The major banks or lending arms of the system were the Federal Land Banks, the Federal Intermediate Credit Banks, and the Banks for Cooperatives. The Farm Credit System was organized into 12 districts across the nation with one of each of the three types of banks located within each district. In addition to the 12 district Banks for Cooperatives, a Central Bank for Cooperatives was located in Washington, D.C. This institution helped finance (1) large cooperative organizations doing business in more than one district and (2) bigger loan requests than single district banks could handle.

The federal government established the Farm Credit System to service particular credit needs of agricultural producers. Since colonial times, a primary focus of most farmers' movements was a demand for adequate credit. As the nation grew, the need for agricultural capital also expanded, but commercial credit facilities did not sufficiently meet the rising number of requests. Existing institutions were accustomed to short-term loans to urban businesses; such lenders were usually not inclined to lengthen their credit terms to accommodate the slower business turnover in agriculture. Furthermore, the concentration of financial institutions in eastern industrial centers required inland farmers to borrow through agents and middlemen

whose commissions and loan renewal fees pushed up borrowing costs.

Frequent loan renewals necessitated by short-term lending (as when payments were due at 90-day intervals even though income was typically available only once a year) added heavy financing burdens to borrowers. The shortage of production credit (to finance the purchase of seeds and the like) frequently caused farmers to seek merchant credit—essentially advances that the retailers granted to farmers for purchasing the materials needed for each season's production. The latter was typically costlier than loans extended for the same purpose by financial institutions. Even real estate loans rarely exceeded three to five years, and renewals were often refused when money was tight. Such stringent credit measures contributed to frequent loan delinquencies and foreclosures. Farmers and their representatives contended that a credit service more suited to the needs of agriculture could avoid much of this financial turmoil.

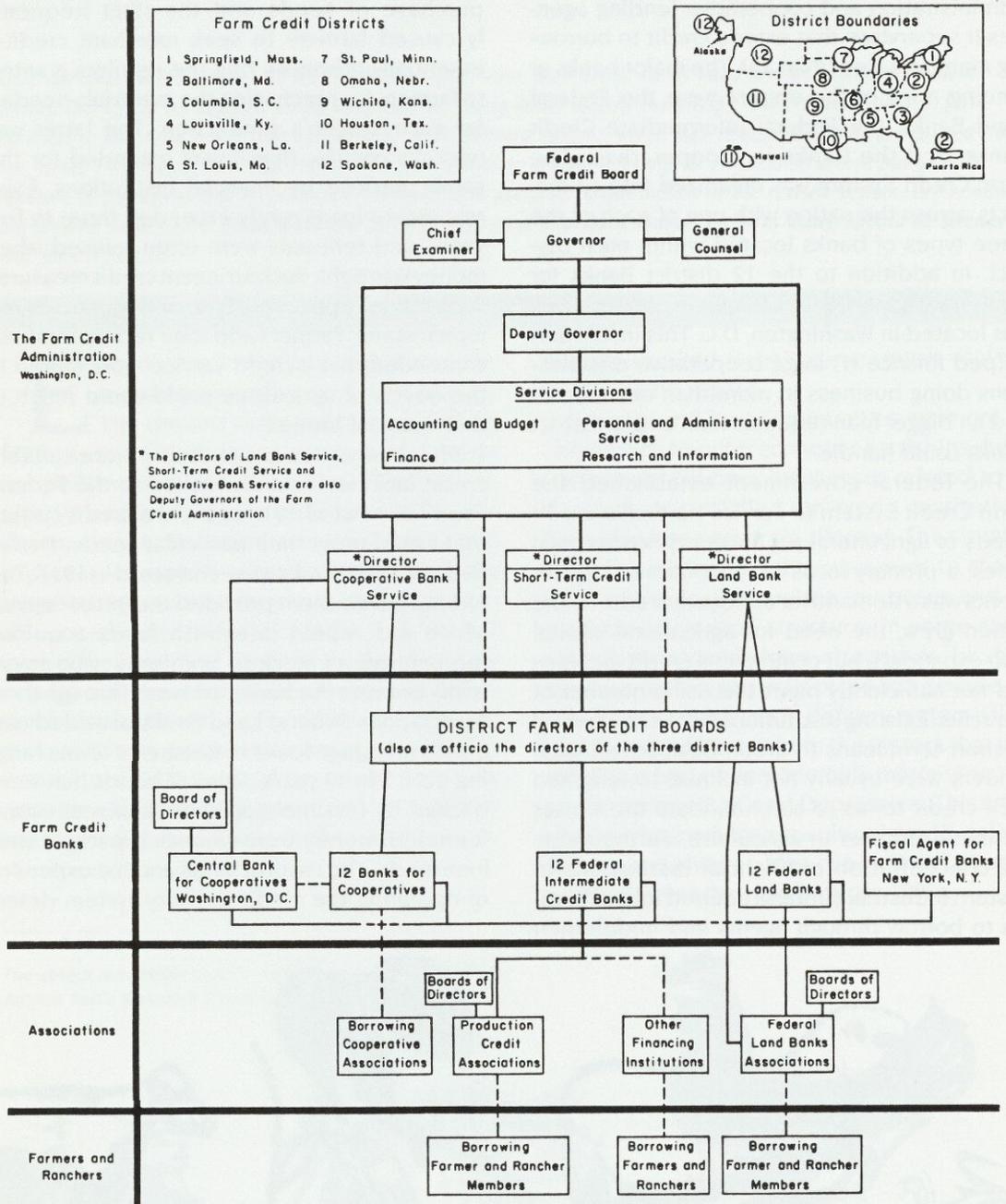
After many attempts to secure more suitable credit facilities, farmers looked to the Federal Farm Loan Act of 1916 to build a credit system that would meet their particular needs. Twelve Federal Land Banks were chartered in 1917. The federal government provided the initial capital, which was repaid later with funds acquired through sale of stock to borrowers, who eventually became the banks' owners. Through local associations Federal Land Banks provided real estate mortgage loans to farmers at terms ranging from 5 to 40 years. Sales of bonds that were backed by first mortgages on farm real estate funneled money from financial markets into loan funds. The costs of funds and the expenses of operating the credit delivery system deter-



mined the interest rates on these loans. Member farmers throughout the country could then borrow at rates comparable to those available to the nation's largest businesses.

In 1923 Congress addressed the short- and intermediate-term credit needs of farmers by establishing 12 Federal Intermediate Credit Banks. Initial funds came from the federal

**Chart 1a.**  
**Historical Structure of the Cooperative Farm Credit System**

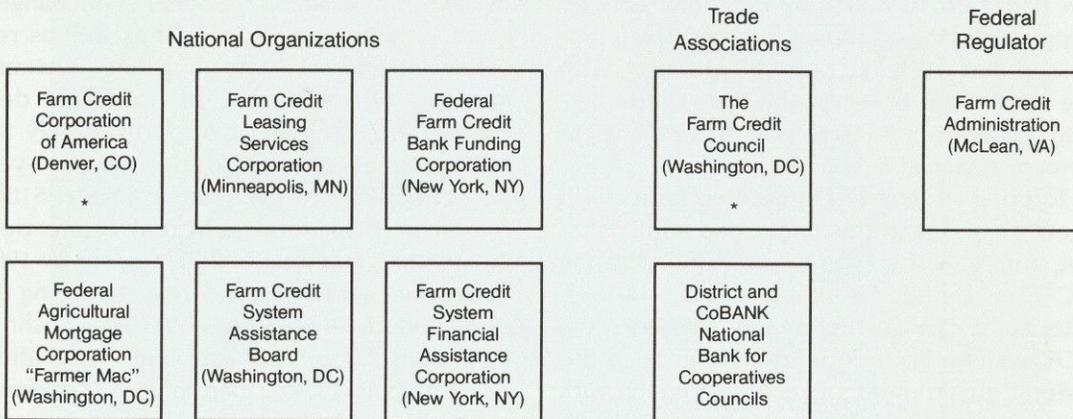


Source: Nelson and Murray (1967): 420-21 (Courtesy of the Farm Credit Administration).

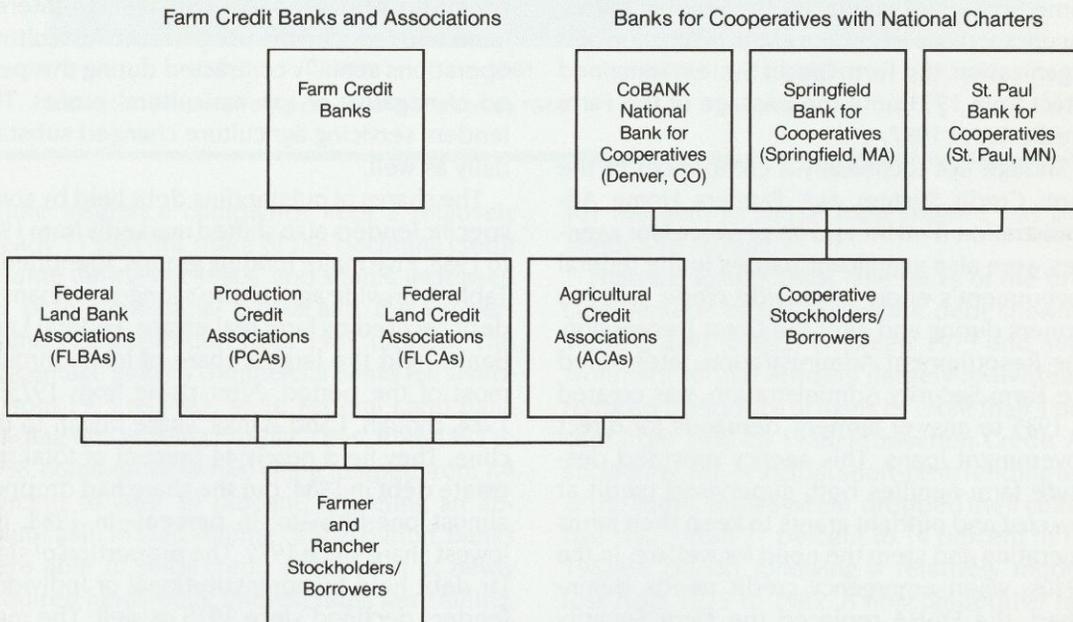
government, but, as with the Federal Land Banks, the Intermediate Credit Banks eventually became fully owned by borrowers. These banks made short- and intermediate-term loans

to Production Credit Associations and a number of other agricultural financing institutions by discounting the loans these agencies made to farmers. The Intermediate Credit Banks ac-

**Chart 1b.  
Major Components of the Cooperative Farm Credit System, 1989**



**System Banks**



*The reorganization of the Farm Credit System has created new entities and changed traditional relationships among its major components. The Farm Credit Administration examines and regulates but no longer exercises a direct supervisory role. Borrower Trade Associations are independent of the Farm Credit Administration. A number of institutions and their governing boards are currently undergoing additional changes that prevent a definitive portrayal of interrelationships such as that shown in Chart 1a.*

*\*In the process of forming an expanded trade association in early 1990.*

Source: The Farm Credit System, "1989 Information Guide"; and The Federal Agricultural Mortgage Corporation.

quired loan funds and set interest charges in the same way that the Federal Land Banks did.

The Farm Credit Act of 1933 established the third arm of the Farm Credit System, the 13 Banks for Cooperatives. These institutions made loans to farmers' cooperative businesses. Although they operated similarly to the Land and Intermediate Credit Banks, the Cooperative Banks also loaned to organizations that sold supplies to farmers as well as firms which processed and marketed farmers' products. With the three types of banks, the Farm Credit System was positioned to service the full range of farmers' financial needs.

To bring all federally sponsored farm credit agencies and activities under one administrative umbrella, the Farm Credit Administration (FCA) was created by executive order in 1933. After some changes during its early years, the FCA became an independent agency in the federal government's executive branch with supervisory responsibility for the Farm Credit Banks. Congress appropriated the amount of the FCA's operating budget, but the actual funds came from assessments on the lending banks. Except for relatively minor shifts in function and organization, the Farm Credit System remained intact from 1933 until the passage of the Farm Credit Act of 1987.

Though not technically a component of the Farm Credit System, the Farmers Home Administration (FmHA) and its predecessor agencies were also significant parties in the federal government's effort to provide credit relief to farmers during and after the Great Depression. The Resettlement Administration, later called the Farm Security Administration, was created in 1935 to answer farmers' demands for direct government loans. This agency provided destitute farm families both supervised credit at low cost and outright grants to keep their farms operating and stem the need for welfare. In the 1940s, when emergency credit needs diminished, the FmHA replaced the Farm Security Administration and focused on providing credit to beginning farmers with limited capital. The FmHA also extended emergency credit to established farmers who were in financial difficulty because of droughts, floods, hail storms, or adverse economic conditions. This agency, with offices in 43 states and most U.S. counties, is part of the U.S. Department of Agriculture.

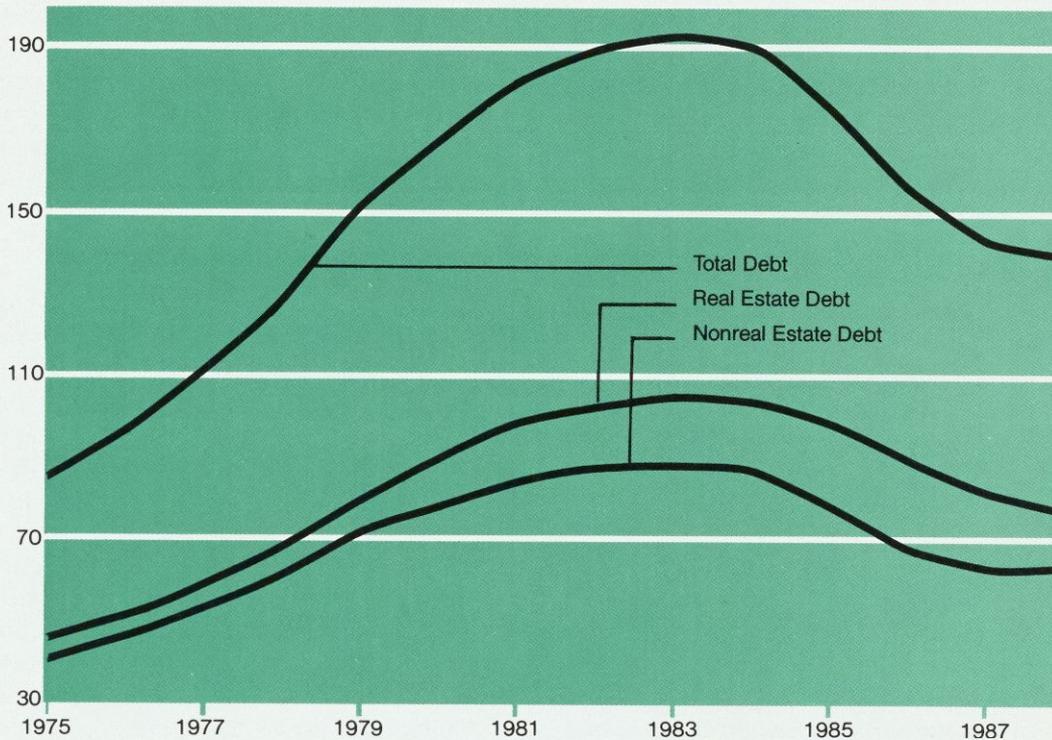
## Shifting Agricultural Loan Volume

After working reasonably well for decades, the tripartite Farm Credit System and all other agricultural lenders began to experience serious problems in the 1980s. Loan volume began to flatten at first and then declined sharply, and its distribution among lenders also changed. Chart 2 shows total farm debt as well as real estate and nonreal estate obligations outstanding from 1975 through 1988. Total farm debt outstanding dropped by approximately \$53 billion, or 28 percent, during the five-year period ending in 1988. From a peak of \$104.8 billion in 1983, total farm real estate debt outstanding had declined 27 percent by 1988. Nonreal estate debt fell 29 percent during the same period. Outstanding debt began to shrink in 1984 as agricultural problems intensified. Aside from fluctuating loan volume, many lenders sustained heavy losses because of uncollectible loans. Some losses were recognized and written off, leading to many foreclosures; borrowers who were able paid off high-interest loans and reduced the use of credit. Agricultural operations actually contracted during this period of negative or low agricultural profits. The lenders servicing agriculture changed substantially as well.

The shares of outstanding debt held by some specific lenders also shifted markedly from 1983 to 1988. Five major lending groups, identified in Table 1, provide agriculture's long-term loans or debt secured by farm real estate. Federal Land Banks held the largest share of loans through most of the period. After rising from 1975 to 1984, though, Land Banks' share began to decline. They held nearly 44 percent of total real estate debt in 1984, but the share had dropped almost one-fifth—to 36 percent—in 1988, the lowest share since 1979. The proportion of similar debt held by noninstitutional or individual lenders declined since 1975 as well. The most notable drop occurred from 1984 to 1988, when total debt outstanding was also declining sharply. A near cessation of new lending caused individual (noninstitutional) lenders to lose their 1975 position as the primary source of real estate loans with almost 35 percent of the total. In 1988 they held a weak second place with only 22 percent of total loans.

Billions  
of  
Dollars

**Chart 2.**  
**Volume of Farm Debt Outstanding**



Source: U.S. Department of Agriculture, AFO-32 (February 1989).

Life insurance companies kept a relatively steady 11 percent share of the declining credit volume during the 1980s, and shares increased for both commercial banks and the Farmers Home Administration from 1983 onward. The percentage held by commercial banks fell sharply from 1975 to 1982, while Federal Land Bank lending was growing rapidly. Then, from 1982 to 1988, commercial banks' share jumped from 7.4 percent to over 18 percent, reflecting an absolute gain in loan volume of \$6.6 billion. Banks were able to price credit at the cost of newly acquired funds while interest rates were falling, allowing them to attract business away from other lenders, especially from Federal Land Banks, whose policy of pricing based on the average of their interest costs on bonds made their loan rates noncompetitive. (Average cost pricing had given Federal Land Banks an advantage during periods of rising interest rates.) From 1982 to 1988 the FmHA upped its share by over 3 percentage points to nearly 12 percent,

yet the gain in actual loan volume was only about \$0.6 billion.

**Nonreal Estate Debt.** The ranks of the principal lenders of nonreal estate debt shown in Table 2 also shifted between 1975 and 1988. Noninstitutional lenders (largely individuals) reduced their share of loans by more than 3 percent from 1982 to 1988. Production Credit Associations, the principal short-term lending arm of the Farm Credit System, dropped their collective share from 21 percent to 14 percent in the 1983-88 period following a relatively modest loss from 1975 to 1982. A noncompetitive rate structure, along with the shrinkage in total agricultural production during the 1983-88 period, penalized Production Credit Association lending.

As with real estate debt, the nonreal estate debt share gainers were commercial banks and the FmHA. Commercial banking's share declined during the period of rising interest rates from 1975 to 1981 but edged upward through

**Table 1.**  
**Lender Shares of Farm Real Estate Debt**  
(percent)

Year	Federal Land Banks	Life Insurance Companies	Commercial Banks	Farmers Home Administration	Individuals and Others	Total Debt*
1975	32.1	13.7	12.4	6.7	34.8	45.3
1976	33.4	13.5	12.0	6.6	34.2	50.5
1977	33.6	13.9	12.0	6.2	33.5	58.4
1978	34.0	14.5	11.6	5.6	32.5	66.7
1979	34.3	14.1	9.8	7.8	32.2	79.7
1980	37.0	13.4	8.7	8.3	31.0	89.6
1981	40.8	12.3	7.7	8.2	29.7	98.7
1982	42.9	11.6	7.4	8.2	28.8	102.5
1983	43.0	11.3	8.1	8.3	28.5	104.8
1984	43.7	11.2	9.0	8.9	26.7	103.7
1985	42.2	11.3	10.7	9.8	25.8	97.7
1986	39.3	11.5	13.2	10.7	25.1	88.5
1987	37.0	11.4	16.5	11.4	23.6	80.8
1988	36.0	11.6	18.5	11.8	22.1	76.7

\*Total debt is in billions of dollars.

Source: U.S. Department of Agriculture, AFO-32 (February 1989).

the remainder of the 1980s. In comparison, the Farmers Home Administration share exploded from a minuscule 3.9 percent in 1975 to 22 percent in 1988 with the greatest gains coming before 1982. In fact, even though total nonreal estate debt outstanding fell sharply as severe economic problems beset agriculture, the volume of FmHA debt grew by nearly \$1.0 billion during this period. The agency not only made increasing loans to previous borrowers as unpaid debts were rolled forward from year to year but also acquired some new customers that other lenders turned away. The FmHA has followed a long-standing policy of extending credit to farmers who could not obtain financing at reasonable rates from other sources.

**Commercial Banks.** As the single most important source of short-term or operating credit for farmers, commercial banks experienced a major share of the repercussions from the economic hardship on farms. Delinquent farm loans at commercial banks grew from \$0.9 billion in 1982 to \$2.6 billion in 1985 (see Table 3), reach-

ing a peak in that year of 7.3 percent of total farm production loans outstanding. Net charge-offs of farm loans at commercial banks reached their highest levels of \$1.3 billion and \$1.2 billion in 1985 and 1986, respectively, which represented 3.7 and 3.8 percent of such loans outstanding in those years (see Table 4). By 1987 charge-offs had dropped to \$535 million, or 1.8 percent, of such loans outstanding, and preliminary data for 1988 indicate a decline to a relatively insignificant level. Reflecting these lending losses, agricultural bank failures increased from a single incident in 1981 to 67 in 1985, 65 in 1986, and 69 in 1987.

From 1981 through 1988, 289 agricultural banks failed.<sup>1</sup> While this figure accounts for less than 6 percent of the nearly 5,000 banks classified as agricultural during this period, the loss of banks combined with the move toward more conservative lending policies reduced the volume of credit (nonreal estate loans) flowing to agriculture through commercial banks. Because of heavy losses on farm loans, bankers had a

**Table 2.**  
**Lender Shares of Nonreal Estate Debt**  
(percent)

Year	Production Credit Associations	Federal Intermediate Credit Banks	Commercial Banks	Farmers Home Administration	Individuals and Others	Total Debt*
1975	26.1	0.9	48.0	3.9	21.1	39.7
1976	25.8	0.8	48.3	3.6	21.5	45.6
1977	24.8	0.7	46.4	5.3	22.9	52.4
1978	23.7	0.8	44.0	8.4	23.1	60.7
1979	24.2	0.9	40.8	11.4	22.7	71.8
1980	24.6	1.1	38.9	13.0	22.5	77.1
1981	24.4	1.1	37.3	15.2	22.0	83.6
1982	22.6	1.0	39.5	14.9	22.0	87.0
1983	21.1	1.0	42.2	14.6	21.1	87.9
1984	19.8	1.0	43.2	15.8	20.3	87.1
1985	17.4	0.7	43.5	19.0	19.4	77.5
1986	15.4	0.4	44.4	21.6	18.2	66.8
1987	14.7	0.3	44.6	22.8	17.6	61.9
1988	14.0	0.1	45.3	21.9	18.7	62.7

\*Total debt is in billions of dollars.

Source: U.S. Department of Agriculture, AFO-32 (February 1989).

motive to divert funds to more profitable and less risky uses than agriculture. However, the rising share of total agricultural loans made by commercial banks indicates that they did not reduce farm loans as sharply as did other major lenders.

**Insurance Companies.** Insurance companies have traditionally provided long-term or real estate credit to agriculture. Even though farm loans are typically secured by first mortgages on farm real estate, insurance companies' losses mounted because of deteriorating conditions in the farm economy and the subsequent drop in farm land prices. Loan delinquencies soared from \$300 million in 1980 to \$1.8 billion at their peak in 1986 (see Table 3). Of the total farm loan volume 17 percent was delinquent, more than double the delinquency rate for commercial banks and the highest rate for any lender except the FmHA. Actual farm loan losses are not available for insurance companies, but the volume of foreclosures soared to \$827 million in 1986 (see Table 4).

As a group, insurance companies responded to relatively heavy agricultural loan losses by reducing the volume of new loans. Some companies closed agricultural field offices or severed relationships with agents who had originated farm real estate loans. These insurance companies' actions further restricted the availability of long-term or real estate credit to agriculture.

**Farm Credit System Institutions.** Loan losses at lending institutions in the Farm Credit System began to escalate. Total loan losses for the system peaked at \$1.35 billion annually—2 percent of total assets in 1986—and diminished rapidly thereafter (see Table 4). However, losses from 1982 through 1988 totaled about \$3.9 billion; nearly two-thirds of this amount arose from the lending activities of the Federal Land Banks. Banks for Cooperatives accounted for only 1 percent of the losses, leaving Federal Intermediate Credit Banks and Production Credit Associations responsible for the remaining third of the total.

**Table 3.**  
**Delinquent Farm Loans of Reporting Lenders**

	Commercial Banks		Farm Credit System		Life Insurance Companies		Farmers Home Administration	
	Billions of Dollars	Percent	Billions of Dollars	Percent	Billions of Dollars	Percent	Billions of Dollars	Percent*
1980	NA	NA	0.3	0.5	0.3	2.0	3.6	18.2
1981	NA	NA	0.4	0.5	0.5	3.7	5.8	24.1
1982	0.9	2.5	0.7	1.1	0.8	6.4	9.5	37.9
1983	1.5	3.8	1.3	1.8	1.0	8.3	11.0	43.9
1984	2.1	5.2	2.1	3.3	1.2	9.6	12.1	45.9
1985	2.6	7.3	5.3	8.7	1.7	15.1	11.9	41.5
1986	2.2	7.0	7.1	14.4	1.8	17.0	12.0	42.9
1987	1.5	5.2	5.2	9.9	1.3	14.3	11.8	45.8
1988 <sup>†</sup>	1.3	4.5	4.5	8.6	1.2	13.3	13.4	52.6

\*Percentage of total farm loans outstanding.

<sup>†</sup>As of June 30. In other years, data are as of September 30 for FmHA and December 31 for all other lenders.

Source: U.S. Department of Agriculture, AFO-32 (February 1989).

## Agricultural Credit System Reform

The problems with loan delinquencies, foreclosures, and losses have motivated vast changes in structure or operations of most lenders. Insurance companies, Farm Credit System institutions, and the Farmers Home Administration have all been affected.

**Insurance Companies.** Since recovery in the agricultural economy began in 1987 and 1988, some insurance companies have become aggressive in seeking new loans. However, other firms that were stung by earlier problems remain out of the market. In general, credit policies of active lenders have further shifted toward targeting large-scale operations as the customer base as opposed to small or mid-sized farms. As with most lenders, the borrower's ability to repay the loan is currently given much greater weight than collateral values in the loan assessment and approval process. Such a focus is in opposition to practices followed by most lenders during the late 1970s, when the estimated value of the asset securing the loan was often more prominent among the factors considered in the approval decision.

**Farm Credit System Institutions.** The Farm Credit System banks were particularly hard hit by soaring loan delinquencies and outright losses as a consequence of the economic pressures on the farm economy during the 1980s. The pressures of these growing losses spurred efforts to reduce costs and improve operational efficiencies among all lenders. In particular, scrutiny of the Farm Credit System brought to light excessive overhead costs caused by duplicating personnel roles and inefficient lending procedures at the numerous separate farm credit establishments. Mergers and consolidations of lending institutions and the elimination of overlapping jobs were obvious steps for improving efficiency.

Heavy losses and a generally poor agricultural outlook provided the impetus for the Farm Credit Act of 1987 (signed into law on January 6, 1988). This legislation authorized federal assistance to Farm Credit System lenders and also mandated certain changes in the system's structure and operation. The Farm Credit Act authorized federal assistance through the newly established FCS Assistance Board and FCS Assistance Corporation, which, respectively, are responsible for approving and providing finan-

**Table 4.**  
**Farm Loan Losses of Reporting Lenders**  
*(millions of dollars)*

Year	Commercial Banks	Farm Credit System	Farmers Home Administration	Life Insurance Companies*
1982	NA	13	32	170
1983	NA	8	77	247
1984	900	428	128	289
1985	1,300	1,105	257	530
1986	1,200	1,352	434	827
1987	535	488	1,199	692
1988 <sup>†</sup>	71	413	NA	185

\*Data for life insurance companies show foreclosures; loan charge-offs are not available.

<sup>†</sup>Data reflect first half of year for commercial banks and life insurance companies.

Sources: U.S. Department of Agriculture, AFO-32 (February 1989); and Farm Credit Administration (1989).

cial help. By issuing 15-year bonds, the Assistance Corporation could raise funds that would be used to purchase preferred stock of troubled institutions.

On two separate dates in 1988 a total of \$690 million in 15-year bonds was sold. The coupon rates ranged from 9.375 to 9.45 percent; the rate spread over similar Treasury issues ranged from 32 to 36.5 basis points. The Farm Credit Act stipulated that the U.S. Treasury would pay all interest on the bonds for the first five years and up to one-half of the interest for the next five years. The Farm Credit System must pay all of the interest for the third five-year period. Beneficiary institutions are largely responsible for the eventual repayment of principal and the interest that the Treasury paid on the assistance bonds.

When an institution requests aid, the FCS Assistance Board is empowered to supervise the affairs of that institution and to request that the Farm Credit Administration approve or require a merger or consolidation, appoint a receiver, or exercise enforcement powers authorized under the act. When the Assistance Board certifies an institution as eligible for aid, that lender issues preferred stock (in an amount authorized by the Assistance Board) to be purchased with proceeds from the Assistance Corporation's sale of 15-year bonds.

The Jackson, Mississippi, Federal Land Bank—the first institution to request assistance—was determined to be insolvent and was subsequently placed in receivership. This bank and its 90 service centers in Alabama, Louisiana, and Mississippi are now being liquidated under the authority of the act. Other institutions authorized assistance in 1988 and the amounts of aid granted were: \$90 million to the Louisville Banks, \$110 million to the Omaha Banks, \$113 million to the St. Paul Banks, and approximately \$21 million to the receivers of six Production Credit Associations in liquidation in the Spokane and Omaha Farm Credit Districts.

The 1987 act required the Federal Land and Intermediate Credit Banks within the 12 Farm Credit Districts to merge within six months of its enactment. As of July 1989 these mergers had been completed, except in Jackson, Mississippi, where the Intermediate Credit Bank lacks a local merger partner. In the wake of the mergers, a single institution called the Farm Credit Bank now handles both the long- and short-term credit needs of farmers, thus consolidating lending activity. In districts where the two banks were operated separately, the mergers resulted in substantial savings in personnel costs. However, in some districts—such as the third, headquartered in Columbia, South Carolina—the two banks were already functioning under a single

management team, and the efficiencies gained from the merger were not as large as for the system as a whole.

Following the bank mergers, the Federal Land Bank Associations and Production Credit Associations (the local lending offices of the two banks) were required to consolidate in cases where the two offices served largely overlapping territories. In addition, stockholders in two or more adjacent Production Credit Associations or Federal Land Bank Associations could vote to merge into a single association. Such voluntary mergers during 1988 reduced the number of Federal Land Bank Associations from 233 to 154 and the number of Production Credit Associations from 155 to 94. Also, 38 separate Federal Land Bank Associations and Production Credit Associations merged with organizations serving substantially the same territories and formed 33 Agricultural Credit Associations. When complete throughout the system, such mergers could eliminate around half of the local offices of the Farm Credit System. Overall savings associated with the mergers are estimated at between 10 and 20 percent of overhead costs. Reflecting these savings as well as a shrinking volume of operations, total noninterest expenses for the system declined from \$1,167 million in 1985 to \$710.6 million in 1988, a drop of nearly 40 percent.

With reduced numbers of farm customers and local lending offices, fewer district banks are probably needed now to deliver credit to the system's borrowers. What's more, additional mergers between banks may cut overhead costs. The act permits the reorganization of the district structure to include no less than six districts. A comprehensive reorganization plan developed by a special system committee calls for district mergers to include several two- and three-district combinations.

The 1987 act has also generated new regulations aimed at raising and stabilizing the capital of system institutions. Although the average capital-to-assets ratio for Farm Credit System institutions has been between 8.1 and 10.5 since 1985, most of the capital consists of borrower stock that may be retired when a loan is repaid. During a heavy loan pay-down period, capital stock may shrink abruptly, thus exposing credit institutions to capital instability. In 1988, considering only its permanent or unprotected

components, the capital of FCS institutions was 3.3 percent of total assets. New regulations require system institutions to develop plans for achieving by 1993 a minimum permanent level of capital at 7 percent of risk-adjusted assets and off-balance sheet commitments. An institution that fails to achieve this capitalization target would be prohibited from retiring member stock or issuing dividends to shareholders. One FCS estimate holds that raising the capitalization level as specified would increase the system's average loan interest rate between 1 and 3 percentage points, depending on whether the capital is obtained through sales of stock or by elevating the level of retained earnings. Competitors feel that the low capitalization of Farm Credit System institutions has traditionally provided an unfair advantage, which this increased capital requirement is likely to remove.

The 1987 act also required stockholders of the Banks for Cooperatives to vote on a plan to merge the 12 district banks and the Central Bank for Cooperatives into one lending institution. Previously, the Central Bank participated in loans that exceeded the local lending limits of the separate district banks. Some cooperative borrowers are now so large that their operations overlap several Farm Credit Districts, making one centralized source of credit a more logical means of credit delivery. As a result of the vote of stockholders, 11 banks have been merged into one institution named CoBank. The former separate banks now operate as branches of the consolidated institution, which is headquartered in Denver, Colorado. Banks in two districts—St. Paul, Minnesota, and Springfield, Massachusetts—opted to remain independent; along with CoBank, they are now authorized to make loans anywhere in the country. Chart 1b shows the major components of the Farm Credit System as they existed in 1989 and depicts the vast changes from the historical structure indicated in Chart 1a.

**The Farmers Home Administration (FmHA).** The FmHA has been the principal lender of last resort for farmers needing both long- and short-term financing. Unlike the Farm Credit System institutions, the FmHA is funded by government appropriations that are utilized to make direct loans to farmers or to guarantee loans of other lenders. As already noted, the FmHA's loan

volume and delinquency rates continued to grow during the period of retrenchment by most other lenders. FmHA's delinquent loan volume expanded from \$3.6 billion to \$13.4 billion from 1980 to 1988, and the delinquency rate jumped from 18 to 53 percent. Between 1986 and 1987, loan losses nearly tripled, reaching \$1.2 billion. However, new lending activity has trended downward since 1986 partly because of greater emphasis on the loan guarantee program.

In an effort to deal with this portfolio deterioration, substantial revisions with anticipated far-reaching effects have been made to FmHA's lending regulations. Now, FmHA loan servicing programs are organized into a five-phase structure. Every borrower is placed in one of these five phases regardless of whether he or she has a delinquent loan. The objective of each phase is to keep agricultural producers in business at the lowest cost to the government.

Borrowers placed in Phase I status are current on their interest and principal payments. FmHA's stated objective is to graduate these borrowers to private-sector creditors. Borrowers with short-term delinquencies are placed in Phase II. For these borrowers, FmHA may lower interest rates on loans generally to three percentage points below the regular rate. If needed, the Farmers Home Administration will defer interest and principal payments for up to five years. If these service programs fail to keep borrowers from falling 180 days behind in their payments, borrowers move to Phase III. In this phase, after notifying a borrower of the delinquency and his or her rights and privileges as a borrower, the FmHA will restructure the debt through principal and interest writedowns provided certain value stipulations are met and other creditors agree to debt restructuring.

The borrower enters Phase IV if a writedown fails to yield a feasible debt repayment plan; at this point, the FmHA sends a notice of intent to begin foreclosure. Here, the borrower may pay off the loan with cash at the government's net recovery value of collateral, or the individual may voluntarily convey the collateral to the FmHA in exchange for a discharge of debt. If the borrower does not voluntarily convey the property to the FmHA, foreclosure proceeds; the Farmers Home Administration takes the property and the borrower is moved to Phase V. Phase IV and V borrowers both have the oppor-

tunity to lease their property back with an option to buy it at a later date. If the borrower resides on the property, homestead protection rules allow the buildings and surrounding 10 acres to be leased or bought from the FmHA.

The new loan-servicing policy compels the FmHA to try to keep every farmer on the farm, continuing the objective of its predecessor agencies—the Resettlement Administration and the Farm Security Administration. Since delinquent borrowers can generally avoid severe penalties, critics maintain the program lacks strong incentives for farmers to make timely loan payments or good business management decisions. Also, detractors from the new policies question whether a borrower would be motivated to move from the liberal provisions of a Farmers Home loan to the higher-cost, market-oriented credit that private lenders typically provide.

The ultimate impact of the new five-phase loan-servicing policy is difficult to determine because each loan is handled on a case-by-case basis. FmHA has estimated that 85,000 out of 242,000 borrowers had delinquent loans in early 1988; another 33,000 were in some state of default. An estimated 31 percent of these 118,000 borrowers could absolve their delinquency with loan-servicing programs available under Phases I and II. Only 16,000, or 14 percent of total borrowers, would be eligible for debt writedowns under Phase III. The remaining 65,000 could be assisted solely through the preservation programs found in Phases IV and V. The FmHA's estimated losses would eventually total \$2.7 billion on loans receiving writedowns and \$6.7 billion for borrowers who benefit from other servicing options. Most of these losses would probably be incurred regardless of the loan-servicing policies put in place.

## A New Secondary Market for Farm Loans

Another change and projected amendment to the traditional farm credit delivery system addresses the liquidity needs of lenders who provide long-term credit. The Federal Agricultural Mortgage Corporation (Farmer Mac), a new agency under the supervision and regulation of

the Farm Credit Administration, offers such lenders significant additional access to financial markets. Farmer Mac's goal is to provide financing to buyers of farms and rural homes. This corporation functions by guaranteeing securities issued against agricultural and rural real estate loans that participating lenders originate and pool. The attractiveness of Farmer Mac to lenders is that it allows them to free up capital and reduce risks by selling up to 90 percent of the value of acceptable loans to loan poolers, who, in turn, sell securities backed by the loans to investors. Farmer Mac guarantees the securities, but the loan poolers hold the mortgages. Farmer Mac does not specify capital requirements for participating lenders beyond the need for participants to purchase stock in Farmer Mac in order to utilize the market; also in cooperation with poolers, lenders must establish a 10 percent reserve fund against marketed loans to protect against defaults.

Farmer Mac is funded by sales of stock to Farm Credit System institutions, banks, life insurance companies, and any other lenders wishing to use the secondary market. Minimum stock purchases are based on asset holdings of loan originators, from 250 shares for the smallest originators to 5,000 shares for institutions with more than \$500 million in total assets. When the stock was offered for sale in December 1988, 1,500 lenders and 30 prospective loan poolers made purchases. Additional funding comes from an initial fee charged to loan poolers amounting to not more than 0.5 percent of the outstanding principal amount of loans guaranteed. In the third year after a guarantee has been issued, Farmer Mac may assess an annual fee of 0.5 percent of the outstanding principal.

The permanent Board of the Federal Agricultural Mortgage Corporation—composed of five representatives of private lending institutions, five members of the Farm Credit System, and five presidential appointees—met for the first time in March 1989. The board was charged with developing the agency's underwriting standards, which were presented to Congress in July 1989 and subsequently approved with only minor revisions. Farmer Mac will issue its first securities on pooled loans and begin trading in these securities early in 1990.

**Potential Gains from Creation of a Secondary Market.** The usefulness and ultimate suc-

cess of Farmer Mac depends largely on the underwriting standards that govern the acceptability of loans for the program. If the standards prove to be lenient, major efforts will probably be directed toward marketing the large number of loans the program is likely to attract. On the other hand, excessive stringency aimed at eliminating any chances for loan defaults could limit the number of acceptable loans and restrict the usefulness of the program. Those involved, of course, hope that the standards have achieved some middle ground that will allow Farmer Mac to function at an optimal level of activity.

An agency that is successful in establishing a secondary market for farm credit would have some significant advantages. First, such an organization should help stabilize primary loan

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***"Farmer Mac could raise the total amount of money available to rural areas and, with enhanced competition among lenders, thus be instrumental in reducing interest rates to borrowers."***

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markets by enabling lenders to sell farm real estate loans and gain additional liquidity when needed. This result would meet the needs of small lenders, such as community commercial banks, which have restricted farm real estate lending in the past because of the risk that liquidity might be needed prior to the maturation of a typically long-lived farm mortgage loan. Second, a thriving secondary market should help better allocate the regional flow of funds, making more money available in areas where local deposits are not sufficient to meet total lending needs. Unit bankers across the breadth of small-town rural America would be special beneficiaries of improved access to long-term funds. Finally, Farmer Mac could raise the total amount of money available to rural areas and, with enhanced competition among lenders, thus be instrumental in reducing interest rates to borrowers.

Several safeguards protect this secondary mortgage market from financial stress. Farmer Mac securities are subject to the Securities Exchange Act of 1934, which requires security issuers to disclose information pertinent to establishing the value of their securities. Also, as a precautionary measure, Farmer Mac must begin operations slowly. For example, it can only guarantee up to 2 percent of total outstanding farm real estate debt during its first year of operation. The ceiling rises an additional 4 and 8 percent in the next two years. Although the thinness of the market initially could prove to be a disadvantage, investors are accustomed to dealing with similar Farm Credit Bank issues and will probably accept the new Farmer Mac securities on the same basis. The slow start-up

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***"In the event of loan defaults, investors will be protected by the 10 percent reserve fund established by lenders in cooperation with the pools . . . [and] a backup reserve from funds garnered by charging participants a guarantee fee."***

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gives lenders a period to learn about the market before committing massive amounts of funds.

In the event of loan defaults, investors will be protected by the 10 percent reserve fund established by lenders in cooperation with the pools. If that reserve proves insufficient, Farmer Mac provides a backup reserve from funds garnered by charging participants a guarantee fee. Once these reserves are exhausted, the \$20 million in Farmer Mac stock can be used to cover losses. Finally, Farmer Mac can borrow up to \$1.5 billion from the federal government by issuing securities to the U.S. Treasury. Investors may, therefore, feel rather confident about protection against default.

**Risks in the Program.** As mentioned earlier, loan underwriting standards will play a major role in determining overall risk in the Farmer Mac program. The chances that farmers might default on the original loans will be influenced

largely by actual characteristics of borrowers and loans that are accepted by Farmer Mac. Obviously, chances of default will be reduced if loans are restricted to borrowers with proven track records as successful operators; to properties with realistically appraised values and loans held at safe maximums below those values; to enterprises that exhibit minimum volatility in prices, market volume, and annual income; and to geographic areas that are not subject to disasters such as drought, storms, freezes, and plagues of pests and diseases, or to borrowers who are adequately insured against those calamities. The standards require diversification of individual loan pools so that they cannot be dominated by a few large loans, a single geographic area, a single commodity type, or a particular kind of collateral.

With these kinds of safeguards in place, purchasers of securities backed by these loans should have minimal concern over prospects of massive borrower defaults. As explained earlier, if defaults do occur, investors in Farmer Mac securities would be protected by several layers of capital set aside to back up the loans. It is also likely that if losses should ever exceed the reserve capital, the federal government would absorb the shortfall.

The exact level at which the risk of losses will be borne has been a matter of some discussion. Loan originators contend that when 90 percent of the value of the loans is sold to a pooler, the risk of loss should also be transferred with the sale. The 10 percent share maintained by originators on all loans in the pool would be utilized to cover particular loan defaults. In preliminary discussions, the Office of the Comptroller of the Currency maintained that commercial banks would remain liable for loans transferred (sold) to pools and would be required to maintain specific capital requirements on the full value of such loans. Late in 1989 the Comptroller conceded that, for the first year of the program's operation, banks could maintain capital requirements on the 10 percent share in pooled loans, but the permanent rules for bank participation were still under consideration.

One option under negotiation would be for banks to sell the full value of the loan to the pool and then purchase securities from the pool equivalent to 10 percent of the value of loans transferred. This alternative could preserve the

originators' 10 percent equity requirement while relieving them of the higher capital requirements accompanying partial ownership of specific loans. This procedure might also increase loan riskiness to the degree that originators could have less incentive to monitor these loans. However, Farmer Mac would not guarantee the securities held in this way by loan originators. Only securities sold to outside investors would be guaranteed.

**Lender Benefits from Farmer Mac.** The usefulness of Farmer Mac to different agricultural and rural housing lenders is likely to vary substantially. As already mentioned, commercial banks in predominantly agricultural areas are likely to find the system most useful because of their needs for liquidity. On the other hand, Farm Credit System institutions already have access to national money markets through their established markets for bonds. Although these lenders can qualify as loan poolers, they are likely to continue to use their own bond markets for the majority of needed funds. Farmer Mac bonds could prove to require higher yields than Farm Credit System bonds, which would, in turn, raise the cost of credit to system borrowers. However, the increased capital requirements for Farm Credit System institutions could encourage some secondary market sales of loans in order to alleviate needs for cash.

Life insurance companies are generally self-sufficient in generating funds for agricultural lending, and such companies typically do not experience sudden pressing needs for liquidity. However, these firms might use the pools to invest in farm mortgages without taking on the risk associated with direct farm lending. The capital fund established against pooled loans provides protection against losses that is unavailable to a direct lender.

Farmer Mac is expected to have little direct effect on Farmers Home Administration lending. A separate secondary market to be administered by the Secretary of Agriculture is being

created for FmHA loans. The strictness of underwriting standards for Farmer Mac loans could mean that an increasing number of borrowers would have difficulty obtaining credit from conventional lenders. These high-risk borrowers would either have to use FmHA credit or pay more for loans from other lenders. Thus, loan requests to the FmHA might increase as Farmer Mac begins to attain a greater business volume.

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## Summary

The agricultural credit delivery system is undergoing far-reaching changes in both structure and methods of operation in the wake of heavy loan losses during the recent period of economic adversity in agriculture. Mergers and consolidations have reduced the number of credit outlets in Farm Credit System institutions. The remaining lenders should be stronger as a result of this activity, and credit costs are likely to be lower. Borrowers may find that credit outlets are not as conveniently located or as readily accessible as they have been in the past, though.

A significant new development is the establishment of the secondary market for farm loans through the organization of the Federal Agricultural Mortgage Corporation. Lenders of all sizes and in all locations can access national money-market funds by participation in the Farmer Mac program. The program also potentially enables participating lenders to dispose of farm mortgage loans when pressing needs for liquidity arise. The Farmer Mac program should enhance competition among lenders, and borrowers may eventually benefit by paying lower interest rates on loans. In short, the future agricultural credit delivery system should function more efficiently and serve all participants more equitably as a result of the changes now in progress.

## Agricultural Credit Developments in the Southeast

The southeastern region experienced agricultural problems in the 1980s that were somewhat more moderate but otherwise much the same as those afflicting the nation as a whole. In some areas the Southeast's declines were less severe because the region's agriculture is generally more diversified.<sup>1</sup> Producers of corn, wheat, and soybeans suffered from low prices and falling incomes just as did those in the Midwest, but those enterprises are not as prevalent in the Southeast as they are in the midwestern region. Even though incomes dropped sharply for grain and soybean producers, farmers growing citrus products, sugarcane, peanuts, vegetables, and tobacco, as well as poultry producers, were enjoying relatively good income because of the benefits of special government programs or because demand for these products was strong and growing. Thus, some southeastern borrowers and lenders escaped the extreme losses that plagued agricultural credit market participants in other regions of the country. Nevertheless, agricultural incomes in the region did fall, loan losses occurred as farming operations failed and property was foreclosed, and total farm loan volume shrank in all states.

Debt levels among lenders shifted in the region just as they did at the national level. Some lenders expanded outstanding loan volume while others contracted sharply (see Tables 1 and 2). A number of individual lenders did not survive. The Federal Land Bank of Jackson is currently being liquidated because of the heavy losses it sustained on farm real estate loans during the agricultural downturn. Some commercial banks with relatively high concentrations of farm loans also failed, and some insurance companies and individual lenders withdrew from the market. The rest of this box reviews the experiences of specific agricultural lenders in the Southeast during roughly the past decade.

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### Commercial Banks

Total agricultural loans of commercial banks tended to flatten between 1975 and 1985. The growth in new loans of competitors—the Federal Land Banks, Production Credit Associations, and the Farmers Home Administration (FmHA), for example—may have accounted for the absence of growth of farm loans at commercial banks during the period. However, as other lenders began to experience difficulties in the mid-1980s, commer-

cial bank loans to agriculture began to increase again. Farm real estate loans at banks in southeastern states grew from \$1.3 billion in 1983 to \$1.9 billion in 1988, a 46 percent increase. All states except Louisiana contributed to the growth; Florida and Georgia accounted for most of the increase in real estate loans (see Table 1).

Nonreal estate loans of southeastern banks grew briskly from 1975 to 1984 but they began to decline thereafter. However, the gain in real estate lending more than offset the slippage, and as stated above, total bank loans to agriculture rose. Nonreal estate loans of banks declined after 1984 or 1985 in all southeastern states except Florida (see Table 2). Banks apparently attracted loan volume away from other lenders in Florida, particularly from the Production Credit Associations, since the state's total nonreal estate credit declined rather sharply during this period. Specialty crops such as citrus, vegetables, sugarcane, and ornamentals also offered banks profitable opportunities for loans that were not as available in other states. Mississippi and Tennessee banks, which operate in areas mostly without these specialty crops, registered the greatest declines in bank production loans to farmers following 1984's peak in loans outstanding.

Although total bank loans to agriculture increased since 1984 largely because of heightened real estate lending activity, the number of banks involved in significant agricultural lending dropped sharply from 1984 to 1988 (see Chart 1). During 1984 there were 157 banks in Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee that reported agricultural loans equivalent to 25 percent or more of total loan volume. Georgia was home to more than 40 percent of these banks. By the third quarter of 1988, only 109 banks in southeastern states made 25 percent or more of their loans to agriculture, a drop of over 30 percent within four years. The number of Georgia's agricultural banks was cut almost in half while Alabama and Tennessee had about two-fifths as many of these institutions. Mississippi and Louisiana bucked the trend by increasing the number of agricultural banks, but this activity largely reflected a sharp demise in other kinds of business—especially oil and gas related lending—rather than a renewed emphasis on agriculture.

Throughout the region, a few agricultural banks failed and some others were merged with larger banking organizations, but the falling number of

**Table 1.**  
**Real Estate Farm Debt Outstanding in Southeastern States\***  
*(millions of dollars)*

Year	Federal Land Banks	Farmers Home Administration	Life Insurance Companies	Commercial Banks	Individuals and Others	Total <sup>†</sup>
Alabama						
1983	679	119	96	140	192	1,232
1984	691	124	87	138	178	1,223
1985	617	130	84	133	162	1,130
1986	459	124	75	149	143	952
1987	381	115	59	162	123	842
1988	342	107	50	170	108	777
Florida						
1983	1,335	118	484	167	598	2,704
1984	1,321	120	587	220	554	2,802
1985	1,235	125	563	298	504	2,725
1986	1,063	122	567	383	445	2,580
1987	910	127	549	462	382	2,431
1988	862	122	637	546	334	2,501
Georgia						
1983	1,267	196	195	274	288	2,231
1984	1,205	210	194	255	267	2,139
1985	1,083	220	191	270	243	2,010
1986	847	212	164	309	215	1,749
1987	726	212	143	367	184	1,634
1988	721	201	138	452	161	1,674
Louisiana						
1983	931	145	215	218	171	1,685
1984	860	157	196	207	159	1,583
1985	696	162	193	195	145	1,393
1986	488	166	180	179	128	1,142
1987	405	172	173	171	110	1,031
1988	364	173	137	141	96	912
Mississippi						
1983	903	310	290	226	277	2,013
1984	903	325	268	248	257	2,006
1985	794	328	232	244	234	1,835
1986	645	317	211	256	207	1,637
1987	535	308	197	291	177	1,510
1988	480	291	192	264	155	1,382
Tennessee						
1983	560	243	59	289	264	1,425
1984	536	257	61	289	244	1,394
1985	438	267	49	288	223	1,268
1986	343	260	44	310	197	1,156
1987	280	253	42	335	169	1,080
1988	275	239	48	330	148	1,040

\*Loan data are as of December 31 of each year. Debt of households is excluded.

<sup>†</sup>Total includes Commodity Credit Corporation storage facility loans not shown separately.

Sources: U.S. Department of Agriculture, ECIFS 7-2 (November 1988); AFO-34 (August 1989).

**Table 2.**  
**Nonreal Estate Farm Debt Outstanding in Southeastern States\***  
*(millions of dollars)*

Year	Commercial Banks	Production Credit Associations	Farmers Home Administration	Individuals and Others	Total†
Alabama					
1983	229	203	276	303	1,011
1984	217	193	274	293	977
1985	207	153	264	253	877
1986	183	152	236	206	777
1987	170	140	209	182	701
1988	182	126	171	204	683
Florida					
1983	215	469	256	422	1,362
1984	235	427	251	398	1,312
1985	234	343	233	328	1,139
1986	331	255	222	262	1,070
1987	298	221	227	239	985
1988	309	204	217	248	978
Georgia					
1983	286	473	885	443	2,088
1984	289	378	860	428	1,956
1985	297	266	836	360	1,760
1986	265	175	761	283	1,484
1987	250	151	770	244	1,415
1988	277	139	702	266	1,384
Louisiana					
1983	280	260	539	213	1,303
1984	340	233	577	202	1,372
1985	313	175	628	174	1,303
1986	260	150	672	135	1,225
1987	216	134	708	116	1,179
1988	208	124	680	129	1,141
Mississippi					
1983	378	229	899	286	1,842
1984	411	202	945	272	1,910
1985	349	149	940	232	1,719
1986	317	136	903	179	1,574
1987	274	103	901	156	1,458
1988	262	113	841	167	1,383
Tennessee					
1983	338	400	338	250	1,327
1984	349	354	366	247	1,316
1985	308	261	366	227	1,162
1986	267	216	352	186	1,021
1987	230	185	342	172	929
1988	234	181	319	172	906

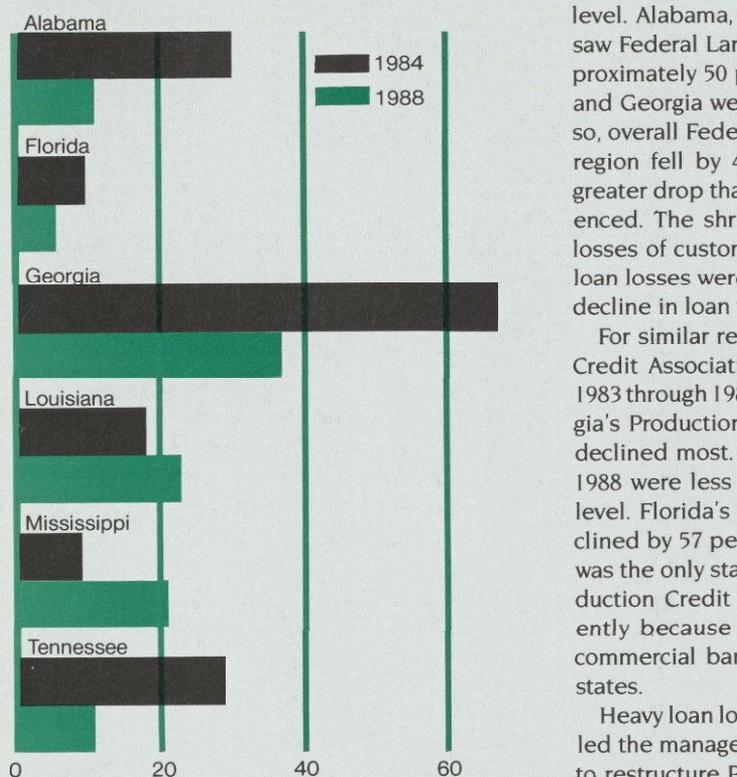
\*Loan data are as of December 31 of each year. Debt of households is excluded.

†Total includes Federal Intermediate Credit Bank and Commodity Credit Corporation commodity loans not shown separately except that in 1988 Production Credit Association loans included Intermediate Credit Bank loans.

Sources: U.S. Department of Agriculture, ECIFS-7 (November 1988); AFO-34 (August 1989).

agricultural banks is attributable primarily to a reduction in agricultural lending or, at least, more rapid growth in lending to other types of customers during the period of economic adversity on farms. The fact that total bank loans to agriculture have increased since 1984 suggests that the reduced number of banks in agricultural lending are now making larger farm loans. The growth in real estate lending would also suggest that some banks are now making larger long-term loans, which smaller banks have typically shunned. The limited capital structure and proportionately high liquidity needs of most small banks make it imprudent for them to tie up large sums of money for long periods of time in farm real estate loans.

**Chart 1.  
Number of Agricultural Banks  
In Southeastern States\***



\*For the purposes of this chart, agricultural banks are defined as banks for which farm loans make up at least 25 percent of the bank's total loan volume.

Source: Computed at the Federal Reserve Bank of Atlanta using information from Federal Deposit Insurance Corporation Call Reports.

## Farm Credit Banks

Unlike commercial banks, Farm Credit System lenders in the Southeast had sharp loan declines following their peak lending period in 1982 and 1983. In the Columbia, South Carolina, Farm Credit District, the combined loan volume of the Federal Land Bank, Federal Intermediate Credit Bank, and Bank for Cooperatives increased 2.4 times from 1975 until the peak of \$7.8 billion was reached in 1982. By the end of December 1988, total loans outstanding had declined to \$3.9 billion, 50 percent below 1982's peak.

Real estate loans provided by the Federal Land Banks fell in all states throughout the mid-1980s. The decline was most drastic in Louisiana where exceptionally severe land value deflation, partially related to the oil industry's collapse, was associated with a drop in Federal Land Bank loan volume in 1988 to less than 30 percent of its 1983 level. Alabama, Mississippi, and Tennessee also saw Federal Land Bank loan volume drop by approximately 50 percent during this time. (Florida and Georgia were somewhat less affected.) Even so, overall Federal Land Bank loan volume in the region fell by 46 percent from 1983 to 1988, a greater drop than other lenders generally experienced. The shrinkage of the agricultural sector, losses of customers to other lenders, and heavy loan losses were the major reasons for the sharp decline in loan volume.

For similar reasons, loans through Production Credit Associations fell by more than half from 1983 through 1988. Among individual states, Georgia's Production Credit Association loan volume declined most. Loans outstanding at the end of 1988 were less than one-fourth the earlier peak level. Florida's loans from these institutions declined by 57 percent from 1983 to 1988. Alabama was the only state to lose less than half of its Production Credit Association loan volume, apparently because fewer customers transferred to commercial banks and the FmHA than in other states.

Heavy loan losses as well as declining business led the management of district banks to attempt to restructure Production Credit Associations. In some cases, separate association offices agreed to merge into statewide or districtwide organizations that then operated some of the former separate offices as branches of the larger group. A number of local offices were closed outright, or they were merged with a neighboring office so that some of the remaining branches now serve wider

territories than did their predecessor organizations. This reorganization has sharply reduced staffing levels and overhead expenses.

In some cases, local Production Credit Association offices have been combined with Federal Land Bank offices to realize further economies from having just one lending office, known as an Agricultural Credit Association. Through this new type of credit association, the Farm Credit System now meets the total credit needs of its farmer constituents. Additional Agricultural Credit Associations are expected to be formed during the coming year. As mentioned previously, the 1987 Farm Credit Act mandated the merger of the Federal Land Bank and the Federal Intermediate Credit Bank within each district. Thus, at the district level, servicing of farm credit needs of all members is now done under one management group. The only exception is the Jackson, Mississippi, Farm Credit District, where the Intermediate Credit Bank still operates separately because the Federal Land Bank is in the process of liquidation. Forthcoming mergers between Farm Credit Districts will probably provide a merger partner for the Jackson Intermediate Credit Bank as well.

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### **The Farmers Home Administration (FmHA)**

The volume of FmHA loans extended grew faster in the Southeast from 1975 to 1985 than in the nation as a whole; the Southeast had a proportionately larger number of marginal farmers for whom the FmHA represented the lender of last resort. The boom in soybean production during the late 1970s led farmers to borrow money from the FmHA to purchase and clear acreages of hilly, poor soil and other such marginal land in order to plant soybeans in hopes of selling their output at the unusually high prices available at that time. However, soybean prices did not remain at the high level expected, and the land soon began to suffer from erosion and loss of fertility so that yields dwindled along with prices. A series of severe droughts compounded problems for producers on marginal land. Emergency loans from the FmHA kept farmers in business for a while, but eventually the amount of unpaid debt grew far beyond the dwindling value of the land serving as security for the loans. In contrast to the declining loan volume for most other lenders from 1983 to 1988, FmHA loans were at nearly the same level in 1988 that they had been five years earlier.

Farmers Home Administration delinquency rates began to rise rapidly around 1980 and eventually

increased from average levels of 10 percent or less to as high as 81 percent in Georgia in 1988 (see Chart 2). Florida's delinquency rate was second highest at 75 percent, while Mississippi and Louisiana recorded rates of 60 and 54 percent, respectively. Tennessee and Alabama had comparatively low delinquency rates ranging between one-fourth and one-third of total loan volume. In general, the highest rates occurred where drought impacts on row crop farmers were most severe and where the volume of emergency loans was high. Eventually, farmers obtained more emergency loans than could realistically be repaid with revenue from crop production, even at relatively high commodity price levels.

For the region as a whole, about 50 percent of the Farmers Home Administration total loan volume was delinquent in 1988, and the majority of the unpaid principal of those loans is probably lost. In many cases borrowers had abandoned their farming efforts and could no longer be found. In some cases where the mortgaged property had substantial value, the Farmers Home Administration was not the first mortgage holder. Revenue from sales of such foreclosed property frequently would be exhausted in absolving the claims of prior lenders, leaving nothing to apply toward Farmers Home Administration debt. Unfortunately, for the large volume of delinquent loans outstanding, it is doubtful that the new procedures implemented by the Farmers Home Administration to return delinquent borrowers to a current position can recover these past-due funds from a majority of debtors in the Southeast.

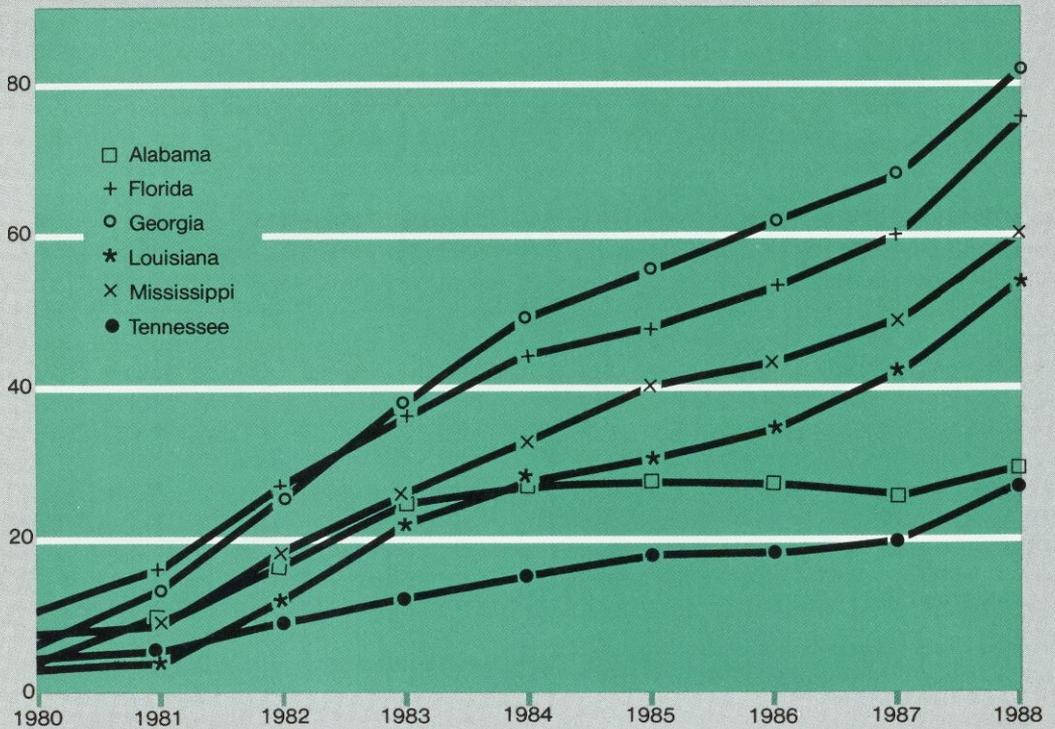
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### **Other Lenders**

Insurance companies and individuals, the remaining principal sources of credit to agriculture, also reduced loans sharply in most locations during the 1983-88 period. Insurance companies, making only real estate loans, reduced lending activity in all states except Florida, where loan volume increased nearly one-third between 1983 and 1988. As an indication of the attractiveness of Florida's agriculture relative to other states, insurance company loans were 2.3 times larger there than in any other state. Loans outstanding in Alabama and Tennessee were only 7 or 8 percent as large as the loan volume in Florida. Alabama's loan volume fell about 50 percent in the 1983-88 period, while insurance company loans in Tennessee were comparatively low at the outset and did not fall as much.

Percent of  
Total  
Outstanding

**Chart 2.**  
**Delinquent FmHA Farm Loans**



Source: U.S. Department of Agriculture, Farmers Home Administration Finance Office, Form FMHA 389-375-A.

Loans from individuals fell sharply in all states during the period of unprofitable production for much of agriculture. Although farming returns have been improving since 1987, real estate loans made by individuals have continued to decline. However, nonreal estate credit from individuals, which includes merchants and dealers, did turn up a bit in 1988 in all states except Tennessee. Farm owners, the major source of real estate loans from individuals, apparently are not yet willing to resume extending credit to would-be purchasers

of farms, but increased farm profits have led merchants to grant increased short-term credit to finance crop and livestock production.

**Note**

<sup>1</sup>Southeast here refers to the states wholly or partially within the Sixth Federal Reserve District: Alabama, Georgia, Florida, Louisiana, Mississippi, and Tennessee.

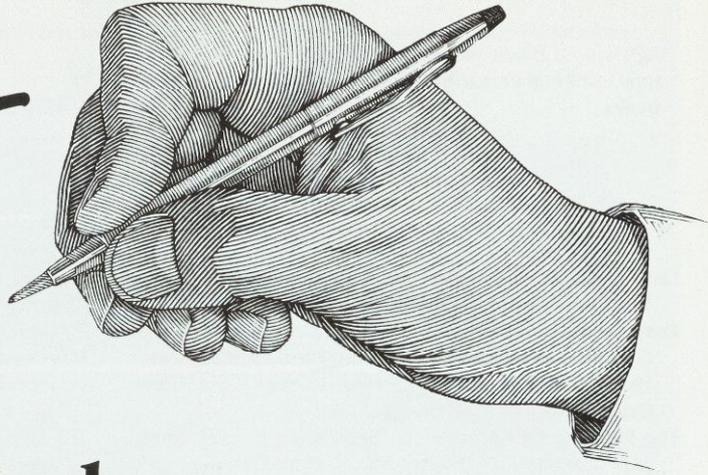
## Note

<sup>1</sup> *Agricultural banks* include banks with a ratio of farm to total loans higher than the unweighted average ratio for all banks.

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J. S. I.



# What's Behind Milk Price Movements?

Gene D. Sullivan

Two unusual circumstances, increased export demand and a dip in productivity, combined to drive milk prices higher in 1989. Despite a five-year pattern of stable to declining prices, moving from an average annual rate of \$13.58 per hundred pounds in 1985 to \$12.24 per hundred pounds in 1988, the farm price for milk began to advance in 1989. By December it had reached \$15.90—17.8 percent above its level the previous year and 29.9 percent higher than the average price in 1988. The shift, which contributed to a rising rate of food price inflation that persists into 1990, was atypical since the market price normally does not vary much from the government support price for milk, and this price had fallen from a peak of \$13.49 in 1981 to \$10.60 in July 1989.

This article looks at the circumstances leading to the price increase, as well as future trends for milk production and consumption, and concludes that prices are likely to drop during 1990. While this is good news for consumers, farmers will feel income constraints that could create

pressures in Congress to set higher support levels for dairy products. However, the dynamics of supply and demand in the milk industry over the past decade, the impact of government programs on prices and surpluses, and patterns of milk consumption all seem to indicate that greater reliance on markets might offer substantial long-run benefits to consumers and the dairy industry alike.

## Exports Heighten Demand in 1989

Per capita use of milk in the United States has long been declining. Since 1972 aggregate demand for all milk products has grown at an average rate of only 0.2 percent per year, and for beverage milk it has hardly grown at all despite the 1.0 percent annual growth in population during that period. The surprising increase in demand in 1989 can be traced largely to a sudden jump in commercial exports of nonfat dry milk to Europe as a result of farm policies there.

In most years since 1965 the United States has been a net importer of milk products, with the

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majority of milk exports limited to relief and aid programs that distributed surplus government stocks. However, European Community measures to curb surplus output of milk products by reducing the supply tightened markets for powdered milk in 1989, especially in France. Heavy European orders to U.S. traders followed, driving dairy product exports in the first half of 1989 to 3.4 times their level during the same period in 1988. Although this export activity accounted for only 2.3 percent of total U.S. milk production, it came at a time when domestic production was slackening.

## Drought and Buy-Outs Cut Supply

As a result of severe drought in 1988 and an unusually cool spring in 1989, milk output per cow dropped sharply in the second half of 1989 despite production gains earlier in the year. Quality forage supplies, already diminished by the drought, were exhausted, and new growth was delayed by cool weather. Loss in feed

quality led to a dip in per cow production—only the second time since World War II year-to-year production has declined. This drop in output came at a time when milk supplies had already been curbed by the Dairy Termination Program (DTP).

Part of the Food Security Act of 1985, the Dairy Termination Program was designed to reduce surplus milk production, with the aim of cutting soaring government outlays required to prop up milk prices through purchases of dairy products. Net expenditures by the Commodity Credit Corporation for dairy support programs had increased dramatically, from \$24 million in 1979 to a peak of \$2.5 billion in 1983 (see Table 1). Stocks of nonfat dry milk and cheese, most held by the U.S. government, reached record high levels of 1.4 and 1.3 billion pounds respectively in 1983, both nearly triple the levels just five years earlier (see Table 2).

Through the Dairy Termination Program dairy farmers volunteered to sell their milk production rights to the Secretary of Agriculture, proposing a price (or bid) based on the volume of milk they marketed in 1985. If the bid were

**Table 1.**  
**Net Outlays of the**  
**Commodity Credit Corporation**  
*(millions of dollars)*

Year	Dairy Support	Total All Programs
1970	87	3,839
1975	424	585
1979	24	3,612
1980	1,011	2,752
1981	1,894	4,036
1982	2,182	11,652
1983	2,528	18,851
1984	1,502	7,315
1985	2,085	17,683
1986	2,337	25,841
1987	1,166	22,408

Source: U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1989* (Washington, D.C., 1989), 638, Table 1102.

**Table 2.**  
**Stocks of Selected**  
**U.S. Dairy Products**  
*(millions of pounds)*

Year	Butter	Cheese	Nonfat Dry Milk
1975	11	369	469
1978	207	457	585
1980	305	691	587
1981	429	976	890
1982	467	1,064	1,282
1983	499	1,266	1,406
1984	310	1,062	1,248
1985	217	944	1,011
1986	252	789	687
1987	147	460	177
1988*	215	398	53

\* Preliminary

Source: U.S. Department of Agriculture, Economic Research Service, *Dairy Situation and Outlook Yearbook*, DS-421 (August 1989), 19-21, Tables 17, 18, 19, 21.

accepted by the Secretary, the farmer would then sell all his or her dairy animals and refrain from producing milk for a period of five years.

The program attracted enough volunteers to cut the number of milk cows by around 675,000 head and reduce milk production by about 800 million pounds—0.6 percent—by 1987. DTP's effect initially offset a sharp increase in per cow milk production during 1987, but in 1988 total milk output began to grow again. However, 1989's output fell markedly in the wake of the 1988 drought, as noted earlier. Reduced supplies and abrupt expansion in export demand combined to raise the market price for milk.

## Prospects for the Future

Does the steep increase in 1989 milk prices mean the Dairy Termination Program reduced supplies too drastically, especially given other production curtailments, so that scarcities will continue? Indications are that the 1989 milk shortage will prove temporary. High milk prices are encouraging several short-run adjustments that will expand output. A new supply of better-quality feed produced in 1989 is now available, and dairy farmers are likely to increase feeding rates, quickly returning output per cow to its trend growth rate or above. Producers will also probably delay culling of herds to keep total production as high as possible during the period of relatively high milk prices, and dairy farm liquidations that might have occurred are likely to be postponed until milk prices fall. Rising numbers of young animals for dairy herd replacement will add to production potential in coming months as well. Larger supplies of feed crops from 1989 harvests are also reducing ration costs for dairy cows, further strengthening the incentive to expand output. Thus milk production is likely to increase in 1990—perhaps by as much as 3 percent—more than restoring the shortfall in 1989.

A continuation of 1989's high prices could tempt some dairy farmers who sold their herds under the Dairy Termination Program to return to production. Even though the program required participating farmers to refrain from production for five years, those entering the program in 1985 could resume in 1990. Since high

prices are not expected to persist in 1990, however, substantial long-run expansion is not likely. Nevertheless, milk supplies will almost certainly rise, while demand seems destined to return to its normal level.

Export markets are likely to erode in 1990 as temporary shortages of products in European markets abate and trade resumes its normal patterns. Contrary to the unusual situation in 1989, European countries have tended to be surplus milk producers, with Belgium, France, Germany, Ireland, and the Netherlands accounting for the lion's share of world export trade in milk products, while U.S. milk exports have largely been confined to distribution of surplus products.

Total domestic demand for dairy products, which has grown at a much slower pace than the annual rate of population expansion, is unlikely to rise much faster in the years ahead and will probably not grow enough to offset the higher production anticipated in 1990. Increasing supplies, declining exports, and sluggish domestic demand suggest that milk prices will fall in the year ahead.

## The Impact of Government Policies

Throughout most of the history of government milk programs prices have been pushed upward by the rising support price level, and lower dairy incomes in response to price reductions could result in pressure on Congress to raise dairy support levels. Since the mid-1930s, federal, state, and municipal programs have evolved to adjust milk supplies and support prices. The rationale for these controls rests in the seasonality of milk production, which, prior to regulatory efforts, caused great volatility in the supply of milk over the course of the year.

In the fall and winter months, both the quality and quantity of feed for dairy cows dwindled; milk production fell sharply below the levels of spring and summer, when high quality green forage crops are usually more abundant. Thus prices tended to fluctuate with the changes in volume of milk available: during the spring and summer, farmers typically had surplus milk that was difficult to sell at any price, while prices were high but producers had less to sell in the

fall and winter. This volatility led to strong demand for government programs that would adjust supplies and support prices at levels that would cover costs. (Futures markets, which are often helpful in reducing seasonal price variation, have not been developed for milk products.)

Beginning with the Agricultural Adjustment Act of 1935, supplies have typically been regulated through marketing orders that specify the amount of fluid milk producers are entitled to sell during given periods of the year. Since fluid milk deteriorates in storage, surplus production has been relegated to nonfluid uses such as butter, cheese, and nonfat dry milk. These applications usually command lower prices than milk allocated to fluid uses.

To support milk prices the federal government buys milk powder, butter, and cheese in sufficient quantities to keep manufacturing milk at a designated price level. In an effort to maintain a parity relationship between the average milk price and the cost of items dairy farmers purchase to produce milk, the designated support price has tended to be set at levels that encourage surplus production.

Until the early 1980s law required the Federal Price Support Program to maintain milk's price between 75 and 90 percent of parity. The parity pricing formula did not take into account the productivity improvements many farmers have been able to achieve over time to cut the relative cost of per-unit milk production. Given greater efficiencies, even support prices set at 75 percent or less of parity can return increasing profits to producers. For example, Table 3 indicates that support prices have generally exceeded cash expenses of milk production and so provided the average producer with an incentive to expand output in order to recoup as much noncash (sunk) expense as possible.

From 1978 to 1983 support prices exceeded not only cash expenses but total costs as well, greatly increasing the profit incentive to expand output. During this period, government-owned stocks of manufactured milk commodities became burdensomely large. In 1983 inventories of cheese and nonfat dry milk rose to inordinately high levels (see Table 2), and stocks of milk-equivalent dairy products reached 17.4 billion pounds—about 12.5 percent of total annual milk production.

Not until the mid-eighties were support prices permitted to decline rather than ratchet upward each year. Though inventories in 1984 and 1985 fell well below 1983 peaks, they were still high enough to warrant the Dairy Termination Program. By early 1988, the support price had fallen to \$10.60 (40 percent of parity) from a peak of \$13.49 per hundredweight. With one or two brief exceptions the market price of milk hovered near the support price until the supply-demand imbalance in 1989, which pushed the average price of all milk sold as much as \$5.00 per hundred above the support price level.

**Table 3.**  
**Price Support Level for**  
**Manufacturing Milk and**  
**U.S. Milk Production Costs**  
(dollars per hundredweight)

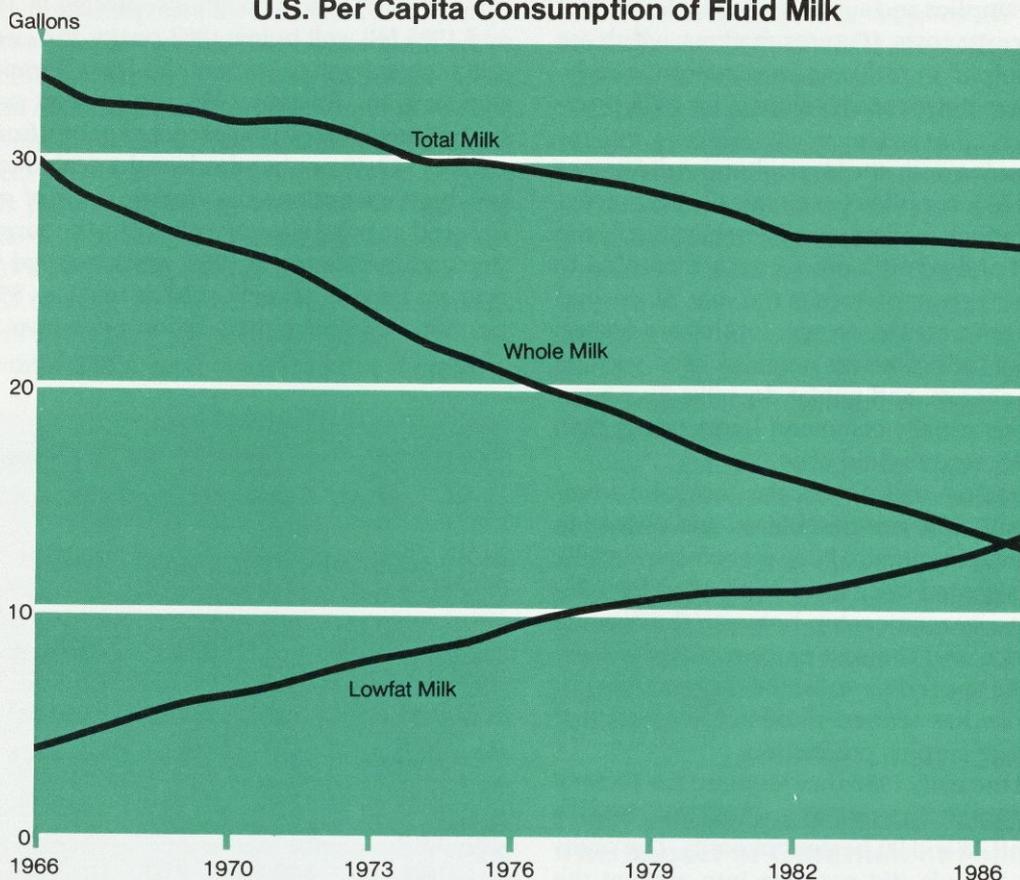
Year	Support Price*	Milk Production Costs	
		Cash Expense	Total Costs†
1973	5.61	5.41	7.36
1974	6.57	6.60	8.79
1975	7.71	6.81	8.79
1976	8.26	7.08	9.09
1977	9.00	6.90	9.04
1978	9.87	7.08	9.49
1979	11.49	8.26	11.07
1980	13.10	9.39	12.27
1981	13.49	9.88	12.64
1982	13.10	9.90	12.50
1983	13.10	10.39	12.91
1984	12.60	10.64	12.95
1985	12.60	10.58	12.18
1986	11.60	10.55	12.13
1987	11.35	10.08	11.74
1988	10.60	—	—

\* Indicates highest support level during the year.

† Includes all overhead expenses and allocated returns to owned inputs.

Sources: U.S. Department of Agriculture, Economic Research Service, *Dairy Situation and Outlook Yearbook*, DS-421 (August 1989), 23, Table 24; and *Dairy Situation and Outlook Report*, DS-417 (October 1988), 10, Table 9.

**Chart 1.**  
**U.S. Per Capita Consumption of Fluid Milk**



Source: U.S. Department of Agriculture, Economic Research Service, *Food Consumption, Prices, and Expenditures, 1966-87*, Statistical Bulletin No. 773 (January 1989).

## How Price Affects Consumption

Though a drop in the cost of milk may generate some increase in consumption, the demand for milk is price inelastic so that gains in use will be proportionately less than the price decline. A recent study by Dale M. Heien and Cathy Roheim Wessells estimates the price elasticity of milk demand at  $-0.63$ ; that is, for each 1 percent change in the price of milk, the corresponding change in consumption is  $-0.63$  percent.<sup>1</sup> This means that the 17.8 percent increase in milk prices in December 1989 over prices the previous year would trigger a reduction in consumption of about 11.2 percent, if all other factors influencing demand remain the same. Should milk's price return to its pre-1989 level

as expected, consumption would likewise be restored to its previous level.

In keeping with the correspondence between the price of milk and the demand for this staple, per capita consumption declined throughout the period of rising prices. Chart 1 demonstrates that from 1966 to 1987 whole milk consumption dropped from 29 gallons per person to about 13—a reduction of 55 percent. Some of that loss was compensated by increased consumption of lowfat milk products, which grew from 3.9 to 13.2 gallons per person. In total, however, fluid milk consumption declined by 7 gallons per person, or 21 percent.

Fluid milk consumption patterns are different from those of other dairy products. Table 4 shows that per capita use of all dairy products declined from the 1960s to the mid-1970s. How-

**Table 4.**  
**U.S. Per Capita Consumption of Selected and Total Dairy Products**  
(pounds)

Year	Whole Milk	Lowfat Milks	Total Fluid Products	Cheese*	Frozen Products†	All Dairy Products‡
1966	250.5	33.5	290.8	9.7	28.1	606.0
1967	239.5	36.5	282.5	10.0	27.9	581.4
1968	233.2	41.9	281.4	10.5	28.7	582.7
1969	225.8	47.1	279.0	10.8	28.7	572.0
1970	219.1	50.0	275.1	11.4	28.5	563.9
1971	214.9	54.5	275.6	12.0	28.2	558.4
1972	207.5	59.6	273.6	13.0	28.0	560.1
1973	197.7	64.6	269.0	13.5	28.0	551.0
1974	186.8	66.9	260.4	14.4	27.7	538.3
1975	181.1	72.7	261.2	14.3	28.6	539.4
1976	175.8	77.6	261.0	15.5	27.5	539.7
1977	167.7	82.5	258.1	16.0	27.5	541.1
1978	161.7	85.1	254.7	16.8	27.3	544.5
1979	155.6	88.1	251.7	17.2	26.5	548.0
1980	147.0	91.2	246.4	17.5	26.4	543.4
1981	139.6	92.9	240.6	18.2	26.4	540.9
1982	134.1	93.1	235.7	19.9	26.4	555.5
1983	130.8	95.9	236.1	20.5	27.0	572.4
1984	126.6	99.1	236.0	21.4	27.1	581.2
1985	122.7	104.6	238.5	22.5	27.8	592.7
1986	115.4	110.4	237.5	23.0	28.7	590.6
1987	109.9	113.6	235.7	24.0	29.1	598.2

\* Excludes cottage cheese.

† Includes ice cream, sherbet, ice milk, mellorine, and frozen yogurt.

‡ Milk-equivalent, fat-content basis of all products including those used as ingredients.

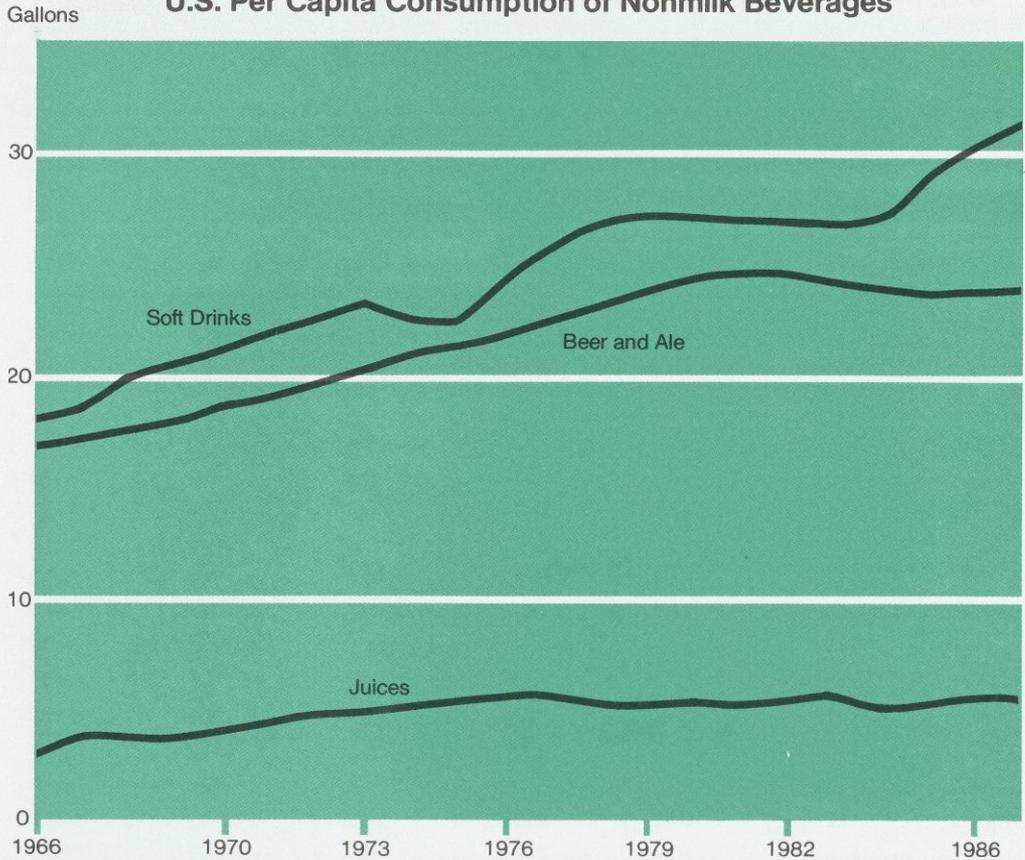
Source: U.S. Department of Agriculture, Economic Research Service, *Food Consumption, Prices, and Expenditures, 1966-87*, Statistical Bulletin No. 773 (January 1989).

ever, rising purchases of cheese and frozen dairy products in the 1980s have helped boost total per capita consumption near its early 1960s level.

Higher prices were not the only cause for declines in fluid milk consumption. Growing concern over the healthfulness of milk fat in the diet was a major factor in the switch from whole to skim milk. Demographic changes have also played a role in decreased milk use. The Heien and Wessells study of demand for milk products demonstrated that the proportion of meals eaten at home significantly affected milk con-

sumption. The higher the share of home meals, the greater the consumption of milk.<sup>2</sup> Income trends may be a related factor. Though higher incomes boost consumption of some foods (known as superior goods), income effects for milk and dairy products generally have been found to be small and negative.<sup>3</sup> As per capita and family incomes have risen, especially as a result of more extensive employment of women, the effect has been to reduce milk consumption slightly. As incomes increase, consumers seem somewhat more likely to choose substitute beverages for milk.

**Chart 2.**  
**U.S. Per Capita Consumption of Nonmilk Beverages**



Source: U.S. Department of Agriculture, Economic Research Service, *Food Consumption, Prices, and Expenditures, 1966-87*, Statistical Bulletin No. 773 (January 1989).

The number of family members in different age and sex groups is also important. Generally, men drink more milk than women though consumption by men drops off after age 20, whereas consumption by women gradually rises through the age group of 21 to 35 (the primary years of childbirth) and declines thereafter. These results suggest that an aging U.S. population, a smaller proportion of children, and reduced shares of meals eaten at home as outside employment increases would have prompted a drop in per capita milk consumption even in the absence of rising milk prices.

Comparisons of price elasticities between milk and other beverages indicate that higher milk prices did not account for much change in consumption of other products.<sup>4</sup> Nevertheless,

per capita consumption of alternative beverages did increase while milk consumption was falling (see Chart 2). A close look at potential mealtime substitutes for milk shows that some of the drop in milk consumption was picked up by gains in soft drink use. In 1966 soft drink consumption stood at 18 gallons per person, but by 1986 it had expanded to 30 gallons—an increase of nearly 70 percent. Consumption of juices, while not a large part of the total, also picked up, from 2.8 to 5.5 gallons per person. The other large gain was in the use of beer and ale, which was up from 16.5 gallons in 1966 to 24 gallons per person in 1987. The 45 percent boost in beer and ale use together with the large growth in soft drink consumption more than offset the volume loss in per capita use of milk. The same demo-

graphic factors that reduced milk consumption apparently worked to increase per capita use of nonmilk beverages.

## Dairy Policy Alternatives

In view of trends toward declining milk consumption and the negative impact of increasing milk prices on demand, support programs that maintain high milk prices or push them still higher may be ill-advised. Though price supports have generally edged downward since 1981, many milk producers understandably resist this income-reducing measure. Rising market prices in 1989 temporarily alleviated the income pressures of declining support prices, but, as subsiding demand and growing production return market prices near support price levels in 1990, producers will again face income constraints.

A new farm bill scheduled to be written during 1990 will probably elicit strong pressures from dairy producers to elevate milk price supports, especially among high-cost producers at the margin who will be forced to liquidate operations if milk prices drop further. Additional buy-out measures like the Dairy Termination Program that would provide an opportunity for such producers to leave the industry might be preferable to returning to high and rising support prices. Higher support levels are not only likely to result in large federal government expenditures but also to lead to reaccumulation of large surplus stocks in government ownership.

Alternatively, policies that allow milk prices to drop to market-clearing levels could have

several long-run benefits to the dairy industry as well as consumers. While more high-cost producers would be weeded out, efficient producers would be able to expand output. Increased efficiency should eventually enlarge the market for milk by passing along productivity gains in lower market prices. Greater price competitiveness could also expand the United States' modest share of exports. The government's cost of supporting dairy operations would diminish since products would no longer need to be purchased, stored, and eventually sold below cost in order to prop up above-market prices for milk.

In addition to reducing public costs, a market-oriented dairy policy might also lower retail prices. This benefit would allow consumers with low to moderate incomes to substitute milk for less nutritious beverages that currently cost less. Nutrition experts claim that a better diet for poverty-class youth could yield large future dividends through improved health and personal development. New directions in dairy policy could thus broaden horizons for the dairy industry while providing significant gains for consumers.

## Notes

<sup>1</sup> Dale M. Heien and Cathy Roheim Wessells, "The Demand for Dairy Products: Structure, Prediction, and Decomposition," *American Journal of Agricultural Economics* 70 (May 1988): 219-28.

<sup>2</sup> *Ibid.*, 222-23.

<sup>3</sup> *Ibid.*, 226.

<sup>4</sup> *Ibid.*, 221.

# Book Review

## *The Economics of Education and the Education of an Economist*

by Mark Blaug.

New York: New York University Press, 1987.

363 pages. \$45.00.



Since the publication of *A Nation at Risk* in 1983, Americans' concern about the United States' international competitiveness has focused largely on schools. Surveys report incredible gaps in U.S. high school and even college graduates' knowledge of elementary geographic and historical facts. American students perform abysmally on standardized math tests compared to their counterparts in other industrialized countries. One-quarter of the nation's high school students do not graduate. In the Southeast, where investment in education has traditionally lagged, a consensus is developing among business leaders and state and local policymakers that the region must increase its commitment to education if it wishes to narrow the ongoing economic gap between itself and the rest of the country.

In this environment Americans are testing a variety of solutions to address the perceived crisis. Proposed agendas vary from an expansion of existing programs to new approaches such as parental choice of schools or a return to a fundamental "core" curriculum.

To gain some perspective on this array of nostrums, people interested in the economics of education should read *The Economics of Education and the Education of an Economist* by Mark Blaug, Emeritus Professor of the Eco-

nomics of Education at the University of London and Consultant Professor of Economics at the University of Buckingham. As intimated in the title, the book not only explores the economic impact of education but also reveals the evolution in Blaug's own views on this subject. That evolution is so substantial that it should caution even the most ardent educational reformers against placing too much faith in the efficacy of any particular proposal. Notwithstanding the warning implicit in Blaug's own experience, several of the book's themes should—given the depth of Blaug's research in this field and his intellectual evolution—encourage policymakers to experiment on several fronts.

The book is divided into three parts, and the articles in each section span as much as two decades. The first section covers the theoretical basis for believing that education has some impact on the economy. The second and third sections deal more directly with policy issues in industrialized economies and developing countries, respectively.

Although the theoretical discussions and the empirical research on education in nations like India, the Philippines, and Thailand might seem of interest only to specialists and practitioners, these articles provide valuable insights into current policy debates, as do the expositions

on economics-related educational issues in Europe and the United States. While Blaug's technical presentations may stretch and challenge readers who lack familiarity with basic econometric techniques, his highly accessible writing style conveys a "bottom-line" sense of research methods and results.

The theoretical section begins with a 1965 article representative of the jejune optimism that marked this early period of research into the economic impact of education. The piece expresses the view widely held then that returns to investment in education could be rather accurately calculated and compared with returns on traditional types of investment. Proponents of this idea believed that a dollar spent on education, whether by individuals or society, offers at least as good a return as tangible capital or financial investments. Three of the other four articles in this section report on the severe blow dealt to this sanguine view by developments in the discipline of economics during the 1970s, which called into question education's intrinsic contributions to productivity and hence to advancements in individual and social wealth.

At the same time that the U.S. economy was marked by accelerating inflation, oil shortages, and a flood of postwar baby boom entrants into the labor force, the economics profession was developing alternative explanations for the correlation identified during the 1960s between education and income. These new views were based not so much on later data or a different theoretical approach as on reinterpretations of the results of earlier studies, which had never directly tested the correlation between education and productivity. Much of the 1960s' research had essentially inferred from correlations of cross-sectional data on schooling and earnings that a link exists between investments in education at one point and productivity in later periods. (Other studies assumed that any productivity gains not explained by such factors as capital investment were the result of education.)

Among the new interpretations of observed statistical relationships, perhaps the most important (and devastating to those who had hewed to the simple education-productivity link of early human capital theory) was the "screening hypothesis," which asserted that

education per se did little to increase productivity. Instead, the hypothesis claimed, high school or college graduates' credentials merely signal to potential employers character traits such as initiative, self-reliance, persistence, and achievement motivation, as well as the graduates' capacity to learn. Education, according to this school of thought, does not create or necessarily enhance either one's learning potential or personality. These traits already exist, whether by virtue of family background or innate abilities. Collecting degrees and diplomas is simply a rational way to move oneself to the head of the job queue, proponents argued.

Blaug's reaction to these different interpretations of education's economic significance is instructive. Although the screening hypothesis pummeled his initial views, Blaug does not reject human capital theory outright even though he remains cautious in his views on what education can be expected to achieve in terms of economic growth. His new middle ground becomes more apparent in the discussion of education issues in the First and Third Worlds.

Six articles are devoted to educational policies in the world's advanced economies. Some of the topics are not directly germane to American policy debates today. Public subsidies to private education, for example, are much less an issue in the United States than in other countries. The concept of recurrent education, whereby postsecondary schooling would be postponed until later years when one would interrupt one's career to pursue relevant courses, perhaps at the employer's expense, has already been adopted by many corporations. The practice has had less impact, though, on people initially unable to afford or qualify for college than on those already in management jobs, according to Blaug.

More relevant to contemporary American concerns are the articles on vouchers. Under a voucher program, states' subsidies to education would not go exclusively to institutions but instead would be passed directly to parents in the form of coupons that could be used at whichever school a family chose. Although this idea is less popular now than early in the 1980s, the concept of parental choice of public schools, whether across the board or for magnet schools, is still very much alive. Blaug carefully analyzes many different ways in which a voucher system

would work, setting forth the attendant costs of each alternative. He shows that open enrollment programs like magnet schools offer most of the advantages of the fullest voucher system without the additional costs he believes such a program would entail. The option of choosing a school tends to force parents to become better informed about education and thus to foster greater cost-effectiveness in resource allocation within school systems, Blaug argues.

Also relevant to current discussions are several articles dealing with public support of higher education, one of Blaug's *bêtes noires*. Such subsidies purport to benefit poorer students as well as to promote macroeconomic growth. In Europe higher education has traditionally been virtually free, at least in terms of tuition. By comparing the absolute and proportional amounts various countries spend on higher education with their respective growth rates, Blaug undermines the argument that any direct correlation exists between the two. He explains that, in some countries, instructional costs are substantially higher without boosting the value of output commensurately.

Blaug attacks even more assertively the argument that subsidized higher education fosters more equitable distribution of wealth over time. He observes, for example, that subsidies to higher education tend to aid students from wealthier families—who can support young adults during four or more years when they could otherwise be earning a living—far more than working-class students. Given the greater expense to the state of providing postsecondary education and the higher opportunity costs to individuals forgoing work, this seemingly proequity policy actually perpetuates social stratification.

Rather than almost exclusive use of government grants to students and direct support of the institutions, as is the practice in many European and developing countries, Blaug instead favors more limited, less costly alternatives, such as greater use of low-interest student loans whose terms would be geared to income. In this way, governments would save money for other purposes such as improving and expanding primary education, which is particularly needed in developing countries, or promoting public programs like health care, housing, or public transportation in industrialized nations, where

primary education is nearly universal. These targeted education subsidies, the author feels, would provide greater benefits to the members of society for whom proequity measures are intended.

Blaug's discussion of public subsidies to higher education is significant in at least two respects. First, it has direct implications for the South, which has funded postsecondary education at a rate higher than the national average while spending proportionately less on kindergarten through grade 12. Changing this policy might help the region find some of the resources it needs to support a greater emphasis on educational goals. Second, Blaug's discourse illustrates the continued value of concepts developed in the golden era of the economics of education, particularly the advan-

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***"Blaug attacks . . . the argument that subsidized higher education fosters more equitable distribution of wealth over time."***

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tages to be gained from considering educational expenditures, even for the purpose of income redistribution, as investments.

The economist returns to this theme in the book's third section, which deals with education's economic impact in the Third World. His articles present the results of empirical research on India, Thailand, and the Philippines. The overriding theme of this portion of the book is expressed by such strong statements as: "[F]ree higher education is a form of regressive taxation which makes a mockery of the policy of egalitarianism to which most Third World governments are dedicated" (p. 350). Just as in the industrialized economies, such subsidies fail to promote a more equitable distribution of wealth. Moreover, in Blaug's view, in the developing nations these policies also contribute to massive un- and underemployment of college graduates and to bloated public sectors,

which absorb many of these countries' more educated citizens.

The author clearly brings home how such practices, considering developing nations' far more limited resources, have been supported at the expense of funding for elementary and secondary education, for which the returns are proportionately higher because the costs per student are so much less. Not surprisingly, developing countries' illiteracy rates remain high and the percentage of their population that has completed primary schooling remains low. Blaug contrasts this situation with that in countries which have achieved greater economic development, such as Japan and the Soviet Union, where universal primary schooling was attained before the expansion of public support for higher education.

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***"The book also indirectly helps readers comprehend . . . economics['] alleged tendency to ignore vital debate in favor of abstruse mathematical research on topics of narrow interest."***

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Of course, Blaug's historical and cross-cultural comparisons may overlook other important explanatory factors. One can also quibble occasionally with his methodology. For example, readers may question whether his conclusions about education's positive contributions to higher income in Thailand are consistent with his acknowledgment of the difficulty of separating education's impact on income from that of other factors such as family background and innate ability.

Moreover, the author's criticism of the overemphasis on providing more years of schooling is somewhat out of date, at least in the United States. During recent decades, particularly the 1960s and 1970s, this country's considerable expansion in higher education—with the creation of more junior colleges and satellite campuses of major state universities as well as more open enrollment at many existing colleges—fell

short of expectations. Many people who took advantage of these opportunities found that their job prospects had not improved much compared to those of the previous generation who had only a high school diploma. At the macroeconomic level, U.S. productivity advances have not matched the performance of the 1950s and 1960s. Still, the nation today has shifted its focus from the quantity of education to its quality. Thus, articles like Eric Hanushek's "The Economics of Schooling," which discusses the effects of such variables as class size, per pupil expenditures, and teacher experience and level of education, are much more useful in grappling with current concerns.<sup>1</sup>

Another of the book's shortcomings is the absence of a comprehensive, analytical essay to integrate all the articles and bring readers up to date. While Blaug does this for theoretical issues through his 1985 article, he does not summarize or update policy issues regarding the industrialized nations and Third World economies. This omission is especially disappointing since the latest article in that section is from 1979. Nor does Blaug present an overall assessment of his own views. (The three-page introduction is little more than a summary of article topics.)

Notwithstanding these minor criticisms—and conceding that current relevance is not the most important criterion by which to judge a body of research—*The Economics of Education and the Education of an Economist* is a useful text for anyone interested in understanding better the complex interrelationship between education and economic growth. Mark Blaug's broad knowledge of educational systems in Africa and Asia as well as Europe and the United States, his familiarity with a wide array of research on this topic, and his ability to communicate both effectively make this book worthwhile reading.

The book also indirectly helps readers comprehend a broader issue in the discipline of economics, namely, its alleged tendency to ignore vital debate in favor of abstruse mathematical research on topics of narrow interest. Economists are frequently criticized for failing to address policy issues like economic development and preferring instead to construct complex models that only a select group of scholars find comprehensible or interesting. Blaug's book demonstrates, though perhaps not by

intent, that if economics has moved away from applied social questions in recent years, it is not because economists themselves are uncaring. Rather, social problems often prove intractable even for the most powerful research methodologies because the various factors which presumably underlie phenomena like poverty, productivity, or educational success tend to be closely intertwined.

Sorting out influences such as family income and teacher salaries on performance in school and later on the job is extremely difficult, if not impossible. Researchers cannot ethically or realistically create and then monitor over a period of years control groups of students from similar family backgrounds but with different classroom experiences—one having more experienced, better-paid teachers, say, and the other having the opposite. Economists who advanced views like the screening hypothesis in the economics of education and in other economic subdisciplines have made it clear that using second-best data leaves research results open to widely varying conclusions and policy implications. Given these difficult conundrums, it is no wonder that many economists have moved on to problems that lend themselves to more certain solutions.

For policymakers the lack of clear-cut answers to questions concerning the relationship of education to economic development means

that reforms will inevitably entail risk. By helping the broader public understand this issue, Blaug's book can build wider acceptance of the fact that just because policy reforms may fail does not mean they were misguided. In today's society the insights of postbehavioral social science, which acknowledge the limits of research and associated policy recommendations, need to be communicated beyond the academic community to policymakers and voters at large. Mark Blaug has made an important contribution to that effort in publishing *The Economics of Education and the Education of an Economist*.

**Bobbie H. McCrackin**

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*The reviewer is public information officer at the Federal Reserve Bank of Atlanta.*

#### **Note**

<sup>1</sup> See Eric A. Hanushek, "The Economics of Schooling: Production and Efficiency in Public Schools," *Journal of Economic Literature* 24 (September 1986): 1141-77.

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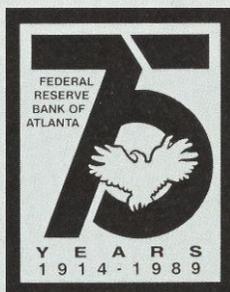
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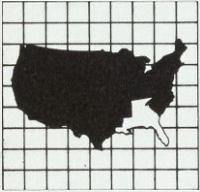


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